Jiangsu Jiayite Hydraulics Co., Ltd.
Add: No. 9, Jinyuan Road, Industrial Park,
Xuyi County, Huai' an , Jiangsu, China 211700
Tel: +86 517 88299106 Fax: +86 517 88299110
Website: www.rekithhydraulics.com

Please scan the QR code
for more information

Rexroth HYDRAULIC

HYDRAULIC VALVES
TECHNICAL CATALOGUE

Directional valve/ Pressure valve/ Flow valve/ Proportional valve/ 2-way logic cartridge valve/ Pressure switch

2024-03

Rexroth® HYDRAULIC

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Directional valve / Pressure valve / Flow valve
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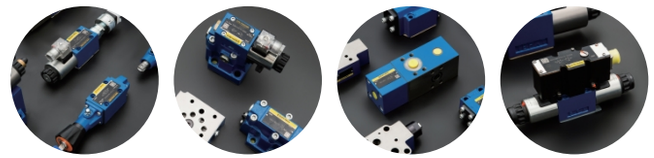
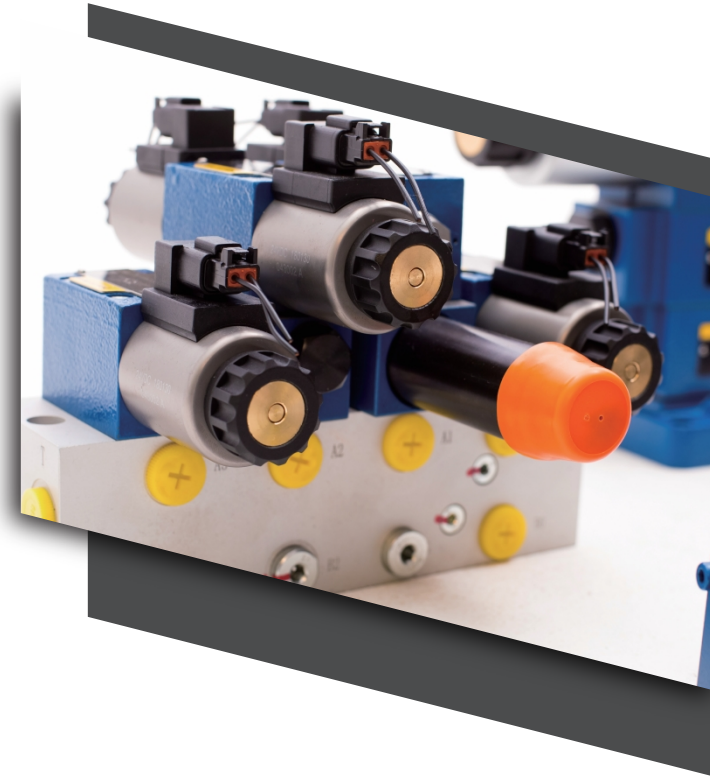
Pressure switch



Jiangsu Jiayite Hydraulics Co., Ltd.

Rekith®
HYDRAULIC



COMPANY PROFILE

Jiangsu Jiayite Hydraulics Co., Ltd. is located in Xuyi County, Jiangsu Province. It is a hi-tech enterprise focuses on manufacture of hydraulic valves and manifolds as an integration of independent R&D, manufacture, sales, and services. The company pays attention to every detail, from manufacturing and logistics delivery to consumption experience.

The company was certified by ISO9001: 2015 quality management system, and gained CE certification and importing and exporting license. We currently have about 600 manufacturing equipment of diverse categories, including testing devices, CNC, high-precision grinders, honing machines, and various high-speed lathes. The annual production capacity for hydraulic valves is more than 800,000 pieces.

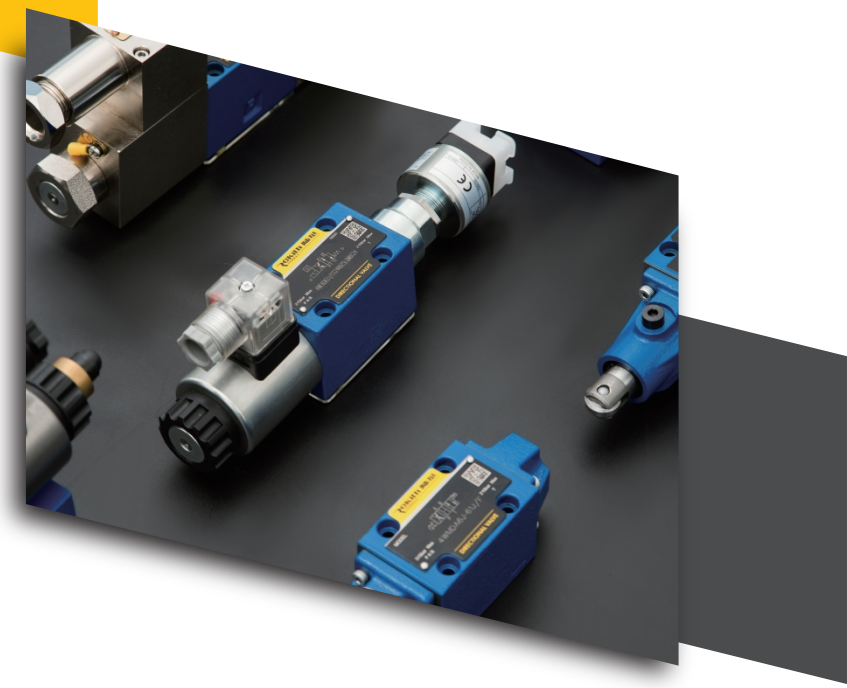
The self-owned brand REKITH is with high quality and high cost performances, which considerably improve customers' market competitiveness. The products are exported to more than 20 countries and regions in North America, Europe, Southeast Asia, Asia, Latin America, and Africa. These products are widely applied to industries such as machine tools, injection machines, agricultural machines, metallurgy industry, vessels, military industry, environmentally-friendly equipment, construction machinery, coal mining machinery, engineering machinery, and aerospace etc.

Valve spool workshop

Valve body workshop

Assembly workshop

Manifolds workshop



Important notes

01.General information

1.1 Notice

This document is an important information for the correct selection, using and maintenance of the hydraulic products and manifolds. Properly using and maintenance of products can reduce failures caused by non-product quality issues and also extend the service life of products.

1.2 Customer's applicable responsibilities

Our company does not assume the quality responsibility due to product damage caused by the following situations:

1.2.1 Failure to operate according to our company's instructions and relevant national standards resulting in product damage.

1.2.2 Disassembly and assembly of products without consent or replacement with parts not designated by our company to result to product damage.

1.3 Important Information

Due to the product information of our hydraulic products is only applicable in a general sense, thus some content may not necessarily be applicable to the hydraulic products you have purchased. But it can prevent accidents and ensure trouble-free operation of hydraulic products only when strictly adhering to this product information and operating instructions.

1.4 Edition rights

It can only reproduce the whole or part of this product information electronically or mechanically with our written permission. Similarly, without permission, this product information can not be published, modified, disseminated, translated into other languages, or used or copied for any other purpose or by any other means.

1.5 Operating Instructions

1.5.1 Technical specifications and environment

Technical specifications: the following specifications apply to the used working fluid unless otherwise specified in the operating instructions:

The working fluid mainly composed of mineral oil meets the requirements of DIN 51524. The working temperature range 0 ° C to + 80 ° C, recommended 55 ° C (<72 ° C in the tank). It can find any deviation from this in the operating instructions. The oil cleanliness is NAS1638 Class 9, the oil cleanliness of the proportional valve is not lower than NAS1638 Class 8.

1.5.2 Climate environment conditions for operation

Unless otherwise specified in the operating instructions, the allowable environment temperature
For the control devices: 0°C...+50°C

For devices with motor but no heat exchanger, cooled by free air circulation system on the surface: 0°C...+30°C

For devices with heat exchanger: <+40°C

02.Hydraulic valve installation instructions

2.1 General

The commissioning and installation of the hydraulic valve should follow the the below standards:

— German standard DIN 24346

— ISO standard ISO 4413

2.2 Washing of system and valve block

In order to meet the cleanliness requirements, the hydraulic system and integrated valve block must be repeatedly washed and continuously tested online by the particle counter. During the washing process, it is necessary to check the filter at any time and the filter element must be replaced as required.

2.3 Installation

After verifying the models of the hydraulic valve, ensure that the connection surface and bottom of the valves are clean, no rust, without moisture and oil.

2.4 Cleaning

2.4.1 During installation, it must ensure that the hydraulic valve and the surroundings are clean. The tank should be sealed, and the pipeline and the tank must be free of dirt, rust, sand, debris, etc. The hot bending or welded pipelines must be pickled, flushed, and oiled. It is recommended to wipe with non-woven fabric.

2.4.2 The pipelines are made with seamless steel pipes in accordance with DIN2391 Parts 1 and 2.

2.4.3 The installation surface finishing according to Ra ⩽ 0.8, flatness ⩽ 0.01mm/100mm.

2.4.4 The fixing screws must meet the specifications and strength specified in the catalogue, and be tightened according to the specified tightening torque.

2.4.5 It is recommended to use the oil and air filters with the same accuracy as the hydraulic system filters.

2.4.6 When installing hydraulic valves, ensure that the installation surface and bottom are without moisture and oil.

If the oil is unavoidable on the connection surface, please tighten the screws manually firstly and then use the dynamic torque tool to tighten the screws according to the tightening torque value. If there are more than four screws, it should tighten the middle screw first.

2.4.7 The installation position of the hydraulic valve:
Directional valve: horizontally (the spool is in the horizontal direction)
Check valve without spring: vertically (the spool can be reversed closed under self-gravity)
Pressure switch with drain port: it must ensure that the maximum drain pressure does not exceed 2bar.

03.Commissioning and maintenance of hydraulic valve

3.1 Requirements for hydraulic maintenance personnel

The maintenance includes three separate activities: cleaning and care, inspection and repair.
The maintenance personnel shall meet the following requirements:
The maintenance personnel must be familiar with the functions of the hydraulic system in general (from the subsystem to its interaction with the functionality of the machine).
The maintenance personnel must be able to read hydraulic circuit diagrams, interpret various functions based on symbols, and understand the functional diagrams.
The maintenance personnel must understand the function and structure of hydraulic valve components.

3.2 Hydraulic oil

The hydraulic oil used should comply with the specifications in the catalogue, follow the pressure and temperature range, and do not exceed the recommended maximum temperature. In order to ensure constant response characteristics, the hydraulic oil temperature should be kept constant (± 5 °C). The hydraulic oil should be avoided from contamination at all times to prevent jamming of hydraulic valves.

3.3 Sealing material

It should choose NBR, HNBR or FKM seals according to the type of oil and the highest or lowest temperature conditions. Please consult our company specifically.

3.4 Filtering

Please comply with the maximum allowable contamination specified in the catalogue. The filtering elements used must not exceed the specified maximum pressure difference. It is recommended to use a filter with a blockage indicator. It must keep clean when replacing the filter. The pollutant on outlet side of the filter will be flushed into the system and cause failure, and the pollutant on inlet side of the filter will reduce the service life of the filter element.

3.5 Maintenance

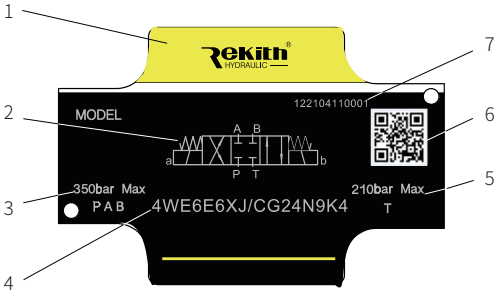
It must be replaced in time because of the natural wear and aging of the seals.

3.6 Storage

It must be stored in a place which dry, dust-free, no corrosion and steam. When the storage period exceeds 6 months, the valve should be injected with anti rust oil and then sealed.

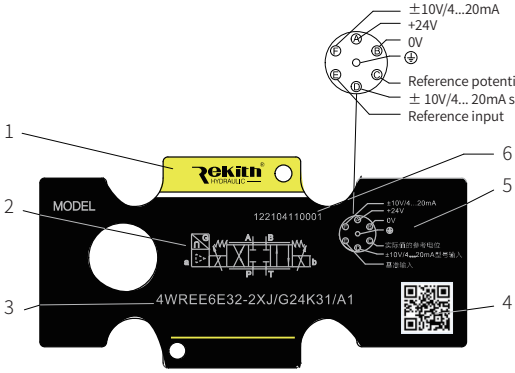
Instruction of name plate

Schematic diagram of on/off valve name plate:



1 Brand
2 Functional symbol
3 Maximum working pressure at ports P, A, and B
4 Model
5 Maximum working pressure at port T
6 Company official website QR code
7 Product tracking code

Schematic diagram of proportional valve name plate:



1 Brand
2 Functional symbol
3 Model
4 Company official website QR code
5 Wiring instruction for proportional valve
6 Product tracking code

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1 - Directional valves

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- WE6...6XJ/Solenoid operated directional valve 0111-0120
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- 4WEMM6/10.../Solenoid operated directional valve with emergency handle 0139-0146
- WE/(26)...(QMBG24).../Solenoid directional valve with spool position monitoring 0147-0158

Isolating valve

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1 - Directional valves

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- WEH/WH...5XJ/Hydraulic or electro-hydraulic directional valve 0223-0242
- WEH/WH...4X/6X/7XJ/Hydraulic or electro-hydraulic directional valve 0243-0268

Explosion-proof solenoid directional valve

- GD-WE6...6XJ/Explosion-proof solenoid directional valve 0269-0276
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- GD-4WEMM6/10.../Explosion-proof solenoid operated directional valve with emergency handle 0285-0290
- G-M-SEW6...3XJ/Explosion-proof solenoid operated poppet valve 0291-0300
- G-M-SEW10...1XJ/Explosion-proof solenoid operated poppet valve 0301-0310
- G-WEH/WH...4X/6X/7XJ/Explosion-proof electro-hydraulic directional valve 0311-0334

Check Valve

Model: S

- Size 6 to 30
- Maximum working pressure 450 bar
- Maximum working flow 450 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Characteristic curve	03
Component size	04-05

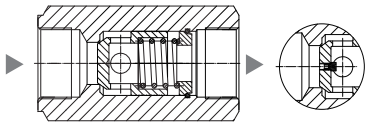
Features

- Leakage-free blocking in one direction
- Various cracking pressure
- Threaded connection
- Subplate mounting

Function description, sectional drawing

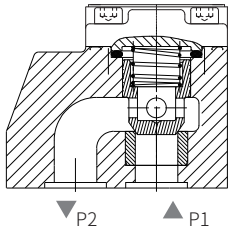
The S type check valve is used to allow the oil to flow freely in one direction but without allowing reverse flow. It is a conical valve structure with small pressure loss, various cracking pressure and two connections.

The valve is mainly used at the outlet of the pump for back pressure valve and bypass valve.



Threaded connection

With throttle



Subplate mounting

Symbol:

without spring

with spring

Modes and specifications

S | | | | | J | | | | | | *

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

connection threaded[2] no code= G thread
2= Metric thread

throttle[2]
no code= without throttle
B00= M4 thread without installation
B10= throttle ϕ1.0mm
B12= throttle ϕ1.2mm
B15= throttle ϕ1.5mm

corrosion resistance (according to EN ISO9227)[2]
J3= improve corrosion resistance, 240h salt spray test
J5= improve corrosion resistance, 720h salt spray test

Maximum working pressure[2]
420= 42MPa (size 25, 30)
450= 45MPa (size 6~20)

J= Rexroth

check valve =S

A	P	size
6	-	= 6
8	-	= 8
10	10	= 10
15	-	= 15
20	20	= 20
25	-	= 25
30	30	= 30

subplate mounting =P
threaded connection =A

cracking pressure:

	P	A
without spring	=0	=00
cracking pressure 0.2bar	=-	=01
cracking pressure 0.5bar	=1	=05
cracking pressure 1.5bar	=2	=15
cracking pressure 3bar	=3	=30
cracking pressure 5bar	=5	=50
cracking pressure 8bar[1]	=-	=80

0 series (only for P type) =0
(0 to 9 series: installation and connection size unchanged)
1 series (only for A type) =1X
(10 to 19 series: installation and connection size unchanged)

Note: [1] Only for size 25,30
[2] Only for threaded connection

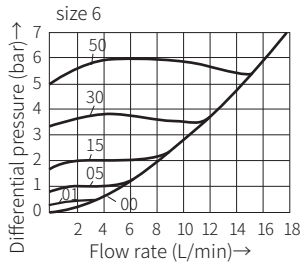
Technical parameters

Fluid		Mineral hydraulic oil or phosphate hydraulic oil
Temperature range	(°C)	-30 to +80
Viscosity range	(mm^2 / s)	2.8 to 500
Working pressure	(bar)	to 420(size 25, 30) ; to 450 (size 6~20) , to 315 (subplate mounting)
Cracking pressure	(bar)	See characteristic curve
Maximum flow	(L/min)	

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

size 6



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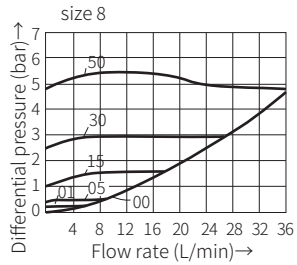

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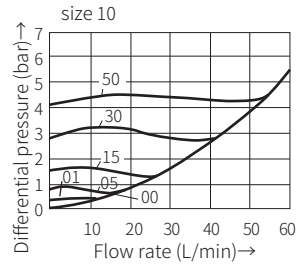
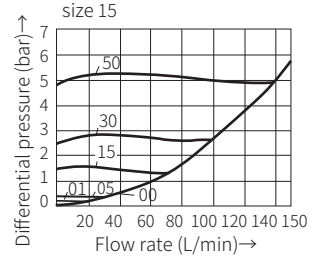
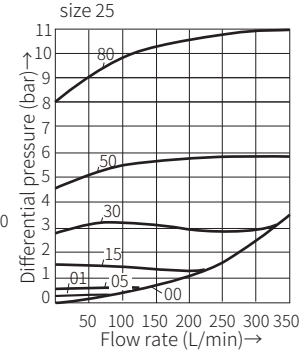


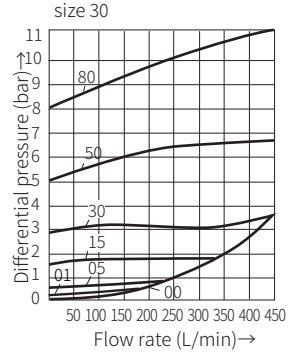
size 15



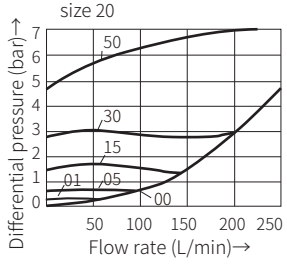
size 25



size 30



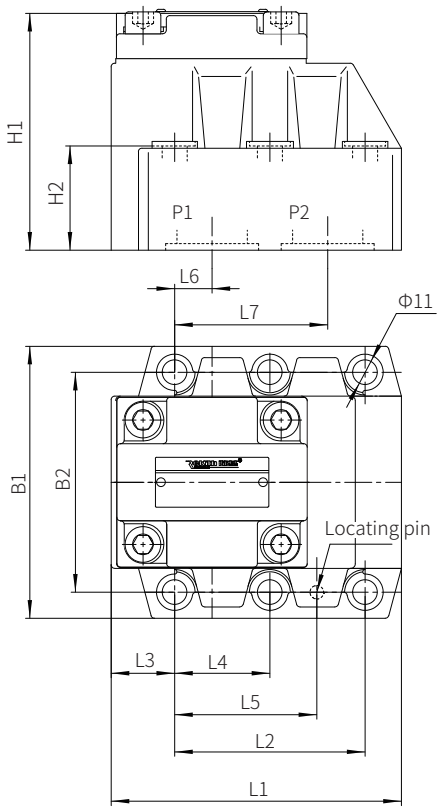
size 20

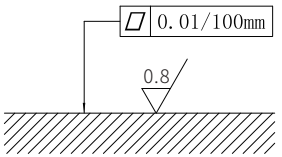


Component size

Size unit: mm

Subplate mounting valve S...P...0J





Required surface finishing of mating components

Subplate model:

size 10:G460/01 G460/02
G461/01 G461/02

size 20:G412/01 G412/02
G413/01 G413/02

size 30:G414/01 G414/02
G415/01 G415/02

Valve fixing screw:

size 10:4-M10×40-10.9 GB/T70.1-2000
Tightening torque M_A=60Nm

size 20:4-M10×50-10.9 GB/T70.1-2000
Tightening torque M_A=60Nm

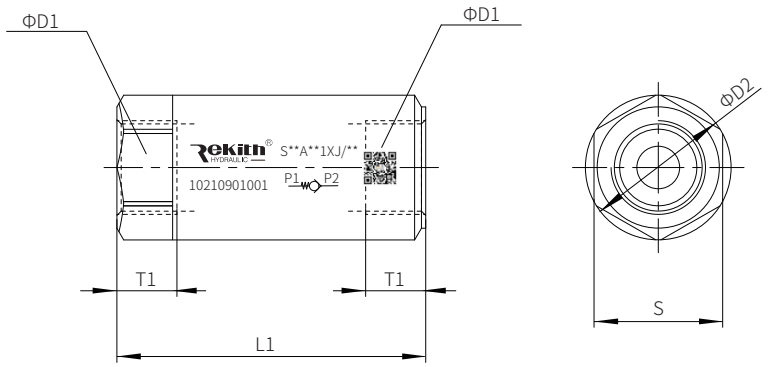
size 30:4-M10×70-10.9 GB/T70.1-2000
Tightening torque M_A=60Nm

Size	B1	B2	L1	L2	L3	L4	L5	L6	L7	H1	H2	O-ring for ports P1、P2
10	85	66.7	78	42.9	17.8	-	31.8	7.1	35.7	64	21	17.12×2.62
20	102	79.4	101	60.3	23	-	44.5	11.1	49.2	91	31.5	28.17×3.53
30	120	96.8	128	84.2	28	42.1	62.7	16.7	67.5	104.5	46	34.52×3.53

Component size

Size unit: mm

Threaded connection valve S...A...J/



Size		6	8	10	15	20	25	30
D1	G	G1/4″	G3/8″	G1/2″	G3/4″	G1″	G1-1/4″	G1-1/2″
	M	M14×1.5	M18×1.5	M22×1.5	M27×2	M33×2	M42×2	M48×2
D2		22.5	28	34	42	52	68	74.5
L1		58	58	72	85	98	120	132
T1		12	12	14	16	18	20	22
S		19	24	30	36	46	60	65
Weight（Kg）		0.1	0.2	0.3	0.5	1	2	2.5

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Check Valve

Model: RVP...1XJ

- Size 6 to 40
- Maximum working pressure 315 bar
- Maximum working flow 600 L/min

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Component size	04

Features

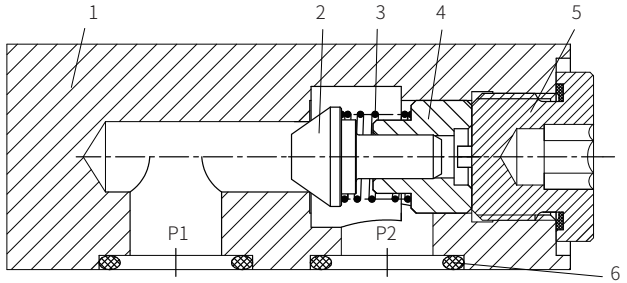
- Subplate mounting
- Leakage-free blocking in one direction

Function description, sectional drawing

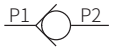
The RVP type check valve is used to allow the oil to flow freely in one direction without allowing reverse flow.

The stroke of the valve core is limited by the spring seat, and the built-in spring keeps the valve core in a closed state.

The RVP type check valve is a conical valve structure with low pressure loss. It is mainly used at the outlet of the pump as a back pressure valve and bypass valve.



1 Valve body 2 Conical valve core 3 Spring 4 Spring seat 5 Plug 6 O ring

Symbol 

Models and specifications

RV | P | – | 1X | J | / | *

Check valve =RV

Subplate mounting =P

Size 6 =6
Size 8 =8
Size 10 =10
Size 12 =12
Size 16 =16
Size 20 =20
Size 25 =25
Size 30 =30
Size 40 =40

1X= Series 10 to 19 (10 to 19 series installation and connection size unchanged)

J= Rexroth

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

Technical parameters

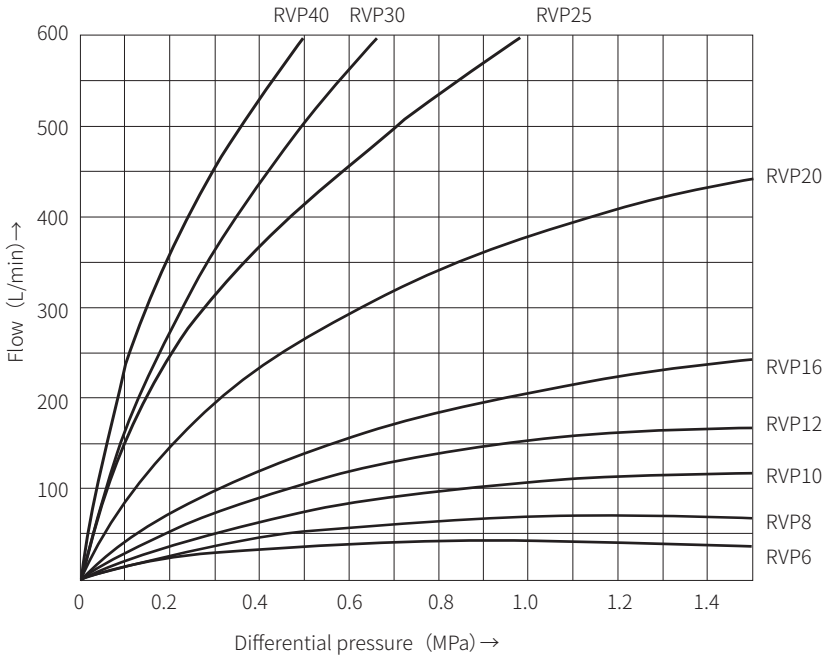
Size	6	8	10	12	16	20	25	30	40
Maximum working pressure (MPa)	31.5								
Cracking pressure of check valve (MPa)	0.05								
Pressure medium	Mineral oil(HL,HLP)[1] in accordance with DIN51524; Fast living organisms Degraded oil according to VDMA 24568; HETG(Rapeseed oil)[1] HEPG(Polyethylene glycol)[2]; HEES(synthetic ester)[2]								
Oil temperature range (°C)	-20 to 80								
Viscosity range (mm^2/s)	2.8 to 500								
Installation position	Optional								

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C±5°C)

Flow direction: P1 to P2

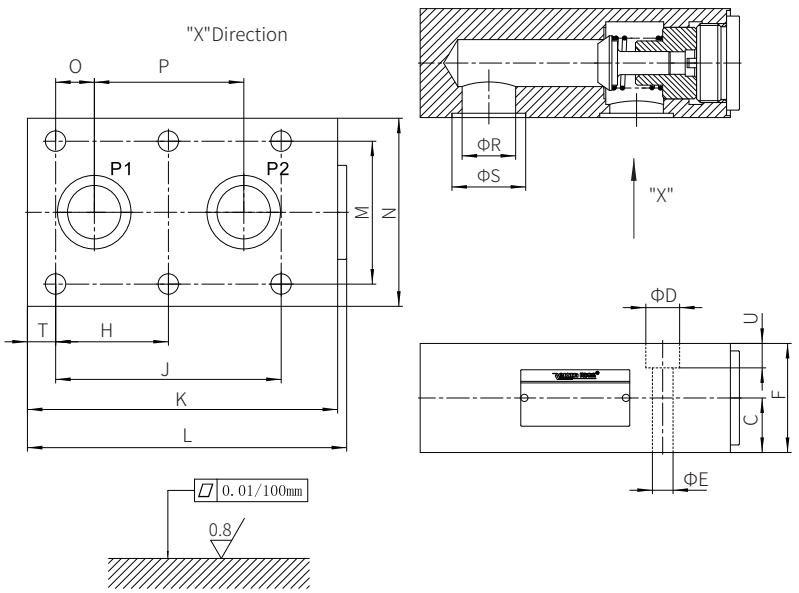
The relationship between differential pressure △ P and flow Q



Component size

Size unit: mm

Model RVP...1XJ/...



Required surface finishing of mating components

Size	C	D	E	F	H	J	K	L	M
RVP-6	11.5	11	6.6	23	-	19	41.5	46	28.5
RVP-8	13	11	6.6	24	-	35	63.5	67	33.5
RVP-10	13.5	11	6.6	27	-	33.5	70	74	38
RVP-12	16	11	6.6	32	-	38	80	84	44.5
RVP-16	22.5	14	9	45	38	76	104	109	54
RVP-20	26	14	9	50	47.5	95	127	132	60
RVP-25	29	18	11	58	60	120	165	170	76
RVP-30	37.5	20	14	75	71.5	143	186	192	92
RVP-40	50	20	14	100	67	133.5	192	198	111

Size	N	O	P	R	S	T	U	Weight (kg)
RVP-6	41.5	1.6	16	6	12.2	6.4	8	0.26
RVP-8	46	4.5	25.5	8	13.7	14.2	10	0.5
RVP-10	51	4	25.5	10	15.7	18	7	0.80
RVP-12	57.5	4	30	13	21.8	21	7	1.10
RVP-16	70	11.4	54	17	24.5	12	12	2.25
RVP-20	76.5	19	57	22	31.5	16	12	3.90
RVP-25	100	20.6	79.5	28.5	39.2	15	13	6.70
RVP-30	115	23.8	95	31	41	15	13	11.0
RVP-40	140	25.5	89	45	54	16	18	17.0

Plug-in Check Valve

Model: M-SR...KE...1XJ

- Size 8 to 30
- Maximum working pressure 315 bar
- Maximum working flow 400 L/min

Contents

Function description, sectional drawing	02
Functional symbols	02
Models and specifications	02
Technical parameters	03
Characteristic curve	04
Component size	05

Features

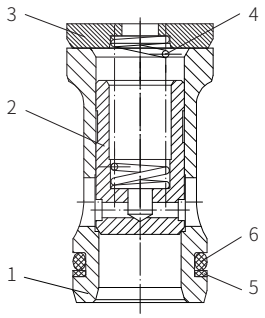
- Insert into the manifolds blocks
- Reverse closing without leakage
- 6 optional cracking pressure

Function description, sectional drawing

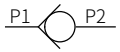
The M-SR..KE...1XJ/ type plug-in check valve is used to allow oil to flow freely from one direction only. The spring inside keeps the valve core in a closed state.

M-SR...KE... 1XJ/ plug-in check valve valve mainly includes:
(1) Valve sleeve
(2) Valve core
(3) Spring seat
(4) Spring
The check valve has a conical valve structure with low pressure loss.

It is mainly used at the outlet of the pump as a back pressure valve and bypass valve.



Functional symbols



Models and specifications

M-SR | | KE | | – 1X | J | / | | *

plug-in check valve

size 8	=8
size 10	=10
size 15	=15
size 20	=20
size 25	=25
size 30	=30

right angle type =KE

no spring	=00
cracking pressure 0.2bar	=02
cracking pressure 0.5bar	=05
cracking pressure 1.5bar	=15
cracking pressure 3.0bar	=30
cracking pressure 5.0bar	=50

1X= 10 to 19 series (10 to 19 series installation and connection size unchanged)

J= Rekith

sealing material
No code= NBR seals
V= FKM seals (consult for other seals)

more information in text

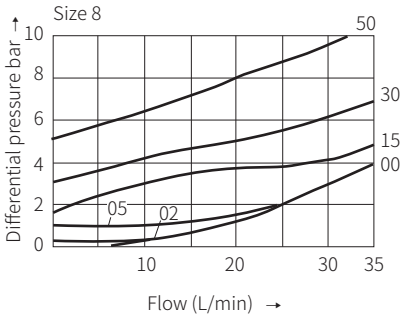
Technical parameters

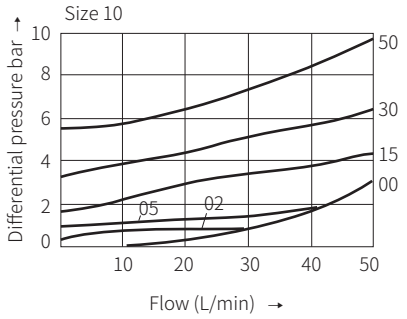
Maximum working pressure	bar	to 315					
Cracking pressure	bar	See models and specifications					
Pressure medium		Mineral oil(HL,HLP) [1] in accordance with DIN 51524; fast living organisms Degraded oil according to VDMA 24568; HETG(Rapeseed oil)[1]; HEPG(Polyethylene glycol)[2]; HEES(synthetic ester)[3];					
Oil temperature range	°C	-30 to +80 (NBR seal)					
		-20 to +80 (FRM seal)					
Viscosity range	mm^2/s	2.8 to 500					
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15					
Size		8	10	15	20	25	30
Maximum flow		35	50	120	200	300	400

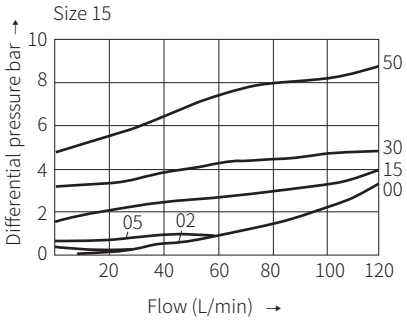
1)For NBR seal and FKM seal
2)Only for FKM seal
3)The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effect oil filtration can prevent failure and increase the service life of the components.

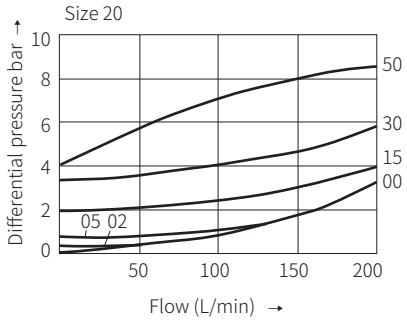
Characteristic curve

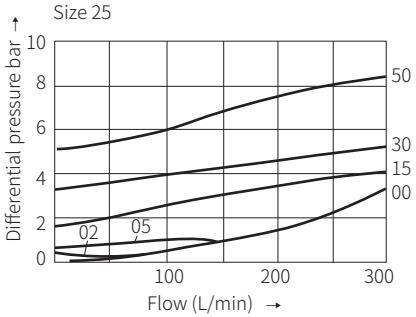
(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)

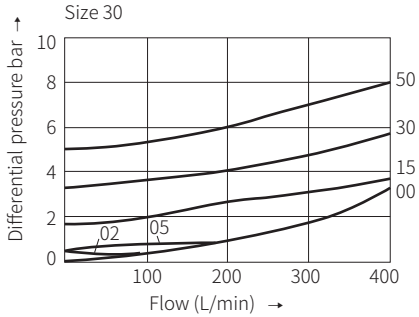








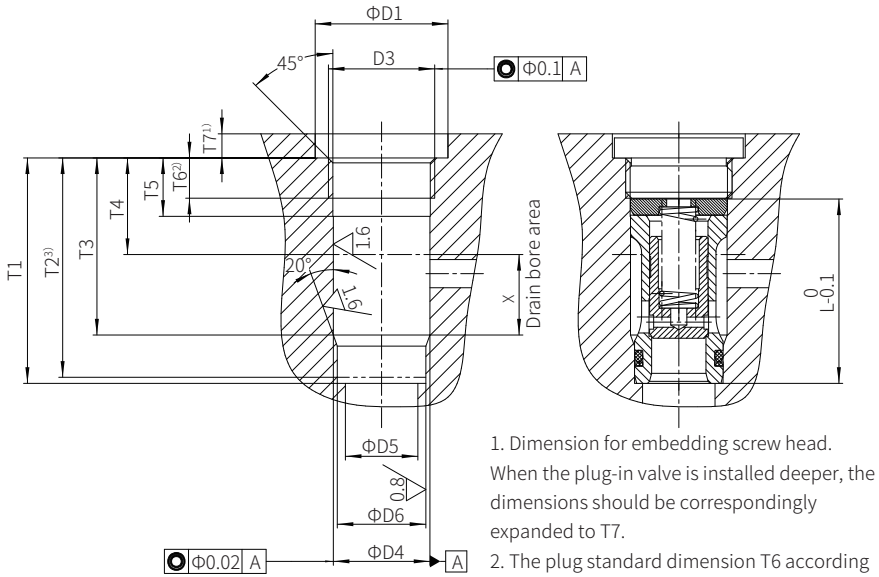




Component size

Size unit: mm

Model M-SR..KE..-1XJ/..



1. Dimension for embedding screw head. When the plug-in valve is installed deeper, the dimensions should be correspondingly expanded to T7.
2. The plug standard dimension T6 according to DIN3852.
When using other plugs, it should be recalculated based on the total length L of the valve.
3. Fitting depth.

Size	8	10	15	20	25	30
L	36.3	39.3	45.8	55.3	74.3	83.3

Hole size of the right angle type plug-in check valve

Size	P(bar)	D1	D3	D4(H8)	D5	D6(H7)	$T1^{+0.1}_{0}$	T2	T3	T4	T5	T6	T7	X
8	315	23	G3/8	14	8	13	48.5	47.5	38.5	20	15	12	6	18
10	315	28	G1/2	18	10	17	53.5	52.5	43.5	24	18	14	6	19
15	315	33	G3/4	24	15	22	62	60.5	50	26	20.5	16	6	24
20	315	41	G1	30	20	28	71.5	70	56.5	26	20.5	16	7	30
25	315	51	G11/4	38	25	36	90.5	88	72.5	28	22	16	7	43
30	315	56	G11/2	44	30	42	99.5	96.5	79.5	31	22	16	7	48

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01

Modular Check Valve

Model: Z1S6...3XJ

- Size 6
- Maximum working pressure 315 bar
- Maximum working flow 40 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	04

Features

- Modular type valve
- For vertical stacking installation

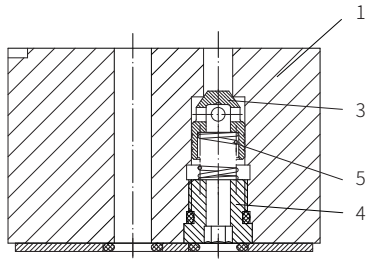
Functional description, sectional drawing

The Z1S6 type valve is a direct operated check valve with a modular structure. This check valve is closed without leakage in one direction and allows free flow in the other direction.

The stroke of the conical spool (3) is limited by the spring seat (4). The spring (5) causes the conical spool (3) to close. When there is no fluid flows through the valve, the spring (5) holds the conical spool (3) in the closed position.

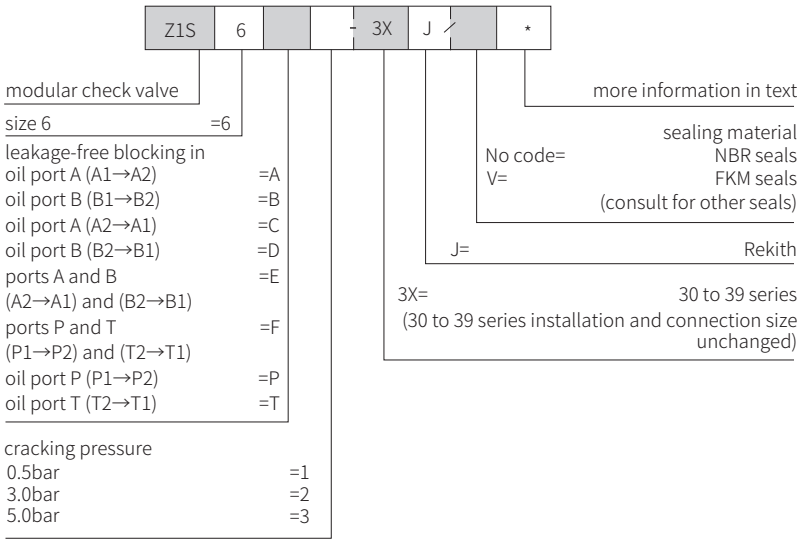
Model Z1S6...3X/V (metal-sealed)

This valve has a metallic seal between the conical spool (3) and the valve body (1). Therefore, it is particularly suitable for condition of working pressure higher than 100bar and the flow rate greater than 4m/s.



Model Z1S6D...-3XJ/

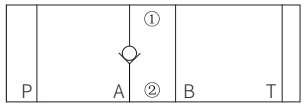
Models and specifications



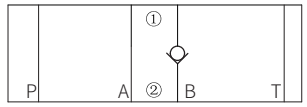
Functional symbols

(①= Valve side, ②= Subplate side)

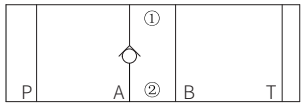
Model Z1S6A



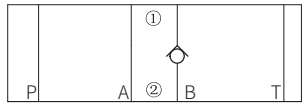
Model Z1S6B



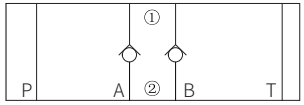
Model Z1S6C



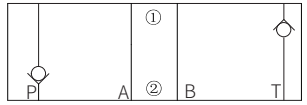
Model Z1S6D



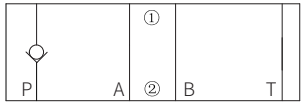
Model Z1S6E



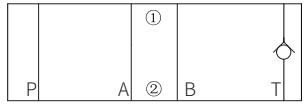
Model Z1S6F



Model Z1S6P



Model Z1S6T



Technical Parameters

Overview		
Weight	kg	0.8
Installation position		Optional
Environment temperature range	°C	-20 to +80
Hydraulic		
Maximum working pressure	bar	315
Cracking pressure — Metal-sealed		0.5; 3; 5
Maximum flow	L/min	40
Flow rate — Metal-sealed	m/s	＞4
Pressure medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range	°C	-20 to +80
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15

1) For NBR seal and FKM seal.

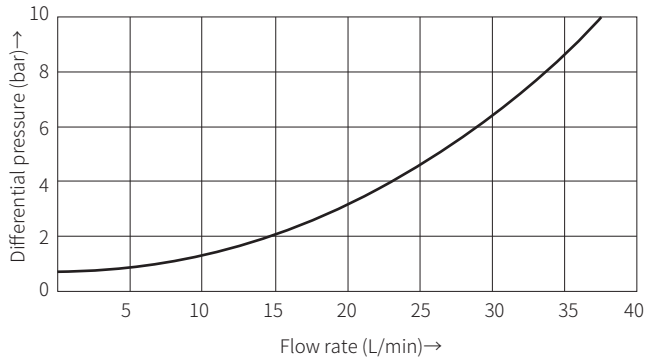
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

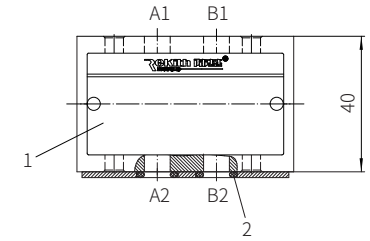
△p-q_v Characteristic curve (A1 to A2)



Component size

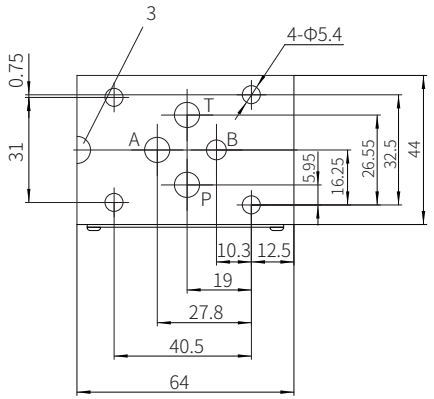
Size unit: mm

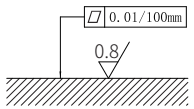
Model Z1S6...-3XJ/...



1 Name plate
2 O-ring 9.25x1.78
3 The top surface with R groove

Valve fixing screw (need to be ordered separately)
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm





Required surface finishing of mating components

Modular Check Valve

Model: Z1S10...3XJ

- Size 10
- Maximum working pressure 315 bar
- Maximum working flow 100 L/min

Contents

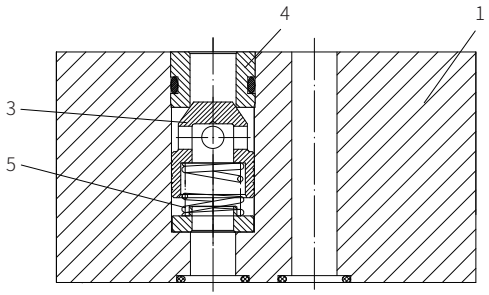
Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	04

Features

- Modular type valve
- For vertical stacking installation

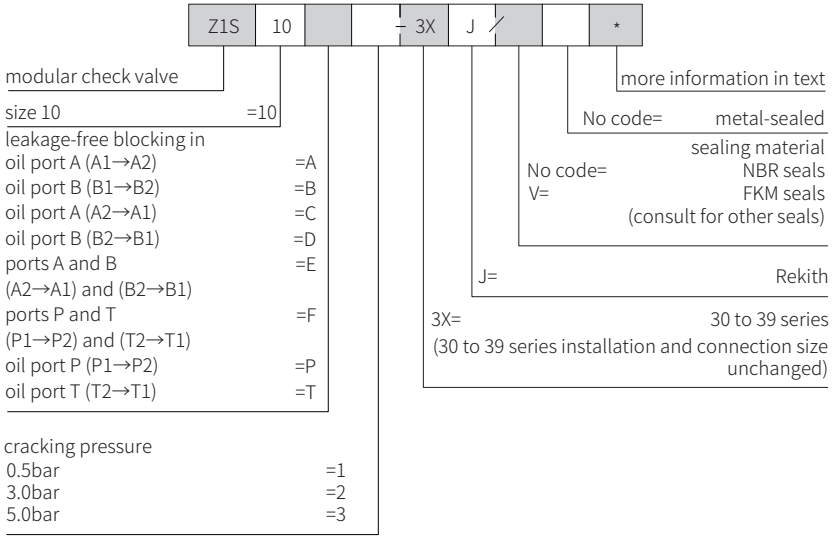
Functional description, sectional drawing

The Z1S10 type valve is a direct operated check valve with a modular structure. This check valve is closed without leakage in one direction and allows free flow in the other direction.
The stroke of the conical spool (3) is limited by the spring seat (4). The spring (5) causes the conical spool (3) to close. When there is no fluid flows through the valve, the spring (5) holds the conical spool (3) in the closed position.
Model Z1S10...3XJ/V (metal-sealed)
This valve has a metallic seal between the conical spool (3) and the valve body (1). Therefore, it is particularly suitable for condition of working pressure higher than 100bar and the flow rate greater than 4m/s.



Model Z1S10...3XJ/

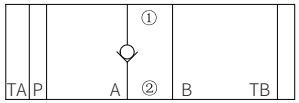
Models and specifications



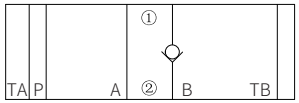
Functional symbols

(①= Valve side, ②= Subplate side)

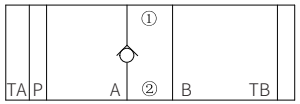
Model Z1S10A...



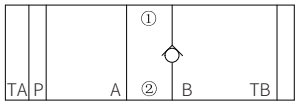
Model Z1S10B...



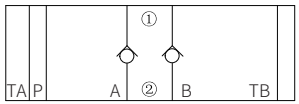
Model Z1S10C...



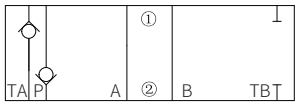
Model Z1S10D...



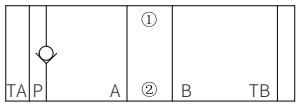
Model Z1S10E...



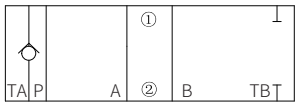
Model Z1S10F...



Model Z1S10P...



Model Z1S10T...



Technical Parameters

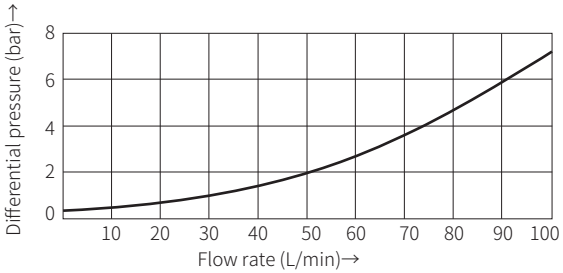
Overview		
Weight	kg	0.8
Installation position		Optional
Environment temperature range	°C	-20 to +80
Hydraulic		
Maximum working pressure	bar	315
Cracking pressure — Metal-sealed		0.5; 3; 5
Maximum flow	L/min	40
Flow rate — Metal-sealed	m/s	>4
Pressure medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range	°C	-20 to +80
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

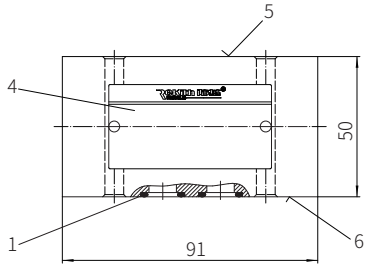
△p-q Characteristic curve (A1 to A2)



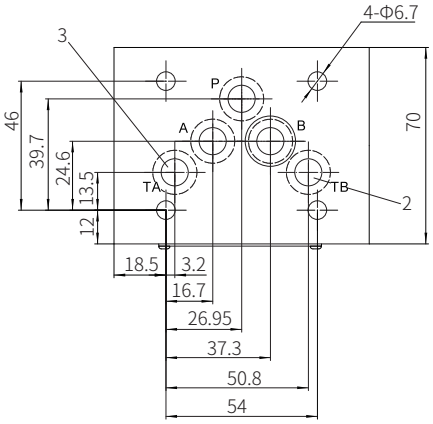
Component size

Size unit: mm

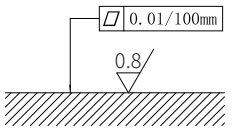
Model Z1S10...-3XJ/...



1O ring 12x2 (for oil port A, B, P, TA, TB)
2 This port is blocked for "F" and "T" type valves
3 In "F" and "T" type valves, the check valve is installed in this channel
4 Name plate
5 Valve side
6 Subplate side



Valve fixing screw (need to be ordered separately)
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm



Required surface finishing of mating components

Modular Hydraulic Control Check Valve

Model: Z2S4...6XJ

- ◆ Size 4
- ◆ Maximum working pressure 320 bar
- ◆ Maximum working flow 20 L/min

Contents

Function description, sectional drawing	02
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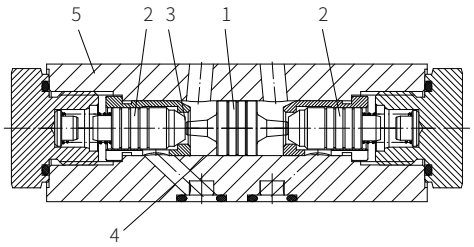
Features

- ● For vertical stacking installation
- ● One or two working oil ports blocked for leakage-free as required.

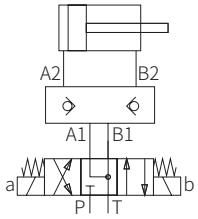
Function description, sectional drawing

The Z2S type is a superimposed structure hydraulically control check valve. This type of valve can keep one or two working oil ports leakage-free even if it works for a long time.
There is a free flow in the direction A1 to A2 and B1 to B2 but closed in the opposite direction. When the oil flows from A1 to A2 or B1 to B2, the piston (1) works, the control spool (1) is moved to the right or left and pushes the valve spool (2) away from its seat. In order to ensure the valve spool (2) to be closed safely, the oil must flow from B2 to B1 or A2 to A1.The working oil port of the directional valve must be connected to the oil tank in the neutral position (see circuit example).

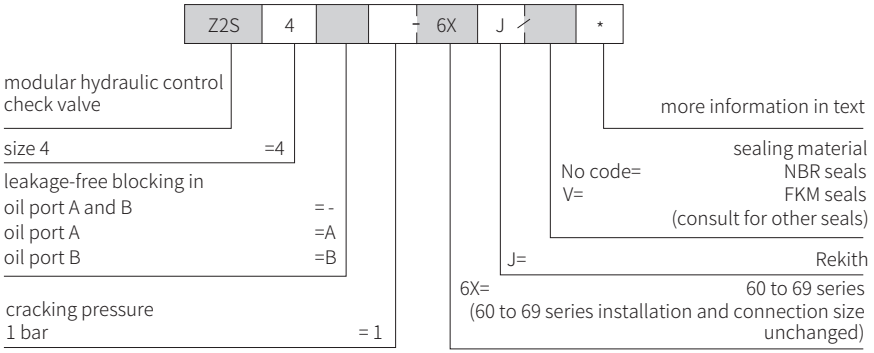


Model Z2S4...6XJ/

Circuit example



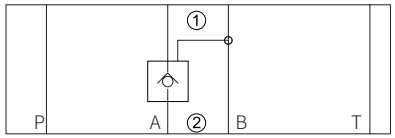
Models and specifications



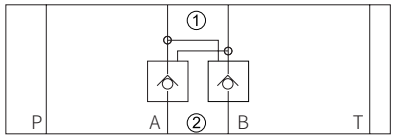
Functional symbols

(①= Valve side, ②= Subplate side)

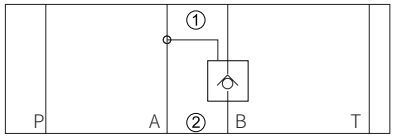
Model Z2S4A...



Model Z2S4...



Model Z2S4B...



Technical Parameters

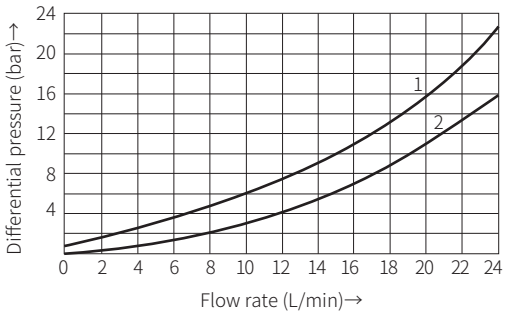
Weight	kg	about 0.7
Installation position		Optional
Environment temperature range	℃	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Maximum working pressure	bar	320
Cracking pressure in free flow direction	bar	1
Maximum flow	L/min	20
Flow direction		See functional symbols
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range	℃	-30 to + 80 (NBR seal) -20 to + 80 (FKM seal)
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15
Area ratio (hydraulic piston/valve seat)		3:1

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_v Characteristic curve

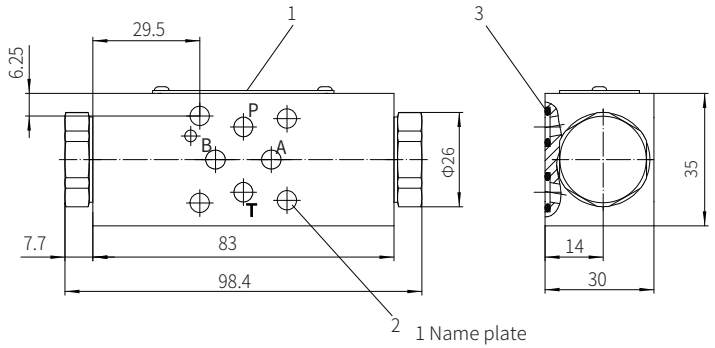


1 A1→A2 (B1→B2)
2 A2→A1 (B2→B1)

Component size

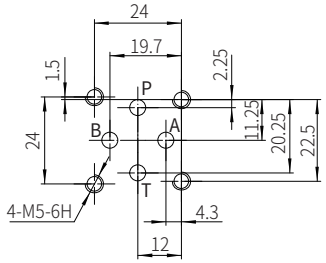
Size unit: mm

Model Z2S4...6XJ/...

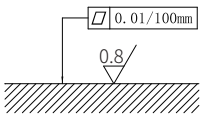


1 Name plate
2 Mounting screw hole 4-Φ5.4
3 O-ring 7.5x1.8(for oil port P, A, B, T)

Valve fixing screw (need to be ordered separately)
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm



Oil port P, A, B, T--maxΦ4.5mm



Required surface finishing of mating components

Modular Hydraulic Control Check Valve

Model: Z2S6...6XJ

- Size 6
- Maximum working pressure 315 bar
- Maximum working flow 60 L/min

Contents

Function description, sectional drawing	02
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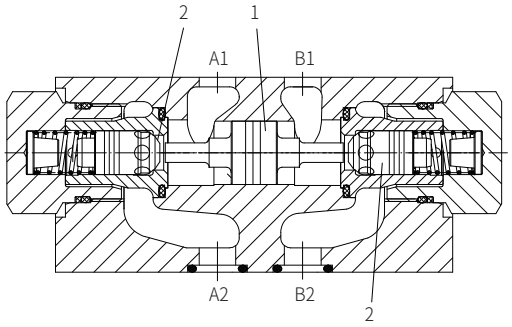
Characteristic curve	04
Component size	05

Features

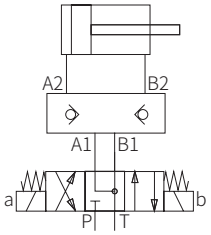
- For vertical stacking installation
- One or two working oil ports blocked for leakage-free as required.

Function description, sectional drawing

The Z2S type is a superimposed structure hydraulically controlled check valve. This type of valve can keep one or two working oil ports leak-free even if it works for a long time.
There is a free flow in the direction A1 to A2 and B1 to B2 but closed in the opposite direction. When the oil flows from A1 to A2 or B1 to B2, the control spool (1) is moved to the right or left and pushes the valve spool (2) away from its seat. In order to ensure the valve spool (2) to be closed safely, the oil must flow from B2 to B1 or from A2 to A1. The working oil port of the directional valve must be connected to the oil tank in the neutral position (see circuit example).



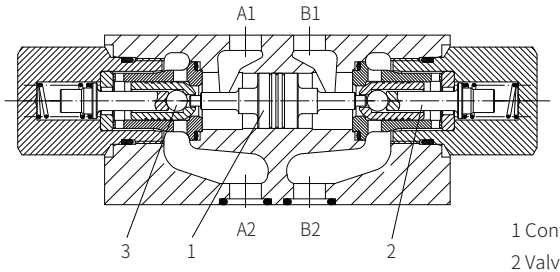
Circuit example



Model Z2S6...6XJ/(without pre-opening)

1 Control spool, area A2
2 Valve spool, area A1

Version "S055" (with pre-opening)
This valve is set-up with an additional pre-opening. The control spool (1) will be moved to the right by applying pressure to port X.
To do this, it should push the ball (5) away from the valve seat firstly, then push the spool (2). Now the valve allows fluid to flow from B to A as well.



Model Z2S6...-6XJ/SO55 (with pre-opening)

1 Control spool, area A2
2 Valve spool, area A1
3 Pre-opening, area A3.

Models and specifications

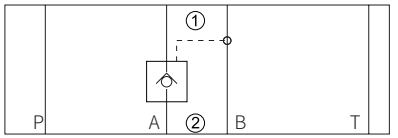
Z2S	6		-	6X	J	/		*

- modular hydraulic control check valve
- size 6 =6
- leakage-free blocking in
  - oil port A and B = -
  - oil port A =A
  - oil port B =B
- cracking pressure
  - 1.5 bar =1
  - 3 bar =2
  - 7 bar =3
- 6X= 60 to 69 series (60 to 69 series installation and connection size unchanged)
- J= Rekith
- sealing material
  - No code= NBR seals
  - V= FKM seals (consult for other seals)
- No code= without pre-opening
- SO55= with pre-opening
- * more information in text

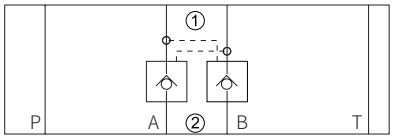
Functional symbols

(①= Valve side, ②= Subplate side)

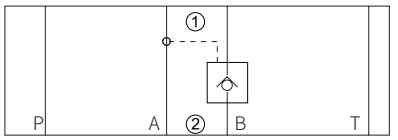
Model Z2S6A...



Model Z2S6 -...



Model Z2S6B...



01

Technical Parameters

Overview		
Weight	kg	about 0.8
Installation position		Optional
Environment temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Hydraulic		
Maximum working pressure	bar	315
Cracking pressure in free flow direction		See characteristic curve
Maximum flow	L/min	60
Flow direction		See functional symbols
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range	°C	-30 to + 80 (NBR seal) -20 to + 80 (FKM seal)
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15
Area ratio		A1/A2=1/3.5; A3/A2=1/12.5 (See section view above)

1) For NBR seal and FKM seal.

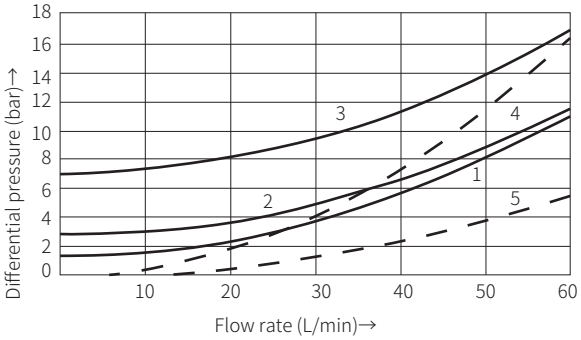
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V Characteristic curve



A1→A2;B1→B2

A2→A1;B2→B1

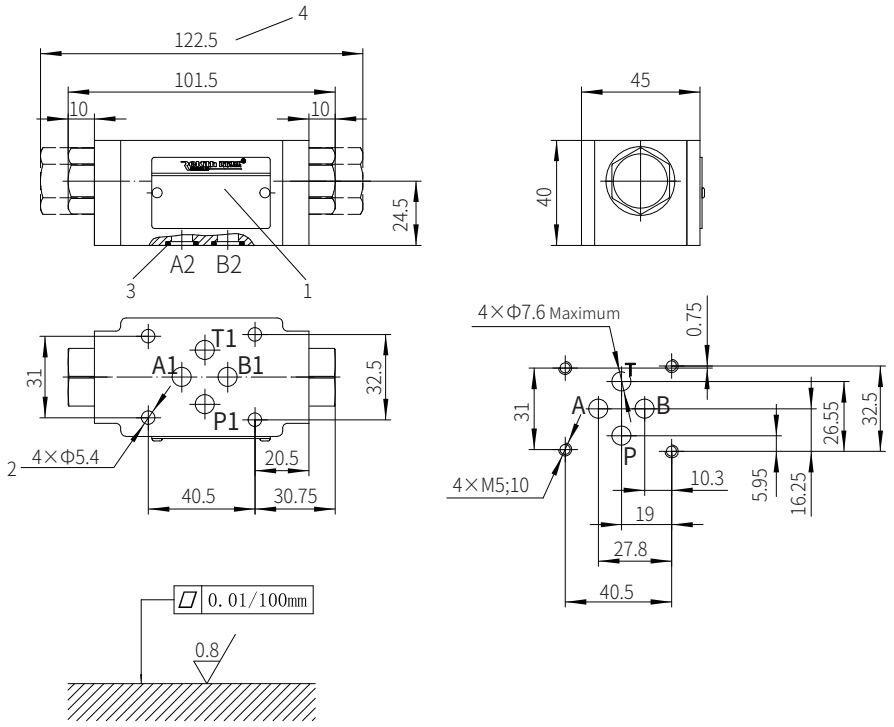
Cracking pressure:
1 1.5 bar
2 3 bar
3 7 bar
4 Flow through cartridge check valve
5 Free flow (without cartridge check valve)
Version "A" and "B"

01

Component size

Size unit: mm

Model Z2S6...-6XJ/...



Required surface finishing of mating components

Valve fixing screw (need to be ordered separately)
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

1 Name plate
2 Mounting screw holes
3 O-ring 9.25x1.78 (for oil port A2, B2, P2, T2)
4 Size of model Z2S6...-SO55

01

Modular Hydraulic Control Check Valve

Model: Z2S10...3XJ

- ◆ Size 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 120 L/min

Contents

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Characteristic curve	04
Component size	04

Features

- ● For vertical stacking installation
- ● One or two working oil ports blocked for leakage-free as required

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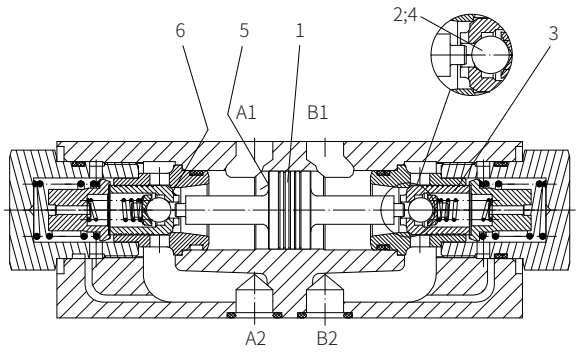
Function description, sectional drawing

The Z2S type is a superimposed structure hydraulically controlled check valve. This type of valve can keep one or two working oil ports leakage-free even if it is shut down for a long time.
There is a free flow in the direction A1 to A2 or B1 to B2 but closed in the opposite direction. When the oil flows from A1 to A2, the spool (1) is pushed to the right under pressure, opens the ball valve core (2) and then opens the sleeve valve core (3).
In order to ensure that the valve is closed correctly in the center position, the working oil port of the directional valve must be connected to the tank when it is in the neutral position (see circuit example).

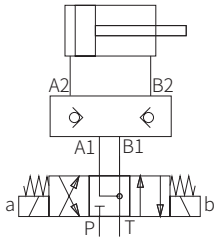
01



Model Z2S10...-3XJ/

2;4 Ball, area A3
5 Control spool, area A2
6 Valve spool, area A1

Circuit example



Models and specifications

Z2S	10		–	3X	J	/		*

modular hydraulic control check valve

size 10 =10

leakage-free blocking in
oil port A and B = -
oil port A =A
oil port B =B

cracking pressure
1.5 bar =1
3 bar =2
6 bar =3
10 bar =4

3X= 30 to 39 series (30 to 39 series installation and connection size unchanged)

J= Rekith

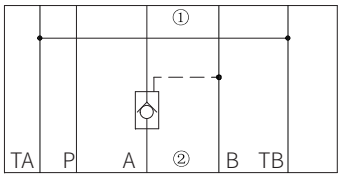
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

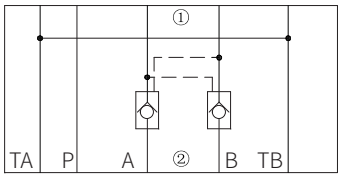
Functional symbols

(①= Valve side, ②= Subplate side)

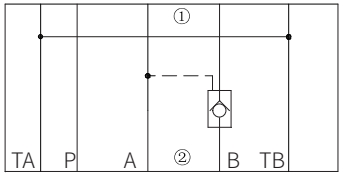
Model Z2S10A-...



Model Z2S10-...



Model Z2S10B...



01

Technical Parameters

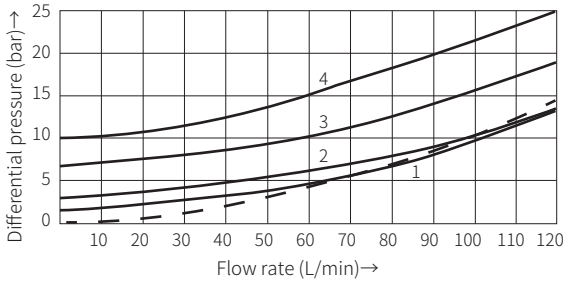
Overview		
Weight	kg	about 3
Installation position		Optional
Environment temperature range	°C	-30 to + 50 (NBR seal) -20 to + 50 (FKM seal)
Hydraulic		
Maximum working pressure	bar	315
Cracking pressure in free flow direction		See characteristic
Maximum flow	L/min	120
Flow direction		See the symbol
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range	°C	-30 to + 80 (NBR seal) -20 to + 80 (FKM seal)
Viscosity range	mm²/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15
Area ratio		A1/A2=1/3;A3/A2=1/11.5（See section view above）

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V Characteristic curve



A1→A2;B1→B2

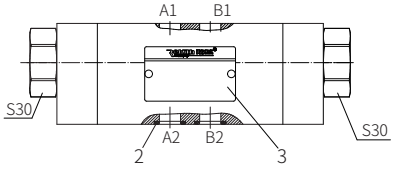
A2→A1;B2→B1

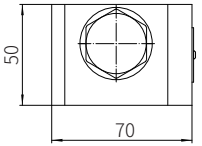
1 Cracking pressure 1.5bar
2 Cracking pressure 3bar
3 Cracking pressure 6bar
4 Cracking pressure 10bar

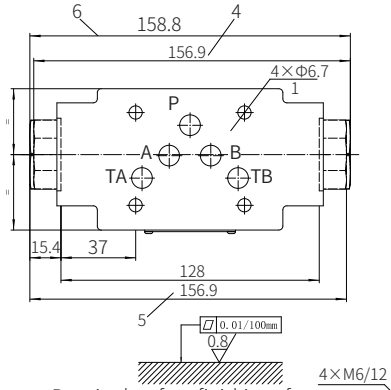
Component size

Size unit: mm

Model Z2S10...-3XJ/...







Required surface finishing of mating components

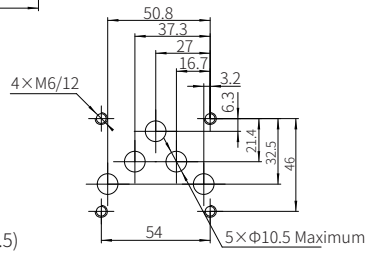
It must be ordered separately if connection subplate is needed.

Subplate model:

G66/01 (G3/8") ; G66/02(M18×1.5)

G67/01 (G1/2") ; G67/02 (M22×1.5)

G534/01 (G3/4") ; G534/02 (M27×2)



1 Mounting hole
2 O-ring 12X2 (oil port P, A, B, T)
3 Name plate
4 Check valve in port B
5 Check valve in port A
6 Check valve in port A and B

Valve fixing screw
M6-10.9 grade GB/T70.1-2000

Tightening torque M_A=13.7Nm

Modular Hydraulic Control Check Valve

Model: Z2S16...5XJ

- ◆ Size 16
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 300L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic limit	04
Component size	04

Features

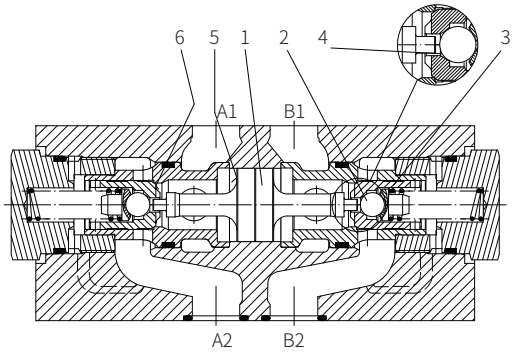
- ● One or two working ports blocked without leakage
- ● For vertical installation
- ● 4 cracking pressures, optional

Function description, sectional drawing

The Z2S type is a superimposed structure hydraulically controlled check valve. This type of valve can keep one or two working oil ports leakage-free even if it is shut down for a long time.

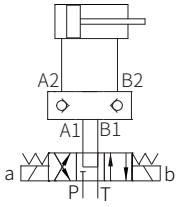
There is a free flow in the direction A1 to A2 or B1 to B2 but closed in the opposite direction. When the oil flows from A1 to A2, the spool (1) is pushed to the right under pressure, opens the ball valve core (2) and then opens the sleeve valve core (3).

In order to ensure that the valve is closed correctly in the center position, the working oil port of the directional valve must be connected to the tank when it is in the neutral position (see circuit example).



4 ball, area A1
5 control spool, area A2
6 Valve spool, area A3

Circuit example



Model Z2S16...-5XJ/

Models and specifications

Z2S | 16 | | | 5X | J | | *

modular hydraulic control check valve

size 16 =16

leakage-free blocking in
oil ports A and B =-
oil port A =A
oil port B =B

cracking pressure 3 bar =1
cracking pressure 5bar =2
cracking pressure 7.5bar =3
cracking pressure 10bar =4

5X= 50 to 59 series
(50 to 59 series installation and connection size unchanged)

J= Rekith

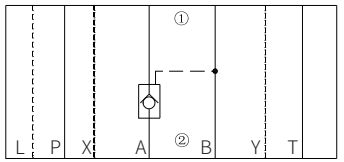
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

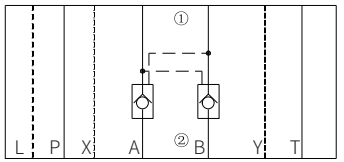
Functional symbols

(①= Valve side, ②= Subplate side)

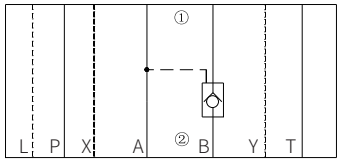
Model Z2S16A-...



Model Z2S16-...



Model Z2S16B-...



Technical parameters

Overview		
Installation position		Optional
Environmental temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
weight	kg	About 6.5

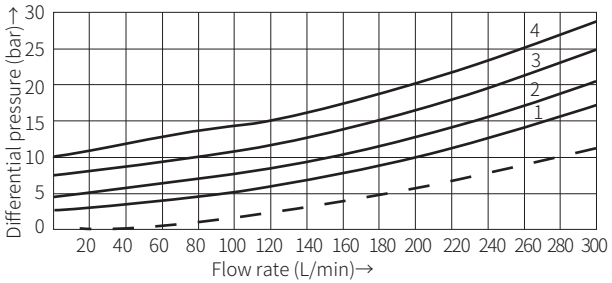
Hydraulic		
Maximum working pressure	bar	315
Maximum flow	L/min	300
Flow direction		See the symbol
Cracking pressure in free flow direction		See characteristic curve
Area ratio	L/min	A1/A2=1/11.8; A3/A2=1/2.8 (See section view above)
Pressure medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Pressure medium temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 level 20/18/15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V Characteristic curve



A1 to A2
B1 to B2

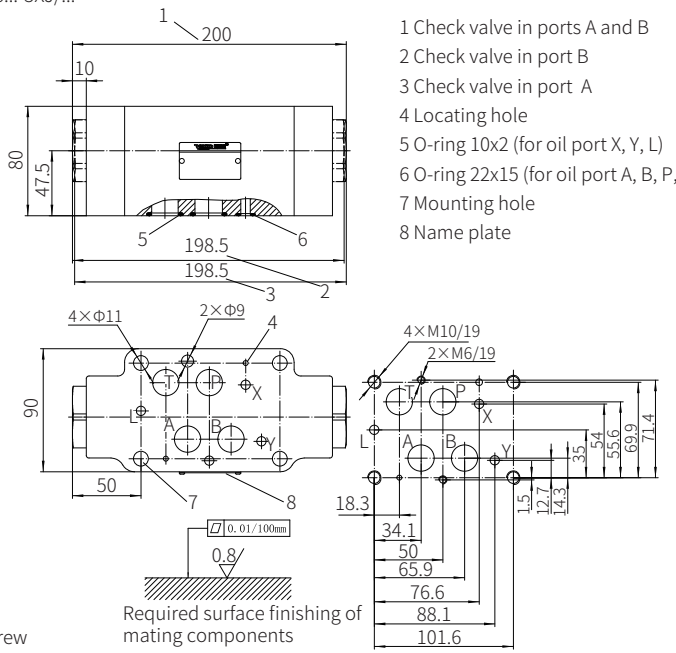
1 Cracking pressure 3bar
2 Cracking pressure 5bar
3 Cracking pressure 7.5bar
4 Cracking pressure 10 bar

A2 to A1
B2 to B1

Component size

Size unit: mm

Model Z2S16...-5XJ/...



1 Check valve in ports A and B
2 Check valve in port B
3 Check valve in port A
4 Locating hole
5 O-ring 10x2 (for oil port X, Y, L)
6 O-ring 22x15 (for oil port A, B, P, T)
7 Mounting hole
8 Name plate

Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm
M10-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
Need to order separately

It must be ordered separately
if connection subplate is needed.
Subplate model:
G172/01 (G3/4") ; G172/02 (M27x2)
G174/01 (G1") ; G174/02 (M33x2)

Modular Hydraulic Control Check Valve

Model: Z2S22...5XJ

- ◆ Size 22
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 450 L/min

Contents

Function description, sectional drawing	02
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Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	04

Features

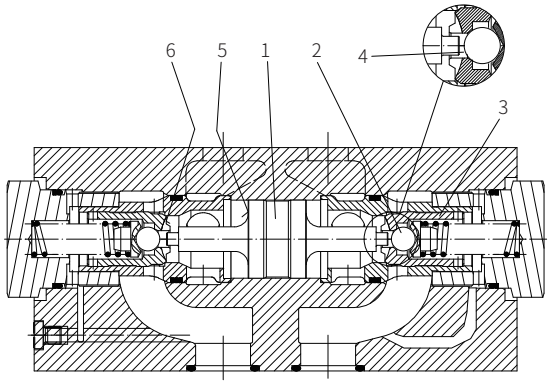
- ● Modular valve
- ● One or two working oil ports blocked for leakage-free as required
- ● For vertical stacking installation
- ● 4 cracking pressures, optional

Function description, sectional drawing

The Z2S type is a superimposed structure hydraulically controlled check valve. This type of valve can keep one or two working oil ports leakage-free even if it is shut down for a long time.

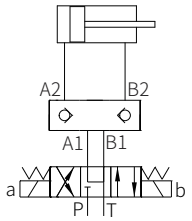
There is a free flow in the direction A1 to A2 or B1 to B2 but closed in the opposite direction. When the oil flows from A1 to A2, the spool (1) is pushed to the right under pressure, opens the ball valve core (2) and then opens the sleeve valve core (3).

In order to ensure that the valve is closed correctly in the center position, the working oil port of the directional valve must be connected to the tank when it is in the neutral position (see circuit example).



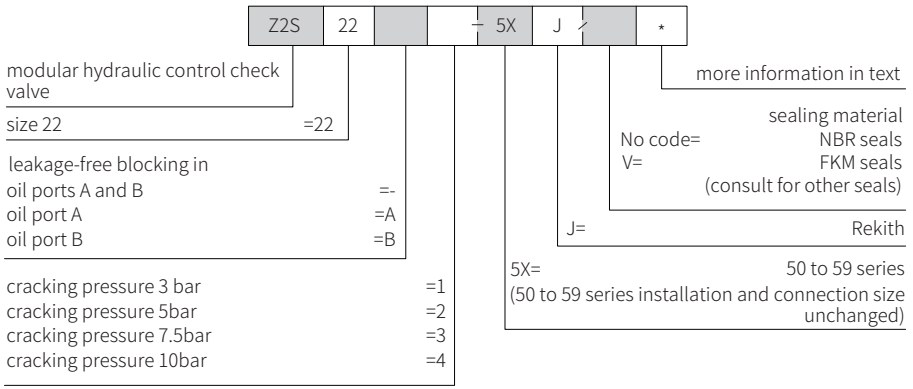
4 ball, area A1
5 control spool, area A2
6 Valve spool, area A3

Circuit example



Model Z2S22...-5XJ/

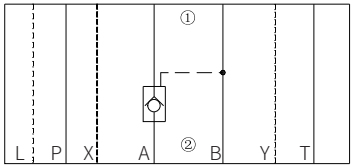
Models and specifications



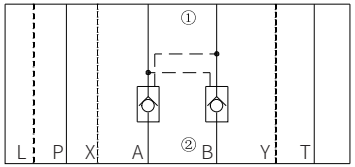
Functional symbols

(①= Valve side, ②= Subplate side)

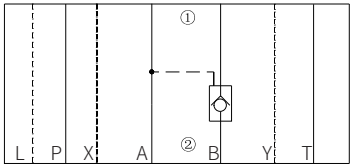
Model Z2S22A-...



Model Z2S22-...



Model Z2S22B...



Technical parameters

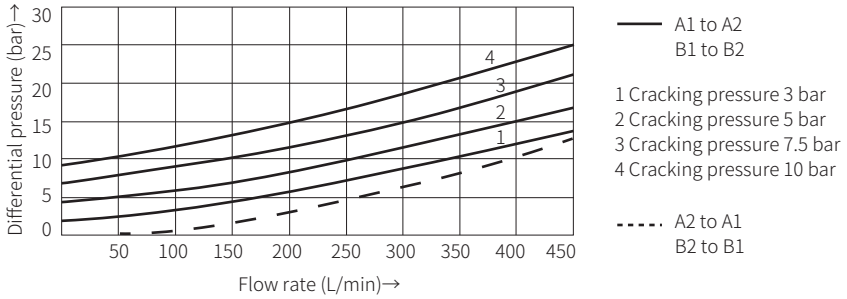
Overview		
Installation position		Optional
Environmental temperature range	℃	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
weight	kg	About 12
Hydraulic		
Maximum working pressure	bar	315
Maximum flow	L/min	450
Flow direction		See the symbol
Cracking pressure in free flow direction		See characteristic curve
Area ratio		A1/A2=1/13.6; A3/A2=1/2.8; (See section view above)
Pressure medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 level 20/18/15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V Characteristic curve



A1 to A2
B1 to B2

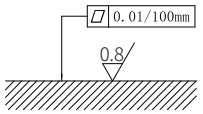
1 Cracking pressure 3 bar
2 Cracking pressure 5 bar
3 Cracking pressure 7.5 bar
4 Cracking pressure 10 bar

A2 to A1
B2 to B1

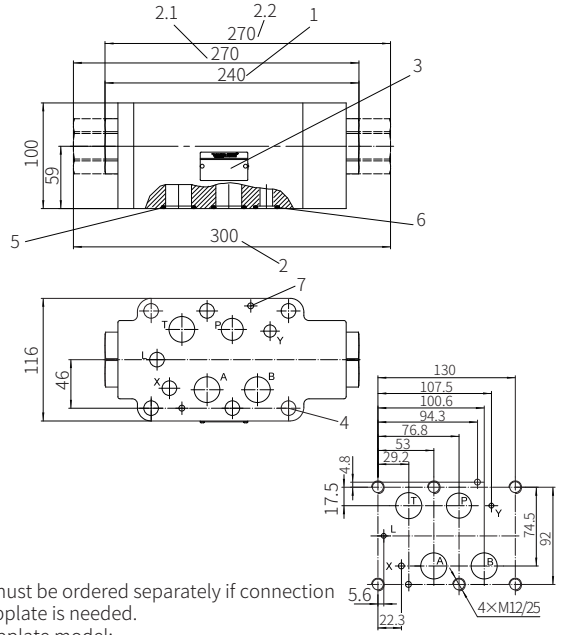
Component size

Size unit: mm

Model Z2S22...-5XJ/...



Required surface finishing of mating components



1 Check valve in port A, B when cracking pressure is 3 or 5 bar
2 Check valve in port A, B when cracking pressure is 7.5 or 10bar
2.1 Check valve in port A when cracking pressure is 7.5 or 10bar
2.2 Check valve in port B when cracking pressure is 7.5 or 10bar
3 Name plate
4 Mounting holes
5 O-ring 27X3 (for oil port A, B, P, T).
6 O-ring 19X3 (for oil port X, Y, L)
7 Valve fixing screw mounting holes M12-10.9 grade GB/T70.1-2000

Tightening torque M_A=95Nm
Need to order separately

It must be ordered separately if connection subplate is needed.
Subplate model:
G153/01 (G1") ; G153/02 (M33×2)
G154/01 (G1-1/4"); G154/02 (M42×2)
G156/01(G1-1/2"); G156/02 (M48×2)

Hydraulic-operated Check Valve

Model: SV/SL6...6XJ

- ◆ Size 6
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 60 L/min

Contents

Function description, sectional drawing	02
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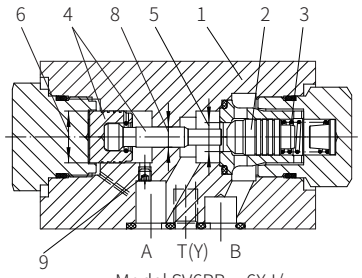
Characteristic curve	04
Component size	05

Features

- ● Hydraulic-operated check valve
- ● Connection dimensions according to DIN 4401-03-02-0-05
- ● Subplate mounting
- ● With or without drain port as required
- ● With or without pre-opening port as required
- ● Various opening pressures

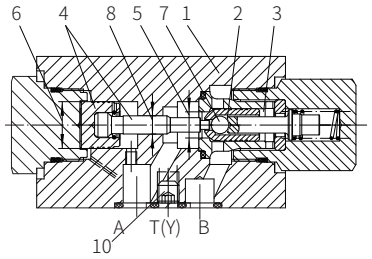
Function description, sectional drawing

The SV and SL valves are hydraulic-operated check valve for subplate mounting. It is used for leakage-free blocking of one working port even in the event of long-term shutdowns.
The valve mainly consists of valve body (1), seat poppet (2), compression spring (3), control spool (4) and an optional pre-opening ball seat valve (7). The seat valve allows the fluid to flow from A to B without external pilot pressure.
Condition: PA>PB+cracking pressure (compression spring). In the opposite direction, the seat valve is hydraulically closed.
The high pilot pressure at port X moves the control spool (4) in the direction of the seat valve and pushed the seat poppet (2) away from its seat. This enables free flow in both directions (actively hold open).
In order to ensure that the seat valve opens actively, the pressure conditions on both sides of the control spool (4) are same important as the area ratio on the seat poppet (2) or (7).



Model SV6PB...-6XJ/

Therefore, it results different types as below:
-SV (large spool surface A_2(6) connected to P_A) or
-SL (small front surface A_4(8) connected to P_A,
- Models with pre-opening "A" and without pre-opening "B"



Model SL6PA...-6XJ/

Model "A" with pre-opening
The valve is equipped with an additional pre-opening. By applying pressure to the port X, the control spool (4) will move to the right. In this way, the ball (7) and the seat poppet (2) will be pushed out of the valve seat successively.

Note!
Model "A":
Due to the using of a two-stage structure with enlarged opening control area ratio, safe unloading is also possible with lower pilot pressures.

5 area A1 (seat poppet)
6 area A2 (control spool
7 area A3 (ball)
8 area A4 (control spool)

Type	Plug (9)	Plug (10)
SV	M3 (open)	M6 (closed)
SL	M3 (closed)	M6 (open)

Avoidance of switching shocks due to the attenuation of the pressure volume on the actuator side.

Model "B":
When the valve without pre-opening, it may suddenly unloaded the contained pressure volume. The resulting switching shocks may not only creates noise but also wears of mounting components early.

The conversion between SV type and SL type can be achieved by replacing the plugs (9) and (10). One of the plugs must always be installed!

Models and specifications

S | | | | | – 6X | J | / | | *

without drain port =V
external pilot oil drain =L

size 6 =6

subplate mounting =P

with decompression function =A
without decompression function =B

[1] Version"B"only

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

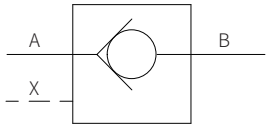
J= Rekith

6X= 60 to 69 series
(60 to 69 series installation and connection size unchanged)

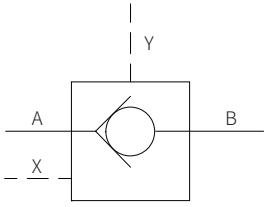
1= cracking pressure
2= see characteristic curve
3= A to B
4[1] =

Functional symbols

Model SV (without drain port)



Model SL (with drain port)

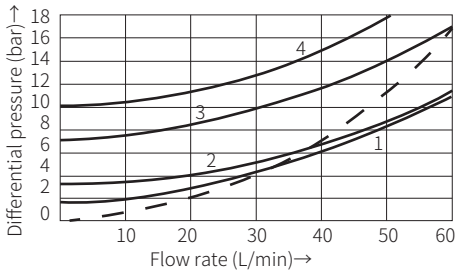


Technical Parameters

Weight		kg	About 0.8
Installation location			Optional
Flow direction			Free flow from A to B, flow from B to A under hydraulic operation
Environment temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Maximum working pressure		bar	315
Maximum flow		L/min	60
Pilot pressure		bar	5 to 315
Viscosity range		mm^2/s	2.8 to 500
The maximum allowable pollution level of hydraulic oil - cleanliness class 20/18/15 to ISO 4406			
Pilot flow	Oil port X	cm^3	0.68
	Oil port Y (model SL only)	cm^3	0.58
Control area ratio	Model "A"		A3/A2:1/13
	Model "B"		A1/A2:1/3
			A4/A2:1/7

Characteristic curve

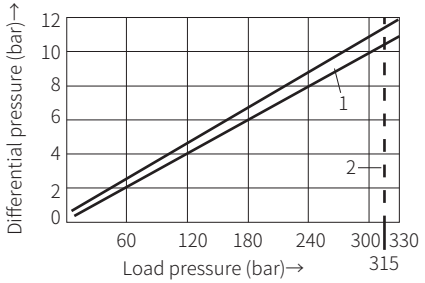
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



A to B

1 Cracking pressure 1.5 bar
2 Cracking pressure 3 bar
3 Cracking pressure 7 bar
4 Cracking pressure 10 bar

B to A

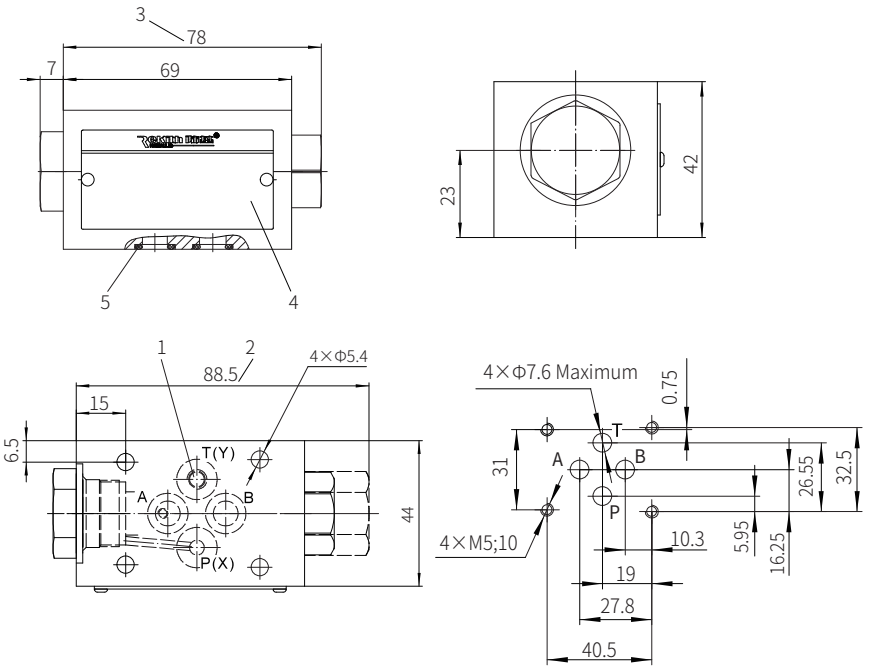


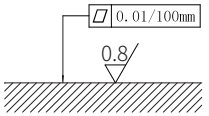
1 Tolerance zone
2 Limit value

Component size

Size unit: mm

Model SV/SL6...6XJ/...





Required surface finishing of mating components

1 Port Y (M6; closed for model SV)
2 Size of model SV/SL6PA
3 Size of model SV/SL6PB
4 Name plate
5 O-ring 9.25X1.78

It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14×1.5)
G342/01 (G3/8") ; G342/02 (M18×1.5)
G502/01 (G1/2") ; G502/02 (M22×1.5)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

01

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Hydraulic-operated Check Valve

Model: SV/SL...4XJ

- Size 10~32
- Maximum working pressure 315 bar
- Maximum working flow 550 L/min

Contents

Function description, sectional drawing	02
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Characteristic curve	05-06
Component size	07-08

Features

- Hydraulic-operated check valve
- Connection dimensions according to DIN 24340
- Subplate mounting or threaded connection
- With or without drain port as required
- With or without pre-opening port as required
- Four opening pressures optional

Function description, sectional drawing

The SV and SL valves are hydraulic-operated check valves with a poppet valve structure which can be opened to allow flow in the reverse direction.

This type valve is used to isolate parts of the hydraulic circuit as a safety measure to prevent load loss of pressure when the pipe bursts, or to avoid creeping movements of actuator during hydraulic lockout.

It mainly consists of the valve body (1), spool (2), compression spring (3), control piston (4) and an optional pressure relief ball valve (5).

Model SV..

The fluid can flow freely from A to B. In the opposite direction, the spool (2) is firmly held on its seat by the compression spring and system pressure. By applying pressure to control port X, the control piston (4) is pushed to the right. In this way, the spool (2) leaves the valve seat and the fluid flows from B to A.

In order to ensure the opening of the valve, a certain minimum pilot pressure is required to act on the control piston. And a certain minimum pilot pressure is necessary to ensure that the valve can open by applying pressure to the control spool (4).

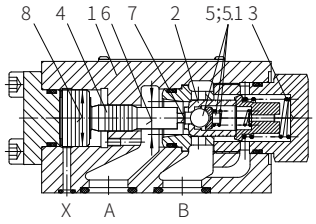
Models SV...A.. and SL.A.. (with decompression function, section 1)

The valve has an additional unloading mechanism. When control pressure is provided to port X, the control piston (2) is pushed to the right. It firstly pushes open the ball spool (5.1), then the main spool (2) lifts off its seat. In this way, the fluid flows from B to A, thereby avoiding possible pressure shock.

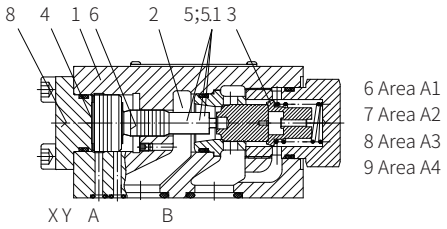
Due to this pre-opening feature, it can achieve a stable decompression of the pressurized fluid in the cylinder.

Model SL...

The function of this valve is the same as model SV. The difference is in the addition of drain port Y. Here the annular area of the control piston (4) is isolated from port A. The pressure from port A only acts on the area A4(9) of the control piston (4).



Model SV...PA..-4XJ
(No oil drain port, with unloading function)



Model SL...PB..-4XJ
(With drain port, no unloading function)

Models and specifications

S | | | | | – 4X | J | / | * |

without drain port =V
external pilot oil drain =L

	model SV		model SL	
connection type	G	P	G	P
	ordering code			
size 10	=10	=10	=10	=10
size 16	=15	—	=15	—
size 20	=20	=20	=20	=20
size 25	=25	—	=25	—
size 32	=30	=30	=30	=30

subplate mounting =P
threaded connection =G

with decompression function =A
without decompression function =B

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

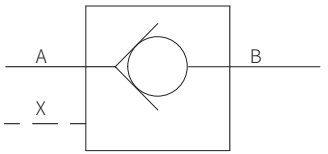
J= Rekith

4X= 40 to 49 series
(40 to 49 series installation and connection size unchanged)

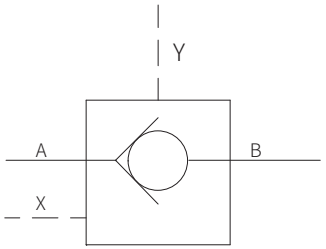
1= cracking pressure
2= see characteristic curve
3= A to B
4=

Functional symbols

Model SV (without drain port)



Model SL (with drain port)



Technical parametes

Overview							
Size			size 10	size 16	size 20	size 25	size 32
Weight	-subplate mounting	kg	1.8		4.7		7.8
	-threaded connection	kg	2.1	5.4	5.4	10	10
Installation position			Optional				
Environment temperature range		℃	-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Hydraulic							
Maximum working pressure		bar	315				
Maximum flow		L/min	see characteristic curve				
Control pressure		bar	5 to 315				
Fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]				
Fluid temperature range		℃	-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Viscosity range		mm^2/s	2.8 to 500				
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 class 20/18/15				
Flow direction			Flow freely from A to B, from B to A when opened				
Control volume	-oil port x	cm^3	2.5	10.8	10.8	19.27	19.27
	-oil port Y (model SL)	cm^3	2.0	9.6	9.6	17.5	17.5
Control area	-area A1	cm^2	1.33	3.46	3.46	5.72	5.72
	-area A2	cm^2	0.33	0.7	0.7	1.33	1.33
	-area A3	cm^2	3.8	10.17	10.17	16.61	16.61
	-area A4	cm^2	0.79	1.13	1.13	1.54	1.54

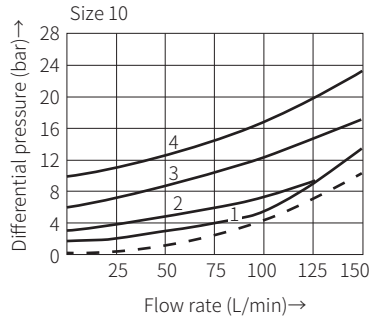
1) For NBR seal and FKM seal.

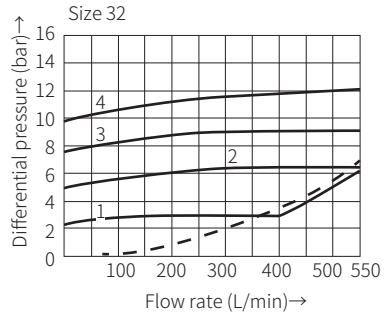
2) Only for FKM seal.

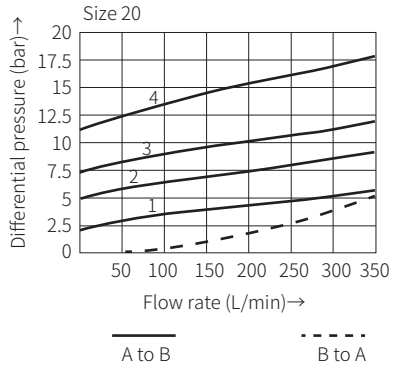
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

Subplate mounting (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



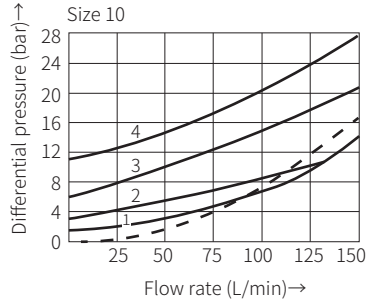


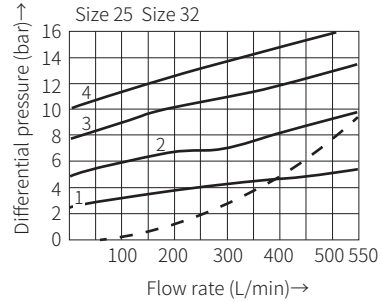


Cracking pressure（bar）

	Size 10	Size 20	Size 32
1	1.5	2.5	2.5
2	3	5	5
3	6	7.5	8
4	10	10	10

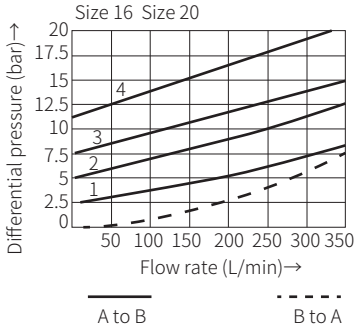
Threaded connection (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)





Characteristic curve

Threaded connection (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

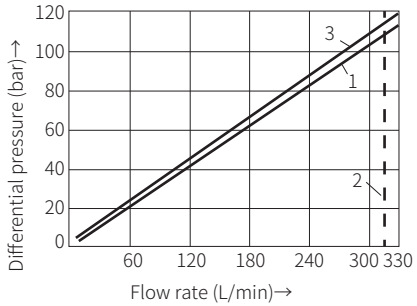


Cracking pressure (bar)

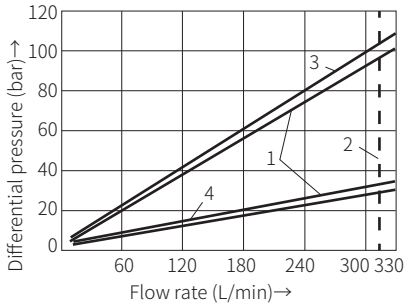
	Size 10	Size 16、Size 20	Size 25、Size 32
1	1.5	2.5	2.5
2	3	5	5
3	6	7.5	8
4	10	10	10

Control pressure-load pressure-characteristic curve

Without decompression



With decompression

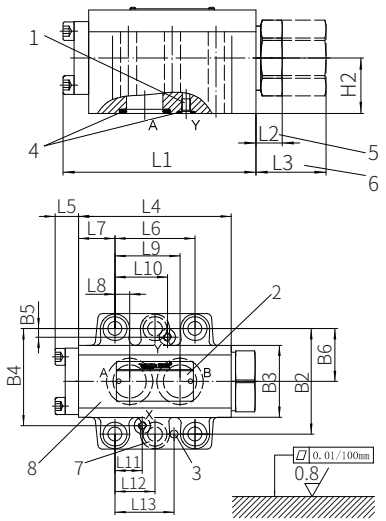


1 Scatter range
2 Limit value
3 Conical valve core
4 Decompression

Component size

Size unit: mm

Subplate mounting SV/SL...4XJ/...



1. Port Y for valve model "SL"
(the port is blocked for model "SV")
2. Name plate
3. Locating pin hole
4.O-ring
-for ports A and B
-for ports X and Y
5.Valve with cracking pressure"1" and "2"
(dimension L2)
6. Valve with cracking pressure "3" and "4"
(dimension L3)
7. 6 valve fixing holes for model SV/SL30

Required surface finishing of mating components

Valve fixing screw
10 size: 4-M10x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
20 size: 4-M10x70-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
30 size: 4-M10×85-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

It must be ordered separately if connection subplate is needed. Subplate model:
10 size: G460/01 (G3/8") ; G460/02(M18×1.5)
G461/01 (G1/2") ; G461/02(M22×1.5)
20 size: G412/01 (G3/4") ; G412/02 (M27×2)
G413/01 (G1") ; G413/02 (M33×2)
30 size: G414/01 (G1-1/4") ; G414/02(M42×2)
G415/01 (G1-1/2") ; G415/02(M48×2)

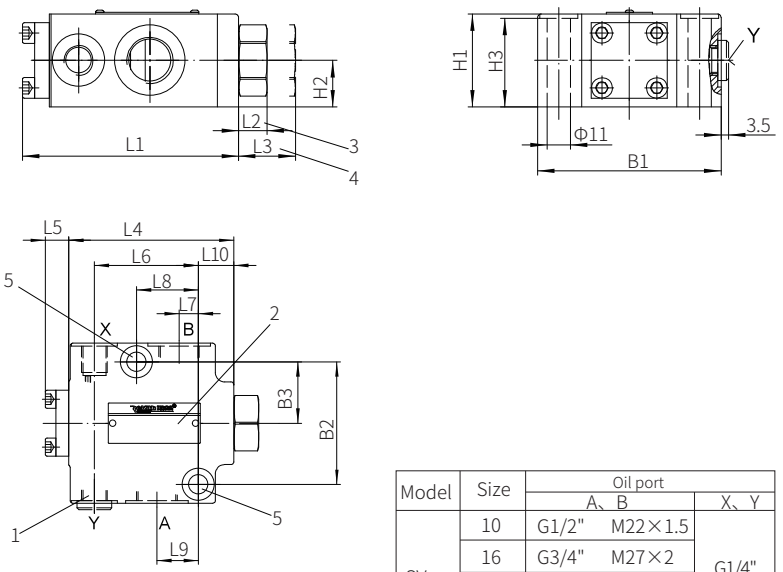
Model	Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
SV	10	101.7	14.3	14.3	89	31.4	42.9	24	7.2	35.8	-	21.5
	20	132.5	18.1	48.1	115	17.5	60.3	27.5	11.1	49	-	20.6
	32	155.5	35.6	45.6	134	21.5	84.2	39	16.7	67.5	-	24.6
SL	10	101.7	14.3	14.3	89	31.4	42.9	24	7.2	35.8	21.5	21.5
	20	132.5	18.1	48.1	115	17.5	60.3	27.5	11.1	49	39.5	20.6
	32	155.5	35.6	45.6	134	21.5	84.2	39	16.7	67.5	59.5	24.6

Model	Size	L12	L13	B1	B2	B3	B4	B5	H1	H2	H3	B6
SV	10	-	31.8	83	66.7	44	58.8	-	51	29	34	42.25
	20	-	44.5	99.5	79.4	62.5	73	-	71	38.4	56	39.7
	32	42.1	62.7	118	96.8	76	92.8	-	85	42.5	70	48.4
SL	10	-	31.8	83	66.7	44	58.8	7.9	51	29	34	42.25
	20	-	44.5	99.5	79.4	62.5	73	6.4	71	38.4	56	39.7
	32	42.1	62.7	118	96.8	76	92.8	3.8	85	42.5	70	48.4

Component size

Size unit: mm

Threaded connection SV/SL...4XJ/...



1. Port Y for valve model "SL"
(the port is blocked for model "SV")
2. Name plate
3. Valve with cracking pressure"1" and "2"
(dimension L2)
4. Valve with cracking pressure "3" and "4"
(dimension L3)
5. 2 valve fixing holes

Model	Size	Oil port A、B	Oil port X、Y
SV	10	G1/2" M22×1.5	G1/4" M14×1.5
	16	G3/4" M27×2	
	20	G1" M33×2	
	25	G11/4" M42x2	
	32	G11/2" M48×2	
SL	10	G1/2" M22×1.5	G1/4" M14×1.5
	16	G3/4" M27×2	
	20	G1" M33x2	
	25	G11/4" M42×2	
	32	G11/2" M48×2	

Model	Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	B1	B2	B3	H1	H2
SV	10	102.5	13.5	13.5	89.8	12.7	56.5	10.5	33.5	22.5	19.3	87	66.7	33.4	44	42
	16、20	132.5	18.1	48.1	115	17.5	74.5	17.2	50.5	36.2	27	106	79	40.5	69	67
	25、32	155.5	35.6	45.6	134	21.5	101.2	25.5	84	50.5	18	130	96.8	48.4	86	84
SL	10	102.5	13.5	13.5	89.8	12.7	56.5	10.5	33.5	22.5	19.3	87	66.7	33.4	44	42
	16、20	132.5	18.1	48.1	115	17.5	74.5	17.2	50.5	36.2	27	106	79	40.5	69	67
	25、32	155.5	35.6	45.6	134	21.5	101.2	25.5	84	50.5	18	130	96.8	48.4	86	84

Manual Directional Valve

Model: WMM...5XJ

- Size 10
- Maximum working pressure 350 bar
- Maximum working flow 160 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Characteristic curve	04-05
Component size	06

Features

- Direct operated directional spool valve with handle
- With reset spring or detent, optional
- Subplate mounting

Function description, sectional drawing

The WMM manual directional valve is a direct operated directional spool valve which switches the oil circuit by rotating the handle to move the spool axially. It has 3/2-way, 4/2-way, 4/3-way as well as various spool symbols, and it is subplate mounting with optional detent and spring reset.

Model 4WMM 5XJ/

The valve is composed of valve body (1), handle(2), control spool (3), one or two reset springs (4), etc.

The control spool (3) is held in the middle or initial position by the reset springs (4) in no operation condition. When the handle (2) is pushed to the right or left, the handle pushes the push rod (5) via hinge and controls the valve spool (3) directly to force the spool to move to the required position to obtain the required flow cross-section. When the handle return to the zero position, the control spool returns to the normal position by reset spring (4). The switching position of this valve is operated by the handle.

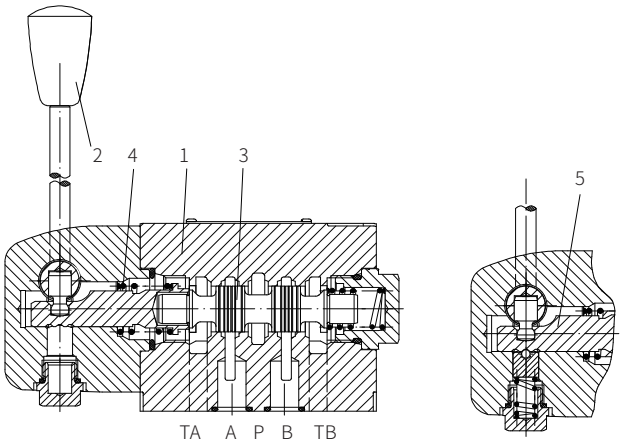
Model 4WMM 5XJ/F

The principle is basically the same with WMM...5XJ/. But this type valve is a control valve with two or three switching positions and one detent. Therefore, all the switching positions are fixed.

Plug-in throttle

Due to working conditions limitations, it may occur that the flow of the valve exceeds the specified flow rate on the valve performance curve during switching process, then the use of a throttle is required. It is installed in the P chamber of the valve or oil circuit.

This type valve has advantages such as small volume, large flow capacity, and good reliability compared to other series of valves. It can be used together with the modular valves in same size, and widely used in engineering machinery, coal mining machinery, chemical machinery, light industry machinery, locomotives and many other industries.



Model WMM10...5XJ/

Plug-in throttle

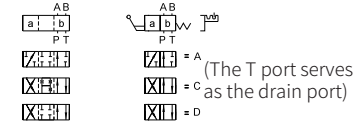
Models and specifications

WMM | 10 | – | 5X | J | / | | | | *

- 3 ways =3
  4 ways =4
- manual directional valve
- size 10 =10
- symbols e.g. C, D, J, E, etc
- 50 to 59 series =5X
  (50 to 59 series installation and connection size unchanged)
- J= Rekith
- No code= without detent, with reset spring
  F= with detent
- No code= no plug-in throttle
  B08= throttle Φ0.8mm
  B10= throttle Φ1.0mm
  B12= throttle Φ1.2mm
- No code= NBR seals
  V= FKM seals
  (consult for other seals)
- sealing material
- more information in text

Functional symbols

Transition function / Spool valve function

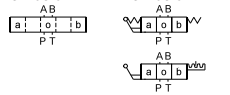


(The T port serves as the drain port)

Transition function / Spool valve function

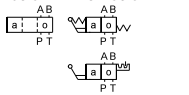
(The T port serves as the drain port)

Transition function / Spool valve function



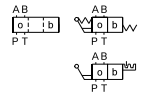
= E, = F, = G, = H, = J, = L, = M, = P, = Q, = R, = T, = U, = V, = W

Transition function / Spool valve function



= EA, = FA, = GA, = HA, = JA, = LA, = MA, = PA, = QA, = RA, = TA, = UA, = VA, = WA

Transition function / Spool valve function



= EB, = FB, = GB, = HB, = JB, = LB, = MB, = PB, = QB, = RB, = TB, = UB, = VB, = WB

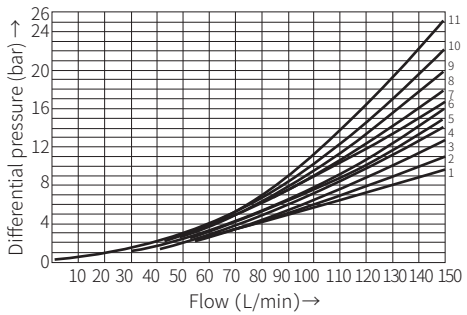
Technical parametes

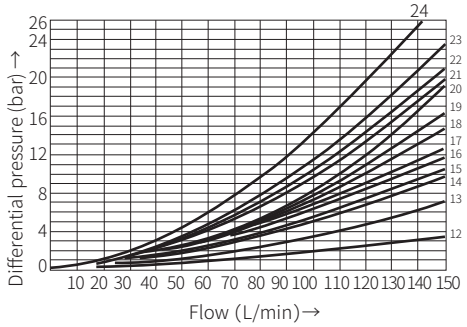
Size		10
Working pressure	Oil port A、B、P (bar)	to 350
	Oil port T(bar)	to 210
Flow (L/min)		to 160
Flow cross-section (middle position)		Q-type, 6% of nominal cross-section W-type, 3% of nominal cross-section
Medium		Mineral hydraulic oil or phosphate ester hydraulic oil
Oil temperature range (°C)		-20 to +80
Viscosity range (mm^2/s)		2.8 to 500
Weight (kg)		about 3.6
Operating force (N)		With detent about 30 to 40 Without detent about 18 to 20

Characteristic curve

(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)

△p-q_V characteristic curve





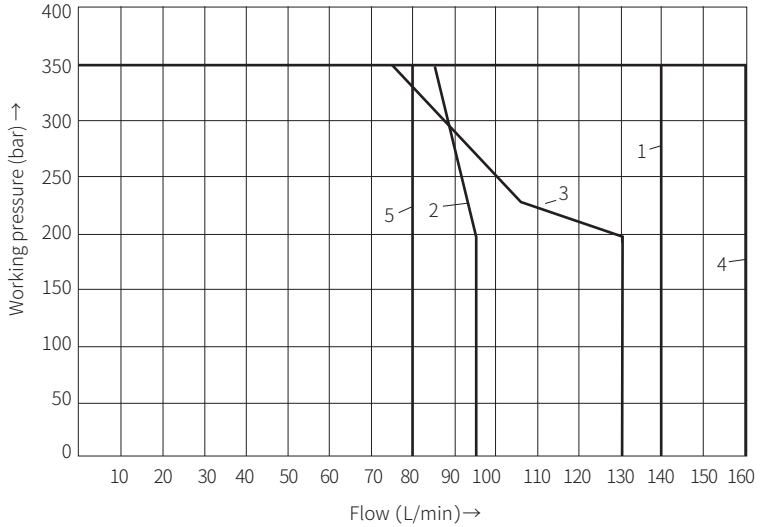
Functional symbol	Flow direction			
	P-A	P-B	A -T	B-T
A、B	6	6	-	-
C	1	2	5	7
D	2	2	5	7
E	17	16	19	21
F	2	3	22	23
G	4	4	24	24
H	14	14	20	21
J	3	3	9	11
L	3	3	9	9
M	14	14	6	8
P	17	14	20	23
Q	16	17	4	8
R	18	21	18	24
T	18	4	10	24
U	3	3	6	11
V	17	17	18	20
W	According to the requirements			

Middle position

Functional symbol	Flow direction				
	P-A	P-B	B-T	A-T	P-T
H	12	12	13	13	15

Characteristic curve

(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)



With reset spring

Characteristic curve	Functional symbol
1	C、D、E、J、L、M、Q U、V、W
2	H
3	T、G

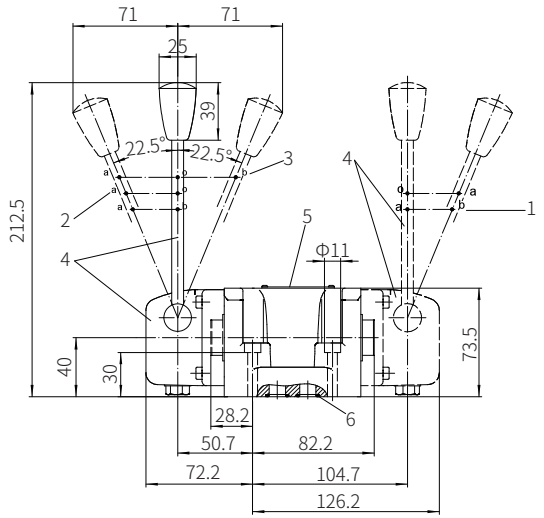
With detent “F”

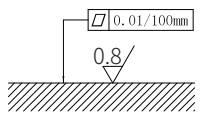
Characteristic curve	Functional symbol
4	C、D、E、J、L、 M、Q、U、
5	T、G、H

Component size

Size unit: mm

Model WMM10...-5XJ/...





Required surface finishing of mating components

1 Two-position valve, functional symbols B, Y, EB
2 Two-position valve, functional symbols A, C, EA
3 Three-position valve
4 End cover and handle
5 Name plate
6 O-ring (for oil port A, B, P, TA, TB)

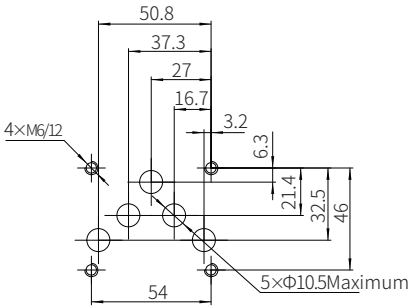
Valve fixing screw

M5x50-10.9 grade GB/T70.1-2000

Tightening torque M_A=13.7Nm

It must be ordered separately if connection subplate is needed.
Subplate model:

G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)
G534/01 (G3/4") ; G534/02(M27x2)



Manual Directional Valve

Model: WMM...

- Size 6, 10, 16, 25, 32
- Maximum working pressure 350 bar
- Maximum working flow 1100 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	05
Characteristic curve	05-07
Characteristic limit	07-08
Component size	09-14

Features

- Direct operated directional spool valve with handle
- With reset spring or detent, optional
- Subplate mounting

Function description, sectional drawing

The WMM manual directional valve is a direct operated directional spool valve which switches the oil circuit by rotating the handle to move the spool axially. It has 3/2-way, 4/2-way, 4/3-way as well as various spool symbols, and it is subplate mounting with optional detent and spring reset.

Model WMM...

The valve is composed of valve body (1), handle (2), valve spool (3), one or two reset springs (4), and push rod (5).

The valve spool (3) is held in the middle or initial position by the reset springs (4) in no operation condition. When the handle (2) is pushed to the right or left, the handle pushes the push rod (5) via hinge and controls the valve spool (3) directly to force the spool to move to the required position to obtain the required flow cross-section. When the handle return to the zero position, the control valve spool returns to the normal position by reset spring (4). The switching position of this valve is operated by the handle.

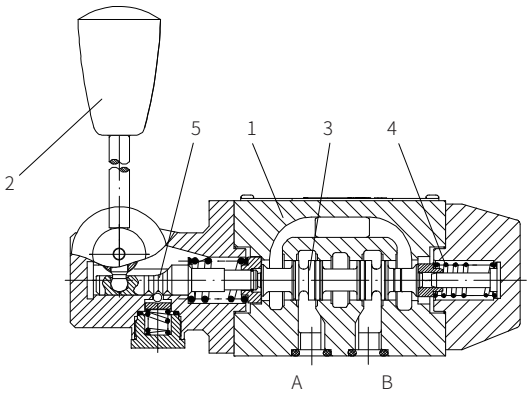
Model WMM.../F

The principle is basically the same with WMM.../. But this type valve is a control valve with two or three switching positions and one detent. Therefore, all the switching positions are fixed.

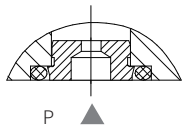
Plug-in throttle

Due to working conditions limitations, it may occur that the flow of the valve exceeds the specified flow rate on the valve performance curve during switching process, then the use of a throttle is required. It is installed in the P chamber of the valve or oil circuit.

This type valve has advantages such as small volume, large flow capacity, and good reliability compared with other series of valves. It can be used together with the modular valves in same size, and widely used in engineering machinery, coal mining machinery, chemical machinery, light industry machinery, locomotives and many other industries.



Model 4WMM6...5XJ/



Plug-in throttle

Models and specifications

WMM – J /

3 ways =3
4 ways =4

manual directional valve

size 6 =6
size 10 =10
size 16 =16
size 25 =25
size 32 =32

symbols e.g.
C, D, J, E, etc

10 to 19 series (for size 10) =1X
(10 to 19 series installation and connection size unchanged)
50 to 59 series (for size 6, 16, 25) =5X
(50 to 59 series installation and connection size unchanged)
60 to 69 series (for size 32) =6X
(60 to 69 series installation and connection size unchanged)

No code= without detent, with reset spring
F= with detent

J= Rekith

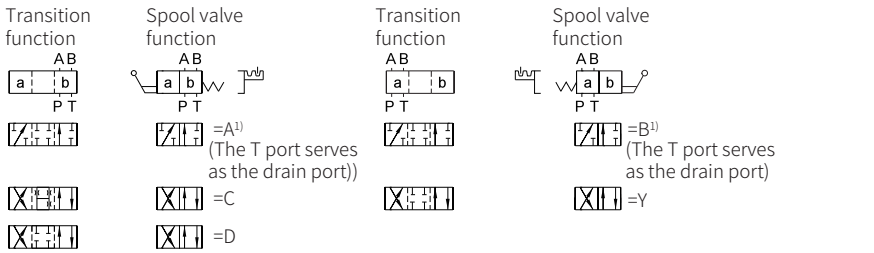
No code= no plug-in throttle
B08[1)] = throttle Φ0.8mm
B10[1)] = throttle Φ1.0mm
B12[1)] = throttle Φ1.2mm

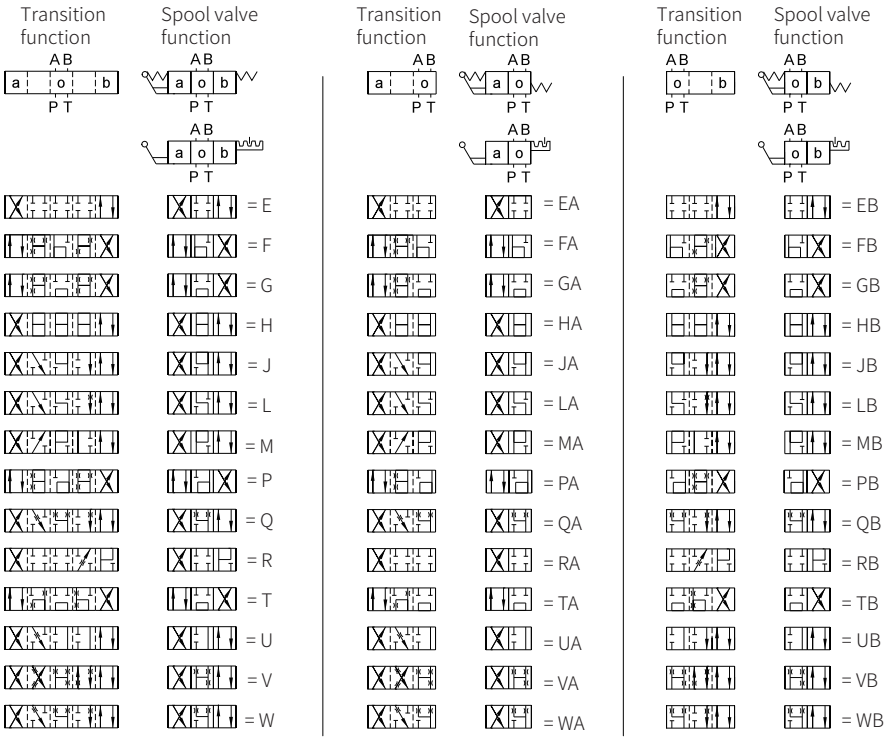
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

* more information in text

[1)] Only for size 6 and 10 when the flow > performance of the valve, effective in P chamber.

Functional symbols





Explanation:

(1) Symbol A and B only for size 6 and 10

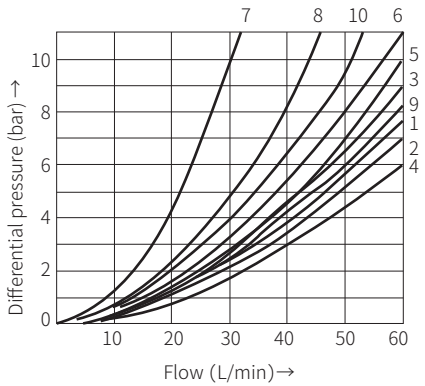
Technical parametes

Size		6	10	16	25	32
Working pressure	Oil port A, B, P (bar)	to 315		to 350		
	Oil port T (bar)	to 160	to 150	to 250	to 250	to 250
Flow	(L/min)	to 60	to 100	to 300	to 450	to 1100
Flow cross-section (middle position)		Q-type, 6% of nominal cross-section W-type, 3% of nominal cross-section		Q, V-type, 16% of nominal cross-section W-type, 3% of nominal cross-section		
Medium		Mineral oil(HL,HLP) in accordance with DIN 51524; fast living organisms Degraded oil according to VDMA 24568; HETG(Rapeseed oil); HEPG(Polyethylene glycol); HEES(synthetic ester);				
Oil temperature range	(°C)	-30 to +80				
Viscosity range	(mm^2/s)	2.8 to +500				
Weight	(kg)	about 1.4	about 3.3	about 8	about 17	about 45
Operating force	(N)	Without return pressure about 20 Without return pressure about 30 (at 150 bar)	With detent: about 16 to 23 Without detent: about 20 to 27	about 75	about 120	about 170

Characteristic curve

(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)

WMM6 pressure loss curve



Function symbol	Flow direction			
	P→A	P→B	A→T	B→T
A	3	3	-	-
B	3	3	-	-
C	1	1	3	1
D	5	5	3	3
E	3	3	1	1
F	1	3	1	1
G	6	6	9	9
H	2	4	2	2
J	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
Q	1	1	2	1
R	5	5	4	-
T	10	10	9	9
U	3	3	9	4
V	1	2	1	1
W	1	1	2	2
Y	5	5	3	3

7. Symbol "R" in control position A to B

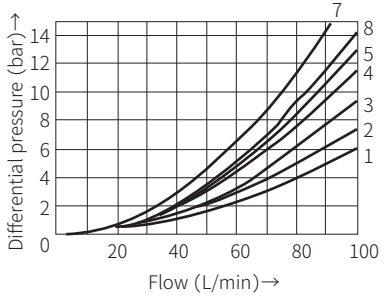
8. Symbols "G" and "T" in the middle position P to T

Characteristic curve

(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)

WMM10 pressure loss curve

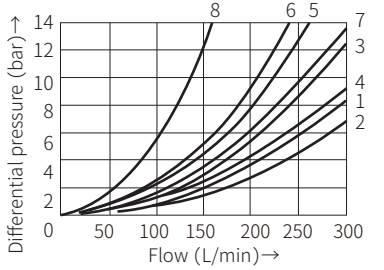
4. Symbols "G" and "T" in the middle position P to T
7. Symbol "R" in control position A to B



Function symbol	Flow direction			
	P→A	P→B	A→T	B→T
A	2	2	-	-
B	2	2	-	-
C	2	2	3	3
D	2	2	3	3
E	2	2	4	4
F	2	3	3	5
G	3	3	4	6
H	1	1	4	5
J	2	2	3	3
L	2	2	3	5
M	1	1	5	5
P	3	2	5	3
Q	2	2	4	4
R	2	4	3	-
T	3	5	5	6
U	2	2	3	5
V	2	2	4	4
W	2	2	5	5
Y	2	2	5	3

WMM16 pressure loss curve

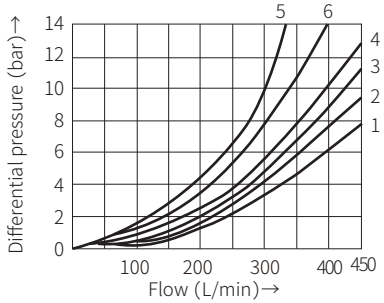
6. Symbols "G" and "T" in the middle position P to T
8. Symbol "S" in switching position P to T



Function symbol	Flow direction			
	P→A	P→B	A→T	B→T
E, D, T	1	1	1	3
F	2	2	3	3
G, T	5	1	3	7
H, C, Q	2	2	3	3
V, Z	2	2	3	3
J, K, L	1	1	3	3
M, W	2	2	4	-
R	2	2	4	-
U	1	1	4	7
S	4	4	4	-

WMM25 pressure loss curve

4. Symbol "L" in A to T
6. Symbol "U" in B to T



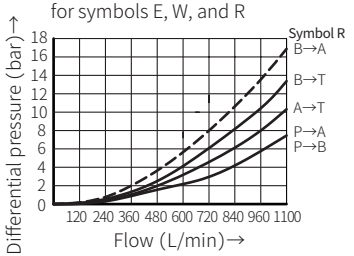
Function symbol	Flow direction			
	P→A	P→B	A→T	B→T
E	2	2	1	4
F	1	2	1	2
G	2	2	2	4
H	2	2	1	3
J	2	2	1	3
L	2	2	1	2
M	2	2	1	4
P	2	2	1	4
Q	2	2	1	4
R	1	2	1	-
T	2	2	2	4
U	2	2	1	4
V	2	2	1	4
W	2	2	1	3

Characteristic curve

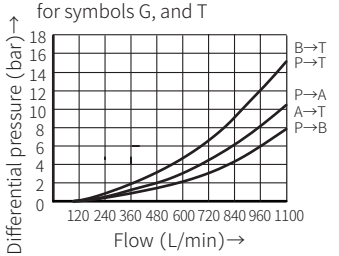
(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)

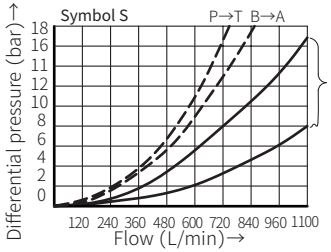
WMM32 pressure loss curve

Δp-Q characteristic curve applicable for symbols E, W, and R



Δp-Q characteristic curve applicable for symbols G, and T





Characteristic curves of other symbols

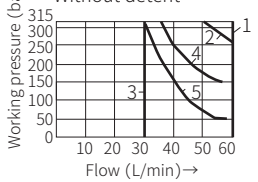
Characteristic limit

Due to blockage, the switching function of the valve is related to filtration. In order to obtain the specified maximum flow, it is recommended to use a 20um full-flow filtration. The various forces acting on the valve also affect the flow characteristics.

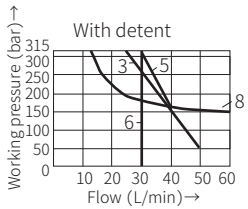
For a four-way valve, the specified flow data is valid for normal operation with two flow directions (i.e. from P to A and return flow from B to T at the same time)(see table). If only one direction of flow is needed, e.g. when the four-way valve with chamber A or B blocked is used as three-way valve, the maximum flow rate will greatly decrease in severe cases.

WMM6 characteristic limit

Without detent

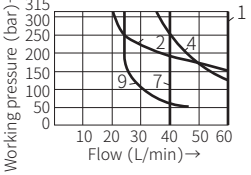


With detent



Characteristic curve		Spool valve symbol	Characteristic curve		Spool valve symbol
Without detent	1	E, E1, H, C, D M, Q, U W, G, J L, R, Y	With detent	1	E1, M, H C, D, Y
	2	A, B		2	E, J, Q L, U, W
	3	V		3	A, B
	4	F, P		4	G, T
	5	T		5	F
				6	V
				7	P
				8	R
				9	T

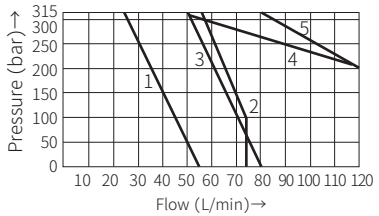
With detent



Characteristic limit

WMM10 characteristic limit

Characteristic curve	Spool valve symbol
1	A, B
2	H
3	F, G, P, R, T
4	J, L, Q, U, W
5	C, D, E, M, V, Y



WMM16 characteristic limit

Permitted flow qv L/min, 2-position valve						Permitted flow qv L/min, 3-position valve					
Function symbol	Working pressure P bar					Function symbol	Working pressure P bar				
	70	140	210	280	315		70	140	210	280	315
Spring reset						Spring reset					
C	300	300	300	260	220	E, H, J, L, M, Q, R, U, W	300	300	300	300	300
D	300	300	210	190	160	F, P	300	300	210	190	170
K	300	300	200	150	130	G, S, T	300	300	220	210	180
Z	300	240	190	170	150	V	300	260	200	180	170
With detent						With detent					
C, D, K, Z	300	300	300	300	300	E, H, J, L, M, Q, R, U, W	300	300	300	300	300
						F, P	300	300	280	230	230
						G, S, T	300	300	230	230	230
						V	300	300	250	230	230

WMM25 characteristic limit

Permitted flow qv L/min, 2-position valve						Permitted flow qv L/min, 3-position valve					
Function symbol	Working pressure P bar					Function symbol	Working pressure P bar				
	70	140	210	280	315		70	140	210	280	315
Spring reset						Spring reset					
C	450	300	250	200	180	E, J, L, M, Q, R, U, W	450	450	450	450	450
D	350	300	275	250	200	F	450	250	200	135	110
K	200	150	140	130	120	G, T	450	330	290	230	180
Z	300	270	240	220	200	H	450	450	400	400	350
						P	450	310	240	215	150
						V	450	310	280	270	200
With detent						With detent					
C, D, K, Z	450	450	450	450	450	E, F, G, H, J, L, M, P, Q, R, T, U, W	450	450	450	450	450
						V	450	450	400	350	300

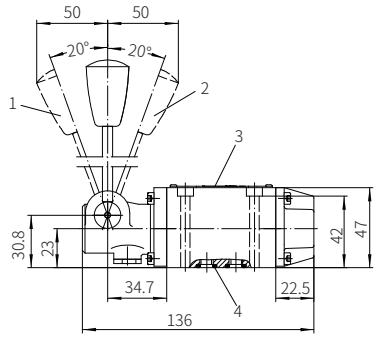
WMM32 characteristic limit

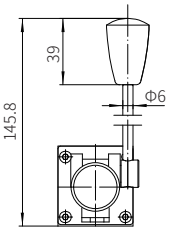
2-position and 3-position valves with spring reset					
Flow L/min	Under pressure of ...(bar)				
Function symbol	70	140	210	280	315
E, J, L, M, Q, R, V, U, W	1100	1050	860	750	680
F, G, H, S, T C, D, K, Z	650	450	370	320	280
2-position and 3-position valves with detent					
All symbols	1100	1050	860	750	680

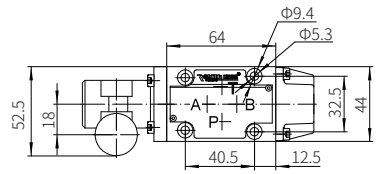
Component size

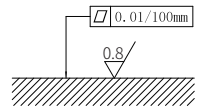
Size unit: mm

Model 4WMM6...5XJ/...





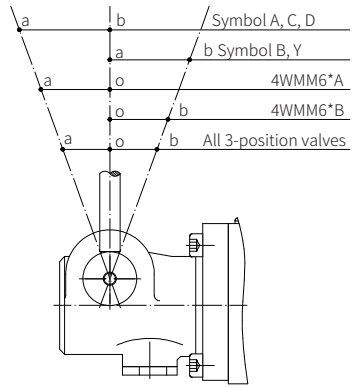




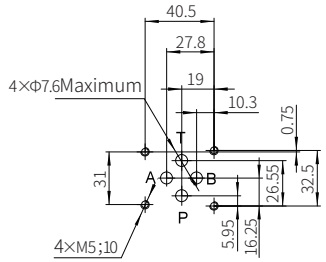
Required surface finishing of mating components

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4"); G341/02 (M14x1.5)
G342/01 (G3/8"); G342/02 (M18x1.5)
G502/01 (G1/2"); G502/02 (M22x1.5)



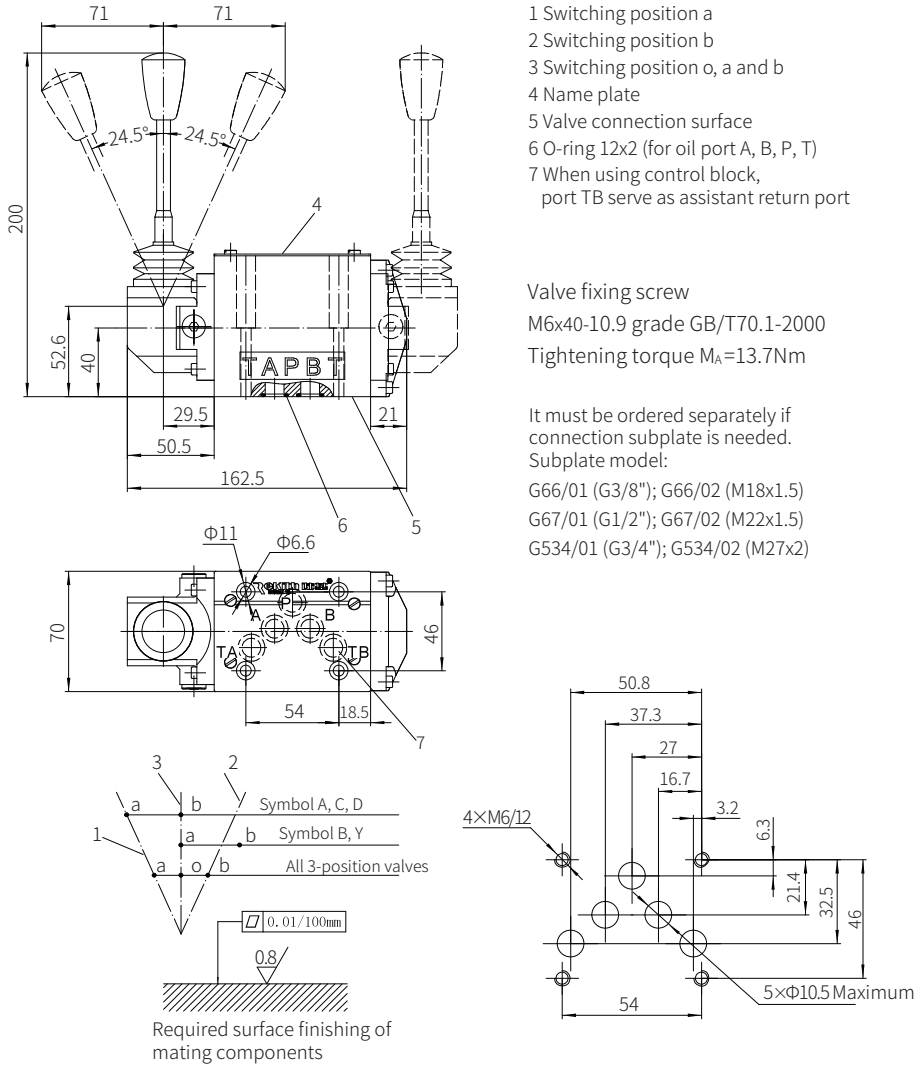
1 Switching position b→a and o→a
2 Switching position a→b and o→b
3 Name plate
4 O-ring 9.25x1.78 (for oil port A, B, P, T)



Component size

Size unit: mm

Model 4WMM10...1XJ/F...



Required surface finishing of mating components

1 Switching position a
2 Switching position b
3 Switching position o, a and b
4 Name plate
5 Valve connection surface
6 O-ring 12x2 (for oil port A, B, P, T)
7 When using control block, port TB serve as assistant return port

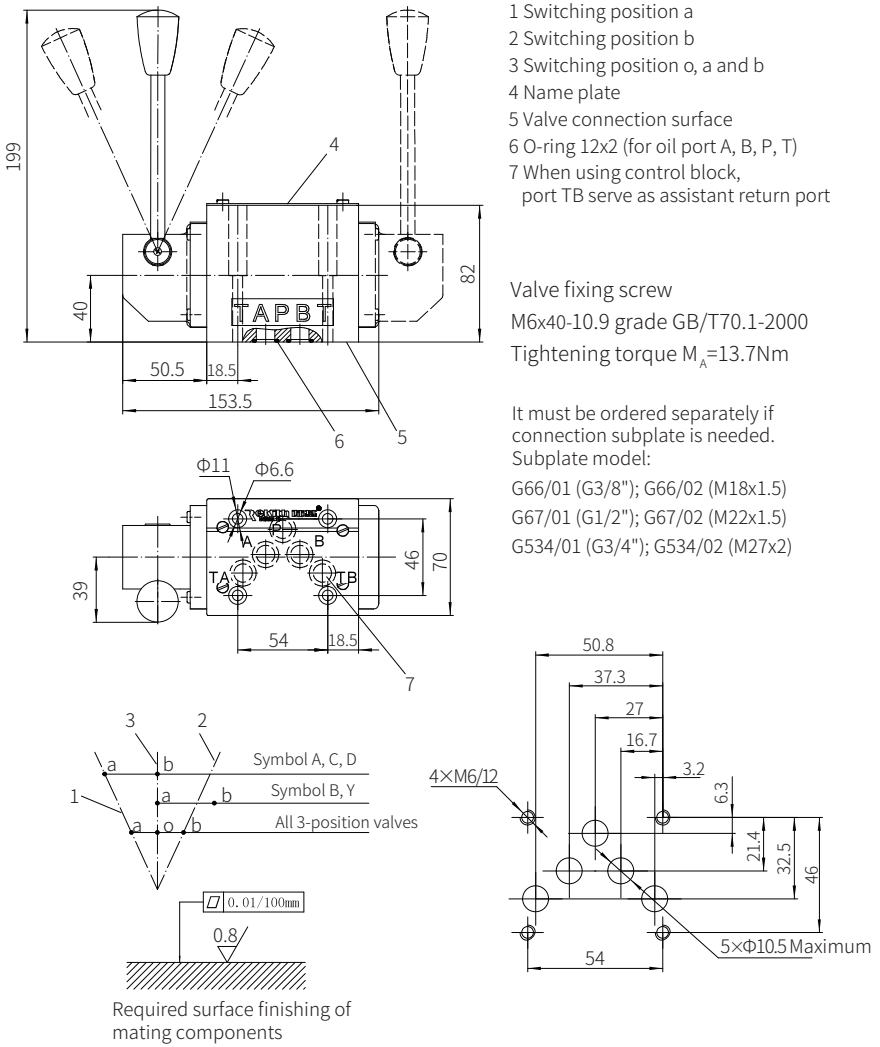
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G66/01 (G3/8"); G66/02 (M18x1.5)
G67/01 (G1/2"); G67/02 (M22x1.5)
G534/01 (G3/4"); G534/02 (M27x2)

Component size

Size unit: mm

Model 4WMM10...1XJ/...



Required surface finishing of mating components

1 Switching position a
2 Switching position b
3 Switching position o, a and b
4 Name plate
5 Valve connection surface
6 O-ring 12x2 (for oil port A, B, P, T)
7 When using control block, port TB serve as assistant return port

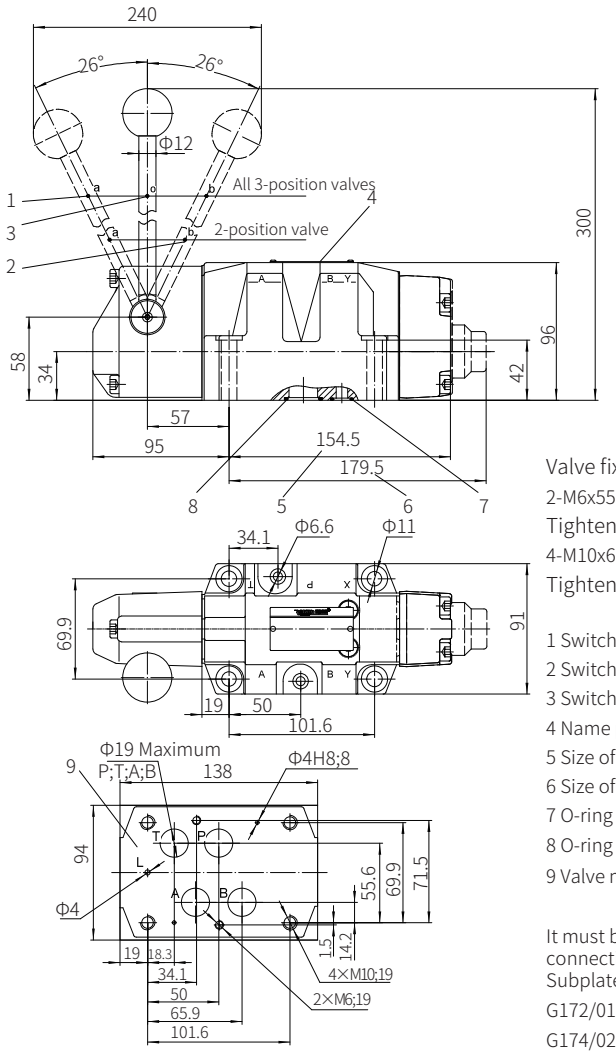
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

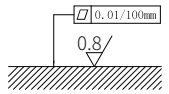
It must be ordered separately if connection subplate is needed.
Subplate model:
G66/01 (G3/8"); G66/02 (M18x1.5)
G67/01 (G1/2"); G67/02 (M22x1.5)
G534/01 (G3/4"); G534/02 (M27x2)

Component size

Size unit: mm

Model 4WMM16...5XJ/F





Required surface finishing of mating components

Valve fixing screw
2-M6x55-10.9 grade GB/T70.1-2000
Tightening torque M_A=15.5Nm
4-M10x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

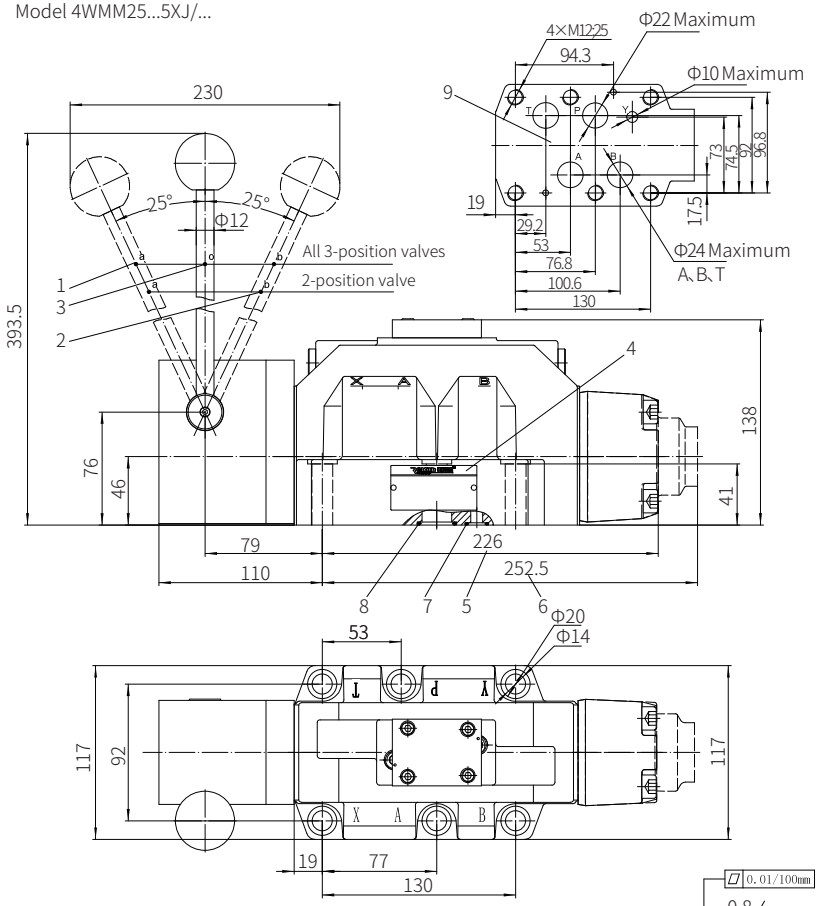
1 Switching position a
2 Switching position b
3 Switching position o
4 Name plate
5 Size of 3-position valve
6 Size of 2-position valve
7 O-ring 12x2 (for oil port L, X, Y)
8 O-ring 22x2.5 (for oil port P, A, B, T)
9 Valve mounting surface

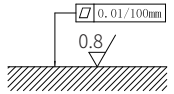
It must be ordered separately if connection subplate is needed.
Subplate model:
G172/01; G172/02; G174/01;
G174/02

Component size

Size unit: mm

Model 4WMM25...5XJ/...





Required surface finishing of mating components

1 Switching position a
2 Switching position b
3 Switching position o
4 Name plate
5 Size of 3-position valve
6 Size of 2-position valve
7 O-ring 19x3 (for oil port X, Y)
8 O-ring 27x3 (for oil port P, A, B, T)
9 Valve mounting surface

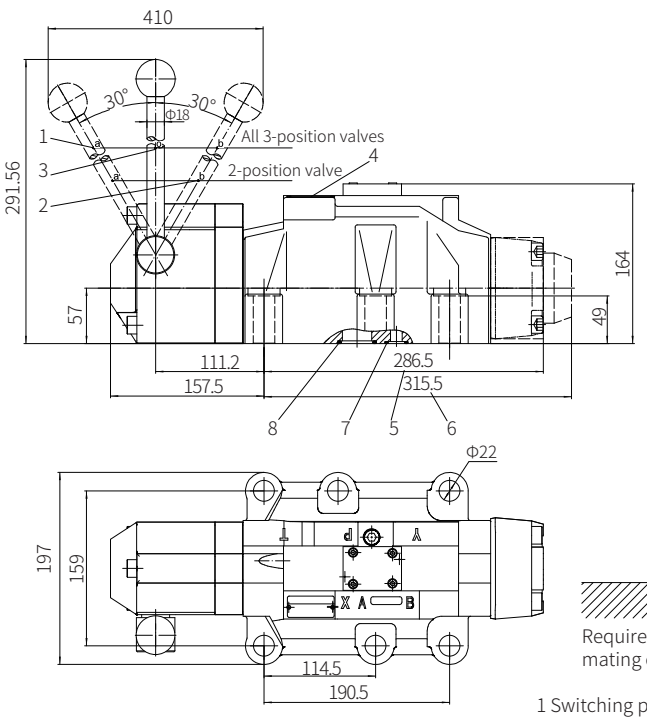
Valve fixing screw
6-M12x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=90Nm

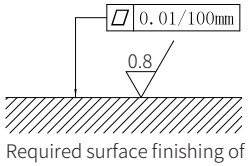
It must be ordered separately if connection subplate is needed.
Subplate model:
G151/01(G1"); G151/02 (M33x2)
G154/01(G1-1/4"); G154/02 (M42x2)
G156/01(G1-1/2"); G156/02 (M48x2)

Component size

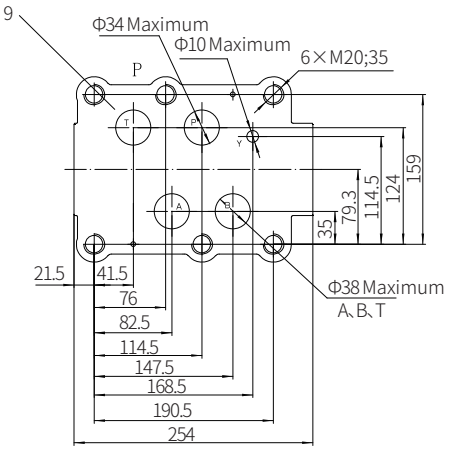
Size unit: mm

Model 4WMM32...6XJ/...





Required surface finishing of mating components



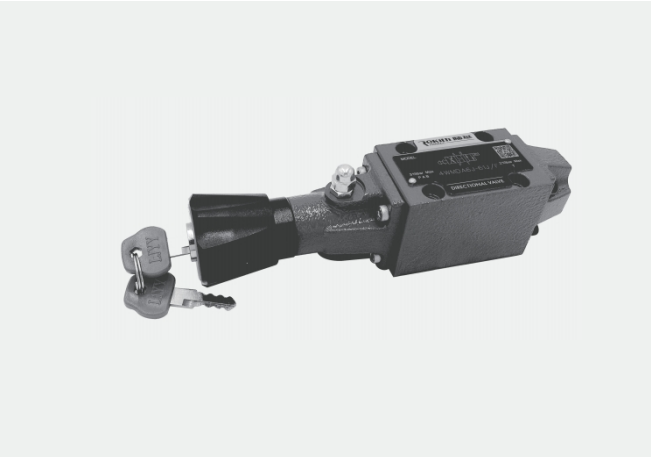
1 Switching position a
2 Switching position b
3 Switching position o
4 Name plate
5 Size of 3-position valve
6 Size of 2-position valve
7 O-ring 19x3 (for oil port X, Y)
8 O-ring 42x3 (for oil port P, A, B, T)
9 Valve mounting surface

Valve fixing screw
6-M20x80-10.9 grade GB/T70.1-2000
Tightening torque M_A=373Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G157/01 (G1-1/2") ; G157/02 (M48x2)

Rotary Directional Valve

Model: WMD6/10...



- Size 6 and 10
- Maximum working pressure 315 bar
- Maximum working flow 120 L/min

Contents

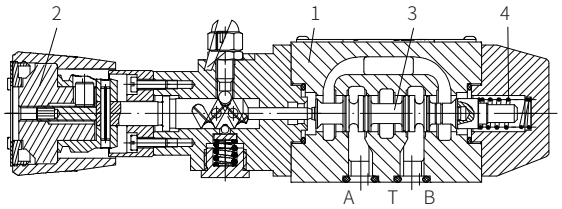
Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Functional symbols	04
Characteristic curve	05
Characteristic limit	06
Component size	07-08

Features

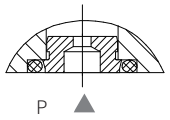
- Direct operated directional spool valve with rotary knob
- Subplate mounting

Function description, sectional drawing

The WMD rotary directional valve is a direct operated directional spool valve that switches the oil circuit by rotating the handle to move the spool axially. It has 3/2-way, 4/2-way and 4/3-way as well as various spool symbols, and it is subplate mounting valve with detent.
The valve consists of valve body (1), rotary knob (2), control spool (3) and reset spring (4).
The control spool (3) is held in the neutral or initial position by the reset spring (4) in no operation on the rotary knob (2). When the rotary knob (2) is pushed to the right or left, the control spool (3) is directly controlled through the connecting rod and moved to the required position to obtain the required flow cross-section.
Plug-in throttle:
Due to working conditions limitations, it may occur that the flow rate of the valve exceeds the specified flow rate on the valve performance curve during the switching process. In this case, a throttle is required. It is installed in the P chamber of the valve or oil circuit.

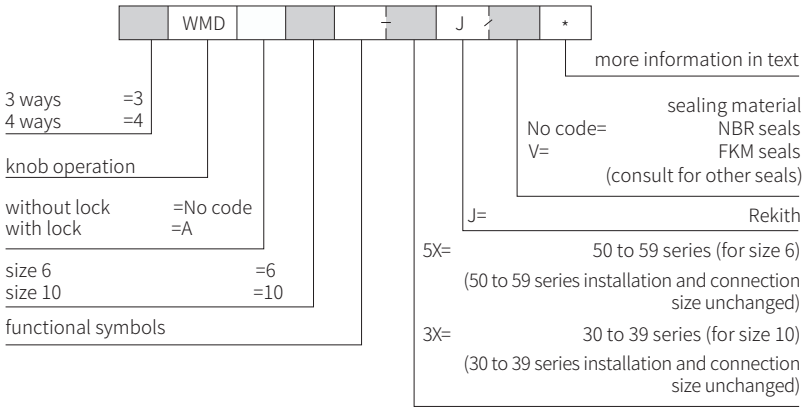


Model WMD6...5XJ/



Plug-in throttle

Models and specifications



Technical parametes

Size 6

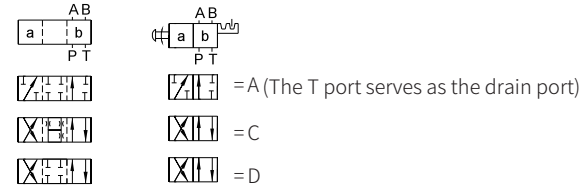
Working medium temperature range		°C	-30 to +80 (NBR seal)
Maximum working pressure	Oil port A, B, P	bar	315
	Oil port T	bar	160
Maximum flow		L/min	60
Flow cross-section (middle position)	Q type	mm^2	6% of nominal cross-section
	W type	mm^2	3% of nominal cross-section
Working medium			Mineral oil; phosphate ester
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is IS04406 Class 20/18/15
Weight		kg	1.5

Size 10

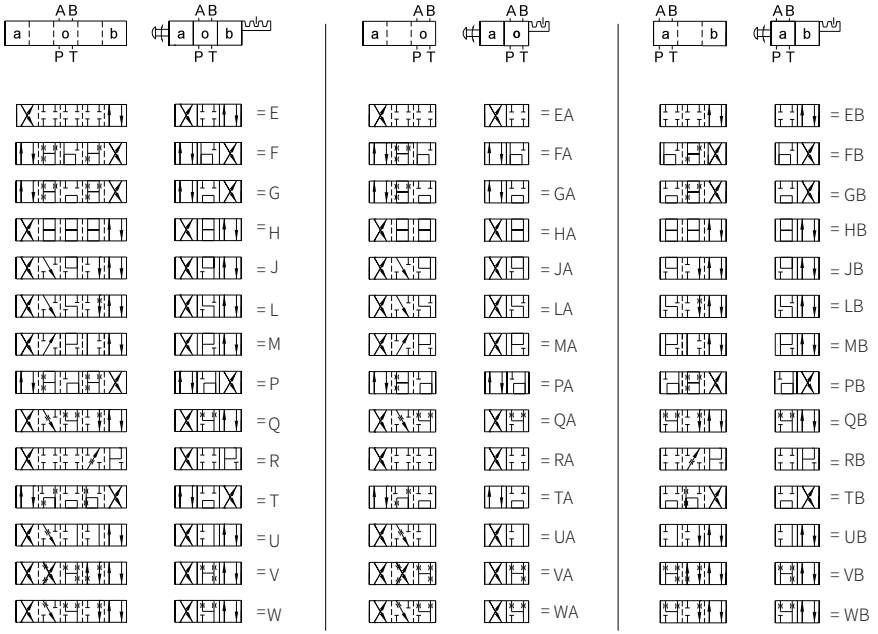
Working medium temperature range		°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Maximum working pressure	Oil port A, B, P	bar	315
	Oil port T	bar	160
Maximum flow		L/min	120
Effective flow cross-section (middle position)	V type	mm^2	11 (A/B→T) ; 10.3 (P→A/B)
	W type	mm^2	2.5 (A/B→T)
	Q type	mm^2	5.5 (A/B→T)
Working medium			Mineral oil; phosphate ester
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is IS04406 Class 20/18/15
Weight		kg	4.2

Functional symbols

Transition function / Spool valve function



Transition function / Spool valve function



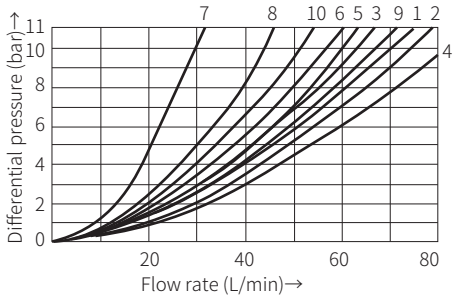
Transition function / Spool valve function

Transition function / Spool valve function

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

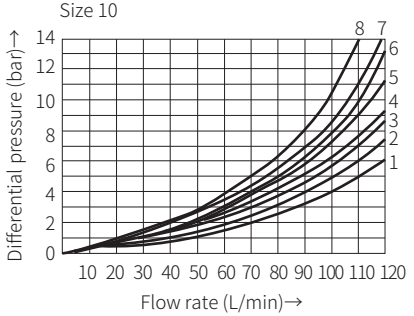
Size 6



7 Symbol "R" in switching position B→A
8 Symbols "G" and "T" in the middle position P→T
9 Symbol "H" in the middle position P-→T

Functional symbol	Flow direction			
	P to A	P to B	A to T	B to T
AB	3	3	-	-
C	1	1	3	1
DY	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
JQ	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

Size 10



7 Symbol "R" in switching position A→B
8 Symbols "G" and "T" in the middle position P→T

Functional symbol	Flow direction			
	P to A	P to B	A to T	B to T
A	4	3	-	-
B	3	4	-	-
C	3	3	4	4
D	3	3	5	5
E	2	2	4	4
F	1	2	3	4
G,T	4	4	7	7
H	1	1	5	5
J	2	2	3	3
L	3	3	2	4
M	1	1	4	4
P	3	1	5	5
Q	2	2	2	2
R	3	4	3	-
U	3	3	5	2
V	2	2	3	3
W	3	3	3	3
Y	4	4	6	6

Working limit

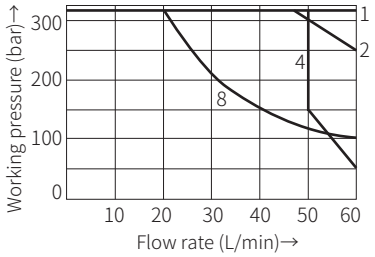
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

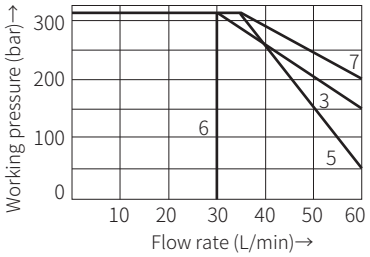
Due to blockage, the working performance of the valve is related to the filtration accuracy. In order to obtain the given flow value, it is recommended to use 25um full-flow filtration. The various forces inside the valve also affect its working limit.

Therefore, for a four-way valve, the given flow value is valid for normal operation when two flow directions(i.e. from P to A and return flow from B to T).

If only one direction of flow is required, when the four-way valve with chamber A or B blocked is used as three-way valve, the flow rate may be very small in severe cases.

Size 6

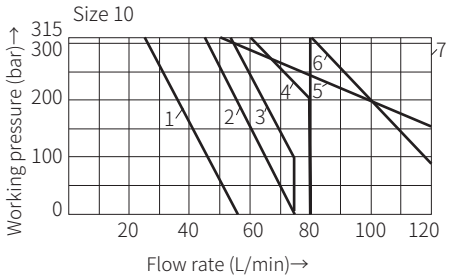




Performance curve	Functional symbol
1	E, M, H, C, D, Y, Q, U, W
2	J, L
4	G, P
8	T

Performance curve	Functional symbol
3	A, B
5	F
6	V
7	R

Size 10

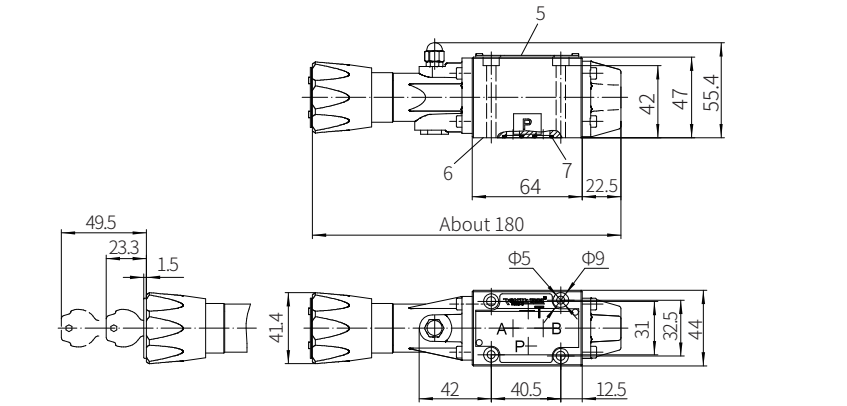


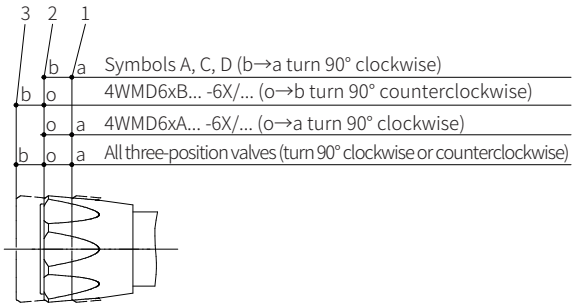
Performance curve	Functional symbol
1	A、B
2	A/O
3	H
4	F、G、P、R、T
5	J、L、Q、U、W
6	C、D、E、M、V、Y
7	C/O、C/OF D/O、D/OF

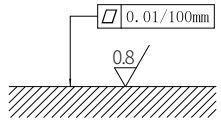
Component size

Size unit: mm

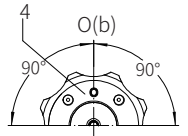
Model 4WMD6...5XJ/...







Required surface finishing of mating components



Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

1 Switch position b→a,o→a

2 Switch position a→b,a→o,b→o

3 Switch position o→b

4 Three-position valve (including symbols *A and *B):
turn 90° clockwise or counterclockwise.
Two-position valve (symbols A, C, D): turn 90° clockwise

5 Name plate

6 Mounting surface

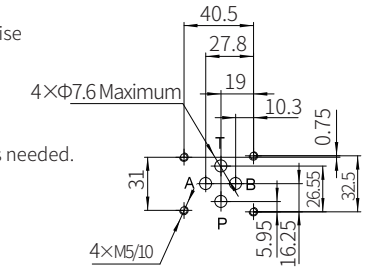
7 O-ring: 9.25x1.78 (for oil ports A, B, P, T)

It must be ordered separately if connection subplate is needed.
Subplate model:

G341/01(G1/4") ; G341/02(M14x1.5)

G342/01(G3/8") ; G342/02(M18x1.5)

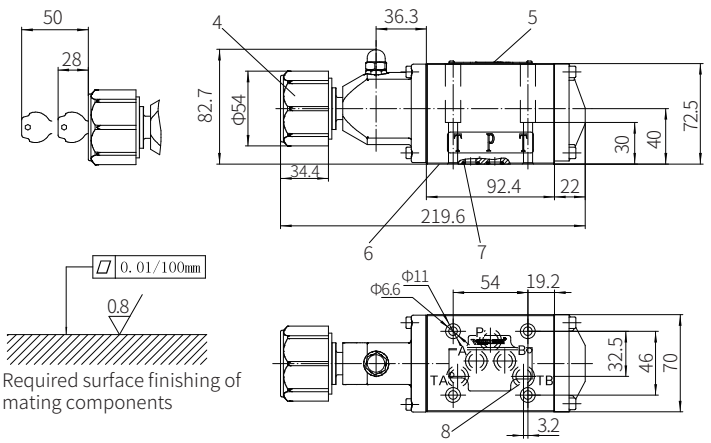
G502/01(G1/2") ; G502/02(M22x1.5)



Component size

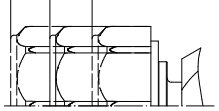
Size unit: mm

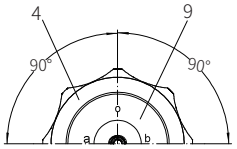
Model 4WMD10...3XJ/...



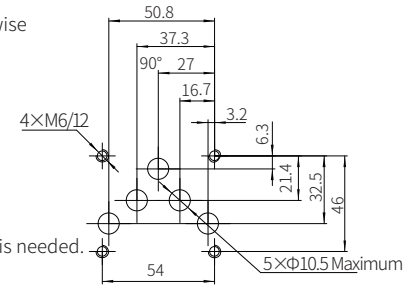
Required surface finishing of mating components

b	a	Symbols A, C, D (b→a turn 90° clockwise)
b	o	4WMDxB... -6X/... (o→b turn 90° counterclockwise)
o	a	4WMDxA... -6X/... (o→a turn 90° clockwise)
b	o	a	All three-position valves (turn 90° clockwise or counterclockwise)





1 Switch position b→a,o→a
2 Switch position a→b,a→o,b→o
3 Switch position o→b
4 Three-position valve (including symbols *A and *B): turn 90° clockwise or counterclockwise.
Two-position valve (symbols A, C, D): turn 90° clockwise
5 Name plate
6 Mounting surface
7 O-ring: 12x2 (for oil ports A, B, P, T)
8 Additional return port when using control block
9 Observe the spool position by the colored disc in front of the rotary knob



It must be ordered separately if connection subplate is needed.
Subplate model:

G66/01 (G3/8") ; G66/02(M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)
G534/01(G3/4") ; G534/02 (M27x2)

Valve fixing screw
M6x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Roller Directional Valve

Model: WMU/R6/10...

- Size 6/10
- Maximum working pressure 315 bar
- Maximum working flow 120 L/min

Contents

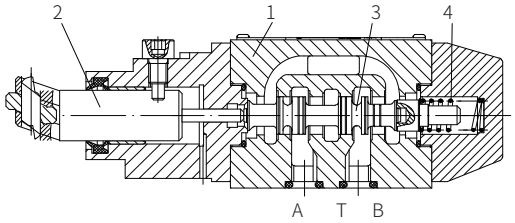
Functional description,sectional drawing	02
Models and specifications	02
Technical Parameters	03
Functional symbols	03
Characteristic curve	04
Characteristic limit	05
Component size	06-07

Features

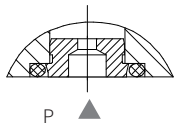
- Right-angle directional valve operated by roller
- The roller can rotate 90°
- Interpolar conversion or deviation from the scanning direction by the curve control surface directly
- Radial direction (to 30° angle) is completely absorbed

Function description, sectional drawing

The WMR/U mechanical valve is direct operated directional spool valve with a roller/push rod controlled by a stopper or cam installed on the actuator.
There are 3/2-way, 4/2-way and 4/3-way valves with variety of symbols. The rollers and push rods can be rotated by 90°, and the radial direction (30°) is fully absorbed.
The valve consists of valve body (1), roller/push rod (2), control spool (3) and reset spring (4). When no external force operation, the control spool (3) is held in the initial position (switching position b) by the reset spring (4). When the external force operate the roller/push rod, the control spool (3) is pushed back to the initial position by the reset spring.
Due to limitations of working conditions, the flow of the valve may exceed the value of the performance curve during the switching process. In this case, a throttle is required to install in the P chamber of the valve or in the oil circuit.

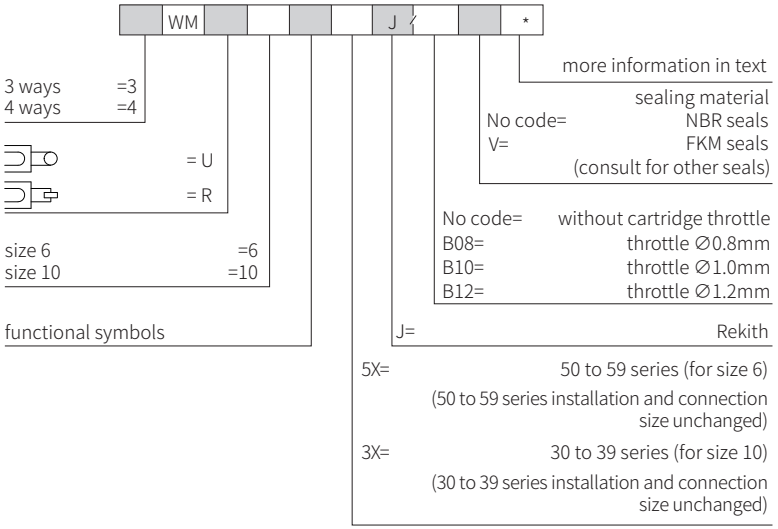


Model 4WMR6E-5XJ/



Plug-in throttle

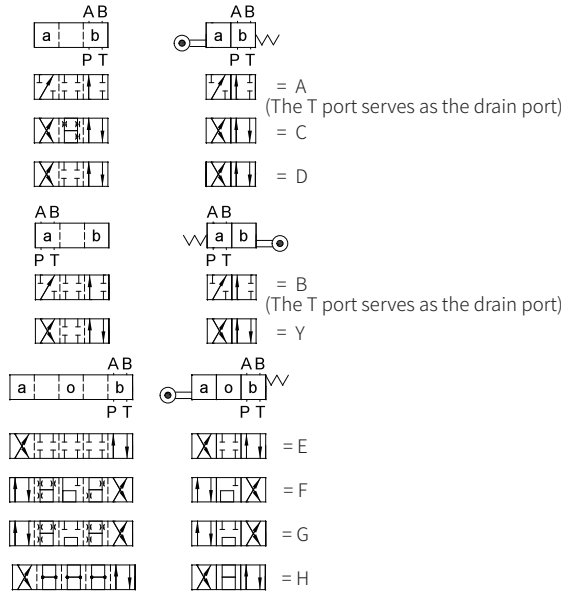
Models and specifications



Technical parametes

Size			6	10	
Working pressure	port A, B, P	MPa	to 31.5		
	port T	MPa	to 6	to 16	
For symbols A and B, when the pressure exceeds the maximum return pressure, the oil port T must be used as a drain port					
Flow		L/min	to 60	to 120	
Flow cross section (in the middle position)			For symbol Q, 6% of nominal cross-section		
			For symbol W, 3% of nominal cross-section		
Medium			Mineral hydraulic oil or phosphate ester hydraulic oil		
Oil temperature range		°C	- 30 to + 80		
Viscosity range		mm^2/s	2.8 to 500		
Weight		kg	About 1.4	About 3.3	
Operating force on roller push rod		N	Without return pressure	About 100 to 121	2-position valve	About 70 to 140
			With return pressure	About 184 to 205	3-position valve	About 70 to 175

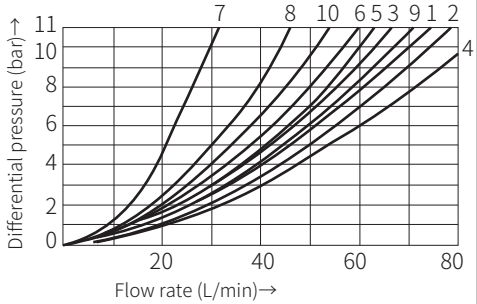
Functional symbols



Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

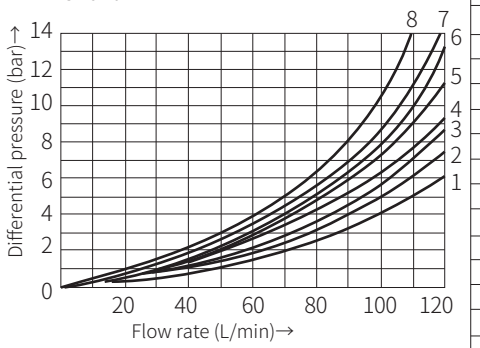
Size 6 △P/Q- characteristic curve



7 Symbol "R" in switching position B→A
8 Symbols "G" and "T" in the middle position P→T
9 Symbol "H" in the middle position P-→T

Function symbol	Flow direction			
	P to A	P to B	A to T	B to T
A B	3	3	-	-
C	1	1	3	1
D Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

Size 10



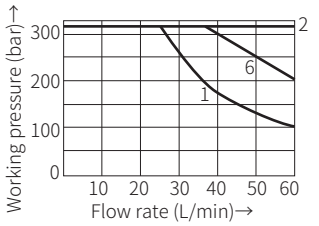
7 Symbol "R" in switching position B→A
8 Symbols "G" and "T" in the middle position P→T

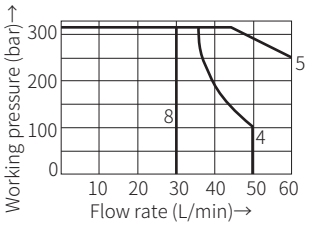
Function symbol	Flow direction			
	P to A	P to B	A to T	B to T
A	4	3	-	-
B	3	4	-	-
C	3	3	4	4
D	3	3	5	5
E	2	2	4	4
F	1	2	3	4
G, T	4	4	7	7
H	1	1	5	5
J	2	2	3	3
L	3	3	2	4
M	1	1	4	4
P	3	1	5	5
Q	2	2	2	2
R	3	4	3	-
U	3	3	5	2
V	2	2	3	3
W	3	3	3	3
Y	4	4	6	6

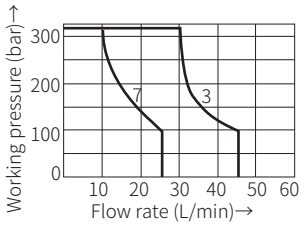
Characteristic limit

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Due to blockage, the switching function of the valve is related to filtration. In order to obtain the maximum flow rate shown, 20u full flow filtration is recommended. Various forces acting on the valve also affect the flow characteristics. For four-way valves, the flow data shown are obtained under normal use of two flow directions (i.e., from P to A, while return from B to T) (see table).
If only one direction of flow is required, for example, block A or B of the four-way valve and use it as a three-way valve, its maximum flow rate will be greatly reduced in severe cases.

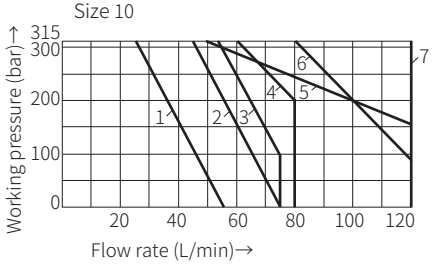






Characteristic curve	Function symbol
1	A, B
2	E, M, H, C, D, Y, Q, U, W
3	F, P
4	G
5	J, L
6	R
7	T
8	V

Size 10

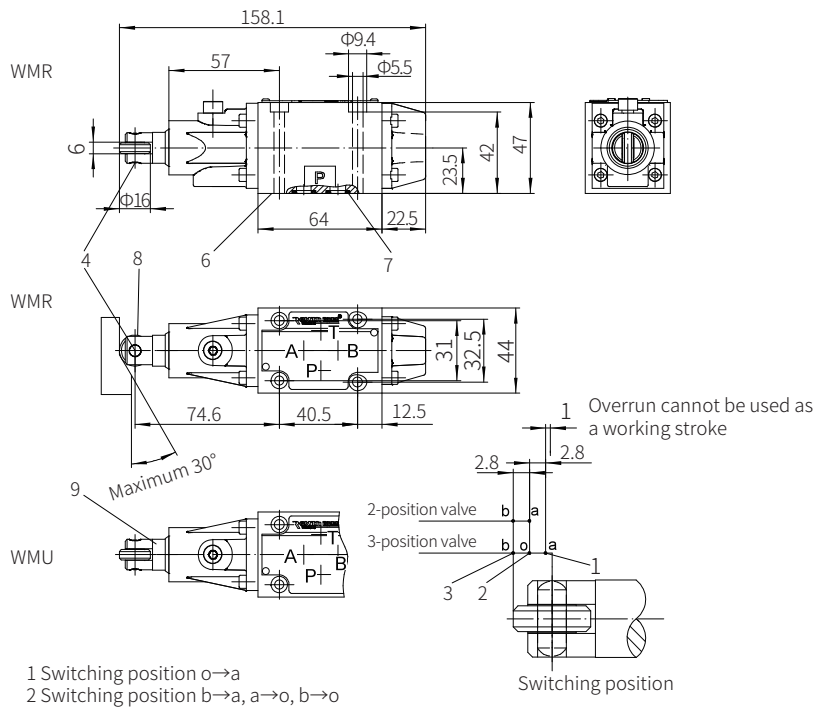


Characteristic curve	Function symbol
1	A, B
2	A/O
3	H
4	F, G, P, R, T
5	J, L, Q, U, W
6	C, D, E, M, V, Y
7	C/O, C/OF, D/O, D/OF

Component size

Size unit: mm

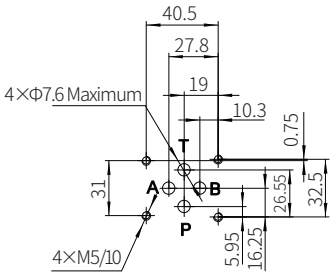
Model WMU/R6...

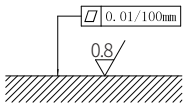


1 Switching position o→a
2 Switching position b→a, a→o, b→o
3 Switching position o→b, a→b
4 Pin
5 Name plate
6 Mounting surface
7 O-ring: 9.25x1.78 (for oil ports A, B, P, T)
8 Roller
9 Putter

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm



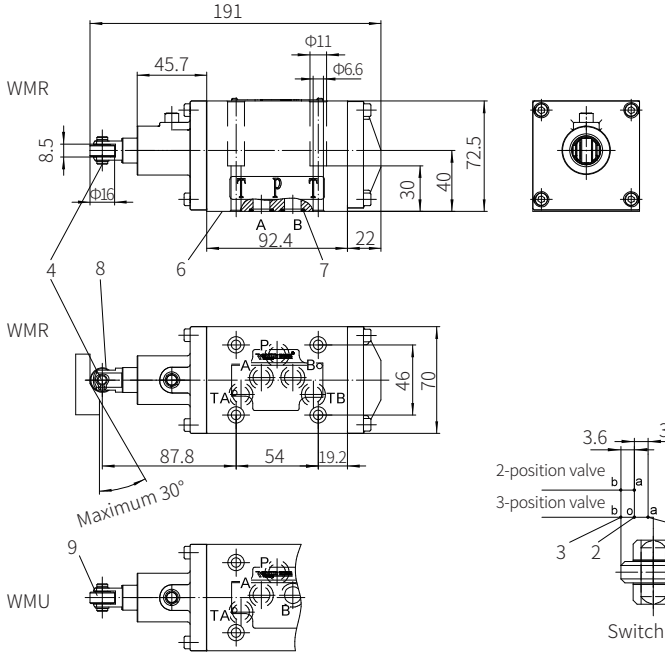


Required surface finishing of mating components

Component size

Size unit: mm

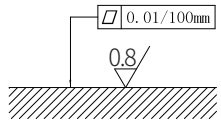
Model WMU/R10...



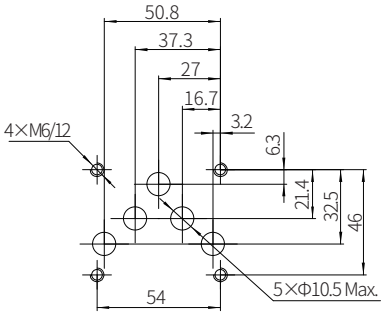
1 Switching position o→a
2 Switching position b→a, a→o, b→o
3 Switching position o→b, a→b
4 Pin
5 Name plate
6 Mounting surface
7 O-ring: 9.25x1.78 (for oil ports A, B, P, T)
8 Roller
9 Putter

It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02(M18x1.5)
G67/01 (G1/2") ;G67/02 (M22x1.5)
G534/01 (G3/4") ; G534/02(M27x2)

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm



Required surface finishing of mating components



01

Solenoid Operated Directional Valve

Model: WE4...2XJ

- Size 4
- Maximum working pressure 210 bar
- Maximum working flow 30 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Characteristic curve	05
Characteristic limit	05
Component size	06

Features

- Solenoid operated direct type directional spool valve
- Wet-pin DC or AC solenoids

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Function description, sectional drawing

The WE4 directional valve is a solenoid operated directional spool valve. It controls the opening, closing and flow direction of the liquid flow.

The directional valve is mainly composed of valve body (1), one or two solenoid coils (2), control spool (3), and one or two reset springs (4). The control spool (3) is held in the middle or original position by means of the reset springs (4) (except for impulse spools) in the de-energized condition.

The control spool (3) is operated by wet pin solenoids (2). It must be taken that the pressure chamber of the solenoid is filled with oil to make sure the proper functioning.

The force of the solenoid (2) acts on the control spool (3) through the push rod (5) to push it from the middle position to the required end position. In this way, the fluid flow from P to A and B to T, or from P to B and A to T. When the solenoid (2) is de-energized, the control spool (3) will return to the neutral position under the action of the return spring (4). A manual emergency operation (6) is provided to operate the control spool (3) without solenoid.

Model WE4...2X/O...

This model is a directional valve with two switching positions and two solenoids but without detent and spring. There is no defined switching position during power failure.

Model WE4...2X/OF...

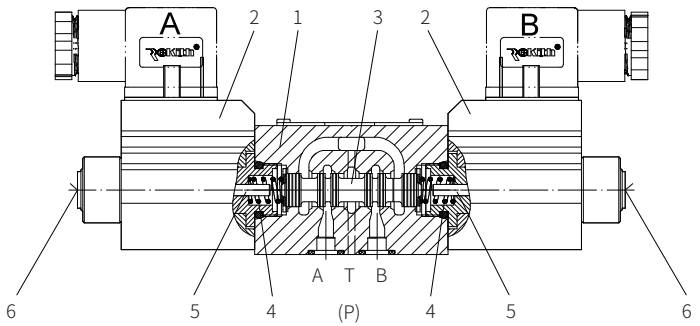
This model is a directional valve with two switching positions, two solenoids and a detent. Therefore, the relevant switching position is fixed and there is no require of continuous power supply.

Note:

If two or more valves share one return tube, the spool may work abnormally because of pressure peak especially for the valves with detent. It is recommended to use a separate return tube for each valve or install a check valve in the tank pipe to prevent drain completely of the tank. If the installation condition is available, a back pressure valve can be installed. (Back pressure is about 2bar).

Plug-in throttle valve

If the flow exceeds the maximum power limit of the valve during the direction changing process under the given working conditions, it is recommended to insert a plug-in throttle into port P.



Model 4WE4E...2XJ/

Models and specifications

WE 4 – 2X J / C *

3 ways =3
4 ways =4

size 4 =4

Symbols e.g. D, E, EA, EB, etc.

20 to 29 series =2X
(20 to 29 series installation and connection size unchanged)

Rekith =J

with reset spring =No code
no reset spring =O

wet pin standard solenoid =C

12V DC =G12
220V AC, 50H =W220-50
24V DC =G24
110 or 220V AC with rectifier =W110R/220R

without manual emergency operation =No code
with hidden manual emergency operation =N9

more information in text

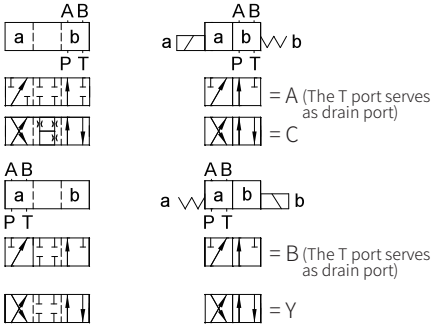
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code= without plug-in throttle
B08= throttle Ø0.8mm
B10= throttle Ø1.0mm
B12= throttle Ø1.2mm

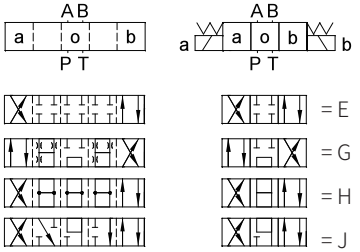
Z4= standard plug
Z5L= large right angle plug with light
FS2= deutsch waterproof plug

Functional symbols

Transition function spool valve function



Transition function spool valve function



Technical parameters

Universal			
Installation position			Optional
Environment temperature range		°C	-30 to +50 (NBR seal) -20 to +50 (FKM seal)
Weight	Valve with one solenoid	kg	0.8
	Valve with two solenoids	kg	1.1
Hydraulic			
Maximum working pressure	Oil port A, B, P	bar	210
	Oil port T	bar	100 When the working pressure exceeds the allowable tank pressure, port T must be used as drain port for symbols A and B.
Maximum flow		L/min	30
Pressure fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range		°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 500
Oil cleanliness			The maximum allowable pollution level of oil is IS04406 level 20/18/15
Electric			
Voltage available		V	24 (DC)
Allowable voltage tolerance (voltage unit)		%	±10
Power consumption		W	19
Duty		%	100 (continued)
Switching time to ISO 6403	On[5]	ms	20 to 30
	Off	ms	10 to 20
Switching frequency		1/h	to 15000
Protective measures to EN 60529			IP65, plug-in connector installed and fixed
Maximum coil temperature		°C	150

1) For NBR seal and FKM seal.

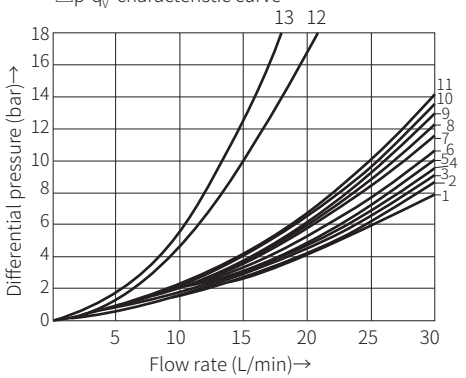
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V characteristic curve



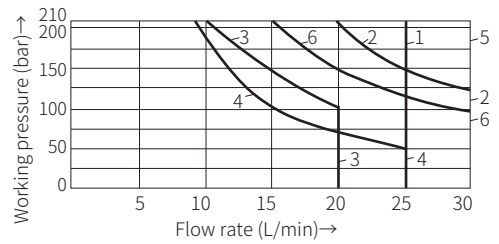
Symbol	Flow direction					
	P-A	P-B	A-T	B-T	P-T	B-A
A、B	7	6	-	-	-	-
C	11	11	8	7	-	-
D、Y	11	11	8	7	-	-
E	8	8	6	6	-	-
G	6	8	8	6	12	-
H	2	4	6	7	7	-
Q	9	8	4	5	-	-
L	9	7	1	5	-	-
M	3	3	7	7	-	-
R	11	9	5	-	-	13
J	10	10	3	4	-	-
W	11	11	8	7	-	-

Characteristic limit

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The performance limits shown are valid when using valves with flow in both directions (e.g. flow from P to A with return flow from B to T).
Because of the hydraulic force inside the valve, the allowable performance limit when oil flows in one direction (for example, from P to A and oil port B is blocked) is much lower!

Performance limits are measured using a solenoid coil at operating temperature and undervoltage 10%, without tank preinstalled.



Characteristic curve	Symbol
1	C, C/O, C/OF, D, D/O, D/OF, Y
2	E, J, L, Q, U, W
3	G
4	A, B
5	H, M
6[1]	R

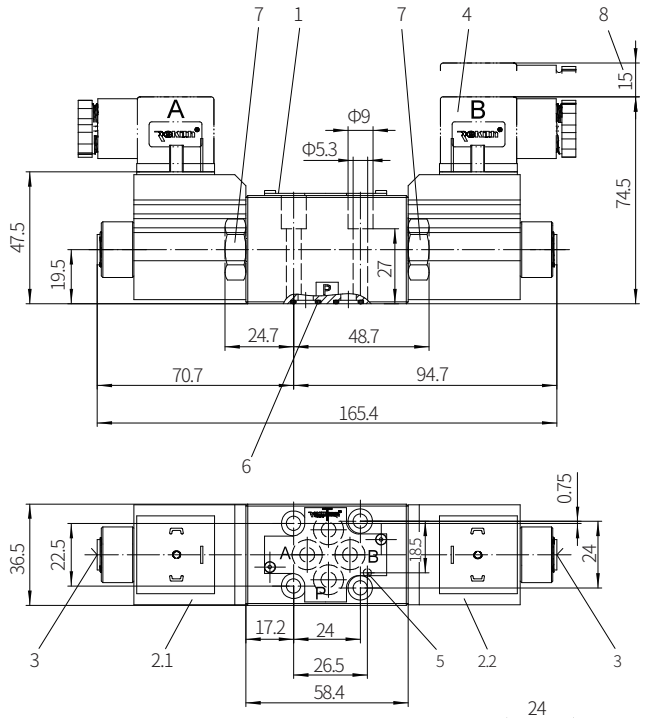
Return oil flow
(Independent from area ratio)

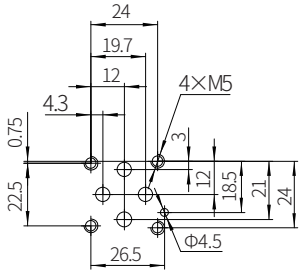
Other switching performance limits available on request!

Component size

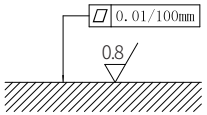
Size unit: mm

Model 4WE4...2XJ/...





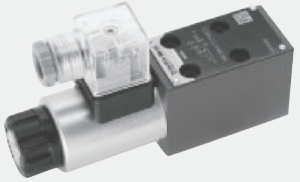
1 Name plate
2.1 Solenoid "a"
2.2 Solenoid "b"
3 Manual emergency operation "N9"
4 Plug
5 Hole of locating pin
6 O-ring (for oil port P, A, B, T)
7 Plug for valve with one solenoid
8 Space required to remove the plug
Valve fixing screw
M5x35-10.9 grade GB/ T70.1-2000
Tightening torque M_A=6Nm



Required surface finishing
of mating components

Solenoid Operated Directional Valve

Model: WE5...6XJ



- Size 5
- Maximum working pressure 250 bar
- Maximum working flow 14 L/min

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Technical parameters	03
Characteristic curve	04
Characteristic limit	04
Component size	05

Features

- Direct solenoid operated directional spool valve
- Wet pin DC or AC solenoids
- Plate connection

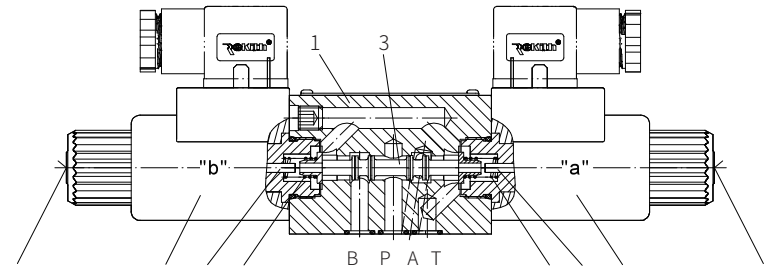
Function description, sectional drawing

The WE5 solenoid operated directional valve uses wet pin AC (or DC) solenoids to control different spool valve positions. This valve is mainly composed of valve body (1), one or two solenoids (2), spool (3) and one or two reset springs (4).

When the solenoid is de-energized, the spool valve is held in the middle or initial position by the spring (except for impulse valve). When the solenoid is energized, the force of the solenoid acts on the spool (3) through the push rod (5) to push it to the desired working position. Pushing the fault check button (6) can move the spool valve to check the working condition of the valve.

The WE5 valve adopts plate connection

Due to the use of wet pin solenoids, this valve has the advantages of long service life, good heat dissipation performance, and short action time. DC solenoids have many advantages such as high commutation frequency, soft operating characteristics, insensitivity to overvoltage and low voltage response, and highly reliable operation. The valve is widely used in various hydraulic systems and as pilot valves for pressure valves.



Model WE5...6XJ/

Models and specifications

WE5 [ ] 6X J [ ] C [ ] [ ] [ ] [ ] [ ] *

3 ways =3
4 ways =4

symbols e.g. N, J, E, etc

60 to 69 series =6X
(60 to 69 series installation and connection size unchanged)

Rekith =J

with reset spring =no code
no reset spring =O

wet pin solenoid with detachable coil =C

more information in text

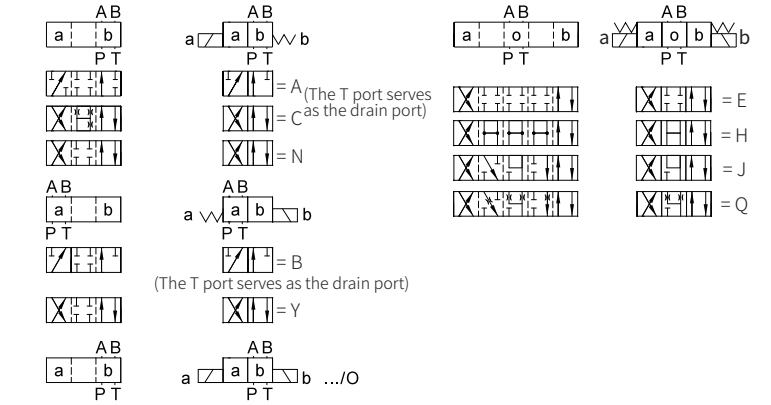
sealing material
No code = NBR seals
V= FKM seals
(consult for other seals)

Z4= standard plug
Z5L= large right angle lamp plug

No code = no manual emergent operation
N9= with hidden manual emergent operation

W220-50= AC 220V/50Hz
G24= DC 24V
G12= DC 12V
G27= DC 27V
W220R= solenoid with rectifier (AC voltage 220V)

Functional symbols

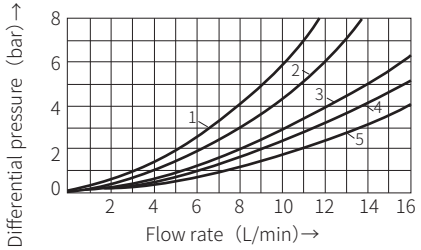


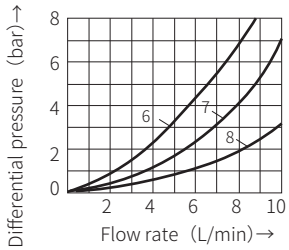
Technical parameters

Hydraulic			
Medium	Mineral hydraulic oil or phosphate grease hydraulic oil		
Temperature range (°C)	-30 to +80		
Viscosity range (mm^2/s)	2.8 to 500		
Maximum allowable working pressure (bar)	A, B, P	to 250	
	T	to 60	
Overflow section O position (middle position)	Q type		
	6% of rated cross-sectional area		
Weight (kg)	Valve →	Subplate G115/01	← Subplate G96/01
	About 1.4	About 0.7	About 0.5
Electrical			
AC voltage (V)	110, 220 in 50Hz		
DC voltage (V)	12, 24, 27		
Voltage type	DC voltage	AC voltage	
Power consumption (W)	26		
Holding power	-	48VA	
Starting power	-	130VA	
Operating time	Consecutive		
Connection time (ms)	40	25	
Disconnect time (ms)	30	20	
Maximum allowable environment temperature (°C)	+50		
Maximum allowable coil temperature (°C)	+150		
Maximum allowable switching frequency (times/h)	15000	7200	
Protection device type DIN 40050	IP65		

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40 ° C ± 5 ° C)





1 Symbol B: P→B, P→A
2 Symbol B: P→A, P→B
3 All symbols except B: A→T
4 All symbols except B: B→T
5 All symbols except B: P→A, P→B, A→T
6 Symbol G: P→A, B→T
7 Symbol G: P→T, P→B
8 Symbol G: A→T

Characteristic limit

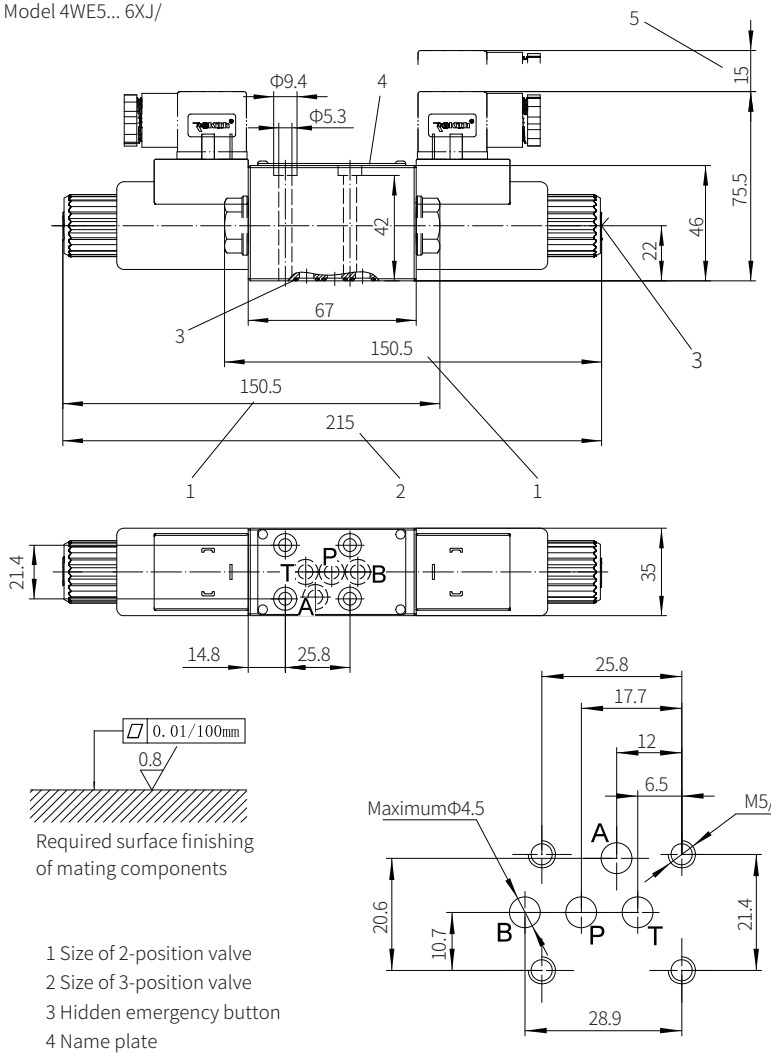
The switching characteristics of the valve are related to the adhesion effect of the filter. To achieve the recommended flow value, it is recommended to use a 20um filter in the system.
Due to the hydraulic force acting inside the valve affects the flow capacity of the valve.
Therefore, different spool valve symbols have different power limits.
In the case of only one channel, e.g. when the four-way valve with chamber A or B blocked is used as three-way valve, the power limit difference is significant.

Flow rate (L/min) / Working pressure (bar) / Symbols	50	100	250
A, B, C, N, E, F, H, J, L, M, Q, R, V, W	14	14	12
G	10	10	9

Component size

Size unit: mm

Model 4WE5... 6XJ/



Required surface finishing of mating components

1 Size of 2-position valve
2 Size of 3-position valve
3 Hidden emergency button
4 Name plate
5 Space required to remove the plug
6 O-ring 7x1.5 (for port P, A, B, T)
Valve fixing screw
M5x50-10.9 grade to GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G115/01 (G1/4") ; G115/02(M14x1.5)

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Solenoid Operated Directional Valve

Model: WE6...6XJ

- Size 6
- Maximum working pressure 350 bar
- Maximum working flow 80 L/min-DC
  60 L/min-AC

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Characteristic limit	07
Component size	08-09

Features

- With the direct type solenoid operated directional spool valve as the standard type
- Wet-pin DC or AC solenoids with detachable coil
- The solenoid coil can be rotated by 90°
- Replace the coil without releasing the oil
- Individual or central electrical connection, optional
- Optional manual emergency operation

Function description, sectional drawing

The WE6 directional valve is a directional spool valve operated by the solenoid. It controls the opening, closing, and flow direction of the liquid flow.

The directional valve is mainly composed of valve body (1), one or two solenoids (2), control spool (3), and one or two reset springs (4). The control spool (3) is held in the middle or original position by means of the reset spring (4) (except for impulse spools) in the de-energized condition.

The control spool (3) is operated by wet pin solenoids (2). The force of the solenoid (2) acts on the control spool (3) through the push rod (5) to push it from the stationary position to the terminal position. In this way, the hydraulic oil passes from P to A and from B to T, or from P to B and from A to T. After the solenoid (2) is de-energized, the reset spring (4) pushes the control spool (3) back to the middle position. As an optional emergency operation (6), it can change the position of the control spool (3) without solenoid.

Model WE6..6XJ/O (only for symbols A, C and D)

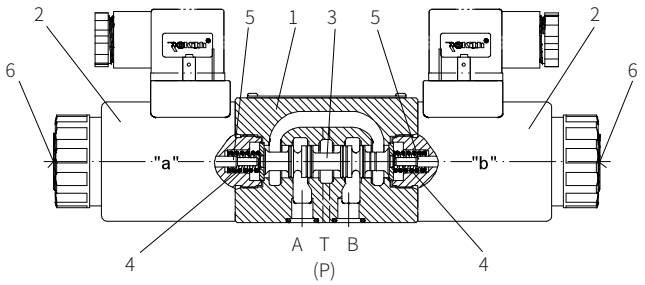
This model is a directional valve with two solenoids, two-position switch, without detent and no definite switching position in the power loss state. During power failure, there is no predetermined spool position.

Model WE6..6XJ/OF (impulse spool valve, only for symbols A, C and D)

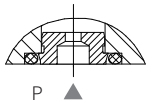
This type refers to a two-position valve composed of two solenoids and a detent. The detent maintains the spool valve in its closest position and It is no require of continuous power supply.

Attention!

If two or more valves share one return tube, the spool may work abnormally because of pressure peak especially for the valves with detent. It is recommended to use a separate return tube for each valve.



Model 4WE6...6XJ/



Plug-in throttle

Models and specifications

WE | 6 | | 6X | J | | C | | | | | | | *

3 working oil ports =3
4 working oil ports =4

symbols e.g. C, E, EA, EB etc.

60 to 69 series =6X
(60 to 69 series installation and connection size unchanged)

Rekith =J

with reset spring = No code
no reset spring =O
no reset spring, with detent = OF

wet pin solenoid with detachable coil =C

12V DC =G12
24V DC =G24
28V DC =G28
220V AC 50/60Hz =W220
120V or 110V AC 50 or 60Hz =W110
=W+Voltage
110V or 220V AC with rectifier =W110R or
=W+Voltage+R W220R

with hidden manual emergency operation (standard) =N9
no manual emergency operation =No code

more information in text

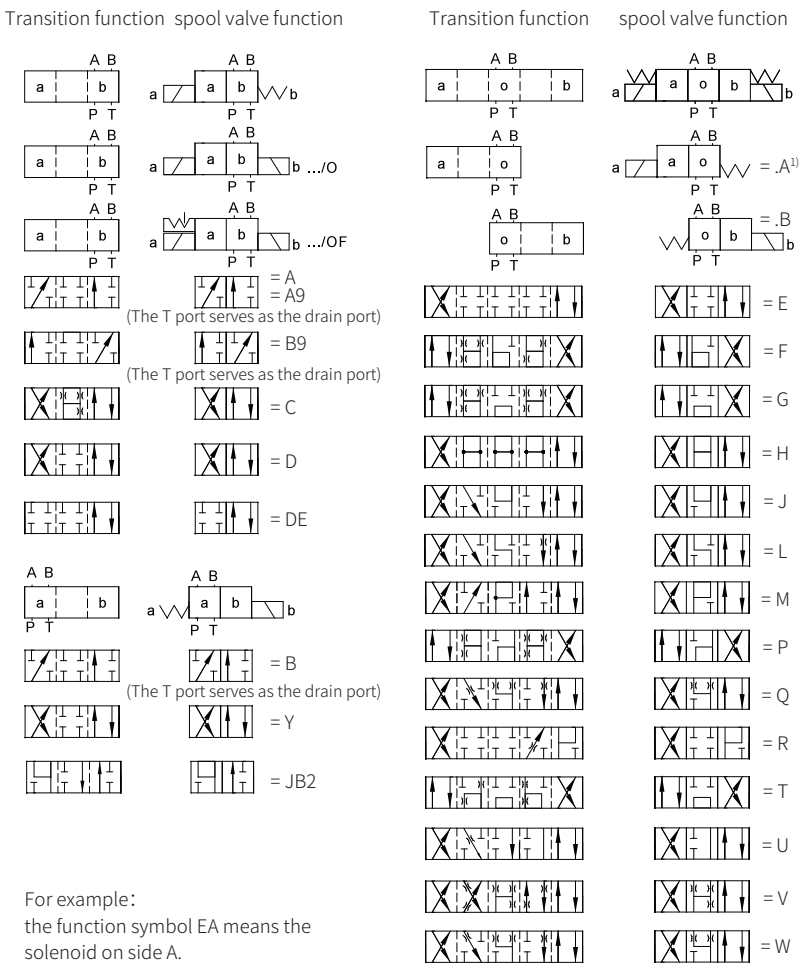
sealing material
No code = NBR seals
V= FKM seals
(consult for other seals)

No code = no plug-in throttle port
plug-in throttle port (see table)

Oil port	Throttle portΦ(mm)		
	0.8	1.0	1.2
P	=B08	=B10	=B12
A	=H08	=H10	=H12
B	=R08	=R10	=R12
A and B	=N08	=N10	=N12
T	=X08	=X10	=X12

single connection
K4= no insert plug
Z4= standard plug
Z5L= large right angle lamp plug
FS2= deutsch waterproof plug
centralized connection
DL= connection box with lamp

Functional symbol



For example:
the function symbol EA means the solenoid on side A.
Note: function A9 and B9 are only used as pilot valves.

Technical parameters

Overview			
Weight	Valve with one solenoid	kg	1.45
	Valve with two solenoids	kg	1.95
Installation position			Optional
Environment temperature range		(°C)	-30 to + 50 (NBR seal) -20 to + 50 (FKM seal)
Hydraulic			
Maximum working pressure	Oil port A、B、P	bar	350
	Oil port T	bar	210 (DC); 160 (AC) When the working pressure exceeds the allowable pressure, port T must be used as drain port for symbols A and B.
Maximum flow		L/min	80 (DC); 60 (AC)
Effective over-flow section (spool position)	symbol Q	mm^2	About 6% cross-sections
	symbol W	mm^2	About 3% cross sections
Oil fluid			Mineral oil (HL, HLP)1) in accordance with DIN 51524; Fast living organisms Degraded oil according to VDMA 24568; HETG (Rapeseed oil)1) HEPG(Polyethylene glycol)2) HEES (synthetic ester)2)
Oil temperature range		(°C)	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Technical parameters

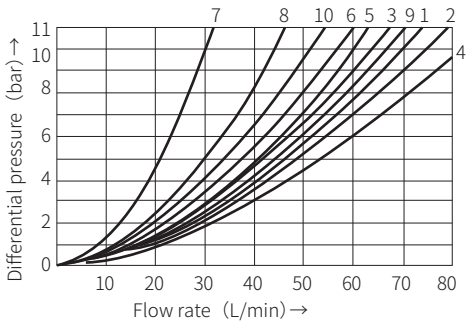
Electric				
Voltage type			DC	AC 50/60 Hz
Voltage available[4]		V	12, 24, 42, 60, 96 110, 180, 205, 220	42, 110, 120, 230
Allowable voltage tolerance (voltage unit)		%	±10	±10
Power consumption		W	30	-
Holding power		VA	-	50
Impact power		VA	-	220
Power rate			100 %	100 %
Switching time to ISO6403	On	ms	25 to 45	10 to 20
	Off	ms	10 to 25	15 to 40
Maximum switching frequency		Times/h	15000	7200
Insulation requirements			IP65	IP65

[4]Other voltages are determined as required

Note:
There are 2-3 kinds of power supply options for AC voltage solenoids, such as W110; 110V-50Hz; 110V-60Hz; 120V-60Hz.

Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)



7 Symbol R in control position B→A
8 Symbols G and T in center position
9 Symbols H and T in center position P→T

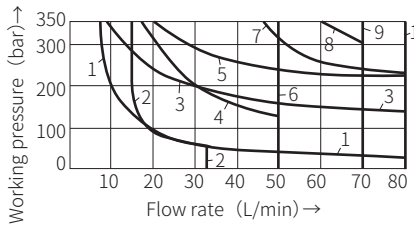
Functional symbol	Flow direction			
	P-A	P-B	A-T	B-T
A; B	3	3	-	-
C	1	1	3	1
D; Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J; Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

Characteristic limit

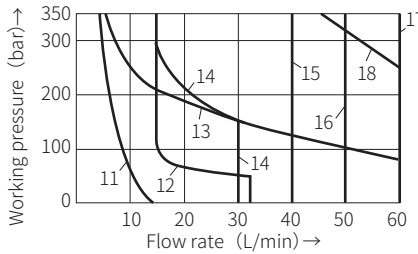
(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

Attention!
The given working limit is suitable for the use of flow in both directions (e. g. from P to A and return from B to T at the same time).
Due to the power of the fluid in the valve, the power limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

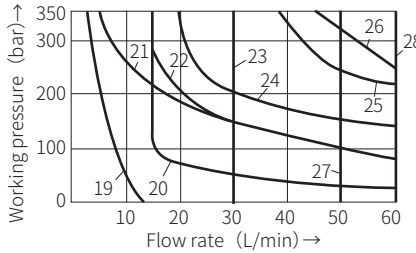
The power limit is measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.



DC solenoid			
Characteristic curve	Function symbol	Characteristic curve	Function symbol
1	A; B[1]	6	G; H; T
2	V	7	A/O; A/OF; L; U
3	A; B	8	C; D; Y
4	F; P	9	M
5	J	10	E; E1-[2]; R[3]; C/O; C/OF; D/O; D/OF; Q; W



AC solenoid—50Hz	
Characteristic curve	Function symbol
11	A; B[1]
12	V
13	A; B
14	F; P
15	G; T
16	H
17	A/O; A/OF; C/O; C/OF; D/O; D/OF; E; E1-[2]; J; L; M; Q; R[3]; U; W
18	C; D; Y



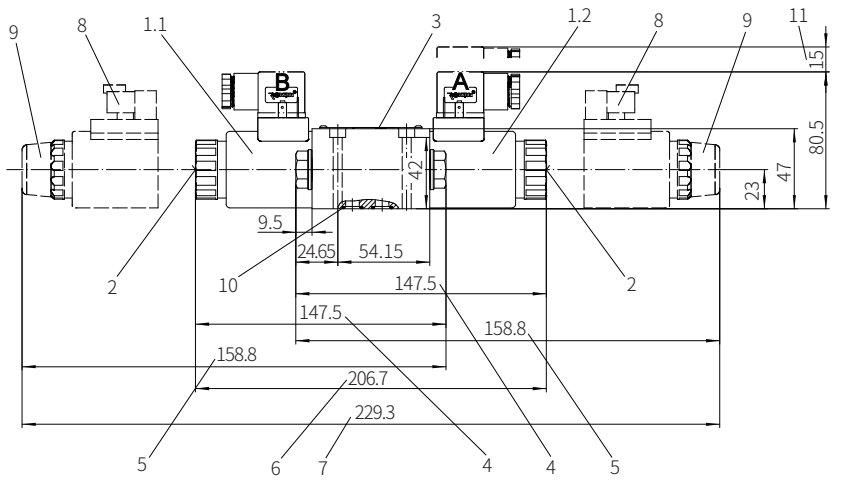
AC solenoid—60Hz	
Characteristic curve	Function symbol
19	A; B[1]
20	V
21	A; B
22	F; P
23	G; T
24	J; L; U
25	A/O; A/OF; Q; W
26	C; D; Y
27	H
28	C/O; C/OF; D/O; D/OF; E; E1-[2]; M; R[3]

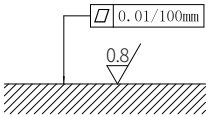
[1] With manual emergency device [2] P- A/B pre-opening [3] Back from the actuator to the oil tank.

Component size

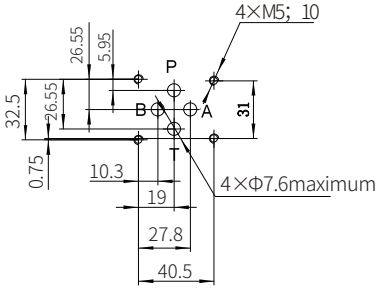
Size unit: mm

Valve with DC or AC rectified solenoid





Required surface finishing of mating components



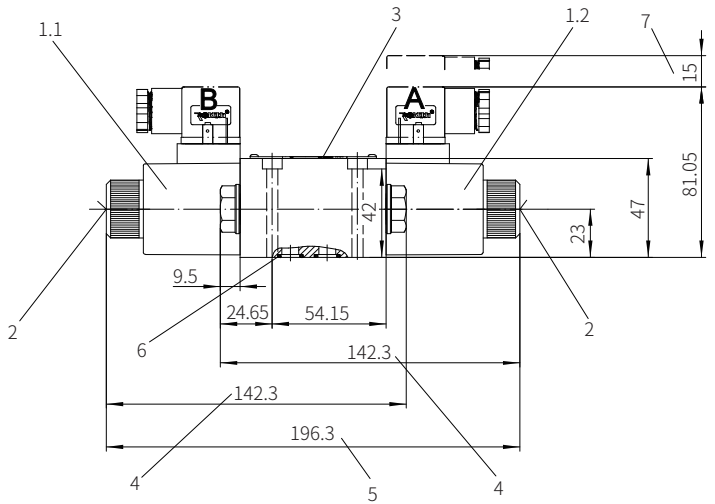
1.1 Solenoid a
1.2 Solenoid b
2 Hidden emergency button
3 Name plate
4 Size of 2-position valve (non-waterproof)
5 Size of 2-position valve (waterproof with waterproof cap)
6 Size of 3-position valve (non-waterproof)
7 Size of 3-position valve (waterproof with waterproof cap)
8 Waterproof deutsch plug
9 Waterproof rubber cap (optional)
10 O-ring 9.25x1.78 (for oil port P, A, B, T)
11 Space required to remove the plug

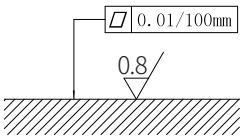
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02(M14x1.5)
G342/01 (G3/8") ; G342/02(M18x1.5)
G502/01 (G1/2") ; G502/02(M22x1.5)

Component size

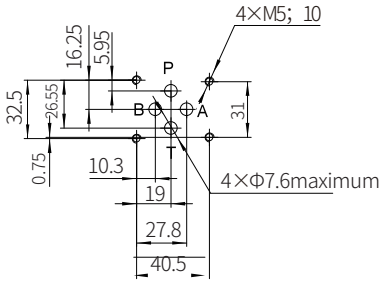
Size unit: mm

Valve with AC solenoid





Required surface finishing of mating components



1.1 Solenoid a
1.2 Solenoid b
2 Hidden emergency button
3 Name plate
4 Size of 2-position valve
5 Size of 3-position valve
6 O-ring 9.25x1.78 (for oil port P, A, B, T)
7 Space required to remove the plug

It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02(M14x1.5)
G342/01 (G3/8") ; G342/02(M18x1.5)
G502/01 (G1/2") ; G502/02(M22x1.5)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

01

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Solenoid Operated Directional Valve

Model: WE10...3XJ

- ◆ Size 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 120 L/min

Contents

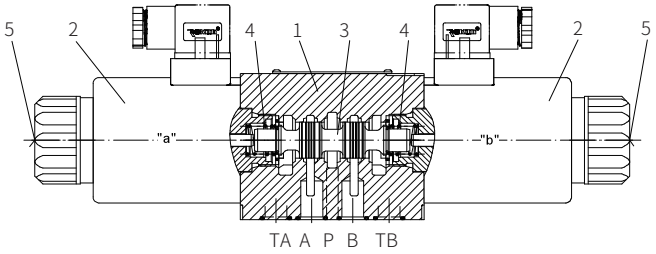
Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	05
Characteristic curve	06
Characteristic limit	06-07
Component size	08-09

Features

- ● Solenoid operated directional spool valve
- ● Wet-pin DC or AC solenoids
- ● The solenoid coil can be rotated by 90°
- ● Replace the coil without releasing the oil
- ● Individual or central electrical connection, optional
- ● Optional manual emergency operation

Function description, sectional drawing

The WE10 directional valve is a directional spool valve operated by solenoids, It controls the opening, closing, and flow direction of the liquid flow.
The directional valve is mainly composed of valve body (1), one or two solenoids (2), control spool (3), and one or two reset springs (4). Without power on, the control spool (3) is under the action of the reset spring (4), it is in the middle or original position (except impulse type). The control spool (3) is operated by the wet-pin solenoid (2).
To ensure proper function, the pressure chamber of the solenoid must be filled with oil. The force of solenoid (2) acts on control spool (3) and push it from the stationary position to the terminal position. In this way, the pressure oil flows from P to A and B to T, or from P to B and A to T. After the solenoid (2) powered off, the reset spring (4) push the control spool (3) towards the middle position. As an optional "emergency manual operation" (5), it can change the position of control spool (3) without solenoids.



Model 4WE10...3XJ

Model WE10... 3XJ/OF... (impulse spool valve), with detent

(Only for symbols A, C and D)

This model is a two-position directional valve with two solenoids and detents,
In this way, the control spool can be held in any position and the solenoids do not need to be continuously energized.

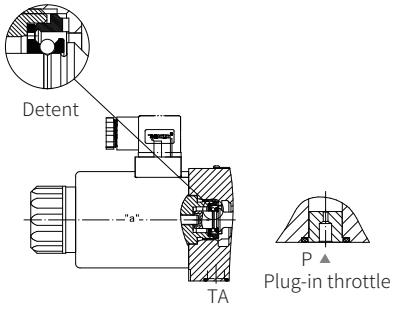
Plug-in throttle valve (model 4WE10.../.../B...)

If the flow exceeds the power limit of the valve during the direction changing process under the given working conditions, it is recommended to insert a plug-in throttle into port P.

Model WE10... 3XJ/O... type

(Only for symbols A, C and D)

This model is a directional vale with two solenoids, two-position switch but no detent.
Regardless of its position, one of the solenoids must be powered on, and there is no exact switching position when power is off.



Model 4WE10...3XJ/OF... (Impulse spool valve)

Models and specifications

WE 10 - 3X J / C / / *

3 way =3
4 way =4

size 10 =10

function symbol

30 to 39 series =3X
(30 to 39 series installation and connection size unchanged)

Rexroth =J

with reset spring = No code
no reset spring =O
no reset spring, with detent = OF

wet pin solenoid with detachable coil =C

12V DC =G12
24V DC =G24
28V DC =G28
220V AC-50Hz/240V AC-60Hz =W220
220V AC with rectifier =W220R

with hidden manual emergency operation =N9
(standard)
no manual emergency operation =No code

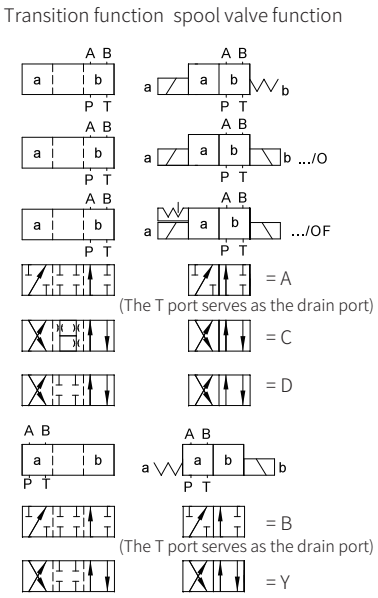
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

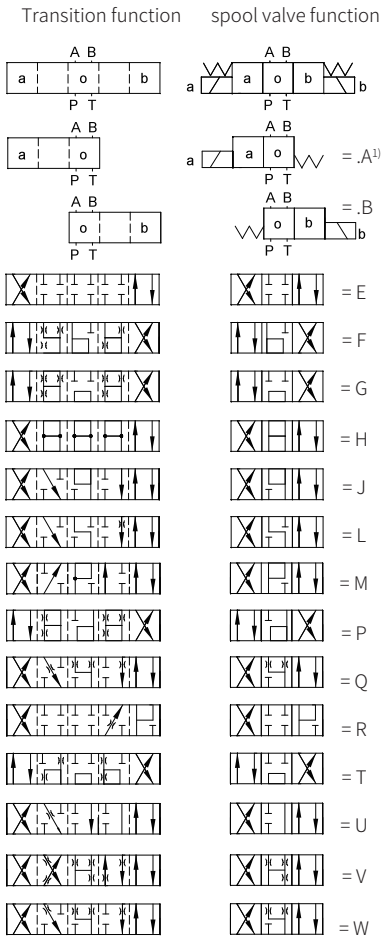
No code = no plug-in throttle port
B08= throttle port diameter 0.8mm
B10= throttle port diameter 1.0mm
B12= throttle port diameter 1.2mm

single connection
K4= no insert plug
Z4= standard plug
Z5L= large right angle lamp plug
FS2= deutsch waterproof plug
centralized connection
DL= connection box with lamp

more information in text

Function symbols





1) For example:

the function symbol EA means the solenoid on side A.

Technical parameters

Overview				
Installation position			Optional	
Environment temperature range		°C	-30 to +50 (NBR seal)	
			-20 to +50 (FKM seal)	
Weight			Central connection	Individual connection
	Valve with one solenoid	kg	4.4 (DC); 3.6 (AC)	4.3 (DC); 3.5 (AC)
	Valve with two solenoids	kg	6.0 (DC); 4.4 (AC)	5.9 (DC); 4.3 (AC)
Hydraulic				
Maximum working pressure	port A、B、P	bar	315	
	port T	bar	210 (DC), 160 (AC) When the working pressure exceeds the allowable pressure, port T must be used as drain port for symbols A and B.	
Maximum flow		L/min	120	
Flow cross section (spool position O)	symbol V	mm^2	11 (A/B→T); 10.3 (P→A/B)	
	symbol W	mm^2	2.5 (A/B→T)	
	symbol Q	mm^2	5.5 (A/B→T)	
Oil fluid			Mineral oil (HL, HLP)1) in accordance with DIN 51524; Fast living organisms Degraded oil according to VDMA 24568; HETG (Rapeseed oil)1); HEPG(Polyethyleneglycol)2) ; HEES (Synthetic Fats) 2)	
Oil temperature range		°C	-30 to +80 (NBR seal)	
			-20 to +80 (FKM seal)	
Viscosity range		mm^2/s	2.8 to 500	
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15	
Electrical				
Voltage type			DC	AC
Voltage available 4)		V	12, 24, 42, 60, 96, 110, 180, 205, 220	42, 110, 220, 230 50/60Hz
Allowable voltage tolerance		%	± 10	
Power consumption		W	35	-
Holding power		VA	-	90
Impact power		VA	-	550
Power rate			Continuous operation	
Switching time to ISO6403	On	ms	45 to 60	15 to 25
	Off	ms	20 to 30	20 to 30
Switching frequency		Times/h	to 15000	to 7200
Protection class to DIN 40050 5)			IP 65	
Insulation grade VDE 0580			F	H
Maximum coil temperature 6)		°C	150	180

1) For NBR seal and FKM seal.

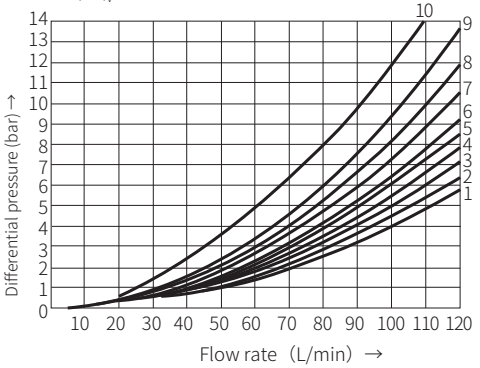
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

△p-q_V-Characteristic curve



Open position		P to A	B to A	A to T	P to T
R		-	9	-	-
Open position	P to A	P to B	B to T	A to T	P to T
F	4	-	-	9	9
P	-	5	8	-	10
G, T			-	-	9
H			-	-	3

Function symbol	Flow direction			
	P to A	P to B	A to T	B to T
A, B	3	3	-	-
C	3	3	4	5
D, Y	5	5	6	6
E	1	1	4	4
F	2	3	7	4
G	3	3	6	7
H	1	1	6	7
J	1	1	3	3
L	2	2	3	5
M	1	1	4	5
P	4	2	5	7
Q	1	2	1	3
R	3	6	4	-
T	3	3	6	7
U, V	2	2	3	3
W	2	2	4	5

Characteristic limit

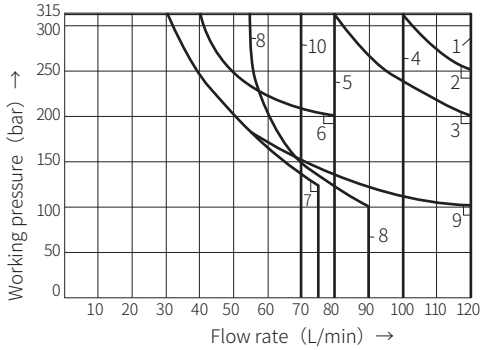
(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

The indicated limit applies to two flow directions (e.g. from P to A and simultaneous return oil flow from B to T).

Due to the effect of hydraulic power inside the valve, the allowable power will be significantly reduced when there is only one flow direction (e.g. from P to A, and the B oil port is closed).

The power limit is measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.

Valve with DC solenoid



Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y, M
2	E
3	A/O, A/OF L, U, J, Q, W
4	H
5[1]	R, L[2], U[2]
6	G
7	T
8	F, P
9	A, B
10	V

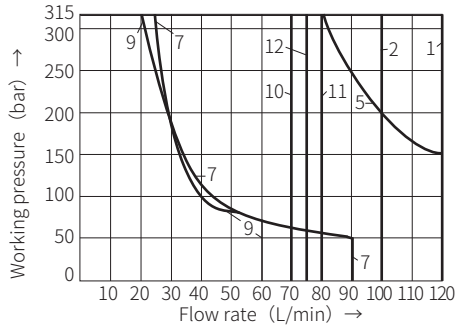
1) Return oil flow
(Independent from area ratio)

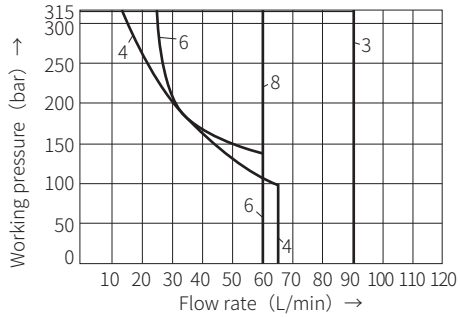
2) Applicable only in the middle position

Characteristic limit

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

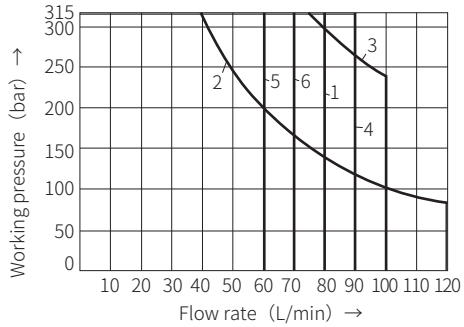
Valve with AC solenoid





Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	E, L U, Q, W
3	M
4	A, B
5	A/O, A/OF, J
6	G
7	F, P
8	V
9	T
10	H
11	R
12[1]	L, U

Applicable only in the middle position
42V, 50Hz; 110V, 50Hz; 120V, 60Hz;
127V, 50Hz; 220V, 50Hz; 240V, 60Hz;



Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	A/O, A/OF
3	E
4	M
5	V
6	H

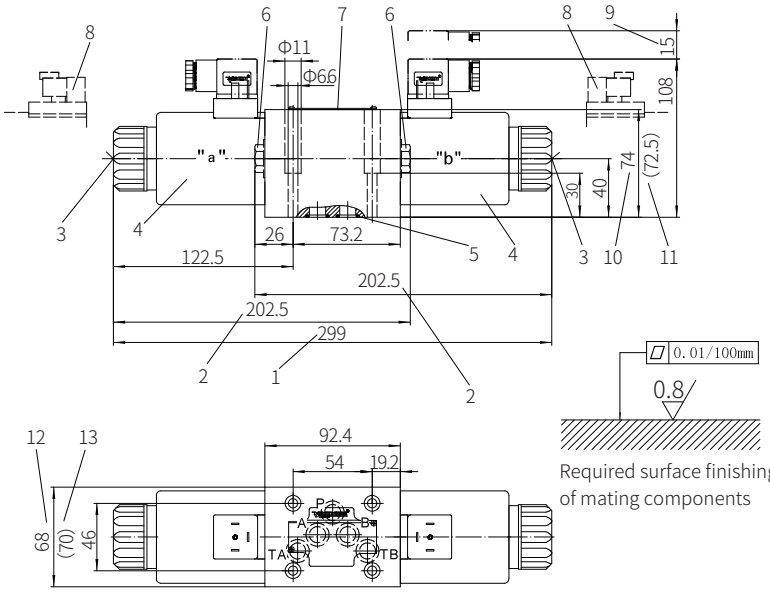
42V, 60Hz; 110V, 60Hz;
127V, 60Hz; 220V, 60Hz;

Please consult us for the power limit of the special valve spools!

Component size

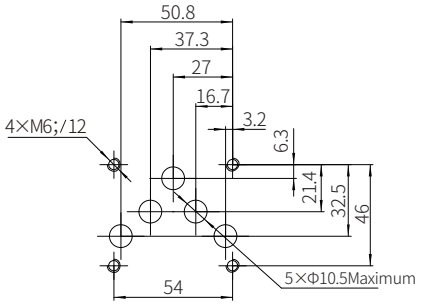
Size unit: mm

Valve with DC or AC rectified solenoid



Required surface finishing of mating components

1.Size of 3-position valve
2.Size of 2-position valve
3 Hidden emergency button
4 Solenoids
5 O-ring 12x2 (for port P, A, B, T)
6 Plug for valve with one solenoid
7 Name plate
8 Deutsch plug
9. Space required to remove the plug
10, 12 Size when three sides not machined
11, 13 Size when surface milling



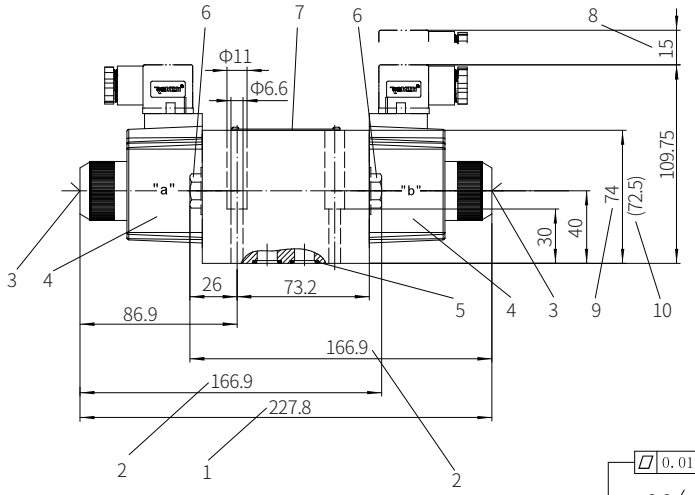
It must be ordered separately if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02(M18x1.5)
G67/01 (G1/2") ; G67/02(M22x1.5)
G534/01 (G3/4") ; G534/02(M27x2)

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Component size

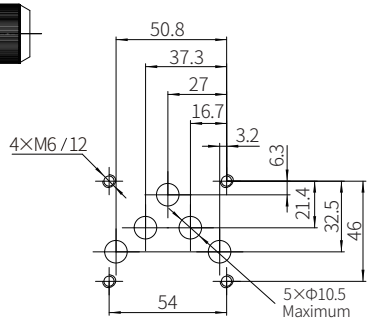
Size unit: mm

Valve with AC solenoid



Required surface finishing of mating components

1.Size of 3-position valve
2.Size of 2-position valve
3 Hidden emergency buttons
4 Solenoids
5 O-ring 12x2 (for port P, A, B, T)
6 Plug for valve with one solenoid
7 Name plate
8 Space required to remove the plug
9, 11 Size when three sides are not machined
10, 12 Size when surface milling



Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02(M18x1.5)
G67/01(G1/2") ; G67/02 (M22x1.5)
G534/01 (G3/4") ; G534/02 (M27x2)

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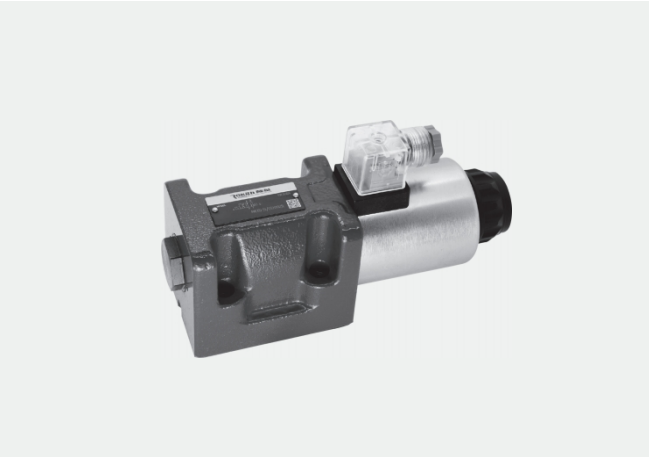
Solenoid Operated Directional Valve

Model: WE10...5XJ



- ◆ Size 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Technical parameters	03
Functional symbols	04
Characteristic curve	05
Characteristic limit	05-06
Component size	07-08

Features

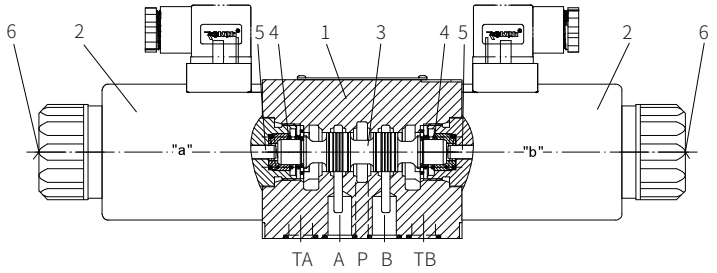
- ● Direct acting high-power solenoid operated directional spool valve
- ● Wet-pin DC or AC solenoids
- ● The solenoid coil can be rotated by 90°
- ● Replace the coil without releasing the oil
- ● Individual or central electrical connection, optional
- ● Optional manual operation

Function description, sectional drawing

The valve mainly consists of valve body (1), one or two solenoids (2), control spool (3), and one or two reset springs (4).

When the solenoid is not energized, the control spool (3) is held in the neutral or starting position by the reset springs (4) (except for impulse spools). The action of the control spool (3) is achieved by wet-pin solenoid (2). When the solenoid (2) is energized, the force of the solenoid acts on the control spool (3) through the push rod (5) to push it from its stationary position to the working position. In this way, the oil passes from P to A and B to T, or from P to B and A to T.

When the solenoid is powered off, the control spool (3) is pushed back to its original position by the reset springs (4). At this time, the manual button (6) can be pushed to move the control spool.



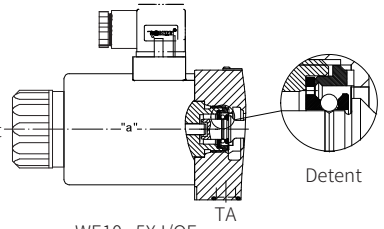
4WE10E 5X/J type structural diagram

Model WE10...5XJ/O...:

This type is a two-position valve operated by two solenoids, but without reset spring and detent, and is no definite switching position in the power loss state. Its working position can only be determined when powered on, and the solenoids need to be powered on for a long time.

Model WE10...5XJ/OF...:

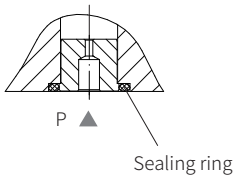
This type is also a two-position valve operated by two solenoids without reset spring but with detent, both working positions can be fixed. The spool is held in the fixed switching position without requirement of constant energization of the solenoids.



WE10...5XJ/OF...

Plug-in damper:

Due to working conditions limitations, it is possible that the flow exceeds the given value of the characteristics curve during the spool switching process. It is necessary to insert an plug-in throttle into port P of the valve.



Models and specifications

WE | 10 | | 5X | J | | C | | | | | | | *

- 3 working oil ports = 3
  4 working oil ports = 4
- size 10 =10
- symbols e.g. C, E, EA, EB etc.
- 50 to 59 series =5X
  (50 to 59 series installation and connection size unchanged)
- Rekith = J
- no reset spring =O
  no reset spring, with detent =OF
  with reset spring =No code
- wet pin solenoid with detachable coil =C
- 220V AC 50Hz/240V AC 60Hz =W220
  24V DC =G24
  28V DC =G28
  solenoid with rectifier (AC voltage 220V) =W220R
- No code= no manual emergency operation
  N= with manual emergency operation
  N9= with hidden manual emergency operation
- single connection
  Z4= standard plug
  Z5L= large right angle lamp plug
  K4= no insert plug
  FS2= deutsch waterproof plug
  centralized connection
  DL= connection box with lamp
- No code= No plug-in throttle port
  B08= throttling diameter 0.8mm
  B10= throttling diameter 1.0mm
  B12= throttling diameter 1.2mm
- sealing material
  No code = NBR seals
  V= FKM seals
  (consult for other seals)
- more information in text

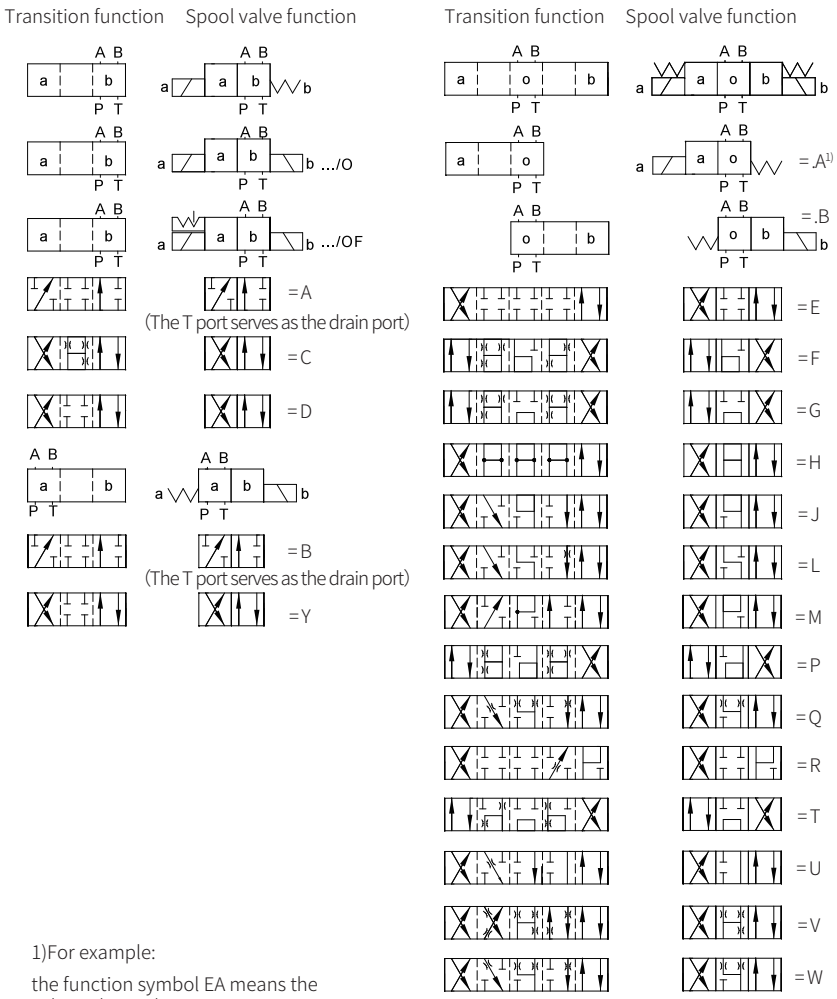
Technical Parameter

work pressure (MPa)	Oil port A, B, P	to 315
	Oil port T	to 210(DC), 160(AC)
Flow	L/min	120
Over-flow section	middle position	6% of rated cross-sectional area for symbol Q, 3% of rated cross-sectional area for symbol W
Pressure medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1] HEPG(Polyethylene glycol)[2] HEES (synthetic ester)[2]
Working medium temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm²/s	2.8 to 500
Weight (kg)	Single solenoid	5.1 DC; 4.3 AC
	Double solenoids	6.7 DC; 5.1 AC

1) For NBR seal and FKM seal. 2) Only for FKM seal.

Note: For symbols A and B, if the working pressure exceeds the allowable pressure of the T chamber, port T must be used as a drain port.

Functional symbols



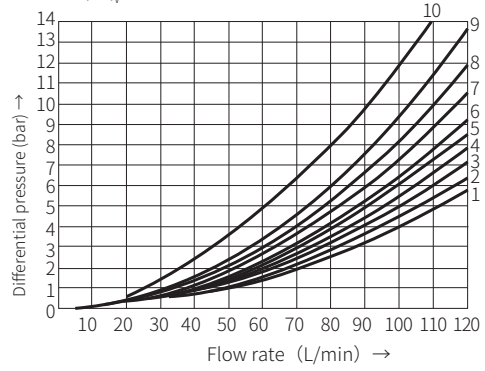
1)For example:

the function symbol EA means the solenoid on side A.

Characteristic curve

(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

△p-q_V-Characteristic curve



Open position		P to A	B to A	A to T	P to T
R		-	9	-	-
Open position	P to A	P to B	B to T	A to T	P to T
F	4	-	-	9	9
P	-	5	8	-	10
G, T			-	-	9
H			-	-	3

Function symbol	Flow direction			
	P to A	P to B	A to T	B to T
A, B	3	3	-	-
C	3	3	4	5
D, Y	5	5	6	6
E	1	1	4	4
F	2	3	7	4
G	3	3	6	7
H	1	1	6	7
J	1	1	3	3
L	2	2	3	5
M	1	1	4	5
P	4	2	5	7
Q	1	2	1	3
R	3	6	4	-
T	3	3	6	7
U, V	2	2	3	3
W	2	2	4	5

Characteristic limit

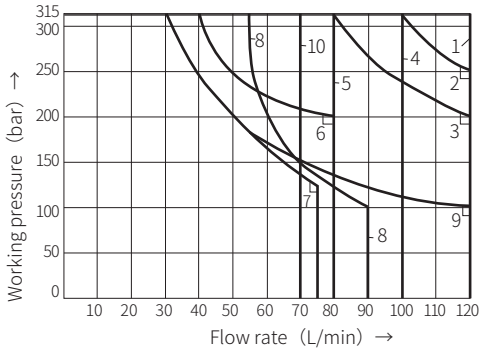
(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

The indicated limit applies to two flow directions (e.g. from P to A and simultaneous return oil flow from B to T).

Due to the effect of hydraulic power inside the valve, the allowable power will be significantly reduced when there is only one flow direction (e.g. from P to A, and the B oil port is closed).

The power limit is measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.

Valve with DC solenoid



Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y, M
2	E
3	A/O, A/OF L, U, J, Q, W
4	H
5[1)]	R, L[2)], U[2)]
6	G
7	T
8	F, P
9	A, B
10	V

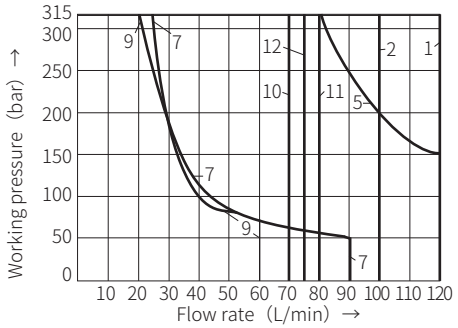
1) Return oil flow
(Independent from area ratio)

2) Applicable only in the middle position

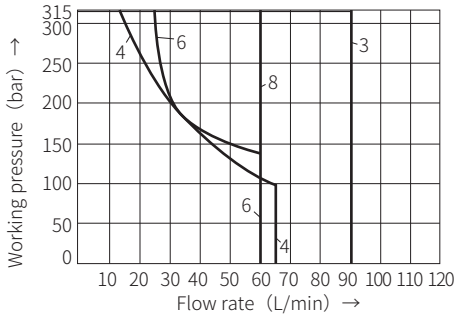
Characteristic limit

(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

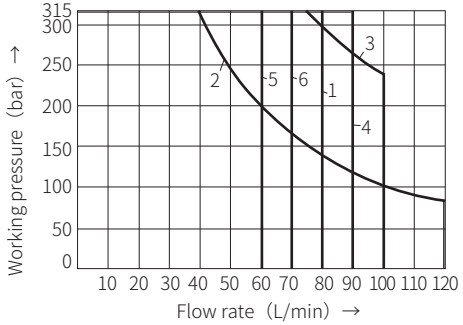
Valve with AC solenoid



Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	E, L U, Q, W
3	M
4	A, B
5	A/O, A/OF, J
6	G
7	F, P
8	V
9	T
10	H
11	R
12[1)]	L, U



Applicable only in the middle position
42V, 50Hz; 110V, 50Hz; 120V, 60Hz;
127V, 50Hz; 220V, 50Hz; 240V, 60Hz;



Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	A/O, A/OF
3	E
4	M
5	V
6	H

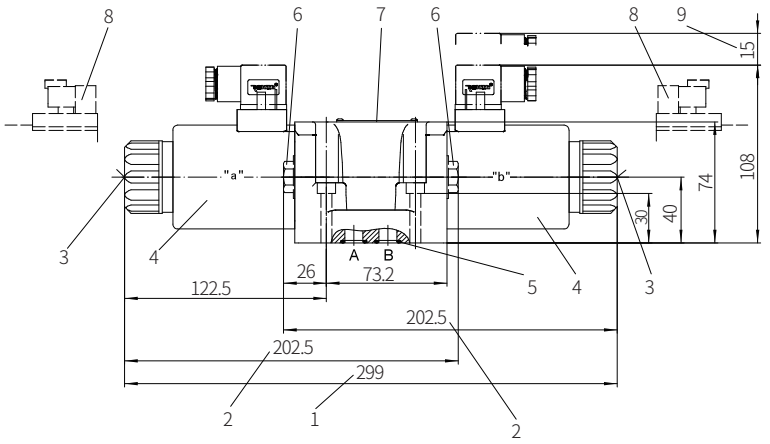
42V, 60Hz; 110V, 60Hz;
127V, 60Hz; 220V, 60Hz;

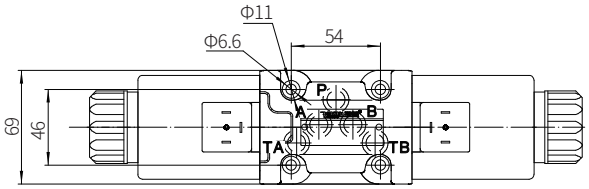
Please consult us for the power limit
of the special valve spools!

Component size

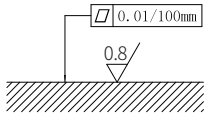
Size unit: mm

Valve with DC or AC rectified solenoid

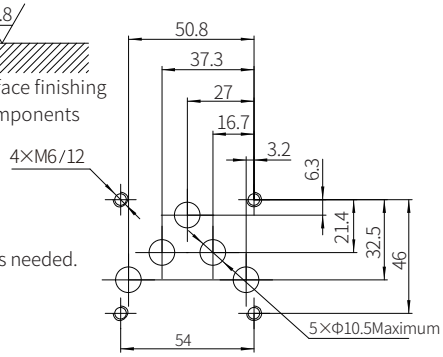




1.Size of 3-position valve
2.Size of 2-position valve
3 Hidden emergency button
4 Solenoids
5 O-ring 12x2 (for oil port P, A, B, T)
6 Plug for valve with one solenoid
7 Name plate
8 Deutsch plug
9 Space required to remove the plug



Required surface finishing
of mating components



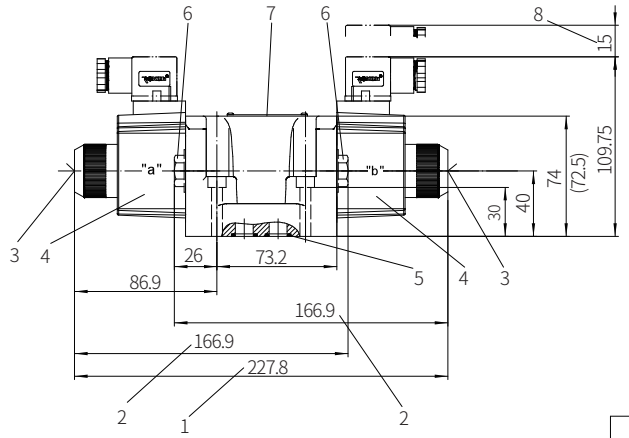
It must be ordered separately if connection subpate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02(M18x1.5)
G67/01 (G1/2") ; G67/02(M22x1.5)
G534/01 (G3/4") ; G534/02(M27x2)

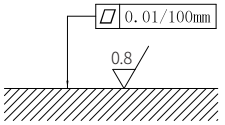
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Component size

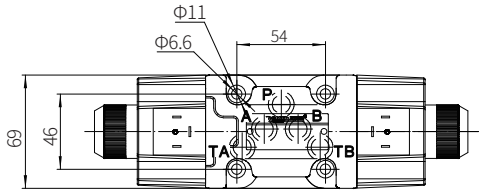
Size unit: mm

Valve with AC solenoid

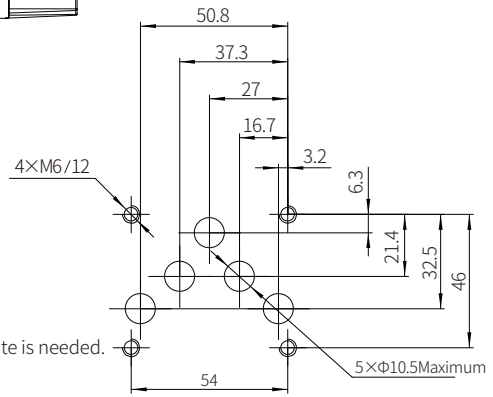




Required surface finishing of mating components



1.Size of 3-position valve
2.Size of 2-position valve
3 Hidden emergency button
4 Solenoids
5 O-ring 12x2 (for oil port P, A, B, T)
6 Plug for valve with one solenoid
7 Name plate
8 Space required to remove the plug



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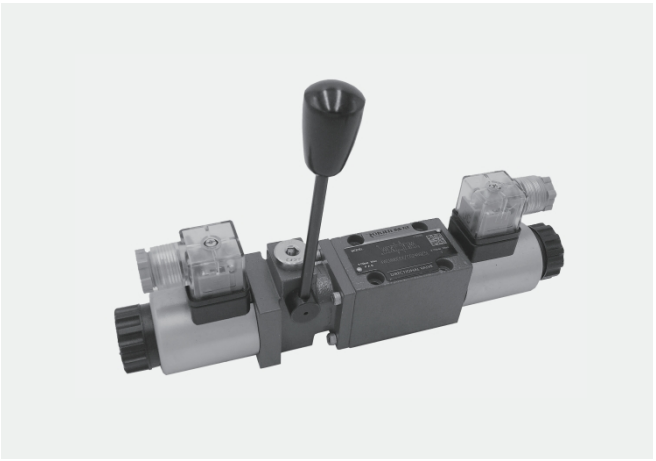
G534/01 (G3/4") ; G534/02(M27x2)

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Solenoid Operated Directional Valve with Emergency Handle

Model: 4WEMM6(10).../...



- ◆ Size 6 to 10
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow rate 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Functional symbols	03
Component size	04-07

Features

- ● The opening, closing and direction of the flow controlled by the solenoid and manual
- ● Wet-pin solenoid with detachable coil
- ● The solenoid can rotate 90 °
- ● Subplate mounting

Function description, sectional drawing

The WEMM directional valve is a directional spool valve operated by solenoid and control handle. It controls the opening, closing and flow direction of liquid flow.

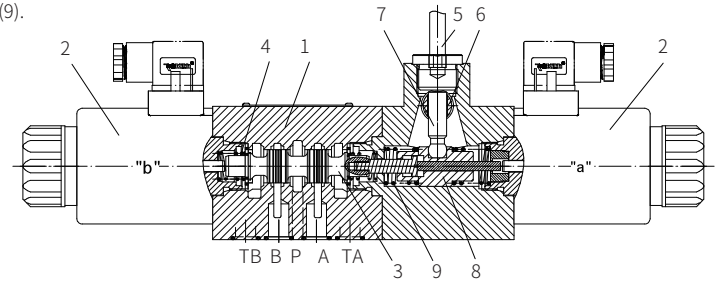
It is mainly composed of valve body (1), one or two solenoids (2), valve spool (3), reset spring (4) and manual control device.

Solenoid operation:

When the solenoid is de-energized, the valve spool (3) is held in the middle or original position by means of the reset spring. The force of the solenoid (2) acts on the valve spool (3) to push it from the stationary position to the terminal position. In this way, the pressure oil flows from P to A and B to T, or from P to B and A to T. After the solenoid (2) is de-energized, the reset spring (4) pushes the valve spool (3) back to its original position.

Auxiliary handle operation:

When the solenoid is not energized, the valve spool (3) can be moved by operating the auxiliary handle. Turn the auxiliary handle (5) to the right so that the operating force acts on the valve spool (3) through the spindle (6), the ball valve core (7) and the guide sleeve (8) to move it to the left. When the auxiliary handle (5) returns to the zero position, the valve spool (3) returns to the original position under the action of the reset spring (9).



Model 4WEMM10E...3XJ/

Models and specifications

WEMM – J / C / *

3 way =3
4 way =4

with auxiliary handle
solenoid spool valve =WEMM

size 6 =6
size 10 =10

symbols

size 6
design serial number =6X
size 10
design serial number =3X

Rexroth =J

wet-pin solenoid with detachable coil =C

12V DC =G12
24V DC =G24
28V DC =G28
220V AC，50HZ or 60HZ =W220
solenoid with rectifier for AC voltage 220V =W220R

No code= no manual emergency operation
N9= with hidden manual emergency operation

Z4= standard plug
Z5L= large right angle plug with light
FS2= deutsch waterproof plug

No code= without plug-in throttle
B08= throttle hole diameter 0.8mm
B10= throttle hole diameter 1.0mm
B12= throttle hole diameter 1.2mm

No code= NBR seals
V= FKM seals
(consult for other seals)

sealing material

Technical parameters

Working pressure	Mpa	port A, B, P to 35
T port pressure	Mpa	to 16 (AC), to 21 (DC)
Medium		Mineral hydraulic oil or phosphate ester wave pressure oil
Viscosity range	mm^2/s	2.5 to 500
Temperature range	°C	-30 to +80

Note: For symbols A and B, port T must be used as drain port if the working pressure exceeds the allowable pressure.

For the characteristic curve and operating limit, please refer to the catalogue of WE solenoid directional valve.

Functional symbols

Transition function Spool valve function

= A
= A9
(The T port serves as drain port)

= B9
(The T port serves as drain port)

= C
= D
= DE

= B
(The T port serves as drain port)

= Y
= JB2

Transition function Spool valve function

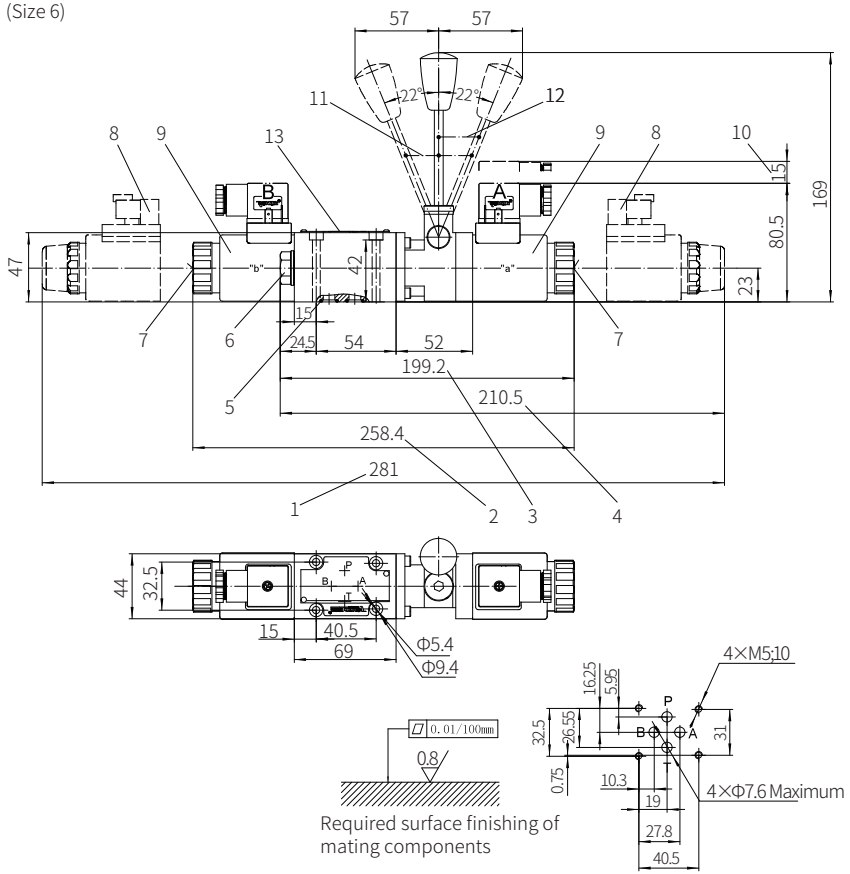
= E
= F
= G
= H
= J
= L
= M
= P
= Q
= R
= T
= U
= V
= W

1) For example: .A
The function symbol EA means the coil on side A
Note: Functions A9 and B9 are only used as pilot valves

Component size

Size unit: mm

Valve with DC or AC rectified solenoid
(Size 6)



1 Size of 3-position valve (waterproof type)
2 Size of 3-position valve
3 Size of 2-position valve
4 Size of 2-position valve (waterproof type)
5 O-ring 9.25x1.78 (for oil ports P, A, B, T)
6 Plug for 2-position valve
7 Hidden emergency button
8 Deutsch plug
9 Solenoids
10 Space required to remove plug
11 Switching position for 3-position valve
12 Switching position for 2-position valve

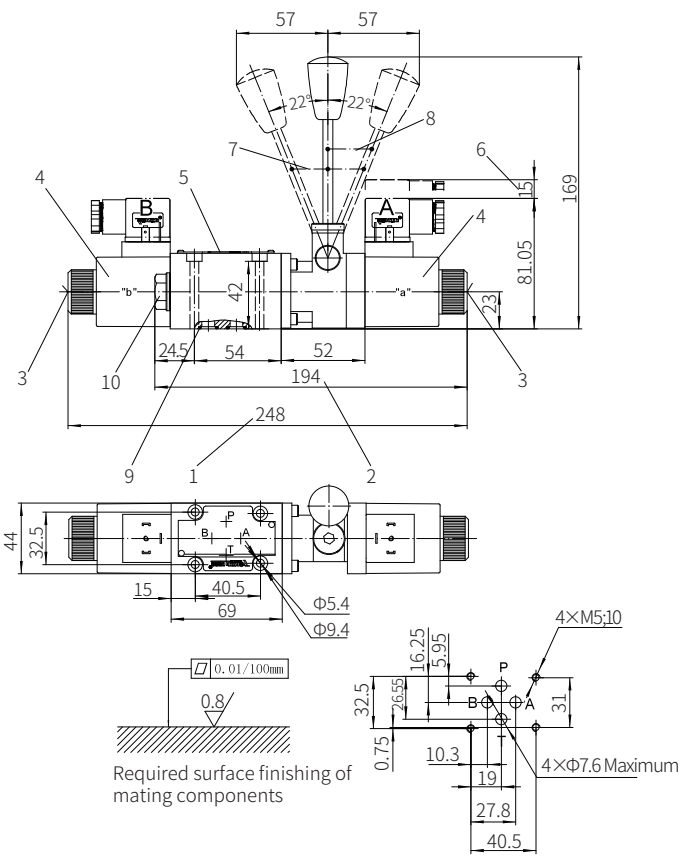
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

Component size

Size unit: mm

Valve with AC solenoid
(Size 6)



1 Size of 3-position valve
2 Size of 2-position valve
3 Hidden emergency button
4 Solenoids
5 Name plate
6 Space required to remove plug
7 Switching position for 3-position valve
8 Switching position for 2-position valve
9 O-ring 9.25x1.78 (for oil ports P, A, B, T)
10 Plug for 2-position valve

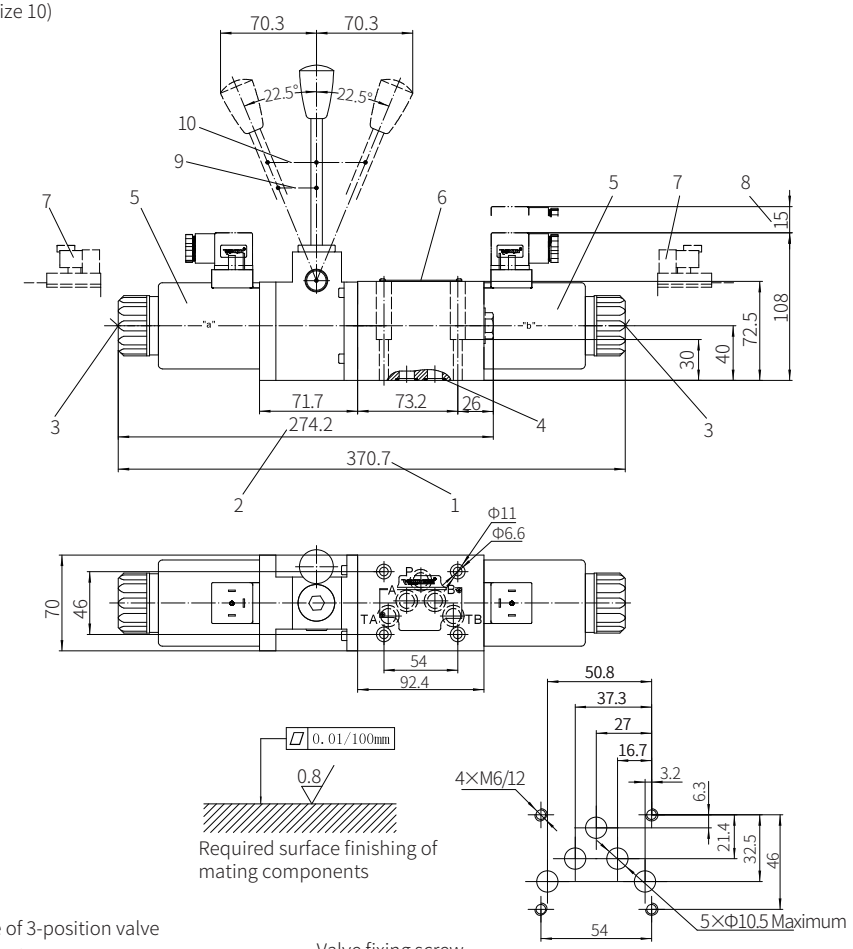
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

Component size

Size unit: mm

Valve with DC or AC rectified solenoid
(Size 10)



1 Size of 3-position valve
2 Size of 2-position valve
3 Hidden emergency button
4 O-ring 12x2 (for oil ports P, A, B, T)
5 Solenoids
6 Name plate
7 Deutsch plug
8 Space required to remove plug
9 Switching position for 2-position valve
10 Switching position for 3-position valve

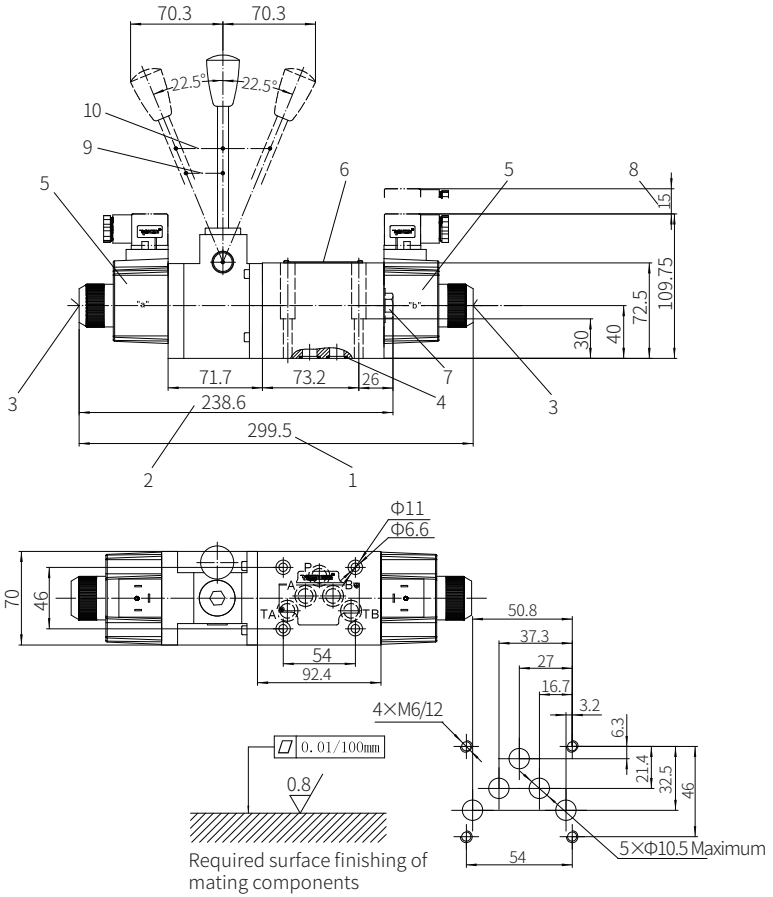
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)
G534/01 (G3/4") ; G534/02 (M27x2)

Component size

Size unit: mm

Valve with AC solenoid
(Size 10)



1 Size of 3-position valve
2 Size of 2-position valve
3 Hidden emergency button
4 O-ring 12x2 (for oil ports P, A, B, T)
5 Solenoids
6 Name plate
7 Deutsch plug
8 Space required to remove plug
9 Switching position for 2-position valve
10 Switching position for 3-position valve

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)
G534/01 (G3/4") ; G534/02 (M27x2)

01

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Solenoid Directional Valve with Spool Position Monitoring

Model: WE/(26)...(QMBG24)

- Size 6 to 10
- Maximum working pressure 350 bar
- Maximum working flow 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	05
Electrical connection	05
Component size	06-12

Features

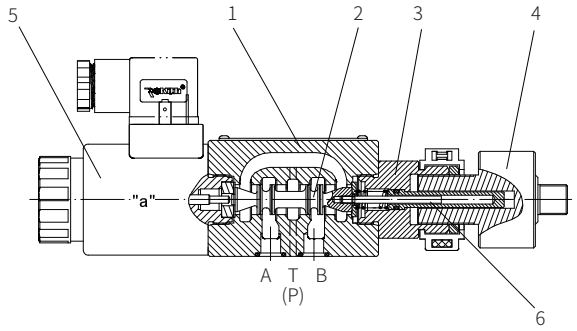
- The opening, closing and direction of flow controlled by solenoid
- Position monitoring by high voltage proximity switch
- Short response time, high induction frequency, good repeatability
- Accurately detect the spool switching position
- Non-contact induction to avoid wear and increase the service life

Function description, sectional drawing

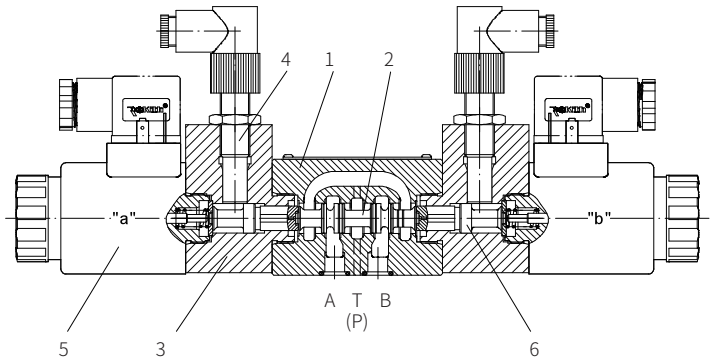
The valve is composed of valve body (1), valve spool (2), transition joint (or transition cover) (3), sensor (4), solenoid (5), and sensing rod (or transition spool) (6).

The valve spool is moved from the rest position to the required working position to realize the switching process by energizing or de-energizing solenoid. The fluid flows from P to A and B to T, or from P to B and A to T.

During the switching process, the signal is received through the proximity switch to feedback timely to the system whether the switching is in place and protect the system.



Model 4WE6D62J/CG24N9K4QMBG24



Model 4WE6E6XJ/26CG24N9Z5LG24WD

Models and specifications

Model WE../..QMBG24

5 | 4 | WE | | D | | J | C | G24 | | | QMBG24 | |

1)
four-way valve =4
solenoid spool valve =WE
size 6 =6
size 10 =10
functional symbols
size 6
design serial number =62
size 10
design serial number =5X
Rekith =J
wet-pin solenoid with detachable coil =C

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)
QMBG24= monitored spool position "b"
Z4= standard plug
Z5L= large right angle lamp plug
No code= no manual emergency operation
N9= with manual emergency operation
G24= 24V DC

1) Only for size 10 with 5-chamber

Models and specifications

Model WE../26...

| | WE | | | | J | 26 | C | | | | | |

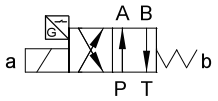
3-way valve=3
4-way valve=4
solenoid spool valve =WE
size 6 =6
size 10 =10
functional symbols
size 6
design serial number =6X
size 10
design serial number =3X
Rekith =J
with position monitoring
wet-pin solenoid with detachable coil =C

24V DC =G24
220V AC, 50Hz or 60 Hz =W220
220V AC with rectifier =W220R

high voltage proximity switch
G24ZO= right angle connector without cable
G24WO= angled connector without cable
G24ZD= right angle connector with cable
G24WD= angled connector with cable
G24ZOL= right angle lamp connector without cable
G24WOL= angled lamp connector without cable
G24ZDL= right angle lamp connector with cable
G24WDL= angled lamp connector with cable
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)
Z4= standard plug
Z5L= large right angle lamp plug
No code= no manual emergency operation
N9= with manual emergency operation

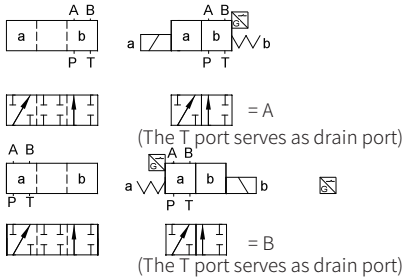
Functional symbols

Functional symbols of WE6 (10)D.../...QMBG24



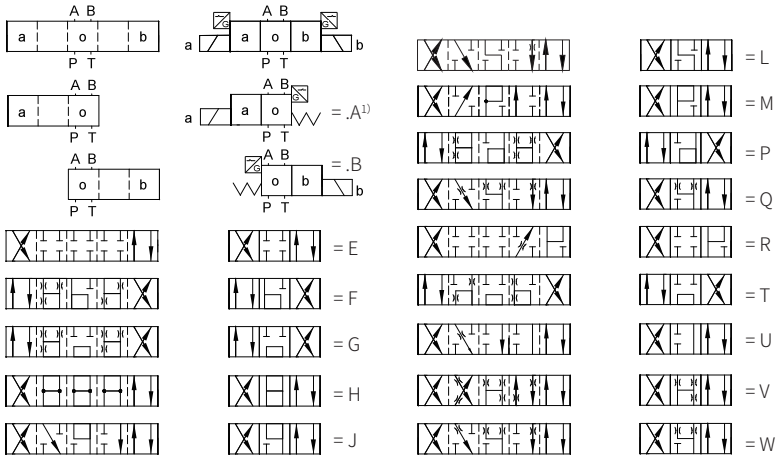
Functional symbols of WE6 (10)D.../26...

Transition function Spool valve function



1)For example:
the function symbol A means the solenoid on side A

Transition function Spool valve function



Technical parameters

Working pressure	Port A, B, P	to 35
	Port T	to 16 (AC), to 21 (DC)
Medium		Mineral hydraulic oil or phosphate hydraulic oil
Viscosity range	mm^2/s	2.5 to 500
Temperature range	°C	-30 to +80

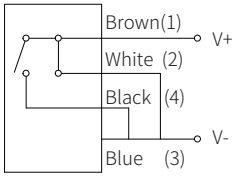
Note: When the working pressure exceeds the allowable pressure, port T must be used as drain port for symbols A and B.

Note: For characteristic curves and limits, see the catalogue of WE solenoid directional valve .

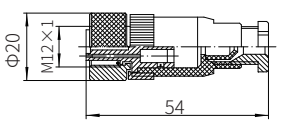
Electrical connection

Electrical connection of high voltage proximity switch: achieved by connecting plug with connection thread M12×1

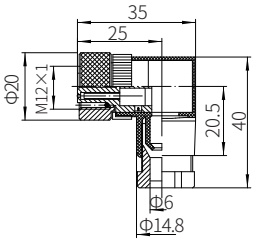
Connection voltage	24V±25%(DC)
Peak voltage	≤10%
Output voltage	Max. 200mA
Sensing frequency	600Hz



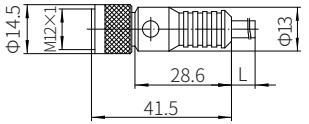
Right angle connector



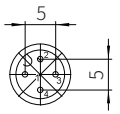
Angled connector



Cable connector (M12x1) (cable length 2m)



Pin position
from side of pin

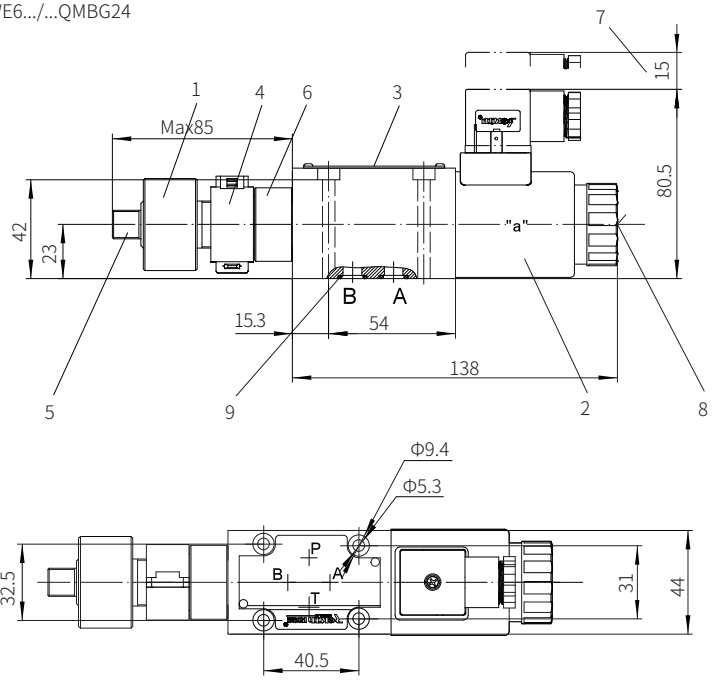


1 Brown
2 White
3 Blue
4 Black

Component size

Size unit: mm

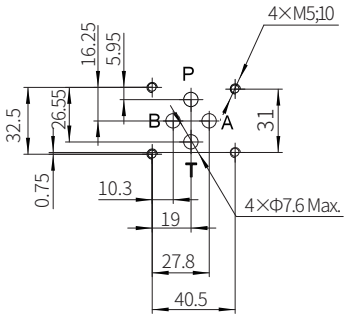
Model 4WE6.../...QMBG24

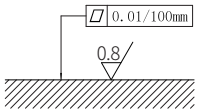


1 Sensor
2 Solenoid
3 Name plate
4 Protective cap
5 Connection thread M12x1 for sensor electrical connector
6 Transition joint
7 Space required to remove the plug
8 Hidden manual emergency operation
9 O ring 9.25x1.78 (for oil ports P, A, B and T)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4"); G341/02(M14x1.5)
G342/01 (G3/8"); G342/02(M18x1.5)
G502/01 (G1/2"); G502/02(M22x1.5)



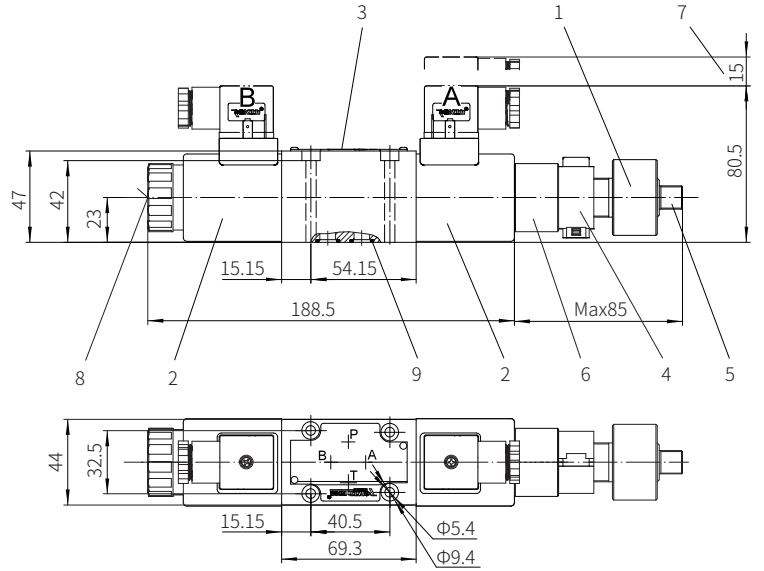


Required surface finishing of mating components

Component size

Size unit: mm

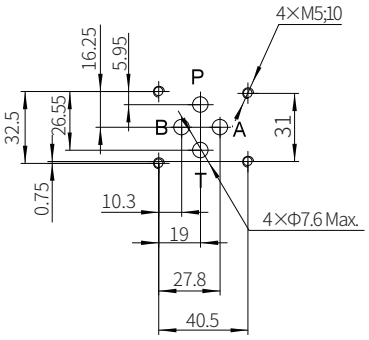
Model 4WE6.../...QMBG24

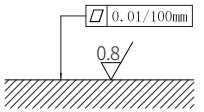


1 Sensor
2 Solenoid
3 Name plate
4 Protective cap
5 Connection thread M12x1 for sensor electrical connector
6 Transition joint
7 Space required to remove the plug
8 Hidden manual emergency operation
9 O ring 9.25x1.78 (for oil ports P, A, B and T)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4"); G341/02(M14x1.5)
G342/01 (G3/8"); G342/02(M18x1.5)
G502/01 (G1/2"); G502/02(M22x1.5)



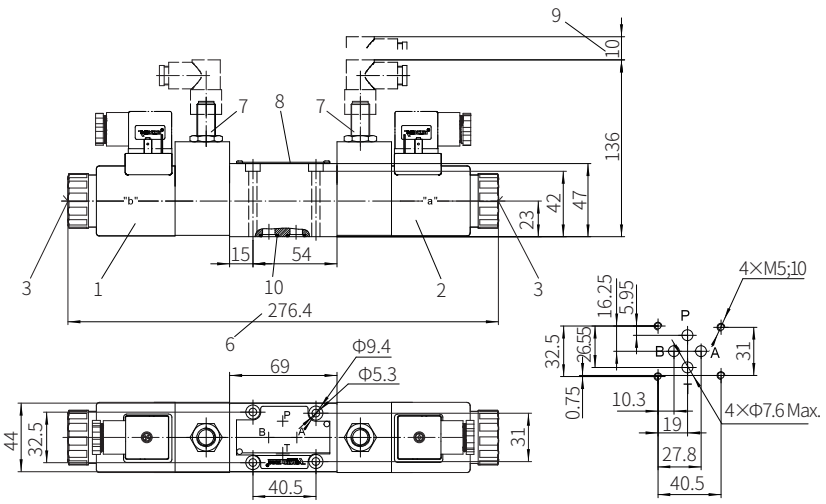


Required surface finishing of mating components

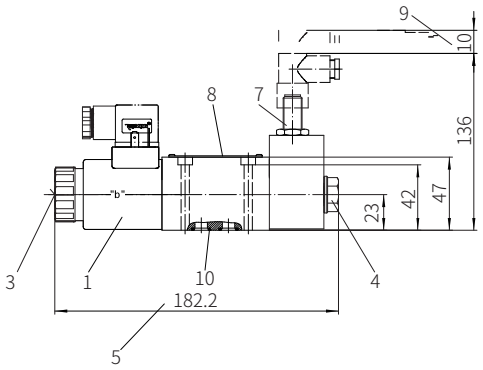
Component size

Size unit: mm

Model 4WE6.../26... 3-position valve with DC or AC rectified solenoid



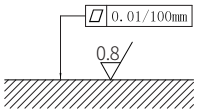
Model 4WE6.../26... 2-position valve with DC or AC rectified solenoid



1 Solenoid
2 Solenoid
3 Hidden manual emergency operation
4 Plug for 2-position valve
5 Size for 2-position valve
6 Size for 3-position valve
7 High voltage proximity switch
8 Name plate
9 Space required to remove the connector
10 O ring 9.25x1.78 (for oil ports P, A, B, T)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4"); G341/02(M14x1.5)
G342/01 (G3/8"); G342/02(M18x1.5)
G502/01 (G1/2"); G502/02(M22x1.5)

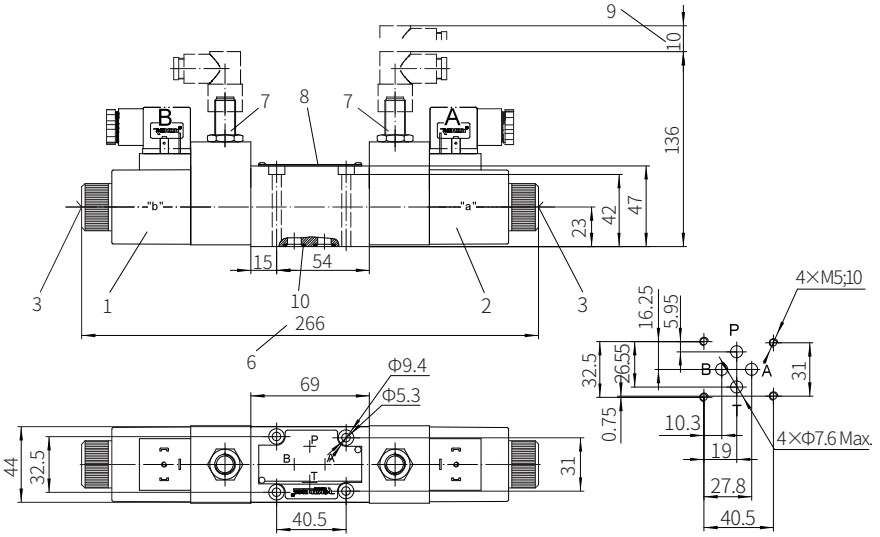


Required surface finishing of
mating components

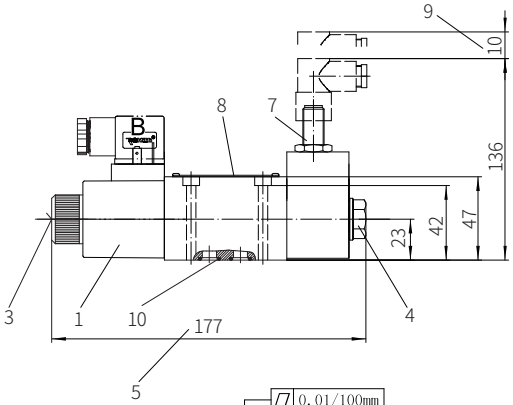
Component size

Size unit: mm

Model 4WE6.../26... 3-position valve with AC solenoid



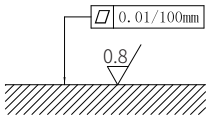
4WE6.../26... 2-position valve with AC solenoid



1 Solenoid
2 Solenoid
3 Hidden manual emergency operation
4 Plug for 2-position valve
5 Size for 2-position valve
6 Size for 3-position valve
7 High voltage proximity switch
8 Name plate
9 Space required to remove the connector
10 O ring 9.25x1.78 (for oil ports P, A, B, T)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4"); G341/02(M14x1.5)
G342/01 (G3/8"); G342/02(M18x1.5)
G502/01 (G1/2"); G502/02(M22x1.5)

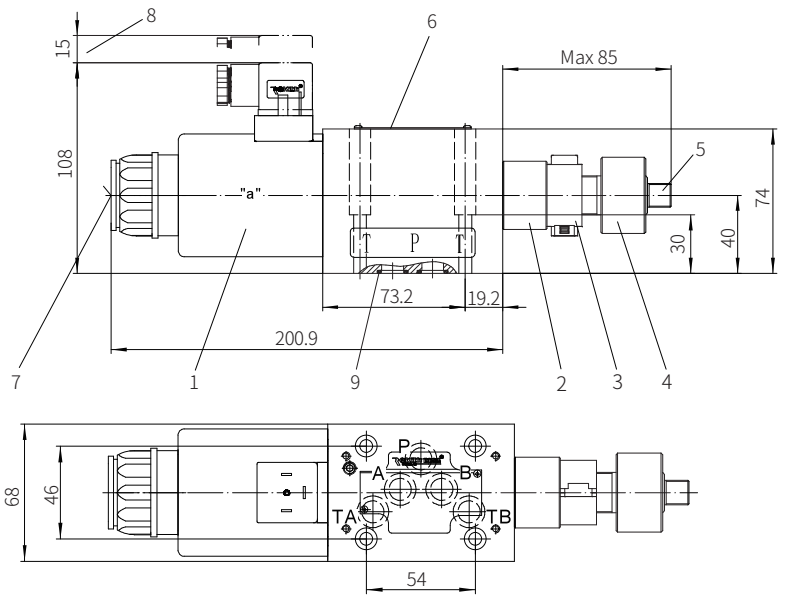


Required surface finishing of
mating components

Component size

Size unit: mm

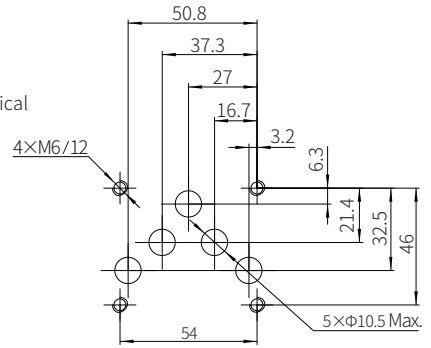
Model 4WE10D.../...QMBG24

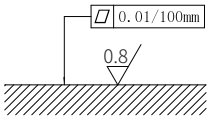


1 Solenoid
2 Transition joint
3 Protective cap
4 Sensor
5 Connection thread M12x1 for sensor electrical connector
6 Name plate
7 Hidden manual emergency operation
8 Space required to remove the plug
9 O ring 10X2 (for oil ports P, A, B and T)

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01(G3/8"); G66/02(M18x1.5)
G67/01(G1/2"); G67/02(M22x1.5)
G534/01 (G3/4"); G534/02(M27x2)



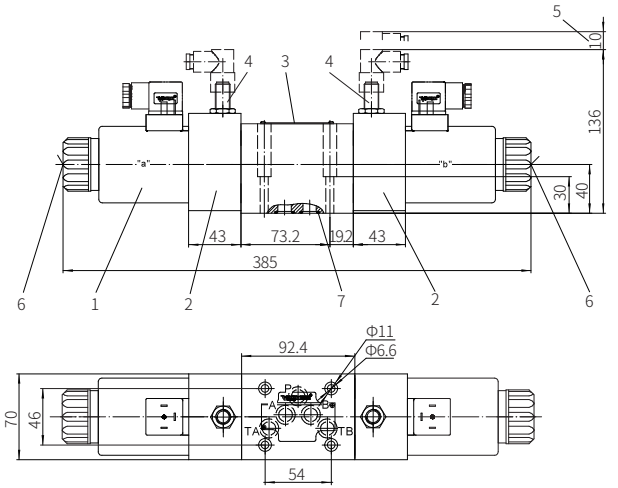


Required surface finishing of mating components

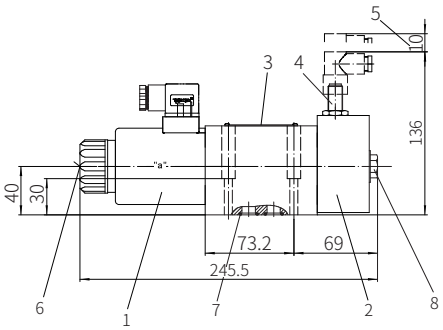
Component size

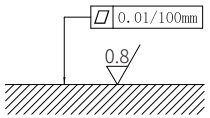
Size unit: mm

Model 4WE10.../26... 3-position valve with DC or AC rectified solenoid



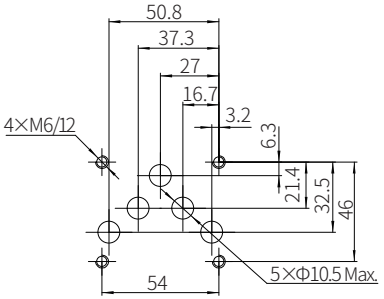
4WE10.../26... 2-position valve with DC or AC rectified solenoid





Required surface finishing of mating components

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm



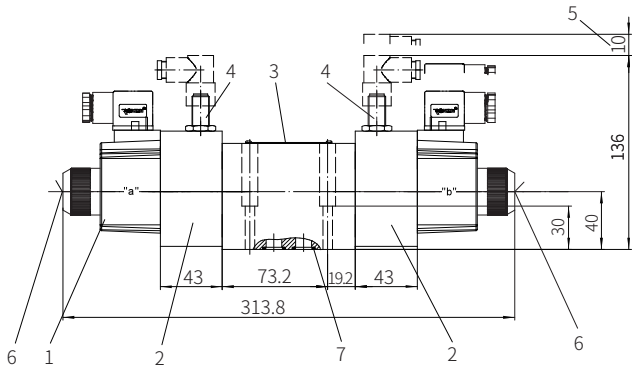
1 Solenoid
2 Transition cover
3 Name plate
4 High voltage proximity switch
5 Space required to remove the connector
6 Hidden manual emergency operation
7 O ring 10X2 (for oil ports P, A, B and T)
8 Plug for 2-position valve

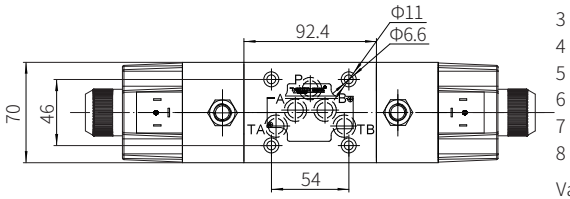
It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01(G3/8"); G66/02(M18x1.5)
G67/01(G1/2"); G67/02(M22x1.5)
G534/01 (G3/4"); G534/02(M27x2)

Component size

Size unit: mm

Model 4WE10.../26... 3-position valve with AC solenoid



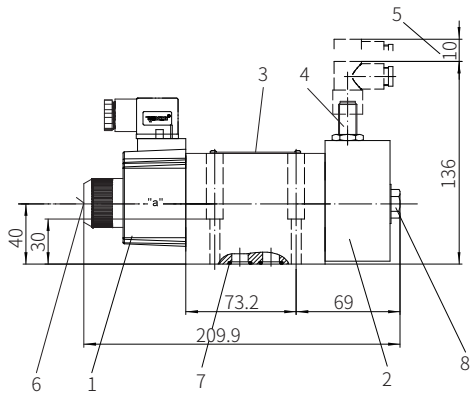


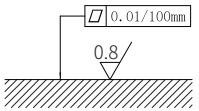
1 Solenoid
2 Transition cover
3 Name plate
4 High voltage proximity switch
5 Space required to remove the connector
6 Hidden manual emergency operation
7 O ring 10X2 (for oil ports P, A, B and T)
8 Plug for 2-position valve

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

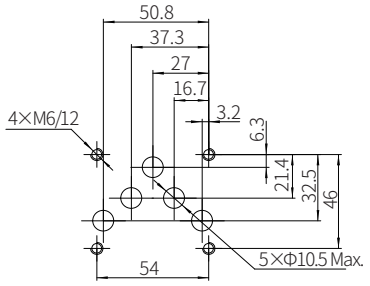
It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01(G3/8"); G66/02(M18x1.5)
G67/01(G1/2"); G67/02(M22x1.5)
G534/01 (G3/4"); G534/02(M27x2)

4WE10.../26... 2-position valve with AC solenoid





Required surface finishing of
mating components



Isolating valve

Model: Z4WE6...3XJ

- ◆ Size 6
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 40 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Electrical parameters	03
Characteristic curve	04
Characteristic limit	04
Component size	05-06

Features

- ● Directional spool valve operated by solenoid
- ● Control the opening and closing of the oil
- ● The manual emergency operation controls the movement of the control spool when solenoid de-energized

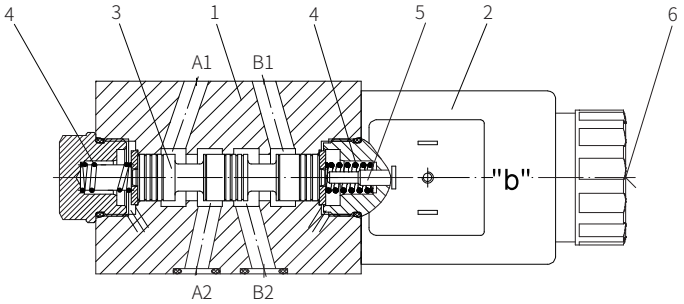
Function description, sectional drawing

The Z4WE6 isolating valve is solenoid operated directional spool valve. It controls the opening and closing of the oil.

The valve is composed of valve body (1), one or two solenoids (2), control spool (3) and 2 reset springs (4). In the de-energized condition, the control spool(3) is held in the neutral or initial position by reset spring (4), the control spool (3) is controlled via wet-pin solenoid (2). To ensure proper function, the pressure chamber of the solenoid must be filled with oil.

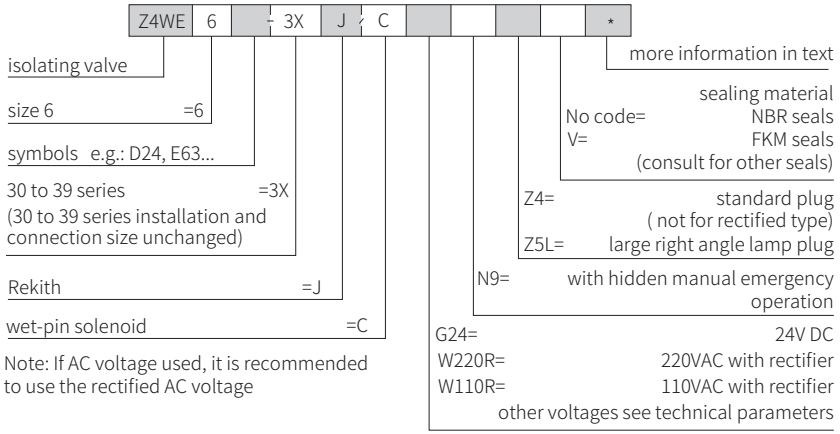
The force of the solenoid (2) via push rod (5) acts on control spool (3) and pushes it from the stationary position to the required position. Then port A1, A2, B1 and B2 can be either connected or disconnected. The port P and T always flow freely.

When the solenoid (2) is de-energised, the control spool (3) is returned to the neutral position via reset spring (4). The manual emergency operation controls the movement of the control spool when solenoid de-energized.



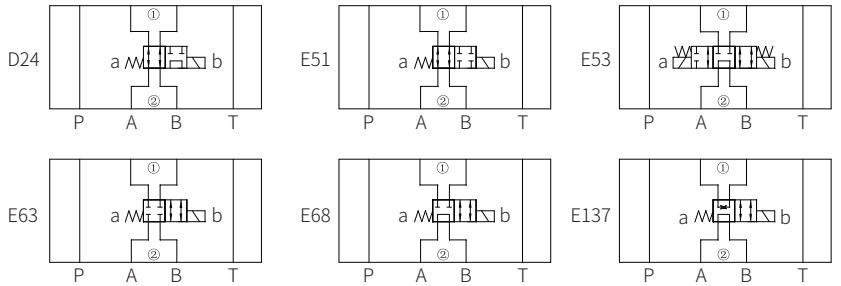
Model: Z4WE6...XJ/

Models and specifications



Functional symbols

(①= Valve side, ②= Subplate side)



Technical parameters

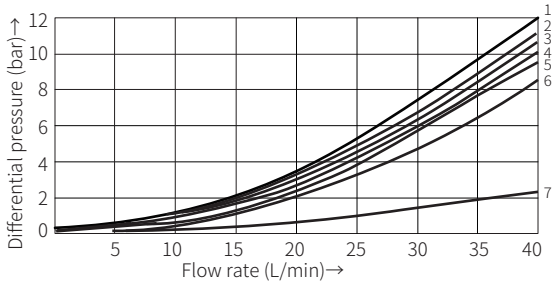
Installation position			Optional
Environment temperature range		°C	-30 to + 50 (NBR seal)
			-20 to + 50 (FKM seal)
Weight	Valve with one solenoid	kg	1.5
	Valve with two solenoids	kg	2.0
Maximum working pressure	Oil port A, B, P	bar	315
	Oil port T	bar	210（DC），160（AC）
Maximum flow		L/min	40
Working medium			Mineral oil - for NBR seals or FKM seals
			Phosphonolipid - for FKM seals
Working medium temperature range		°C	-30 to + 80 (NBR seal)
			-20 to + 80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15

Electrical parameters

Voltage type			DC	AC 50/60Hz
Voltage available		V	12，24，96，110，205，220	110，220，230
Allowable voltage tolerance		%	+10 to -15	
Power consumption(DC)		W	30	-
Holding power(AC)		VA	-	50
Impact power(AC)		VA	-	220
Power rate			continuous	
Switching time to ISO 6403	on	ms	20 to 45	10 to 20
	off	ms	10 to 25	15 to 40
Switching frequency		times/h	to 15000	to 7200
Protection grade to DIN 40050			IP 65	

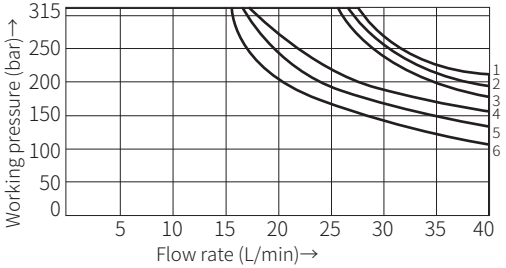
Note:
When electrical connection, the protective conductor (PE) must be connected properly as rules.

Characteristic curve



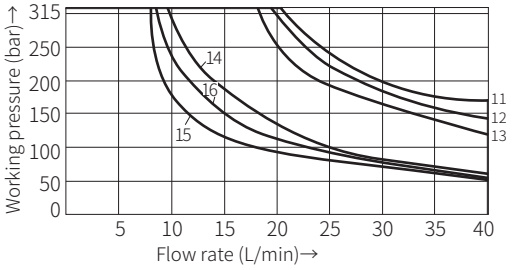
	A2 to A1	A1 to A2	B2 to B1	B1 to B2	A2 to B2	B2 to A2	T2 to T2	P2 to P1
D24	4	1	2	4	3	2	7	7
E51	3	1	1	3	-	-	7	7
E53	2	2	2	2	5	2	7	7
E63	2	5	5	3	-	-	7	7
E68	4	4	6	5	4	5	7	7
E137	1	4	3	2	5	6	7	7

Characteristic limit



1 E63 1 E51
2 E68 2 E137
3 E53 3 D24

(Measured when using HLP46,
ϑ_{oil}=40°C ± 5°C and 24VDC)



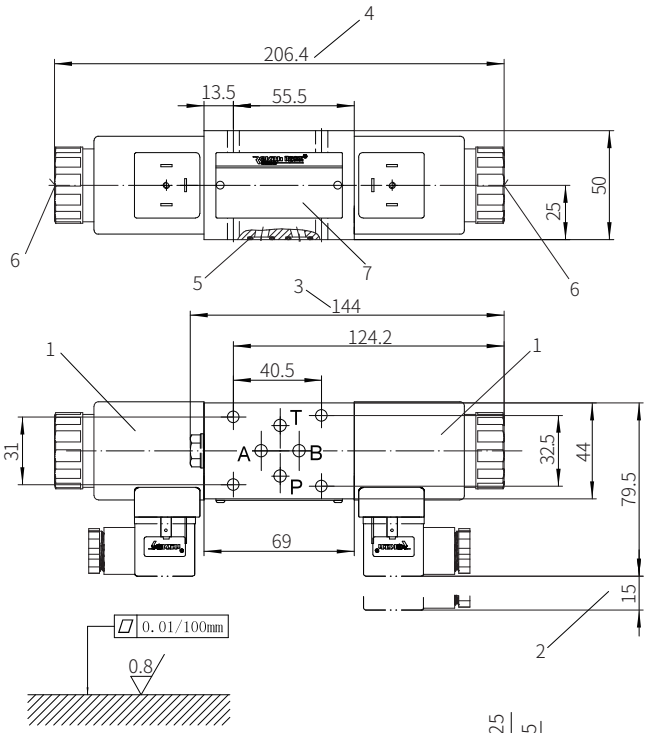
	W230-50Hz	W230-60Hz
E63	11	14
E68	12	16
E53	13	16
E137	15	15
E51	15	15
D24	15	15

(Measured when using HLP46,
ϑ_{oil}=40°C ± 5°C and 230VAC)

Component size

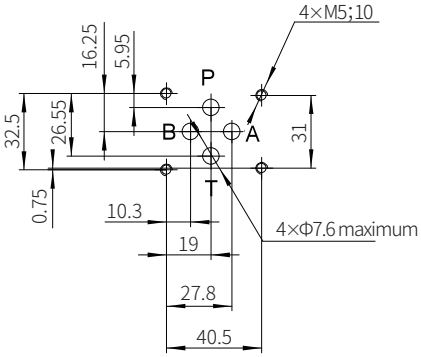
Size unit: mm

Valve with DC or AC rectified solenoid



Required surface finishing of mating components

1 Solenoid
2 Required space to remove plug
3 Size for 2-position valve
4 Size for 3-position valve
5 O ring 9.25x1.78 (for oil port P, A, B and T)
6 Hidden manual emergency operation
7 Name plate



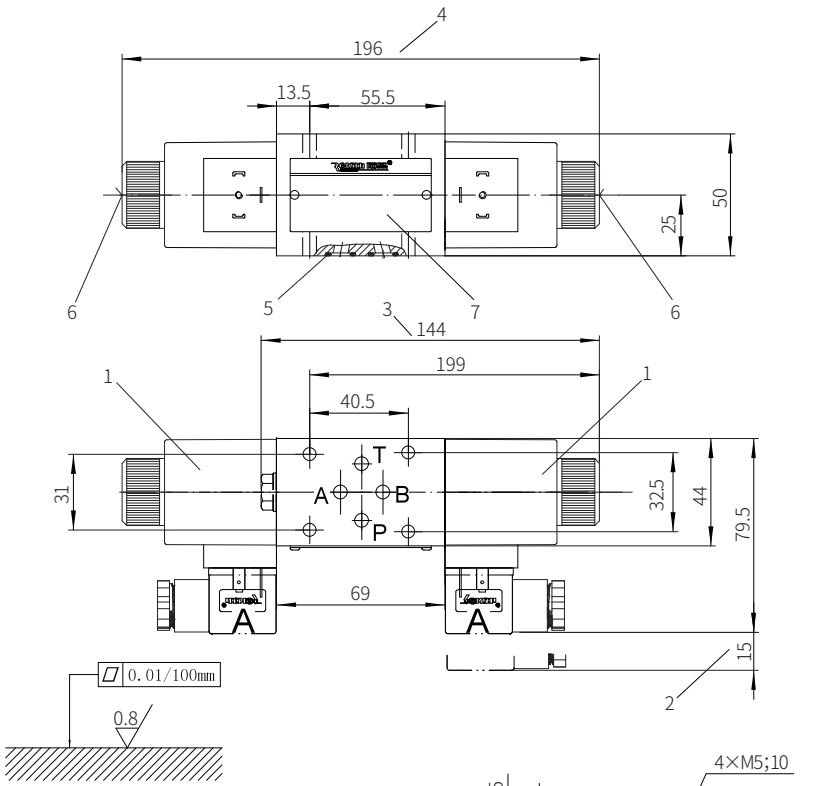
It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01(G1/4"); G341/02(M14x1.5)
G342/01(G3/8"); G342/02(M18x1.5)
G502/01(G1/2"); G502/02(M22x1.5)

Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Component size

Size unit: mm

Valve with AC solenoid



Required surface finishing of mating components

1 Solenoid
2 Required space to remove plug
3 Size for 2-position valve
4 Size for 3-position valve
5 O ring 9.25x1.78 (for oil port P, A, B and T)
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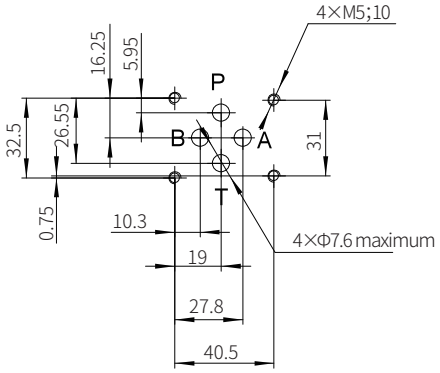
G342/01(G3/8"); G342/02(M18x1.5)
G502/01(G1/2"); G502/02(M22x1.5)



Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Hydraulic and Pneumatic Directional Valve

Model: WH/WP6...XJ

- Size 6
- Maximum working pressure 315 bar
- Maximum flow rate 60 L/min

Contents

Functional description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical Parameters	04
Characteristic curve	04
Characteristic limit	05
Component size	06-07

Features

- Direct operated directional spool valve
- Operating types:
  Pneumatic (WP)
  Hydraulic (WH)
- Subplate mounting
- Porting pattern to DIN 24340 form A and ISO4401

Function description, sectional drawing

The WH/WP are directional spool valves with fluid logic actuation. It is used to control the opening, closing and direction of the flow.

The valve mainly consists of valve body (1), one or two control pistons (2), valve spool (3), and one or two reset springs (4).

Model WH and WP

When there is no pressure oil in the control piston (2), the valve spool (3) is held in the middle or initial position by the reset spring (4). After the pressure oil acts on the control piston (2), the piston (2) pushes the valve spool (3) to move from the stationary position to the required position, thereby opening the required flow section. If the pressure oil is removed, the valve spool (3) is pushed back to the original position by the reset spring (4).

Model WH.../O and WP.../O (Only for symbols A, C, D)

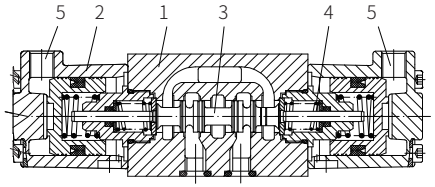
The directional valve operated by hydraulic pressure has no definite switching position in its original state when operation without reset spring and detent.

Model WH.../OF and WP.../OF (Only for symbols A, C, D)

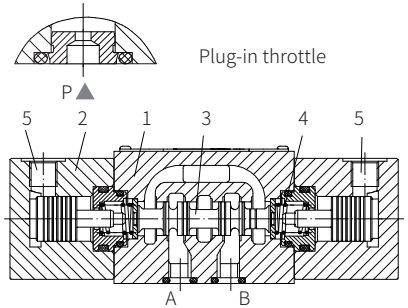
The the valve spool of the hydraulic pressure operated directional valve can be held in any switching position when operation with detent.

Plug-in throttle

Due to working conditions limitations, the flow rate may exceed the value of the performance curve during the switching process. Therefore, it is necessary to install a plug-in throttle in the channel P of the control valve.

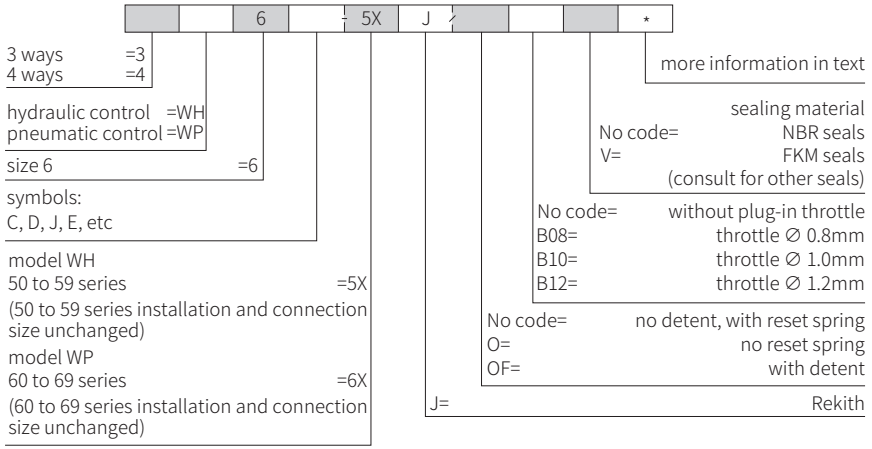


Model 4WP6...6XJ/

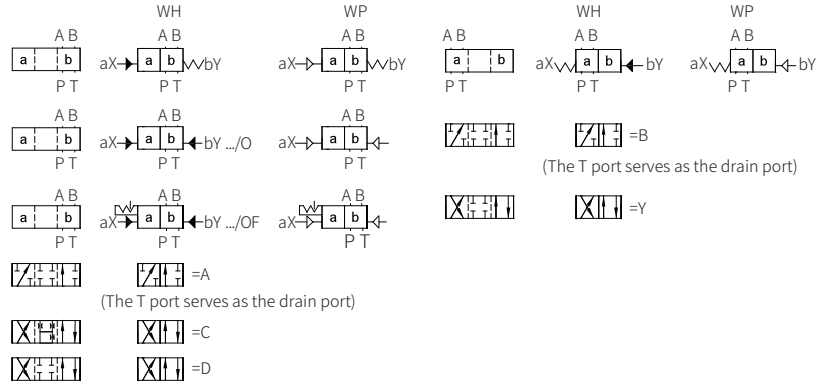


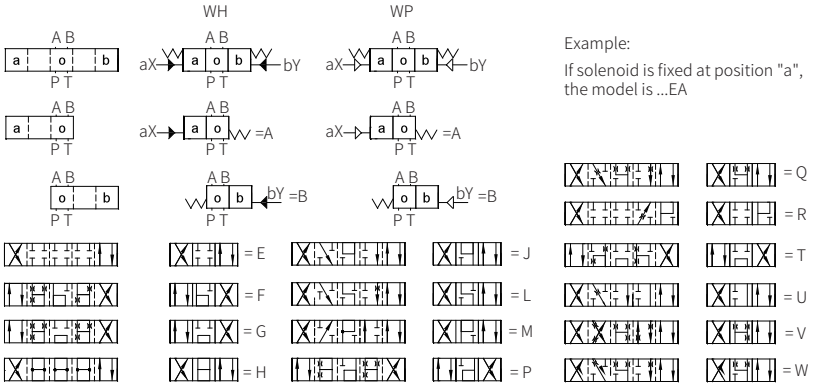
Model 4WH6...5XJ/

Models and specifications



Functional symbols





Example:

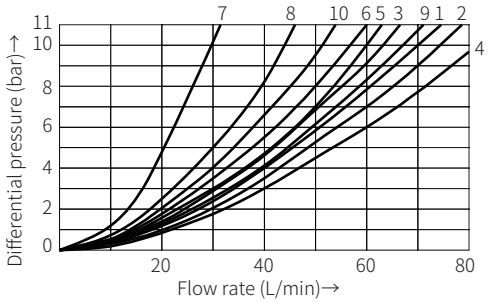
If solenoid is fixed at position "a", the model is ...EA

Technical parameters

Valve type				WP	WH
Weight	1 operating cylinder		kg	1.8	2.0
	2 operating cylinder		kg	2	2.2
Oil temperature range			°C	-30 to +80 (NBR seal)	
				-20 to +80 (FKM seal)	
Max. working pressure	oil port A, B, P		bar	315	
	oil port T		bar	160	
Minimum control pressure			bar	4	6-10
Maximum control pressure			bar	10	200
Maximum flow			L/min	60	
Effective over-flow section (neutral position)	Type W		mm^2	3% of the nominal cross-section	
	Type Q		mm^2	6% of the nominal cross-section	
Control pressure			bar	Minimum 6 to 10>return oil pressure, maximum 200	
Working medium				Mineral oil, Phosphate ester	
Viscosity range			mm^2/s	2.8 to 500	
Cleanliness of oil				The maximum allowable pollution level of oil is ISO4406 Class 20/18/15	

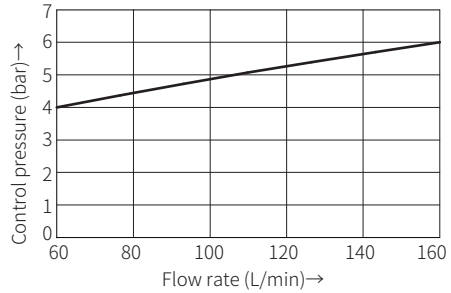
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



Function symbol	Flow direction			
	P to A	P to B	A to T	B to T
A B	3	3	-	-
C	1	1	3	1
DY	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
JQ	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

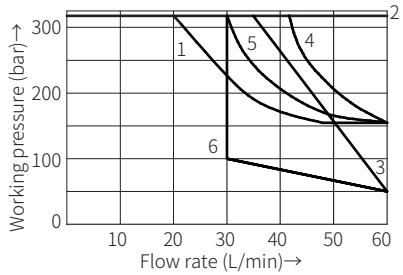
7 Symbol "R" in the switching position B → A
8 Symbols "G" and "T" in the middle position P → T
9 Symbol "H" in the middle position P → T



If the pressure of the return oil (tank) increases, the minimum control pressure must be increased according to this curve.

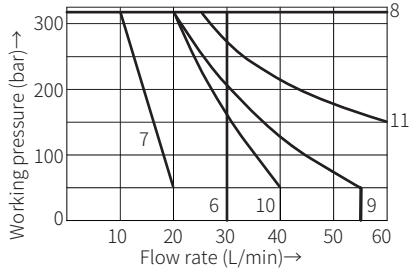
Characteristic limit

Due to blockage, the working performance of this type of valve is related to the filtration accuracy. In order to obtain the given allowable flow value, it is recommended to use a full flow filtration of 25um. The various forces inside the valve also affect its working limit. Therefore, for a four-way valve, the given flow value is the value under normal conditions when both flow channels are working (for example, P To A and simultaneously return from B to T).
If only one direction of flow is needed, the A or B ports of the four-way valve is blocked and used as a three-way valve, the flow rate may be very small in severe cases

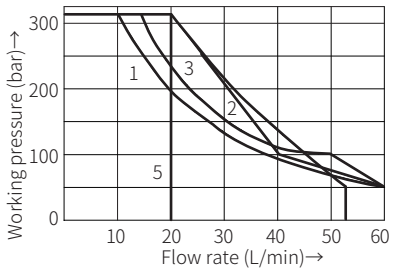


WP，WH

Characteristic curve	Function symbol
1	A，B
2	A/O, C, C/O, D, D/O, E, G, H, J, L, M, Q, U
3	F, P
4	R
5	T
6	V



WP，WH



WP，WH

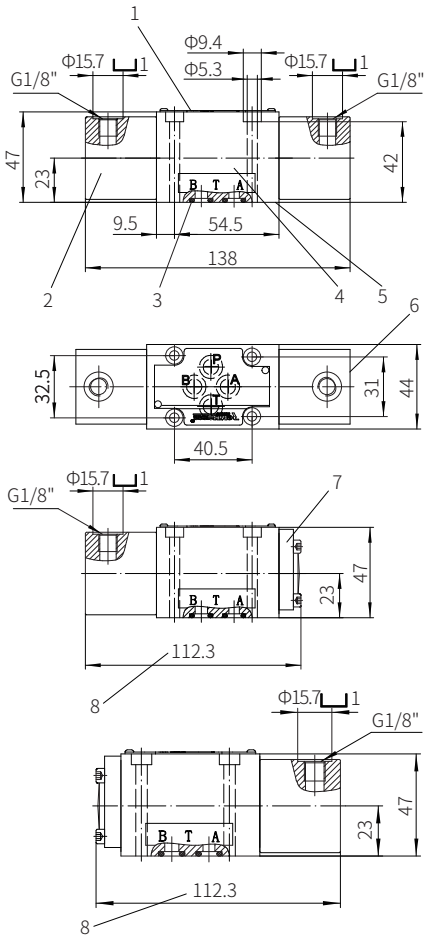
Control pressure 6 bar>T-port pressure		
Characteristic curve		Function symbol
Reset Spring	1	A, B
	2	C, D, Y
	3	E, J, L, U, M, Q, V, W
	4	F, P
	5	T
	6	G, H
	7	R
.../OF... .../O...	8	A, C, D

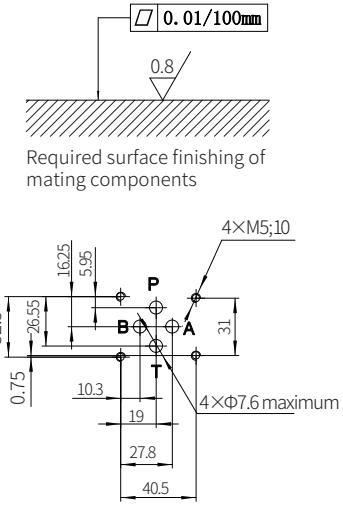
Control pressure 10 bar>T-port pressure		
Characteristic curve		Function symbol
Reset Spring	1	A, B
	8	C, D, Y, E, G, H, J, L
		U, M, Q, V, W
	9	F, P
	10	R
	11	T
.../OF... .../O...	8	A, C, D

Component size

Size unit: mm

Model WH6...5XJ/...





1 Name plate
2 Actuation cylinder "b"
3 O-ring 9.25x1.78 (for oil ports P, A, B, T)
4 Valve body
5 Connection surface
6 Actuation cylinder "a"
7 Cover plate for 2-position valve
8 Size of 2-position valve

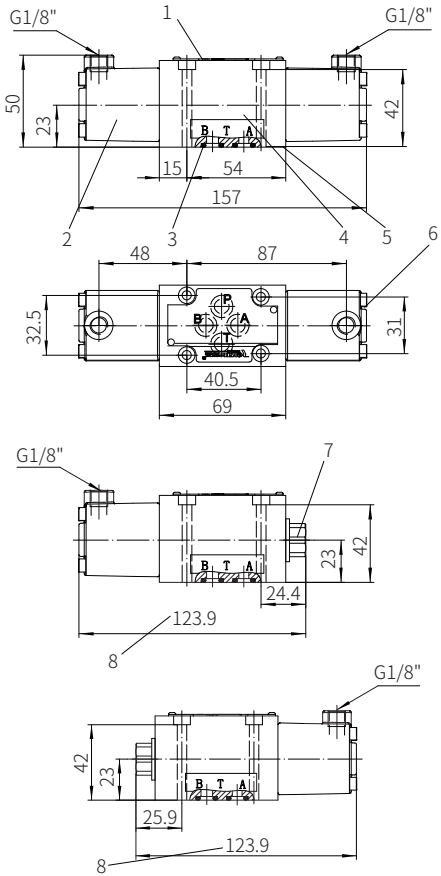
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

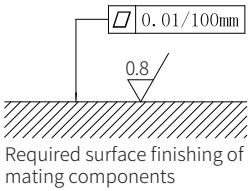
It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

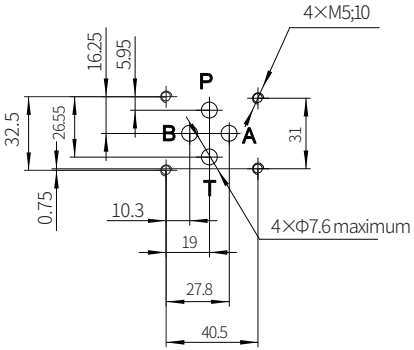
Component size

Size unit: mm

Model WP6...6XJ/...







1 Name plate
2 Actuation cylinder "b"
3 O-ring 9.25x1.78 (for oil ports P, A, B, T)
4 Valve body
5 Connection surface
6 Actuation cylinder "a"
7 Cover plate for 2-position valve
8 Size of 2-position valve

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

01

Hydraulic Control Directional Valve

Model: WHD10...3XJ

- Size 10
- Maximum working pressure 315 bar
- Maximum working flow 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	04
Characteristic curve	04
Characteristic limit	05
Component size	06

Features

- Direct operated directional spool valve
- Type of actuation:
  Hydraulic (WHD)
- Subplate mounting
- Porting pattern to DIN 2430 Form A, and ISO4401

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Function description, sectional drawing

The WHD valve is directional spool valve with fluid logic actuation, it controls the opening, closing and direction of the flow.

The valve is composed of valve body (1), main spool (2), one or two reset spring (3), and one or two position (4).

Model WHD...

In the initial state, the main spool (2) remains in the middle position under the action of two reset springs (3). If external signal oil enters through port A, the oil pushes the left position (4) to the right, thus driving the main spool (2) to the right. Removing the control oil, the main spool (2) returns to the middle position under the right spring force.

If external signal oil enters through port B, the oil pushes the right position (4) to the left, thus driving the main spool (2) to the left. Removing the control oil, the main spool (2) returns to the middle position under the left spring force.

Model WHD.../O（Only for symbols A、C、D）

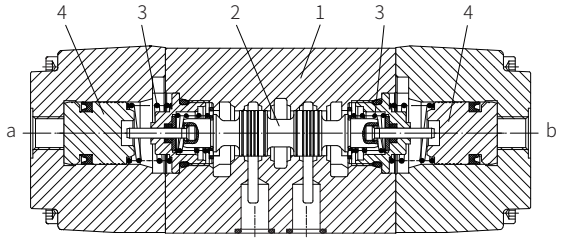
This model is a hydraulic operated direction valve. If using actuation elements without reset springs and without detent, there is no defined spool position in initial condition.

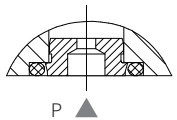
Model WHD.../OF（Only for symbols A、C、D）

This model is a hydraulic operated direction valve. When actuation elements with detent, the spool position can be locked.

Plug-in throttle

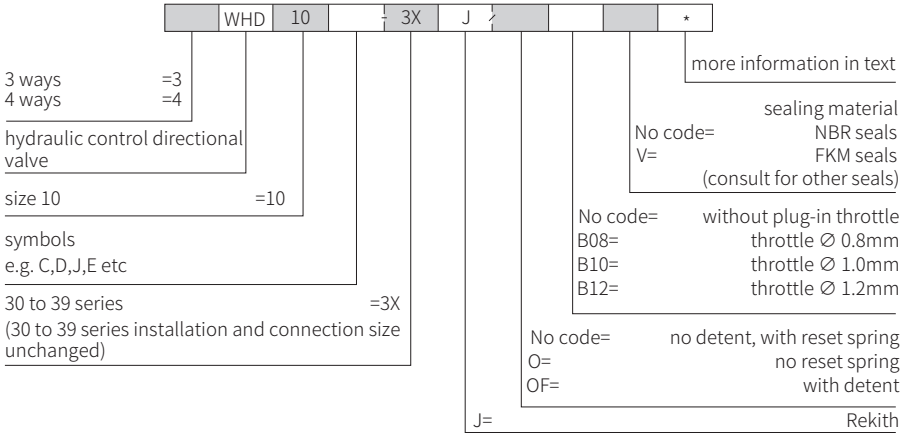
Due to the limitation of the working conditions, the flow may exceed the value of the performance curve during switching process, so it is necessary to install a plug-in throttle into channel P.



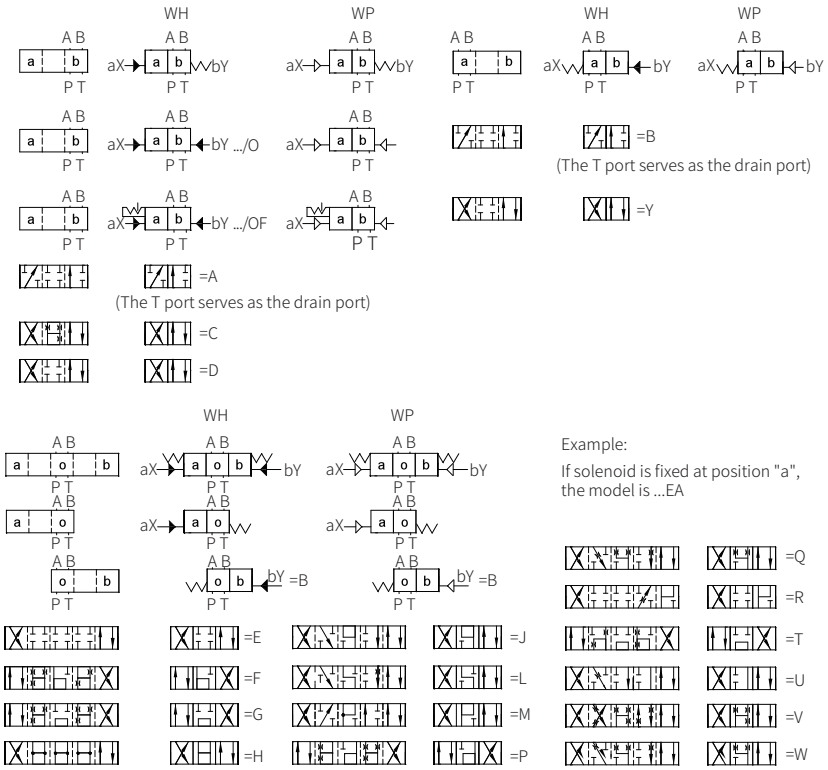


Plug-in throttle

Models and specifications



Functional symbols

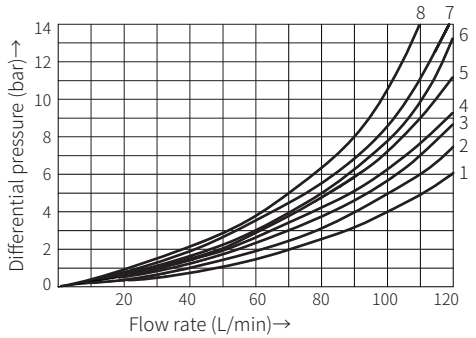


Technical parameters

Valve type			WHD
Weight	1 operating cylinder	kg	3.0
	2 operating cylinder	kg	3.3
Oil temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Max. working pressure	oil port A, B, P	bar	315
	oil port T	bar	160
Max. flow		L/min	120
Effective over-flow section (neutral position)	Type V	mm^2	11(A/B→T); 10.3(P→A/B)
	Type W	mm^2	2.5(A/B→T)
	Type Q	mm^2	5.5(A/B→T)
Control pressure		bar	5~160
Working medium			Mineral oil, Phosphate ester
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



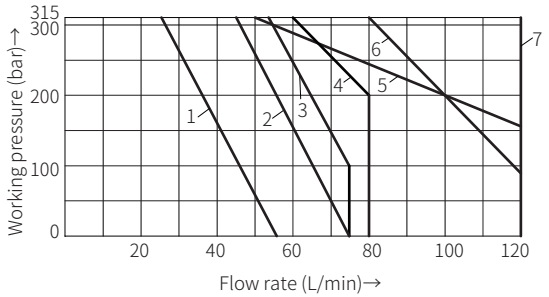
8 Symbols "G" and "T" in neutral position P→T
8 Symbol "R" in switching position A→B

Function symbol	Flow direction			
	P to A	P to B	A to T	B to T
A	4	3	-	-
B	3	4	-	-
C	3	3	4	4
D	3	3	5	5
E	2	2	4	4
F	1	2	3	4
G,T	4	4	7	7
H	1	1	5	5
J	2	2	3	3
L	3	3	2	4
M	1	1	4	4
P	3	1	5	5
Q	2	2	2	2
R	3	4	3	-
U	3	3	5	2
V	2	2	3	3
W	3	3	3	3
Y	4	4	6	6

Characteristic limit

Because of adhesive effect, the switching function of the valves depends on the filtration. In order to achieve the specified admissible flow values, we suggest full flow filtration with 25um. The flow force acting within the valves also affect the flow performance. With 4 way valves the specified flow data thus apply to normal operation with 2 volume flow directions(e.g. from P to A and at the same time return flow from B to T)

If only one flow direction is available, when 4-way valve is used as a 3-way valve by blocking port A or B, the flow can be significantly smaller in critical cases.

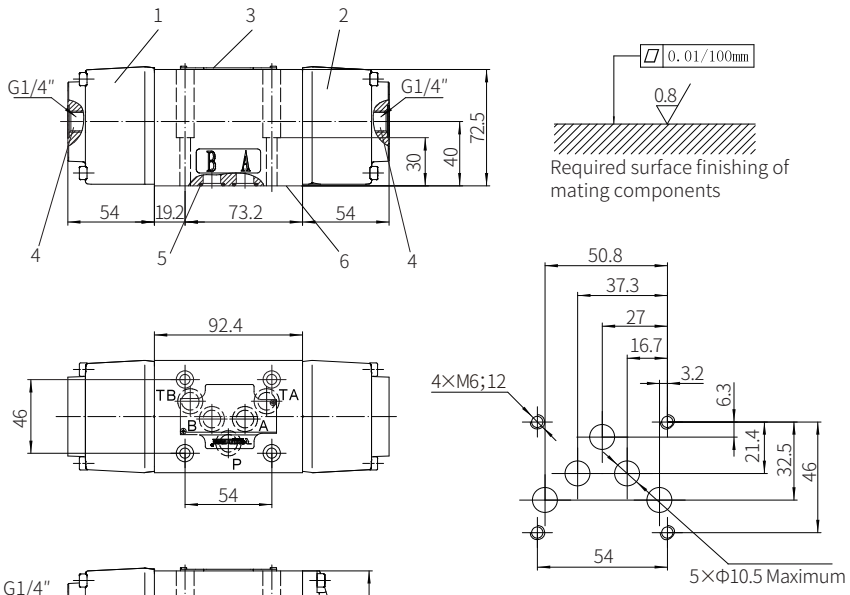


Curve	Function symbol
1	A, B
2	A/O
3	H
4	F, G, P, R, T
5	J, L, Q, U, W
6	C, D, E, M, V, Y
7	C/O, C/OF D/O, D/OF

Component size

Size unit: mm

Model WHD10...3XJ/...



1 Actuation cylinder "b"
2 Actuation cylinder "a"
3 Name plate
4 Control port thread G1/4"
5 O-ring 12x2 (for oil ports P, A, B, TA, TB)
6 Connection surfaces
7 Size of 2-position valve

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8"); G66/02(M18x1.5)
G67/01 (G1/2"); G67/02 (M22x1.5)
G534/01 (G3/4"); G534/02(M27x2)

Solenoid Operated Poppet Valve

Model: M-SEW6...3XJ

- Size 6
- Maximum working pressure 420/630 bar
- Maximum working flow 25 L/min

Contents

Function description, sectional drawing	02-03
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Characteristic limit	07
Component size	08-09
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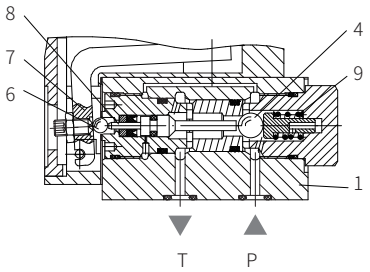
Features

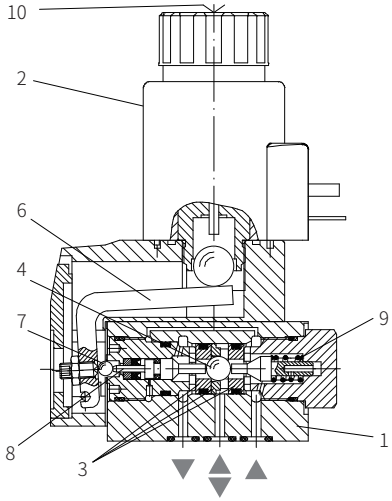
- Direct operated solenoid directional poppet valve
- Closed port without leakage
- Switching smoothly even in high-pressure state long periods

Function description, sectional drawing

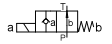
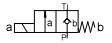
General:
The M-SEW6 directional valve is solenoid operated directional seat valve. It is used to control the opening, closing and flow direction of fluid.
The valve is mainly composed of valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element.
Basic functions:
In the initial position, the ball (4) is pressed into the valve seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod (8) which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing elements is connected to oil port P. Therefore, the valve system is pressure compensated based on the actuating force (solenoid or reset spring). In this way, the valve can be used up to 630bar.
Note:
The 3/2-way directional seat valve has "negative cover" function. Therefore, port T must be always connected. That means the ports P-A-T are connected with each other during the switching process (from the starting of the opening of one valve seat to the closing of the other valve seat) . But this process is completed in a very short time, so it is irrelevant in almost all applications.
The manual emergency operation (10) allows the valve to be switched without solenoid energized.
It must ensure that the specified maximum flow is not exceeded! If necessary, a throttle can be used to limit the flow.

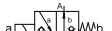
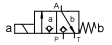


Model M-2SEW6N...3XJ/



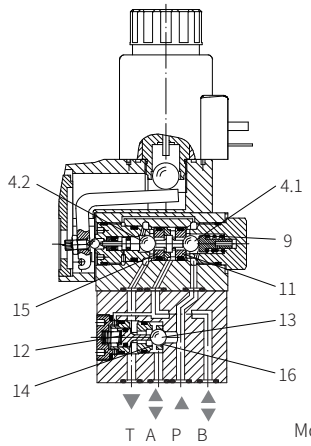
Model M-3SEW6U...3XJ/

2/2-way directional seat valve	
Symbol "P"	
Initial position	P and T connected
Switching position	P blocked
Symbol "N"	
Initial position	P blocked
Switching position	P and T connected

3/2-way directional seat valve	
Symbol "U"	
Initial position	P and A connected, T blocked
Switching position	P blocked, A and T connected
Symbol "C"	
Initial position	P blocked, A and T connected
Switching position	P and A connected, T blocked

Function description, sectional drawing

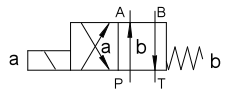
To install a sandwich plate, the pius-1 plate under the 3/2 directional seat valve, the function of a 4/2-way directional seat valve can be realized.
Function of plus-1 plate:
Initial position:
The main valve does not work. The spring (9) holds the ball (4.1) on the valve seat (11). The port P is blocked, and port A is connected to port T. In addition, there is a pilot line connected from A to the large area of the control spool (12), which is unloaded to the tank. The pressure provided by port P will push the ball (13) to the valve seat (14). Now, P is connected to B, and A to T.

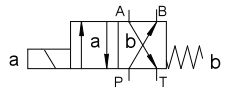


Model M-4SEW6D...3XJ/

Transition position:
When the main valve is operated, the spool (4.2) moves against the spring (9) and is pressed into the valve seat (15). During this process, port T will be closed, P, A and B are connected to each other within a short time.
Switching position:
The port P is connected to A. The pump pressure acts via A on the large area of the control spool (12), the ball (13) is pressed into the valve seat (16). Therefore, B is connected to T and P to A. The balls (13) in the plus-1 plate has "positive cover".
Note:
In order to avoid pressure intensification when the single rod cylinders used, the annular area of the cylinder must be connected to A.

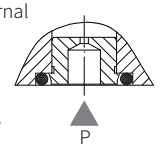
The seat valve with plus-1 plate as bellow:

Symbol "D" 

Symbol "Y" 

Cartridge throttle

Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required.
Example:
-Accumulator operation
-Used as a pilot valve with internal pilot oil supply

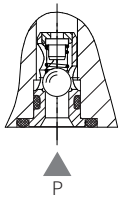


3/2-way poppet valve
The throttle is inserted into the port P of the directional valve.
4/2-way poppet valve
The throttle is inserted into the oil port P of the plus-1 plate.

Cartridge check valve

The cartridge check valve allows free flow from P to A and leak-free closure from A to P.

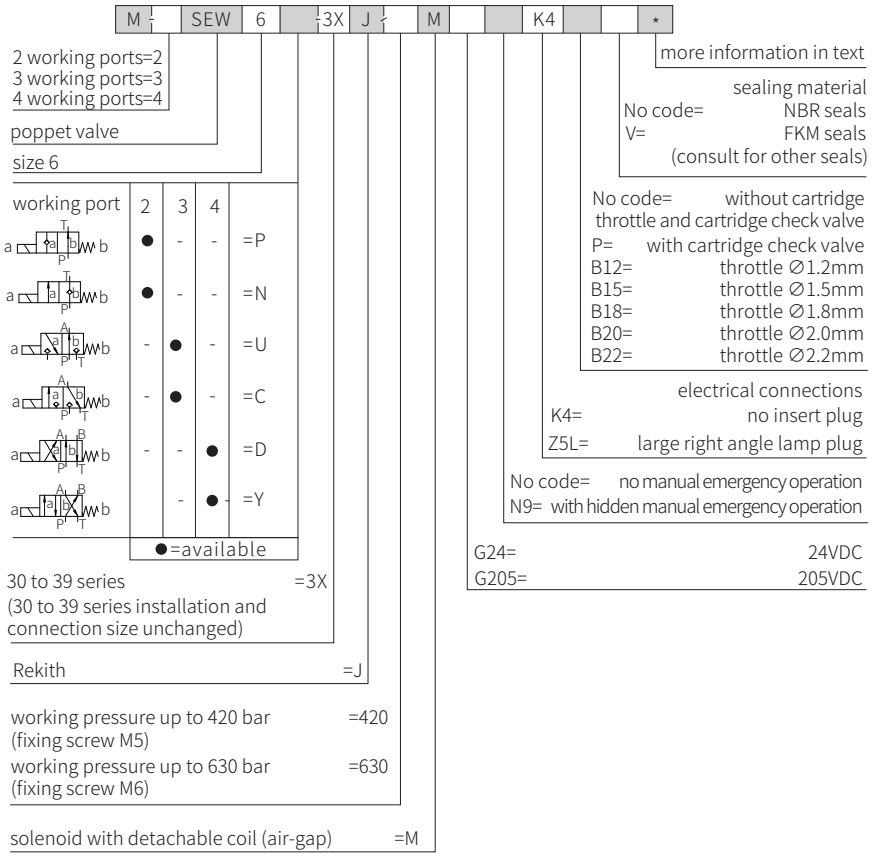
3/2-way poppet valve
The cartridge check valve is inserted into the oil port P of the directional valve.



4/2-way poppet valve

The cartridge check valve is inserted into port P of the plus-1 plate.

Models and specifications



Technical parameters

Overview					
Environment temperature range		°C	-30 to +50 (NBR seal)		
			-20 to +50 (FKM seal)		
Weight	2/2-way valve	kg	1.5		
	3/2-way valve	kg	1.5		
	4/2-way valve	kg	2.3		
Hydraulic					
Maximum working pressure		bar	See characteristic limit		
Maximum flow		L/min	25		
Pressure medium 1) For NBR and FKM seal 2) Only for FKM seal			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]		
Pressure medium temperature range		°C	-30 to +80 (NBR seal)		
			-20 to +80 (FKM seal)		
Viscosity range		mm²/s	28 to 500		
Cleanliness of oil[3]			The maximum allowable pollution level of oil is IS04406 Class 20/18/15		
Electrical					
Voltage type			DC	AC	
Available voltage		V	24、205	Only available via rectifier	
Allowable voltage tolerance (nominal voltage)		%	±10		
Power consumption		W	30		
Continuous power on time		%	100		
Switch time to ISO 6403			See below table		
Switching frequency		times/hour	15000 (working pressure ⩽ 350bar)/3600 (working pressure ⩾ 350bar)		
Protection type to DIN 40050			IP65 with plug installed and fixed		
Maximum coil temperature		°C	150		

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

4) Please inquire for special voltages

Electrical protective conductor (PE ⏚) must be connected properly as rules

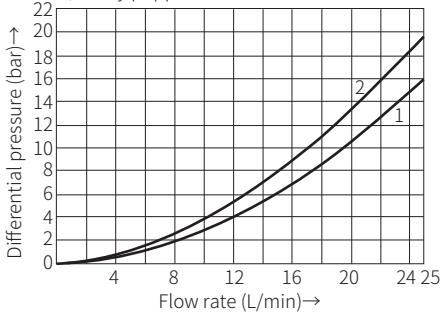
Switching time tms (Installation position: solenoid installed horizontally)

Pressure P bar	Flow q_v L/min	DC Solenoid						AC Solenoid + Rectifier					
		Functional symbol U, C, D, Y						Functional symbol U, C, D, Y					
		t_{on} No tank pressure				t_{off}		t_{on} No tank pressure				t_{off}	
		U	C	D	Y	U/C	D/Y	U	C	D	Y	U/C	D/Y
140	25	25	30	25	30	10	10	30	40	30	40	35	35
280	25	25	30	25	30	10	10	35	45	35	45	40	40
320	25	25	35	25	35	10	10	35	50	35	50	40	40
420	25	25	35	25	35	10	10	40	50	40	50	50	50
500	25	25	40	25	40	10	10	40	55	40	55	50	50
600	25	25	40	25	40	10	10	40	55	40	55	55	55

Characteristic curve

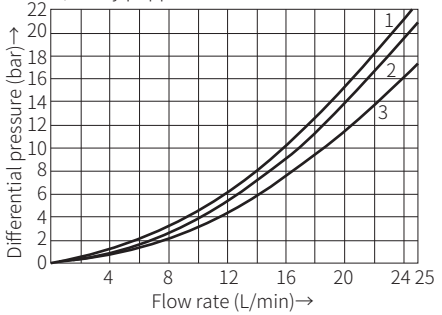
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

p-q_v- characteristic curve
2/2-way poppet valve



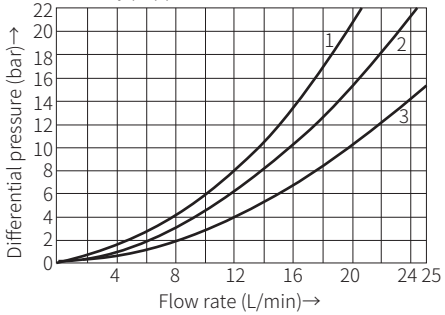
1 M-2SEW6N...P to T
2 M-2SEW6P...P to T

p-q_v- characteristic curve
3/2-way poppet valve



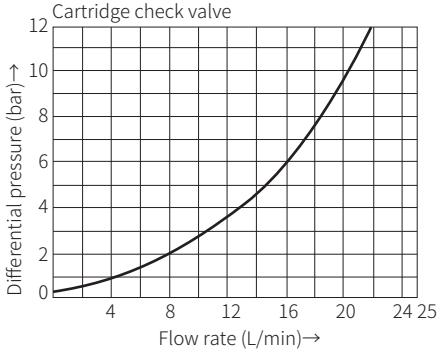
1 M-3SEW6$^{U}_{C}$...A to T
2 M-3SEW6U...P to A
3 M-3SEW6C...P to A

p-q_v- characteristic curve
4/2-way poppet valve

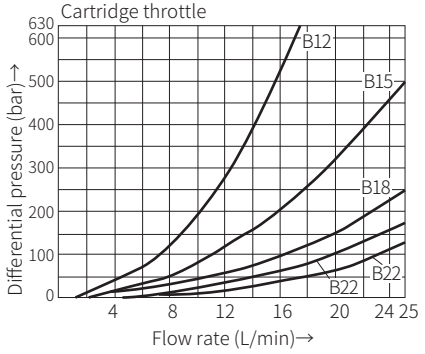


1 M-4SEW6$^{D}_{Y}$...A to T
2 M-4SEW6$^{D}_{Y}$...P to A
3 M-4SEW6$^{D}_{Y}$...P to B, B to T

p-q_v- characteristic curve
Cartridge check valve



p-q_v- characteristic curve
Cartridge throttle



Characteristic limit

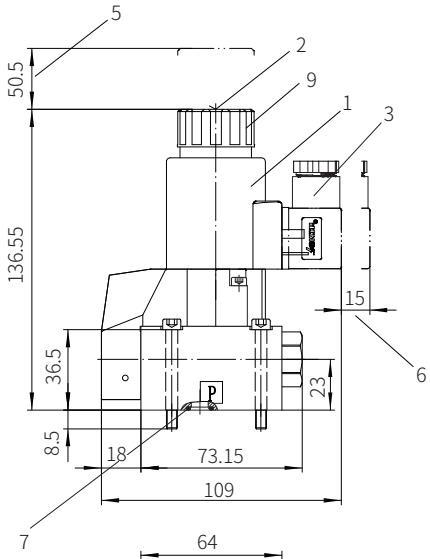
	Functional symbol	comment	Working pressure bar P	A	B	T	Flow L/min
Two-way circuit	"P"	Oil port pressure P≥T	420/630			100	25
	"N"		420/630			100	25
Three-way circuit	"U"	Oil port pressure P≥A≥T	420/630	420/630		100	25
	"C"		420/630	420/630		100	25
Two-way circuit (only for unloading function)	"U"	Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure A≥T		420/630		100	25
	"C"	Oil port pressure A≥T		420/630		100	25
Four-way circuit (flow only in the direction of the arrow)	"D"	Single poppet valve (symbol "U") with plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	25
	"Y"	Double poppet valve (symbol "C") with plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	25

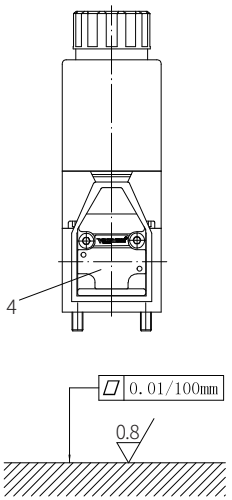
Note:
-In order to operate the valve safely or keep it in the switching position, the oil port pressure P≥A≥T (based on the structure).
-The ports P, A and T (3/2-way valve), and ports P, A. B and T (4/2-way valve) are configured according to their functions and must not be blocked or used in other ways. Liquid flow is only allowed in the direction of the arrow.
- When using the plus-1 plate (4/2-way valve), the following data must be met: Pmin=8bar; Q>3 L/min
- The specified maximum flow should not be exceeded.
The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

Component size

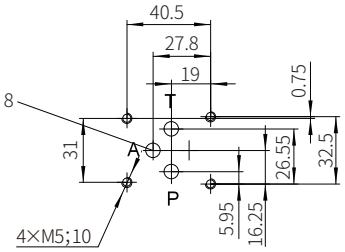
Size unit: mm

2/2 and 3/2-way poppet directional valve





Required surface finishing of mating components



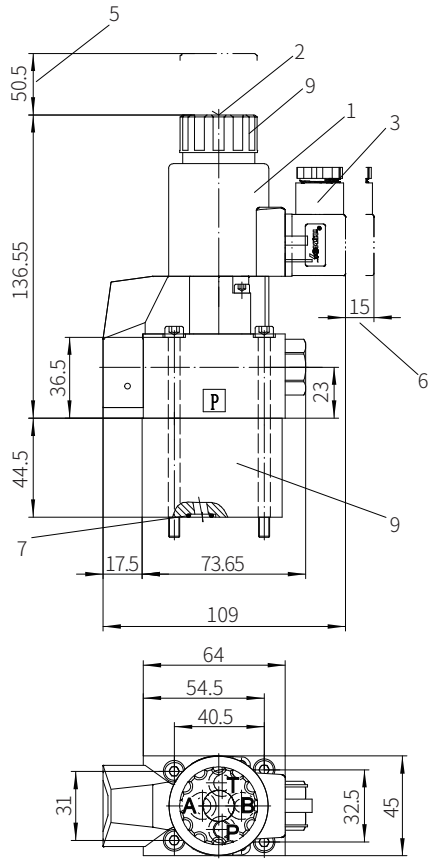
1 Solenoid
2 Hidden emergency button
3 Plug
4 Name plate
5 Space required to remove the coil
6 Space required to remove the plug
7 O-ring 10x2 (for oil port P)
O-ring 9.25x 1.78 (for oil ports B, A, T) 420bar type
O-ring 9.25X 1.78 (for oil ports B, A, T) 630bar type
8 Port A and B are blind holes for 2/2-way valve
Port B is a blind hole for 3/2-way valve

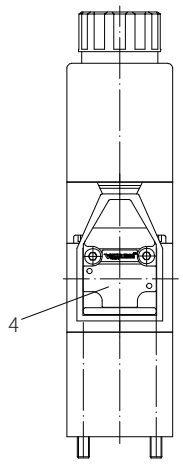
Valve fixing screw
Version 420 bar:
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
Version 630 bar:
M6x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

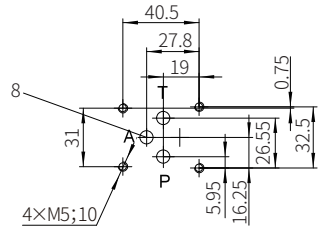
Component size

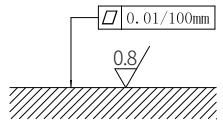
Size unit: mm

4/2-way poppet directional valve









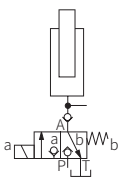
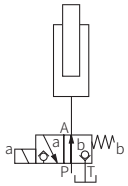
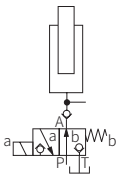
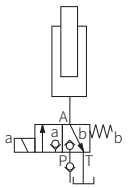
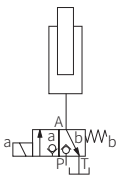
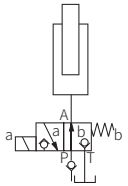
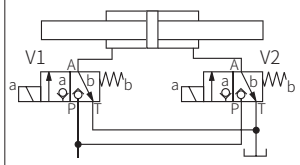
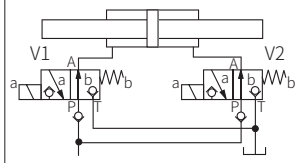
Required surface finishing of mating components

1 Solenoid
2 Hidden emergency button
3 Plug
4 Name plate
5 Space required to remove the coil
6 Space required to remove the plug
7 0-ring 10X2 (for oil port P)
0-ring 9.25X1.78 (for oil ports B, A, T)
8 Port A and B are blind holes for 2/2-way valve
Port B is a blind hole for 3/2-way valve
9 Plus-1 plate

Valve fixing screw
Version 420 bar:
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
Version 630 bar:
M6x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Application examples

These examples only indicate some applications of the poppet valve but not include all functions.

Symbol C 	2/2-way circuit with two poppet valves and check valve at port A The check valve must be installed on the pipeline. Initial position: the flow is blocked and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The fluid flows freely and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol U 	3/2-way circuit with a single poppet valve Initial position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P. Switching position: Descending
Symbol U 	2/2-way circuit with a single poppet valve and check valve at port A The check valve must be installed on the pipeline. Initial position: The fluid flows freely and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The flow blocked and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol C 	3/2-way circuit with two poppet valves and cartridge check valve at port A The check valve is installed at port P of the 3/2-way directional poppet valve. Initial position: Descending Switch position: Lifting The load can be held in any position when the pump is turned off and the solenoid is energized.
Symbol C 	3/2-way circuit with two poppet valves Initial position: Descending Switch position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P.	Symbol U 	3/2-way circuit with a single poppet valve and cartridge check valve at port P The check valve is installed at port P of the 3/2-way poppet valve. Initial position: Lifting The load can be held in any position when the pump is turned off. Switching position: Descending
Symbol C 	4/3-way (4/4-way) circuit with two poppet valves V1 and V2 in the initial position: both ends of the cylinder are connected to the oil tank port. V2 in the switching position: the piston moves to the left. V1 in the switching position: the piston moves to the right. V1 and V2 in the switching position: both ends of the cylinder are connected to the pump port. The fast movement is possible when a single rod cylinder with an area ratio of 2:1 is used. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!		
Symbol U 	4/3-way (4/4-way) circuit with two poppet valves and cartridge check valve at port P of the 3/2-way poppet valve V1 and V2 in the initial position: the piston is locked externally to prevent oil flow. V2 in the switching position: the piston moves to the right. V1 in the switching position: the piston moves to the left. V1 and V2 in the switching position: both ends of the cylinder are connected to the tank port. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum allowable working pressure (overpressure) must be taken into account!		

Solenoid Operated Poppet Valve

Model: M-SEW10...1XJ

- Size 10
- Maximum working pressure 420/630 bar
- Maximum working flow 40 L/min

Contents

Function description,sectional drawing	02-03
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Characteristic limit	06
Component size	07-09
Application examples	10

Features

- Direct operated solenoid directional poppet valve
- Closed port without leakage
- Switching flexibility even in high-pressure state long periods
- Air-gap DC solenoid with detachable coils (AC voltage available after rectification)
- The solenoid coil can be rotated by 90°
- Individual electrical connection

Function description, sectional drawing

3/2-way directional seat valve

General:

The M-SEW10 directional valve is solenoid operated poppet valve. It controls the opening, closing and direction of the fluid.
The valve is mainly composed of valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element. The manual emergency operation (5) can be control the valve when the solenoid is not energized.

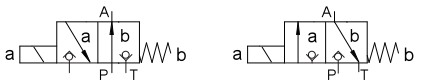
Basic function:

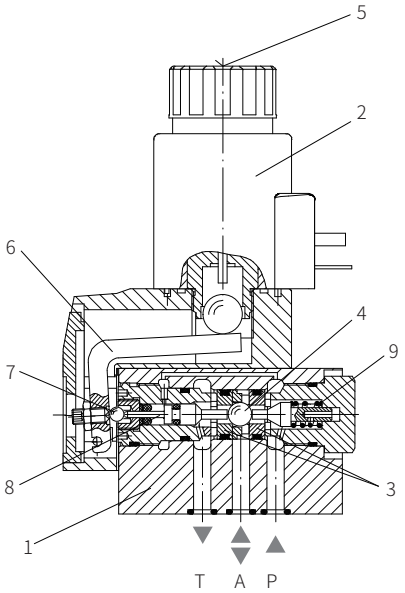
In the initial position, the spool (4) is pressed into the valve seat by the spring (9) and by the solenoid when in the switching position. The force of the solenoid (2) is applied to the actuating push rod (8) which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing elements is connected to the port P. Therefore, the valve system (3) is pressure compensated based on the actuating force (solenoid or spring). In this way, the valve can be used up to 630bar.

Note:

- The 3/2-way poppet directional valve has "negative cover function". Therefore, the port T must be always connected. That means the ports P-A-T are connected to each during the switching process (from the starting of the opening of one valve seat to the closing of the other valve seat). But this process is completed in a very short time, so it is irrelevant in almost all applications.
- It must ensure that the specified maximum flow does not exceeded the performance limit of the valve.
- If necessary, the cartridge throttle can be installed to limit the flow.

Symbol "U" Symbol "C"



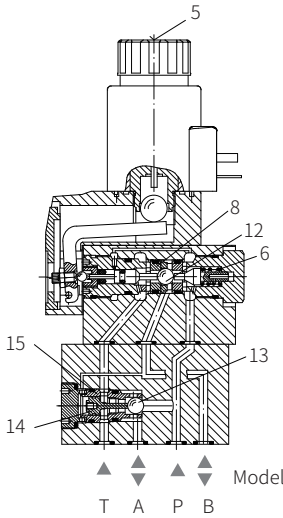


Model M-3SEW10U...XJ/

Function description, sectional drawing

4/2-way poppet directional valve

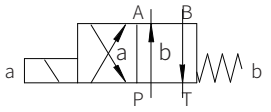
Initial position: When the solenoid is not energized, the force of the spring (6) keeps the ball spool (12) on the left valve seat (8). The port P is connected with A. The pump pressure oil acts on the large area of the control piston (15) through the control line from port A. The steel ball (13) is pushed to the other side of the valve seat (14), so the oil port P is connected to A and B to T.
Switching position: After the solenoid is energized, the oil port A is connected to T.In additional, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat (14). At this time, the oil port P is connected to B.



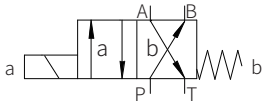
Model M-4SEW10Y...1XJ/

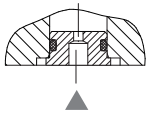
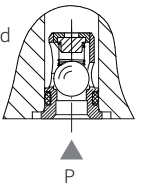
The seat valve with plus-1 plate as bellow:

Symbol "D"



Symbol "Y"



Cartridge throttle	Cartridge check valve
Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required. Example: -Accumulator operation -Used as a pilot valve with internal pilot oil supply  3/2-way poppet valve The throttle is inserted into the port P of the directional valve. 4/2-way poppet valve The throttle is inserted into the oil port P of the plus-1 plate.	The cartridge check valve allows free flow from P to A and leak-free closure from A to P. 3/2-way poppet valve The cartridge check valve is inserted into the oil port P of the directional valve.  4/2-way poppet valve The cartridge check valve is inserted into port P of the plus-1 plate.

Models and specifications

M - | SEW | 10 | - 1X | J | M | | | K4 | | | *

3 working ports=3
4 working ports=4

poppet valve

size 10 =10

working port Functional symbols

3	4	
●	–	= U
●	–	= C
–	●	= D
–	●	= Y

●=available

10 to 19 series =1X
(10 to 19 series installation and connection size unchanged)

Rexroth =J

working pressure up to 420 bar (fixing screw M6) =420
working pressure up to 630 bar (fixing screw M8) =630

solenoid with detachable coil (air-gap) =M

G24= 24VDC
G205= 205VDC

No code= no manual emergency operation
N9= with hidden manual emergency operation

electrical connection
K4= no insert plug
Z5L= large right angle lamp plug

No code= without cartridge check valve and cartridge throttle
P= with cartridge check valve
B12= throttle Ø1.2mm
B15= throttle Ø1.5mm
B18= throttle Ø1.8mm
B20= throttle Ø2.0mm
B22= throttle Ø2.2mm

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

Technical parameters

Overview				
Installation position			Optional	
Environment temperature range		°C	-30 to +50 (NBR seal)	
			-20 to +50 (FKM seal)	
Weight	3/2-way valve	kg	2.0	
	4/2-way valve	kg	3.5	
Hydraulic				
Maximum working pressure		bar	See characteristic limit	
Maximum flow		L/min	40	
Pressure medium			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]	
Pressure medium temperature range			-30 to +80 (NBR seal)	
			-20 to +80 (FKM seal)	
Viscosity range		mm^2/s	28 to 500	
Cleanliness of oil[4]			The maximum allowable pollution level of oil is IS04406 Class 20/18/15	
Electrical				
Voltage type			DC	AC
Available voltage[3]		V	24、205	Only available via rectifier
Allowable voltage tolerance (nominal voltage)		%	±10	
Power consumption		W	30	
Continuous power on time		%	100	
Switch time to ISO 6403			See below table	
Switching frequency		times/hour	15000 (working pressure ⩽ 350bar)/3600 (working pressure ⩾ 350bar)	
Protection type to DIN 40050			IP65 with plug installed and fixed	
Maximum coil temperature		°C	150	

1) For NBR seal and FKM seal
2) Only for FKM seal
3) Please consult for special voltage

4) The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effect oil filtration can prevent failure and increase the service life of the components.

Electrical protective conductor (PE ⏚) must be connected properly as rules

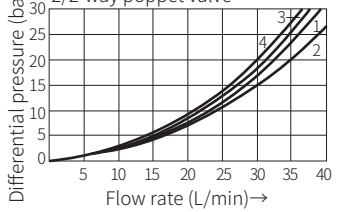
Switching time tms (Installation position: solenoid installed horizontally)

Pressure P bar	Flow q_v L/min	DC Solenoid Functional symbol U, C, D, Y						AC Solenoid + Rectifier Functional symbol U, C, D, Y							
		t_{on} No tank pressure				t_{off}		t_{on} No tank pressure				t_{off}			
		U	C	D	Y	U/C	D/Y	U	C	D	Y	U	C	D	Y
140	40	20	40	20	40	12	17	20	40	20	40	60	45	40	50
280	40	25	45	20	45	12	17	20	45	25	45	60	45	45	55
320	40	25	45	20	45	12	17	25	45	25	45	60	45	45	55
420	40	30	45	20	50	12	17	25	45	25	50	60	45	45	55
500	40	30	45	20	50	12	17	30	50	30	50	65	50	60	60
600	40	30	50	20	50	12	17	30	50	30	50	65	50	60	60

Characteristic curve

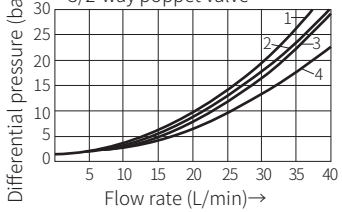
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

p-q_v- characteristic curve
2/2-way poppet valve



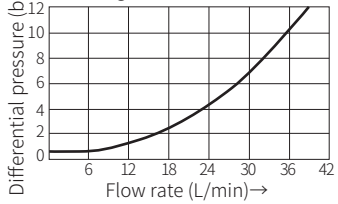
1 M - 3SEW10C..., P to A
2 M - 3SEW10C..., A to T

p-q_v- characteristic curve
3/2-way poppet valve

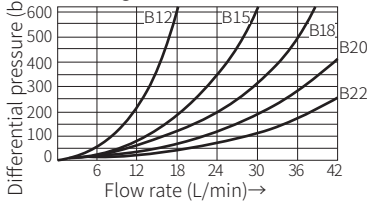


1 M - 4SEW10$^{D}_{Y}$..., A to T
2 M - 4SEW10$^{D}_{Y}$..., P to A
3 M - 4SEW10$^{D}_{Y}$..., P to B
4 M - 4SEW10$^{D}_{Y}$..., B to T

p-q_v- characteristic curve
Cartridge check valve



p-q_v- characteristic curve
Cartridge throttle



Characteristic limit

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

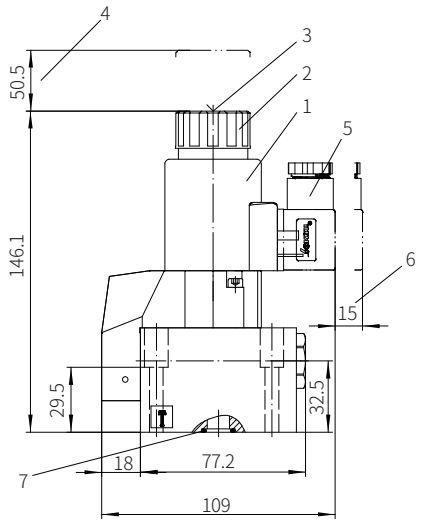
	Functional symbol	Comment	Working pressure bar P	A	B	T	Flow L/min
Three-way circuit	"U"	Oil port pressure P≥A≥T	420/630	420/630		100	40
	"C"		420/630	420/630		100	40
Two-way circuit (only for unloading function)	"U"	Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure A≥T		420/630		100	40
	"C"	Oil port pressure A≥T		420/630		100	40
Four-way circuit (flow only in the direction of the arrow)	"D"	Single poppet valve (symbol "U") with plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	40
	"Y"	Double poppet valve (symbol "C") with plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	40

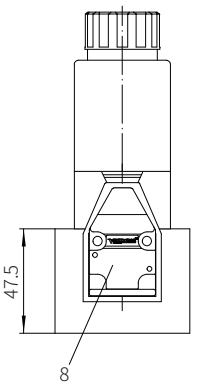
The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

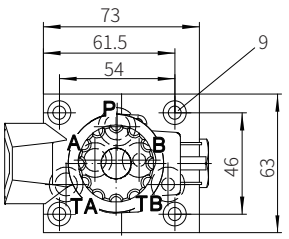
Component size

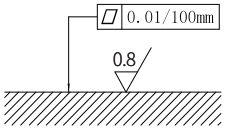
Size unit: mm

3/2-way poppet directional valve, 420 bar





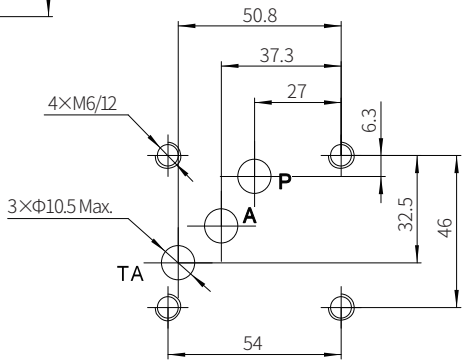




Required surface finishing of mating components

1 Solenoid
2 Solenoid nut
3 Hidden emergency button
4 Space required to remove nut
5 Plug
6 Space required to remove plug
7 O ring 12x2 (for oil port A, B, T)
O ring 14.2x1.78 (for oil port P)
8 Name plate
9 Valve connection hole

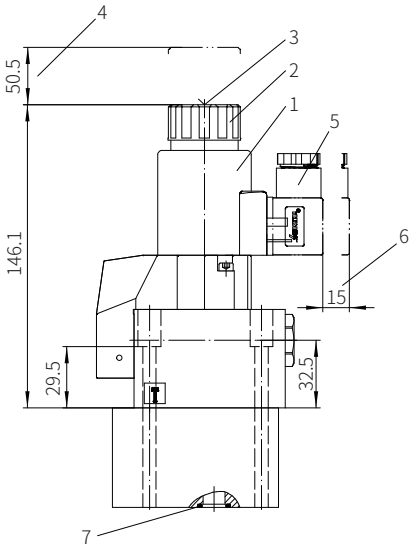
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

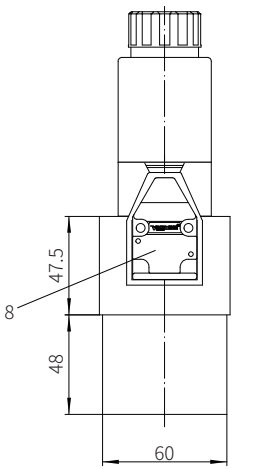


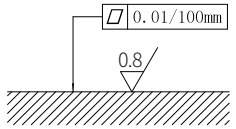
Component size

Size unit: mm

4/2-way poppet directional valve, 420 bar

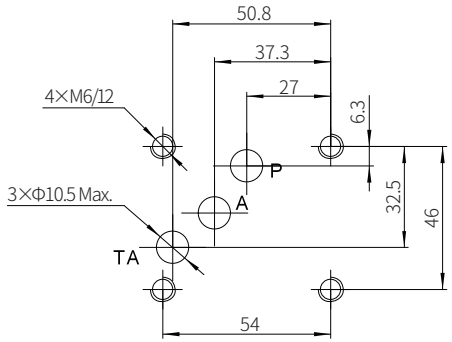






Required surface finishing of mating components

1 Solenoid
2 Solenoid nut
3 Hidden emergency button
4 Space required to remove nut
5 Plug
6 Space required to remove plug
7 O ring 12x2 (for oil port A, B, T)
O ring 14.2x1.78 (for oil port P)
8 Name plate
9 Valve connection hole

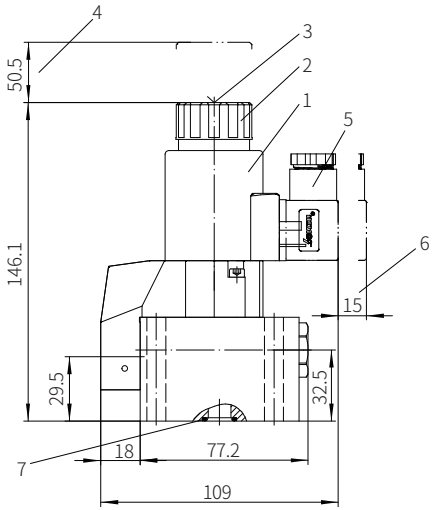


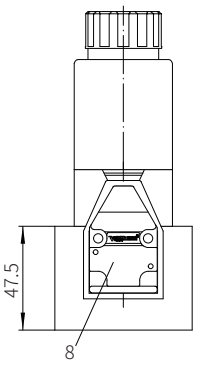
Valve fixing screw
M6x90-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

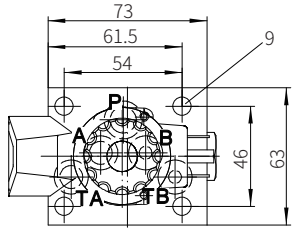
Component size

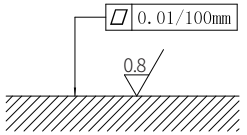
Size unit: mm

3/2-way poppet directional valve, 630 bar



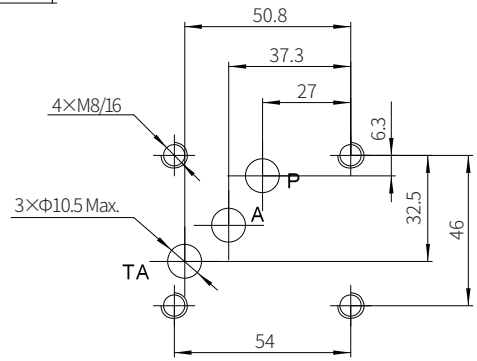






Required surface finishing of mating components

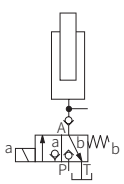
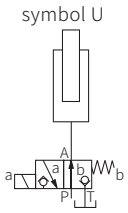
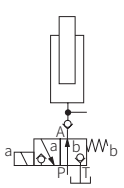
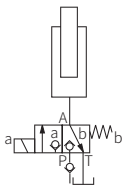
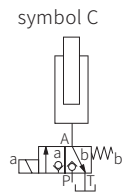
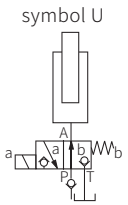
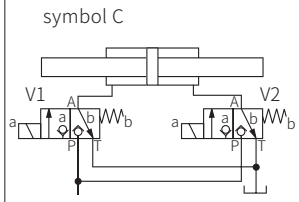
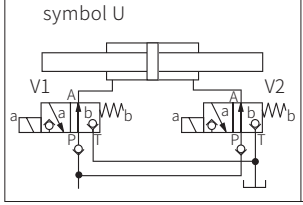
1 Solenoid
2 Solenoid nut
3 Hidden emergency operation
4 Space required to remove nut
5 Plug
6 Space required to remove plug
7 O ring 12x2 (for oil port A, B, T)
O ring 14.2x1.78 (for oil port P)
8 Name plate
9 Valve connection hole



Valve fixing screw
M8x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

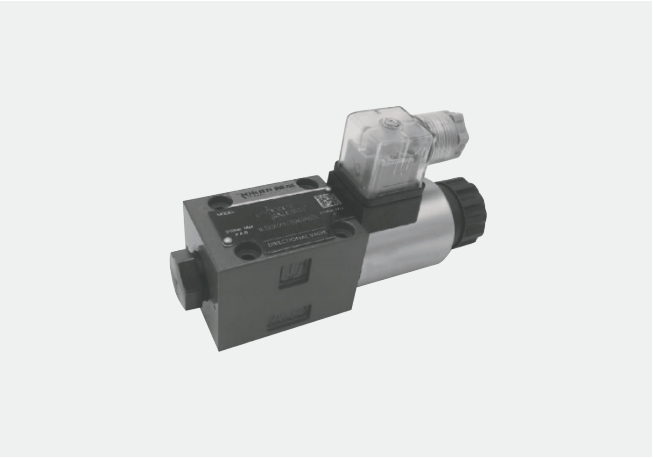
Application examples

These examples only indicate some applications of the poppet valve but not include all functions

symbol C 	2/2-way circuit with two poppet valves and check valve at port A The check valve must be installed on the pipeline. Initial position: The flow is blocked and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The fluid flows freely and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to T during the switching process.	symbol U 	3/2-way circuit with a single poppet valve Initial position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P. Switching position: Descending
symbol U 	2/2-way circuit with a single poppet valve and check valve at port A The check valve must be installed on the pipeline. Initial position: The fluid flows freely and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The flow is blocked and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	symbol C 	3/2-way circuit with two poppet valves and cartridge check valve at port P The check valve is installed at port P of the 3/2-way poppet valve. Initial position: Descending Switching position: Lifting The load can be held in any position when the pump is turned off and the solenoid is energized.
symbol C 	3/2-way circuit with two poppet valves Initial position: Descending Switching position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P.	symbol U 	3/2-way circuit with a single poppet valve and cartridge check valve at port P The check valve is installed at port P of the 3/2-way poppet valve. Initial position: Lifting The load can be held in any position when the pump is turned off. Switching position: Descending
symbol C 	4/3-way (4/4-way) circuit with two poppet valves V1 and V2 in the initial position: Both ends of the cylinder are connected to the oil tank port. V2 in switching position: the piston moves to the left. V1 in switching position: the piston moves to the right. V1 and V2 in switching position: Both ends of the cylinder are connected to the pump port. The fast movement is possible when a single rod cylinder with an area ratio of 2:1 is used. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!		
symbol U 	4/3-way (4/4-way) circuit with two poppet valves and cartridge check valve at port P of the 3/2-way poppet valve V1 and V2 in the initial position: the piston is locked externally to prevent oil flow. V2 in switching position: the piston moves to the right. V1 in switching position: the piston moves to the left. V1 and V2 in switching position: both ends of the cylinder are connected with the oil tank port. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!		

Solenoid Operated Poppet Valve

Model: M-SED6...1XJ



- ◆ Size 6
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 25 L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Characteristic limit	07
Component size	08-11
Application examples	12

Features

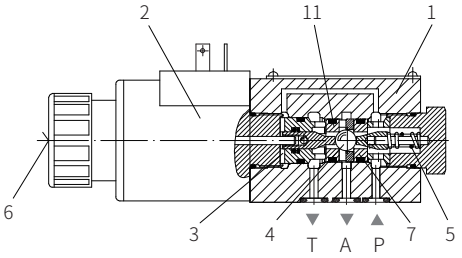
- ● Direct operated solenoid directional poppet valve
- ● Closed port without leakage
- ● Switching flexibility even in high-pressure state long periods
- ● Wet-pin DC solenoid with detachable coil (AC voltage available via rectifier)
- ● The coil can be rotated by 90°
- ● Replace the coil without opening the pressure chamber
- ● Individual electrical connection

Function description, sectional view

General:
The M-SED6 directional valve is solenoid operated directional poppet valve, it is used to control the opening, closing, and flow direction of oil.
The valve mainly consists of the valve body (1), solenoid (2) and closing element (4). The manual emergency operation (6) can control the valve when the solenoid is not energized.

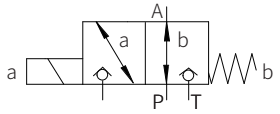
01

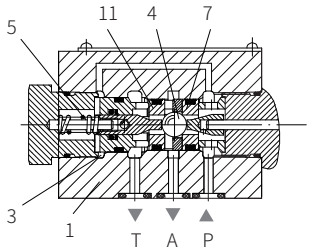
Basic functions:
The initial position of the valve is determined by the setting of the spring (5). When the power is cut off, the "UK"type valve is opened, while the "CK" type valve is closed. The valve chamber (3) behind the closing element (4) is connected to the port P and sealed against the port T. Therefore, the valve is in a pressure balanced state related to the operating force (solenoid and the spring).
Due to the special closing element (4), the valve can work when the working pressure of ports P, A, and T up to 350bar, and flow in both directions (see symbols)!
In the initial position, the closing element (4) is pressed onto the valve seat (11) by the spring (5), and in the switching position, the solenoid (2) pushes it towards the valve seat (7). That results in a leak-free seal.



Model M-3SED6UK...1XJ/

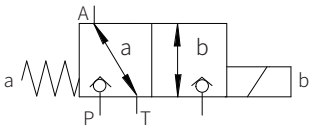
Symbol“UK”





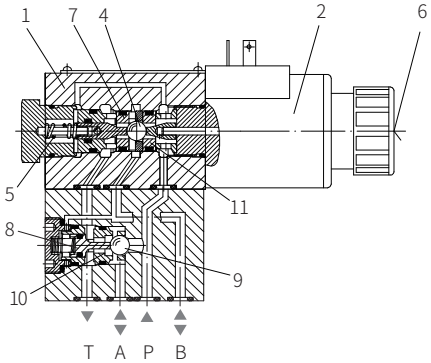
Model M-3SED6CK...1XJ/

Symbol“CK”



Function description, sectional view

To install a sandwich plate, the plus-1 plate under the 3/2-way directional poppet valve, then it can be used as a 4/2-way directional poppet valve.
Function of plus-1 plate:
Initial position:
The main valve does not work. The spring (5) holds the closing member (4) on the valve seat (11). The port P is closed, and port A is connected to port T. In addition, there is a control line over a large area from A to the control piston (8), which unloads to the tank. The pressure oil provided by the oil port P pushes the ball (9) to the valve seat (10), then P is connected to B and A to T.

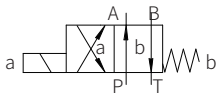


Model M-4SED6Y...1XJ/

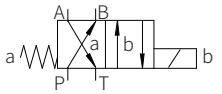
Transition position:
When the main valve is operated, the closing element (4) overcomes the force of the spring (5) and presses on the valve seat (7). Therefore, the oil port T is closed, the ports P, A and B are connected to each other within a short time.
Switching position:
The port P is connected to A. The pressure oil from the pump acts on the large area of the control piston (8) through A, and the ball (9) is pushed to the valve seat (12). Therefore, B is connected to T and P to A.
The ball (9) in the plus-1 plate has a "positive cover switching function". In order to avoid a sudden increase of the pressure when using the single rod cylinder, the annular area of the cylinder must be connected to A.
Because of the using of the plus -1 plate and the different arrangement of the valve seat, the following situations may occur.

01

Symbol“D”:

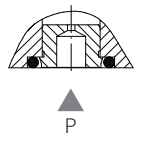


Symbol“Y”:



Cartridge throttle

Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required.
Example:
-Accumulator operation
-Used as a pilot valve with internal pilot oil supply

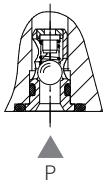


3/2-way poppet valve
The throttle is inserted into the port P of the directional valve.
4/2-way poppet valve
The throttle is inserted into the oil port P of the plus-1 plate.

Cartridge check valve

The cartridge check valve allows free flow from P to A and leak-free closure from A to P.

3/2-way poppet valve
The cartridge check valve is inserted into the oil port P of the directional valve.

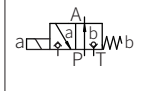
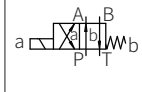
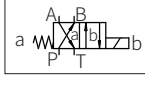


4/2-way poppet valve
The cartridge check valve is inserted into port P of the plus-1 plate.

Models and specifications

M - SED 6 - 1X J / 350 C K4 / *

3 way =3
4 way =4
poppet valve
size 6 =6

Working port	3	4	
functional symbols			
	●	–	= UK
	●	–	= CK
	–	●	= D
	–	●	= Y
● = Available			

10 to 19 series =1X
(10 to 19 series installation and connection size unchanged)

Rekith =J

Working pressure to 350bar =350

wet-pin solenoid with detachable coil =C

24VDC =G24
205VDC =G205[2)]

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code = without cartridge throttle and cartridge check valve
P= with cartridge check valve
B12= throttle Ø1.2mm
B15= throttle Ø1.5mm
B18= throttle Ø1.8mm
B20= throttle Ø2.0mm
B22= throttle Ø2.2mm

electrical connection
K4= no insert plug
Z5L= large right angle lamp plug

N9= with hidden manual emergency operation
No code= no manual emergency operation

2) When using AC power supply to DC solenoid, the voltage must be rectified by a rectifier (see table)
A large angle plug with integrated rectifier can be used for individual connection.

Technical parameters

Overview				
Installation position			Optional	
Environment temperature range		°C	-30 to +50 (NBR seal)	
			-20 to +50 (FKM seal)	
Weight	3/2-way valve	kg	1.5	
	4/2-way valve	kg	2.3	
Hydraulic				
Maximum working pressure		bar	See characteristic limit	
Maximum flow		L/min	25	
Oil fluid			Mineral oil (HL, HLP)[1)] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1)]; HEPG(Polyethyleneglycol)[2)] ; HEES (Synthetic Fats)[2]	
Oil temperature range			-30 to +80 (NBR seal)	
			-20 to +80 (FKM seal)	
Viscosity range		mm^2/s	2.8 to 500	
Cleanliness of oil[4)]			The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15	
Electrical				
Voltage type			DC	AC
Voltage available[3)]		V	24、205	Only available via rectifier
Allowable voltage tolerance		%	±10	
Power consumption		W	30	
Continuous power on time		%	100	
Switching time to ISO6403			See below table	
Switching frequency		times/hour	15000	
Protection type to DIN 40050			IP65 with plug installed and fixed	
Maximum coil temperature[5)]		°C	150	

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) Please inquire for special voltages
4) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Electrical protective conductor(PE ⏚) must be connected properly as rules

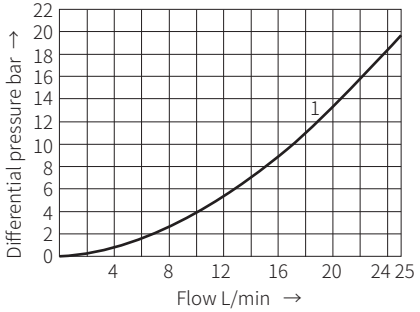
Switching time tms (Installation position: Solenoids installed horizontally)

pressure P bar	Flow q_V L/min	DC Solenoid						AC Solenoid+Rectifier					
		Function symbols UK, CK, D, Y						Function symbols UK, CK, D, Y					
		t_{on} No tank pressure				t_{off}		t_{on} No tank pressure				t_{off}	
		U	C	D	Y	U/C	D/Y	U	C	D	Y	U/C	D/Y
70	25	45	40	50	50	10	15	45	40	45	40	40	40
140	25	60	40	50	50	10	15	55	40	55	40	40	40
210	25	60	45	60	50	10	15	60	45	60	45	40	40
280	25	60	45	60	50	10	15	15	45	65	45	40	40
315	25	65	45	65	50	10	15	15	45	65	45	40	40
350	25	65	45	65	50	10	15	15	45	65	45	40	40

Characteristic curve

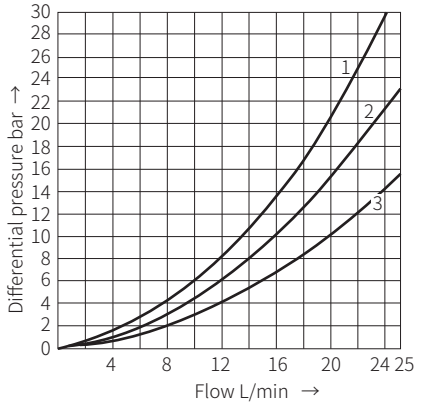
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_v- characteristic curve
3/2-way poppet directional valve



1 M - 3SED6 UK / CK ..., P to A and A to T

△p-q_v- characteristic curve
4/2-way poppet directional valve

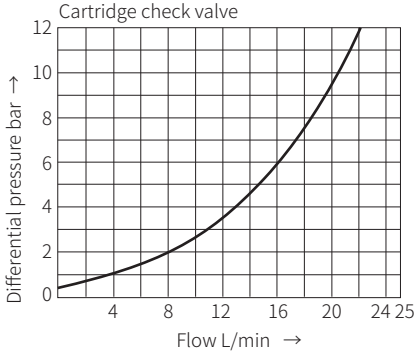


1 M - 4SED6 D / Y ..., A to T

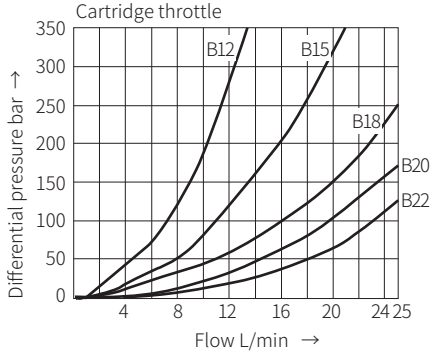
2 M - 4SED6 D / Y ..., P to A

3 M - 4SED6 D / Y ..., B to T, P to B

△p-q_v- characteristic curve
Cartridge check valve

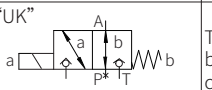
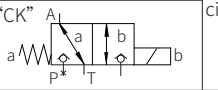
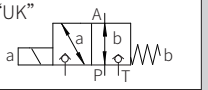
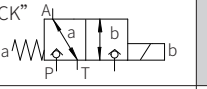
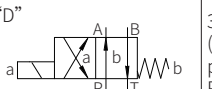
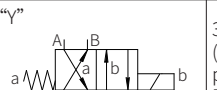


△p-q_v- characteristic curve
Cartridge throttle



Characteristic limit

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

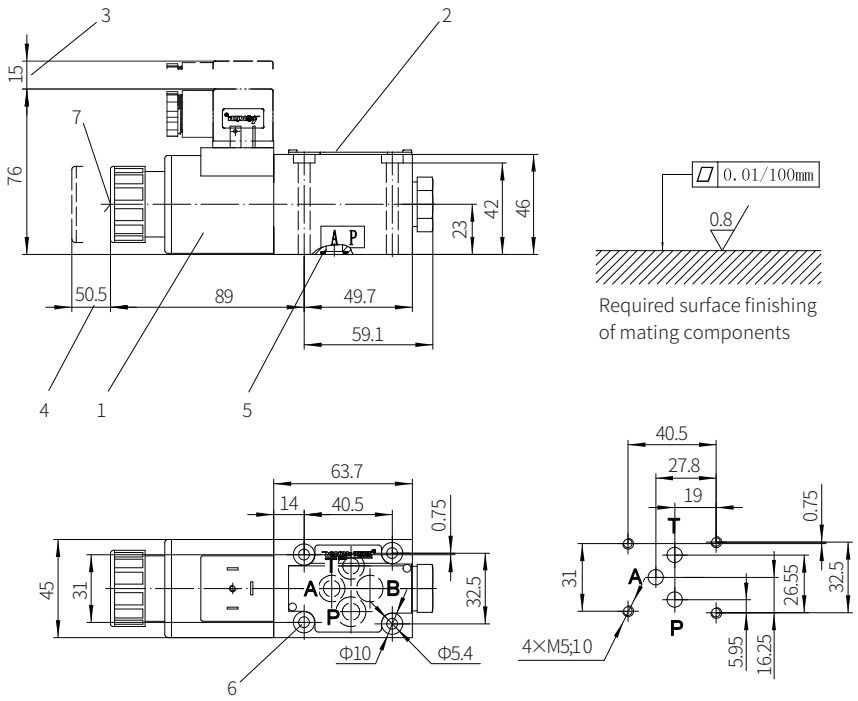
	Functional symbol	comment	Working pressure bar				Flow
			P	A	B	T	
Two-way circuit	"UK" 	The port P or T needs to be blocked by the customer when 2/2-way circuit used!	350	350		350	25
	"CK" 		350	350		350	25
Three-way circuit	"UK" 		350	350		350	25
	"CK" 		350	350		350	25
Four-way circuit (flow only in the direction of the arrow)	"D" 	3/2-way directional valve (model "UK") with plus-1 plate: P≥A≥B≥T	350	350	350	P/A/B-40	25
	"Y" 	3/2-way directional valve (model "CK") with plus-1 plate: P≥A≥B≥T	350	350	350	P/A/B-40	25

The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

Component size

Size unit: mm

3/2-way poppet directional valve, Model "UK"



1 Solenoid
2 Name plate
3 Space required to remove the plug
4 Space required to remove solenoid nut
5 O-ring 9.25x1.78 (for oil port P, A, B, T)
O-ring10x2(for oil port P)
6 Screw connection hole
7 Hidden emergency button

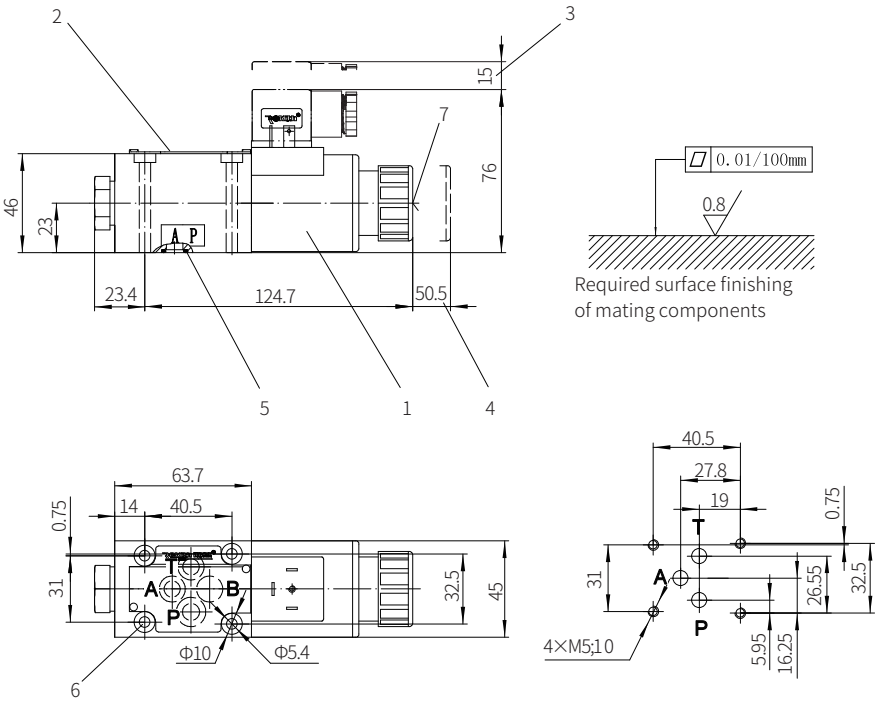
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14×1.5)
G342/01 (G3/8") ; G342/02 (M18×1.5)
G502/01 (G1/2") ; G502/02 (M22×1.5)

Component size

Size unit: mm

3/2-way poppet directional valve, Model "CK"



1 Solenoid
2 Name plate
3 Space required to remove the plug
4 Space required to remove solenoid nut
5 O-ring 9.25x1.78 (for oil port P, A, B, T)
O-ring10x2(for oil port P)
6 Screw connection hole
7 Hidden emergency button

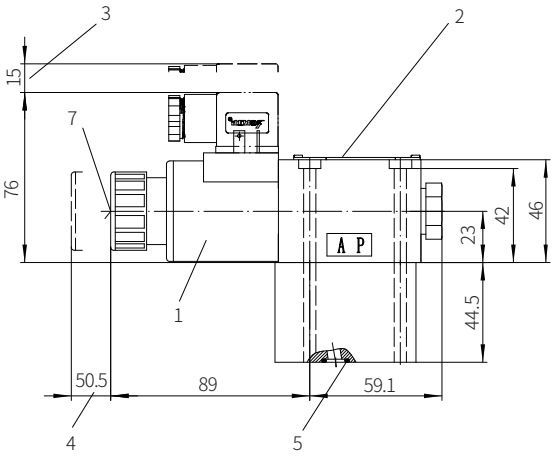
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

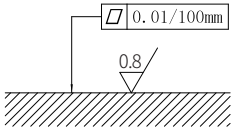
It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14×1.5)
G342/01 (G3/8") ; G342/02 (M18×1.5)
G502/01 (G1/2") ; G502/02 (M22×1.5)

Component size

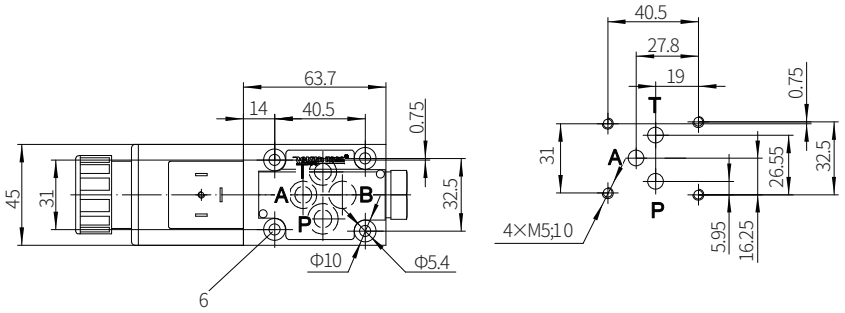
Size unit: mm

4/2-way poppet directional valve“D”





Required surface finishing of mating components



1 Solenoid
2 Name plate
3 Space required to remove the plug
4 Space required to remove solenoid nut
5 O-ring 9.25x1.78 (for oil port P, A, B, T)
O-ring10x2(for oil port P)
6 Screw connection hole
7 Hidden emergency button

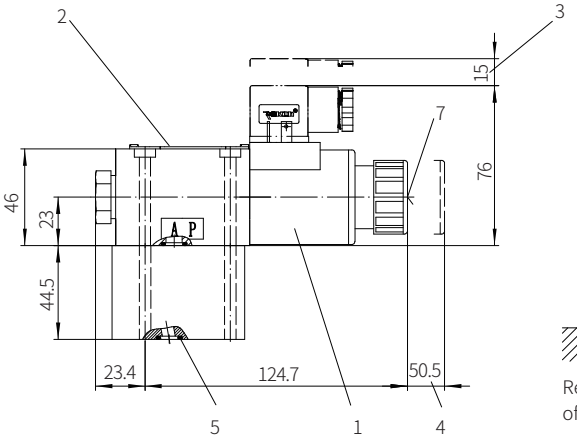
Valve fixing screw
M5x90-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

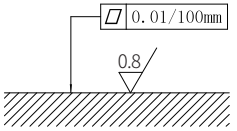
It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14×1.5)
G342/01 (G3/8") ; G342/02 (M18×1.5)
G502/01 (G1/2") ; G502/02 (M22×1.5)

Component size

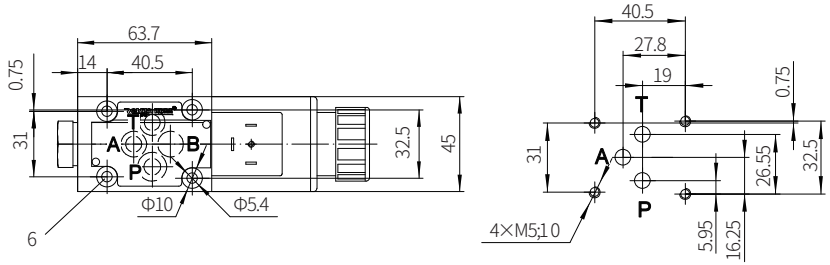
Size unit: mm

4/2-way poppet directional valve“Y”





Required surface finishing of mating components



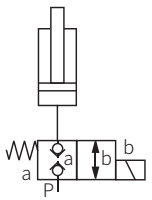
1 Solenoid
2 Name plate
3 Space required to remove the plug
4 Space required to remove solenoid nut
5 O-ring 9.25x1.78 (for oil port P, A, B, T)
O-ring10x2(for oil port P)
6 Screw connection hole
7 Hidden emergency button

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

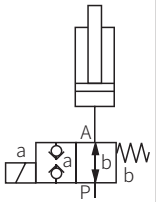
It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14×1.5)
G342/01 (G3/8") ; G342/02 (M18×1.5)
G502/01 (G1/2") ; G502/02 (M22×1.5)

Application examples

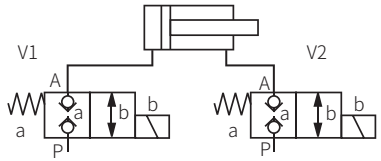
These examples only indicate some applications of the poppet valve but not include all functions.



2/2-way circuit
Initial position:
The flow is blocked and the pressure is held in the actuator even when the pump is turned off
Switching position:
The fluid flows freely and the maximum pressure is allowed.

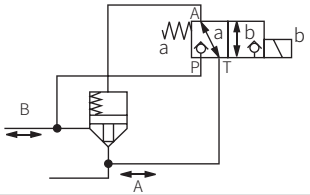


2/2-way circuit
Initial position: Lifting
The maintenance of position only depends on the stroke limit and the pressure at port P.
Switching position: Closed



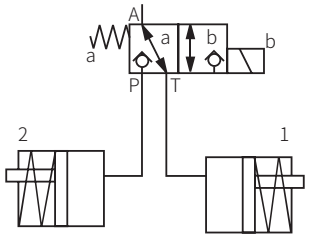
2/2-way circuit with two valves
Initial position:
The piston remains.
Switching position:
Move in both directions.
The direction of movement depends on drives V1 and V2

Symbol“CK”



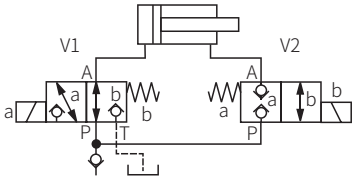
3/2-way circuit
Initial position:
Side A remains logically closed
Switching position:
Side B remains logically closed

Symbol“CK”



3/2-way circuit
Initial position :
Port P is closed, there is pressure at A and T, the piston of cylinder 1 moves to the right, and A is unloaded.
The piston of cylinder 1 moves to the left.
Switching position:
Port T is closed, there is pressure at A and P.
The piston of cylinder 2 moves to the left, and A is unloaded.
The piston of cylinder 2 moves to the right.

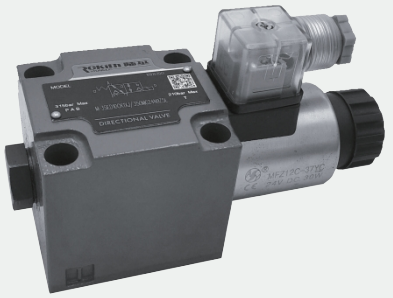
Symbol“2/2”+“UK”



4/2-way circuit with one 2/2-wayand one 3/2-way poppet valve
V1 and V2 in the initial position: the piston is blocked externally.
V1 and V2 in switching position: the piston moves to the right.
V1 in switching position and V2 in the initial position: the piston moves to the left.
Both ends of the cylinder are connected with the pump port.
Attention!
When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!

Solenoid Operated Poppet Valve

Model: M-SED10...1XJ



- ◆ Size10
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 40 L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Characteristic limit	07
Component size	08-11
Application examples	12

Features

- ● Direct operated solenoid directional poppet valve
- ● Closed port without leakage
- ● Switching flexibility even in high-pressure state long periods
- ● Wet-pin DC solenoid with detachable coil(AC voltage available via rectifier)
- ● The solenoid coil can be rotated 90°
- ● Individual electrical connection
- ●Replacing the coil without opening the pressure chamber

Function description, sectional drawing

3/2-way directional poppet valve

General:

The M-SED10 directional valve is solenoid operated directional poppet valve, it is used to control the opening, closing and direction of oil.

The valve mainly consists of the valve body (1), solenoid (2) and closing element (4).

The manual emergency operation (6) can control the valve when the solenoid is not energized.

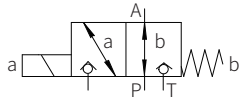
Basic functions:

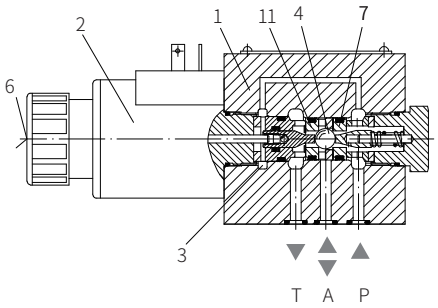
The initial position of the valve is determined by the setting of the spring (5). When the power is cut off, the "UK" type valve is opened, while the "CK" type valve is closed. The valve chamber (3) behind the closing element (4) is connected to the port P and sealed against the port T. Therefore, the valve is in a pressure balanced state related to the operating force (solenoid and spring).

Due to the special closing element (4), the valve can work when the working pressures of ports P, A and T up to 350bar, and the flow in both directions (see symbols)!

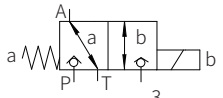
In the initial position, the closing element (4) is pressed onto the valve seat (11) by the spring (5), and in the switching position, the solenoid (2) pushes it towards the valve seat (7). That results in a leak-free seal.

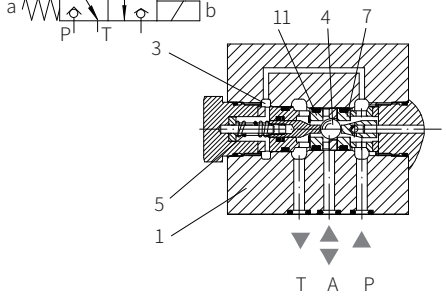
Symbol “UK”





Symbol “CK”





Function description, sectional drawing

4/2-way directional poppet valve

To install a sandwich plate, the plus-1 plate under the 3/2-way directional poppet valve, then it can be used as a 4/2-way directional poppet valve.

Function of plus-1 plate:

Initial position:

The main valve does not work. The spring (5) holds the closing element (4) on the valve seat (11). The port P is closed, and port A is connected to port T. In addition, there is a control line over a large area from A to the control piston (8), which unloads to the tank. The pressure oil provided by the the oil port P pushes the ball (9) to the valve seat (10), then P is connected to B and A to T.

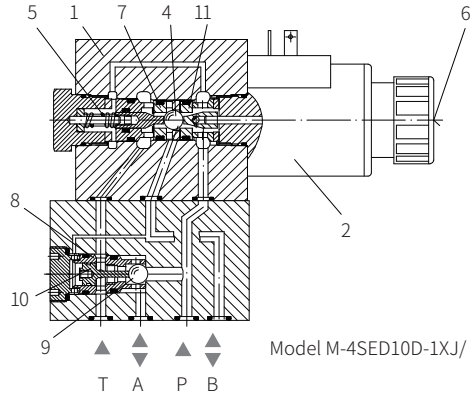
Transition position:

When the main valve is operated, the closing element (4) overcomes the force of the spring (5) and presses on the valve seat (7). Therefore, the oil port T is closed, the ports P, A and B are connected to each other within a short time.

Switching position:

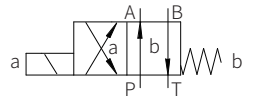
The port P is connected to A. The pressure oil from the pump acts on the large area of the control piston (8) through A, and the ball (9) is pushed to the valve seat (12). Therefore, B is connected to T and P to A. The ball (9) in the plus-1 plate has a "positive covering switching function". In order to avoid a sudden increase in pressure when using a single rod cylinder, the annular area of the cylinder must be connected to A.

Because of the using of the plus-1 plate and the different arrangement of the valve seat, the following situations may occur.

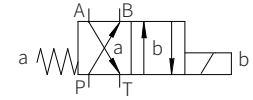


Model M-4SED10D-1XJ/

Symbol “D”:



Symbol “Y”:



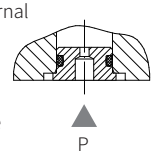
Cartridge throttle

Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required.

Example:

-Accumulator operation

-Used as a pilot valve with internal pilot oil supply



3/2-way poppet valve

The throttle is inserted into the port P of the directional valve.

4/2-way poppet valve

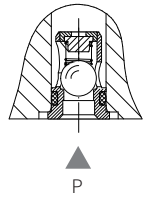
The throttle is inserted into the oil port P of the plus-1 plate.

Cartridge check valve

The cartridge check valve allows free flow from P to A and leak-free closure from A to P.

3/2-way poppet valve

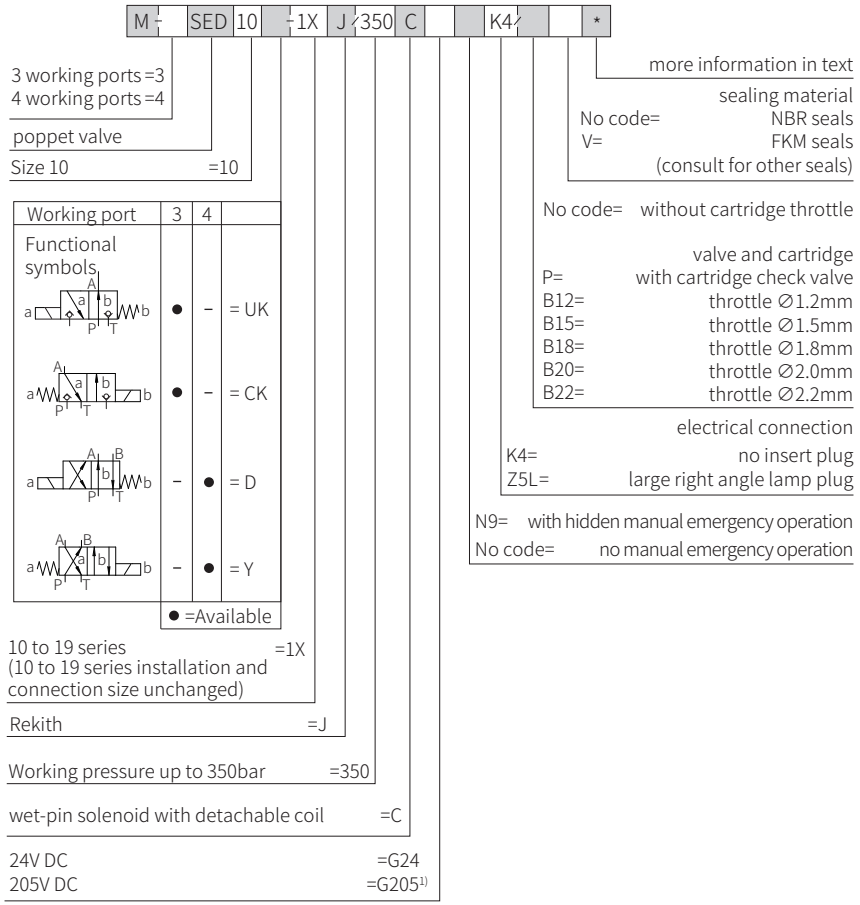
The cartridge check valve is inserted into the oil port P of the directional valve.



4/2-way poppet valve

The cartridge check valve is inserted into port P of the plus-1 plate.

Models and specifications



1)When using AC power supply to DC solenoid, the voltage must be rectified by a rectifier.

Technical parameters

Overview				
Installation position			Optional	
Environmental temperature range		°C	-30 to +50 (NBR seal)	
			-20 to +50 (FKM seal)	
Weight	3/2-way valve	kg	2.6	
	4/2-way valve	kg	3.9	
Hydraulic				
Maximum working pressure		bar	See characteristic limit	
Maximum flow		L/min	40	
Hydraulic oil			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]	
Oil temperature range		°C	-30 to +80 (NBR seal)	
			-20 to +80 (FKM seal)	
Viscosity range		mm^2/s	2.8 to 500	
Cleanliness of oil[4]			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15	
Electrical				
Voltage type			DC	AC
Available voltage[3]		V	24、205	Only available via rectifier
Allowable voltage tolerance (nominal voltage)		%	±10	
Power consumption		W	30	
Continuous power on time			Continuous	
Switching time according to IS06403			See table below	
Switching frequency		times/hour	15000	
Protection type according to DIN 40050			IP65 with plug installed and fixed	
Maximum coil temperature		°C	150	

1) Suitable for NBR seal and FKM seal
2) Only suitable for FKM seals
3) Please inquire for special voltages

4) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Switching time tms (installation position: solenoid installed horizontally)

Electrical protective conductor (PE ⏚) must be connected properly as rules

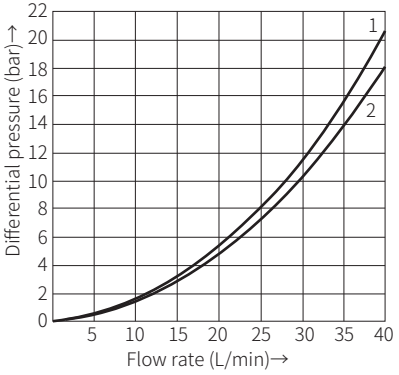
Pressure P bar	Flow q_v L/min	DC Solenoid						AC Solenoid + Rectifier					
		Functional symbols UK, CK, D, Y						Functional symbols UK, CK, D, Y					
		t_{on} No tank pressure				t_{off}		t_{on} No tank pressure				t_{off}	
		UK	CK	D	Y	UK/CK	D/Y	UK	CK	D	Y	UK/CK	D/Y
70	40	40	30	40	35	10	10	35	30	40	35	40	40
140	40	40	30	40	35	10	10	40	30	40	35	40	40
210	40	45	35	45	35	10	10	45	35	45	35	40	40
280	40	45	35	45	35	10	10	45	35	45	35	40	40
315	40	50	35	50	35	10	10	50	40	50	40	40	40
350	40	50	45	50	45	10	10	50	45	50	45	40	40

Note: Switching time is related to flow direction P to A and A to T. There may be bias in reverse flow.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

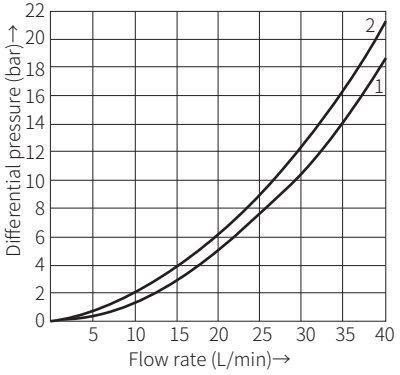
△p-q_V-characteristic curve
3/2-way poppet directional valve



1 M-3SED 10 CK ...,PtoA

2 M-3SED 10 UK CK ...,AtoT

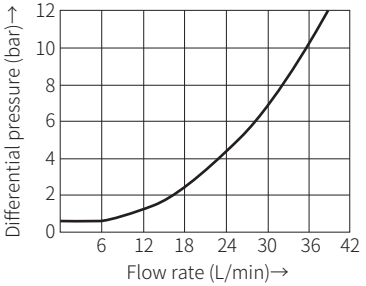
△p-q_V-characteristic curve
4/2-way poppet directional valve



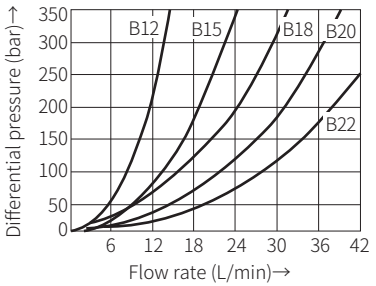
1 M-4SED 10 D Y ...,PtoB,AtoT

2 M-4SED 10 D Y ...,BtoT,PtoA

△p-q_V-characteristic curve
Cartridge check valve

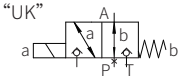
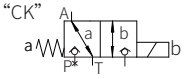
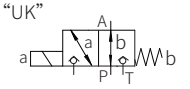
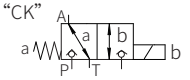
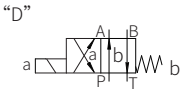
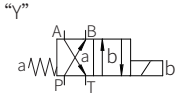


△p-q_V-characteristic curve
Cartridge throttle



Characteristic limit

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

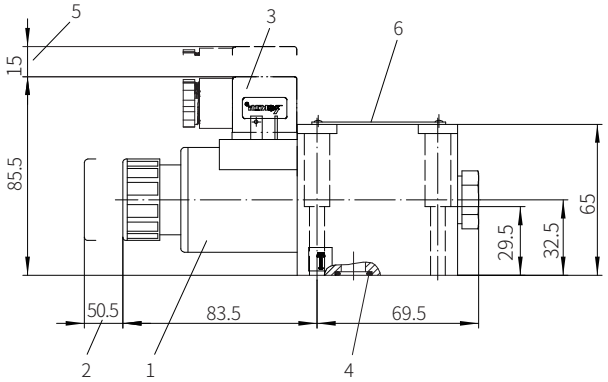
	Functional symbol	comment	Working pressure bar				Flow
			P	A	B	T	
Two-way circuit	"UK" 	The port P or T needs to be blocked by the customer when 2/2-way circuit used!	350	350		350	40
	"CK" 		350	350		350	40
Three-way circuit	"UK" 		350	350		350	40
	"CK" 		350	350		350	40
Four-way circuit flow only in the direction of the arrow	"D" 	3/2-way directional valve (symbol "UK") with plus-1 plate P≥A≥B≥T	350	350	350	P/A/B-40	40
	"Y" 	3/2-way directional valve (symbol "CK") with plus-1 plate P≥A≥B≥T	350	350	350	P/A/B-40	40

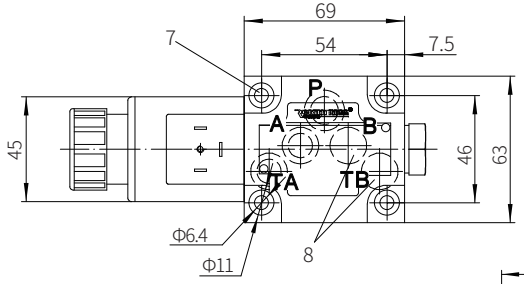
Notice!
The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

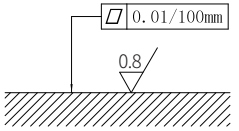
Component size

Size unit: mm

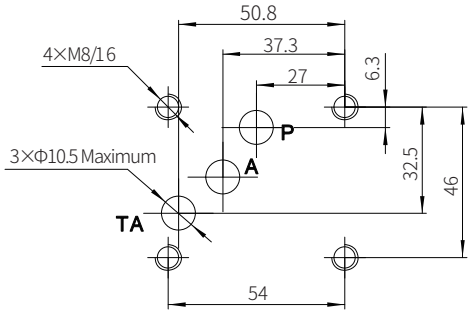
3/2-way poppet directional valve “UK”







Required surface finishing of mating components



1 Solenoid
2 Space required to remove nut
3 plug
4 O ring 12x2 (for oil ports A, B, T)
O ring 14x1.78 (for oil port P)
5 Space required to remove plug
6 Name plate
7 Screw fixing holes
8 B and TB are blind holes

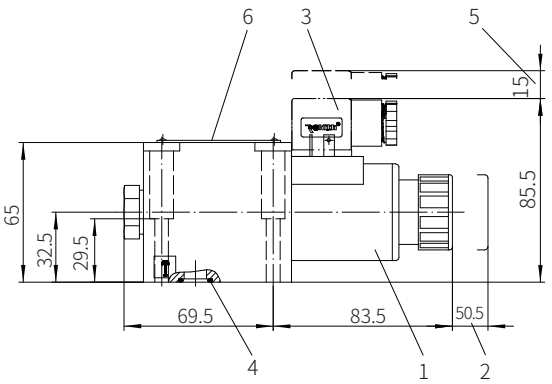
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

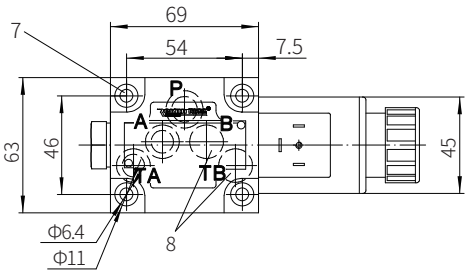
It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)

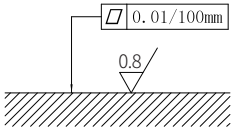
Component size

Size unit: mm

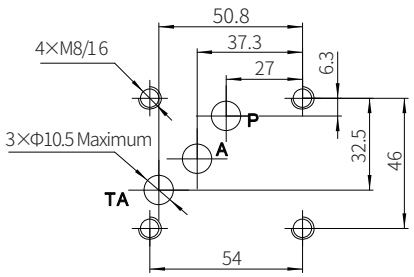
3/2-way poppet directional valve“CK”







Required surface finishing of mating components



1 Solenoid
2 Space required to remove nut
3 plug
4 O ring 12x2 (for oil ports A, B, T)
O ring 14x1.78 (for oil port P)
5 Space required to remove plug
6 Name plate
7 Screw fixing holes
8 B and TB are blind holes

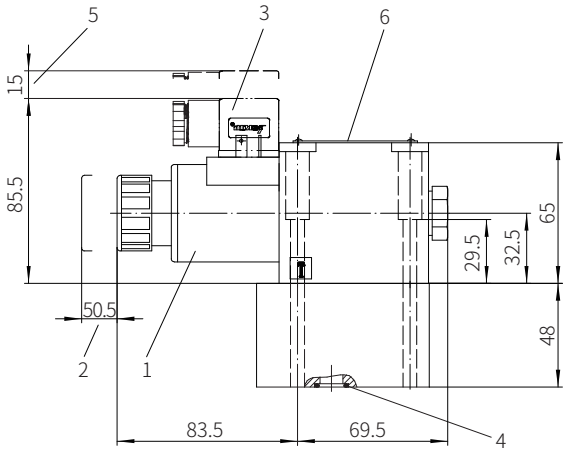
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

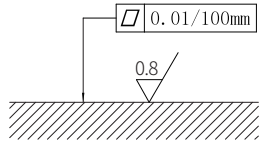
It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)

Component size

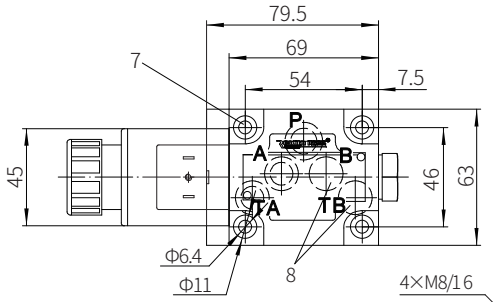
Size unit: mm

4/2-way poppet directional valve“D”



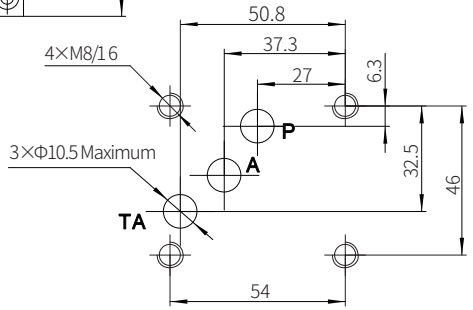


Required surface finishing of mating components



1 Solenoid
2 Space required to remove nut
3 plug
4 O ring 12x2 (for oil ports A, B, T)
O ring 14x1.78 (for oil port P)
5 Space required to remove plug
6 Name plate
7 Screw fixing holes
8 B and TB are blind holes

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

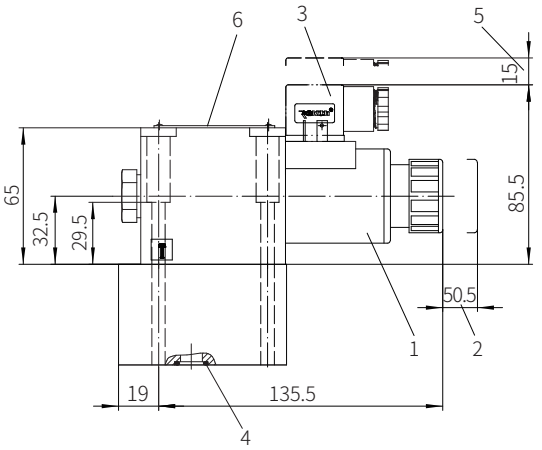


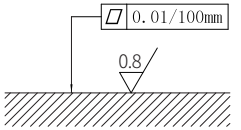
It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)

Component size

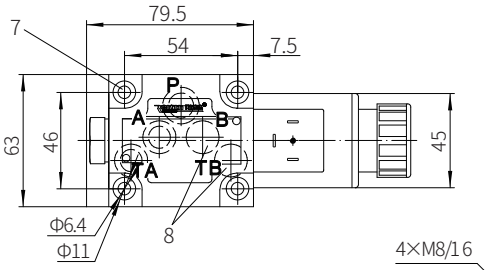
Size unit: mm

4/2-way poppet directional valve“Y”



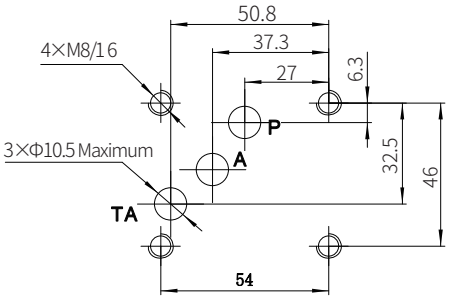


Required surface finishing of mating components



1 Solenoid
2 Space required to remove nut
3 plug
4 O ring 12x2 (for oil ports A, B, T)
O ring 14x1.78 (for oil port P)
5 Space required to remove plug
6 Name plate
7 Screw fixing holes
8 B and TB are blind holes

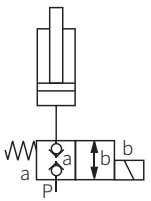
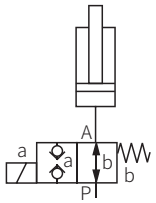
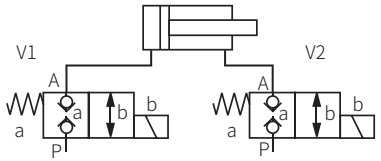
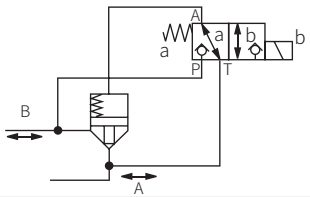
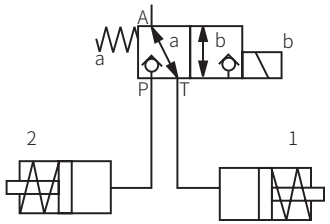
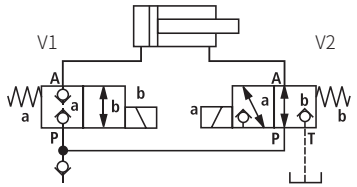
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm



It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)

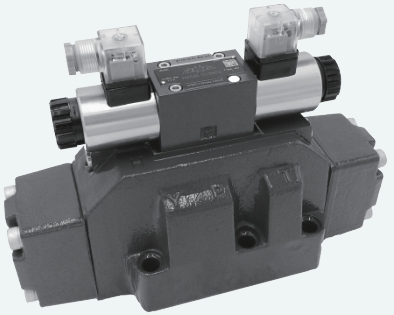
Application examples

These examples only indicate some applications of the poppet valve but not include all functions.

	2/2-way circuit Initial position: The flow is blocked and the pressure is held in the actuator even when the pump is turned off. Switching position: The fluid flows freely and the maximum pressure is allowed.
	2/2-way circuit Initial position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P. Switching position: Closed.
	2/2-way circuit with two valves Initial position: The piston remains. Switching position: Move in both directions. The direction of movement depends on drives V1 and V2.
	3/2-way circuit Initial position: Side A remains logically closed Switching position: Side B remains logically closed
Symbol “CK” 	3/2-way circuit Initial position: Port P is closed, there is pressure at A and T. The piston of cylinder 1 moves to the right, and A is unloaded. The piston of cylinder 1 moves to the left. Switching position: Port T is closed, there is pressure at A and P. The piston of cylinder 2 moves to the left, and A is unloaded. The piston of cylinder 2 moves to the right.
Symbol “2/2”+“UK” 	4/2-way circuit with one 2/2-way and one 3/2-way poppet valve V1 and V2 in the initial position: the piston is blocked external. V1 and V2 in switching position: the piston moves to the right. V1 in switching position and V2 in the initial position: the piston moves to the left. Both ends of the cylinder are connected with the pump port. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!

Hydraulic or Electro-hydraulic Directional Valve

Model: WEH/WH...5XJ



- ◆ Size 10～32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 1100 L/min

Contents

Function description, sectional drawing	02 - 04
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Characteristic limit	11-13
Switching time adjustment, pressure reducing valve and pre-load valve	14
Component size	15-20

Features

- ● Mainly used to control the opening, closing and direction of liquid flow
- ● Electro-hydraulic operation (WEH)
- ● Hydraulic operation (WH)
- ● Subplate mounting

The mounting surface according to DIN24340 form A and ISO4401

- ● Spring or hydraulic centered

Spring or hydraulic return to initial position

- ● Wet-pin DC or AC solenoid

Optional manual emergency operation

- ● Individual or central electrical connection
- ● Optional switching time adjustment
- ● Optional pre-load valve in port P of the main valve
- ● Auxiliary component, optional

-Stroke adjustment of main spool
-Stroke adjustment or end position sensor
-Inductive or mechanical limit switch (proximity type) of the main spool

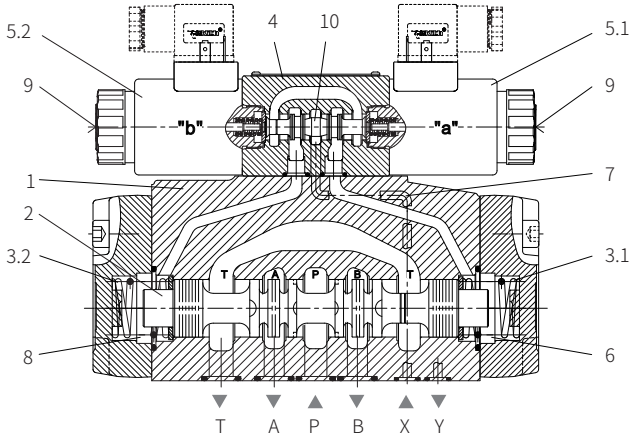
Function description, sectional drawing

Directional valve model WEH

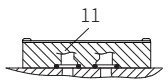
The WEH directional valve is a directional spool valve with electro-hydraulic operation. It is used to control the opening, closing and direction of the liquid flow.
The valve mainly consists of valve body (1), main control spool (2), main valve with one or two reset springs (3.1) and (3.2), pilot valve (4) with one or two solenoids "a" (5.1) and "b" (5.2).
The main control spool is held in the neutral or initial position by the springs or pressure. For the valve with spring-centered, the two spring chambers (6) and (8) are connected to the oil tank through the pilot valve in the initial position. The pilot valve (4) is supplied with oil through the control line (7). The control oil can be supplied internally or externally (externally via port X).
The main control spool (2) is hydraulically operated by the pilot valve (4). Due to the operating of the pilot valve on one end of the main control spool, the spool moves to the operation position, then the valve opens in the operation direction and the fluid flows from P to A and B to T or P to B and A to T. The control oil can be drained internally or externally. An optional manual emergency operation (9) can move the control spool (10) in the pilot valve (4) when the solenoid is not energized.

Directional valve model WH

The WH directional valve is a hydraulically operated directional spool valve. It is used to control the opening, closing and direction of liquid flow.
The valve mainly consists of valve body (1), main control spool (2), one or two reset springs (3.1) and (3.2) with spring centered or spring return functions, and control cover (11).
The main control spool is operated by hydraulic directly. The spool is held in the neutral or initial position by springs or hydraulic pressure. The control oil is supplied and drained externally.
For the 4/3-way valve with spool spring centered, the main control spool (2) is held in the neutral position by two centered springs. The two spring chambers (6, 8) are connected to the oil ports X and Y through the control cover (11). When one end of the main control spool (2) is pressurized, the spool moves to the working position, thereby connecting the corresponding oil circuit.



Directional valve model 4WEH.

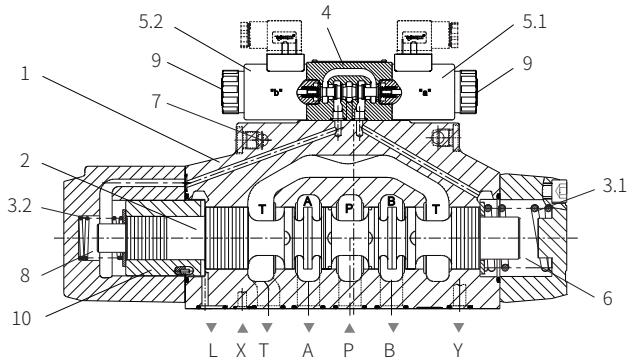


Model 4WH...

Function description, sectional drawing

4/3-way directional valve with hydraulic centered of main valve, model WEH..H/

In this structure, the pressure oil acts on both end surfaces of the main control spool (2). The centering sleeve (10) locates the main control spool (2) and keeps it in the middle position.
If one end of the main control spool (2) is unloaded, the main control spool (2) moves to the working position under the pressure from the other end, thereby changing the direction of the oil flow. The unloaded control spool face displaces the returning pilot oil into port Y externally through the pilot valve (4). The oil is drained internal from port L to the tank directly.



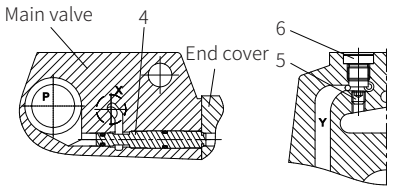
Structural diagram of electro-hydraulic directional valve with hydraulic centered

1 Main valve
2 Main control spool
3.1 Spring
3.2 Spring
4 Pilot solenoid valve
5.1 Solenoid A
5.2 Solenoid B
6 Spring chamber
7 Control oil inlet channel
8 Spring chamber
9 Manual operation
10 Centering sleeve

● **Model WEH16**

◆ Internal supply and drain:
The small end of pin (4) on the top of the main valve is installed toward to the end cover without plug (5).

◆ External supply and drain:
The large end of pin (4) on the top of the main valve is installed toward to end cover with plug (5).



structure diagram of model WEH16...5XJ/ supply and drain

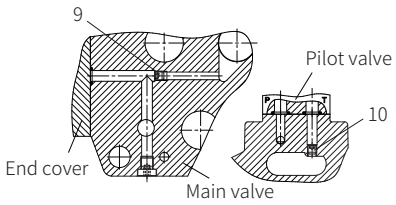
Function description, sectional drawing

Pilot oil supply

● **Model WEH25**

◆ Conversion between internal supply and external supply:
The channel P on the top of the main valve with M6 screw (9) is external supply, and is internal supply when M6 screw (9) dismounted.

◆ Conversion between internal drain and external drain:
The channel T on the top of the main valve with M6 screw (10) is external drain, and is internal drain when M6 screw (10) dismounted.

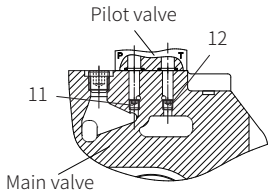


structure diagram of model WEH25... supply and drain

● **Model WEH32**

◆ Conversion between internal supply and external supply:
The channel P on the top of the main valve with M6 screw (11) is external supply and is internal supply when M6 screw (11) dismounted.

◆ Conversion between internal drain and external drain:
The channel T on the top of the main valve with M6 screw (12) is external drain and is internal drain when M6 screw (12) dismounted.



structure diagram of model WEH32... supply and drain

Models and specifications

4 J / / *

working pressure to 35MPa =no code
four-way version =4
operation type
electro-hydraulic =WEH
hydraulic control =WH
size
size 16 =16
size 25 =25
size 32 =32
main valve hydraulic return or centered =H
main valve spring return or centered =No code
functional symbols (see functional symbol diagram)
50 to 59 series =5X
Rekith =J
when the pilot valve is a 2-position valve with two solenoids and hydraulic return in the main valve
without reset spring =O
without reset spring with detent =OF
pilot valve with wet-pin solenoid with threaded connection =6E
DC voltage 24V =G24
AC voltage 220V, 50Hz/60Hz
for other voltages and frequencies, see directional valve WE6 =W220

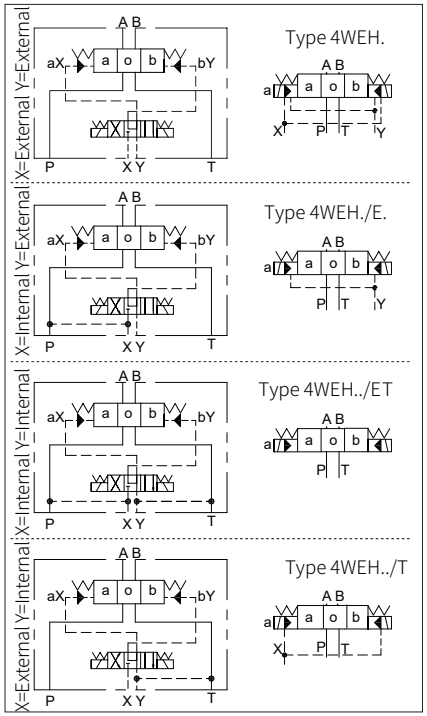
1) For internal oil supply
*Minimum control pressure: see page 231
*To avoid impermissible maximum force peaks, a throttle (B10) must be installed in port P of the pilot valve
2) Only in conjunction with throttle "B10"

more information in text
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)
No code= without pressure reducing valve
D3= with pressure reducing valve
pre-load valve
No code= without pre-load valve
P4.5= with pre-load valve, cracking pressure 0.45MPa
No code= no plug-in throttle
B08= throttle ∅0.8mm
B10= throttle ∅1.0mm
B12= throttle ∅1.2mm
B15= throttle ∅1.5mm
additional device number (see additional device drawing)
electrical connection
K4= no insert plug
No code= without switching time adjustment
S= switching time adjustment as meter-in control
S2=switching time adjustment as meter-out control
pilot oil supply
No code= pilot oil supply and drain external
E= pilot oil supply internal and drain external
ET[1)]= pilot oil supply and drain internal
T= pilot oil supply external and drain internal
(for model 4WH...only available as "no code")
(the 3-position valve with hydraulic centered in ET and T types must meet: P pilot ⩾ 2xP tank + P pilot min)
No code = without manual emergency operation
N9= with hidden manual emergency operation

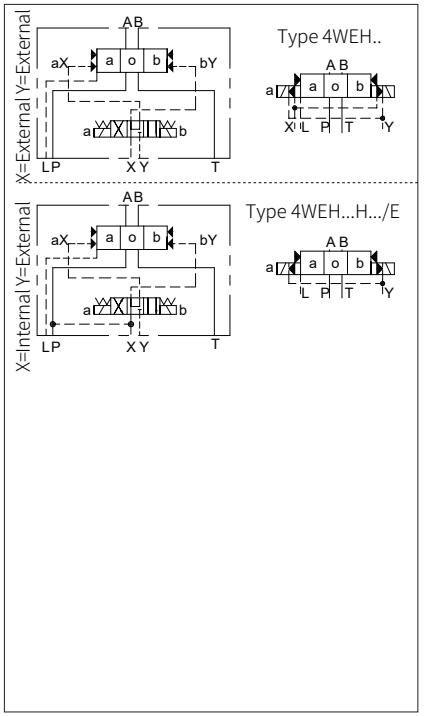
Functional symbols

Detailed and simplified symbols for 3-position directional valves

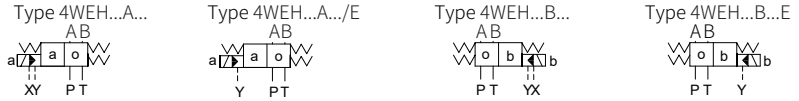
Spring centered



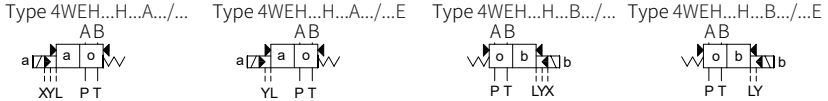
Hydraulic centered



Spring return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Hydraulic return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Functional symbols

Functional symbols of 3-position valves

3-position valve

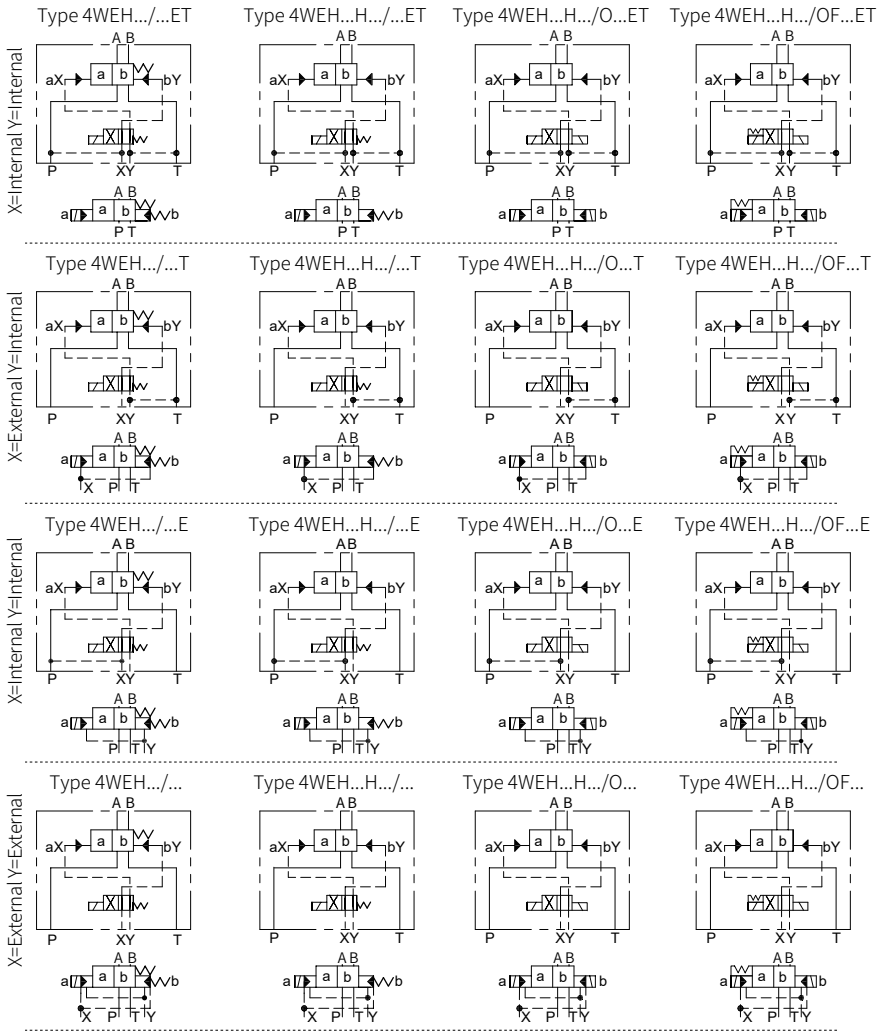
3-position valve model	Functional symbol	Transition function
4WEH...E.../... E		
4WEH...F.../... F		
4WEH...G.../... G		
4WEH...H.../... H		
4WEH...J.../... J		
4WEH...L.../... L		
4WEH...M.../...M		
4WEH...P.../... P		
4WEH...Q.../... Q		
4WEH...R.../... R		
4WEH...S.../... S		
4WEH...T.../... T		
4WEH...U.../... U		
4WEH...V.../... V		
4WEH...W.../...W		

2-position valve derived from 3-position valve

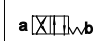
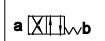
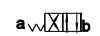
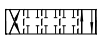
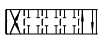
2-position valve model	Functional symbol (Solenoid at end A)	2-position valve model	Functional symbol (Solenoid at end B)
4WEH...EA.../...		4WEH...EB.../...	
4WEH...FA.../...		4WEH...FB.../...	
4WEH...GA.../...		4WEH...GB.../...	
4WEH...HA.../...		4WEH...HB.../...	
4WEH...JA.../...		4WEH...JB.../...	
4WEH...LA.../...		4WEH...LB.../...	
4WEH...MA.../...		4WEH...MB.../...	
4WEH...PA.../...		4WEH...PB.../...	
4WEH...QA.../...		4WEH...QB.../...	
4WEH...RA.../...		4WEH...RB.../...	
4WEH...SA.../...		4WEH...SB.../...	
4WEH...TA.../...		4WEH...TB.../...	
4WEH...UA.../...		4WEH...UB.../...	
4WEH...VA.../...		4WEH...VB.../...	
4WEH...WA.../...		4WEH...WB.../...	

Functional symbols

Detailed and simplified symbols for 2-position directional valves



Function symbols of 2-position valves

Spool valve function:	C	D	K	Z	Y
Spool valve function symbol:					
Transition function:					

Technical parameters

Size			16	25	32
Maximum working pressure					
Oil ports P, A, B		(MPa)	35	35	35
Oil port T	External Y port pilot oil drain	(MPa)	25	25	25
	Internal Y port pilot oil drain	(MPa)	21 DC		
		(MPa)	16 AC		
Oil port Y External pilot oil drain	-DC solenoid	(MPa)	21 DC		
	-AC solenoid	(MPa)	16 AC		
	For 4WH type	(MPa)	25（size 16、25、32）		
Maximum pilot pressure (For high pilot pressure, a pressure reducing valve is required)		(MPa)	25（size 16、25、32）		
Minimum pilot pressure -Pilot oil supply X external -Pilot oil supply X internal (Not for spool C, F, G, H, P, T, V, Z, S[2])			H-4W...		
	Spring centered 3-position valve	(MPa)	1.4	1.3	0.85
	Pressure centered 3-position valve	(MPa)	1.4	1.8	0.85
	Spring centered 2-position valve	(MPa)	1.4	1.3	1.0
	Pressure centered 2-position valve	(MPa)	1.4	0.8	0.5
Pilot oil supply X internal (for spool C, F, G, H, P, T, V, Z, S[2])			0.45[4]	0.45[4]	0.45[4]

1)In a 3-position valve, pressure centered only possible if:
Ppilot ⩾ 2xPtank + Ppilot min.

2) Spool S only for size 16.

3) For the spools C, F, G, H, P, T, V, Z, the internal pilot oil supply is only possible if the flow from P to T in the central position (for 3-position valve) or when the valve moves through the central position (for 2-position valve) is large enough to ensure the pressure differential as 0.65MPa from P to T.

4) For the spools C, F, G. H, P, T, V. Z. S-via the pre-load valve or correspondingly large flow.

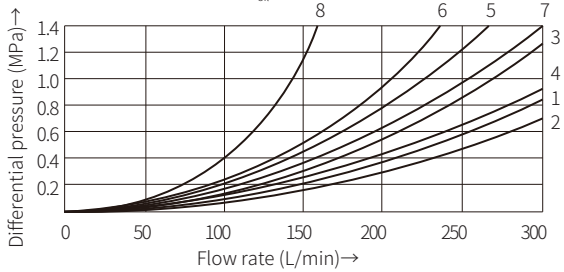
Hydraulic oil			Mineral hydraulic oil or phosphate ester hydraulic oil					
Temperature range		(°C)	-30 to +80 (NBR seal) -20~+ +80 (FKM seal)					
Viscosity range		(mm²/s)	2.8 to 500					
Cleanliness of oil			The maximum allowable pollution level of oil is NAS1638 Class 9, so we recommend a fitter with the minimum filtration accuracy β10⩾75					
Pilot oil volume during switching process								
3-position valve spring centered		(cm³)	5.72		14.2		29.4	
2-position valve		(cm³)	11.45		28.4		58.8	
3-position valve hydraulic centered		(cm³)	WH	WEH	WH	WEH	WH	WEH
from neutral position to position "a"		(cm³)	2.83	2.83	7.15	7.15	14.4	14.4
From position "a" to neutral position		(cm³)	5.72	5.72	14.18	7.0	29.4	15.1
From neutral position to position "b"		(cm³)	5.72	5.72	14.18	14.15	29.4	29.4
from position "b" to neutral position		(cm³)	8.55	8.55	19.88	5.73	43.8	14.4
Pilot oil flow for shortest switching time		(L/min)	about 35		about 35		about 45	
Weight	Valve with one solenoid	(kg)	about 8.5		about 17.6		about 40.5	
	Valve with two solenoid, spring centered	(kg)	about 8.9		about 18.0		about 41.0	
	Valve with two solenoid, hydraulic centered	(kg)	about 8.9		about 19.0		about 41.0	
	Valve with hydraulic control	(kg)	about 7.3		about 16.5		about 39.5	
	Switching time adjustment	(kg)	about 0.8					
	Pressure reducing valve	(kg)	about 0.4					
Installation position			Optional, except for the hydraulic return valve C, D, K, Z, Y installed horizontal					

Technical parameters

Switching time (refers to the time from the solenoid closing to the main valve fully opening.)																	
Size 16	Switching time for valve from neutral position to operating position (for DC (⎓) and AC (~) operation)																
	at pilot pressure	(MPa)	~7⎓				~15⎓				~25⎓						
	3-position valve-spring centered	(ms)	25...30		40		25...30		40		25...30		40				
	2-position valve	(ms)	30...35		55		30...35		55		30...35		55				
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b			
		(ms)	30	30	40	40	30	30	40	40	30	30	35	40			
	Switching time for valve from operating position to static position																
	3-position valve	(ms)	20 to 35 for ~; 30 for ⎓														
	2-position valve	(ms)	30...50		45		30...50		45		30...50		45				
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b			
		(ms)	20...35		20		20...55		20		20...35		20				
Size 25	Switching time for valve from neutral position to operating position (for DC (⎓) and AC (~) operation)																
	at pilot pressure	(MPa)	~7⎓				~14⎓				~21⎓				~25⎓		
	3-position valve-spring centered	(ms)	50		85		40		75		35		70		30		65
	2-position valve	(ms)	120		160		100		130		85		120		70		105
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	20	35	55	65	30	35	55	65	25	30	50	60	25	30	50	60
	Switching time for valve from operating position to static position																
	3-position valve	(ms)	40 to 55 for ~; 40 for ⎓														
	2-position valve	(ms)	120		125		85		100		85		90		75		80
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	30...50		30	35	30...50		30	35	30...50		30	35	30...50		30	35
Size 32	Switching time for valve from neutral position to operating position (for DC (⎓) and AC (~) operation)																
	at pilot pressure	(MPa)	~5⎓				~15⎓				~25⎓						
	3-position valve-spring centered	(ms)	65		80		50		90		35		105				
	2-position valve	(ms)	100		130		75		100		60		115				
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b			
		(ms)	55	35	100	105	40	45	85	95	35	40	85	95			
	Switching time for valve from operating position to static position																
	3-position valve	(ms)	60 to 75 for ~; 50 for ⎓														
	2-position valve	(ms)	115...130		90		85...100		70		65...80		65				
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b			
		(ms)	30...65		30	40	60...90		30	40	105...155		50	50			

Characteristic curve

Model 4WEH16...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				
	P-A	P-B	A-T	B-T	P-T
E、D、Y	1	1	1	3	-
F、P	2	2	3	3	-
G、T	5	1	3	7	6
H、C、Q、V、Z	2	2	3	3	-
J、K、L	1	1	3	3	-
M、W	2	2	4	3	-
R	2	2	4	-	-
U	1	1	4	7	-
S	4	4	4	-	8

Characteristic limit

Model 4WEH16...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						
Spool	Working pressure(MPa)					
	7	14	21	28	35	
Main valve spring return[1)]						
C、D、K、Z、Y	300	300	300	300	300	
Main valve spring return[2)]						
C	300	300	300	300	300	
D、Y	300	270	260	250	230	
K	300	250	240	230	210	
Z	300	260	190	180	160	
Main valve hydraulic return						
HC、HD、HK	300	300	300	300	300	
HZ、HY	300	300	300	300	300	

1)The given flow value can be achieved when the minimum pilot pressure of 1.2MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Allowable flow of 3-position valve (L/min)							
Spool	Working pressure(MPa)					with pre-load valve and X port internal supply	
	7	14	21	28	35		
Main valve spring return[1)]							
E、H、J、L、MQ、U、W、R	300	300	300	300	300		
F、P	300	250	180	170	150	Spools F, G, H P and S in general	
G、T	300	300	240	210	190		
S	300	300	300	250	220		
V	300	250	210	200	180		
Pressure centered (minimum pilot pressure 1.6MPa)						Spool approx. to 160L/min	
All spools	300	300	300	300	300		

Notice:

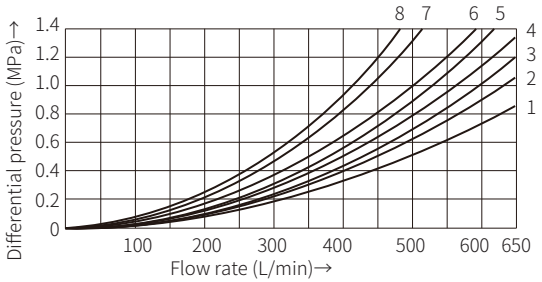
When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.6MPa is required.

The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

01

Characteristic curve

Model 4WEH25...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				Spool	Working position			
	P-A	P-B	A-T	B-T		P-A	P-B	A-T	B-T
E	1	1	1	3	P	4	1	1	5
F	1	4	3	3	Q	2	2	3	5
G	3	1	2	4	Z	1	1	1	-
H	4	4	3	4	U	2	1	1	6
J	2	2	3	5	V	4	4	3	6
L	2	2	3	3	W	1	1	1	3
M	4	4	1	4	T	3	1	2	4

Characteristic limit

Model 4WEH25...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	35	
Main valve spring return[1]						
C, D, K, Z, Y	700	700	700	700	700	
Main valve spring return[2]						
C	700	700	700	700	700	Spools C and Z approx. to 180 L/min
D, Y	700	650	400	350	300	
K	700	650	420	370	320	
Z	700	700	650	480	400	
Main valve hydraulic return						Spools HC and HZ approximately to 180L/min
HC、HD、HK	700	700	700	700	700	
HZ、HY	700	700	700	700	700	
HC.../O	700	700	700	700	700	
HD.../O	700	700	700	700	700	
HK.../O	700	700	700	700	700	
HZ.../O	700	700	700	700	700	
HC.../OF	700	700	700	700	700	
HD.../OF	700	700	700	700	700	
HK.../OF	700	700	700	700	700	
HZ.../OF	700	700	700	700	700	

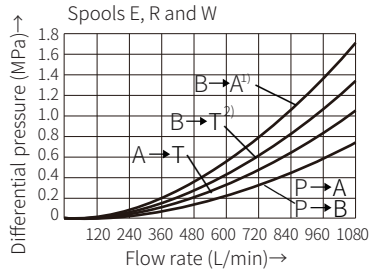
Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	35	
spring centered						
E、L、M Q、U、W	700	700	700	700	650	
G/T	400	400	400	400	400	
F	650	550	430	330	300	
H	700	650	550	400	360	
J	700	700	650	600	520	
P	650	550	430	330	300	Spools F, G, HP and T approximately to 180L/min
V	650	550	400	350	310	
R	700	700	700	650	680	
Pressure centered (minimum pilot pressure 1.8MPa)						
E/F/H/J	700	700	700	700	650	
L/M/P/Q	700	700	700	700	650	
R/U/V/W	700	700	700	700	650	
G/T	400	400	400	400	400	
When the pilot pressure higher than 3MPa						
G/T	700	700	700	700	700	

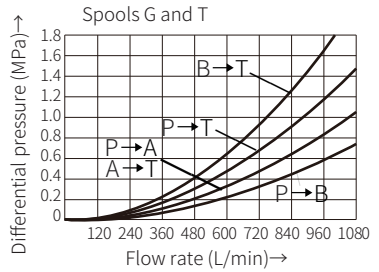
1)The given flow value can be achieved when the minimum pilot pressure of 1.3MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

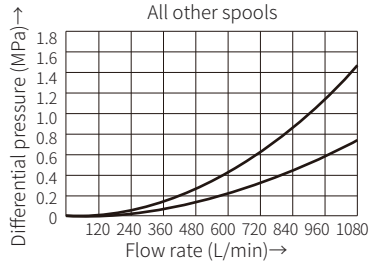
01

Characteristic curve

Model 4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)







1) Only for spool R
2) Not for spool R

Characteristic limit

Model 4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	25	
Main valve spring return[1]						
C、D、K、Z、Y	1100	1040	860	750	680	
Main valve spring return[2]						
C	1100	1040	860	800	700	Spool Z approx to 180L/min
D、Y	1100	1040	540	480	420	
K	1100	1040	860	500	450	
Z	1100	1040	860	750	650	
Main valve hydraulic return						Spool Z approx to 180L/min
HC、HD、HK	1100	1040	860	750	680	
HZ、HY	1100	1040	860	750	680	

Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	25	
Main valve spring return[1]						
E, H, J, L, M Q, U, W, R	1100	1040	860	750	680	
G, T, H, F, P	900	900	800	650	450	Spools F, G, H, P and T approximately to 180L/min
V	1100	1000	680	500	450	
Pressure centered (minimum pilot pressure 0.85MPa)						
All spools	1100	1040	860	750	680	

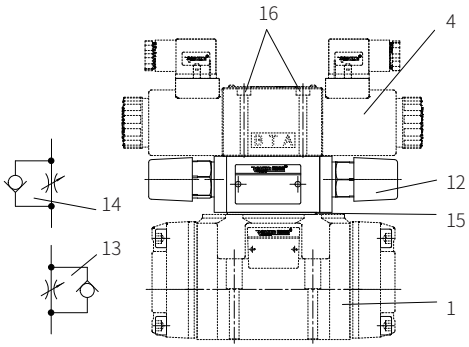
1)The given flow value can be achieved when the minimum pilot pressure of 1.0MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Notice:
When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.5MPa is required.
The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

Switching time adjustment, pressure reducing valve and pre-load valve

Switching time adjustment

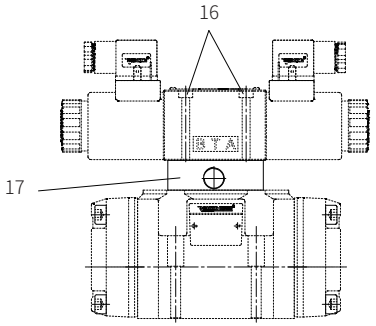
To control the switching time of the main valve (1), a double throttle check valve (12) is installed between the pilot valve and the main valve.
Conversion from meter-in control (13) to meter-out control (14):
Remove the pilot valve (4) but retain the O-ring support plate (15), turn the throttle check valve around its longitudinal axis and reassemble it on the mounting surface, install the pilot valve (4).
Tightening torque M_A=9Nm for fixing screw (16).



Model 4WEH.../S or S2

Pressure reducing valve "D3"

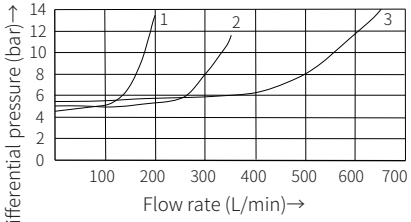
The pressure reducing valve (17) must be used If the pilot pressure exceeds 25MPa. The secondary pressure should be maintained at 4.5MPa. When using the pressure reducing valve D3, it must install a plug-in throttle B10 in port P of the pilot valve.
Tightening torque M_A=9Nm for fixing screw (16).



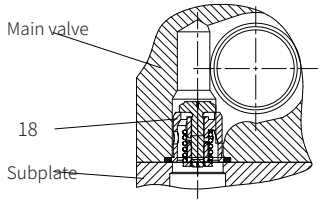
Model 4WEH.../.../D3

Pre-load valve

In the valve with pressureless bypass and internal pilot oil supply, a pre-load valve (18) is installed in port P of the main valve to built up the minimum pilot pressure.



1 Size 16
2 Size 25
3 Size 32

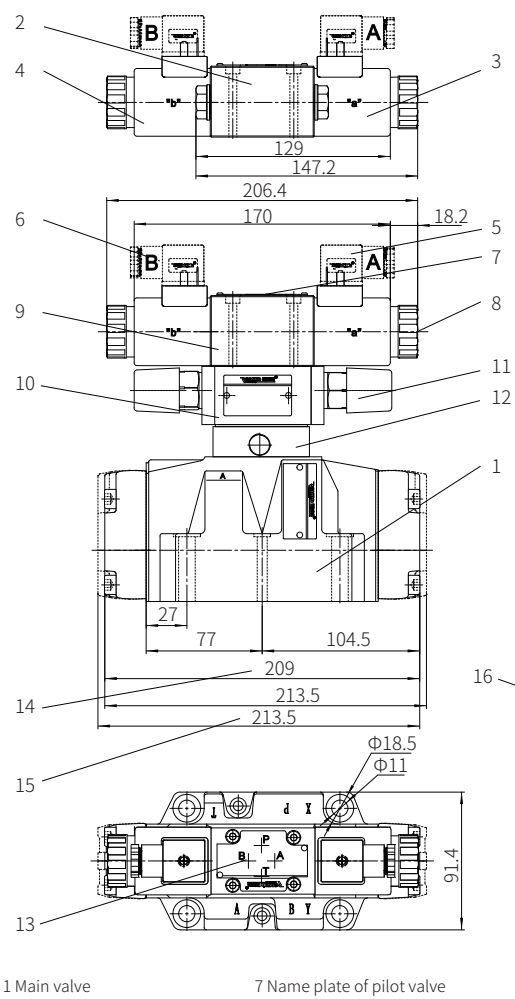


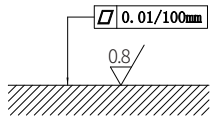
Model
4WEH16...-5X/.../P4.5
4WEH25.../.../P4.5
4WEH32.../.../P4.5

Component size

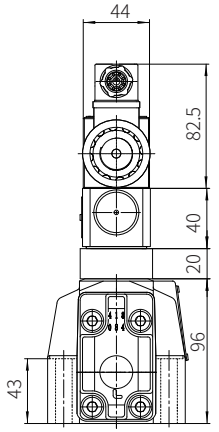
Size unit: mm

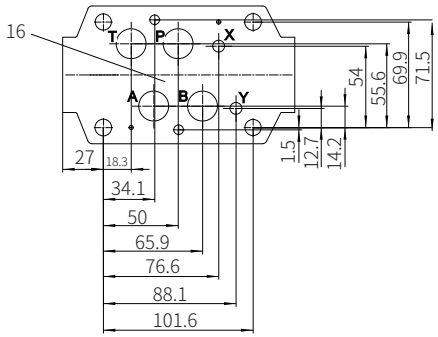
WEH16...5XJ/...





Required surface finishing of mating components





1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

Valve fixing screw
2-M6x55-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

4-M10x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

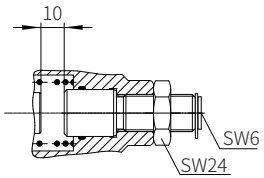
Component size

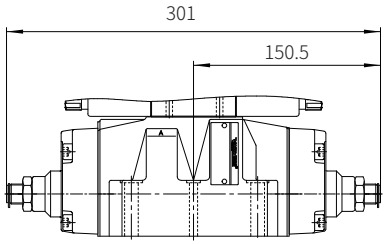
Size unit: mm

Dimension of additional devices for model WEH16

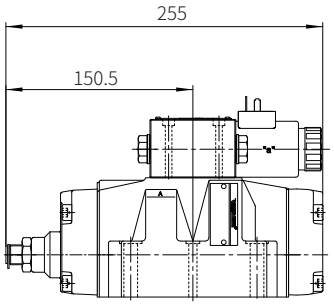
The installation range of the stroke adjustment is 10mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

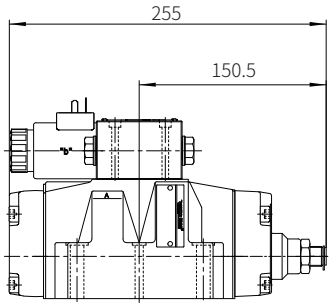




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)

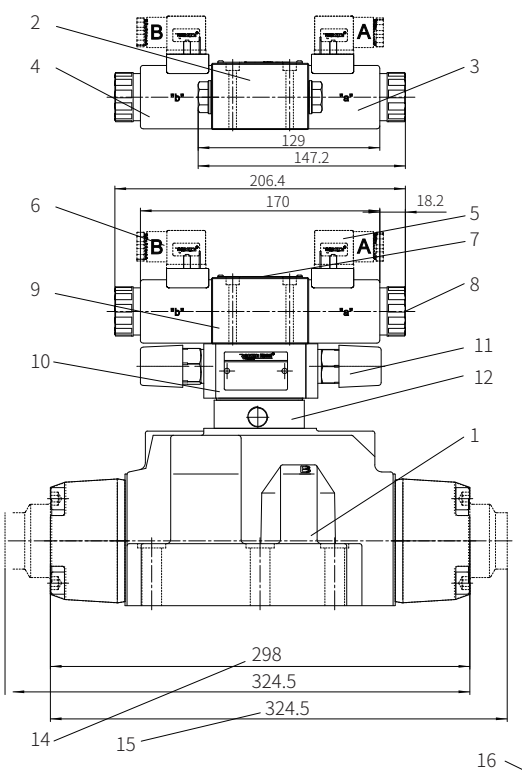


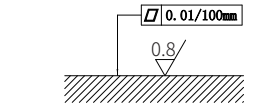
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

Component size

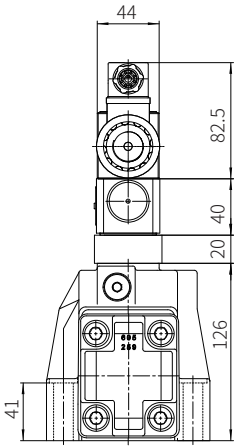
Size unit: mm

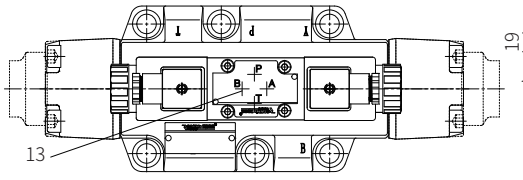
WEH25...5XJ/...

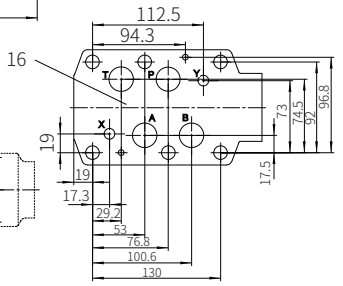




Required surface finishing of mating components







1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

Valve fixing screw
6-M12x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm

Component size

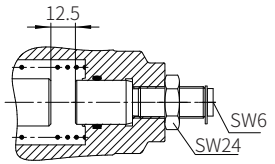
Size unit: mm

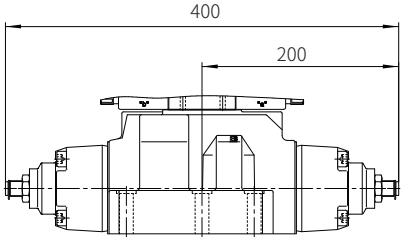
01

Dimension of additional devices for model WEH25

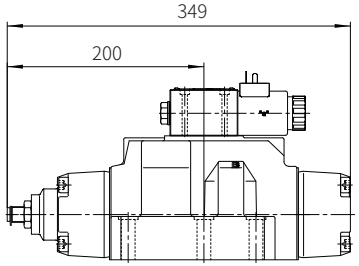
The installation range of the stroke adjustment is 12.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

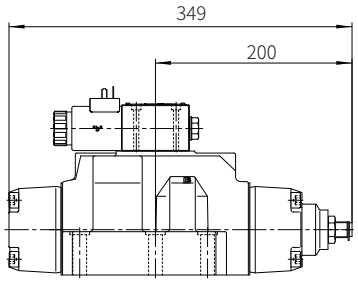




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



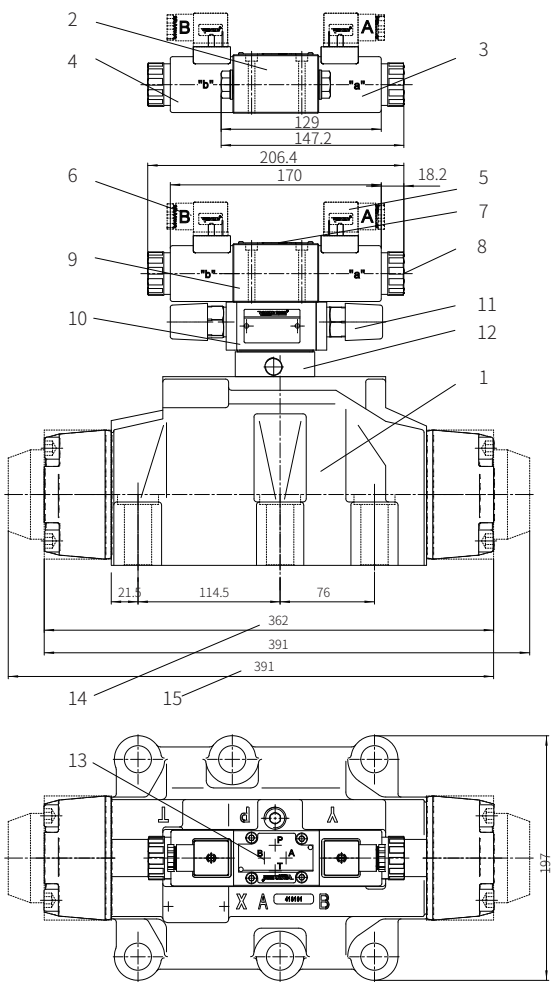
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

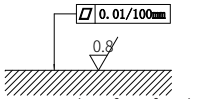
Component size

Size unit: mm

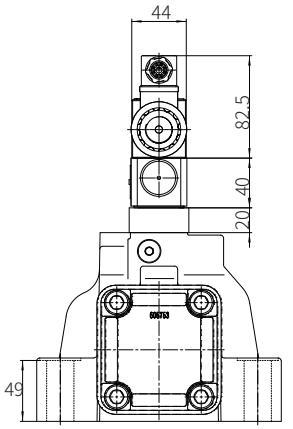
01

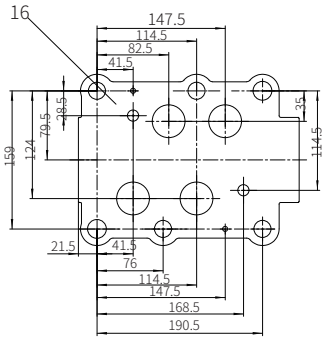
WEH32...5XJ/...





Required surface finishing of mating components





1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

Valve fixing screw
6-M20x80-10.9 grade GB/T70.1-2000
Tightening torque M_A=373Nm

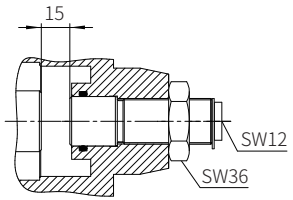
Component size

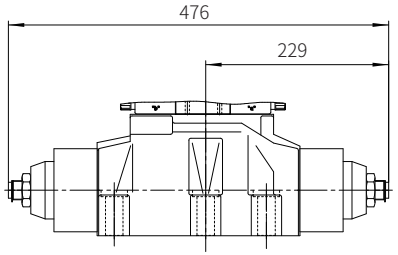
Size unit: mm

Dimension of additional devices for model WEH32

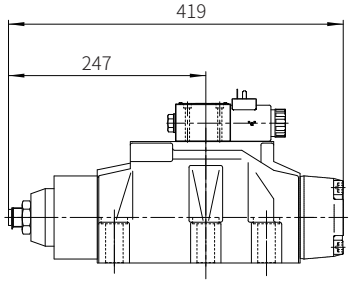
The installation range of the stroke adjustment is 15mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

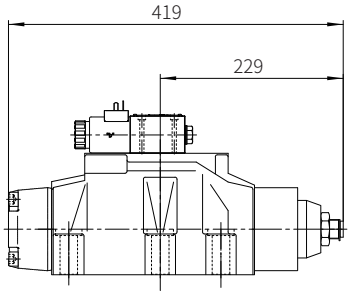




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



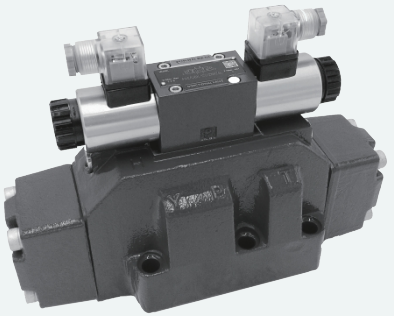
Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

Hydraulic or Electro-hydraulic Directional Valve

Model: WEH/WH...4X/6X/7XJ



- ◆ Size 10～32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 1100 L/min

Contents

Function description, sectional drawing	02 - 04
Models and specifications	05
Functional symbols	06-08
Technical parameters	09-10
Characteristic curve	11-15
Characteristic limit	11-15
Switching time adjustment, pressure reducing valve and pre-load valve	16
Component size	17-25

Features

- ● Mainly used to control the opening, closing and direction of liquid flow
- ● Electro-hydraulic operation (WEH)
- ● Hydraulic operation (WH)
- ● Subplate mounting
  The mounting surface according to DIN24340 form A and ISO4401
- ● Spring or hydraulic centered
  Spring or hydraulic return to initial position
- ● Wet-pin DC or AC solenoid
  Optional manual emergency operation
- ● Individual or central electrical connection
- ● Optional switching time adjustment
- ● Optional pre-load valve in port P of the main valve
- ● Auxiliary component, optional
  -Stroke adjustment of main spool
  -Stroke adjustment or end position sensor
  -Inductive or mechanical limit switch (proximity type) of the main spool

Function description, sectional drawing

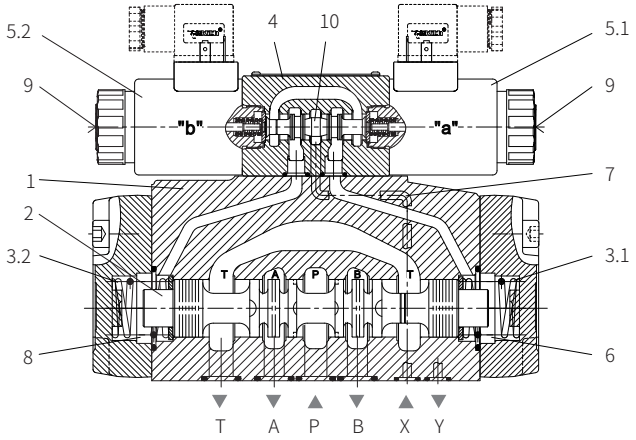
01

Directional valve model WEH

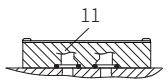
The WEH directional valve is a directional spool valve with electro-hydraulic operation. It is used to control the opening, closing and direction of the liquid flow.
The valve mainly consists of valve body (1), main control spool (2), main valve with one or two reset springs (3.1) and (3.2), pilot valve (4) with one or two solenoids "a" (5.1) and "b" (5.2).
The main control spool is held in the neutral or initial position by the springs or pressure. For the valve with spring-centered, the two spring chambers (6) and (8) are connected to the oil tank through the pilot valve in the initial position. The pilot valve (4) is supplied with oil through the control line (7). The control oil can be supplied internally or externally (externally via port X).
The main control spool (2) is hydraulically operated by the pilot valve (4). Due to the operating of the pilot valve on one end of the main control spool, the spool moves to the operation position, then the valve opens in the operation direction and the fluid flows from P to A and B to T or P to B and A to T. The control oil can be drained internally or externally. An optional manual emergency operation (9) can move the control spool (10) in the pilot valve (4) when the solenoid is not energized.

Directional valve model WH

The WH directional valve is a hydraulically operated directional spool valve. It is used to control the opening, closing and direction of liquid flow.
The valve mainly consists of valve body (1), main control spool (2), one or two reset springs (3.1) and (3.2) with spring centered or spring return functions, and control cover (11).
The main control spool is operated by hydraulic directly. The spool is held in the neutral or initial position by springs or hydraulic pressure. The control oil is supplied and drained externally.
For the 4/3-way valve with spool spring centered, the main control spool (2) is held in the neutral position by two centered springs. The two spring chambers (6, 8) are connected to the oil ports X and Y through the control cover (11). When one end of the main control spool (2) is pressurized, the spool moves to the working position, thereby connecting the corresponding oil circuit.



Directional valve model 4WEH.



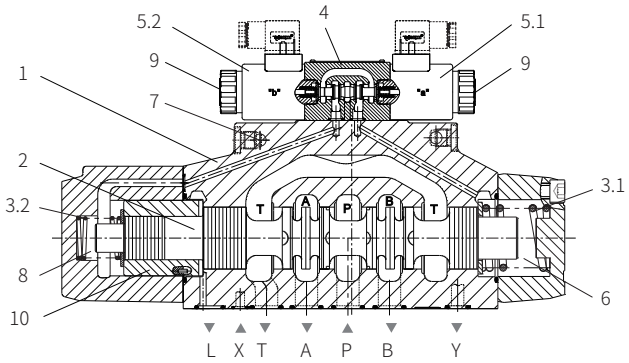
Model 4WH...

Function description, sectional drawing

01

4/3-way directional valve with hydraulic centered of main valve, model WEH..H/

In this structure, the pressure oil acts on both end surfaces of the main control spool (2). The centering sleeve (10) locates the main control spool (2) and keeps it in the middle position.
If one end of the main control spool (2) is unloaded, the main control spool (2) moves to the working position under the pressure from the other end, thereby changing the direction of the oil flow. The unloaded control spool face displaces the returning pilot oil into port Y externally through the pilot valve (4). The oil is drained internal from port L to the tank directly.



Structural diagram of electro-hydraulic directional valve with hydraulic centered

1 Main valve
2 Main control spool
3.1 Spring
3.2 Spring
4 Pilot solenoid valve
5.1 Solenoid A
5.2 Solenoid B
6 Spring chamber
7 Control oil inlet channel
8 Spring chamber
9 Manual operation
10 Centering sleeve

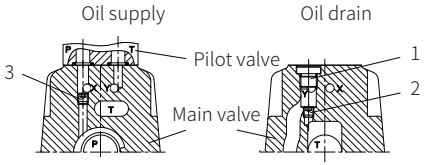
Pilot oil supply

● **Model WEH10**

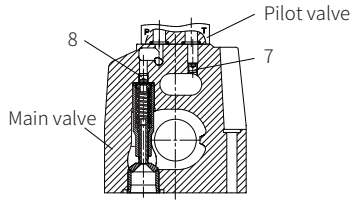
◆ Conversion between internal supply and external supply:
The channel P on the top of the main valve body with M6 screw (3) is external supply, and is internal supply when M6 screw (3) dismounted.
◆ Conversion between internal drain and external drain:
Removing the plug (1) and installing M6 screw (2) is external drain, dismounting M6 screw (2) is internal drain.

● **Model WEH16**

◆ Conversion between internal supply and external supply:
The channel P on the bottom of the main valve with M6 screw (8) is external supply, and is internal supply when M6 screw (8) dismounted.
◆ Conversion between internal drain and external drain:
The channel T on the top of the main valve with M6 screw (7) is external drain, and is internal drain when M6 screw (7) dismounted.



structure diagram of model WEH10...4XJ/ supply and drain



structure diagram of model WEH16...7XJ/ supply and drain

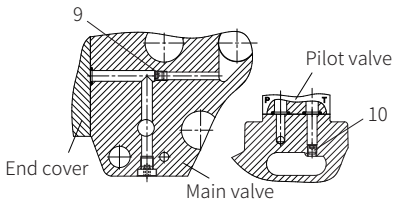
Function description, sectional drawing

Pilot oil supply

● **Model WEH25**

◆ Conversion between internal supply and external supply:
The channel P on the top of the main valve with M6 screw (9) is external supply, and is internal supply when M6 screw (9) dismounted.

◆ Conversion between internal drain and external drain:
The channel T on the top of the main valve with M6 screw (10) is external drain, and is internal drain when M6 screw (10) dismounted.

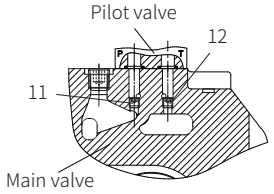


structure diagram of model WEH25...
supply and drain

● **Model WEH32**

◆ Conversion between internal supply and external supply:
The channel P on the top of the main valve with M6 screw (11) is external supply and is internal supply when M6 screw (11) dismounted.

◆ Conversion between internal drain and external drain:
The channel T on the top of the main valve with M6 screw (12) is external drain and is internal drain when M6 screw (12) dismounted.



structure diagram of model WEH32...
supply and drain

Models and specifications

4 J / / *

working pressure
to 35MPa =no code
four-way version =4

operation type
electro-hydraulic =WEH
hydraulic control =WH

size
size 10 =10
size 16 =16
size 22 =22
size 25 =25
size 32 =32

main valve hydraulic return or centered =H
main valve spring return or centered =No code

functional symbols
(see functional symbol diagram)

40 to 49 series (size 10) =4X
60 to 69 series (size 25, 32) =6X
70 to 79 series (size 16, 22) =7X

Rekith =J

when the pilot valve is a 2-position valve with two solenoids and hydraulic return in the main valve
without reset spring =O
without reset spring with detent =OF

pilot valve with wet-pin solenoid with threaded connection =6E

DC voltage 24V =G24
AC voltage 220V, 50Hz/60Hz
for other voltages and frequencies, see directional valve WE6 =W220

1) For internal oil supply
*Minimum control pressure: see page 231
*To avoid impermissible maximum force peaks, a throttle (B10) must be installed in port P of the pilot valve
2) Only in conjunction with throttle "B10"

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code= without pressure reducing valve
D3[2)]= with pressure reducing valve

pre-load valve(not for size 10)
No code= without pre-load valve
P4.5= with pre-load valve, cracking pressure 0.45MPa
P6.0= with pre-load valve, cracking pressure 0.6MPa

No code= no plug-in throttle
B08= throttle ∅0.8mm
B10= throttle ∅1.0mm
B12= throttle ∅1.2mm
B15= throttle ∅1.5mm

additional device number
(see additional device drawing)

electrical connection
K4= no insert plug
Z5L= large right angle lamp plug
FS2= deutsch water-proof plug
DL= connection box with lamp, centralized connection

No code= without switching time adjustment
S= switching time adjustment as meter-in control
S2=switching time adjustment as meter-out control

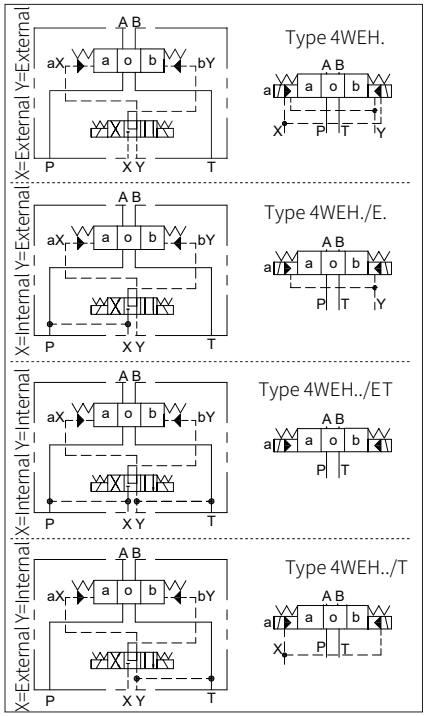
pilot oil supply
No code= pilot oil supply and drain external
E= pilot oil supply internal and drain external
ET[1)]= pilot oil supply and drain internal
T= pilot oil supply external and drain internal
(for model 4WH...only available as "no code")
(the 3-position valve with hydraulic centered in ET and T types must meet:
P pilot ⩾ 2xP tank + P pilot min)

No code = without manual emergency operation
N9= with hidden manual emergency operation

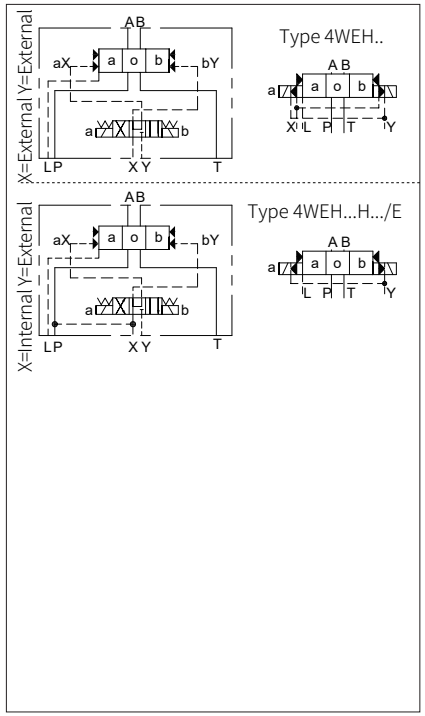
Functional symbols

Detailed and simplified symbols for 3-position directional valves

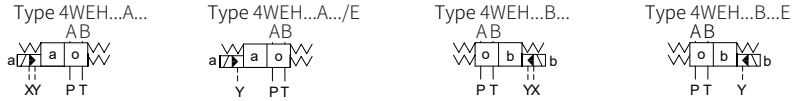
Spring centered



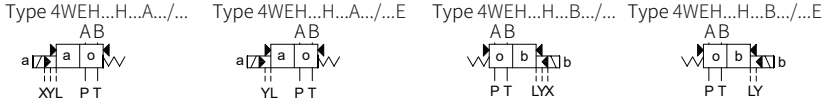
Hydraulic centered



Spring return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Hydraulic return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Functional symbols

Functional symbols of 3-position valves

3-position valve

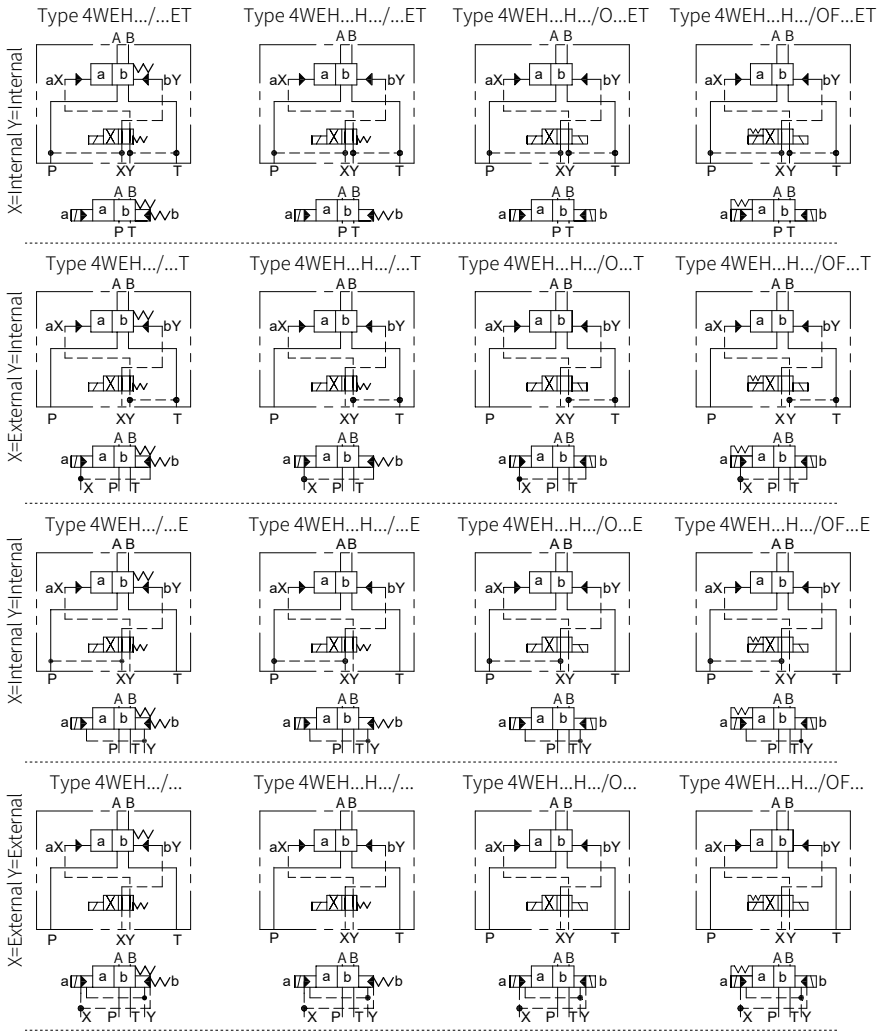
3-position valve model		Functional symbol	Transition function
4WEH...E.../...	E		
4WEH...F.../...	F		
4WEH...G.../...	G		
4WEH...H.../...	H		
4WEH...J.../...	J		
4WEH...L.../...	L		
4WEH...M.../...M			
4WEH...P.../...	P		
4WEH...Q.../...	Q		
4WEH...R.../...	R		
4WEH...S.../...	S		
4WEH...T.../...	T		
4WEH...U.../...	U		
4WEH...V.../...	V		
4WEH...W.../...W			

2-position valve derived from 3-position valve

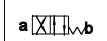
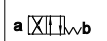
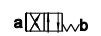
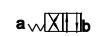
2-position valve model	Functional symbol (Solenoid at end A)	2-position valve model	Functional symbol (Solenoid at end B)
4WEH...EA.../...		4WEH...EB.../...	
4WEH...FA.../...		4WEH...FB.../...	
4WEH...GA.../...		4WEH...GB.../...	
4WEH...HA.../...		4WEH...HB.../...	
4WEH...JA.../...		4WEH...JB.../...	
4WEH...LA.../...		4WEH...LB.../...	
4WEH...MA.../...		4WEH...MB.../...	
4WEH...PA.../...		4WEH...PB.../...	
4WEH...QA.../...		4WEH...QB.../...	
4WEH...RA.../...		4WEH...RB.../...	
4WEH...SA.../...		4WEH...SB.../...	
4WEH...TA.../...		4WEH...TB.../...	
4WEH...UA.../...		4WEH...UB.../...	
4WEH...VA.../...		4WEH...VB.../...	
4WEH...WA.../...		4WEH...WB.../...	

Functional symbols

Detailed and simplified symbols for 2-position directional valves



Function symbols of 2-position valves

Spool valve function:	C	D	K	Z	Y
Spool valve function symbol:					
Transition function:					

Technical parameters

Size			10	16	22	25	32
Maximum working pressure							
Oil ports P, A, B		(MPa)	35	35	35	35	35
Oil port T	External Y port pilot oil drain	(MPa)	31.5[5]	25	25	25	25
	Internal Y port pilot oil drain	(MPa)	21 DC				
		(MPa)	16 AC				
Oil port Y External pilot oil drain	-DC solenoid	(MPa)	21 DC				
	-AC solenoid	(MPa)	16 AC				
	For 4WH type	(MPa)	25（size 10、16、25、32）		21（size 22）		
Maximum pilot pressure (For high pilot pressure, a pressure reducing valve is required)		(MPa)	25（size 10、16、25、32）		21（size 22）		
Minimum pilot pressure -Pilot oil supply X external -Pilot oil supply X internal (Not for spool C, F, G, H, P, T, V, Z, S[2])			H-4W...				
	Spring centered 3-position valve	(MPa)	1.0	1.4	1.25	1.3	0.85
	Pressure centered 3-position valve	(MPa)	-	1.4	1.05	1.8	0.85
	Spring centered 2-position valve	(MPa)	1.0	1.4	-	1.3	1.0
	Pressure centered 2-position valve	(MPa)	0.7	1.4	1.4	0.8	0.5
Pilot oil supply X internal (for spool C, F, G, H, P, T, V, Z, S[2])			0.45[3]	0.45[4]	0.45[4]	0.45[4]	0.45[4]

1)In a 3-position valve, pressure centered only possible if:
Ppilot ⩾ 2xPtank + Ppilot min.

2) Spool S only for size 16.

3) For the spools C, F, G, H, P, T, V, Z, the internal pilot oil supply is only possible if the flow from P to T in the central position (for 3-position valve) or when the valve moves through the central position (for 2-position valve) is large enough to ensure the pressure differential as 0.65MPa from P to T.

4) For the spools C, F, G. H, P, T, V. Z. S-via the pre-load valve or correspondingly large flow.

5) 28MPa for model 4WEH10..., 31.5MPa for model H-4WEH10...

H-4WEH10... type is 31.5MPa

Hydraulic oil		Mineral hydraulic oil or phosphate ester hydraulic oil
Temperature range	(°C)	-30 to +80 (NBR seal) -20~+80 (FKM seal)
Viscosity range	(mm²/s)	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9, so we recommend a fitter with the minimum filtration accuracy β10⩾75

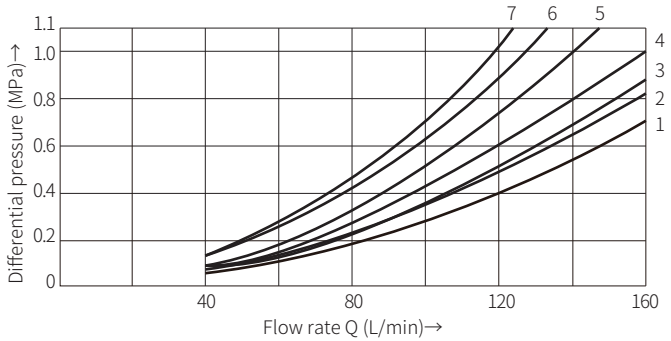
Pilot oil volume during switching process											
3-position valve spring centered	(cm³)	2.04	5.72		7.64		14.2		29.4	
2-position valve	(cm³)	4.08	11.45		15.28		28.4		58.8	
3-position valve hydraulic centered	(cm³)	-	WH	WEH	-	-	WH	WEH	WH	WEH
from neutral position to position "a"	(cm³)	-	2.83	2.83	-	-	7.15	7.15	14.4	14.4
From position "a" to neutral position	(cm³)	-	5.72	5.72	-	-	14.18	7.0	29.4	15.1
From neutral position to position "b"	(cm³)	-	5.72	5.72	-	-	14.18	14.15	29.4	29.4
from position "b" to neutral position	(cm³)	-	8.55	8.55	-	-	19.88	5.73	43.8	14.4
Pilot oil flow for shortest switching time	(L/min)	about 35	about 35		about 35		about 35		about 45	
Weight	Valve with one solenoid	(kg)	about 6.4	about 8.5		about 11.5		about 17.6		about 40.5	
	Valve with two solenoid, spring centered	(kg)	about 6.8	about 8.9		about 11.9		about 18.0		about 41.0	
	Valve with two solenoid, hydraulic centered	(kg)	about 6.8	about 8.9		about 11.9		about 19.0		about 41.0	
	Valve with hydraulic control	(kg)	about 5.5	about 7.3		about 10.5		about 16.5		about 39.5	
	Switching time adjustment	(kg)	about 0.8								
	Pressure reducing valve	(kg)	about 0.4								
Installation position			Optional, except for the hydraulic return valve C, D, K, Z, Y installed horizontal								

Technical parameters

Switching time (refers to the time from the solenoid closing to the main valve fully opening.)															
Size 10	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)														
	at pilot pressure	(MPa)	~7=				~14=				~21=				~25=	
	3-position valve	(ms)	30	65			25	60			20	55	15	50	
	2-position valve	(ms)	35	80			30	75			25	70	20	65	
	Switching time for valve from operating position to neutral position (ms)														
	3-position valve	(ms)	30												
	2-position valve	(ms)	35	40			30	75			25	30	20	25	
Size 16	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)														
	at pilot pressure	(MPa)	~7=				~15=				~25=				
	3-position valve-spring centered	(ms)	25...30		40		25...30		40		25...30		40		
	2-position valve	(ms)	30...35		55		30...35		55		30...35		55		
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b	
		(ms)	30	30	40	40	30	30	40	40	30	30	35	40	
	Switching time for valve from operating position to static position														
	3-position valve	(ms)	20 to 35 for ~; 30 for =												
	2-position valve	(ms)	30...50		45		30...50		45		30...50		45		
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b	
		(ms)	20...35		20		20...55		20		20...35		20		
Size 25	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)														
	at pilot pressure	(MPa)	~7=				~14=				~21=				~25=	
	3-position valve-spring centered	(ms)	50	85			40	75			35	70	30	65	
	2-position valve	(ms)	120	160			100	130			85	120	70	105	
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	20	35	55	65	30	35	55	65	25	30	50	60	25	30	50	60
	Switching time for valve from operating position to static position															
	3-position valve	(ms)	40 to 55 for ~; 40 for =													
	2-position valve	(ms)	120	125			85	100			85	90	75	80		
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	30...50		30 35		30...50		30 35		30...50		30 35		30...50		30 35	
Size 32	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)															
	at pilot pressure	(MPa)	~5=				~15=				~25=					
	3-position valve-spring centered	(ms)	65		80		50		90		35		105			
	2-position valve	(ms)	100		130		75		100		60		115			
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b		
		(ms)	55	35	100	105	40	45	85	95	35	40	85	95		
	Switching time for valve from operating position to static position															
	3-position valve	(ms)	60 to 75 for ~; 50 for =													
	2-position valve	(ms)	115...130		90		85...100		70		65...80		65			
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b		
		(ms)	30...65		30 40		60...90		30 40		105...155		50 50			

Characteristic curve

Model 4WEH10...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				Spool	Working position		
	P-A	P-B	A-T	B-T		A-T	B-T	P-T
E、D、Y	2	2	4	5	F	3	-	6
F	1	4	1	4				
G、T	4	2	2	6	G,T	-	-	7
H、C	4	4	1	4				
J、K	1	2	1	3	H	1	3	5
L	2	3	1	4	L	3	-	-
M	4	4	3	4	P	-	7	5
Q、V、W、Z	2	2	3	5				
R	2	2	3	-	U	-	4	-
U	3	3	3	4				
P	4	1	3	4				

Characteristic limit

Model 4WEH10...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position and 3-position valves (L/min)			
Spool	Working pressure(MPa)		
	20	25	31.5
E、J、L、M、Q、R、U、V、W C、D、K、Z、Y	160		
H	160	150	120
G、T	160	160	140
F、P	160	140	120

Notice:

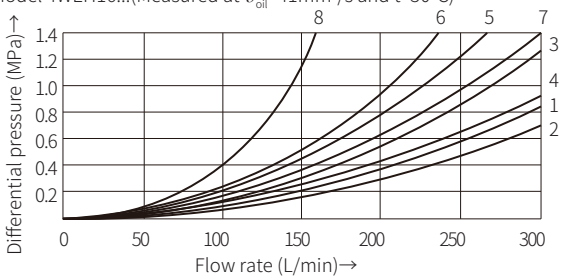
The given characteristic limits are suitable for the use of flow in both directions (e. g. from P to A and return from B to T at the same time).

Due to the power of the fluid in the valve, the characteristic limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

The characteristic limits are measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.

Characteristic curve

Model 4WEH16...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				
	P-A	P-B	A-T	B-T	P-T
E、D、Y	1	1	1	3	-
F、P	2	2	3	3	-
G、T	5	1	3	7	6
H、C、Q、V、Z	2	2	3	3	-
J、K、L	1	1	3	3	-
M、W	2	2	4	3	-
R	2	2	4	-	-
U	1	1	4	7	-
S	4	4	4	-	8

Characteristic limit

Model 4WEH16...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)					
Spool	Working pressure(MPa)				
	7	14	21	28	35
Main valve spring return[1]					
C、D、K、Z、Y	300	300	300	300	300
Main valve spring return[2]					
C	300	300	300	300	300
D、Y	300	270	260	250	230
K	300	250	240	230	210
Z	300	260	190	180	160
Main valve hydraulic return					
HC、HD、HK	300	300	300	300	300
HZ、HY	300	300	300	300	300

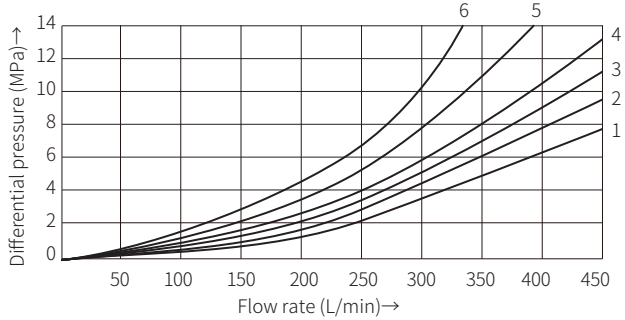
1)The given flow value can be achieved when the minimum pilot pressure of 1.2MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Allowable flow of 3-position valve (L/min)						
Spool	Working pressure(MPa)					with pre-load valve and X port internal supply
	7	14	21	28	35	
Main valve spring return[1]						
E、H、J、L、MQ、U、W、R	300	300	300	300	300	
F、P	300	250	180	170	150	Spools F, G, H P and S in general
G、T	300	300	240	210	190	
S	300	300	300	250	220	
V	300	250	210	200	180	
Pressure centered (minimum pilot pressure 1.6MPa)						Spool approx. to 160L/min
All spools	300	300	300	300	300	

Notice:
When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.6MPa is required.
The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

Characteristic curve

Model 4WEH22...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Switching position			
	P-A	P-B	A-T	B-T
E、M、P、Q、U、V	2	2	1	4
F	1	2	1	2
G、T	2	2	2	4
H、J、W	2	2	1	3
L	2	2	1	2
R	1	2	1	-

Spool	Neutral position		
	A-T	B-T	P-T
F	-	-	4
G、P	-	-	6
H	-	-	2
L	4	-	-
T	-	-	5
U	-	6	-

Characteristic limit

Model 4WEH22...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve L/min					
Spool	working pressure(MPa)				
	7	14	21	28	35
X external supply main valve spring return (with $P_{pilot\ min}$=11bar/14bar)					
C, D, K, Y, Z	450	450	450	450	450
X external supply main valve spring return[1]					
C	450	450	320	250	200
D, Y	450	450	450	400	320
K	450	215	150	120	100
Z	350	300	290	260	160
X external supply hydraulic centered					
HC, HD, HK, HY, HZ	450	450	450	450	450
HC../O..	450	450	450	450	450
HD../O..	450	450	450	450	450
HK../O..	450	450	450	450	450
HZ../O..	450	450	450	450	450
HC../OF..	450	450	450	450	450
HD../OF..	450	450	450	450	450
HK../OF..	450	450	450	450	450
HZ../OF..	450	450	450	450	450

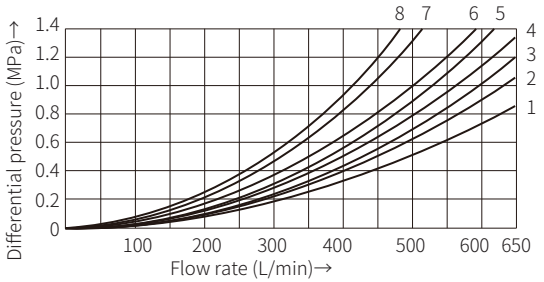
1)The specified flow value is the limited value at which the reset spring can return the spool back to the end position when the pilot pressure disappears.

Allowable flow of 3-position valve L/min					
Spool	working pressure(MPa)				
	7	14	21	28	35
X external supply spring centered					
E, J, L, M, Q, U, W, R	450	450	450	450	450
H	450	450	300	260	230
G	400	350	250	200	180
F	450	270	175	130	110
V	450	300	240	220	160
T	400	300	240	200	160
P	450	270	180	170	110

When internal supply, a back pressure valve is required because of negative cover of spools Z, HZ, V and the flow less than 180L/min. It is also required due to negative cover of spools F, G, M, P and T.

Characteristic curve

Model 4WEH25...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				Spool	Working position			
	P-A	P-B	A-T	B-T		P-A	P-B	A-T	B-T
E	1	1	1	3	P	4	1	1	5
F	1	4	3	3	Q	2	2	3	5
G	3	1	2	4	Z	1	1	1	-
H	4	4	3	4	U	2	1	1	6
J	2	2	3	5	V	4	4	3	6
L	2	2	3	3	W	1	1	1	3
M	4	4	1	4	T	3	1	2	4

Characteristic limit

Model 4WEH25...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

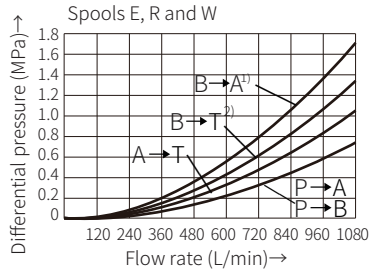
Allowable flow of 2-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	35	
Main valve spring return[1]						
C, D, K, Z, Y	700	700	700	700	700	
Main valve spring return[2]						
C	700	700	700	700	700	Spools C and Z approx. to 180 L/min
D, Y	700	650	400	350	300	
K	700	650	420	370	320	
Z	700	700	650	480	400	
Main valve hydraulic return						
HC、HD、HK	700	700	700	700	700	Spools HC and HZ approximately to 180L/min
HZ、HY	700	700	700	700	700	
HC.../O	700	700	700	700	700	
HD.../O	700	700	700	700	700	
HK.../O	700	700	700	700	700	
HZ.../O	700	700	700	700	700	
HC.../OF	700	700	700	700	700	
HD.../OF	700	700	700	700	700	
HK.../OF	700	700	700	700	700	
HZ.../OF	700	700	700	700	700	

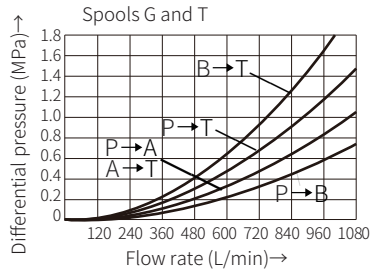
Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	35	
spring centered						
E、L、M Q、U、W	700	700	700	700	650	
G/T	400	400	400	400	400	
F	650	550	430	330	300	
H	700	650	550	400	360	
J	700	700	650	600	520	
P	650	550	430	330	300	Spools F, G, HP and T approximately to 180L/min
V	650	550	400	350	310	
R	700	700	700	650	680	
Pressure centered (minimum pilot pressure 1.8MPa)						
E/F/H/J	700	700	700	700	650	
L/M/P/Q	700	700	700	700	650	
R/U/V/W	700	700	700	700	650	
G/T	400	400	400	400	400	
When the pilot pressure higher than 3MPa						
G/T	700	700	700	700	700	

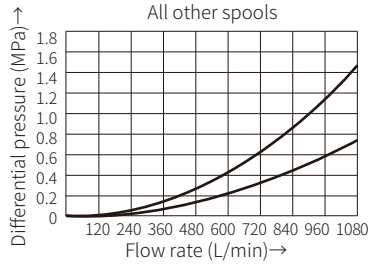
1)The given flow value can be achieved when the minimum pilot pressure of 1.3MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Characteristic curve

Model 4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)







1) Only for spool R
2) Not for spool R

Characteristic limit

Model 4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	25	
Main valve spring return[1]						
C、D、K、Z、Y	1100	1040	860	750	680	
Main valve spring return[2]						
C	1100	1040	860	800	700	Spool Z approx to 180L/min
D、Y	1100	1040	540	480	420	
K	1100	1040	860	500	450	
Z	1100	1040	860	750	650	
Main valve hydraulic return						
HC、HD、HK	1100	1040	860	750	680	Spool Z approx to 180L/min
HZ、HY	1100	1040	860	750	680	

Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	25	
Main valve spring return[1]						
E, H, J, L, M Q, U, W, R	1100	1040	860	750	680	
G, T, H, F, P	900	900	800	650	450	Spools F, G, H, P and T approximately to 180L/min
V	1100	1000	680	500	450	
Pressure centered (minimum pilot pressure 0.85MPa)						
All spools	1100	1040	860	750	680	

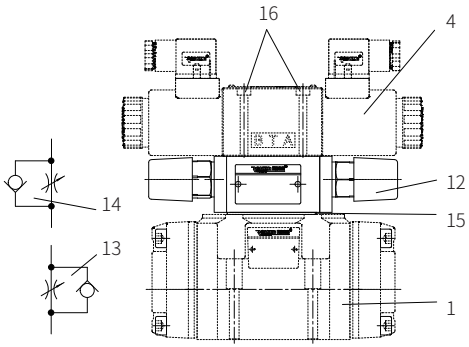
1)The given flow value can be achieved when the minimum pilot pressure of 1.0MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Notice:
When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.5MPa is required.
The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

Switching time adjustment, pressure reducing valve and pre-load valve

Switching time adjustment

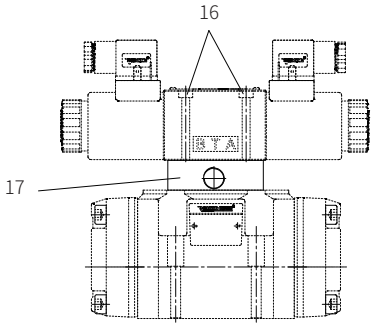
To control the switching time of the main valve (1), a double throttle check valve (12) is installed between the pilot valve and the main valve.
Conversion from meter-in control (13) to meter-out control (14):
Remove the pilot valve (4) but retain the O-ring support plate (15), turn the throttle check valve around its longitudinal axis and reassemble it on the mounting surface, install the pilot valve (4).
Tightening torque M_A=9Nm for fixing screw (16).



Model 4WEH.../S or S2

Pressure reducing valve "D3"

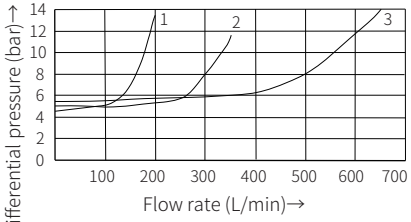
The pressure reducing valve (17) must be used If the pilot pressure exceeds 25MPa. The secondary pressure should be maintained at 4.5MPa. When using the pressure reducing valve D3, it must install a plug-in throttle B10 in port P of the pilot valve.
Tightening torque M_A=9Nm for fixing screw (16).



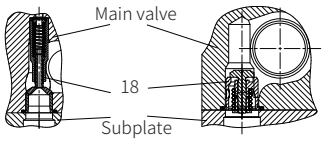
Model 4WEH.../.../D3

Pre-load valve (not for size 10)

In the valve with pressureless bypass and internal pilot oil supply, a pre-load valve (18) is installed in port P of the main valve to built up the minimum pilot pressure.



1 Size 16
2 Size 25
3 Size 32



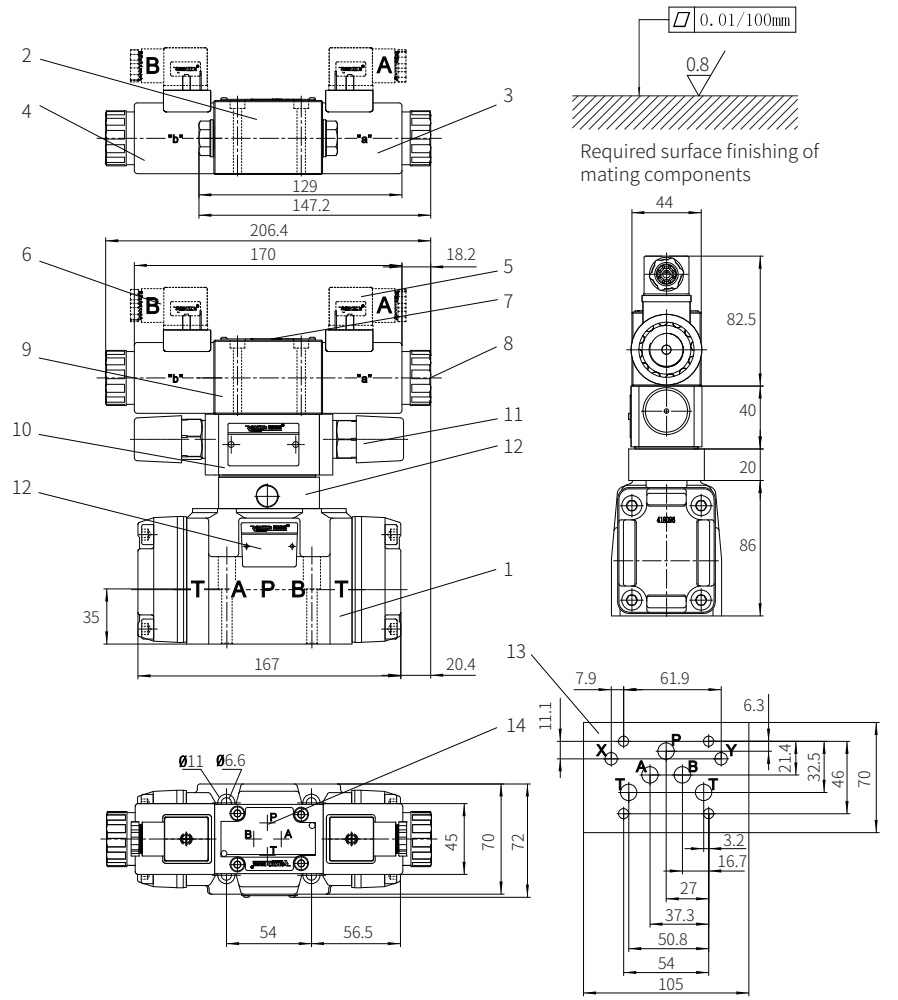
Model
4WEH16...-7X/.../P4.5

Model
4WEH25.../.../P4.5
4WEH32.../.../P4.5

Component size

Size unit: mm

WEH10...4XJ/...



1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Port position of pilot oil
15 Name plate of complete valve

Valve fixing screw
M6x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Component size

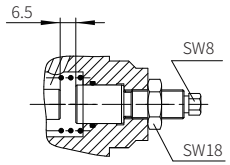
Size unit: mm

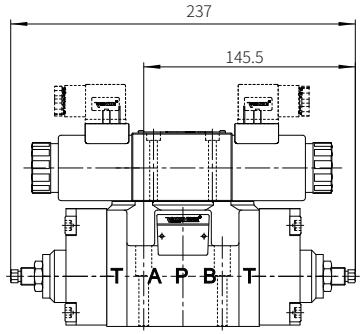
01

Dimension of additional devices for model WEH10

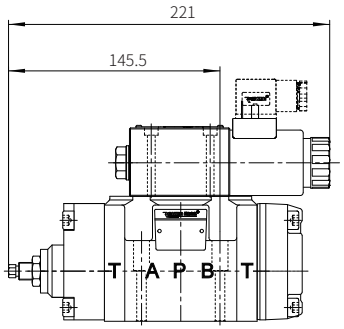
The installation range of the stroke adjustment is 6.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1mm stroke

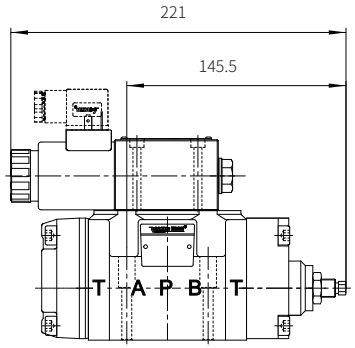




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



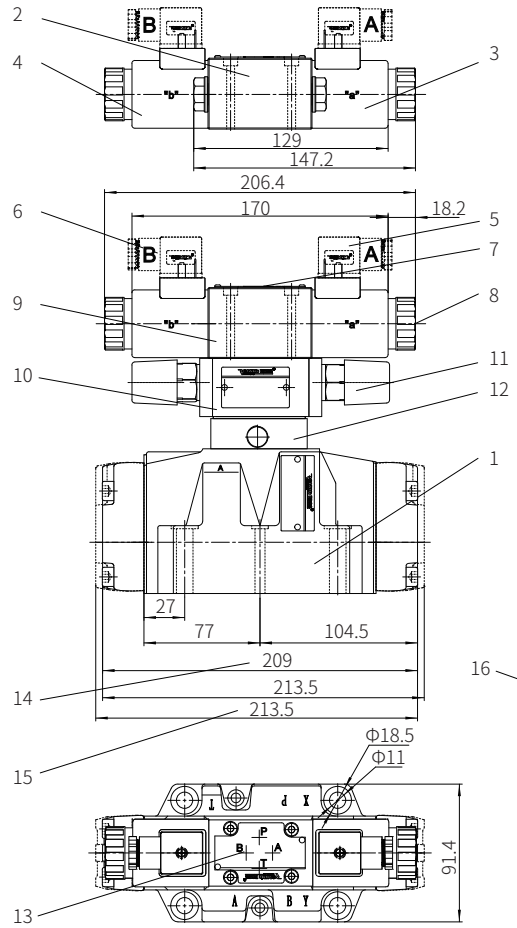
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

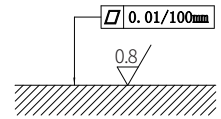
Component size

Size unit: mm

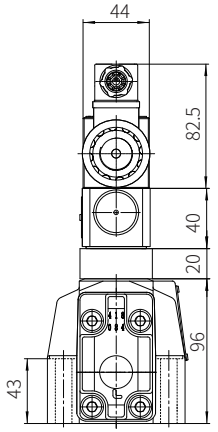
01

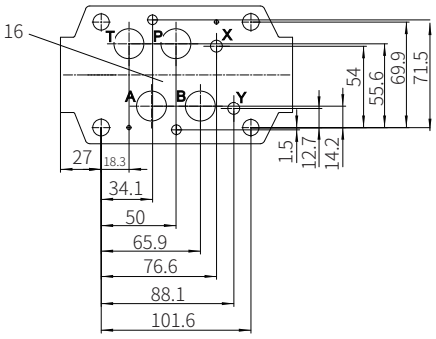
WEH16...7XJ/...





Required surface finishing of mating components





1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

Valve fixing screw
2-M6x55-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

4-M10x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

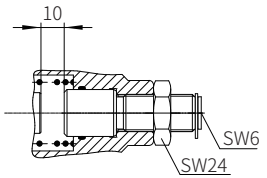
Component size

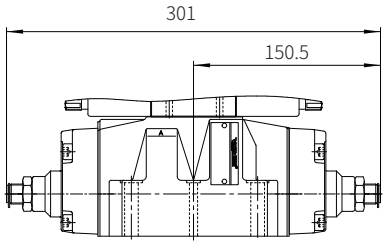
Size unit: mm

Dimension of additional devices for model WEH16

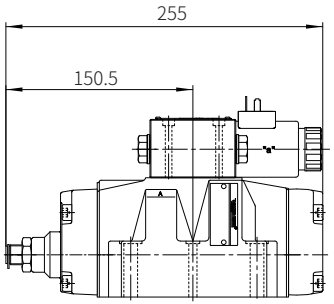
The installation range of the stroke adjustment is 10mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

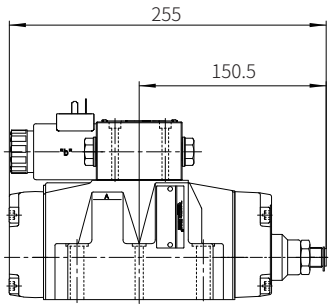




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)

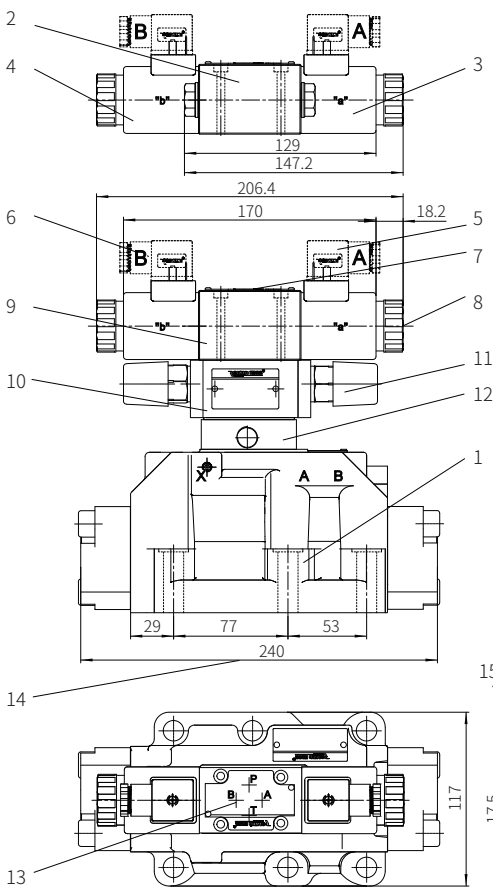


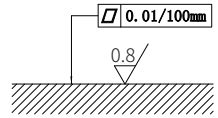
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

Component size

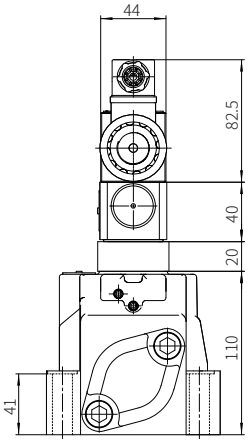
Size unit: mm

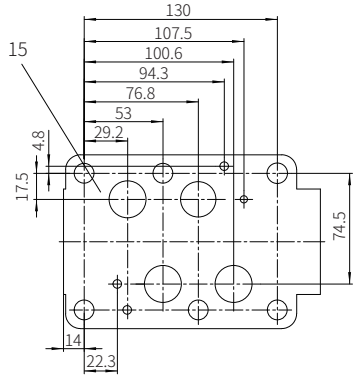
WEH22...7XJ/...





Required surface finishing of mating components





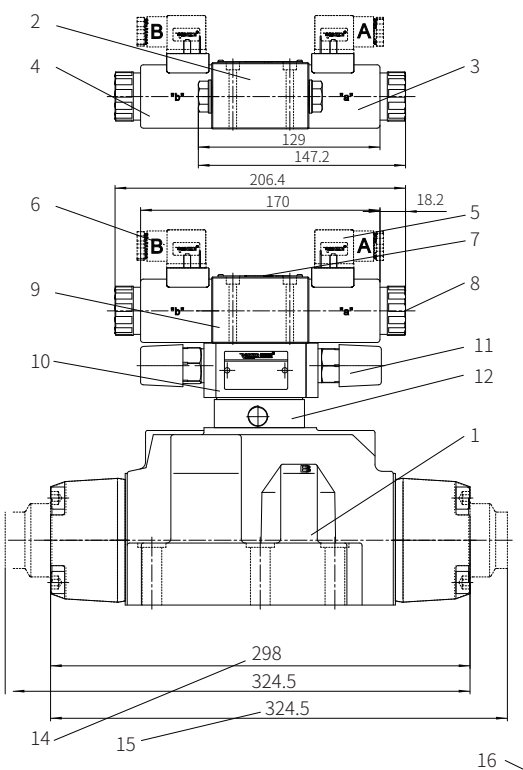
1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Main valve connection diagram

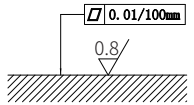
Valve fixing screw
6-M12x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm

Component size

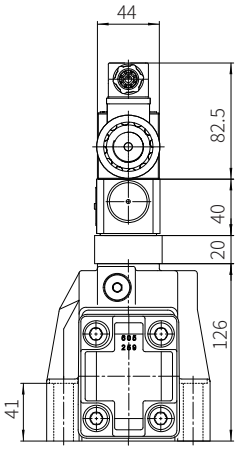
Size unit: mm

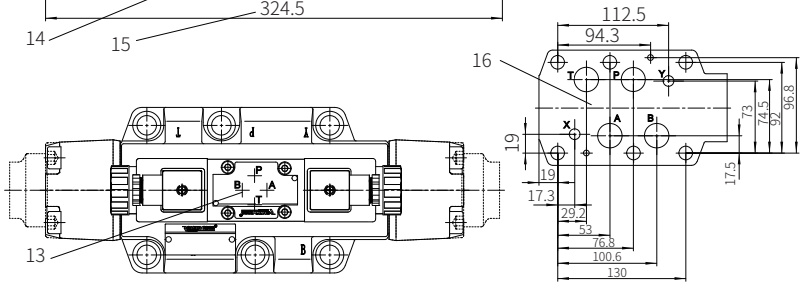
WEH25...6XJ/...





Required surface finishing of mating components





1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

Valve fixing screw
6-M12x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm

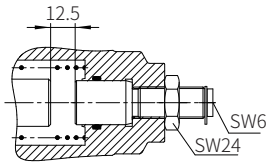
Component size

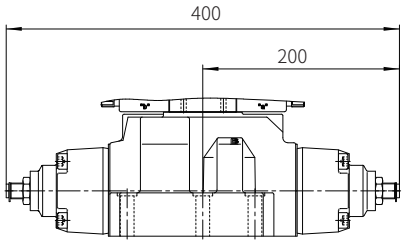
Size unit: mm

Dimension of additional devices for model WEH25

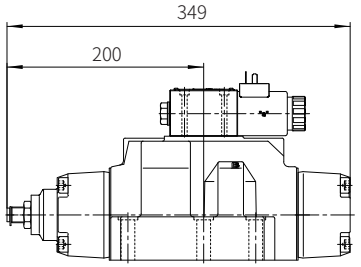
The installation range of the stroke adjustment is 12.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

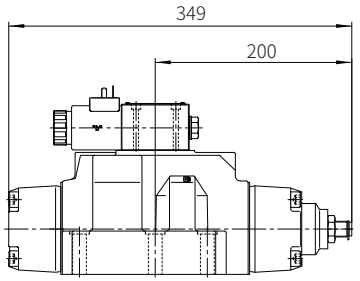




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)

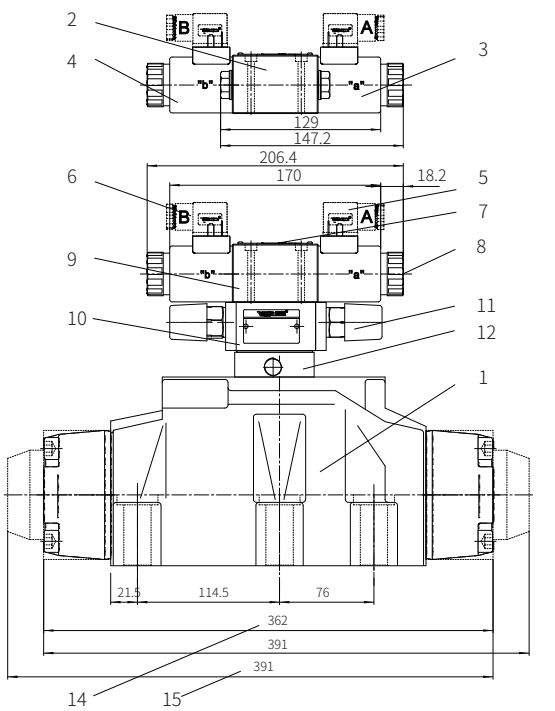


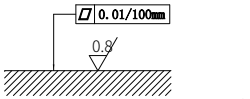
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

Component size

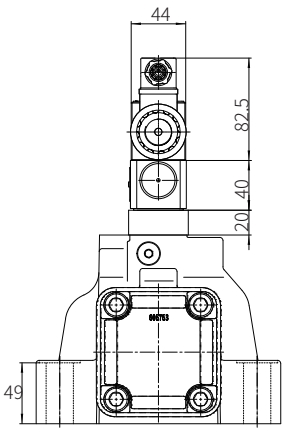
Size unit: mm

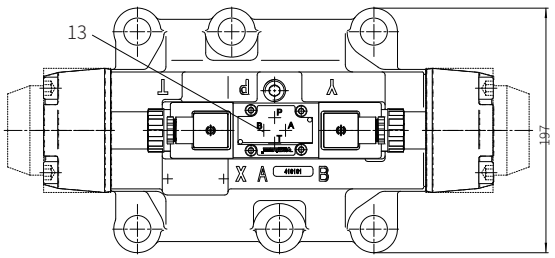
WEH32...6XJ/...

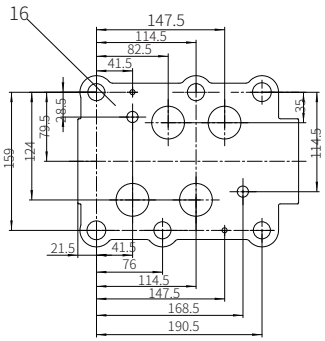




Required surface finishing of mating components







1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

Valve fixing screw
6-M20x80-10.9 grade GB/T70.1-2000
Tightening torque M_A=373Nm

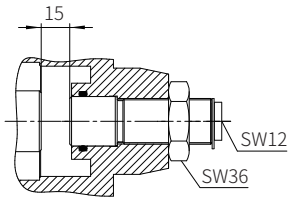
Component size

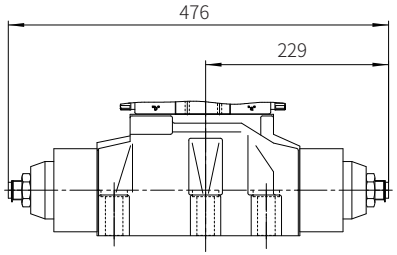
Size unit: mm

Dimension of additional devices for model WEH32

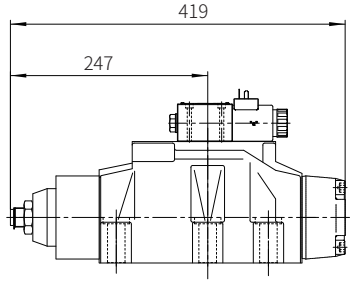
The installation range of the stroke adjustment is 15mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

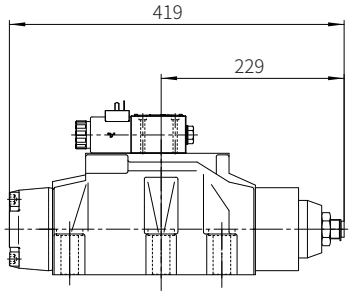




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)

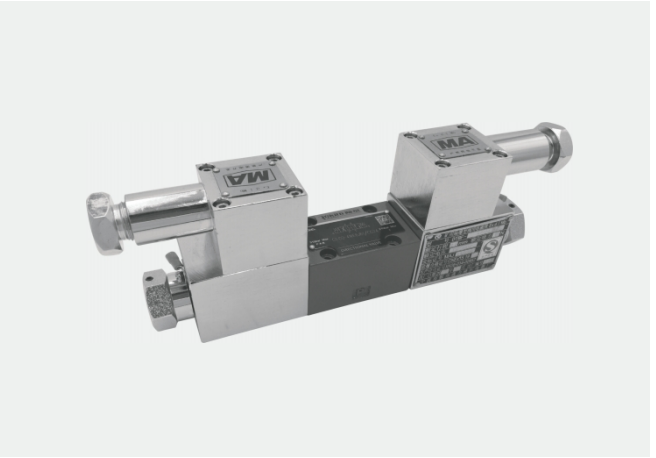


Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

01

Explosion-proof Solenoid Directional Valve

Model: GD-WE6...6XJ



- Size 6
- Maximum working pressure 350 bar
- Maximum working flow rate 80 L/min-DC 60 L/min-AC

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	04
Characteristic curve	05
Characteristic limit	06
Component size	07

Features

- With the direct type solenoid operated directional spool valve as the standard type
- Wet-pin explosion-proof solenoid with detachable coil

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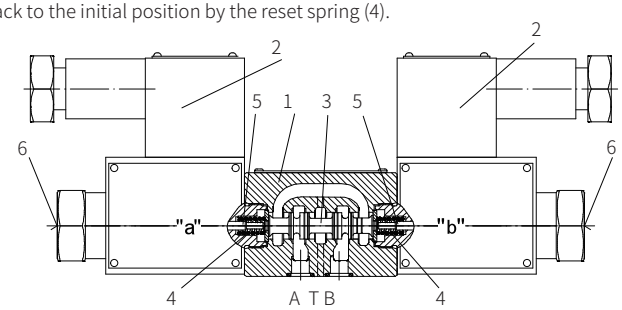
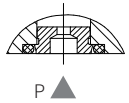
01

Function description, sectional drawing

The GD-WE6 directional control valve is a directional spool valve operated by a explosion-proof solenoid, it is used to control the opening, closing and flow direction of the liquid flow.
This directional control valve mainly includes valve body (1), one or two explosion-proof solenoids (2), control spool (3) and one or two reset springs (4).
In the non-energized condition, the control spool (3) is held in the middle or initial position by the reset spring (4). The control spool (3) is operated by the wet-pin explosion-proof solenoid (2). To ensure the proper functioning, the pressure chamber of the solenoid must be filled with oil.
The force of the explosion-proof solenoid (2) acts on the control spool (3) through the push rod (5) to push from the stationary position to the required position. In this way, the oil flows freely from P to A and B to T, or P To B and A to T. When the explosion-proof solenoid (2) is powered off, the control spool (3) is pushed back to the initial position by the reset spring (4).



Model GD-4WE6E...6XJ/



Plug-in throttle

Models and specifications

GD | WE | 6 | | 6X | J | | | / | | *

- explosion proof class I =G1
  explosion proof class II=G2
- explosion proof valve
- working oil port
  3 working oil ports =3
  4 working oil ports =4
- function symbol
- 60 to 69 series =6X
  (60 to 69 series installation and connection size unchanged)
- Rekith =J
- with reset spring =No code
  no reset spring =O
  no reset spring, with detent =OF
- voltage
  G24 =24V DC
  B36 =36V AC with rectifier
  B127 =127V AC with rectifier
  B220 =220V AC with rectifier
- N9= with hidden emergency button operation
- No code= no plug-in throttle port
  plug-in throttle port (see table)

Oil port	throttle port Ø(mm)		
	0.8	1.0	1.2
P	=B08	=B10	=B12
A	=H08	=H10	=H12
B	=R08	=R10	=R12
A and B	=N08	=N10	=N12
T	=X08	=X10	=X12

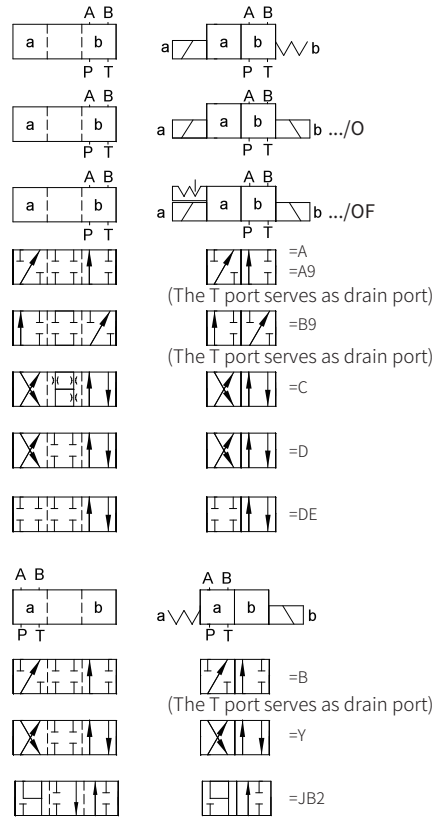
- more information in text
- sealing material
  No code= NBR seals
  V= FKM seals
  (consult for other seals)

Note:
G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

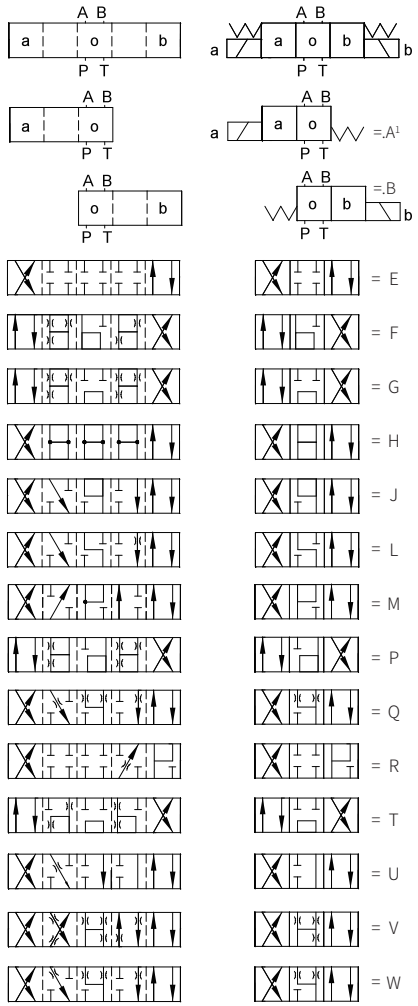
01

Functional symbols

Transition function | Spool valve function



Transition function | Spool valve function



1) For example: .
The function symbol EA means the coil on side A
Note: Functions A9 and B9 are only used as pilot valves

Technical parameters

Hydraulic			
Maximum working pressure	Oil ports A, B, P	bar	350
	Oil port T	bar	210 When the working pressure exceeds the allowable pressure, the valves with symbols A and B must use T port as the drain port.
Maximum flow		L/min	80
Effective over-flow section (spool position)	symbol Q	mm^2	About 6% cross-sections
	symbol W	mm^2	About 3% cross-sections
Oil fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range		°C	-30 to +80 (NBR seal) -15 to +80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is IS04406 level 20/18/15

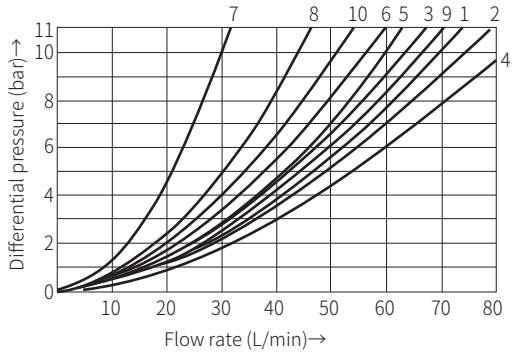
1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Electric				
Voltage type			DC	AC Rectifier
Voltage available[4]		v	24	36 127 220
Allowable voltage tolerance (voltage unit)		%	±10	±10
Power consumption		W	30	—
Holding power		VA	—	50
Impact power		VA	—	220
Power rate			100 %	100 %
Switching time to ISO6403	On	ms	25 to 45	10 to 20
	Off	ms	10 to 25	15 to 40
Maximum switching frequency		1/h	15000	7200

4) Other voltages are determined as required

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



Functional symbol	Flow direction			
	P-A	P-B	A-T	B-T
A; B	3	3	–	–
C	1	1	3	1
D; Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J; Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	–
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

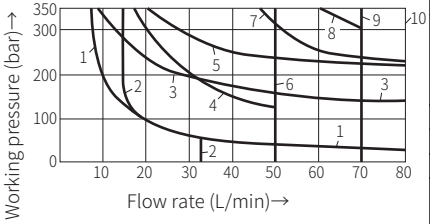
7 Symbol R in control position B-→A
8 Symbols G and T in center position
9 Symbols H and T in center position P→T

Characteristic limit

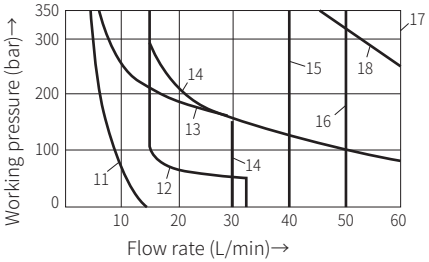
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Attention!
The given working limit is suitable for the use of flow in both directions (e. g. from P to A and return from B to T at the same time).
Due to the power of the fluid in the valve, the power limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

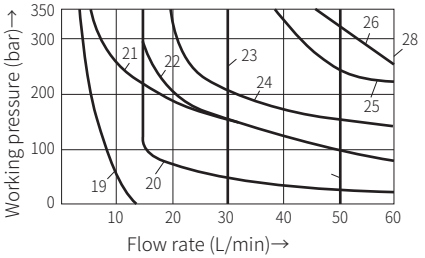
The power limit is measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.



DC Solenoid			
Characteristic curve	Function symbol	Characteristic curve	Function symbol
1	A; B	6	G; H; T
2	V	7	A/O; A/OF; L; U
3	A; B	8	C; D; Y
4	F; P	9	M
5	J	10	E; E1; R; C/O; C/OF; D/O; D/OF; Q; W



AC Solenoid-50 Hz	
Characteristic curve	Function symbol
11	A; B
12	V
13	A; B
14	F; P
15	G; T
16	H
17	A/O; A/OF; C/O; C/OF; D/O; D/OF; E; E1; J; L; M; Q; R; U; W
18	C; D; Y



AC Solenoid-60 Hz	
Characteristic curve	Function symbol
19	A; B
20	V
21	A; B
22	F; P
23	G; T
24	J; L; U
25	A/O; A/OF; Q; W
26	C; D; Y
27	H
28	C/O; C/OF; D/O; D/OF; E; E1; M; R

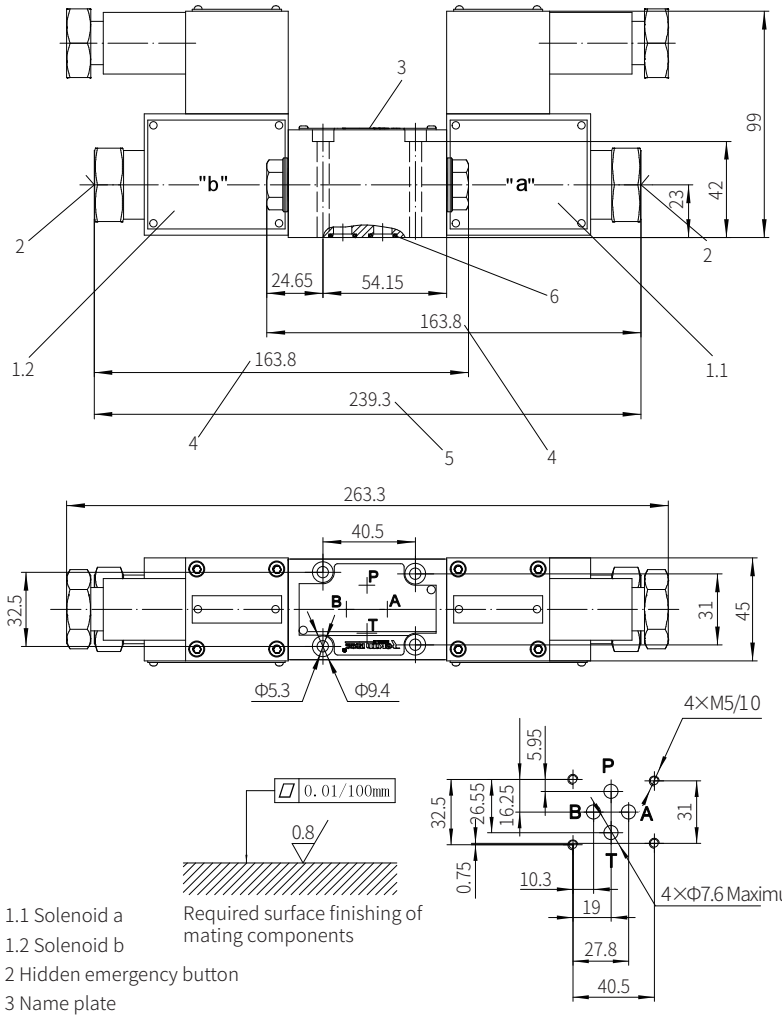
1) P-A/B Pre-opening

2) Back from the actuator to the oil tank

Component size

Size unit: mm

Model GD-4WE6...-6XJ/...



1.1 Solenoid a
1.2 Solenoid b
2 Hidden emergency button
3 Name plate
4 Size of 2-position valve
5 Size of 3-position valve
6 O-ring 9.25x178 (for oil port P, A, B, T)

Required surface finishing of mating components

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

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Explosion-proof Solenoid Directional Valve

Model: GD-WE10...3XJ

- Size 10
- Maximum working pressure 315 bar
- Maximum working flow rate 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	04
Characteristic curve	05
Characteristic limit	05-06
Component size	07

Features

- Solenoid operated directional spool valve
- Wet-pin explosion-proof solenoid

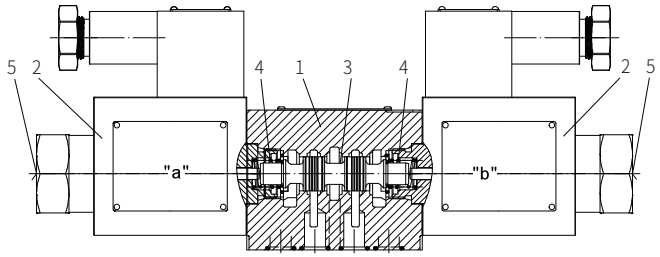
Function description, sectional drawing

The GD-WE10 directional control valve is a directional spool valve operated by explosion-proof solenoid, it is used to control the opening, closing and flow direction of the liquid flow.

The directional control valve mainly includes valve body (1), one or two explosion-proof solenoids (2), control spool (3), and one or two reset springs (4). In the non-energized condition, the control spool (3) is held in the middle or initial position by the reset spring (4). The control spool (3) is operated by the wet-pin explosion-proof solenoid (2).

To ensure proper function, the pressure chamber of the solenoid must be filled with oil. The force of the explosion-proof solenoid (2) acts on the control spool (3) through the push rod (5) to push it from the stationary position to the required position. In this way, the oil flow freely from P to A and B to T, or from P to B and A to T.

When the explosion-proof solenoid (2) is powered off, the control spool (3) is pushed to the initial position by the return spring (4).



Model GD-WE10...3XJ/

Models and specifications

GD | WE | 10 | 3X | J | | | | *

explosion-proof class I =G1
explosion-proof class II =G2

explosion proof valve

working oil port
3 working oil ports =3
4 working oil ports =4

function symbol

30 to 39 series =3X
(30 to 39 series installation and connection size unchanged)

Rekith =J

with reset spring =No code
no reset spring =O
no reset spring, with detent =OF

voltage
G24 =24V DC
B36 =36V AC with rectifier
B127 =127V AC with rectifier
B220 =220V AC with rectifier

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

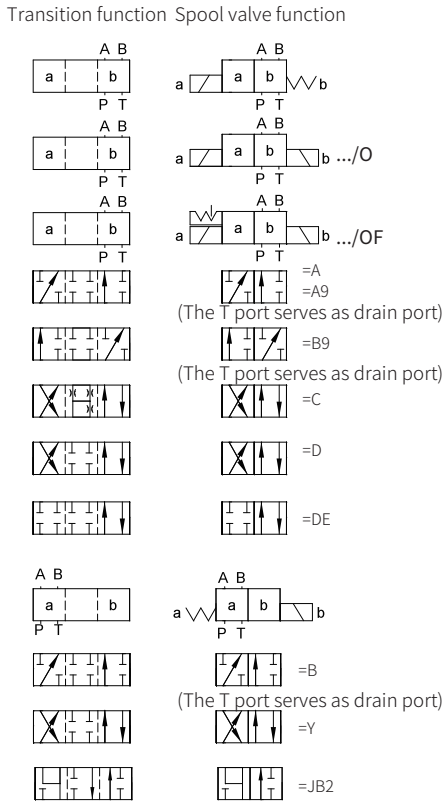
No code=no plug-in throttle port
plug-in throttle port (see table)

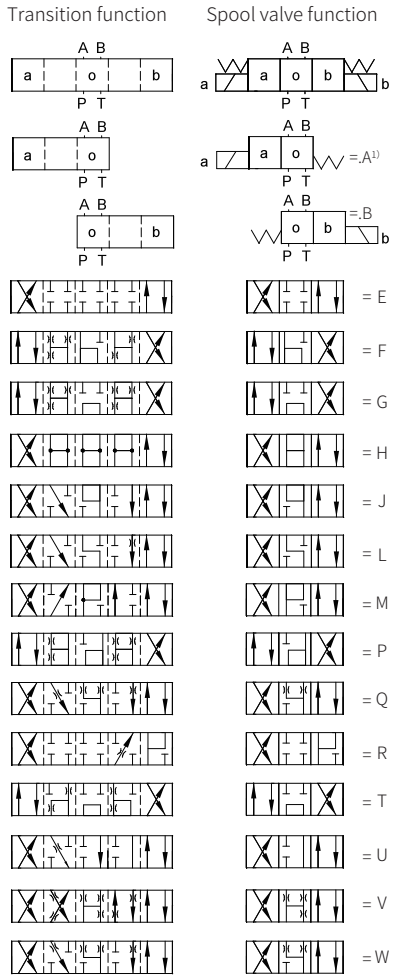
Oil port	Throttle port ∅ (mm)		
	0.8	1.0	1.2
P	=B08	=B10	=B12
A	=H08	=H10	=H12
B	=R08	=R10	=R12
A and B	=N08	=N10	=N12
T	=X08	=X10	=X12

N9= with hidden emergency button operation

Note:
G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Functional symbols





1) For example: .
The function symbol EA means the coil on side A
Note: Functions A9 and B9 are only used as pilot valves

01

Technical parameters

Hydraulic			
Maximum working pressure	Oil ports A, B, P	bar	350
	Oil port T	bar	210 When the working pressure exceeds the allowable pressure, port T must be used as the drain port for symbols A and B.
Maximum flow		L/min	120
Effective over-flow section (spool position)	symbol Q	mm^2	About 6% cross-sections
	symbol W	mm^2	About 3% cross-sections
Oil fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range		°C	-30 to +80 (NBR seal) -15 to +80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is IS04406 level 20/18/15

1) For NBR seal and FKM seal.

2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Electric				
Voltage type			DC	AC Rectifier
Available voltage[4]		v	24	36 127 220
Allowable voltage tolerance (voltage unit)		%	±10	±10
Power consumption		W	30	—
Holding power		VA	—	50
Impact power		VA	—	220
Power rate			100 %	100 %
Switching time to ISO6403	On	ms	25 to 45	10 to 20
	Off	ms	10 to 25	15 to 40
Maximum switching frequency		1/h	15000	7200

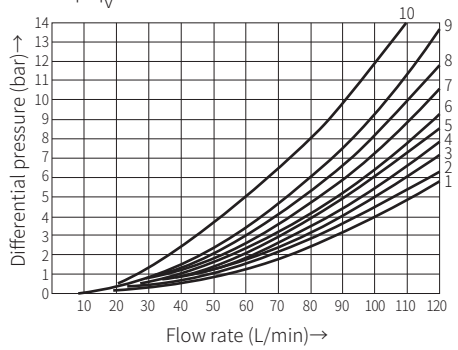
4) Other voltages are determined as required

01

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V-characteristic curve



Flow direction				
Function symbol	P - A	P - B	A - T	B - T
A,B	3	3	-	-
C	3	3	4	5
D,Y	5	5	6	6
E	1	1	4	4
F	2	3	7	4
G	3	3	6	7
H	1	1	6	7
J	1	1	3	3
L	2	2	3	5
M	1	1	4	5
P	4	2	5	7
Q	1	2	1	3
R	3	6	4	-
T	3	3	6	7
U,V	2	2	3	3
W	2	2	4	5
Switch position	P - A	B - A	A - T	P - T
R	-	9	-	-

	P - A	P - B	B - T	A - T	P - T
F	4	-	-	9	9
P	-	5	8	-	10
G,T			-	-	9
H			-	-	3

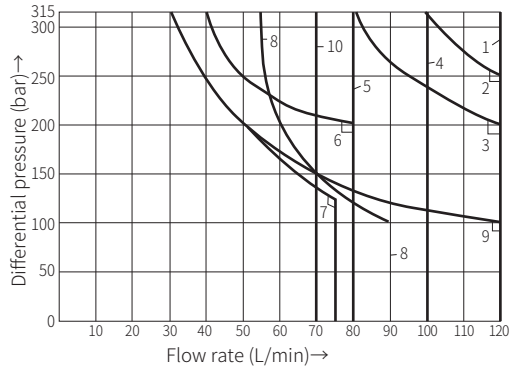
Characteristic limit

DC voltage (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The indicated switching power limit applies to two flow directions (e.g. from P to A and simultaneous return oil flow from B to T).

Due to the effect of hydraulic power inside the valve, the allowable power will be significantly reduced when there is only one flow direction (e.g. from P to A, and the B oil port is closed).

The switching power limit is measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.



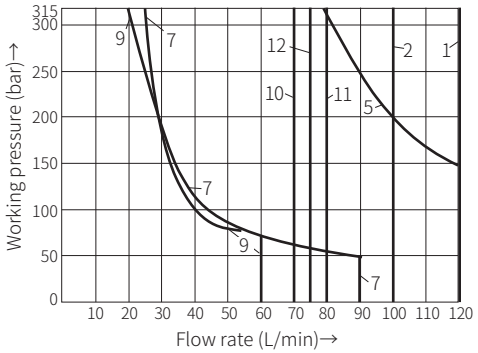
Characteristic curve	Functional symbols
1	C,C/O,C/OF D,D/O,D/OF Y,M
2	E
3	A/O,A/OF L,U,Q,W
4	H
5[1]	R,L[2] ,U[2]
6	G
7	T
8	F,P
9	A,B
10	V

1) Return oil flow (Independent from area ratio)

2) Applicable only in the middle position

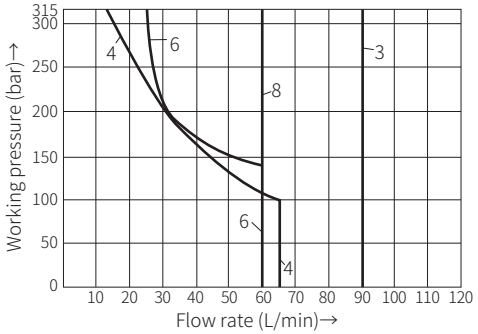
Characteristic limit

AC voltage (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

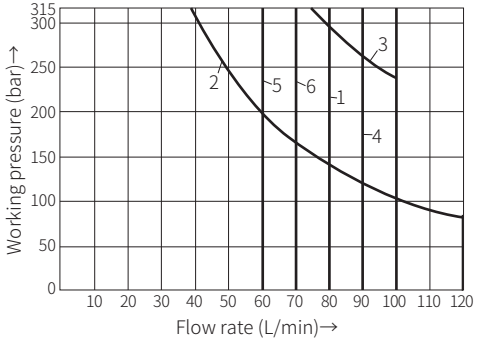


Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	E, L, U Q, W
3	M
4	A, B
5	A/O, A/OF, J
6	G
7	F, P
8	V
9	T
10	H
11	R
12[1)]	L, U

1) Applicable only in the middle position



42V, 50Hz; 110V, 50Hz; 120V, 60Hz;
127V, 50Hz; 220V, 50Hz; 240V, 60Hz



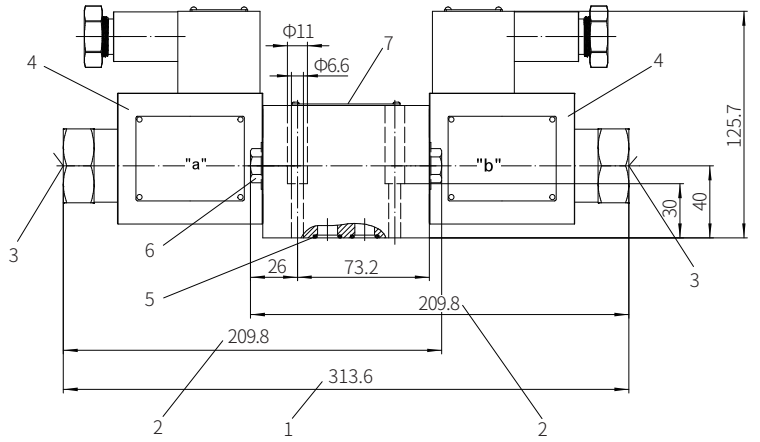
Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	A/O, A/OF
3	E
4	M
5	V
6	H

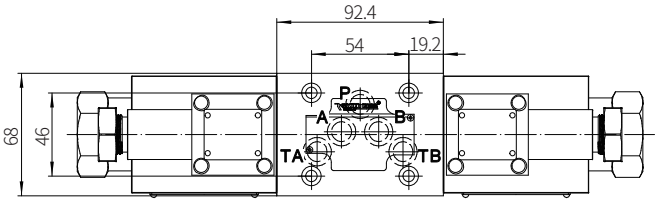
42V, 60Hz; 110V, 60Hz;
127V, 60Hz; 220v, 60Hz
Please consult us the power
limit of the special valve spools!

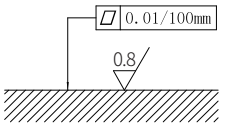
Component size

Size unit: mm

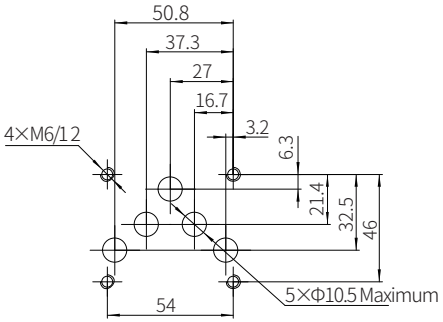
Model GD-4WE10...-3XJ/...







Required surface finishing of
mating components



1 Size of 3-position valve
2 Size of 2-position valve
3 Hidden emergency button
4 Solenoids
5 O-ring 12x2 (for oil ports P, A, B, T)
6 Plug for valve with one solenoid
7 Name plate

Valve fixing screw
M6x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8") ; G66/02 (M18x1.5)
G67/01 (G1/2") ; G67/02 (M22x1.5)
G534/01 (G3/4") ; G534/02 (M27x2)

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Explosion-proof Solenoid Operated Directional Valve with Emergency Handle

Model: GD-4WEMM6(10).../...

- Size 6 to 10
- Maximum working pressure 350 bar
- Maximum flow rate 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Functional symbols	03
Component size	04-05

Features

- The opening closing and direction of the flow controlled by the solenoid and manual
- Wet-pin solenoid with detachable coil
- The solenoid coil can rotate 90°
- Subplate mounting

Function description, sectional drawing

The GD-4WEMM directional valve is a directional spool valve operated by explosion-proof solenoid and control handle. It controls the opening, closing and flow direction of liquid flow.

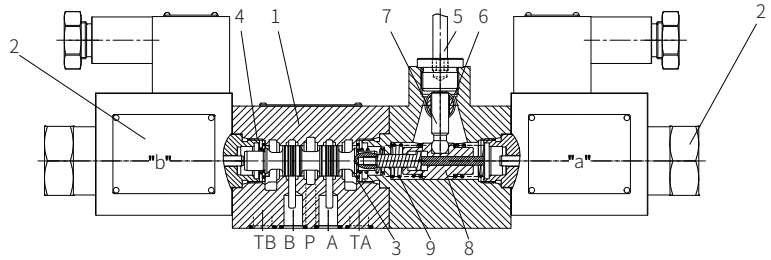
It is mainly composed of valve body (1), one or two solenoids (2), valve spool (3), reset spring (4) and manual control device.

Solenoid operation:

When the solenoid is de-energized, the valve spool (3) is held in the neutral or original position by means of the reset spring. The force of the solenoid (2) acts on the valve spool (3) to push it from the stationary position to the terminal position. In this way, the pressure oil flows from P to A and B to T, or from P to B and A to T. After the solenoid (2) is de-energized, the reset spring (4) pushes the valve spool (3) back to its original position.

Auxiliary handle operation:

When the solenoid is not energized, the valve spool (3) can be moved by operating the auxiliary handle. Turn the auxiliary handle (5) to the right so that the operating force acts on the valve spool (3) through the spindle (6), the ball valve core (7) and the guide sleeve (8) to move it to the left. When the auxiliary handle (5) returns to the zero position, the valve spool (3) returns to the original position under the action of the reset spring (9).



Model GD-4WEMM10E...3XJ/

Models and specifications

-GD- -WEMM - - J / - / *

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

explosion-proof class I =G1
explosion-proof class II =G2

explosion-proof valve

No code= without plug-in throttle
B08= throttle ϕ0.8mm
B10= throttle ϕ1.0mm
B12= throttle ϕ1.2mm

3 way =3
4 way =4

solenoid spool valve with emergency handle =WEMM

size 6 =6
size 10 =10

functional symbols

No code= no manual emergency operation
N9= with hidden manual emergency operation

size 6
design serial number =6X
size 10
design serial number =3X

Rekith =J

12V DC =G12
24V DC =G24
28V DC =G28

Note:
G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II

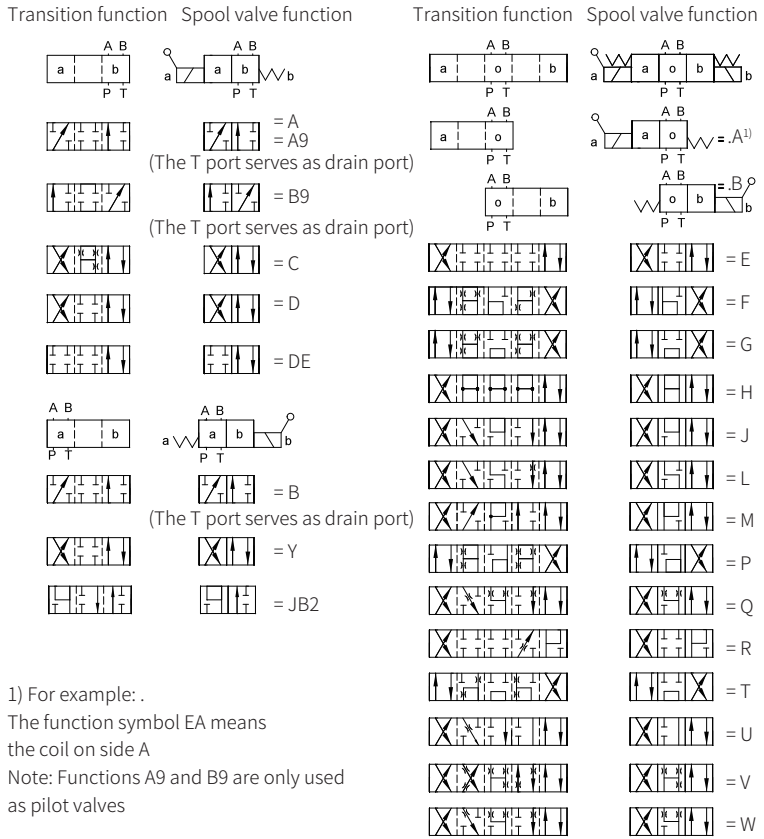
Technical parameters

Working pressure	Mpa	port A,B,P to 35
Pressure in port T	Mpa	to 16(AC), to 21(DC)
Medium		Mineral hydraulic oil or phosphate ester wave pressure oil
Viscosity range	mm^2/s	2.5 to 500
Temperature range	°C	-30 to +80

Note: For symbols A and B, port T must be used as drain port if the working pressure exceeds the allowable pressure.

For the characteristic curve and operating limit, please refer to the WE solenoid directional valve.

Functional symbols

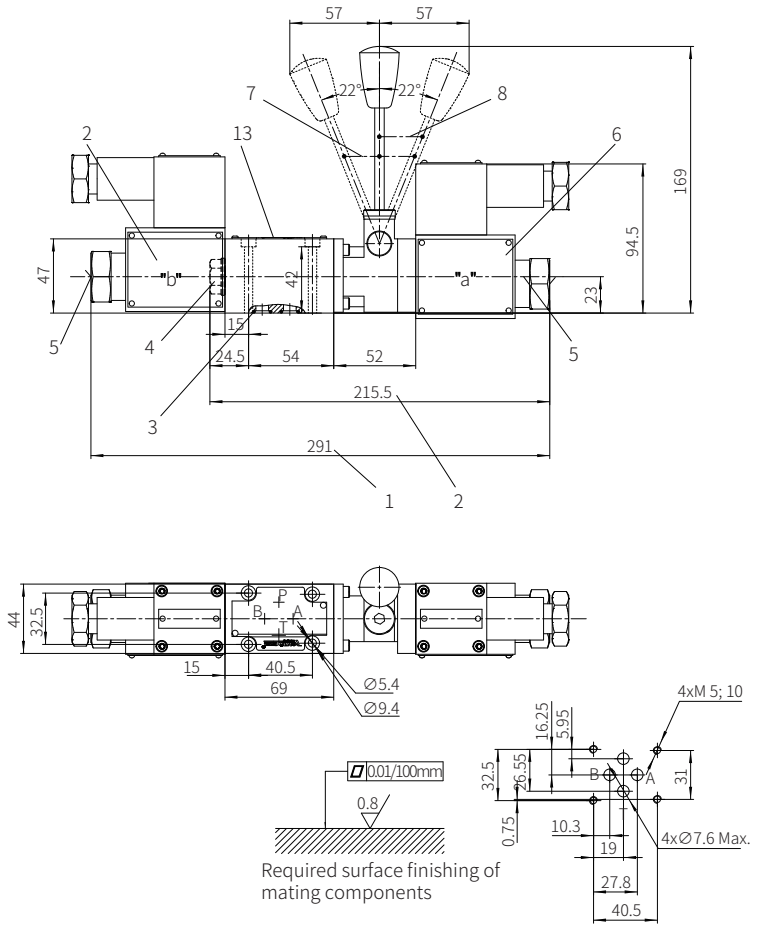


1) For example: .
The function symbol EA means the coil on side A
Note: Functions A9 and B9 are only used as pilot valves

Component size

Size unit: mm

Valve with DC solenoid
(Size 6)



1 Size of 3-position valve
2 Size of 2-position valve
3 O ring 9.25x1.78 (for oil ports P, A, B, T)
4 Plug for 2-position valve
5 Hidden emergency button
6 Solenoid
7 Switching position for 3-position valve
8 Switching position for 2-position valve

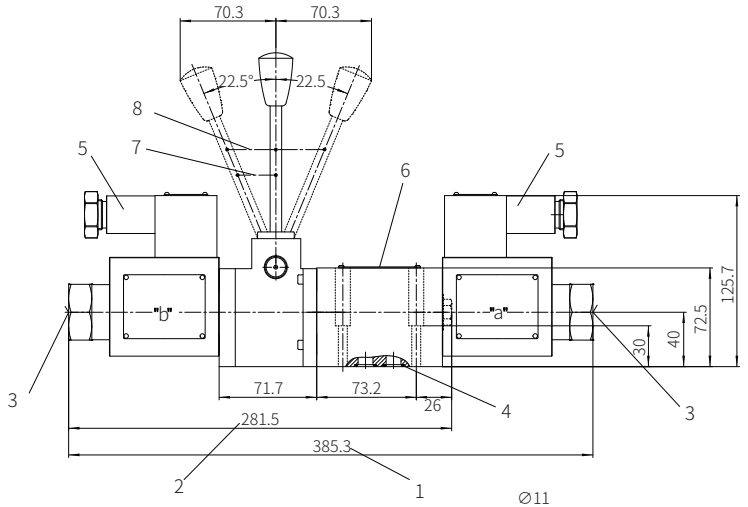
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=8.9Nm

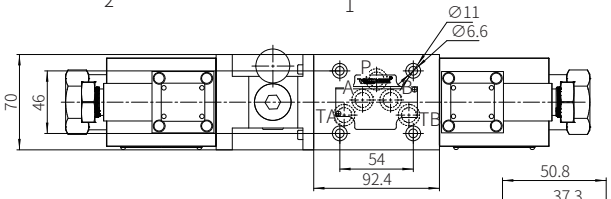
It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4"); G341/02 (M14x1.5)
G342/01 (G3/8"); G342/02 (M14x1.5)
G502/01 (G1/2"); G502/02 (M22x1.5)

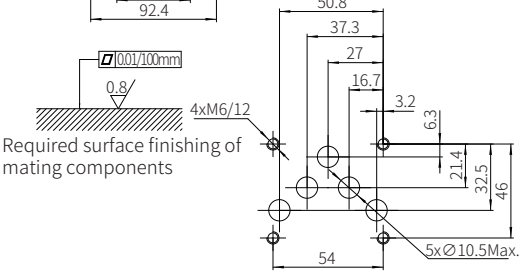
Component size

Size unit: mm

Valve with DC solenoid
(Size 10)







1 Size of 3-position valve
2 Size of 2-position valve
3 Hidden emergency button
4 O ring 12x2 (for oil ports P, A, B, T)
5 Solenoid
6 Name plate
7 Switching position for 2-position valve
8 Switching position for 3-position valve

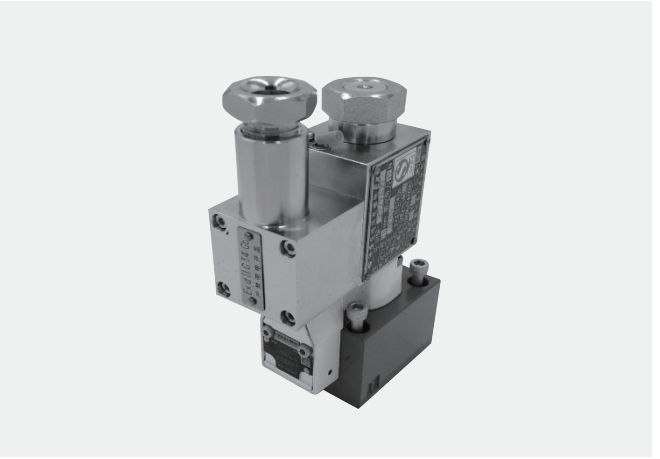
It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8"); G66/02(M18x1.5)
G67/01 (G1/2"); G67/02(M22x1.5)
G534/01 (G3/4"); G534/02 (M27x1.5)

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=15.5Nm

01

Explosion-proof Solenoid Operated Poppet Valve

Model: G-M-SEW6...3XJ



- ◆ Size 6
- ◆ Maximum working pressure 420/630 bar
- ◆ Maximum working flow 25 L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Characteristic limit	07
Component size	08-09
Application examples	10

Features

- ● Steel ball directional valve operated by explosion-proof solenoid
- ● Switching smoothly even in high-pressure state long periods
- ● Closed port without leakage

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Function description, sectional drawing

2/2-way, 3/-way poppet directional valve

The G-M-SEW directional valve is explosion-proof solenoid operated poppet valve. It is used to control the opening, closing and direction of oil.

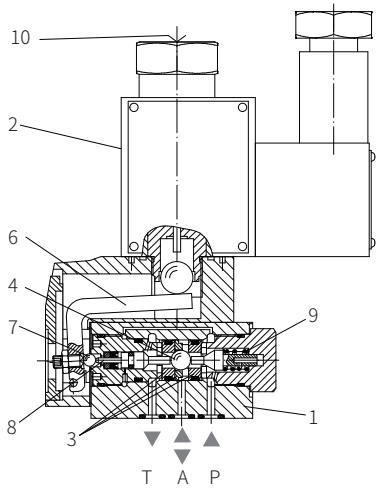
The valve is mainly composed of valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element.

Basic function:

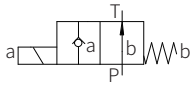
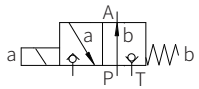
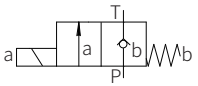
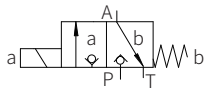
In the initial position, the spool (4) is pushed against the valve seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing elements is connected to the port P. Therefore, the valve system (3) is pressure compensated based on the actuating force (solenoid or spring). In this way, the valve can be used up to 630bar.

Note:

The 3/2-way poppet directional valve has negative cover function. Therefore, port T must be always connected. That means the ports P-A-T are connected with each other during the switching process (from the starting of the opening of one valve seat to the closing of the other valve seat). But this process is completed in a very short time, so it is irrelevant in almost all applications. It must ensure that the maximum flow does not exceed the performance limit of the valve. If necessary, the cartridge throttle can be installed to limit the flow.



Model G-M-3SEW6U...XJ/

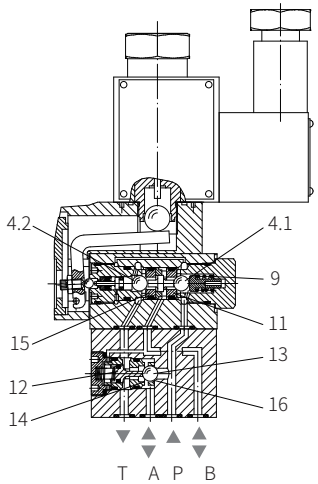
2/2-way directional seat valve		3/2-way directional seat valve	
Symbol "P"		Symbol "U"	
Initial position	P and T connected	Initial position	P and A connected, T blocked
Switching position	P blocked	Switching position	P blocked, A and T connected
Symbol "N"		Symbol "C"	
Initial position	P blocked	Initial position	P blocked, A and T connected
Switching position	P and T connected	Switching position	P and A connected, T blocked

Function description, sectional drawing

4/2-way solenoid directional seat valve G-M-4SEW6

Initial position: When the solenoid is not energized, the force of the spring (6) holds the ball spool (12) on the left valve seat (8). The port P is connected to A. The pump pressure oil acts on the large area of the control piston (15) through the control line from port A. The steel ball (13) is pushed to the other side of the valve seat (14), so P is connected to A and B to T.

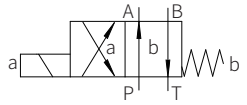
Switching position: After the solenoid is powered on, the oil port A and T are connected. In addition, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat (14). At this time, the oil port P is connected to B.



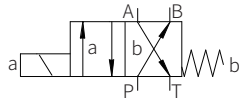
Model G-M-4SEW6Y...3XJ/

The seat valve with plus-1 plate as below:

Symbol "D"



Symbol "Y"



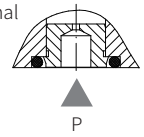
Cartridge throttle

Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required.

Example:

-Accumulator operation

-Used as a pilot valve with internal pilot oil supply



3/2-way poppet valve

The throttle is inserted into the port P of the directional valve.

4/2-way poppet valve

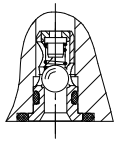
The throttle is inserted into the oil port P of the plus-1 plate.

Cartridge check valve

The cartridge check valve allows free flow from P to A and leak-free closure from A to P.

3/2-way poppet valve

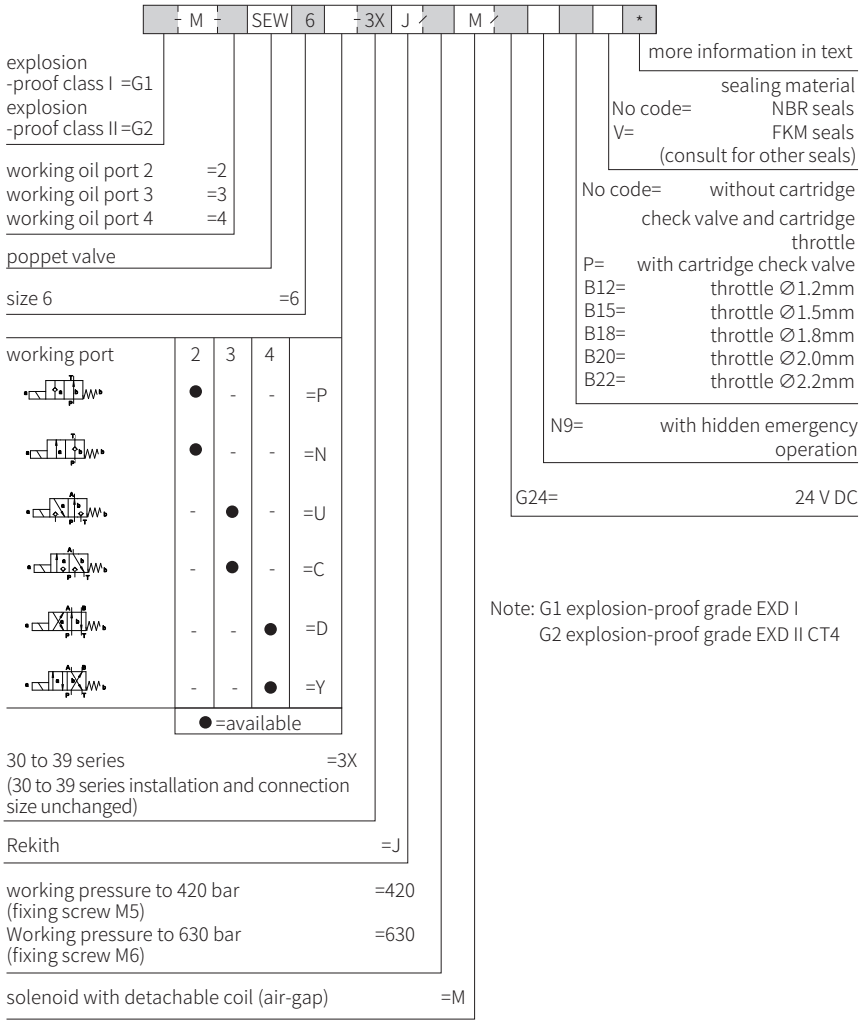
The cartridge check valve is inserted into the oil port P of the directional valve.



4/2-way poppet valve

The cartridge check valve is inserted into port P of the plus-1 plate.

Models and specifications



Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Technical parameters

Overview			
Environment temperature range		°C	-30 to +50 (NBR seal)
			-20 to +50 (FKM seal)
Weight	2/2-way valve	kg	2.7
	3/2-way valve	kg	2.7
	4/2-way valve	kg	3.5
Hydraulic			
Maximum working pressure		bar	See characteristic limit
Maximum flow		L/min	25
Hydraulic oil			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range		°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Electrical			
Voltage type			DC
Available voltage		V	24
Allowable voltage tolerance (nominal voltage)		%	±10
Power consumption		W	3
Continuous power on time		%	100
Switching time according to ISO 6403			See table below
Switching frequency		times/hour	15000
Maximum coil temperature		°C	150

The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Switching time tms (installation position: solenoid installed horizontally)

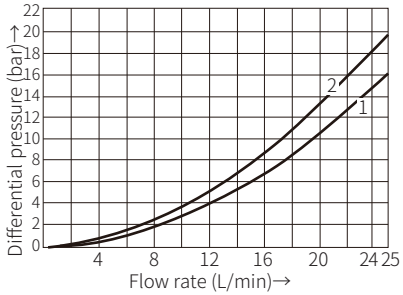
Pressure P bar	Flow q_v L/min	DC Solenoid					
		Functional symbols U, C, D, Y					
		t_{on} No tank pressure				t_{off}	
		U	C	D	Y	U/C	D/Y
140	25	25	30	25	30	10	10
280	25	25	30	25	30	10	10
320	25	25	35	25	35	10	10
420	25	25	35	25	35	10	10
500	25	25	40	25	40	10	10
600	25	25	40	25	40	10	10

Electrical protective conductor (PE ⏚) must be connected properly as rules

Characteristic curve

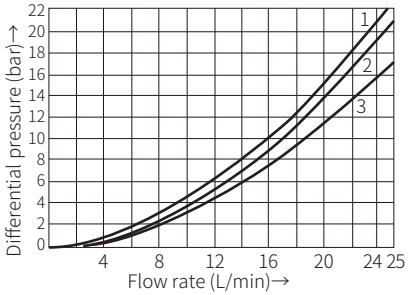
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V - characteristic curve
2/2-way poppet directional valve



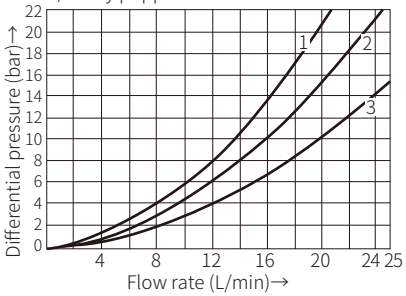
1 G-M-2SEW6N ..., P to T
2 G-M-2SEW6P ..., P to T

△p-q_V - characteristic curve
3/2-way poppet directional valve



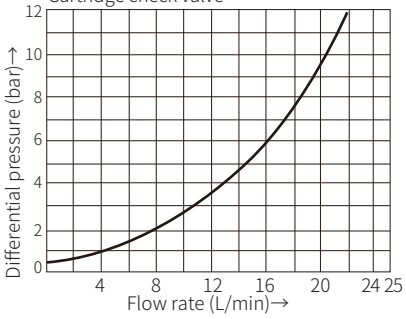
1 G-M-3SEW6 U/C ..., A to T
2 G-M-3SEW6 U ..., P to A
3 G-M-3SEW6 C ..., P to A

△p-q_V - characteristic curve
4/2-way poppet directional valve

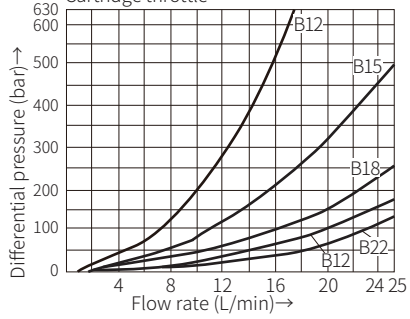


1 G-M-4SEW6 D/Y..., A to T
2 G-M-4SEW6 D/Y..., P to A
3 G-M-4SEW6 D/Y..., P to B, B to T

△p-q_V - characteristic curve
Cartridge check valve



△p-q_V - characteristic curve
Cartridge throttle



Characteristic limit

	Functional symbol	comment	Working pressure bar P	A	B	T	Flow L/min
Two-way circuit	"P"	Oil port pressure P≥T	420/630			100	25
	"N"		420/630			100	25
Three-way circuit	"U"	Oil port pressure P≥A≥T	420/630	420/630		100	25
	"C"		420/630	420/630		100	25
Two way circuit (Only for unloading function)	"U"	Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure A≥T		420/630		100	25
	"C"	Oil port pressure A≥T		420/630		100	25
Four-way circuit (flow only in the direction of arrow)	"D"	Single poppet valve (symbol "U") with plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	25
	"Y"	Double poppet valve (symbol "C") with plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	25

Note:

-In order to operate the valve safely or keep it in the switching position, the oil port pressure P≥A≥T (based on the structure).

-The ports P, A and T (3/2-way valve), and ports P, A. B and T (4/2-way valve) are configured according to their functions and must not be blocked or used in other ways. Liquid flow is only allowed in the direction of the arrow.

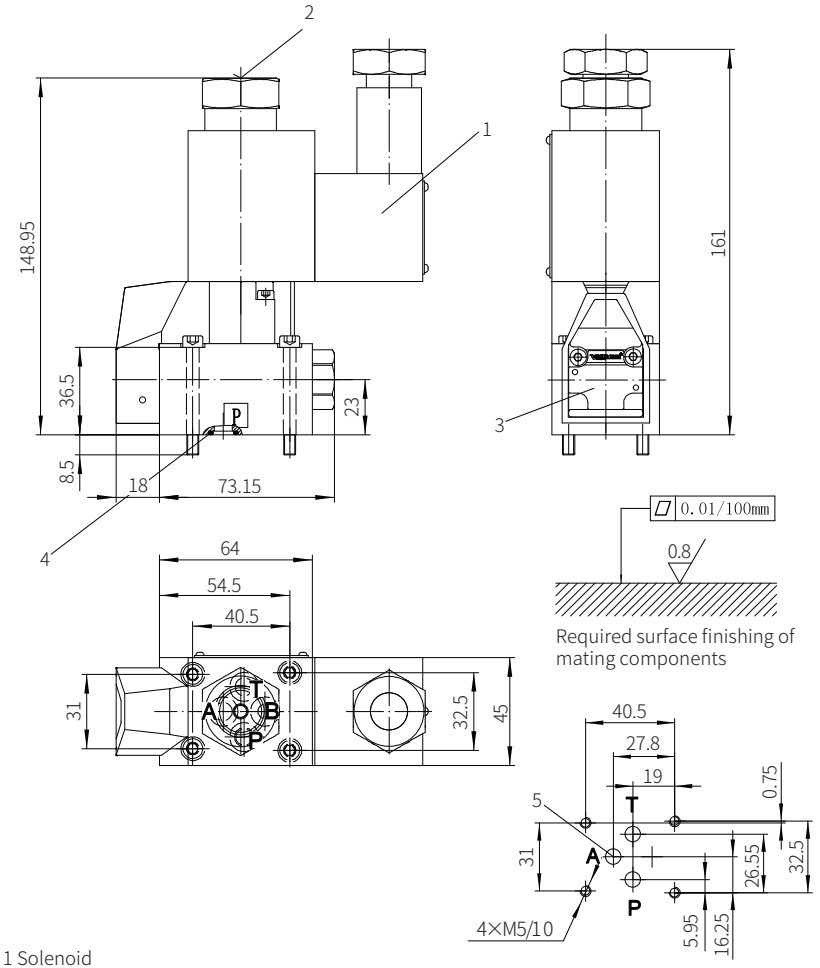
- When using the plus-1 plate (4/2-way valve), the following data must be met: Pmin=8bar; Q>3 L/min
- The specified maximum flow should not be exceeded.

The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

Component size

Size unit: mm

2/2 and 3/2-way poppet directional valve



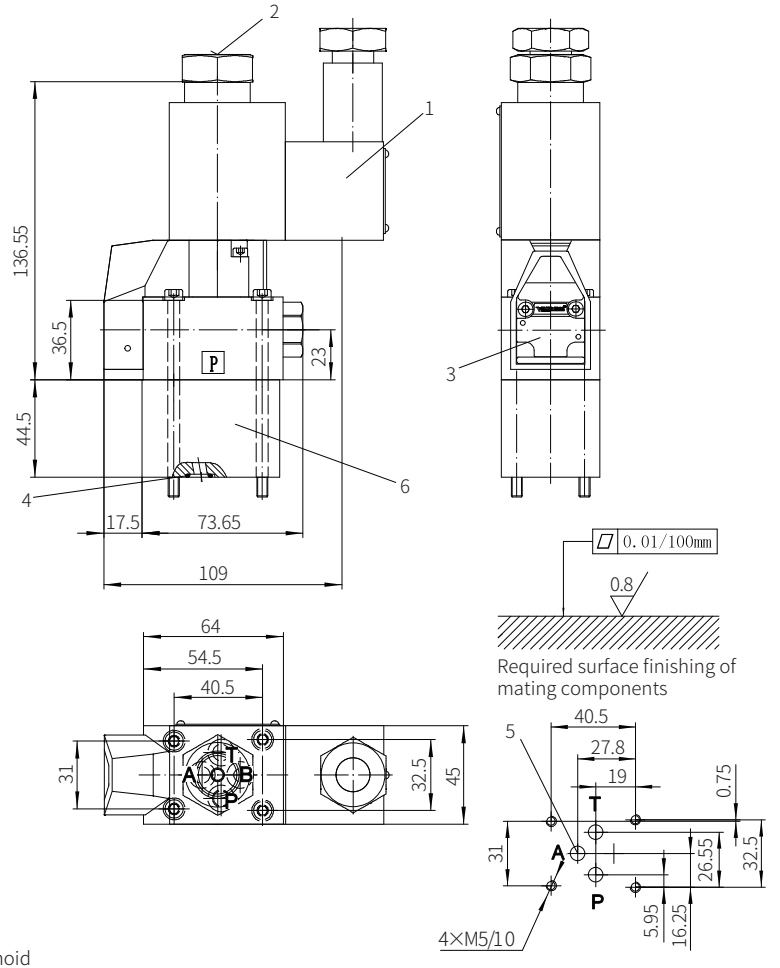
1 Solenoid
2 Hidden emergency button
3 Name plate
4 O-ring 10x2(for oil port P)
O-ring 9.25x1.78(for oil ports B, A, T) 420bar type
O-ring 9.25x1.78(for oil ports P, B, A, T) 630bar type
5 Port A and B are blind holes for 2/2-way valve
Port B is a blind hole for 3/2-way valve

Valve fixing screw
Version 420 bar
M5x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
Version 630 bar
M6x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Component size

Size unit: mm

4/2-way poppet directional valve

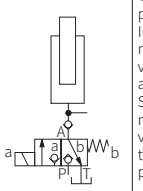
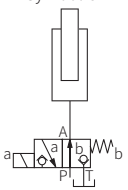
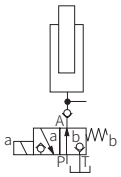
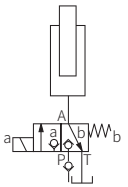
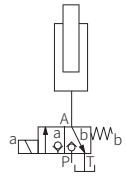
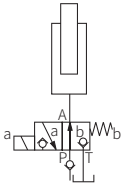


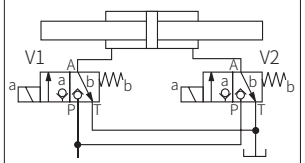
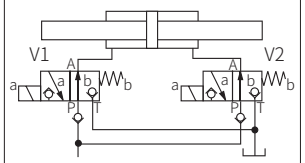
1 Solenoid
2 Hidden emergency button
3 Name plate
4 O-ring 10x2(for oil port P)
O-ring 9.25x1.78(for oil ports B, A, T)
5 Port A and B are blind holes for 2/2-way valve
Port B is a blind hole for 3/2-way valve
6 Plus-1 plate

Valve fixing screw
Version 420 bar
M5x90-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
Version 630 bar
M6x90-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Application examples

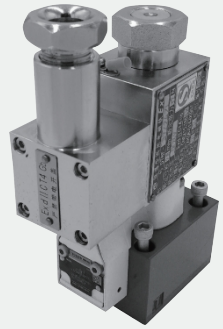
These examples only indicate some applications of the poppet valve but not include all functions.

Symbol C 	2/2-way circuit with two poppet valves and check valve at port A The check valve must be installed on the pipeline. Initial position: the flow is blocked and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The fluid flows freely and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol U 	3/2-way circuit with a single poppet valve Initial position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P. Switching position: Descending
Symbol U 	2/2-way circuit with a single poppet valve and check valve at port A The check valve must be installed on the pipeline. Initial position: The fluid flows freely and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The flow blocked and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol C 	3/2-way circuit with two poppet valves and cartridge check valve at port A The check valve is installed at port P of the 3/2-way directional poppet valve. Initial position: Descending Switch position: Lifting The load can be held in any position when the pump is turned off and the solenoid is energized.
Symbol C 	3/2-way circuit with two poppet valves Initial position: Descending Switch position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P.	Symbol U 	3/2-way circuit with a single poppet valve and cartridge check valve at port P The check valve is installed at port P of the 3/2-way popper valve. Initial position: Lifting The load can be held in any position when the pump is turned off. Switching position: Descending

Symbol C 	4/3-way (4/4-way) circuit with two poppet valves V1 and V2 in the initial position: both ends of the cylinder are connected to the oil tank port. V2 in the switching position: the piston moves to the left. V1 in the switching position: the piston moves to the right. V1 and V2 in the switching position: both ends of the cylinder are connected to the pump port. The fast movement is possible when a single rod cylinder with an area ratio of 2:1 is used. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!
Symbol U 	4/3-way (4/4-way) circuit with two poppet valves and cartridge check valve at port P of the 3/2-way poppet valve V1 and V2 in the initial position: the piston is locked externally to prevent oil flow. V2 in the switching position: the piston moves to the right. V1 in the switching position: the piston moves to the left. V1 and V2 in the switching position: both ends of the cylinder are connected to the tank port. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum allowable working pressure (overpressure) must be taken into account!

Explosion-proof Solenoid Operated Poppet Valve

Model: G-M-SEW10...1XJ



- Size 10
- Maximum working pressure 420/630 bar
- Maximum working flow 40 L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Characteristic limit	06
Component size	07-09
Application examples	10

Features

- Closed port without leakage
- Switching flexibility even in high-pressure state long periods
- Air-gap DC solenoid with detachable coil
- Solenoid coil can be rotated 90°

Function description, sectional drawing

3/2-way directional seat valve

General:

The G-M-SEW directional valve is explosion-proof solenoid operated poppet valve. It is used to control the opening, closing and direction of liquid flow.

The valve mainly includes valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element.

Basic function:

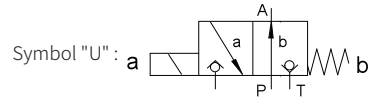
In the initial position, the spool (4) is pushed to the seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod (8) which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing elements is connected to the port P. Therefore, the valve system (3) is pressure compensated based on the actuating force (solenoid or spring). In this way, the valve can be used up to 630bar.

Note:

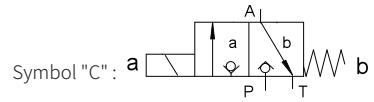
The 3/2-way poppet directional valve has negative cover function. Therefore, the port T must be always connected. That means the ports P-A-T are connected with each other during the switching process (from the starting of the opening of one valve seat to the closing of other valve seat). But this process is completed in a very short time, so it is irrelevant in almost all applications.

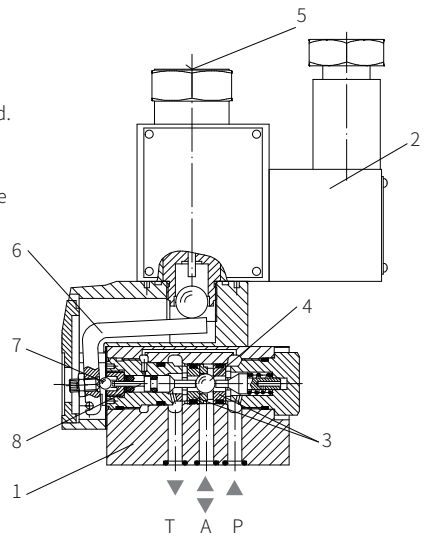
It must ensure that the maximum flow does not exceed the performance limit of the valve. If necessary, the cartridge throttle can be installed to limit flow.

Symbol "U" :



Symbol "C" :





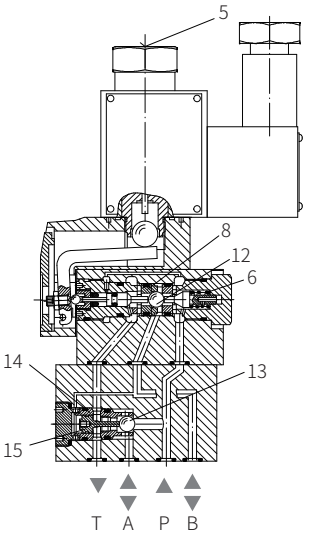
Model G-M-3SEW10U...1XJ/

Function description, sectional drawing

4/2-way poppet directional valve

Initial position: When the solenoid is not energized, the force of the spring (6) holds the ball spool (12) on the left valve seat (8). The port P is connected with A. The pump pressure oil acts on the large area of the control piston (15) through the control line from port A. The steel ball (13) is pushed to the other side of the valve seat (14), so the oil port P is connected to A and B to T.

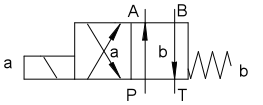
Switching position: After the solenoid is powered on, the oil port A and T are connected. In addition, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat (14). At this time, the oil port P is connected to B.



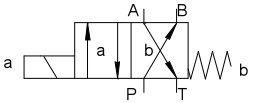
Model G-M-4SEW10D...1XJ/

The seat valve with plus-1 plate as below:

Symbol "D"



Symbol "Y"



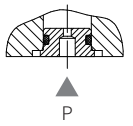
Cartridge throttle

Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required.

Example:

-Accumulator operation

-Used as a pilot valve with internal pilot oil supply



3/2-way poppet valve

The throttle is inserted into the port P of the directional valve.

4/2-way poppet valve

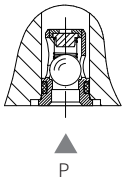
The throttle is inserted into the oil port P of the plus-1 plate.

Cartridge check valve

The cartridge check valve allows free flow from P to A and leak-free closure from A to P.

3/2-way poppet valve

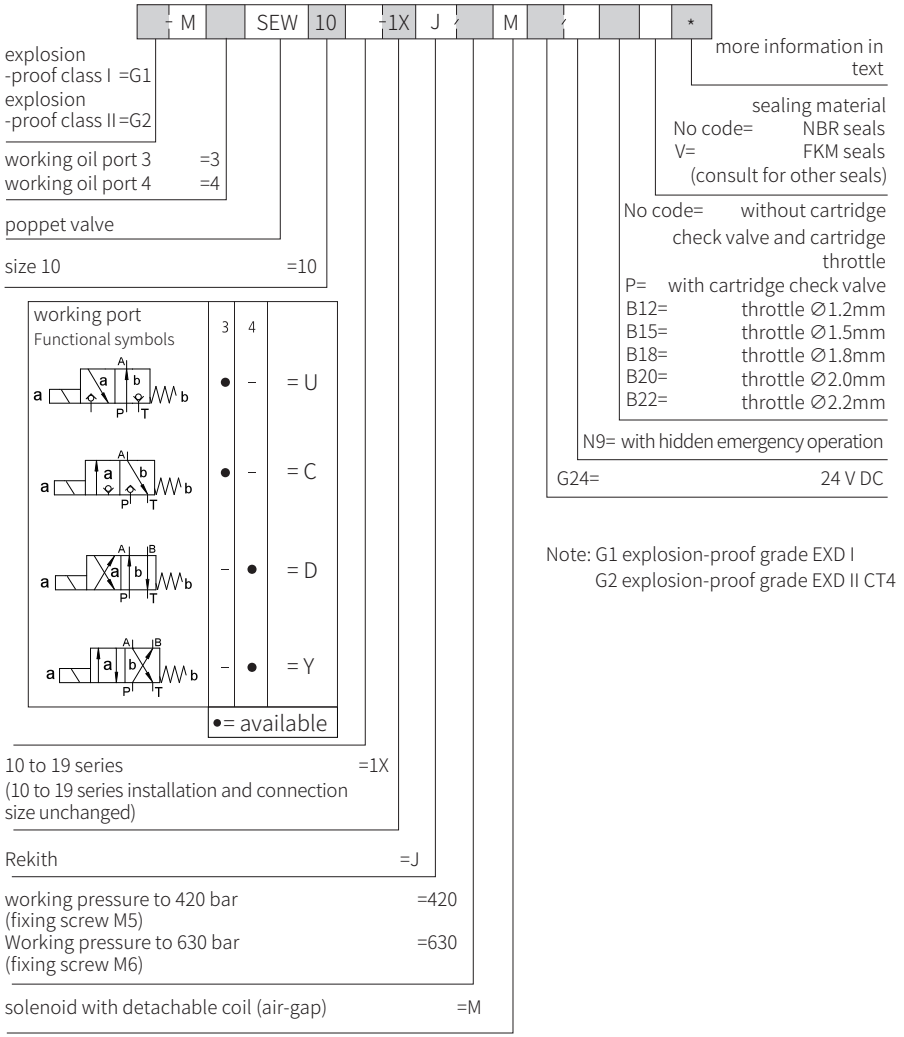
The cartridge check valve is inserted into the oil port P of the directional valve.



4/2-way poppet valve

The cartridge check valve is inserted into port P of the plus-1 plate.

Models and specifications



Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Technical parameters

Overview		
Installation position		Optional
Environment temperature range	°C	-30 to +50 (NBR seal)
		-20 to +50 (FKM seal)
Hydraulic		
Maximum working pressure	bar	See characteristic curve
Maximum flow	L/min	40
Hydraulic oil		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Oil temperature range		-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil[4]		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Electrical		
Voltage type		DC
Available voltage[3]	V	24
Allowable voltage tolerance (nominal voltage)	%	±10
Power consumption	W	30
Continuous power on time	%	100
Switching time according to ISO 6403		See table below
Switching frequency	times/hour	15000
Protection type to DIN 40 050		IP 65 with plug installed and fixed
Maximum coil temperature	°C	150

1) For NBR seal and FKM seal
2) Only for FKM seal
3) Please inquire for special voltages
4) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Electrical protective conductor (PE ⏚) must be connected properly as rules

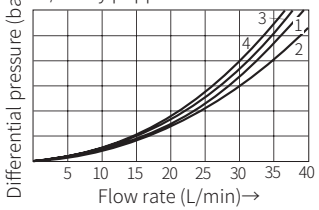
Switching time tms

Pressure P bar	Flow q_V L/min	DC Solenoid Functional symbols U, C, D, Y					
		t_{on}No tank pressure				t_{off}	
		U	C	D	Y	U/C	D/Y
140	40	20	40	20	40	12	17
280	40	25	45	20	45	12	17
320	40	25	45	20	45	12	17
420	40	30	45	20	50	12	17
500	40	30	45	20	50	12	17
600	40	30	50	20	50	12	17

Characteristic curve

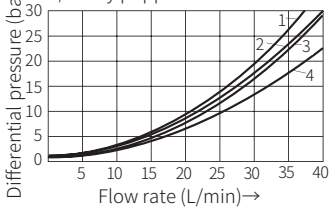
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V - characteristic curve
3/2-way poppet directional valve



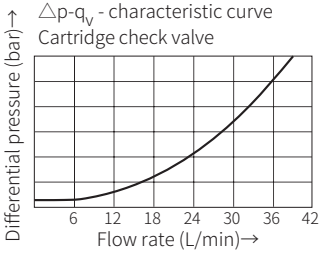
1 G-M-3SEW10 C..., P to A
2 G-M-3SEW10 C..., A to T
3 G-M-3SEW10 U..., P to A
4 G-M-3SEW10 U..., A to T

△p-q_V - characteristic curve
4/2-way poppet directional valve

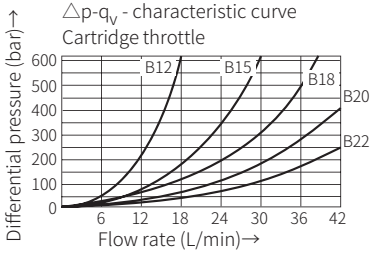


1 G-M-4SEW10 $^{D}_{Y}$ ..., A to T
2 G-M-4SEW10 $^{D}_{Y}$ ..., P to A
3 G-M-4SEW10 $^{D}_{Y}$ ..., P to B
4 G-M-4SEW10 $^{D}_{Y}$ ..., B to T

△p-q_V - characteristic curve
Cartridge check valve



△p-q_V - characteristic curve
Cartridge throttle



Characteristic limit

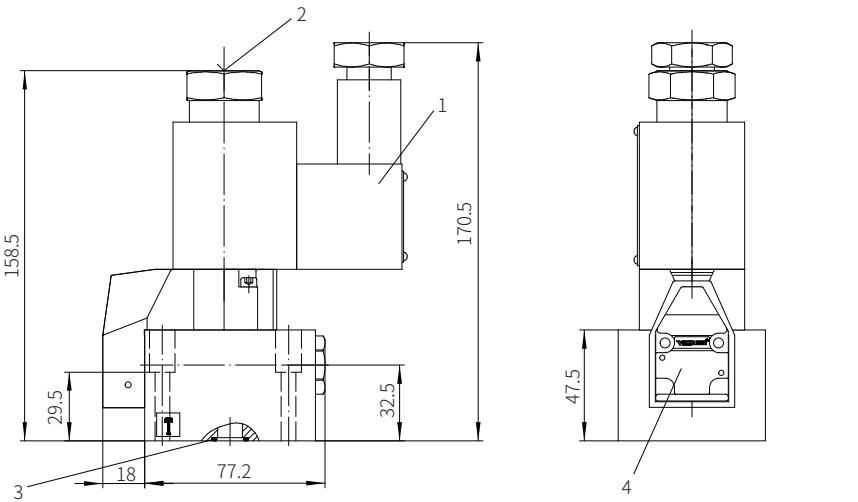
	Functional symbol	comment	Working pressure bar P	A	B	T	Flow L/min
Three-way circuit	"U"	Oil port pressure P≥A≥T	420/630	420/630		100	40
	"C"		420/630	420/630		100	40
Two way circuit (Only for unloading function)	"U"	Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure A≥T		420/630		100	40
	"C"	Oil port pressure A≥T		420/630		100	40
Four-way circuit (flow only in the direction of arrow's)	"D"	Single poppet valve (symbol "U") with the plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	40
	"Y"	Double poppet valve (symbol "C") with the plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	40

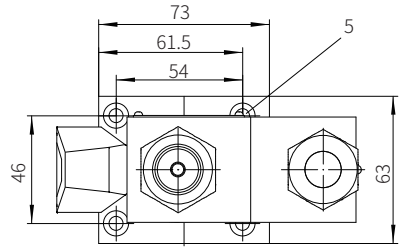
The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

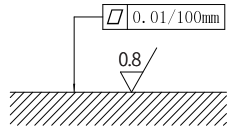
Component size

Size unit: mm

3/2-way poppet directional valve, 420bar



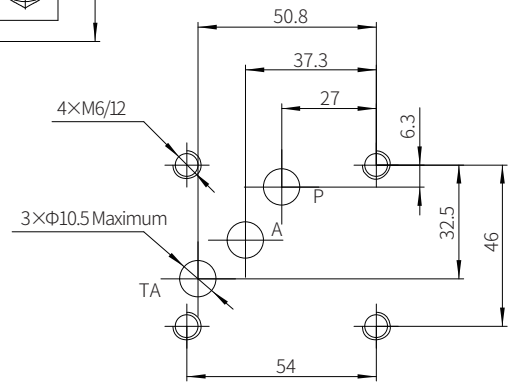




Required surface finishing of mating components

1 Solenoid
2 Hidden emergency button
3 O-ring 10x2(for oil ports A, B, T)
O-ring 14x1.78(for oil port P)
4 Name plate
5 Valve connecting holes

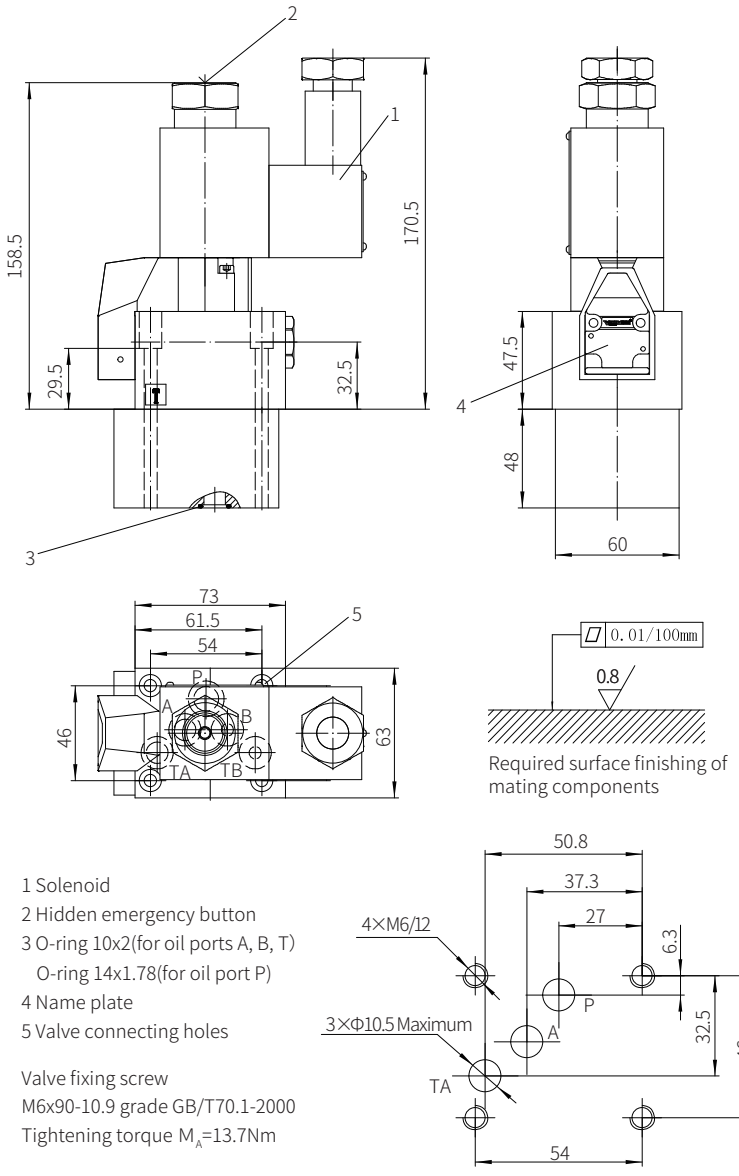
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm



Component size

Size unit: mm

4/2-way poppet directional valve, 420bar



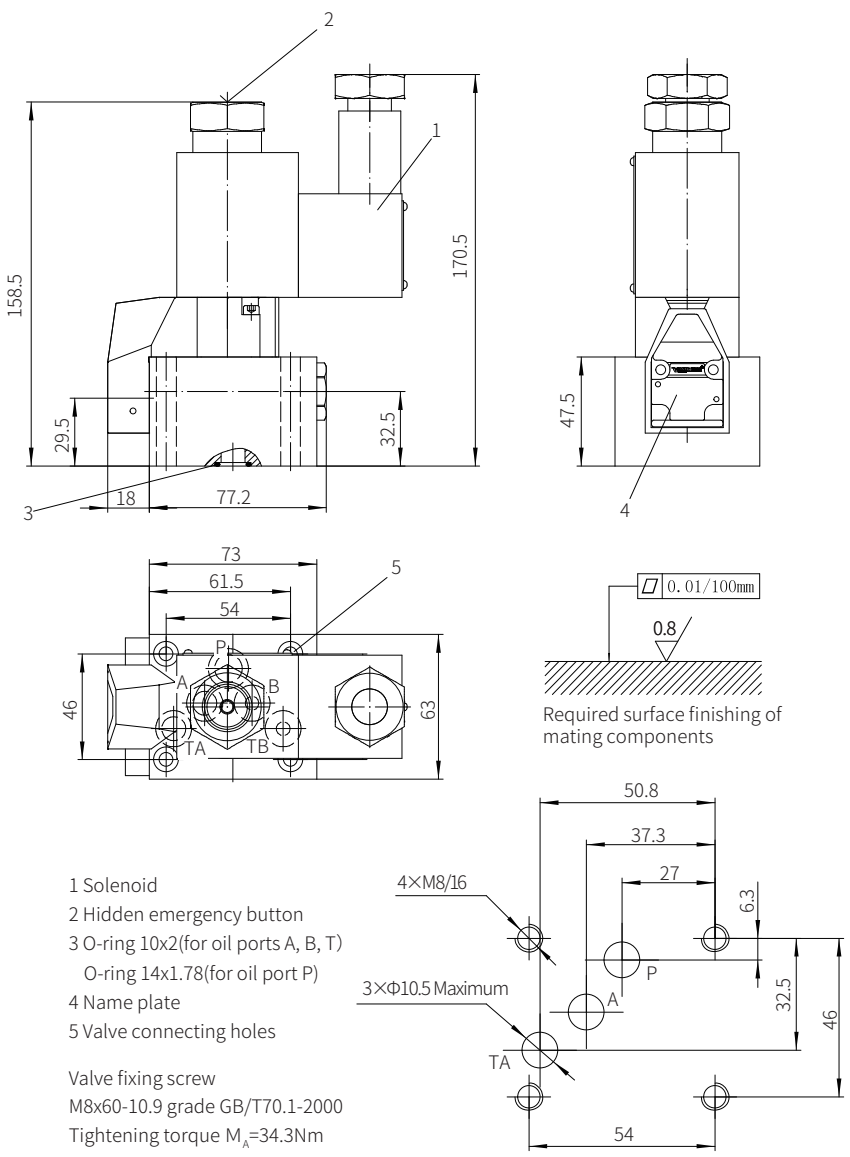
1 Solenoid
2 Hidden emergency button
3 O-ring 10x2(for oil ports A, B, T)
O-ring 14x1.78(for oil port P)
4 Name plate
5 Valve connecting holes

Valve fixing screw
M6x90-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Component size

Size unit: mm

3/2-way poppet directional valve, 630bar

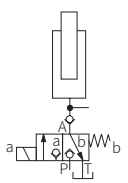
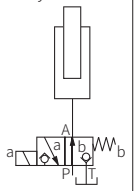
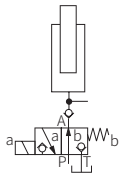
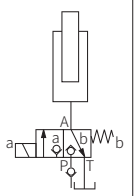
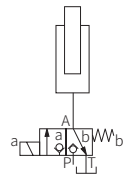
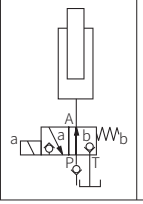
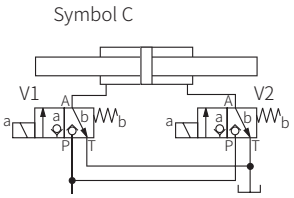
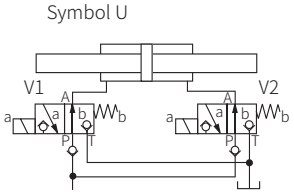


1 Solenoid
2 Hidden emergency button
3 O-ring 10x2(for oil ports A, B, T)
O-ring 14x1.78(for oil port P)
4 Name plate
5 Valve connecting holes

Valve fixing screw
M8x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

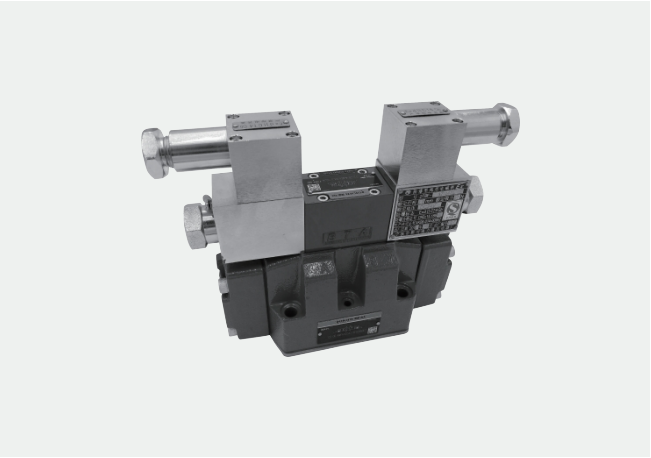
Application examples

These examples only indicate some applications of the poppet valve but not include all functions.

Symbol C 	2/2-way circuit with two poppet valves and check valve at port A The check valve must be installed on the pipeline. Initial position: the flow is blocked and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The fluid flows freely and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol U 	3/2-way circuit with a single poppet valve Initial position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P. Switching position: Descending
Symbol U 	2/2-way circuit with a single poppet valve and check valve at port A The check valve must be installed on the pipeline. Initial position: The fluid flows freely and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The flow blocked and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol C 	3/2-way circuit with two poppet valves and cartridge check valve at port A The check valve is installed at port P of the 3/2-way directional poppet valve. Initial position: Descending Switch position: Lifting The load can be held in any position when the pump is turned off and the solenoid is energized.
Symbol C 	3/2-way circuit with two poppet valves Initial position: Descending Switch position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P.	Symbol U 	3/2-way circuit with a single poppet valve and cartridge check valve at port P The check valve is installed at port P of the 3/2-way popper valve. Initial position: Lifting The load can be held in any position when the pump is turned off. Switching position: Descending
Symbol C 	4/3-way (4/4-way) circuit with two poppet valves V1 and V2 in the initial position: both ends of the cylinder are connected to the oil tank port. V2 in the switching position: the piston moves to the left. V1 in the switching position: the piston moves to the right. V1 and V2 in the switching position: both ends of the cylinder are connected to the pump port. The fast movement is possible when a single rod cylinder with an area ratio of 2:1 is used. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!		
Symbol U 	4/3-way (4/4-way) circuit with two poppet valves and cartridge check valve at port P of the 3/2-way poppet valve V1 and V2 in the initial position: the piston is locked externally to prevent oil flow. V2 in the switching position: the piston moves to the right. V1 in the switching position: the piston moves to the left. V1 and V2 in the switching position: both ends of the cylinder are connected to the tank port. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum allowable working pressure (overpressure) must be taken into account!		

Explosion-proof Electro-hydraulic Directional Valve

Model: G-WEH...4X/6X/7XJ



- Size 10~32
- Maximum working pressure 350 bar
- Maximum working flow 1100 L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04
Functional symbols	05-07
Technical Parameters	08-09
Characteristic curve	10-14
Characteristic limit	10-14
Switching time adjustment, pressure reducing valve and pre-load valve	15
Component size	16-24

Features

- Mainly used to control the opening closing and flow direction of liquid flow
- Subplate mounting
  The mounting surface according to DIN24340 form A and ISO4401
- Spring or hydraulic centered
  Spring or hydraulic return to initial position
- Explosion-proof solenoid
- Optional switching time adjustment
- Optional pre-load valve in port P of the main valve

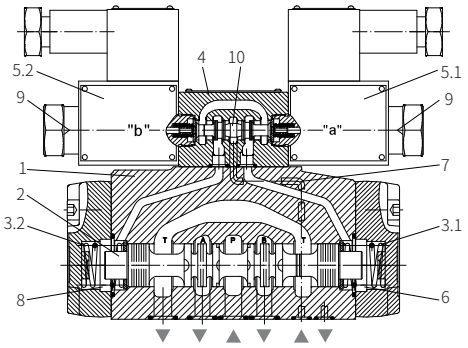
Function description, sectional drawing

The G-WEH directional valve is a directional spool valve with explosion-proof electro-hydraulic operation. It is used to control the opening, closing and direction of the liquid flow.

The valve mainly consists of valve body (1), control spool (2), main valve with one or two reset springs (3.1) and (3.2), pilot valve (4) with one or two explosion-proof solenoids "a" (5.1) and "b" (5.2).

The main control spool is held in the neutral or initial position by springs or pressure. For the valve with spring-centered, the two spring chambers (6) and (8) are connected to the oil tank through the pilot valve in the initial position. The pilot valve (4) is supplied with oil through the control line (7). The control oil can be supplied internally or externally (externally via port X).

The main control spool (2) is hydraulically operated by the pilot valve (4). Due to the operating of the pilot valve on one end of the main control spool, the spool moves to the operation position, then the valve opens in the operation direction and the fluid flows from P to A and B to T or P to B and A to T. The control oil can be drained internally or externally.

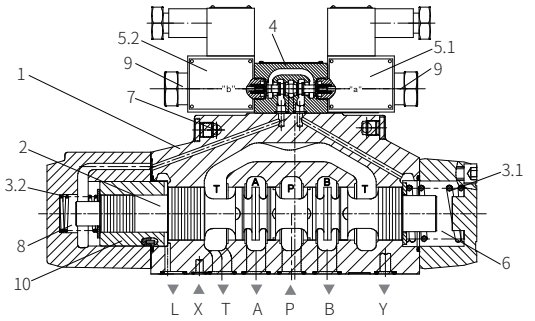


Model G-4WEH...XJ/

4/3-way directional valve with hydraulic centered of main valve, model WEH..H/

In this structure, pressure oil acts on both end surfaces of the main control spool (2). The centering sleeve (10) locates the main control spool (2) and keeps it in the middle position.

If one end of the main spool (2) is unloaded, the main spool (2) moves to the working position under the pressure from the other end, thereby changing the direction of the oil flow. The unloaded control spool face displaces the returning pilot oil into port Y externally through the pilot valve (4). The oil is drained internal from port L to the tank directly.



Structural diagram of electro-hydraulic directional valve with hydraulic centered

Model G-4WEH...H/

1 Main valve
2 Main control spool
3.1 Spring
3.2 Spring
4 Pilot solenoid valve
5.1 Solenoid A
5.2 Solenoid B
6 Spring chamber
7 Control oil inlet channel
8 Spring chamber
9 Manual operation
10 Centering sleeve

Function description, sectional drawing

Pilot oil supply

1、Model G-WEH10

(1) Conversion between internal supply and external supply:

The channel P on the top of the main valve body with M6 screw (3) is external supply, and is internal supply when M6 screw (3) dismounted.

(2) Conversion between internal drain and external drain:

Removing the plug (1) and installing M6 screw (2) is external drain, dismounting the M6 screw (2) is internal drain.

2、Model G-WEH16

(1) Conversion between internal supply and external supply:

The channel P on the bottom of the main valve with M6 screw (8) is external supply, and is internal supply when M6 screw (8) dismounted.

(2) Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (7) is external drain, and is internal drain when M6 screw (7) dismounted.

3、Model G-WEH25

(1) Conversion between internal supply and external supply:

The channel P on the top of the main valve with M6 screw (9) is external supply, and is internal supply when M6 screw (9) dismounted.

(2) Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (10) is external drain, and is internal drain when M6 screw (10) dismounted.

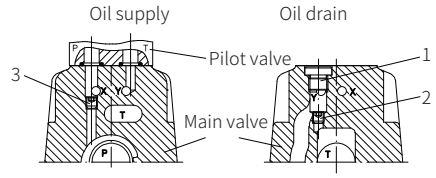
4、Model G-WEH32

(1) Conversion between internal supply and external supply:

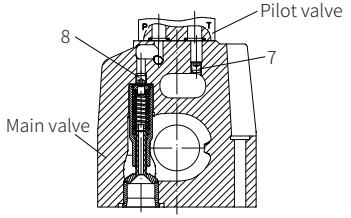
The channel P on the top pf the main valve with M6 screw (11) is external supply, and is internal supply when M6 screw (11) dismounted.

(2) Conversion between internal drain and external drain:

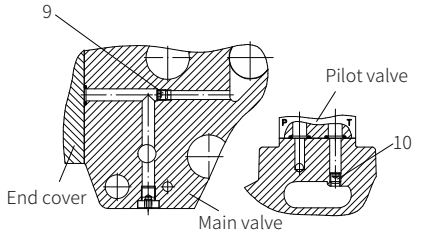
The channel T on the top of the main valve with M6 screw (12) is external drain and is internal drain when M6 screw (12) dismounted.



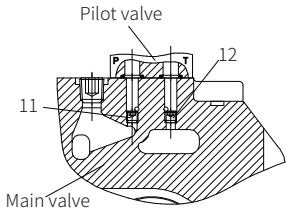
Model G-WEH10...4XJ/



Model G-WEH16...7XJ/



Model G-WEH25...XJ/



Model G-WEH32...XJ/

Models and specifications

working pressure to 35MPa =no code
explosion-proof class I =G1
explosion-proof class II =G2
four-way version =4
electro-hydraulic =WEH
size
size 10 =10
size 16 =16
size 22 =22
size 25 =25
size 32 =32
main valve hydraulic return or centered =H
main valve spring return or centered =No code
functional symbols (see functional symbol diagram)
40 to 49 series (size 10) =4X
60 to 69 series (size 25, 32) =6X
70 to 79 series (size 16, 22) =7X
Rekith =J
when the pilot valve is a 2-position valve with two solenoids and hydraulic return in the main valve
without reset spring =O
without reset spring with detent =OF
solenoid with threaded connection =6E
DC voltage 24V =G24
AC rectified voltage 36V, 220V =B36、B220
for other voltages and frequencies, see directional valve WE6
with hidden manual emergency operation =N9

1) For internal oil supply
*Minimum control pressure: see page 292

*To avoid impermissible maximum force peaks, a throttle (B10) must be installed in port P of the pilot valve

2) Only in conjunction with throttle "B10"

3) G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

pilot oil supply
No code= pilot oil supply and drain external
E= pilot oil supply internal and drain external
ET[1)]= pilot oil supply and drain internal
T= pilot oil supply external and drain internal
(for model 4WH...only available as "no code")
(the 3-position valve with hydraulic centered in ET and T types must meet: P pilot ⩾ 2xP tank + P pilot min)

No code= without switching time adjustment
S= switching time adjustment as meter-in control
S2= switching time adjustment as meter-out control

electrical connection
K4= no insert plug
Z5L= large right angle lamp plug
FS2= deutsch water-proof plug
DL= connection box with lamp, centralized connection

additional device number (see additional device drawing)

pre-load valve(not for size 10)
No code=without pre-load valve
P4.5= with pre-load valve, cracking pressure 0.45MPa
P6.0= with pre-load valve, cracking pressure 0.6MPa

No code= without pressure reducing valve
D3[2)]= with pressure reducing valve

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

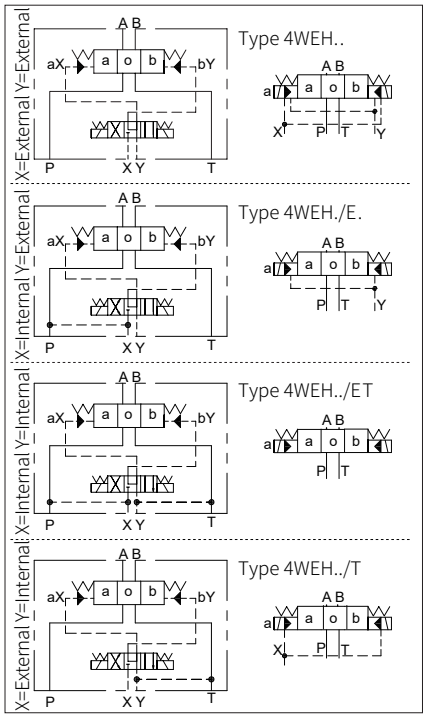
more information in text

No code = without manual emergency operation
N9= with hidden manual emergency operation

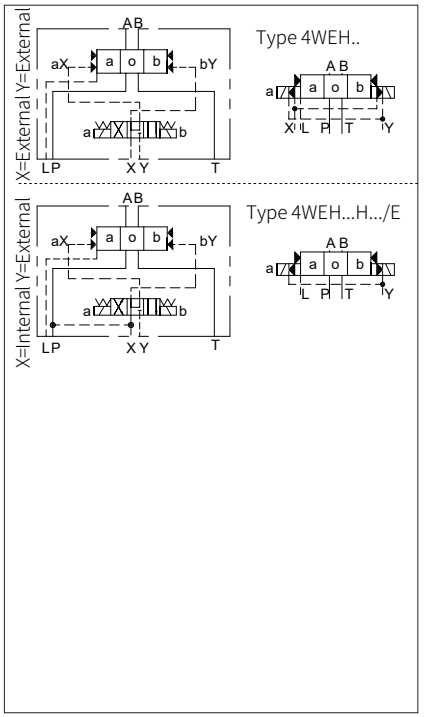
Functional symbols

Detailed and simplified symbols for 3-position directional valves

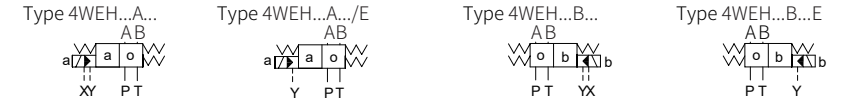
Spring centered



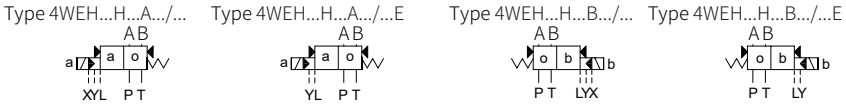
Hydraulic centered



Spring return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Hydraulic return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Functional symbols

Functional symbols of 3-position valves

3-position valve

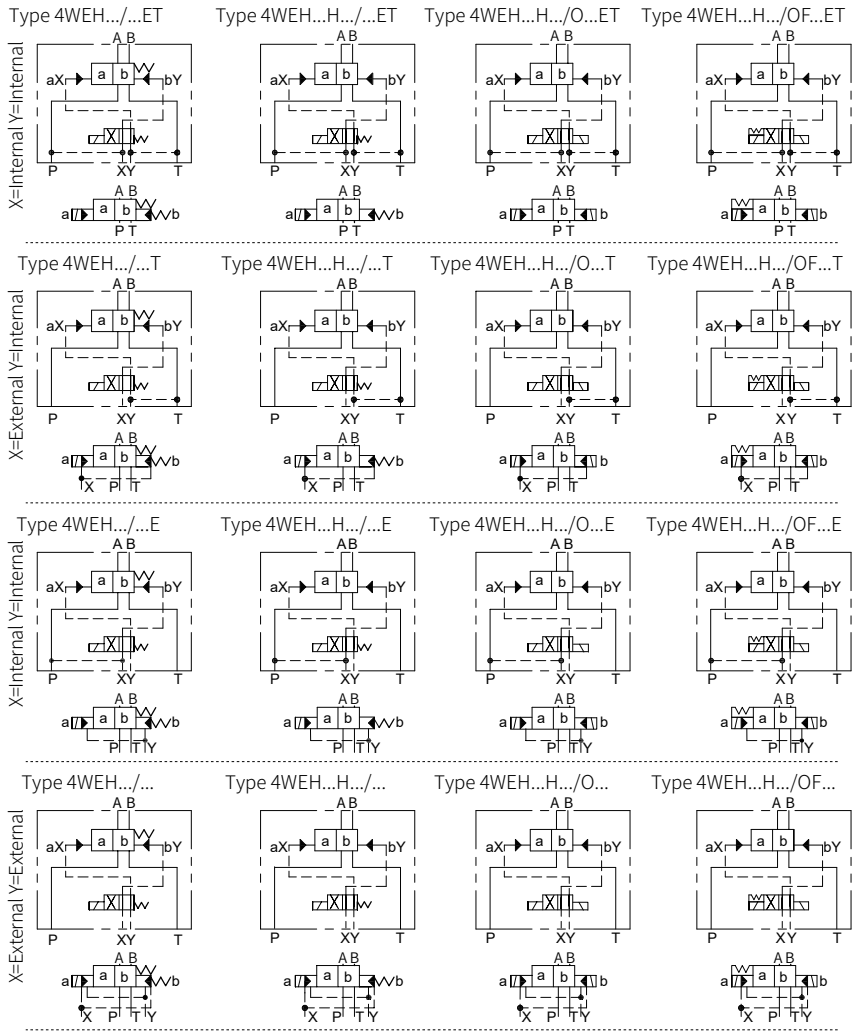
3-position valve model	Functional symbol	Transition function
4WEH...E.../... E		
4WEH...F.../... F		
4WEH...G.../... G		
4WEH...H.../... H		
4WEH...J.../... J		
4WEH...L.../... L		
4WEH...M.../...M		
4WEH...P.../... P		
4WEH...Q.../... Q		
4WEH...R.../... R		
4WEH...S.../... S		
4WEH...T.../... T		
4WEH...U.../... U		
4WEH...V.../... V		
4WEH...W.../...W		

2-position valve derived from 3-position valve

2-position valve model	Functional symbol (Solenoid at end A)	2-position valve model	Functional symbol (Solenoid at end B)
4WEH...EA.../...		4WEH...EB.../...	
4WEH...FA.../...		4WEH...FB.../...	
4WEH...GA.../...		4WEH...GB.../...	
4WEH...HA.../...		4WEH...HB.../...	
4WEH...JA.../...		4WEH...JB.../...	
4WEH...LA.../...		4WEH...LB.../...	
4WEH...MA.../...		4WEH...MB.../...	
4WEH...PA.../...		4WEH...PB.../...	
4WEH...QA.../...		4WEH...QB.../...	
4WEH...RA.../...		4WEH...RB.../...	
4WEH...SA.../...		4WEH...SB.../...	
4WEH...TA.../...		4WEH...TB.../...	
4WEH...UA.../...		4WEH...UB.../...	
4WEH...VA.../...		4WEH...VB.../...	
4WEH...WA.../...		4WEH...WB.../...	

Functional symbols

Detailed and simplified symbols for 2-position directional valves



Function symbols of 2 position valves

Spool valve function:	C	D	K	Z	Y
Spool valve function symbol:	a b	a b	a b	a b	a b
Transition function:					

Technical Parameters

Size			10	16	22	25	32
Maximum working pressure							
Oil ports P, A, B		(MPa)	35	35	35	35	35
Oil port T	External Y port pilot oil drain	(MPa)	31.5[5]	25	25	25	25
	Internal Y port pilot oil drain	(MPa)	21 DC				
		(MPa)	16 AC				
Oil port Y External pilot oil drain	-DC solenoid	(MPa)	21 DC				
	-AC solenoid	(MPa)	16 AC				
	For 4WH type	(MPa)	25（size 10、16、25、32） 21（size 22）				
Maximum pilot pressure (For high pilot pressure, a pressure reducing valve is required)		(MPa)	25（size 10、16、25、32） 21（size 22）				
Minimum pilot pressure -Pilot oil supply X external -Pilot oil supply X internal (Not for spool C, F, G, H, P, T, V, Z, S[2])			H-4W...				
	Spring centered 3-position valve	(MPa)	1.0	1.4	1.25	1.3	0.85
	Pressure centered 3-position valve	(MPa)	-	1.4	1.05	1.8	0.85
	Spring centered 2-position valve	(MPa)	1.0	1.4	-	1.3	1.0
	Pressure centered 2-position valve	(MPa)	0.7	1.4	1.4	0.8	0.5
Pilot oil supply X internal (for spool C, F, G, H, P, T, V, Z, S[2])			0.45[3]	0.45[4]	0.45[4]	0.45[4]	0.45[4]

1)In a 3-position valve, pressure centered only possible if:
Ppilot ⩾ 2xPtank + Ppilot min.

2) Spool S only for size 16.

3) For the spools C, F, G, H, P, T, V, Z, the internal pilot oil supply is only possible if the flow from P to T in the central position (for 3-position valve) or when the valve moves through the central position (for 2-position valve) is large enough to ensure the pressure differential as 0.65MPa from P to T.

4) For the spools C, F, G. H, P, T, V. Z. S-via the pre-load valve or correspondingly large flow.

5) 28MPa for model 4WEH10..., 31.5MPa for model H-4WEH10...

H-4WEH10... type is 31.5MPa

Hydraulic oil		Mineral hydraulic oil or phosphate ester hydraulic oil								
Temperature range	(℃)	-30 to +80 (NBR seal) -20~+80 (FKM seal)								
Viscosity range	(mm^2/s)	2.8 to 500								
Cleanliness of oil	The maximum allowable pollution level of oil is NAS1638 Class 9, so we recommend a fitter with the minimum filtration accuracy β10⩾75									
Pilot oil volume during switching process 3-position valve spring centered	(cm^3)	2.04	5.72		7.64		14.2		29.4	
2-position valve	(cm^3)	4.08	11.45		15.28		28.4		58.8	
3-position valve hydraulic centered	(cm^3)	-	WH	WEH	-	-	WH	WEH	WH	WEH
from neutral position to position "a"	(cm^3)	-	2.83	2.83	-	-	7.15	7.15	14.4	14.4
From position "a" to neutral position	(cm^3)	-	5.72	5.72	-	-	14.18	7.0	29.4	15.1
From neutral position to position "b"	(cm^3)	-	5.72	5.72	-	-	14.18	14.15	29.4	29.4
from position "b" to neutral position	(cm^3)	-	8.55	8.55	-	-	19.88	5.73	43.8	14.4
Pilot oil flow for shortest switching time	(L/min)	about 35	about 35		about 35		about 35		about 45	
Weight: Valve with one solenoid	(kg)	about 7.8	about 10		about 12.8		about 18.8		about 41.7	
Weight: Valve with two solenoid, spring centered	(kg)	about 9.1	about 11.8		about 14.2		about 21.3		about 43.3	
Weight: Valve with two solenoid, hydraulic centered	(kg)	about 9.1	about 11.8		about 14.2		about 21.3		about 43.3	
Weight: Switching time adjustment	(kg)	about 0.8								
Weight: Pressure reducing valve	(kg)	about 0.4								
Installation position		Optional, except for the hydraulic return valve C, D, K, Z, Y installed horizontal								

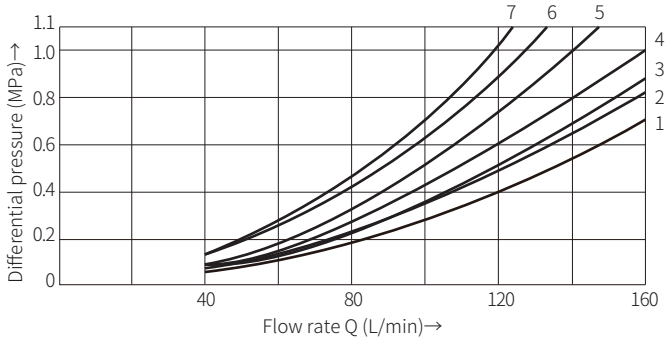
Technical Parameters

Switching time (refers to the time from the solenoid closing to the main valve fully opening.)

Size 10	Switching time for valve from neutral position to operating position (for DC (=) and AC (～) operation)															
	at pilot pressure	(MPa)	～7=				～14=				～21=				～25=	
	3-position valve	(ms)	30	65			25	60			20	55			15	50
	2-position valve	(ms)	35	80			30	75			25	70			20	65
	Switching time for valve from operating position to neutral position (ms)															
	3-position valve	(ms)	30													
	2-position valve	(ms)	35	40			30	75			25	30			20	25
Size 16	Switching time for valve from neutral position to operating position (for DC (=) and AC (～) operation)															
	at pilot pressure	(MPa)	～7=				～15=				～25=					
	3-position valve-spring centered	(ms)	25...30		40		25...30		40		25...30			40		
	2-position valve	(ms)	30...35		55		30...35		55		30...35			55		
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	30	30	40	40	30	30	40	40	30	30	35	40		
	Switching time for valve from operating position to static position															
	3-position valve	(ms)	20 to 35 for ～; 30 for =													
	2-position valve	(ms)	30...50		45		30...50		45		30...50			45		
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	20...35		20		20...55		20		20...35			20		
Size 25	Switching time for valve from neutral position to operating position (for DC (=) and AC (～) operation)															
	at pilot pressure	(MPa)	～7=				～14=				～21=				～25=	
	3-position valve-spring centered	(ms)	50		85		40		75		35		70		30	65
	2-position valve	(ms)	120		160		100		130		85		120		70	105
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	20	35	55	65	30	35	55	65	25	30	50	60	25	30
	Switching time for valve from operating position to static position															
	3-position valve	(ms)	40 to 55 for ～; 40 for =													
	2-position valve	(ms)	120		125		85		100		85		90		75	80
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	30...50		30 35		30...50		30 35		30...50		30 35		30...50	30 35
Size 32	Switching time for valve from neutral position to operating position (for DC (=) and AC (～) operation)															
	at pilot pressure	(MPa)	～5=				～15=				～25=					
	3-position valve-spring centered	(ms)	65		80		50		90		35		105			
	2-position valve	(ms)	100		130		75		100		60		115			
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b		
		(ms)	55	35	100	105	40	45	85	95	35	40	85	95		
	Switching time for valve from operating position to static position															
	3-position valve	(ms)	60 to 75 for ～; 50 for =													
	2-position valve	(ms)	115...130		90		85...100		70		65...80		65			
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b		
		(ms)	30...65		30 40		60...90		30 40		105...155		50 50			

Characteristic curve

Model G-4WEH10...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				Spool	Working position		
	P-A	P-B	A-T	B-T		A-T	B-T	P-T
E、D、Y	2	2	4	5	F	3	-	6
F	1	4	1	4				
G、T	4	2	2	6	G,T	-	-	7
H、C	4	4	1	4				
J、K	1	2	1	3	H	1	3	5
L	2	3	1	4	L	3	-	-
M	4	4	3	4	P	-	7	5
Q、V、W、Z	2	2	3	5				
R	2	2	3	-	U	-	4	-
U	3	3	3	4				
P	4	1	3	4				

Characteristic limit

Model G-4WEH10...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position and 3-position valves (L/min)			
Spool	Working pressure(MPa)		
	20	25	31.5
E、J、L、M、Q、R、U、V、W C、D、K、Z、Y	160		
H	160	150	120
G、T	160	160	140
F、P	160	140	120

Notice:

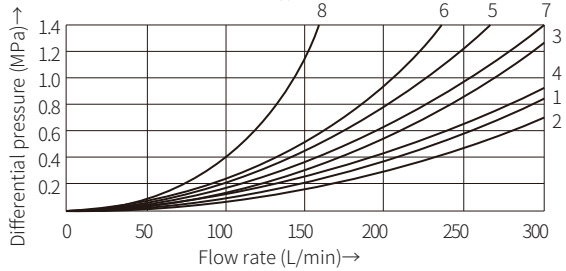
The given characteristic limits are suitable for the use of flow in both directions (e. g. from P to A and return from B to T at the same time).

Due to the power of the fluid in the valve, the characteristic limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

The characteristic limits are measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.

Characteristic curve

Model G-4WEH16...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				
	P-A	P-B	A-T	B-T	P-T
E、D、Y	1	1	1	3	-
F、P	2	2	3	3	-
G、T	5	1	3	7	6
H、C、Q、V、Z	2	2	3	3	-
J、K、L	1	1	3	3	-
M、W	2	2	4	3	-
R	2	2	4	-	-
U	1	1	4	7	-
S	4	4	4	-	8

Characteristic limit

Model G-4WEH16...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						
Spool	Working pressure(MPa)					
	7	14	21	28	35	
Main valve spring return[1)]						
C、D、K、Z、Y	300	300	300	300	300	
Main valve spring return[2)]						
C	300	300	300	300	300	
D、Y	300	270	260	250	230	
K	300	250	240	230	210	
Z	300	260	190	180	160	
Main valve hydraulic return						
HC、HD、HK	300	300	300	300	300	
HZ、HY	300	300	300	300	300	

1)The given flow value can be achieved when the minimum pilot pressure of 1.2MPa exists.

2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Allowable flow of 3-position valve (L/min)						
Spool	Working pressure(MPa)					with pre-load valve and X port internal supply
	7	14	21	28	35	
Main valve spring return[1)]						
E、H、J、L、MQ、U、W、R	300	300	300	300	300	
F、P	300	250	180	170	150	Spools F, G, H P and S in general
G、T	300	300	240	210	190	
S	300	300	300	250	220	
V	300	250	210	200	180	
Pressure centered (minimum pilot pressure 1.6MPa)						Spool approx. to 160L/min
All spools	300	300	300	300	300	

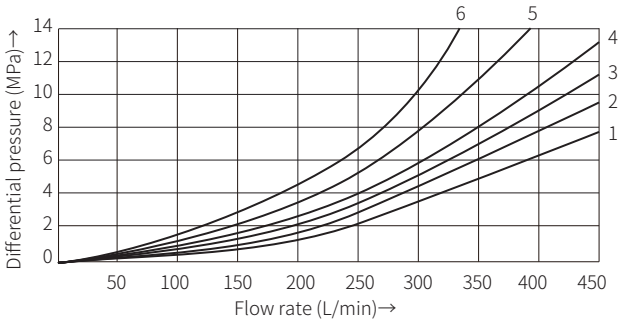
Notice:

When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.6MPa is required.

The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

Characteristic curve

Model G-4WEH22...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Switching position			
	P-A	P-B	A-T	B-T
E、M、P、Q、U、V	2	2	1	4
F	1	2	1	2
G、T	2	2	2	4
H、J、W	2	2	1	3
L	2	2	1	2
R	1	2	1	-

Spool	Median position		
	A-T	B-T	P-T
F	-	-	4
G、P	-	-	6
H	-	-	2
L	4	-	-
T	-	-	5
U	-	6	-

Characteristic limit

Model G-4WEH22...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve L/min					
Spool	working pressure(MPa)				
	7	14	21	28	35
X external supply main valve spring return (with $P_{pilot\ min}$=11bar/14bar)					
C, D, K, Y, Z	450	450	450	450	450
X external supply main valve spring return[1]					
C	450	450	320	250	200
D, Y	450	450	450	400	320
K	450	215	150	120	100
Z	350	300	290	260	160
X external supply hydraulic centered					
HC, HD, HK, HY, HZ	450	450	450	450	450
HC.../O..	450	450	450	450	450
HD../O..	450	450	450	450	450
HK../O..	450	450	450	450	450
HZ../O..	450	450	450	450	450
HC../OF..	450	450	450	450	450
HD../OF..	450	450	450	450	450
HK../OF..	450	450	450	450	450
HZ../OF..	450	450	450	450	450

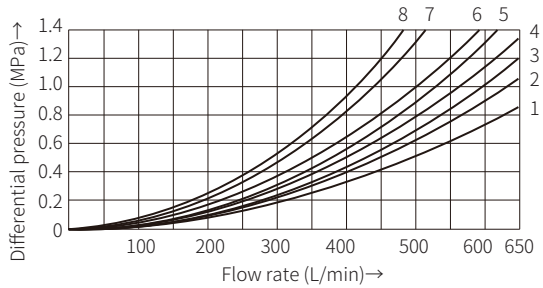
Allowable flow of 3-position valve L/min					
Spool	working pressure(MPa)				
	7	14	21	28	35
X external supply spring centered					
E, J, L, M, Q, U, W, R	450	450	450	450	450
H	450	450	300	260	230
G	400	350	250	200	180
F	450	270	175	130	110
V	450	300	240	220	160
T	400	300	240	200	160
P	450	270	180	170	110

When internal supply, a back pressure valve is required because of negative cover of spools Z, HZ, V and the flow less than 180L/min. It is also required due to negative cover of spools F, G, M, P and T.

1)The specified flow value is the limited value at which the reset spring can return the spool back to the end position when the pilot pressure disappears.

Characteristic curve

Model G-4WEH25...(Measured at ϑ_{oil}=41mm²/s and t=50°C)



Spool	Working position				Spool	Working position			
	P-A	P-B	A-T	B-T		P-A	P-B	A-T	B-T
E	1	1	1	3	P	4	1	1	5
F	1	4	3	3	Q	2	2	3	5
G	3	1	2	4	Z	1	1	1	-
H	4	4	3	4	U	2	1	1	6
J	2	2	3	5	V	4	4	3	6
L	2	2	3	3	W	1	1	1	3
M	4	4	1	4	T	3	1	2	4

Characteristic limit

Model G-4WEH25...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	35	
Main valve spring return[1]						
C, D, K, Z, Y	700	700	700	700	700	
Main valve spring return[2]						Spools C and Z approx. to 180 L/min
C	700	700	700	700	700	
D, Y	700	650	400	350	300	
K	700	650	420	370	320	
Z	700	700	650	480	400	
Main valve hydraulic return						Spools HC and HZ approximately to 180L/min
HC、HD、HK	700	700	700	700	700	
HZ、HY	700	700	700	700	700	
HC.../O	700	700	700	700	700	
HD.../O	700	700	700	700	700	
HK.../O	700	700	700	700	700	
HZ.../O	700	700	700	700	700	
HC.../OF	700	700	700	700	700	
HD.../OF	700	700	700	700	700	
HK.../OF	700	700	700	700	700	
HZ.../OF	700	700	700	700	700	

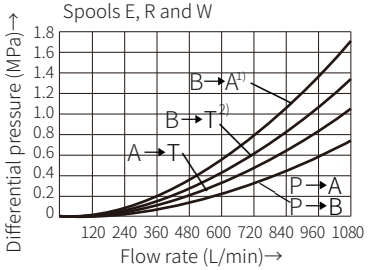
Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	35	
spring centered						
E、L、M Q、U、W	700	700	700	700	650	
G/T	400	400	400	400	400	
F	650	550	430	330	300	
H	700	650	550	400	360	
J	700	700	650	600	520	
P	650	550	430	330	300	
V	650	550	400	350	310	
R	700	700	700	650	680	
Pressure centered (minimum pilot pressure 1.8MPa)						Spools F, G, HP and T approximately to 180L/min
E/F/H/J	700	700	700	700	650	
L/M/P/Q	700	700	700	700	650	
R/U/V/W	700	700	700	700	650	
G/T	400	400	400	400	400	
When the pilot pressure higher than 3MPa						
G/T	700	700	700	700	700	

1)The given flow value can be achieved when the minimum pilot pressure of 1.3MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

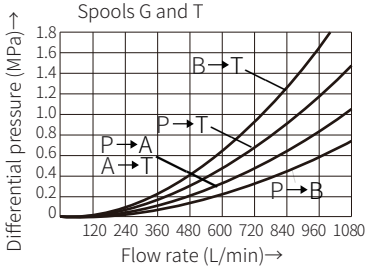
Characteristic curve

Model G-4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

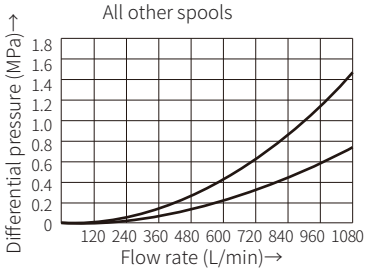
Spools E, R and W



Spools G and T



All other spools



1) Only for spool R
2) Not for spool R

Characteristic limit

Model G-4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						
Spool	Working pressure(MPa)					with pre-load valve and X port internal supply
	7	14	21	28	25	
Main valve spring return1)						
C、D、K、Z、Y	1100	1040	860	750	680	
Main valve spring return2)						
C	1100	1040	860	800	700	Spool Z approx to 180L/min
D、Y	1100	1040	540	480	420	
K	1100	1040	860	500	450	
Z	1100	1040	860	750	650	
Main valve hydraulic return						Spool Z approx to 180L/min
HC、HD、HK	1100	1040	860	750	680	
HZ、HY	1100	1040	860	750	680	

Allowable flow of 3-position valve (L/min)						
Spool	Working pressure(MPa)					with pre-load valve and X port internal supply
	7	14	21	28	25	
Main valve spring return1)						
E, H, J, L, M Q, U, W, R	1100	1040	860	750	680	
G, T, H, F, P	900	900	800	650	450	Spools F, G, H, P and T approximately to 180L/min
V	1100	1000	680	500	450	
Pressure centered (minimum pilot pressure 0.85MPa)						
All spools	1100	1040	860	750	680	

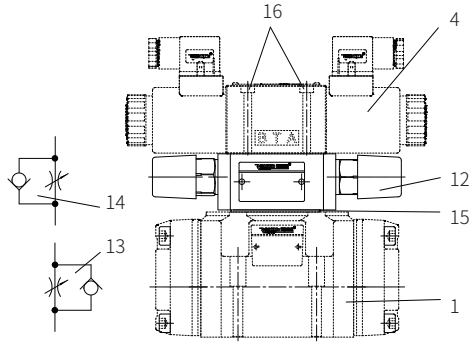
1)The given flow value can be achieved when the minimum pilot pressure of 1.0MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Notice:
When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.5MPa is required.
The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

Operating time, pressure valves and pilot valves

Switching time adjustment

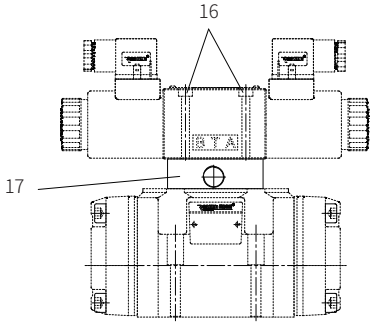
To control the switching time of the main valve (1), a double throttle check valve (12) is installed between the pilot valve and the main valve.
Conversion from meter-in control (13) to meter-out control (14):
Remove the pilot valve (4) but retain the O-ring support plate (15), turn the throttle check valve around its longitudinal axis and reassemble it on the mounting surface, install the pilot valve (4).
Tightening torque M_A=9Nm for fixing screw (16).



Model G-4WEH.../.../S or S2

Pressure reducing valve "D3"

The pressure reducing valve (17) must be used If the pilot pressure exceeds 25MPa. The secondary pressure should be maintained at 4.5MPa. When using the pressure reducing valve D3, it must install a plug-in throttle B10 in port P of the pilot valve.
Tightening torque M_A=9Nm for fixing screw (16).

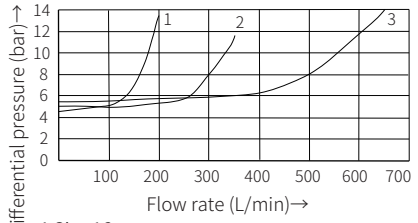


Model G-4WEH.../.../D3

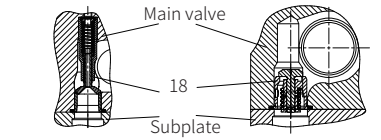
Pre-load valve (not for size 10)

In the valve with pressureless bypass and internal pilot oil supply, a pre-load valve (18) is installed in port P of the main valve to build up the minimum pilot pressure.

The differential pressure of the pre-load valve must be added to the differential pressure of the main valve to determine the actual value (see characteristic curve). The cracking pressure of the valve is 0.45Mpa.



1 Size 16
2 Size 25
3 Size 32



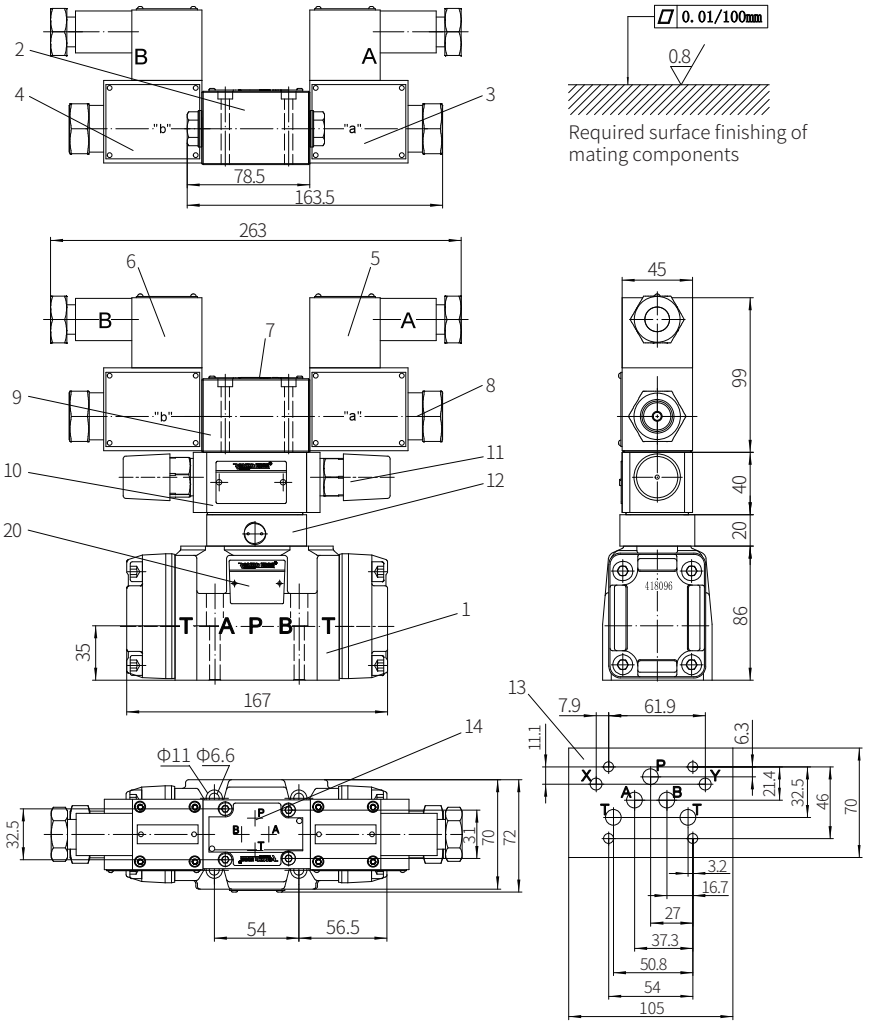
Model 4WEH16...-7X/.../P4.5

Model 4WEH25.../.../P4.5
4WEH32.../.../P4.5

Component size

Size unit: mm

Model G-WEH10...-4XJ/...



Required surface finishing of mating components

1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
13 Port layout of main valve (valve mounting surface)
14 Port position of pilot oil
15 Name plate of complete valve

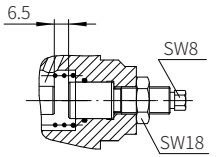
Component size

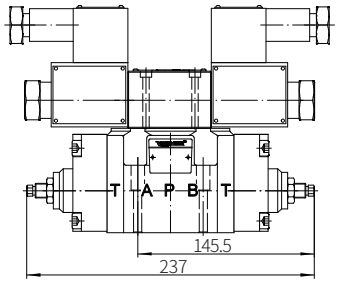
Size unit: mm

Dimension of additional devices for model G-WEH10

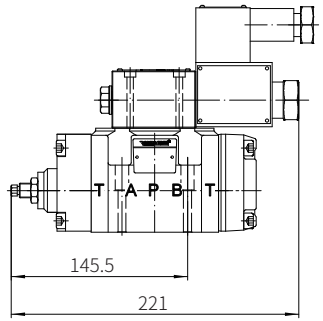
The installation range of the stroke adjustment is 6.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1mm stroke

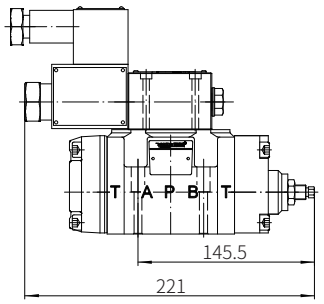




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)

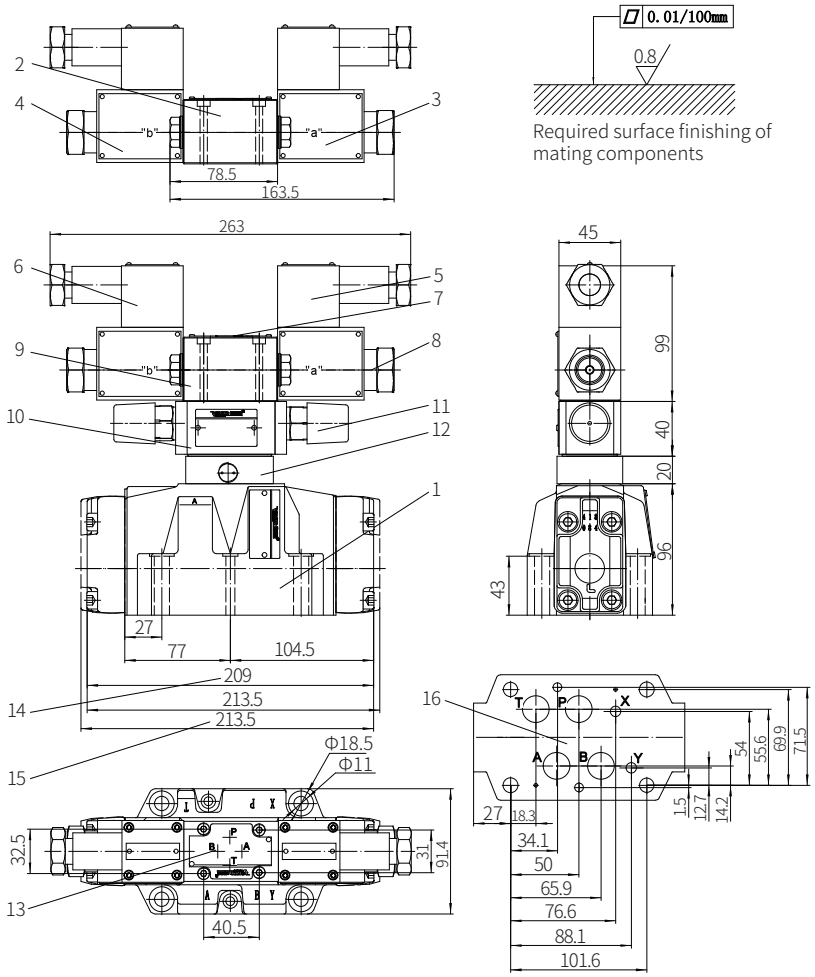


Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

Component size

Size unit: mm

Model G-WEH16...-7XJ/...



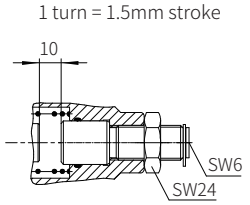
1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

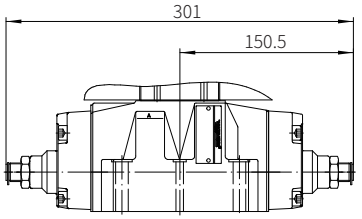
Component size

Size unit: mm

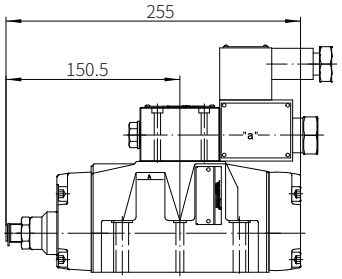
Dimension of additional devices for model G-WEH16

The installation range of the stroke adjustment is 10mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

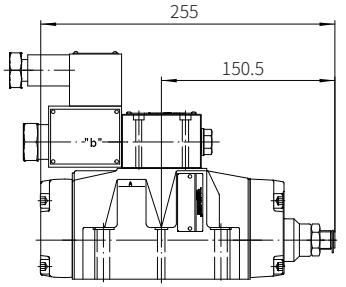




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)

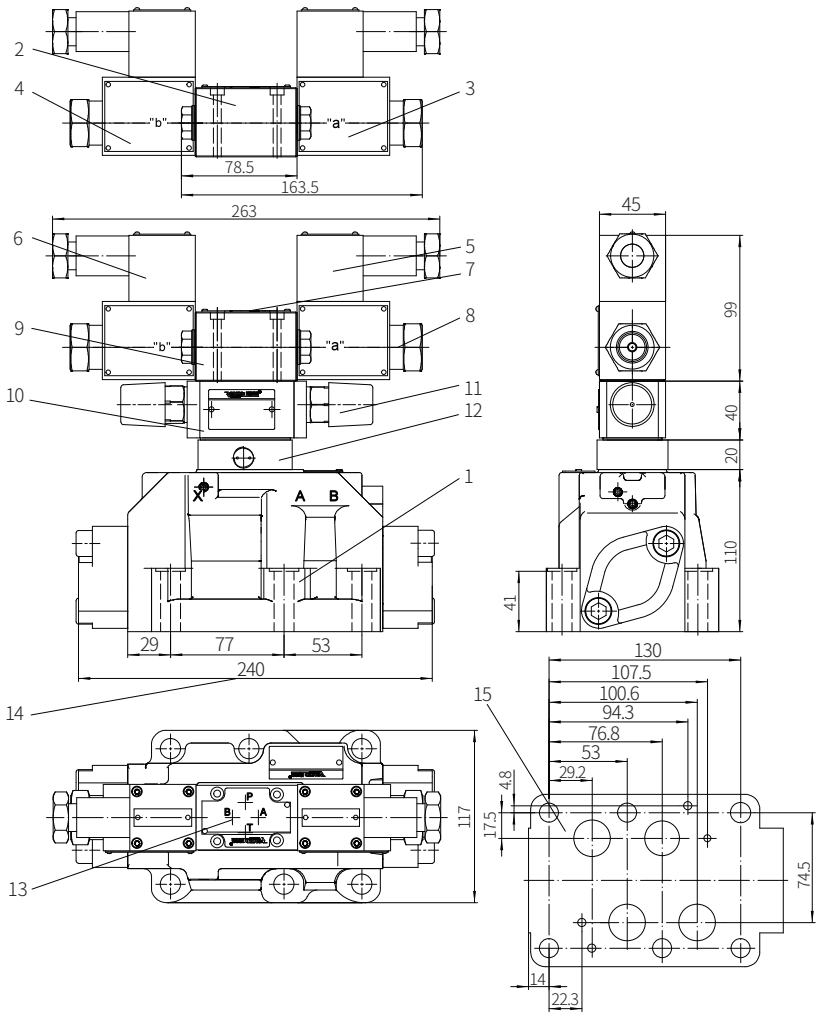


Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

Component size

Size unit: mm

Model G-WEH22...-7XJ/...

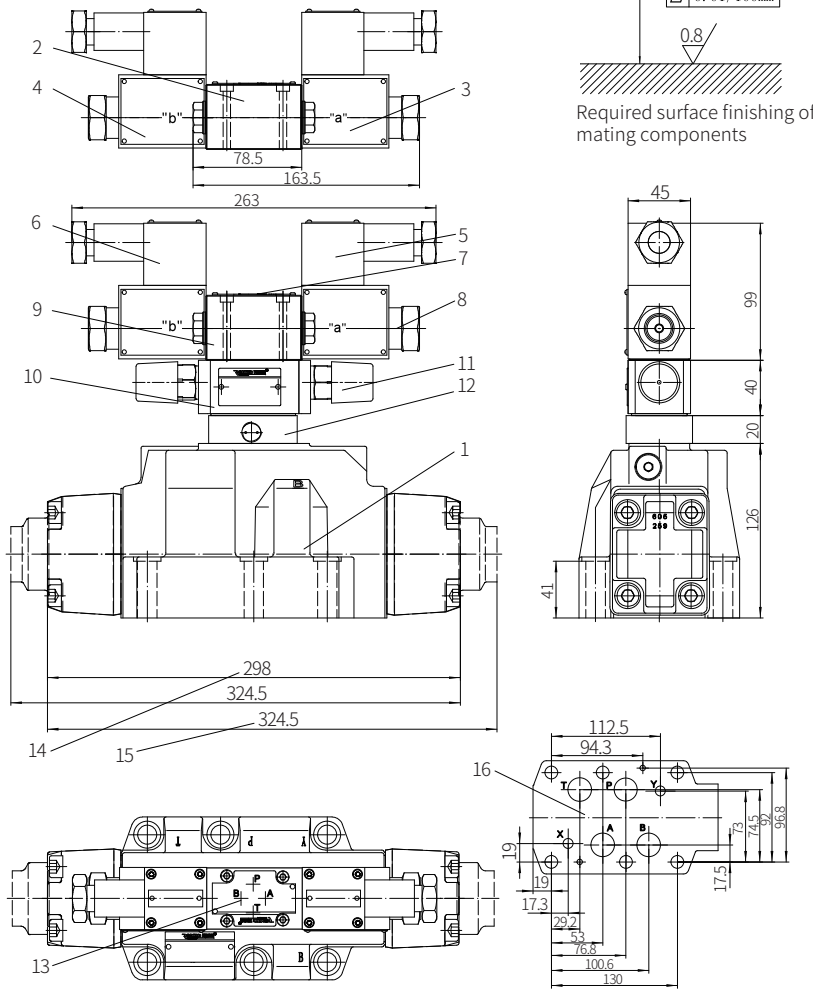


1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Main valve connection diagram

Component size

Size unit: mm

Model G-WEH25...-6XJ/...



1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

Component size

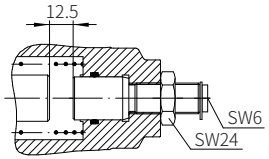
Size unit: mm

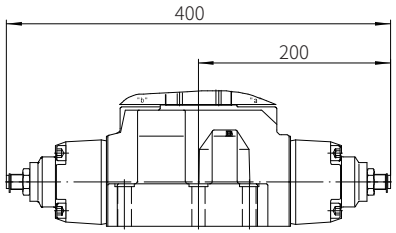
01

Dimension of additional devices for model G-WEH25

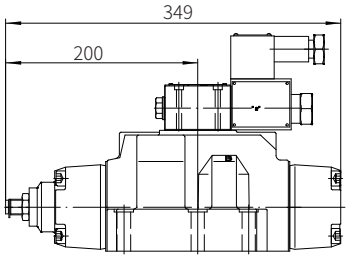
The installation range of the stroke adjustment is 12.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

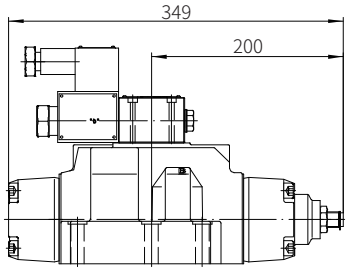




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



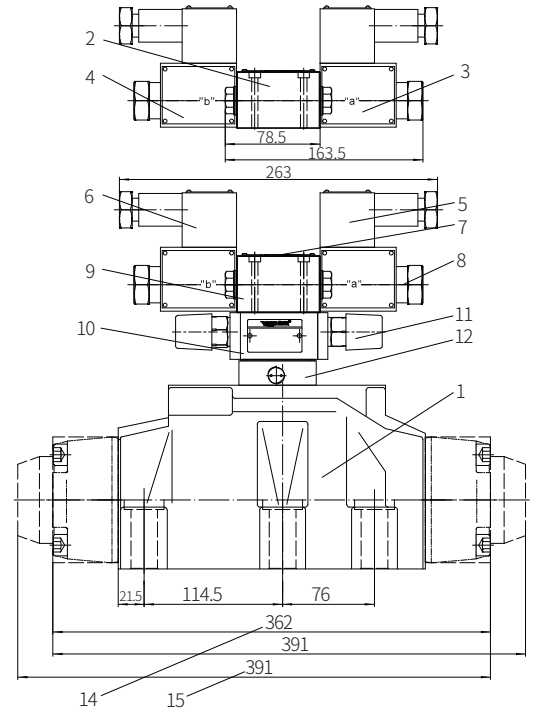
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

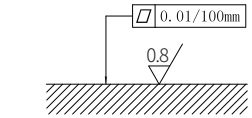
Component size

Size unit: mm

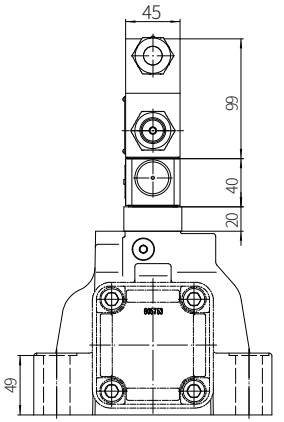
01

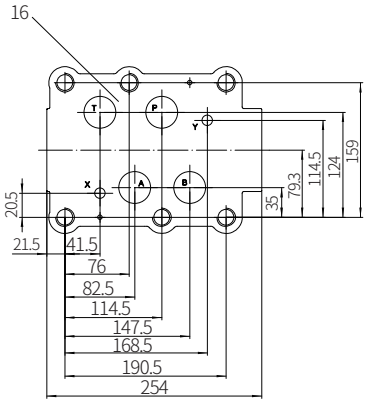
Model G-WEH32...-6XJ/...





Required surface finishing of mating components





1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
11 Adjustment bolt
12 Pressure reducing valve
13 Port layout of main valve (valve mounting surface)
14 Size of 3-position valve with spring centered
15 Size of 2-position valve with spring centered
16 Main valve connection diagram

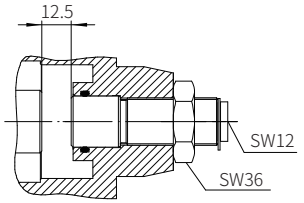
Component size | Size unit: mm

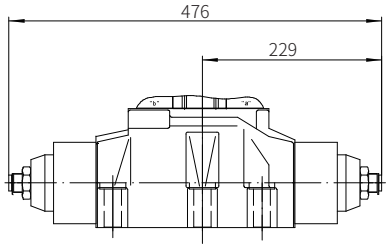
01

Dimension of additional devices for model G-WEH32

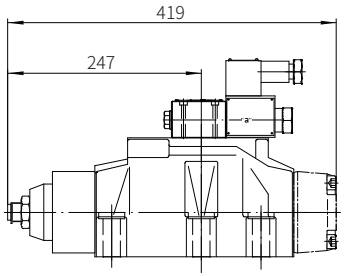
The installation range of the stroke adjustment is 15mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

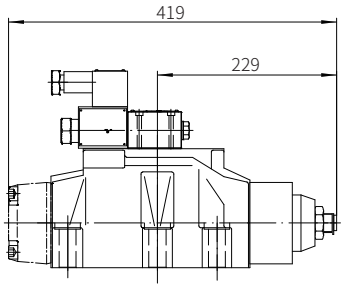




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

2 - Pressure valves

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02

Remote Pressure Relief Valve

Model: DBT/DBWT...3XJ

- Maximum working pressure 315 bar
- Maximum working flow 3 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Technical parameters	03
Component size	04

Features

- Remote control
- Subplate mounting
- 3 pressure adjustment elements

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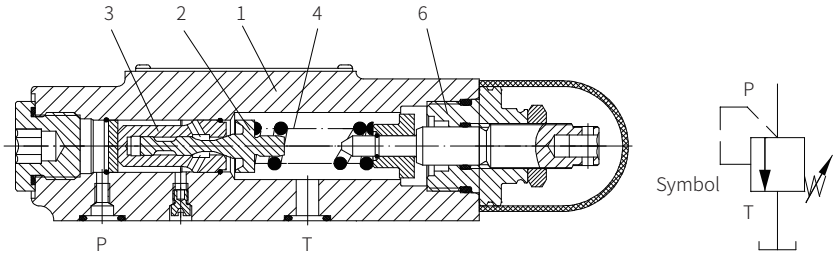
Function description, sectional drawing

The DBT/DBWT remote pressure valve is direct relief valve.This valve has the advantages of simple structure, convenient pressure control, good stability and no noise. It is suitable for plastic machine, machine tool, metallurgy, mining, engineering and other fields in automatic control of hydraulic system.

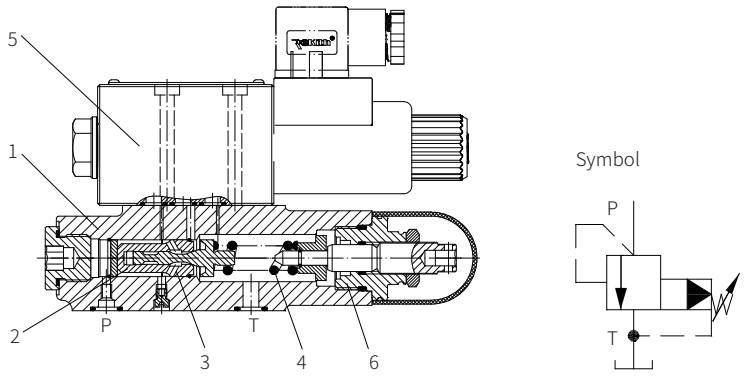
Model DBT:
This valve is used to remote control the pressure of the system.
It is composed of valve body (1), valve spool (2), valve seat (3), spring (4) and adjustment element (6).
The pressure of the system acts on the valve spool (2) by orifice. When the pressure exceeds the setting value at the spring (4), the oil drain to tank from port T (or drain external).



Model DBT

Model DBWT:
This valve is used to remote control the pressure of the system and drain by means of the solenoid valve.

It is composed of valve body (1), valve spool (2), valve seat (3), spring (4), pilot valve (5) and adjustment element (6). The working principle is same as DBT but to drain the pressure via pilot valve (5).



Model DBWT

Models and specifications

DB | T | | | – 3X | J | | | | / | | *

- without directional valve =no code
  with directional valve =W
- normally closed =A[1)]
  normally open =B[1)]
- rotary knob =1
  inner hexagon screw with protective cap =2
  lockable rotary knob with scale =3
- 30 to 39 series (30 to 39 series installation and connection size unchanged) =3X
- Rekith =J
- pressure setting up to 100bar =100
  pressure setting up to 315bar =315
- sealing material
  No code= NBR seals
  V= FKM seals
  (consult for other seals)
- External drain port Y
  No code= G1/4
  2= M14*1.5
- Z4[1)]= standard plug
  Z5L[1)]= large right angle lamp plug
- No code= no manual emergency operation
  N9= with hidden manual emergency operation
- W220-50[1)]= AC 220V-50Hz
  G24[1)]= 24V DC
  W220R[1)]= AC 220V with rectifier
- more information in text

1) For DBWT only

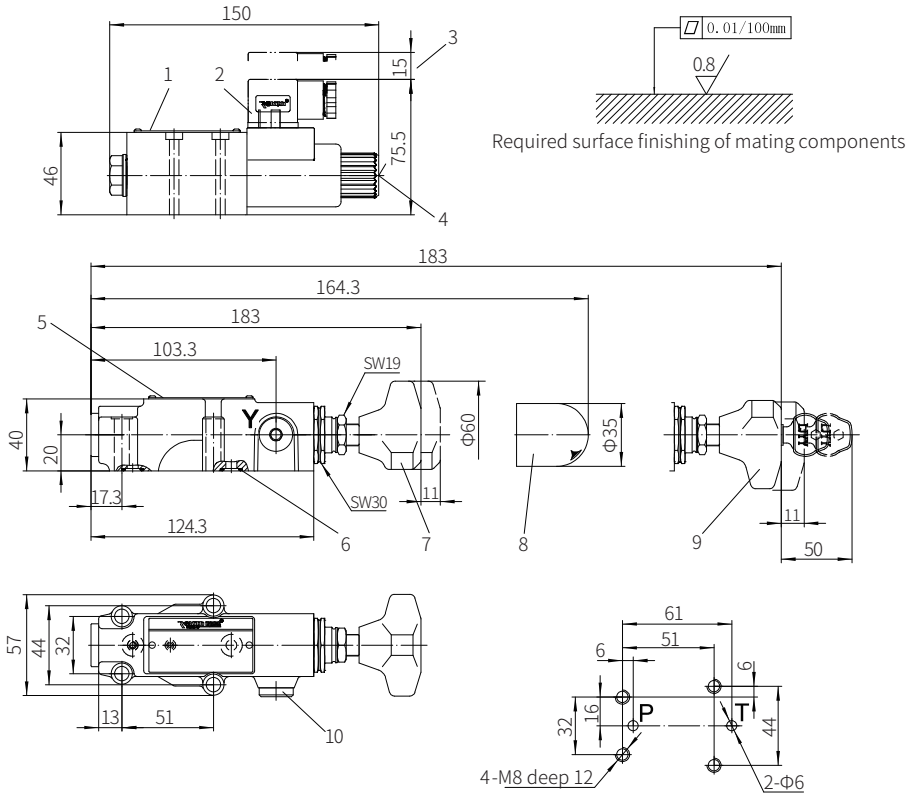
Technical parameters

Medium			Mineral hydraulic oil or phosphate hydraulic oil
Temperature range		°C	-30 to +80
Viscosity range		mm^2/s	10 to 800
Maximum flow		L/min	3
Maximum working pressure (inlet port)		bar	315
Maximum setting pressure		bar	to 100 or 315
Back pressure	DBT DBWT	bar	to 315 to 100 (AC), to 160 (DC)
Pilot valve			see solenoid valve WE5

Component size

Size unit: mm

Model DBT/DBWT...3XJ/...



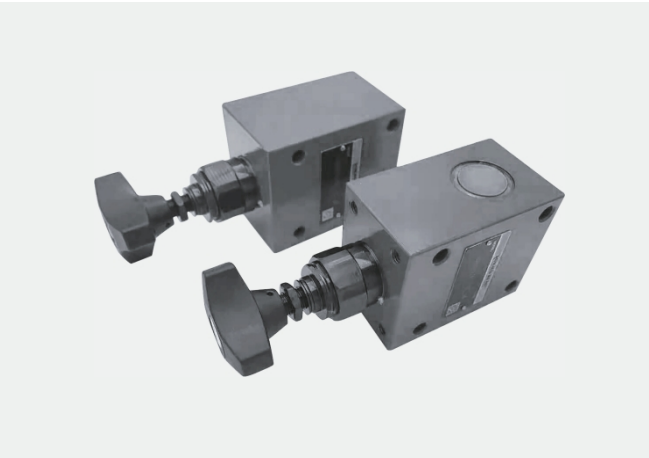
Required surface finishing of mating components

Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

1 DBWT name plate
2 Plug
3 Space required to remove the plug
4 Hidden emergency button
5 DBT name plate
6 O-ring 9.25x 1.78 (for port P, T)
7 Adjustment form "1"
8 Adjustment form "2"
9 Adjustment form "3"
10 External drain port (G1/4"or M14x1.5 optional)

Direct Operated Relief Valve

Model: DBD...1XJ



- Size 6 to 30
- Maximum working pressure 630 bar
- Maximum working flow 330 L/min

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Models and specifications	03
Technical parameters	04
Characteristic curve	05
Component size	06-08

Features

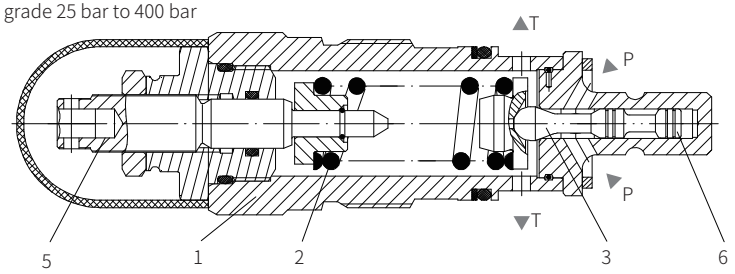
- Inserted cartridge
- Threaded connection
- Subplate mounting
- 3 pressure adjustment elements
  -Inner hexagon adjusting screw with protective cap
  -Adjusting handle
  -Adjusting handle with lock

Function description, sectional drawing

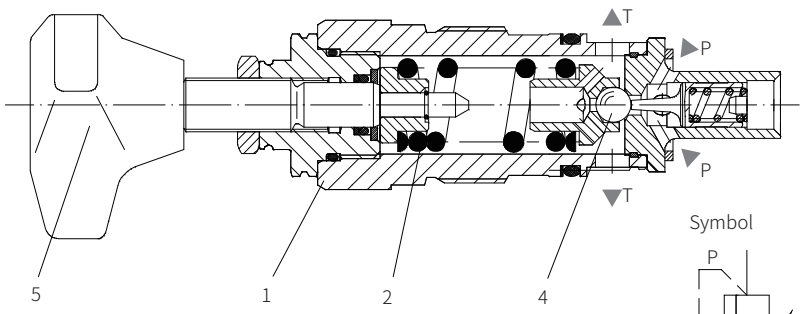
The DBD pressure relief valve is direct operated, it is used to limit the pressure of hydraulic system.
The valve is composed of valve sleeve (1), spring (2), poppet spool (3) with damping (pressure grade 25 to 400 bar) or ball spool (4) (pressure grade 630bar) and pressure adjustment element (5). The system pressure can be set infinitely by the adjustment element (5). The spring (2) pushes the poppet spool (3) onto the valve seat. The channel P is connected to the system and system pressure affect on the area of poppet (or ball) spool.

If the pressure in channel P rises in excess of the value set at the spring (2), the poppet spool (3) or ball spool (4) will opens against the spring (2). The oil flows from channel P to channel T. The stroke of the poppet spool (3) is limited by a pin(6).
In order to gain the accurate setting value within the whole pressure range, the pressure scope is divided into 7 pressure ratings, and every pressure rating has a corresponding spring which may be set maximum pressure.

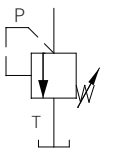
Model DBDS...K..1XJ/...
Pressure grade 25 bar to 400 bar



Model DBDH...K..1XJ/...
Pressure grade 630 bar (poppet valve, only for size 10)



Symbol



Models and specifications

DBD | | | – 1X | J | / | / | | *

direct operated relief valve

adjustment elements	Size 6	8	10	15	20	25	30	
inner hexagon adjusting screw with protective cap	●	●	●	●	●	●	●	= S
Adjusting handle	●	●	●	●	●	●	●	= H
Adjusting handle with lock	●	●	●	●	●	—		= A

size (connection)	=6 G1/4	=8 G3/8	=10 G1/2	=15 G3/4	=20 G1	=25 G1 1/4	=30 G1 1/2	
								= 10

connection type								
inserted cartridge	●	–	●	–	●	–	●	= K
threaded connection	●	●	●	●	●	●	●	= G
subplate mounting	●	–	●	–	●	–	●	= P

10 to 19 series =1X
(10 to 19 series installation and connection size unchanged)

Rexroth =J

pressure grade								
setting pressure up to 25 bar	●	●	●	●	●	●	●	=25
setting pressure up to 50 bar	●	●	●	●	●	●	●	=50
setting pressure up to 100 bar	●	●	●	●	●	●	●	=100
setting pressure up to 200 bar	●	●	●	●	●	●	●	=200
setting pressure up to 315 bar	●	●	●	●	●	●	●	=315
setting pressure up to 400 bar	●	●	●	●	●	–	–	=400
setting pressure up to 630 bar	–	–	●	–	–	–	–	=630

G thread = no code
metric thread (only for G type) =2

sealing material
NBR seals = no code
FKM seals =V
(consult for other seals)

more information in text

● =available

Technical parameters

Overview					
Size		6 and 8	10	15 and 20	25 and 30
Installation position		Optional			
Environment temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)			
Minimum strength of valve body material		The selection of valve body material has been included in the safety factor in all condition (e.g. referenced pressure strength, thread strength and tightening torques.)			
Hydraulic					
Maximum working pressure -inlet port	bar	400	630	400	315
-outlet port	bar	315	315	315	315
Maximum flow rate (standard valve)		See characteristic curve			
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1] HEPG(Polyethylene glycol)[2] HEES (synthetic ester)[2]			
Oil temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FRM seal)			
Viscosity range	mm^2/s	10 to 800			
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15[3]			

[1] For NBR seal and FKM seal

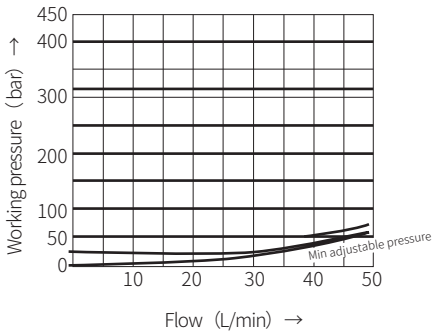
[2] Only for FKM seal

[3] The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effect oil filtration can prevent failure and increase the service life of the components.

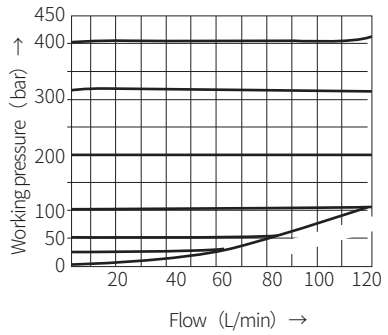
Characteristic curve

(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)

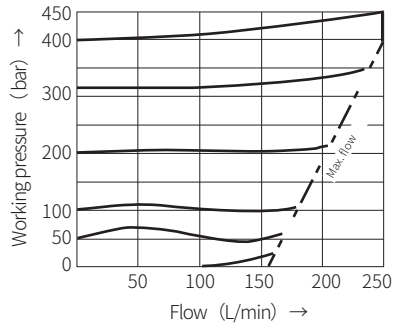
Size 6



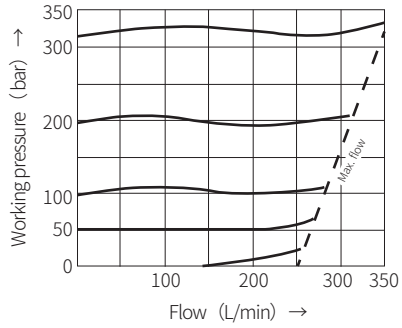
Size 8 and 10



Size 15 and 20



Size 25 and 30



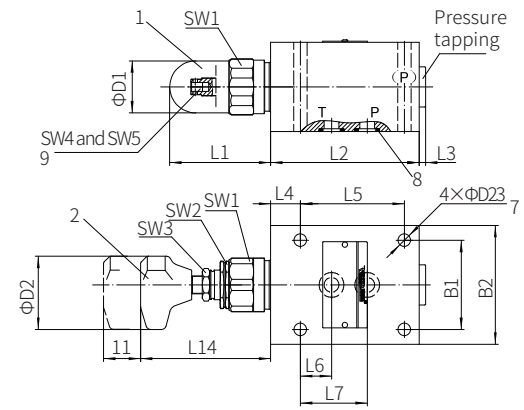
Note:

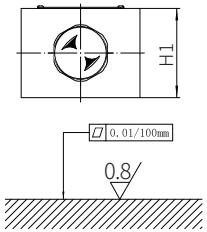
- This characteristic curve is valid for outlet pressure =0 over the entire flow range, but no related to the pressure drop in the housing when measuring.
- The characteristic curve is valid only under the environment and temperature conditions.
  It is necessary to consider that the characteristic curve is affected by changes in boundary conditions.
- This characteristic curve is associated with the given pressure grade(e.g. 200bar).
  The more the setting pressure value differs from the nominal pressure rating (e.g. ＜200bar), the pressure increases with the relief flow increases.

Component size

Size unit: mm

Subplate mounting valve





Required surface finishing of mating components

1 Adjustment form "S"
2 Adjustment form "H"
3 Adjustment form "A"
4 Space required to remove the key
5 Butterfly handwheel (for size 25 and 30 only)
6 Ring with mark
7 Valve fixing hole
8 O-ring
9 Internal hexagon adjusting screw (SW4) S6 (NG6 to NG20)
External hexagon adjusting screw (SW5) S13 (NG25 to NG30)

Size	O-ring (P, T)	Size of pressure tapping	Valve fixing screw (10.9)	Torque (Nm)
6	7×1.5	G1/4	M6×50	10
10	12.3×2.4	G1/2	M8×70	25
20	22×3	G3/4	M8×90	25
30	34×3	G11/4	M10×110	50

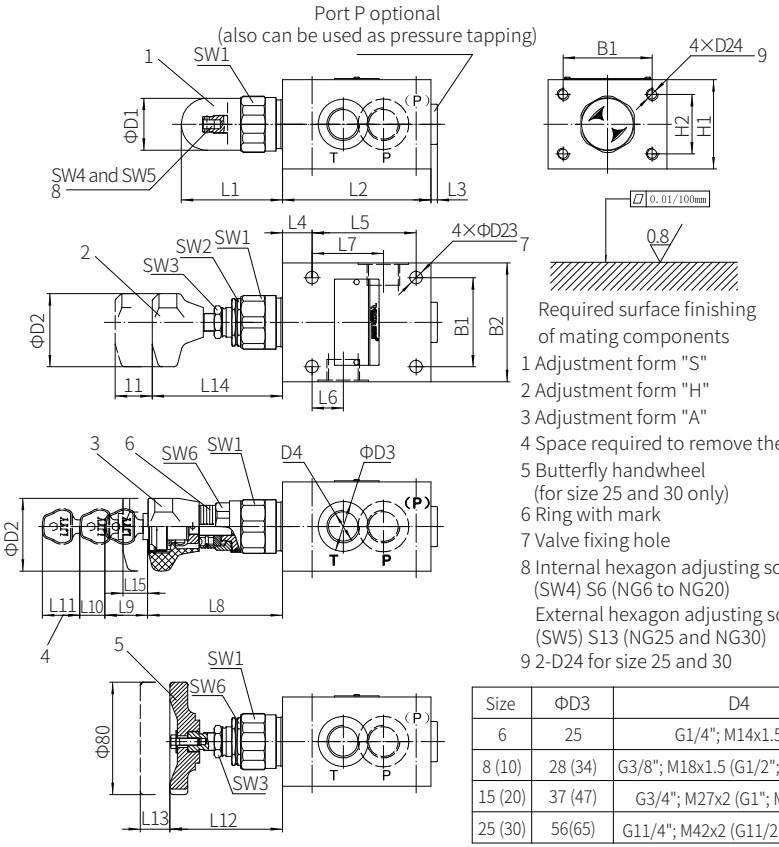
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13
6	72	80	2	15	55	20	40	83	30	11	20	-	-
10	68	100	3	20	70	21	45	79	30	11	20	-	-
20	65	135	4	20	100	34	65	-	-	-	-	-	-
30	83	180	4	25	130	35	85	-	-	-	-	79.5	11

Size	L14	L15	B1	B2	H1	ΦD23	ΦD1	ΦD2	SW1	SW2	SW3	SW4	SW5	SW6
6	83	11	45	60	40	6.6	34	60	32	30	19	6	-	30
10	79	11	60	80	60	9	38	60	36	30	19	6	-	30
20	77	-	70	100	70	9	48	60	46	36	19	6	-	30
30	-	-	100	130	90	11	63	-	60	46	19	-	13	-

Component size

Size unit: mm

Threaded connection



Required surface finishing of mating components

1 Adjustment form "S"
2 Adjustment form "H"
3 Adjustment form "A"
4 Space required to remove the key
5 Butterfly handwheel (for size 25 and 30 only)
6 Ring with mark
7 Valve fixing hole
8 Internal hexagon adjusting screw (SW4) S6 (NG6 to NG20)
External hexagon adjusting screw (SW5) S13 (NG25 and NG30)
9 2-D24 for size 25 and 30

Size	ΦD3	D4
6	25	G1/4"; M14x1.5
8 (10)	28 (34)	G3/8"; M18x1.5 (G1/2"; M22x1.5)
15 (20)	37 (47)	G3/4"; M27x2 (G1"; M33x2)
25 (30)	56(65)	G11/4"; M42x2 (G11/2"; M48x2)

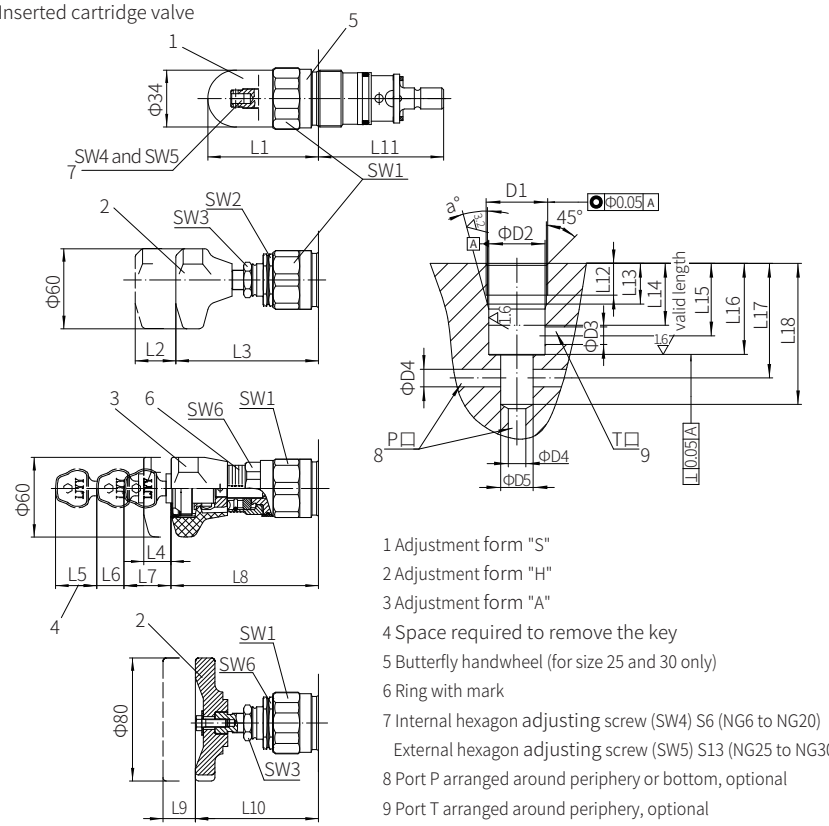
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	D24
6	72	80	2	15	55	20	40	83	30	11	20	-	-	M6
8、10	68	100	3	20	70	21	48	79	30	11	20	-	-	M8
15、20	65	135	4	20	100	34	65	-	-	-	-	-	-	M8
25、30	83	180	4	25	130	35	85	-	-	-	-	79.5	11	M10

Size	L14	L15	B1	B2	H1	ΦD23	ΦD1	ΦD2	SW1	SW2	SW3	SW4	SW5	SW6
6	83	11	45	60	40	6.6	34	60	32	30	19	6	-	30
8、10	79	11	60	80	60	9	38	60	36	30	19	6	-	30
15、20	77	-	70	100	70	9	48	60	46	36	19	6	-	30
25、30	-	-	100	130	90	11	63	-	60	46	19	-	13	-

Component size

Size unit: mm

Inserted cartridge valve



1 Adjustment form "S"
2 Adjustment form "H"
3 Adjustment form "A"
4 Space required to remove the key
5 Butterfly handwheel (for size 25 and 30 only)
6 Ring with mark
7 Internal hexagon adjusting screw (SW4) S6 (NG6 to NG20)
External hexagon adjusting screw (SW5) S13 (NG25 to NG30)
8 Port P arranged around periphery or bottom, optional
9 Port T arranged around periphery, optional

Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13
6	72	11	83	11	20	11	30	83	-	-	64.5	15	19
8、10	68	11	79	11	20	11	30	79	-	-	77	18	23
15、20	65	11	77	-	-	-	-	-	-	-	106	21	27
25、30	83	-	-	-	-	-	-	-	11	79.5	131	23	29

Size	L14	L15	L16	L17	L18	ΦD1	ΦD2	ΦD3	ΦD4	ΦD5	a
6	39	35	45	56.5±15.5	65	M28×1.5	25H9	6	6	15	15
8、10	35	41	52	67.5±7.5	80	M35×1.5	32H9	10	10	18.5	15
15、20	45	54	70	91.5±8.5	110	M45×1.5	40H9	20	20	24	20
25、30	45	60	84	113.5±11.5	140	M60×2	55H9	30	30	38.75	20

Modular Pressure Relief Valve

Model: ZDB/Z2DB6...4XJ

- Size 6
- Maximum working pressure 315 bar
- Maximum working flow 60L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05-07

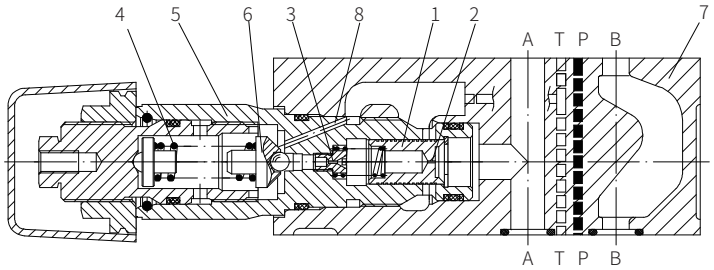
Features

- 4 pressure ranges
- 5 circuit options
- With one or two cartridge relief valves
- 4 adjustment elements
  - -Rotary knob
  - -Hexagon screw with sleeve and protective cap
  - -Lockable rotary knob with scale
  - -Rotary knob with scale

Function description, sectional drawing

The ZDB and Z2DB type relief valve is pilot operated relief valve with sandwich plate design. It's used to limit the pressure within hydraulic system.
The valve is mainly composed of valve body (7), and together with one or two cartridge relief valves. The system pressure is set by adjustment element (4).
At rest, the valve is closed. Pressure in port A acts on the spool (1), at the same time the pressure passes through orifice (2) to act on the spring loaded side of spool (1), and through orifice (3) to act on pilot valve spool (6). If pressure of port A rises above the value set on spring (5), then the pilot valve spool (6) opens.
Hydraulic oil flow from the spring loaded side of the spool (1), orifice (3) and channel (8) into port T.
The resulting pressure drop moves the spool (1)thereby opening the connection A to T, while maintaining the pressure set at spring (5). Pilot oil return from two spring chambers via port T externally.

Model ZDB6VA2-...-4XJ/



Models and specifications

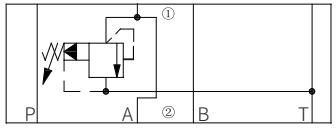
Z | | DB | 6 | | - | 4X | J | / | | * |

- sandwich plate =Z
- 1 cartridge relief valve =No code (only for "VA", "VB" and "VP")
- 2 cartridge relief valves =2 (only for "VC" and "VD")
- pressure relief valve =DB
- size 6 =6
- Relief function from - to:
  - A- T =VA
  - P-T =VP
  - B-T =VB
  - A-T and B-T =VC
  - A-B and B-A =VD
- adjustment element
  - rotary knob =1
  - hexagon screw with sleeve and protective cap =2
  - lockable rotary knob with scale =3
  - rotary knob with scale =7
- 4X= 40 to 49 series (40 to 49 series installation and connection size unchanged)
- J= Rekith
- pressure range
  - 50= pressure adjustable up to 50bar
  - 100= pressure adjustable up to 100 bar
  - 200= pressure adjustable up to 200 bar
  - 315= pressure adjustable up to 315 bar
- sealing material
  - No code= NBR seals
  - V= FKM seals (consult for other seals)
- more information in text

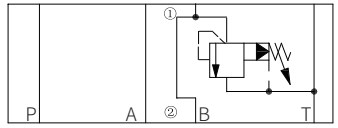
Functional symbols

(①=Valve side ②=Subplate side)

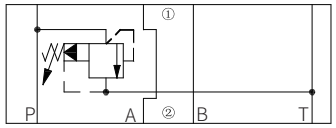
Model ZDB6VA...



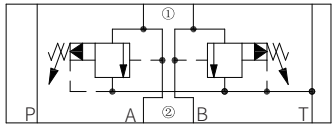
Model ZDB6VB...



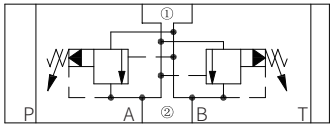
Model ZDB6VP...



Model Z2DB6VC...



Model Z2DB6VD...



Technical parameters

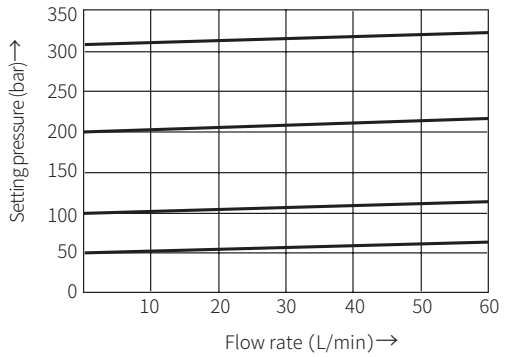
Weight	Model ZDB6	kg	About 1
	Model Z2DB6	kg	About 1.2
Installation position			Optional
Environment temperature range		°C	-20 to +80
Hydraulic			
Maximum working pressure		bar	315
Maximum setting pressure		bar	50; 100; 200;315
Maximum back pressure (port Y)		bar	315 (take the maximum tank pressure of the built-on valve/directional valve into account!)
Maximum flow		L/min	60
Oil fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms Degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1] HEPG(Polyethylene glycol)[2] HEES (synthetic ester)[2]
Oil temperature range		°C	-30 to +80 (NBR seal), -20 to +80 (FKM seal)
Viscosity range		mm^2/s	10 to 800
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15[3]

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

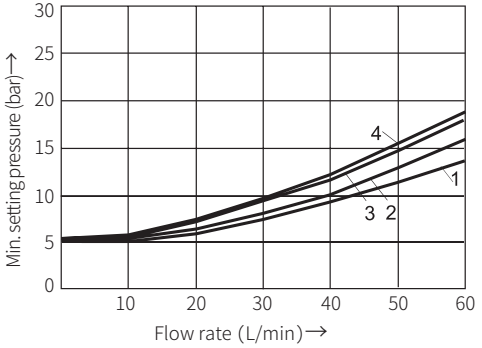
(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

P_E-q_V -Characteristic curve



1 VD(A to B)
2 VA
3 VB, VC
4 VP, VD(B to A)

P_{Emin} -q_V -Characteristic curve

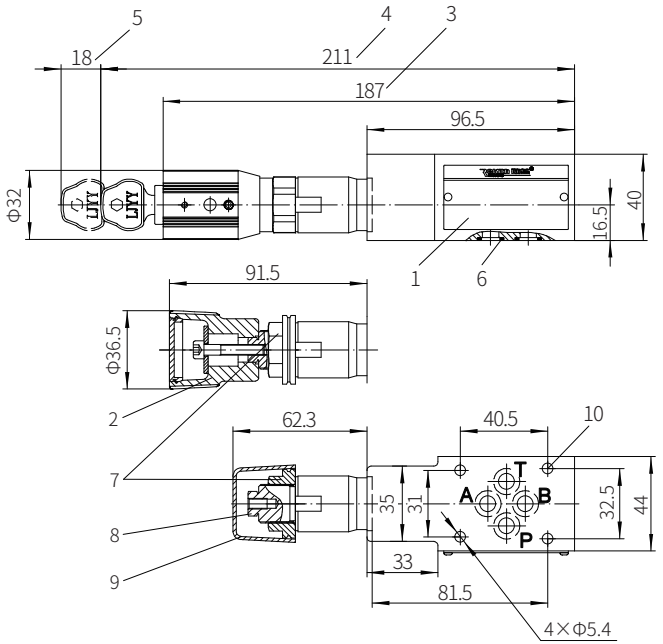


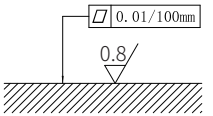
The characteristic curves are valid for an outlet pressure = zero over the entire flow range!

Component size

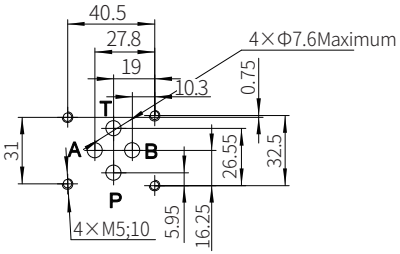
Size unit: mm

Model ZDB6VA...-4XJ/...





Required surface finishing of mating components



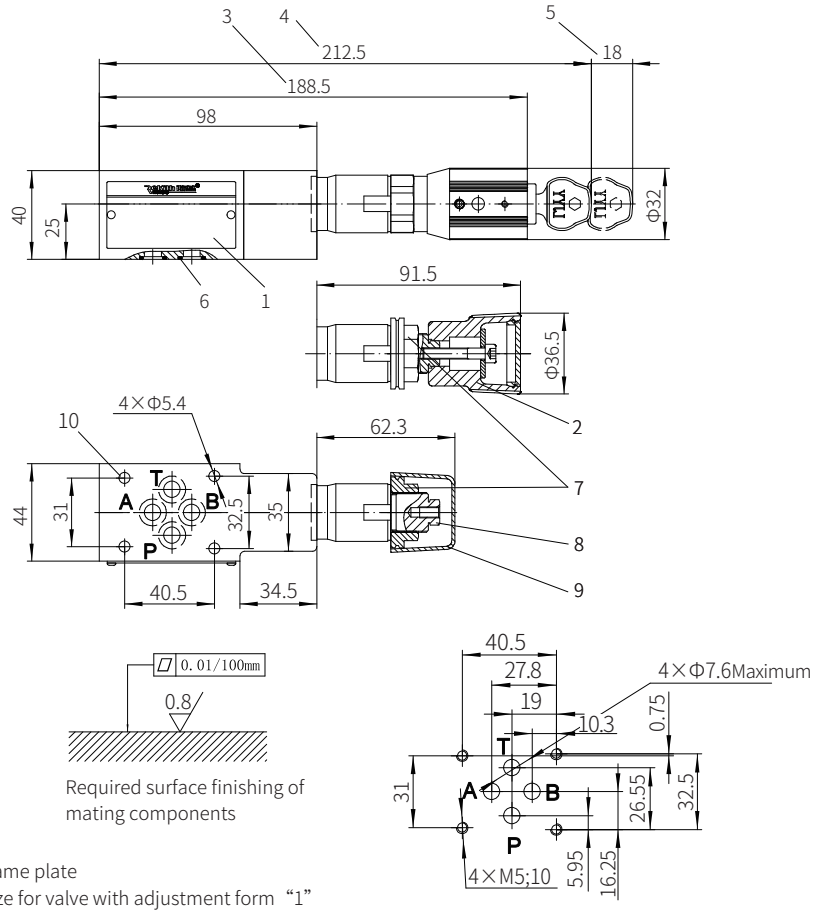
1 Name plate
2 Adjustment form “1”
3 Size for valve with adjustment form “7”
4 Size for valve with adjustment form “3”
5 Space required to remove the key
6 O-ring 9.25x1.78 (for oil port P, A, B, T)
7 Locknut 24A/F
8 Hexagon 10A/F
9 Adjustment form “2”
10 Valve fixing screw holes

Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Component size

Size unit: mm

Model ZDB6VB...-4XJ/...and ZDB6VP...-4XJ/...



Required surface finishing of mating components

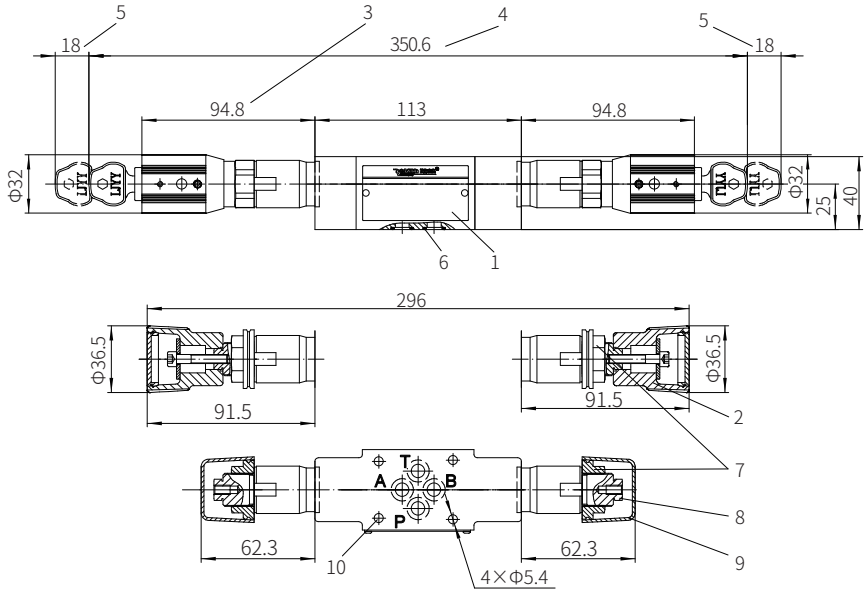
1 Name plate
2 Size for valve with adjustment form “1”
3 Size for valve with adjustment form “7”
4 Size for valve with adjustment form “3”
5 Space required to remove the key
6 O-ring 9.25x1.78 (for oil port P, A, B, T)
7 Locknut 24A/F
8 Hexagon 10A/F
9 Adjustment form “2”
10 Valve fixing screw holes

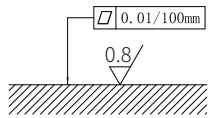
Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Component size

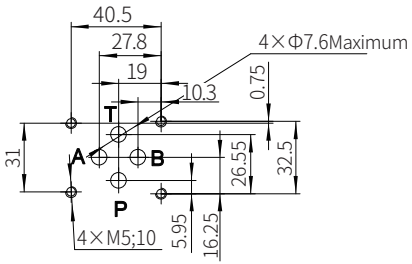
Size unit: mm

Model Z2DB6VC...-4XJ/...and Z2DB6VD...-4XJ/...





Required surface finishing of mating components



1 Name plate
2 Size for valve with adjustment form “1”
3 Size for valve with adjustment form “7”
4 Size for valve with adjustment form “3”
5 Space required to remove the key
6 O-ring 9.25x1.78 (for oil port P, A, B, T)
7 Locknut 24A/F
8 Hexagon 10A/F
9 Adjustment form “2”
10 Valve fixing screw holes

Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

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Modular Pressure Relief Valve

Model: ZDB/Z2DB10...4XJ

- Size 10
- Maximum working pressure 315 bar
- Maximum working flow 100 L/min

Contents

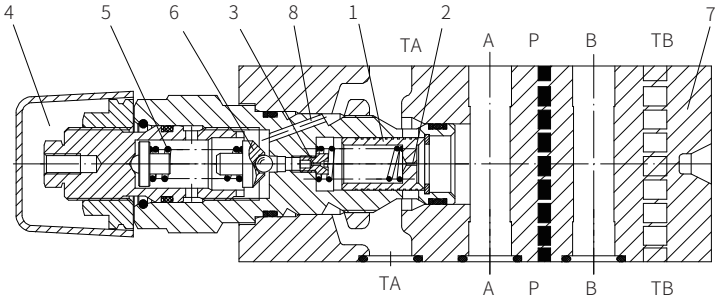
Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05-07

Features

- Cartridge valve
- 4 pressure ranges
- 6 circuit options
- With one or two cartridge relief valves
- 4 adjustment elements
  - -Rotary knob
  - -Hexagon screw with sleeve and protective cap
  - -Lockable rotary knob with scale
  - -Rotary knob with scale

Function description, sectional drawing

The ZDB and Z2DB type relief valve is pilot operated relief valve with sandwich plate design. It's used to limit the pressure within hydraulic system.
The valve is mainly composed of valve body (7), and together with one or two cartridge relief valves. The system pressure is set by adjustment element (4).
At rest, the valve is closed. Pressure in port A acts on valve spool (1), at the same time pressure passes through orifice (2) to act on the spring loaded side of spool (1), and through orifice (3) to act on pilot valve spool (6). If pressure of port A rises above the value set on spring (5), then the pilot valve spool (6) opens.
Hydraulic oil flow from the spring loaded side of the spool (1), orifice (3) and channel (8) into port T. The resulting pressure drop moves the spool (1) thereby opening the connection A to T, while maintaining the pressure set at spring (5). Pilot oil return from two spring chambers via port T externally.



Model ZDB10VA2-...-4XJ/

Models and specifications

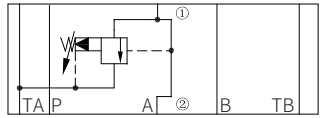
Z | | DB | 10 | | - | 4X | J | | | *

- sandwich plate =Z
- 2 cartridge relief valve =2 (only for "VC" and "VD")
- pressure relief valve =DB
- size 10 =10
- relief function from - to
  - A→TA =VA
  - P→TA =VP
  - TB1→TA2 =VT
  - B→TB =VB
  - A→TA and B→TB =VC
  - A→B and B→A =VD
- adjustment element
  - rotary knob =1
  - hexagon screw with sleeve and protective cap =2
  - lockable rotary knob with scale =3
  - rotary knob with scale =7
- 4X= 40 to 49 series (40 to 49 series: installation and connection size unchanged)
- J= Rekith
- 50= pressure adjustable up to 50bar
- 100= pressure adjustable up to 100bar
- 200= pressure adjustable up to 200bar
- 315= pressure adjustable up to 315bar
- No code = sealing material NBR seals
- V= FKM seals (consult for other seals)
- more information in text

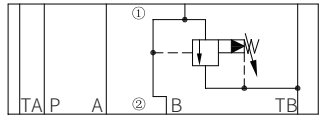
Functional symbols

(① = Valve side ②= Subplate side)

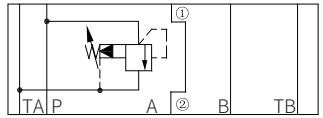
Model ZDB10VA...



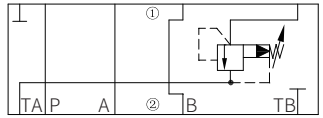
Model ZDB10VB...



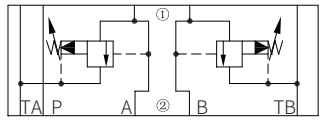
Model ZDB10VP...



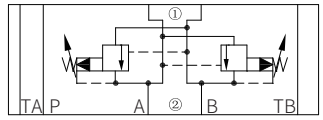
Model ZDB10VT...



Model Z2DB10VC...



Model Z2DB10VD...



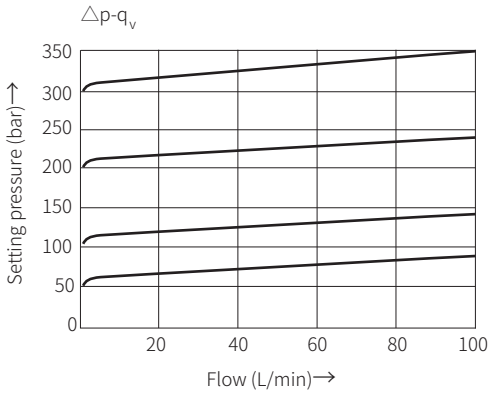
Technical parameters

Overview		
Installation position		optional
Working medium temperature range	°C	-30 to +80 (NBR seals) -20 to +80 (FKM seals)
Weight	Model ZDB10	2.4KG
	Model Z2DB10	2.6KG
Hydraulic		
Maximum working pressure	bar	to 315
Maximum adjustable pressure	bar	50; 100; 200; 315
Maximum flow	L/min	100
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1] HEPG(Polyethylene glycol)[2] HEES (synthetic ester)[2]
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil [3]		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15

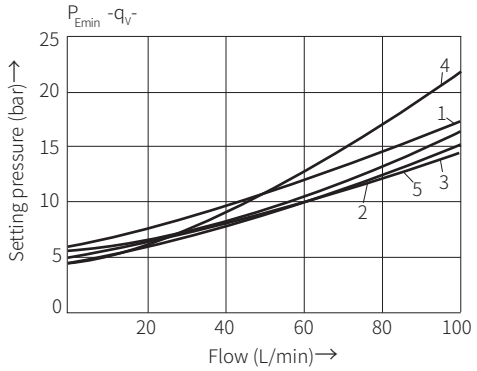
1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)



The characteristic curves are valid for an outlet pressure = zero over the entire flow range!



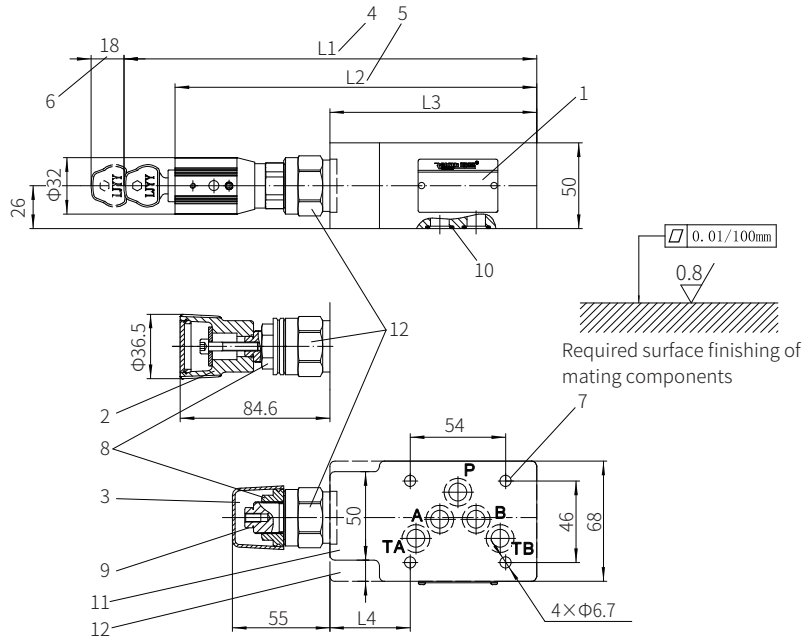
1.VD(A-B) 2.VA

3.VB/VC 4.VP/VD(B-A)

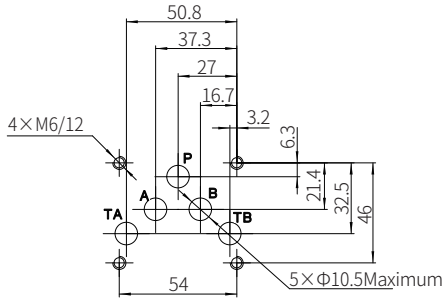
Component size

Size unit: mm

Model ZDB10VA...-4XJ/...and ZDB10VP...-4XJ/...



1 Name plate
2 Adjustment form“1”
3 Adjustment form“2”
4 Adjustment form“3”
5 Adjustment form“7”
6 Space required to remove the key
7 Valve fixing screw holes
8 Locknut S=24
9 External hexagon adjustment screw S=10
10 O ring 12x2 (for all ports)
11 Model ZDB10VA and ZDB10VP version
12 External hexagon S=30



Model	L1	L2	L3	L4
VA and VP	224.2	204.5	117	45.5

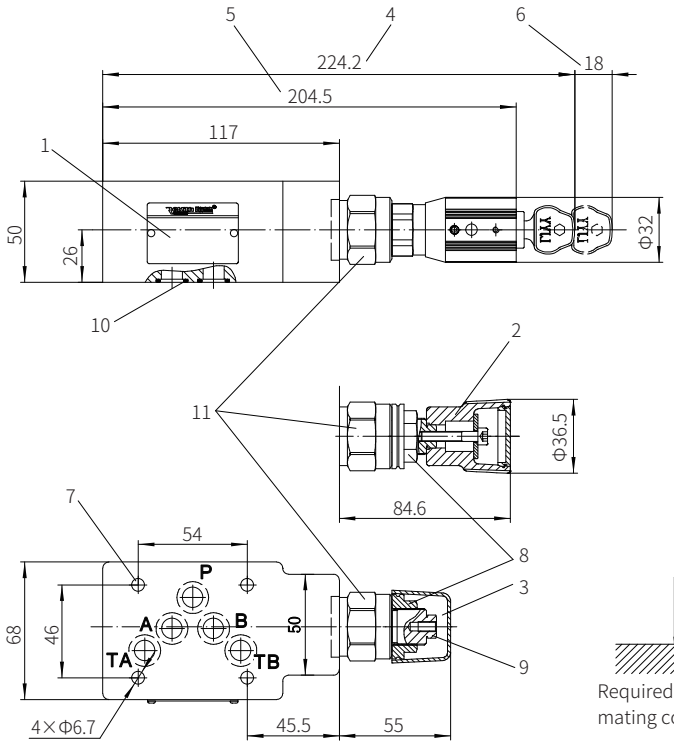
Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

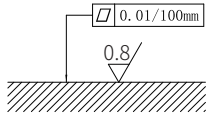
Component size

Size unit: mm

02

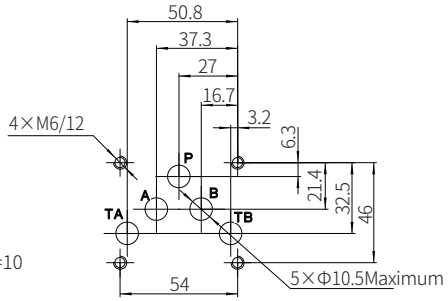
Model ZDB10VB...-4XJ/...





Required surface finishing of mating components

1 Name plate
2 Adjustment form“1”
3 Adjustment form“2”
4 Adjustment form“3”
5 Adjustment form“7”
6 Space required to remove the key
7 Valve fixing screw holes
8 Locknut S=24
9 External hexagon adjustment screw S=10
10 O ring 12x2 (for all ports)
11 External hexagon S=30



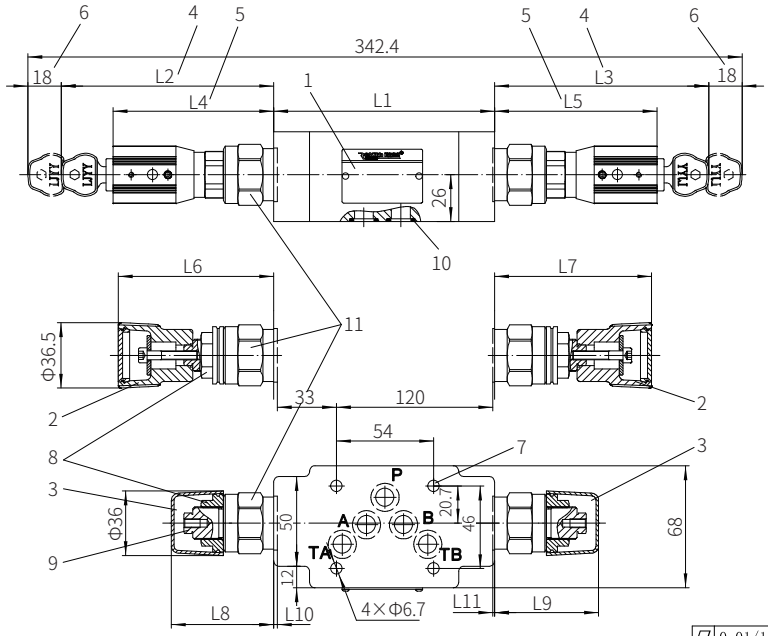
Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Component size

Size unit: mm

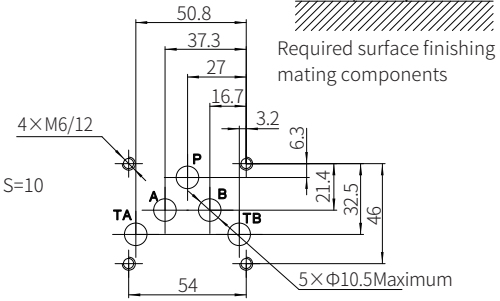
02

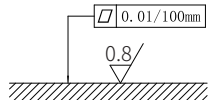
Model Z2DB10VC...-4XJ/...and Z2DB10VD...-4XJ/...



1 Name plate
2 Adjustment form“1”
3 Adjustment form“2”
4 Adjustment form“3”
5 Adjustment form“7”
6 Space required to remove the key
7 Valve fixing screw holes
8 Locknut S=24
9 External hexagon adjustment screw S=10
10 O ring 12x2 (for all ports)
11 External hexagon S=30

Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm





Required surface finishing of mating components

Model	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
VC	123	109.2	110.2	89.5	90.5	86.5	87.5	57	58	2	1
VD	132	105.2	105.2	85.5	85.5	82.5	82.5	53	53	6	6

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Modular Pressure Relief Valve

Model: ZDB/Z2DB16(22)...-3XJ

- Size 16 and 22
- Maximum working pressure 315 bar
- Maximum working flow 200 L/min
  400 L/min

Contents

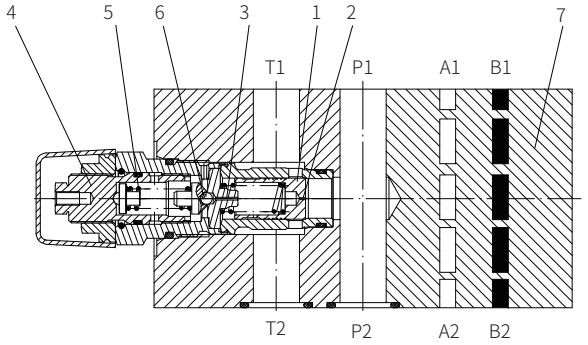
Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05-08

Features

- Sandwich plate type
- The installation surface according to DIN24340A and ISO4401
- Threaded connection and subplate mounting
- 4 pressure ratings
- 5 circuit options
- With one or two cartridge relief valves
- 1 adjustment element
  Adjusting screw with protective cap

Function description, sectional drawing

Relief valve model ZDB and Z2DB are pilot operated relief valve and of sandwich plate design. It's used to limit the pressure within hydraulic system. The valve is composed of valve body (7), with one or two cartridge relief valves, The system pressure is set by adjustment element (4). At rest, the valve is closed. Pressure in port A acts on valve spool (1), at the same time pressure pass through orifice (2) acts on spring, and pass through orifice (3) acts on pilot valve spool (6), if pressure of port A rises above the value set on spring (5), then the pilot valve spool (6) opens. Hydraulic oil flow spring loaded side of the valve spool (1) and orifice (3) into port T. The pressure drop moves valve spool (1) thereby opening the connection A to T, while maintaining the pressure set at spring (5). Pilot oil return from two spring chambers via port T externally.



Model ZDB16VP2-...-3XJ/

Models and specifications

Z | | DB | | | | 3X | J | | | *

sandwich plate =Z

only for "VC" and "VD" 2 cartridge relief valves =2

pilot operated pressure relief valve =DB

size 16 =16
size 22 =22

Relief function from - to:
A——T =VA
B——T =VB
P——T =VP
A——T and B——T =VC
A——B and B——A =VD

more information in text

sealing material
No code = NBR seals
V= FKM seals
(consult for other seals)

50= pressure adjustable up to 50bar
100= pressure adjustable up to 100bar
200= pressure adjustable up to 200bar
315= pressure adjustable up to 315bar

J= Rekith

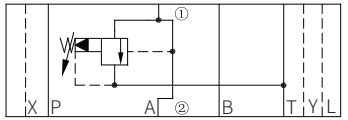
3X= 30 to 39 series
(30 to 39 series installation and connection size unchanged)

adjustment element
2= adjusting screw with protective cap

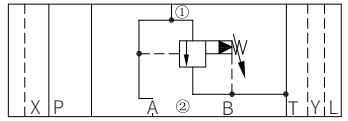
Functional symbols

(① = Valve side ②= Subplate side)

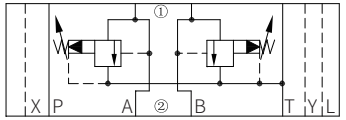
Model ZDB...VA...



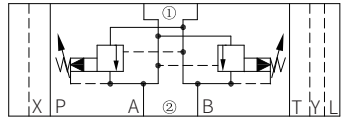
Model ZDB...VB...



Model Z2DB...VC...



Model Z2DB...VD...



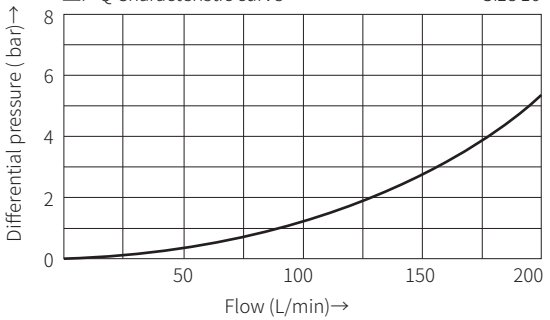
Technical parameters

Oil fluid			Mineral oil - for NBR seal and FKM seal	
			Phosphate oil - for FKM seal	
Working medium temperature range		°C	-30 to +80 (NBR seals)	
			-20 to +80 (FKM seals)	
Viscosity range		mm²/s	10 to 800	
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15	
Maximum working pressure		bar	to 315	
Maximum setting pressure		bar	50, 100, 200, 315	
Size			16	22
Maximum flow		L/min	200	400
Weight	ZDB	kg	about 9.4	about 9.2
	Z2DB	kg	about 11.8	about 10.3

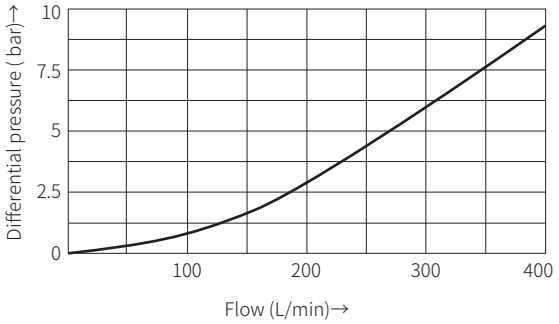
Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

△P-Q Characteristic curve Size 16



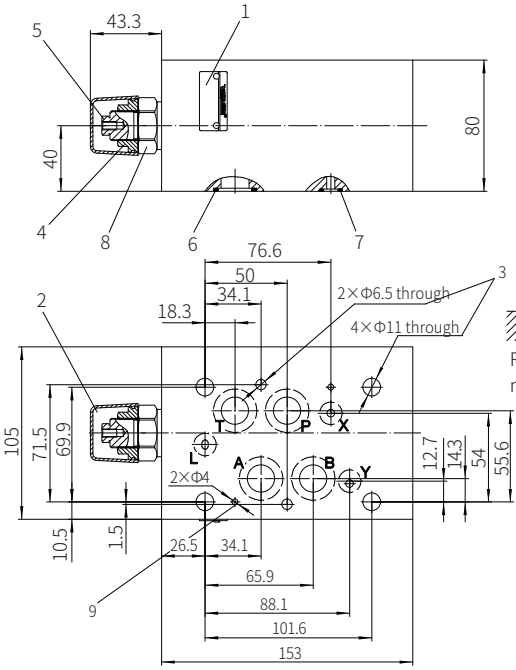
△P-Q Characteristic curve Size 22

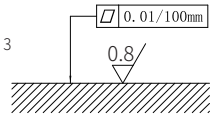


Component size

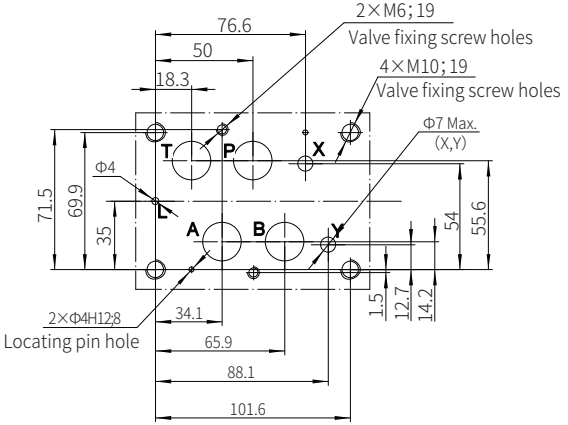
Size unit: mm

Model ZDB16VA...-3XJ/... and ZDB16VP...-3XJ/...





Required surface finishing of mating components



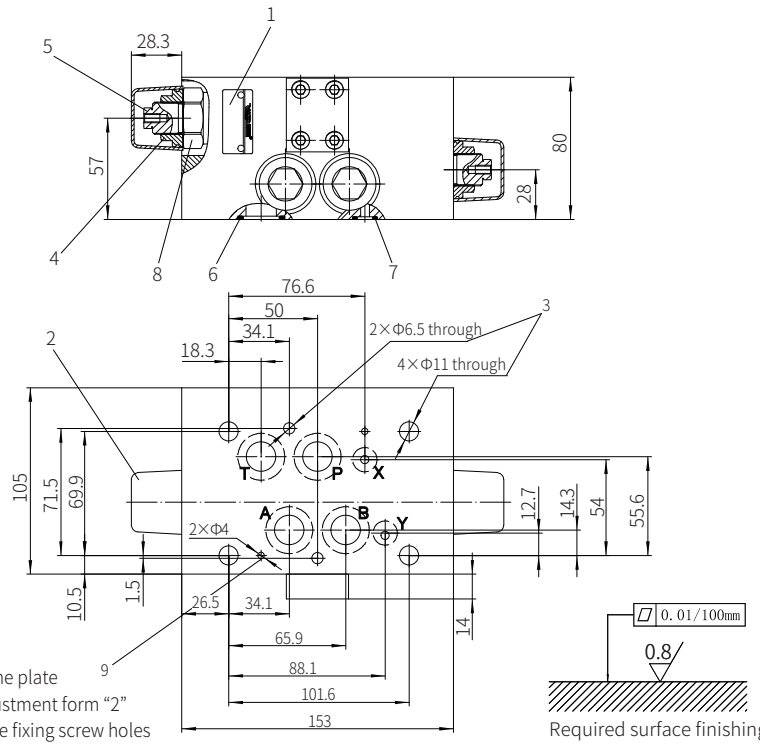
1 Name plate
2 Adjustment form “2”
3 Valve fixing screw holes
4 Locknut S=24
5 External hexagon adjustment screw S=10
6 O ring 21.86x2.62
(for oil port P, A, B, T)
7 O ring 12x2
(for oil port X, Y, L)
8 External hexagon S=30
9 Locating pin hole

Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm
M10-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
The length is determined by the stacking height and must be ordered separately

Component size

Size unit: mm

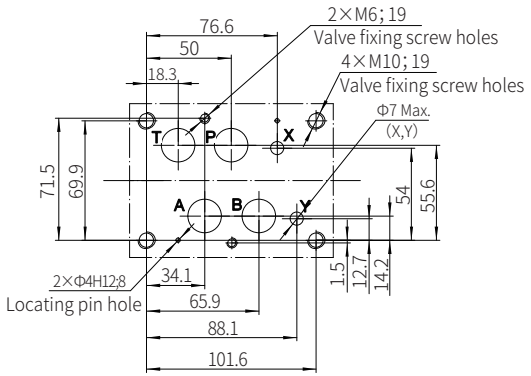
Model Z2DB16VD...-3XJ/...



Required surface finishing of mating components

1 Name plate
2 Adjustment form “2”
3 Valve fixing screw holes
4 Locknut S=24
5 External hexagon adjustment screw S=10
6 O ring 21.86x2.62
(for oil port P, A, B, T)
7 O ring 12x2
(for oil port X, Y, L)
8 External hexagon S=30
9 Locating pin hole

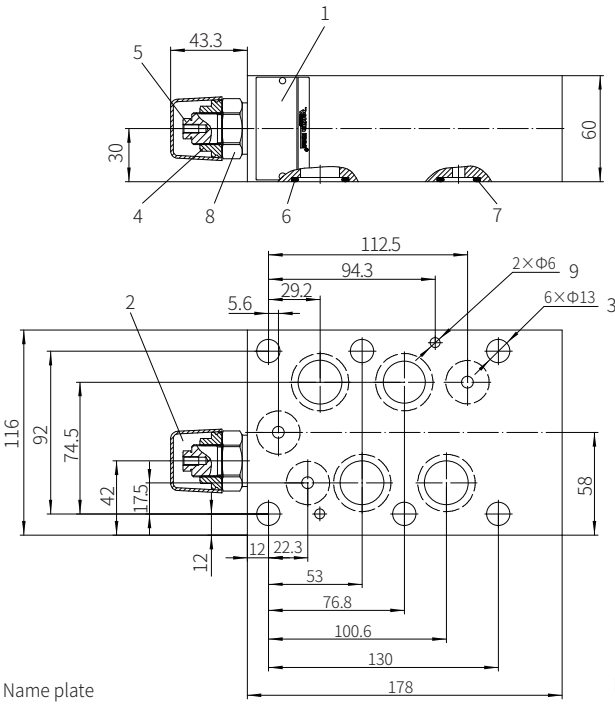
Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm
M10-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
The length is determined by the stacking height and must be ordered separately

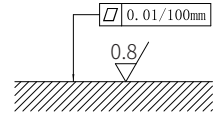


Component size

Size unit: mm

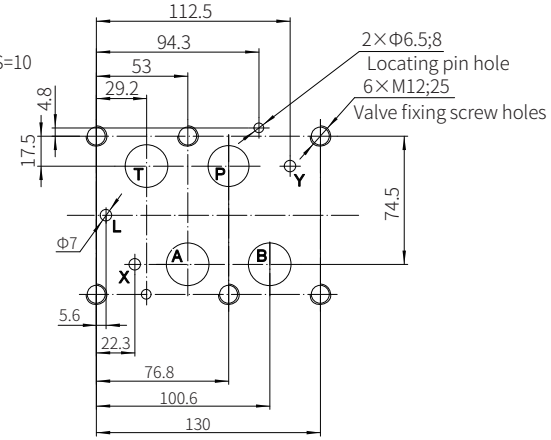
Model ZDB22VP...-3XJ/...





Required surface finishing of mating components

1 Name plate
2 Adjustment form “2”
3 Valve fixing screw holes
4 Locknut S=24
5 External hexagon adjustment screw S=10
6 O ring 27x3
(for oil port P, A, B, T)
7 O ring 19x3
(for oil port X, Y, L)
8 External hexagon S=30
9 Locating pin hole

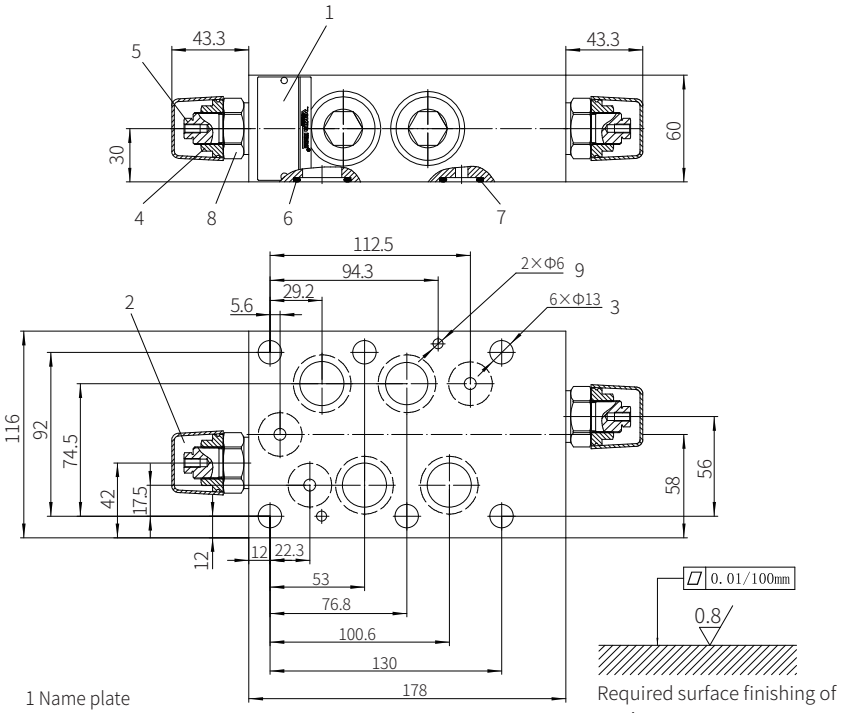


Valve fixing screw
M12-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
The length is determined by the stacking height and must be ordered separately

Component size

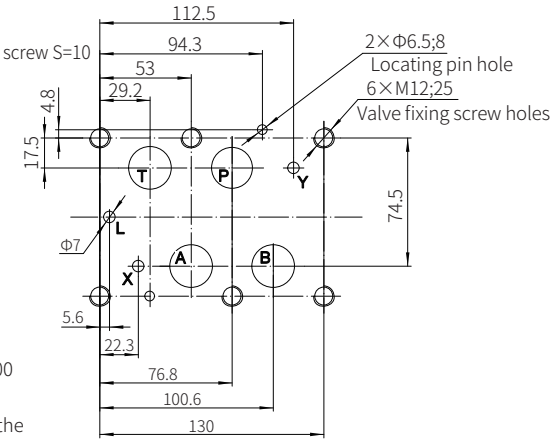
Size unit: mm

Model Z2DB22VD...-3XJ/...



Required surface finishing of mating components

1 Name plate
2 Adjustment form "2"
3 Valve fixing screw holes
4 Locknut S=24
5 External hexagon adjustment screw S=10
6 O ring 27x3
(for oil port P, A, B, T)
7 O ring 19x3
(for oil port X, Y, L)
8 External hexagon S=30
9 Locating pin hole



Valve fixing screw
M12-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm
The length is determined by the stacking height and must be ordered separately

Balanced Valve

Model DC...-1XJ

- Size 10 to 30
- Maximum working pressure 315 bar
- Maximum working flow 330 L/min

Contents

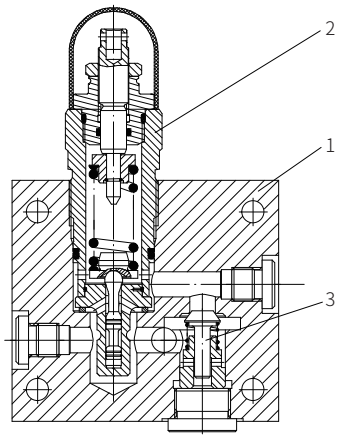
Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Characteristic curve	03-04
Component size	05-06

Features

- Subplate mounting
- Threaded connection
- 3 adjustment elements
  - -Rotary knob
  - -Inner hexagon screw with protective cap
  - -Lockable rotary knob
- 5 pressure ratings

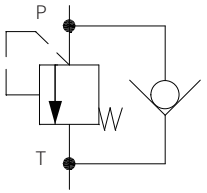
Function description, sectional drawing

The DC pressure control valve is a balanced valve which is composed of valve body (1), direct operated relief valve (2) and check valve (3).
It is used to maintain the hydraulic load. When the cylinder rises, the pressure oil can pass freely. When it falls, the pressure is resulted in the return pipe to prevent the cylinder from falling due to its own weight.



Model DC...1XJ/

Functional symbol



Models and specifications

DC | | | | 1X | J | / | / | | *

size	subplate mounting	threaded connection
6	-	G1/4 or M14*1.5
10	10	G1/2 or M22*1.5
15	-	G3/4 or M27*2
20	20	G1 or M33*2
25	-	G1 1/4 or M42*2
30	30	G1 1/2 or M48*2

subplate mounting =P
threaded connection =G

rotary knob =1
inner hexagon screw with protective cap =2
lockable rotary knob =3

25= set pressure up to 2.5MPa
50= set pressure up to 5MPa
100= set pressure up to 10MPa
200= set pressure up to 20MPa
315= set pressure up to 31.5MPa

J= Rekith

1X= 10 to 19 series
(10 to 19 series installation and connection size unchanged)

No code= G thread
2= M thread
(for threaded connection only)

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

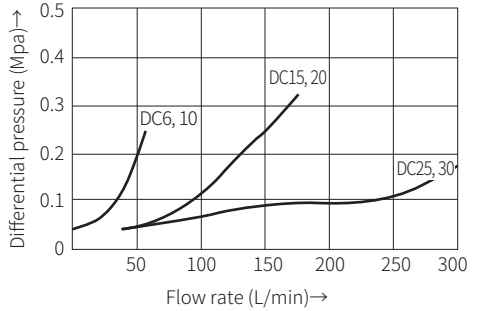
Technical parameters

Medium	Mineral hydraulic oil or phosphate hydraulic oil					
Working temperature range °C	-30 to +80 (NBR seal); -20 to +80 (FRM seal)					
Viscosity range mm^2/s	10 to 800					
Size	6	10	15	20	25	30
Working pressure: port A, B MPa	to 31.5					
Cracking pressure MPa	to 0.05					
Maximum flow L/min	45	110	230		330	

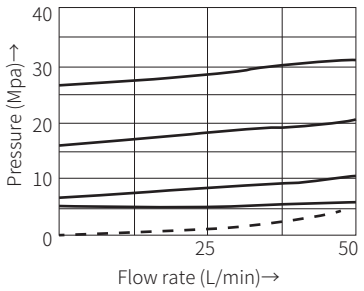
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

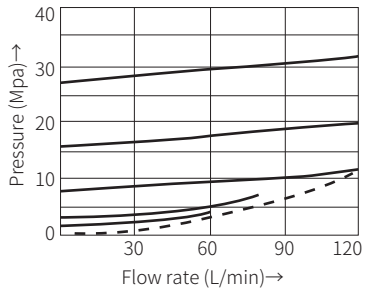
Pressure loss curve (with flow freely via check valve)



DC6



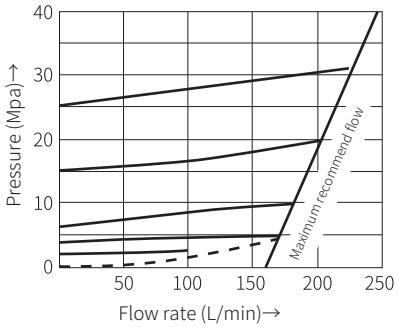
DC10



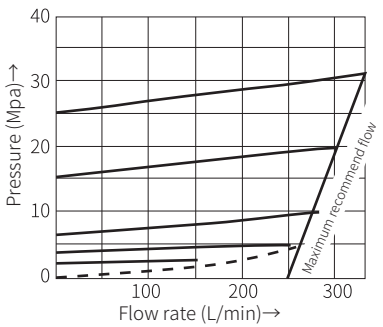
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

DC15, 20



DC25, 30

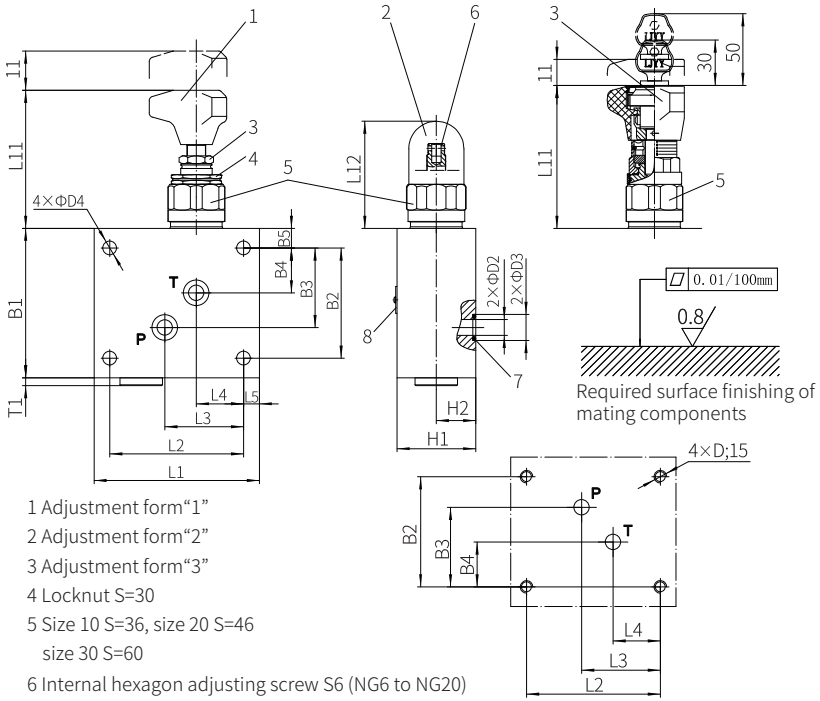


------- Minimum adjusting pressure

Component size

Size unit: mm

Model DC...P...-1XJ/..., subplate mounting



1 Adjustment form“1”
2 Adjustment form“2”
3 Adjustment form“3”
4 Locknut S=30
5 Size 10 S=36, size 20 S=46
size 30 S=60
6 Internal hexagon adjusting screw S6 (NG6 to NG20)
External hexagon adjusting screw S13 (NG25 to NG30)
7 O ring 12.3X2.4(size 10)
O ring 22X3 (size 20)
O ring 34X3 (size 30)
8 Name plate

Valve fixing screw
Size 10: M8x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm
Size 20: M12x80-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm
Size 30: M16x120-10.9 grade GB/T70.1-2000
Tightening torque M_A=196Nm

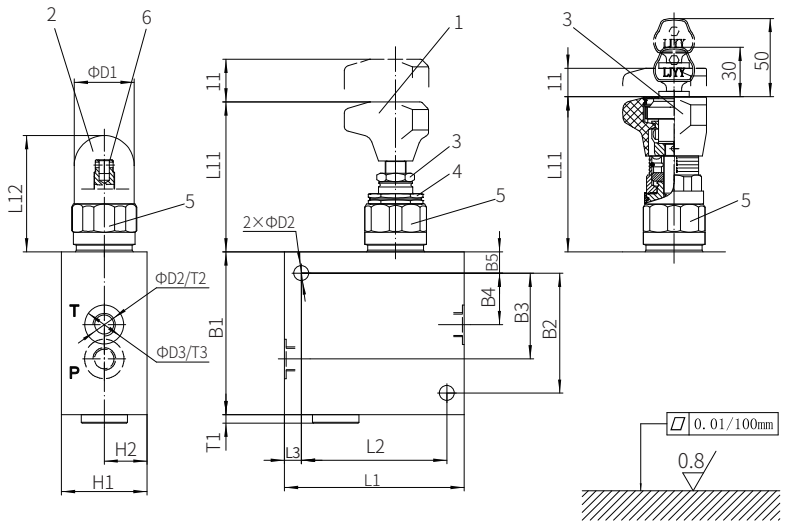
Size	L1	L2	L3	L4	L5	L11	L12	B1	B2	B3	B4
10	105	85	50	30	10	79	68	95	70	50.5	28.5
20	145	115	65	35	15	77	65	135	85	63	29
30	180	150	75	45	15	-	83	175	125	82	35

Size	B5	H1	H2	D1	D2	D3	D4	T1	D
10	12.5	50	25	38	10	17.8	9	4	4×M8
20	25	60	30	46	20	27.7	13	4	4×M12
30	25	80	40	63	30	41.6	17	5	4×M16

Component size

Size unit: mm

Model DC...G...-1XJ/..., threaded connection



1 Adjustment form"1"
2 Adjustment form"2"
3 Adjustment form"3"
4 Locknut S=30
5 Size10 S=36, size20 S=46 size30 S=60
6 Internal hexagon adjusting screw S6 (NG6 to NG20)
External hexagon adjusting screw S13 (NG25 to NG30)

Required surface finishing of mating components

Size	L1	L2	L3	L11	L12	B1	B2	B3	B4	B5
6	105	85	10	83	72	95	70	50.5	28.5	12.5
10				79	68					
15	140	110	15	77	65	135	85	63	29	25
20										
25	180	150	15	-	83	175	125	82	35	25
30										

Size	H1	H2	D1	D2	D3	D	T1	T2	T3
6	50	25	34	9	25	M14×1.5 (G1/4")	4	16	1
10			38		38	M22×1.5 (G1/2")		15	
15	60	30	48	14	45	M27×2(G3/4")	7	18	1
20					52	M33×2 (G1")		20	
25	80	40	63	18	63	M42×2(G1 1/4")	8	23	1
30					65	M48×2(G1 1/2")			

Cartridge Pilot Pressure Relief Valve

Model: DB...K...XJ

- Size 6/10/20
- Maximum working pressure 315bar
- Maximum working flow 300 L/min

Contents

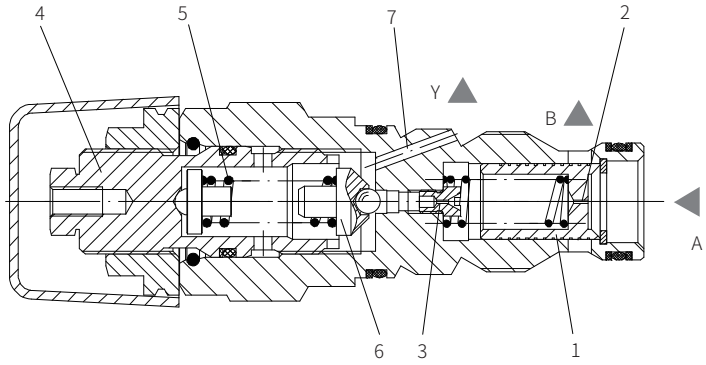
Function description, sectional drawing	02
Models and specifications	03
Technical parameters	03
Characteristic curve	04
Component size	05-07

Features

- Cartridge connection
- 4 pressure range
- 4 adjustment form
  - -Rotary knob
  - -Internal hexagon adjusting screw with -protective cap
  - -Lockable rotary knob with scale
  - -Rotary knob with scale

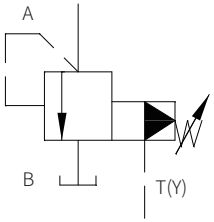
Function description, sectional drawing

The DB...K...valve is cartridge pilot pressure relief valve. It's used to limit the pressure in hydraulic system, the system pressure is set by adjustment element (4).
At rest, the valves is closed. The pressure in the port A acts on valve spool (1). At the same time, the pressure is passed through orifice (2) of the spool (1) onto the spring chamber. and through orifice (3) to act on the pilot poppet (6).
If the pressure in port A rises above the setting value of the spring (5), then the pilot poppet (6) opens, The pressure fluid can flow to the spring chamber of valve spool (1), and to port T(Y) through orifice (3) and channel (8), the resulting pressure drop moves valve spool (1) to open the connection from port A to port B. The control oil from 2 spring chambers is drain to the tank through port T (Y).

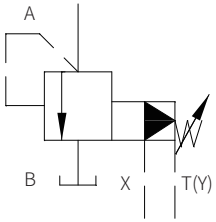


Functional symbols

Model DB...Y...



Model DB...XY...(Only for DB20K)



Models and specifications

DB | | K | – | | J | / | | | *

pilot relief valve=DB

size 6 =6
size 10 =10
size 20 =20

cartridge connection =K

rotary knob=1 =1
internal hexagon adjusting screw with protective cap =2
lockable rotary knob with scale =3
rotary knob with scale =7

40 to 49 series(for size 6 and size 10) =4X
(40 to 49 series: installation and connection size unchanged)
10 to 19 series(for size 20) =1X
(10 to 19 series: installation and connection size unchanged)

J= Rekith

50= pressure setting up to 50bar
100= pressure setting up to 100bar
200= pressure setting up to 200bar
315= pressure setting up to 315bar

Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external(only for DB20K)

No code = sealing material NBR seals
V= FKM seals (consult for other seals)

more information in text

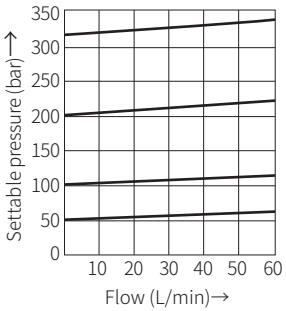
Technical parameters

Size	6	10	20
Oil fluid	Mineral hydraulic oil or phosphate hydraulic oil		
Oil temperature range °C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)		
Viscosity range mm^2/s	100 to 800		
Cleanliness of oil	The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		
Maximum working pressure bar	to 315		
Settable pressure bar	to 50, to 100, to 200, to 315		
Maximum flow L/min	to 60	to 100	to 300
Weight kg	about 0.15	about 0.2	about 0.35

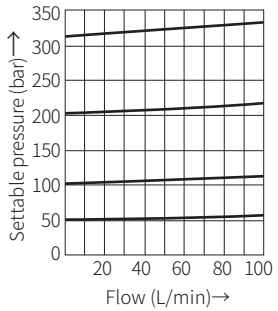
Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

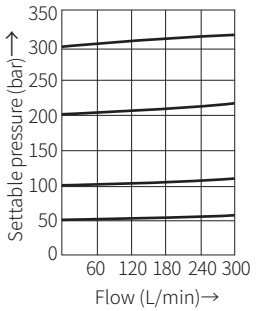
DB6K
Settable pressure-- Flow curve



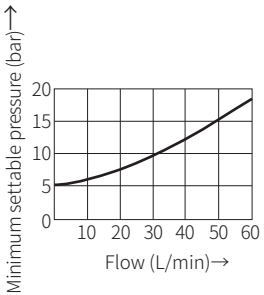
DB10K
Settable pressure-- Flow curve



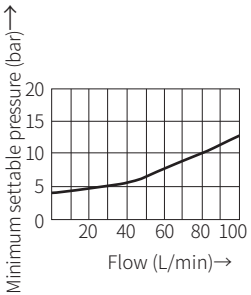
DB20K
Settable pressure-- Flow curve



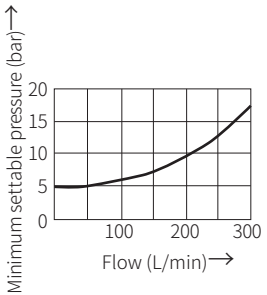
DB6K
Minimum settable pressure curve



DB10K
Minimum settable pressure curve



DB20K
Minimum settable pressure curve

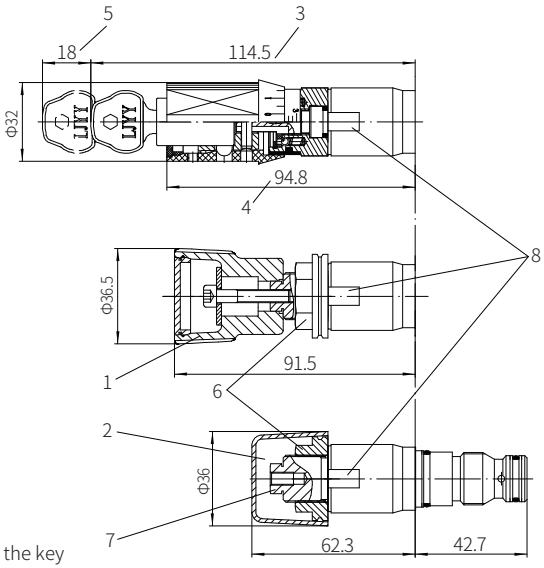


The above curves are measured without back pressure.

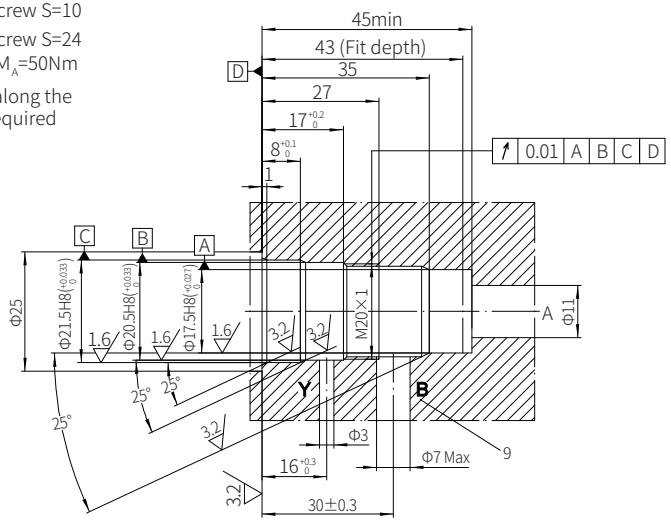
Component size

Size unit: mm

Model DB6K...4XJ/...



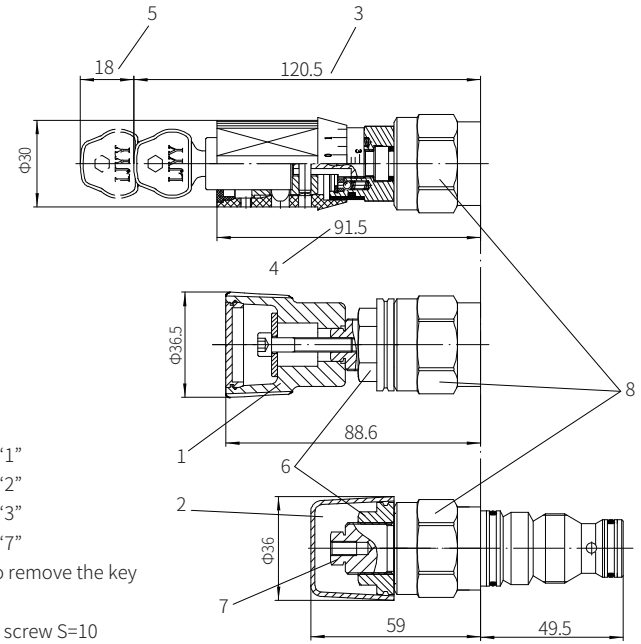
1 Adjustment form“1”
2 Adjustment form“2”
3 Adjustment form“3”
4 Adjustment form“7”
5 Space required to remove the key
6 Lock nut S=24
7 External hexagon screw S=10
8 External hexagon screw S=24
Tightening torque: M_A=50Nm
9 Port B is arranged along the circumference as required



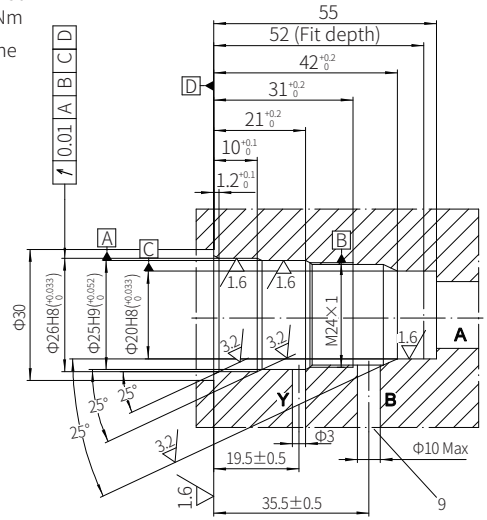
Component size

Size unit: mm

Model DB10K...-4XJ/...



1 Adjustment form“1”
2 Adjustment form“2”
3 Adjustment form“3”
4 Adjustment form“7”
5 Space required to remove the key
6 Lock nut S=24
7 External hexagon screw S=10
8 External hexagon screw S=30
Tightening torque:M_A=50Nm
9 Port B is arranged along the circumference as required

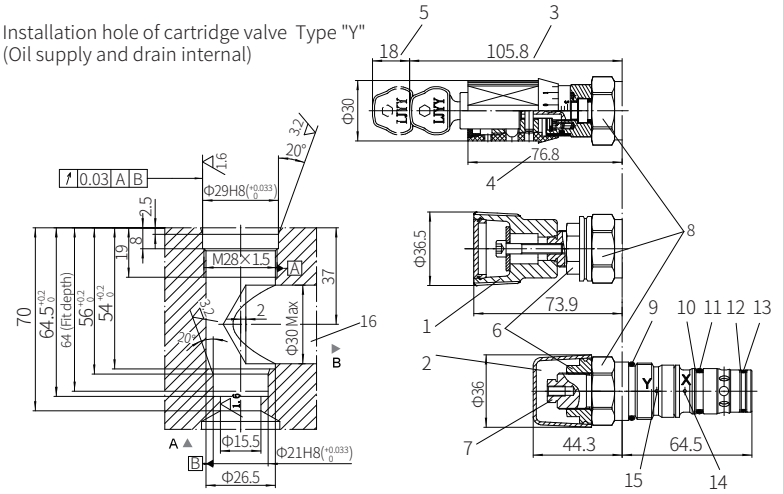


Component size

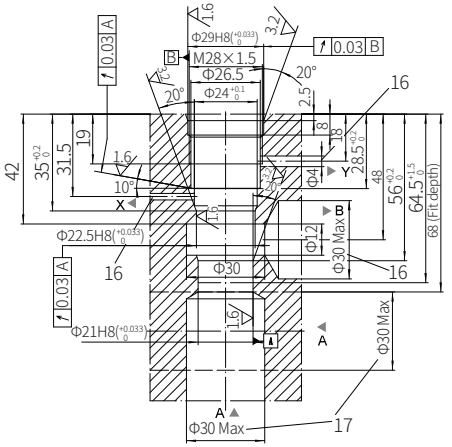
Size unit: mm

Model DB20K...-1XJ/...

Installation hole of cartridge valve Type "Y"
(Oil supply and drain internal)



Installation hole of cartridge valve Type "XY"
(Oil supply and drain external)



1 Adjustment form“1”
2 Adjustment form“2”
3 Adjustment form“3”
4 Adjustment form“7”
5 Space required to remove the key
6 Lock nut S=24
7 External hexagon screw S=10
8 External hexagon screw S=30
Tightening torque:M_A=50Nm
9 O ring 23.47x2.62
10 Retainer ring 18.4x22.6x0.6
11 O ring 17.12x2.62
12 Retainer ring 21.1x18.2x0.6
13 O ring 17.17x1.78
14 Port "Y" used for type DB20K...1XJ/XY
15 Port "Y" used for type
DB20K...1XJ/XY...and DB20K...1XJ/Y..
16 Port X, Y and B are arranged along the circumference
17 Port A, optional

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Multistage Electro-hydraulic Pilot Relief Valve

Model: DB2U...5XJ

- Size 10 to 32
- Maximum working pressure 350 bar
- Maximum working flow 600 L/min

Contects

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	04
Characteristic curve	05
Component size	06-08

Features

- Subplate mounting
- Threaded connection
- Cartridge connection
- Two-stage pressure setting
- Controlled by solenoid directional valve
- Pressure adjusting forms:
  Rotary knob
  Internal hexagon screw with protective cap
  Lockable rotary knob with scale

Function description, sectional drawing

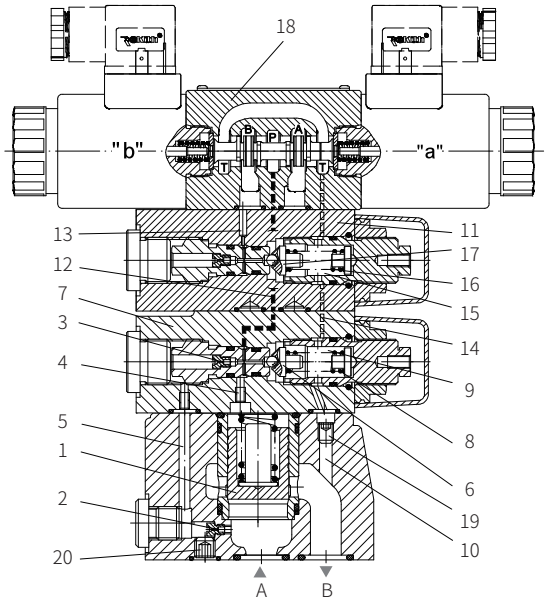
The DB2U...-5X/ valve is pilot controlled two-stage concentric type multistage relief valve (two-stage). The main valve and pilot valve are both seat valve. The valve is used to control the system pressure, and it may switch the system pressure to the secondary pressure by the solenoid directional valve.
DB2U valve mainly consists of main valve, 4/3-way(H type) or 4/2-way(D type) solenoid directional valve (size 6), and two pilot valves, the pilot valve (11) is a direct operated relief valve.

Model DB2U...H...-5XJ

When the solenoid is de-energized, the fluid at port A of main valve acts on bottom of main spool (1), and via orifice (2), channel (5), orifice (3), channel (12), port P and T of pilot solenoid valve (18), spring chamber (15) of pilot valve (11), channel (14), spring chamber (9) of pilot valve (7), channel (10) back to tank (pilot oil drain internal), or via external outlet back to tank (pilot oil drain external). Thus, a differential pressure is formed on the main spool when the pressure oil flow through the orifices (2 and 3) and it opens the main spool to make the relief valve unloading.
When solenoid “b” is energized, the fluid of pilot solenoid valve (18) flows from P to A and B to T, at this time the pressure oil of the secondary pilot valve (11) via channel (13), port B and T of pilot solenoid valve, spring chamber (15), channel (14), spring chamber (9) and channel (10) back to tank, then the secondary pilot valve is unloading. The pressure oil of the pilot valve (7) acts on the valve spool (6) through orifice (3). When the system pressure exceeds the setting pressure of the spring (8), the valve spool (6) is opened, and the pressure oil at the upper end of the main spool flows back to the oil tank through channels (4 and 10) and spring chamber (9). In this way, a differential pressure is formed on the main spool and opens the main spool (1). The pressure oil flows from A to B at a set pressure as the primary pressure regulation.
When solenoid “a” is energized, it is a secondary pressure regulation under the same principle (note: the setting pressure of the secondary pilot valve should be less than the setting pressure of the primary pilot valve).

Model DB2U...D...-5XJ

It is the primary pressure regulation when solenoid is de-energized, but the secondary pressure regulation when solenoid is energized. This valve doesn't have solenoid unloading function. The switch of different supply and drain modes can be achieved by assembling the conical plugs (19 and 20).



Model DB2U10-H-2-5XJ/

Models and specifications

DB | 2U | | | | | 5X | J | | | | | | | | | | | | *

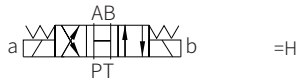
electro-hydraulic relief valve =no code
pilot valve with main valve spool assembly (plug-in) =C

two-staged pressure regulation

size — ordering code

subplate mounting		threaded connection
10	10	10 (G1/2”) or 22X1.5
15	-	15 (G3/4”) or 27X2
20	20	20 (G1”) or 33X2
25	-	25(G1 1/4”)or M42X2
32	32	30(G1 1/2”)or M48X2

subplate mounting =no code
threaded connection =G



=H

=D

adjusting element
rotary knob =1
internal hexagon screw with protective cap =2
lockable rotary knob with scale =3

50 to 59 series =5X
(50 to 59 series installation and connection size unchanged)

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

Z4= standard plug
Z5L= large right angle lamp plug

no code= no manual emergency operation
N9= with hidden manual emergency operation

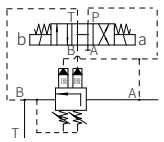
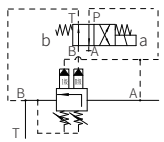
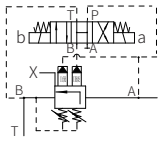
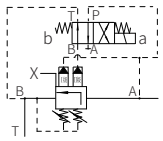
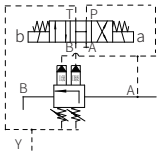
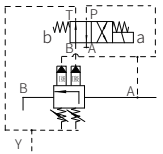
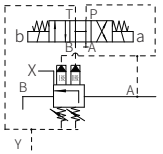
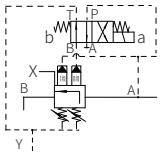
CW220-50= AC voltage 220V-50Hz
CG24= DC24V
CW220R= rectified solenoid

no code=pilot oil supply and drain internal
X=pilot oil supply external and drain internal
Y=pilot oil supply internal and drain external
XY= pilot oil supply and drain external

50= pressure setting up to 5MPa
100= pressure setting up to 10MPa
200= pressure setting up to 20MPa
315= pressure setting up to 31.5MPa
350= pressure setting up to 35MPa

J= Rexroth

Functional symbols

Supply and drain internal	DB2U...H.../... 	DB2U...D.../... 
Supply external and drain internal	DB2U...H.../...X 	DB2U...D.../...X 
Supply internal and drain external	DB2U...H.../...Y 	DB2U...D.../...Y 
Supply and drain external	DB2U...H.../...XY 	DB2U...D.../...XY 

Technical parameters

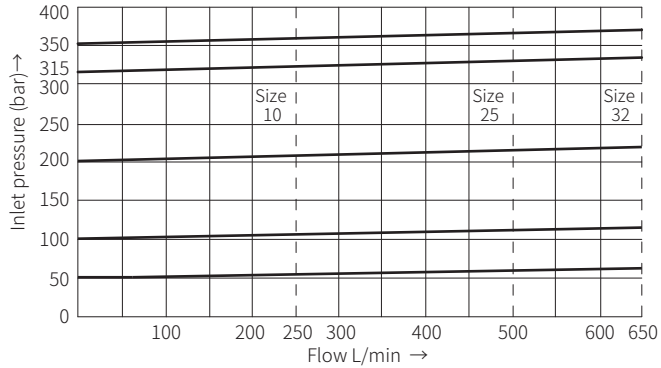
Size			10	15	20	25	30
Flow (L/min)	threaded connection valve		200		400		600
	subplate mounting valve		200	—	400	—	600
Working pressure		Mpa	Port A, B, X to 35				
Port Y back pressure		Mpa	to 31.5				
Minimum setting pressure		Mpa	Related to flow, see characteristic curve				
Maximum setting pressure		Mpa	35				
Medium			Mineral hydraulic oil or phosphate hydraulic oil				
Viscosity range		mm^2/s	10 to 800				
Working medium temperature range		°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Solenoid valve characteristic			See 4WE6 solenoid valve				

Characteristic curve

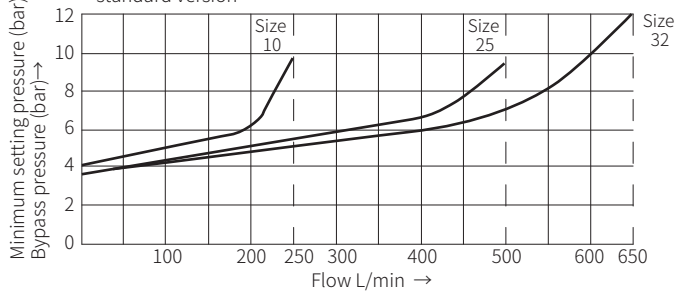
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The curve was measured at zero pressure for externally controlled oil leakage.
For internal control oil return, the pressure at port B is added to the command value.

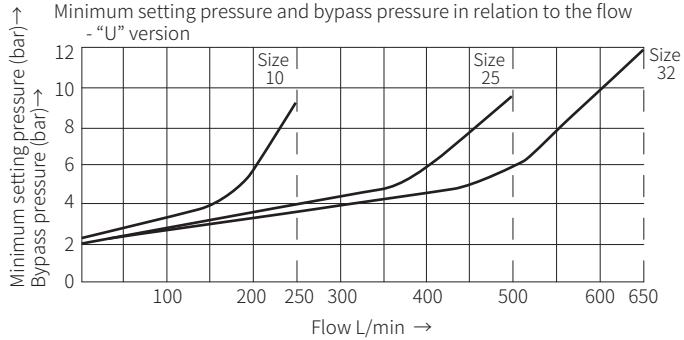
Inlet pressure in relation to the flow



Minimum setting pressure and bypass pressure in relation to the flow
- standard version



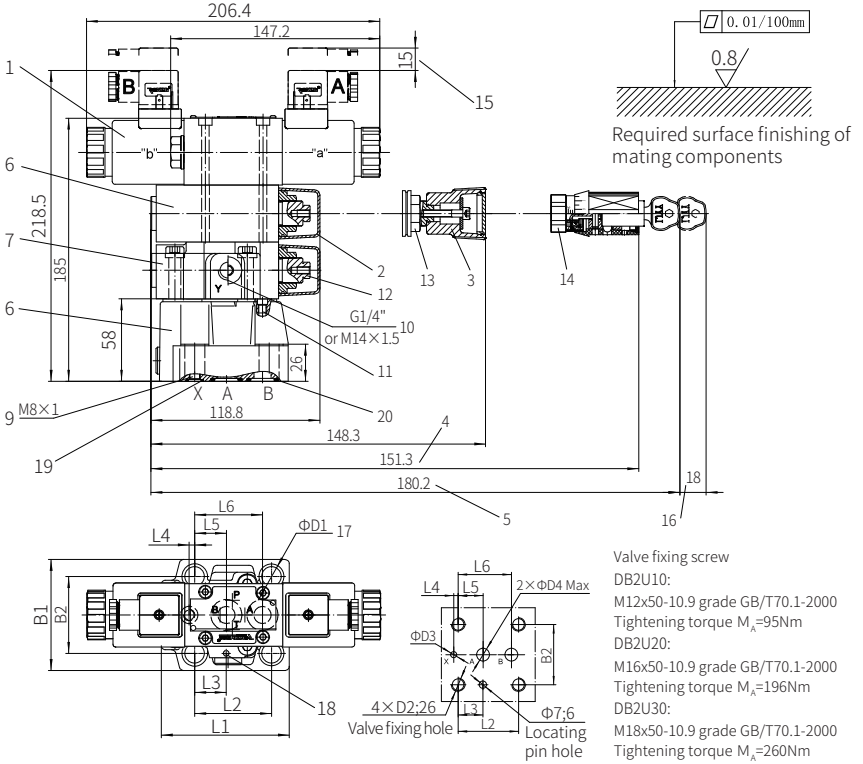
Minimum setting pressure and bypass pressure in relation to the flow
- "U" version



Component size

Size unit: mm

Subplate mounting valve model DB2U...-5XJ/...



Valve fixing screw
DB2U10:
M12x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm
DB2U20:
M16x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=196Nm
DB2U30:
M18x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=260Nm

Size	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and M14x 1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 Valve screw fixing holes
18 Locating pin hole
19 O ring 9.25x1.78(for port X)
20 DB2U10:
O ring 17.12x2.62(for port A, B)
DB2U20:
O ring 28.17x3.53(for port A, B)
DB2U30:
O ring 34.52x3.53(for port A, B)

It must be ordered separately if connection subplate is needed

DB2U10 Subplate model:
G545/01(G3/8") ; G545/02 (M18x1.5)
G546/01(G1/2") ; G546/02(M22x1.5)

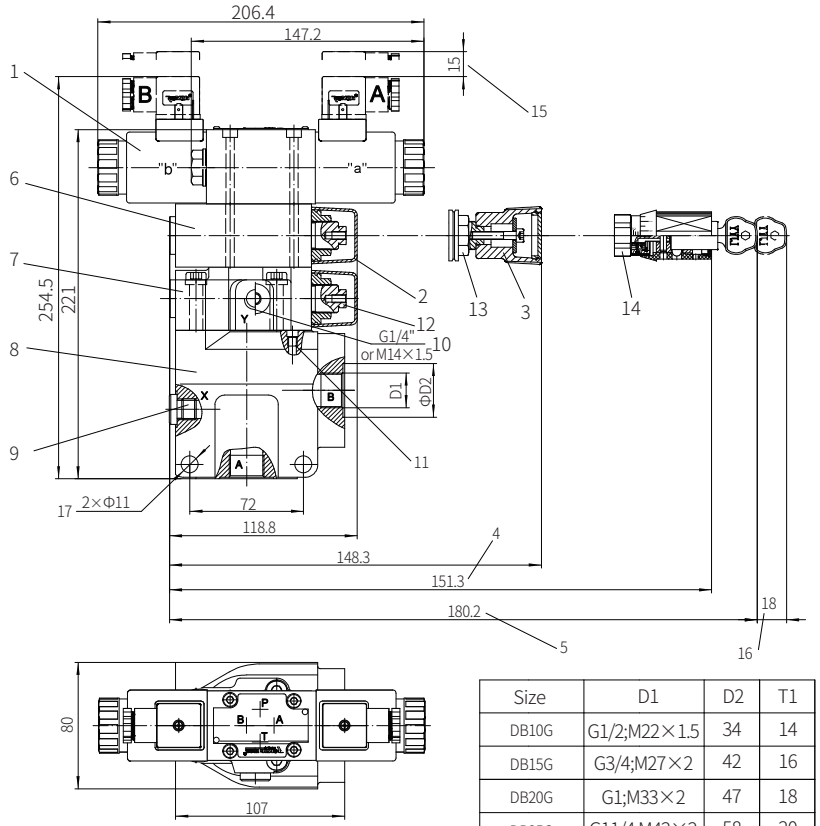
DB2U20 Subplate model:
G408/01(G3/4") ; G408/02 (M27x2)
G409/01(G1") ; G409/02 (M33x2)

DB2U30 Subplate model:
G410/01(G11/4") ; G410/02 (M42x2)
G411/01(G11/2"); G411/02(M48x2)

Component size

Size unit: mm

Threaded connection valve model DB2U...G...-5XJ/...



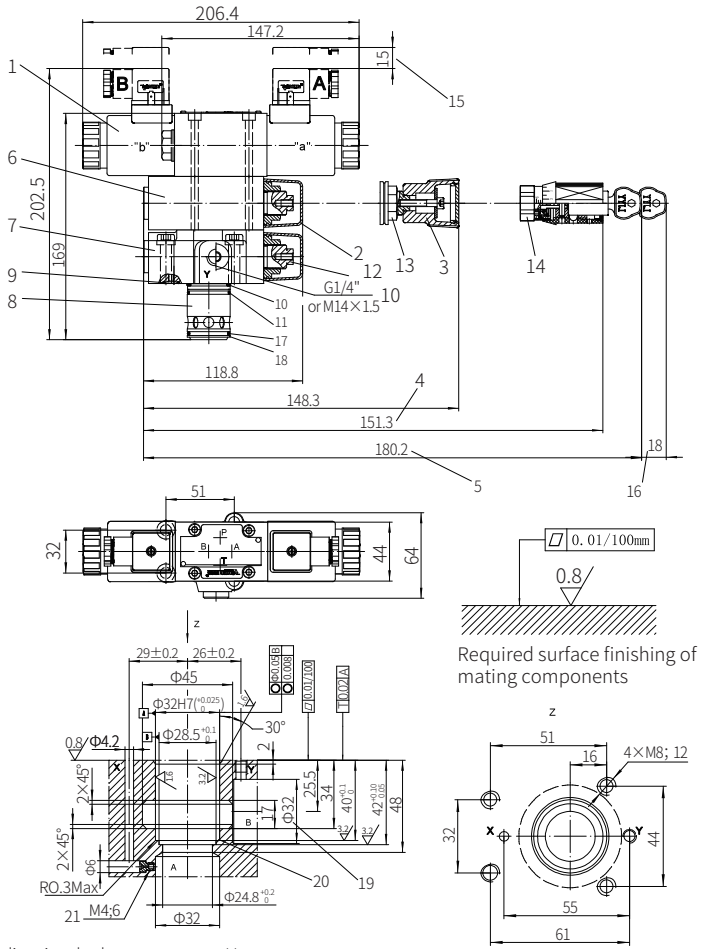
Size	D1	D2	T1
DB10G	G1/2;M22×1.5	34	14
DB15G	G3/4;M27×2	42	16
DB20G	G1;M33×2	47	18
DB25G	G11/4;M42×2	58	20
DB30G	G11/2;M48×2	65	22

1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and M14x 1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 Valve screw fixing holes

Component size

Size unit: mm

with (DBC2U10 or 30) or without (DBC2U)



1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary pilot valve
7 Primary pilot valve
8 Main spool
9 O ring 9.25x1.78
10 O ring 28x2.65
11 O ring 28x1.8
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8
19 The Φ32 hole can intersect Φ45 hole at any position
Be careful not to damage oil port X and fixing holes
20 The retainer ring and O-ring should be installed in this hole before install main spool
21 Throttle must be ordered separately

Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm
it must be ordered separately
if connection subplate is needed
G51/01(G1/4") ; G51/02 (M14x1.5)

Multistage Electro-hydraulic Pilot Relief Valve

Model: DB3U...5XJ

- Size 10 to 32
- Maximum working pressure 350 bar
- Maximum working flow 600 L/min

Contects

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	04
Characteristic limit	05
Component size	06-08

Features

- Subplate mounting
- Threaded connection
- Cartridge connection
- Two-stage or three-stage pressure setting
- Controlled by solenoid directional valve
- Pressure adjusting forms:
  - Rotary knob
  - Internal hexagon screw with protective cap
  - Lockable rotary knob with scale

Function description, sectional drawing

The DB3U valve is a pilot controlled two-stage concentric type multistage relief valve (two or three stages). The main valve and pilot valve are both poppet valve structures. The valve is used to control the system pressure, and it may switch the system pressure to the tertiary or multistage pressure by the solenoid directional valve.

When solenoid is de-energized, the pressure oil at port A is controlled by the pilot valve (7), it acts on bottom of main spool (1), and acts on the upper end of main spool and poppet valve (6) of pilot valve (7) via orifices (2 and 3) and channels (4 and 5).

When the system pressure exceeds the setting pressure of the spring (8), the poppet valve (6) is opened, at the same time, the pressure oil at the upper end of the main spool flows back to the oil tank through the orifice (3), channel (5), spring chamber (9), and channel (10) (control oil drain internal type) or back to the oil tank through the external drain port (control oil drain external).

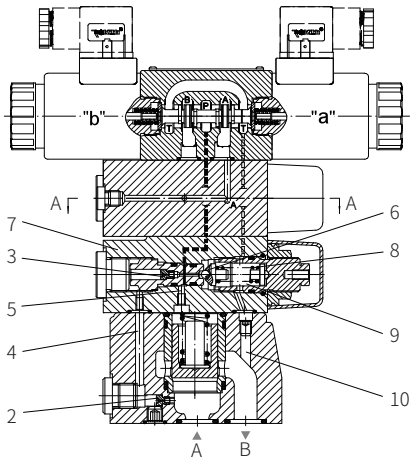
In this way, a differential pressure is formed on the main spool when the pressure oil flows through orifices (2 and 3) and it opens the main spool. The pressure oil flows from A to B at a set pressure.

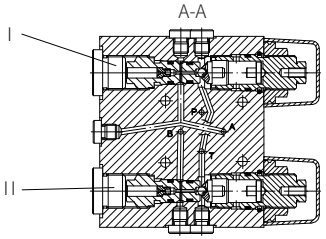
When solenoid “a” is energized, the pressure at port A is controlled by pilot valve II.

When solenoid “b” is energized, the pressure at port A is controlled by pilot valve I.

The setting pressure of pilot valve 7 must be higher than the setting pressure of pilot valves I and II.

There are four different models of control oil: supply and drain internal, supply internal and drain external, supply external and drain internal, supply and drain external. (See the symbols of control oil in details).





Model DB3U10-H-2-5XJ/

Models and specifications

DB | 3U | | | - | | 5X | J | / | | | | | | | | | *

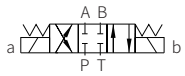
electro-hydraulic relief valve =no code
pilot valve with main valve spool assembly (plug-in) =C

three-staged pressure regulation =3U

size ordering code

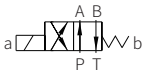
subplate mounting		threaded connection
10	10	10(G1/2”) or 22x1.5
15	-	15(G3/4”) or 27x2
20	20	20(G1”) or 33x2
25	-	25(G1 1/4”) or M42x2
32	32	30(G1 1/2”) or M48x2

subplate mounting =no code
thread connection =G



=E

=H



=D

adjusting element
rotary knob =1
internal hexagon screw with protective cap=2
lockable rotary knob with scale =3

5X= 50 to 59 series (50 to 59 series installation and connection size unchanged)

J= Rekith

50= pressure setting up to 5MPa
100= pressure setting up to 10MPa
200= pressure setting up to 20MPa
315= pressure setting up to 31.5MPa
350= pressure setting up to 35MPa

no code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

CW220-50= AC voltage 220V-50Hz
CG24= DC24V
CW220R= rectified solenoid

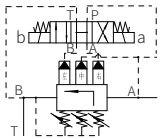
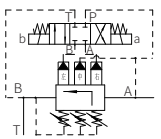
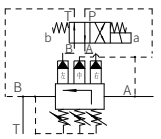
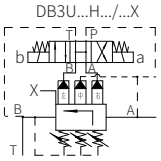
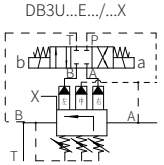
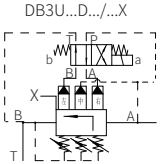
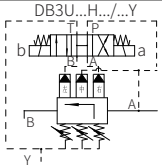
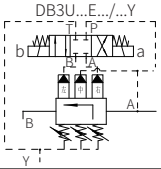
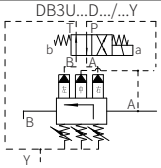
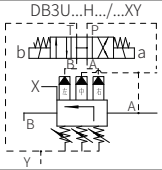
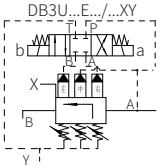
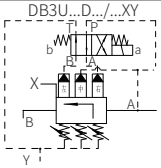
no code= no manual emergency operation
N9= with hidden manual emergency operation

Z4= standard plug
Z5L= large right angle lamp plug

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

Functional symbols

Supply and drain internal	DB3U...H.../... 	DB3U...E.../... 	DB3U...D.../... 
Supply external and drain internal	DB3U...H.../...X 	DB3U...E.../...X 	DB3U...D.../...X 
Supply internal and drain external	DB3U...H.../...Y 	DB3U...E.../...Y 	DB3U...D.../...Y 
Supply and drain external	DB3U...H.../...XY 	DB3U...E.../...XY 	DB3U...D.../...XY 

Technical parameters

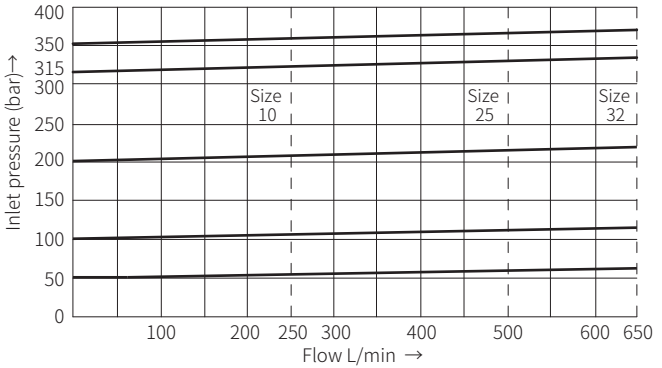
Size			10	15	20	25	30
Flow (L/min)	threaded connection valve		200		400		600
	subplate mounting valve		200	—	400	—	600
Working pressure		Mpa	Port A, B, X to 35				
Port Y back pressure		Mpa	to 31.5				
Minimum setting pressure		Mpa	Related to flow, see characteristic curve				
Maximum setting pressure		Mpa	35				
Medium			Mineral hydraulic oil or phosphate hydraulic oil				
Viscosity range		mm^2/s	10 to 800				
Temperature range		°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Solenoid valve characteristic			See 4WE6 solenoid valve				

Characteristic curve

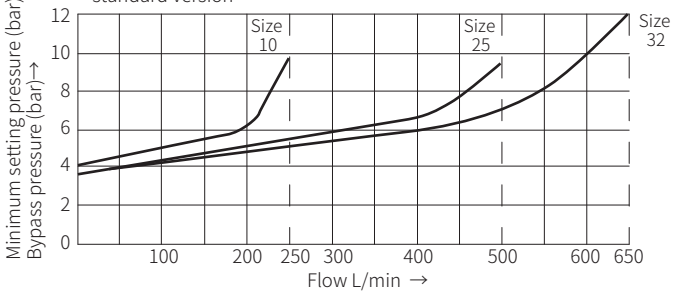
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The curve was measured at zero pressure for externally controlled oil leakage.
For internal control oil return, the pressure at port B is added to the command value.

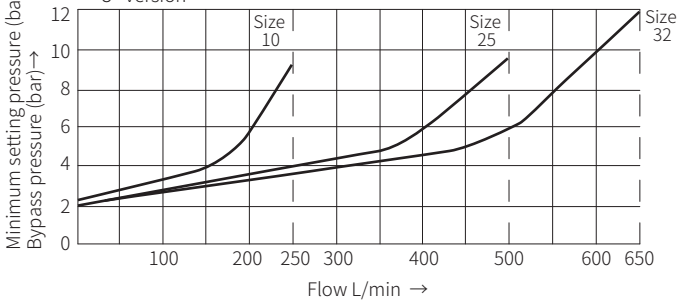
Inlet pressure in relation to the flow



Minimum setting pressure and bypass pressure in relation to the flow
- standard version



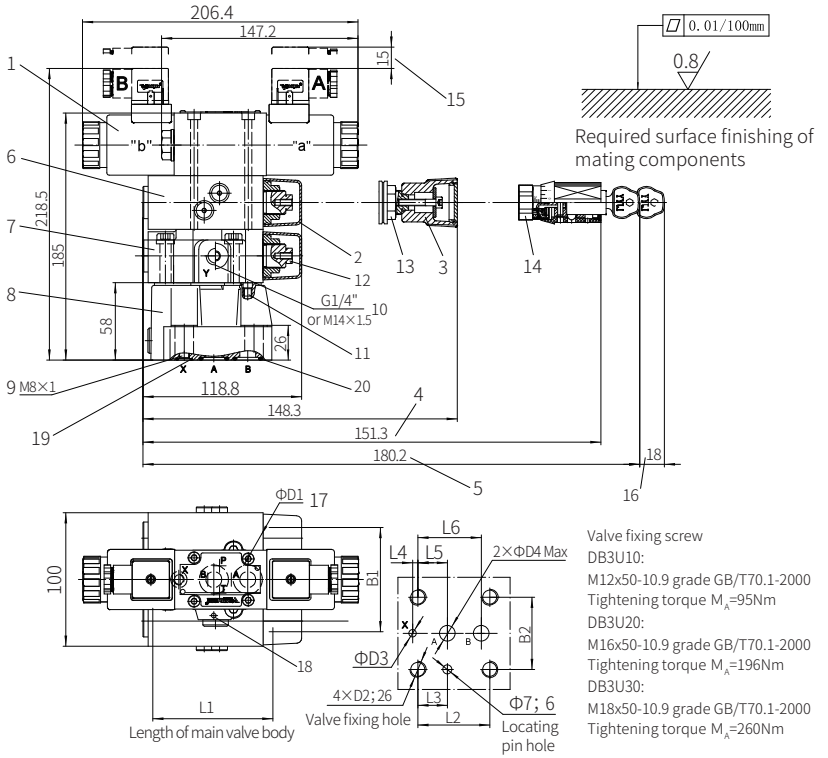
Minimum setting pressure and bypass pressure in relation to the flow
- "U" version



Component size

Size unit: mm

Subplate mounting valve model DB3U...-5XJ/...



Valve fixing screw
DB3U10:
M12x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm
DB3U20:
M16x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=196Nm
DB3U30:
M18x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=260Nm

Size	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and M14x 1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 Valve screw fixing holes
18 Locating pin hole
19 O ring 9.25x1.78 (for port X)
20 DB2U10:
O ring 17.12x2.62(for port A, B)
DB2U20:
O ring 28.17x3.53(for port A, B)
DB2U30:
O ring 34.52x3.53(for port A, B)

It must be ordered separately if connection subplate is needed

DB3U10 Subplate model:
G545/01(G3/8") ; G545/02 (M18x1.5)
G546/01(G1/2") ; G546/02(M22x1.5)

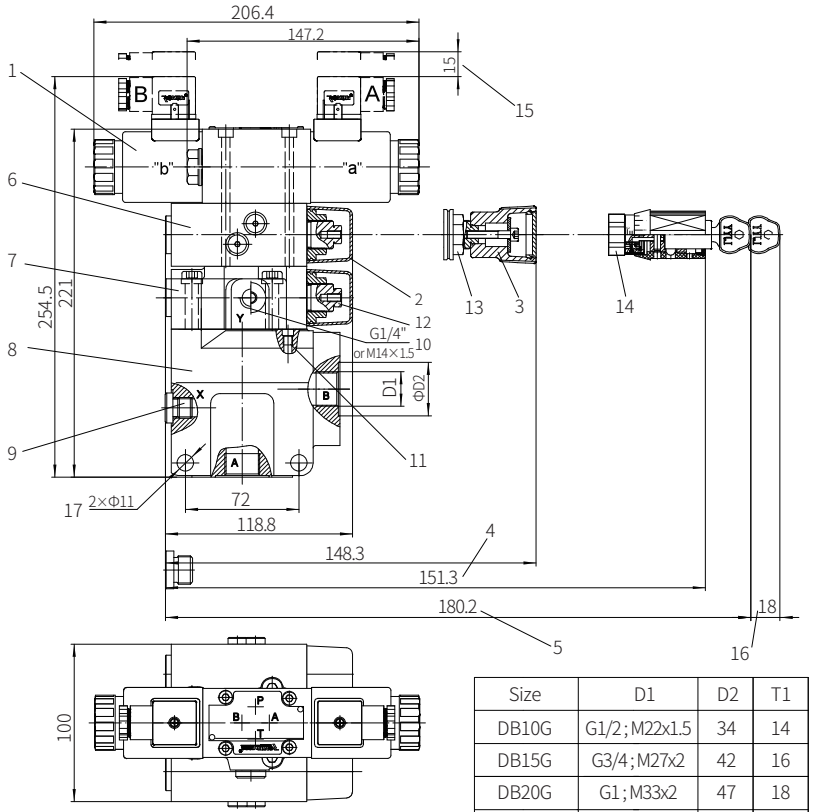
DB3U20 Subplate model:
G408/01(G3/4") ; G408/02 (M27x2)
G409/01(G1") ; G409/02 (M33x2)

DB3U30 Subplate model:
G410/01(G11/4") ; G410/02 (M42x2)
G411/01(G112"); G411/02(M48x2)

Component size

Size unit: mm

Threaded connection valve model DB3U...-5XJ/...



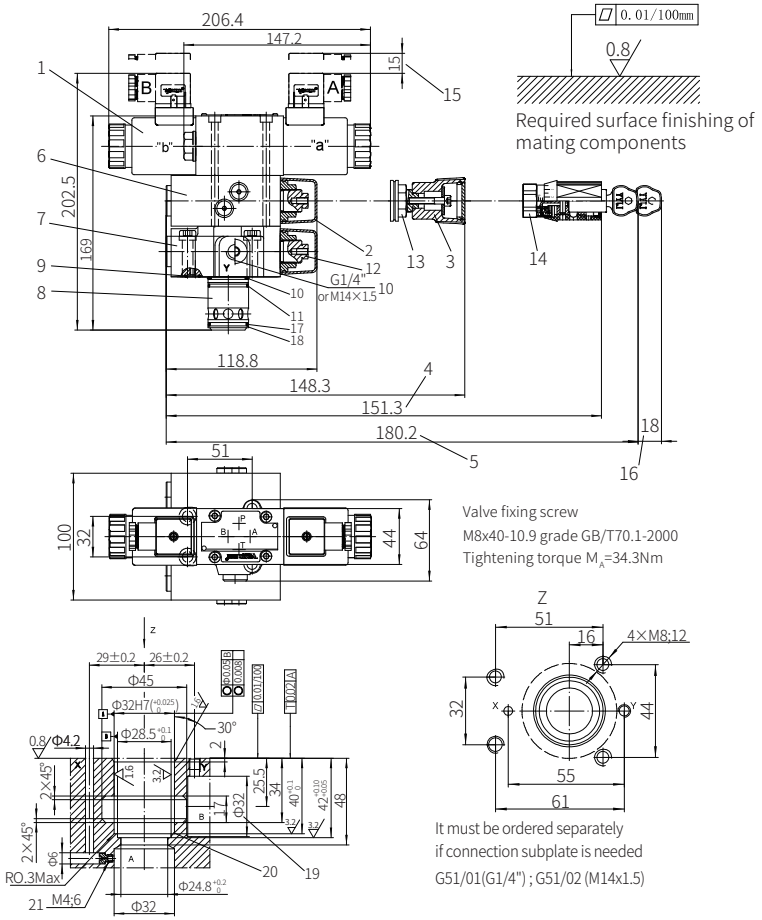
Size	D1	D2	T1
DB10G	G1/2;M22x1.5	34	14
DB15G	G3/4;M27x2	42	16
DB20G	G1;M33x2	47	18
DB25G	G11/4;M42x2	58	20
DB30G	G11/2;M48x2	65	22

1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and M14x 1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 Valve screw fixing holes

Component size

Size unit: mm

with (DBC3U10 or 30) or without (DBC3U)



1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main spool
9 O ring 9.25x1.78
10 O ring 28x2.65
11 O ring 28x1.8
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8
19 The Φ32 hole can intersect Φ45 hole at any position
Be careful not to damage oil port X and fixing holes
20 The retainer ring and O-ring should be installed in this hole before install main spool
21 Throttle must be ordered separately

Pilot Relief Valve/ Solenoid Pilot Relief Valve

Model: DB/DBW...5XJ

- Size 10 to 32
- Maximum working pressure 350 bar
- Maximum working flow 650L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04-05
Functional symbols	06
Technical parameters	07
Characteristic curve	08
Component size	09-11

Features

- Subplate mounting:
size 10/20/30
- Threaded connection:
size 10/15/20/25/32

- Setting pressure:
5MPa/10MPa/20MPa/31.5bar/35MPa

- Flow rate:
250L/min (for size 10 only)
500L/min (for size 15, 20, 25)
650L/min (for size 32 only)

Function description, sectional drawing

The DB and DBW pressure control valves are pilot operated relief valves.
They are used to limit (DB), or to limit and unload by solenoids (DBW) of working pressure.

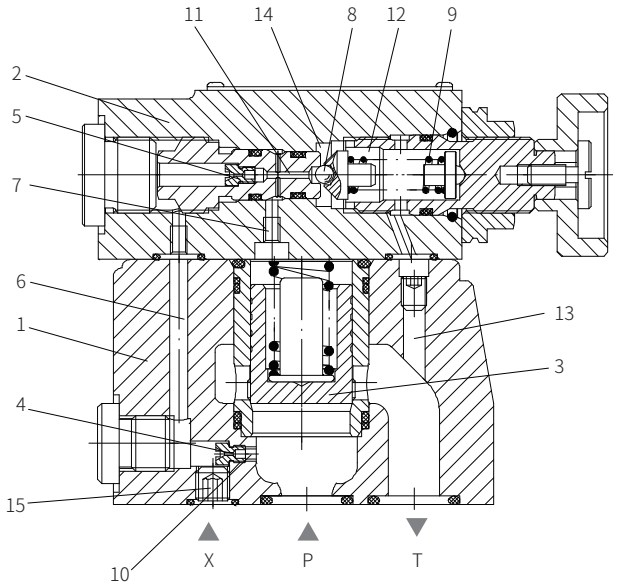
Pilot relief valve Model DB

This valve is basically composed of main valve (1) with main spool inserted (3) and pilot valve (2) with pressure adjustment element.

The pressure of port P acts on the main spool (3), meanwhile, the pressure is applied via control lines (6) and (7) with orifices (4) and (5) to the spring loaded side of the main spool (3) and on the ball (8) in the pilot valve (2). When the pressure in port P rises excess the spring setting pressure, the ball (8) overcomes the spring pressure (9) to open the pilot valve.

The signal is obtained internally via the control channels (10) and (6) from port P. The oil fluid on the spring loaded side of the main spool (3) flows into spring chamber (12) via control line (7), throttle (11) and ball (8). Thus, it flows internally via control line (13) into the tank for model DB, or flows externally via control line (14) into the tank for model DB...Y. Because of throttle (4) and (5), the pressure drop occurs at the main spool (3) and the connection from port P to port T is opened.

The fluid flows from port P to port T while the setting working pressure is no changing. The pressure relief valve can unload or shift the different pressure (second pressure stage) by "X" port.



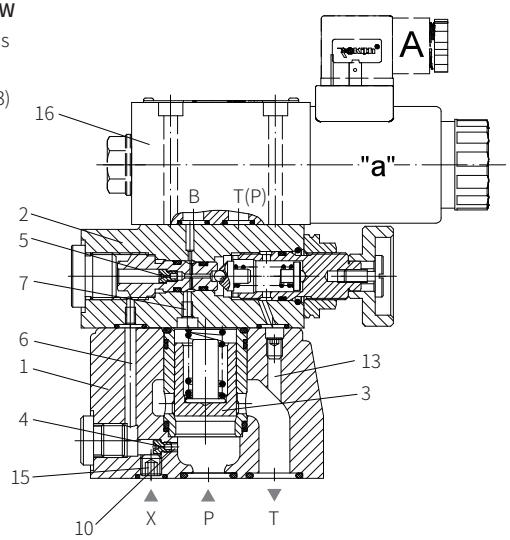
Model DB10-1-5XJ/

Function description, sectional drawing

Solenoid pilot relief valve Model DBW

In principle, the function of this valve is same with model DB.

But the unloading of the main spool (3) is achieved by operating the built-on directional valve (16).



Model DBW10-1-5XJ/

Solenoid pilot relief valve with switching shock damping(sandwich), model DBW...S...R12

The connection from B2 to B1 opens with delay when switching shock damping valve (17) used, it can prevent pressure peaks and unloading shocks in the return line. The valve is installed between pilot valve and directional control valve (16). The degree of damping (unloading shock) depends on the size of throttle (18). Throttle Ø1.2mm is used as standard size (ordering code...R12...).

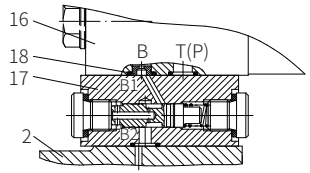
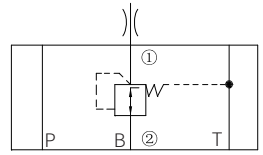


Illustration: directional valve opened



- The unloading function (directional valve function of DBW) cannot be used as safety function!
- When power off or cable breakage, Model DBW... B.. 5XJ/... should use the minimum setting pressure (circulation pressure).
- When power off or cable breakage, the pressure relief function of model DBW...A...5XJ/...is launched.
- The back pressure of pilot oil internal drain in port T or external drain in port Y is 1:1 added in pilot control pressure.

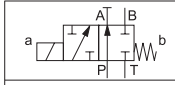
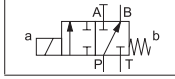
Models and specifications

DB | | | | | | | - 5X | J | / | | |

without directional valve =No code
with solenoid directional valve =W

pilot operated valve (complete) =No code
pilot valve without main spool insert (do not enter size) =C
pilot valve with main spool insert (remark valve size 10 or 30) =C

size	subplate mounting "no code"	threaded connection "G"
10	=10	=10(G1/2)/M22*1.5
16		=15(G3/4)/M27*2
20	=20	=20(G1)/M33*2
25		=25(G1 1/4)/M42*2
32	=30	=30(G1 1/2)/M48*2

	normally closed	= A
	normally open	= B

for subplate and multiway mounting =no code
for threaded connection =G

adjustment element for pressure adjustment

rotary knob =1
inner hexagon screw with protective cap =2
lockable rotary knob with scale =3
rotary knob with scale =7

50 to 59 series =5X
(50 to 59 series: installation and connection size unchanged)

Rekith =J

pressure setting up to 50bar =50
pressure setting up to 100bar =100
pressure setting up to 200bar =200
pressure setting up to 315bar =315
pressure setting up to 350bar =350

Models and specifications

																			*

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code= G thread
2= metric thread
(Except for external remote control port X, port X is inch thread G1/4)

R12= damping Φ1.2mm in port B of directional valve
(only for DBW.../S...)

Z4= standard plug
Z5L= right angle lamp plug large
DL= connection box with lamp

N9= with hidden manual emergency operation
No code= no manual emergency operation

G24= 24V DC
W220-50= AC 220V-50Hz
W220R= 220V AC solenoid with rectifier
(others see WE6)

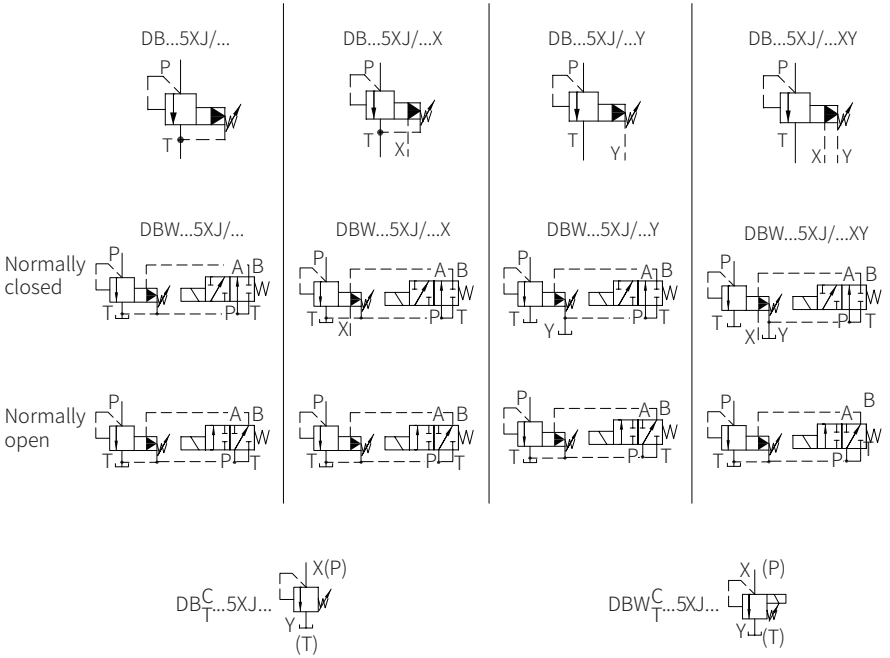
No code= without directional valve
C= with detachable solenoid directional valve size 6

No code= without switching shock damping
S= with switching shock damping (only DBW)

No code= standard valve
U= minimum setting pressure, see characteristic curves

No code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

Functional symbols



Technical parameters

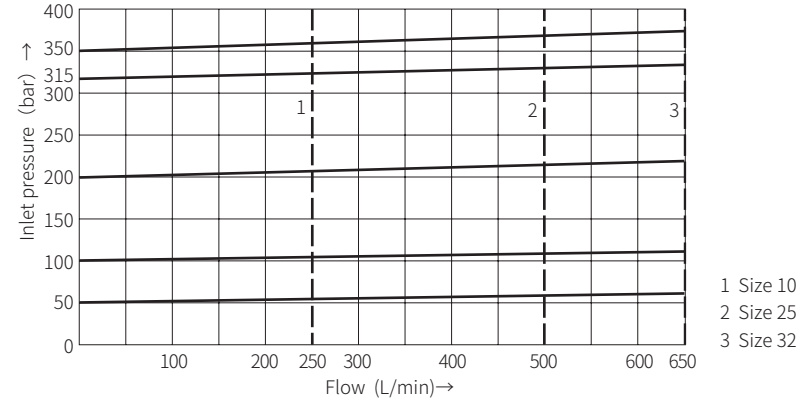
Size				Size 10 DB..10	Size 15 DB..15G	Size 20 DB..20	Size 25 DB..25G	Size 32 DB..30
Weight	Subplate mounting	- DB...	Kg	2.6	–	3.5	–	4.4
		- DBW...	Kg	4.05	–	4.95	–	5.85
		- DBC...	Kg	1.2				
		- DBWC...	Kg	2.65				
		- DBC10 or 30...	Kg	1.5				
		- DBWC10 or 30 ...	Kg	2.95				
	Threaded connection	- DB...G	Kg	5.3	5.2	5.1	5.0	4.8
		- DBW...G	Kg	6.75	6.65	6.55	6.45	6.25
Installation position				optional				
Environment temperature range		-DB...	°c	-30 to +50 (NBR seal) -20 to +50 (FRM seal)				
		-DBW...	°c	-30 to +50 ((NBR seal) -20 to +50 (FRM seal)				
Minimum strength of valve body material (use for subplate mounting and DBC.../DBWC..valves)				The selection of valve body material has been included in the safety factor in all condition (e.g. referenced pressure strength, thread strength and tightening torques.)				
Hydraulic								
Maximum working pressure		– Oil port P, X	MPa	35.0				
		– Oil port T	MPa	31.5				
Maximum back pressure		– Oil port Y (DB)	MPa	31.5				
		– Oil port Y, T (DBW)	MPa	21.0 (DC solenoid) 16.0 (AC solenoid)				
Maximum setting pressure			MPa	5.0; 10.0; 20.0; 31.5; 35.0				
Minimum setting pressure			MPa	Interrelated with flow (see the curve)				
Maximum flow	Subplate mounting		L/min	250	–	500	–	650
	Threaded connection		L/min	250	500	500	500	650
Oil fluid				Mineral oil(HL,HLP) [1] in accordance with DIN 51524; fast living organisms degraded oil according to VDMA 24568; HETG(Rapeseed oil)[1] ; HEPG(Polyethylene glycol)[2]; HEES(synthetic ester)[2];				
Oil temperature range			°c	-30 to +80 (NBR seal) -20 to +80 (FRM seal)				
Viscosity range			mm^2/s	10 to 800				
Cleanliness of oil[3]				The maximum allowable pollution level of oil is ISO4406 Class 20/18/15				

1)For NBR seal and FKM seal
2)Only for FKM seal
3)The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effect oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

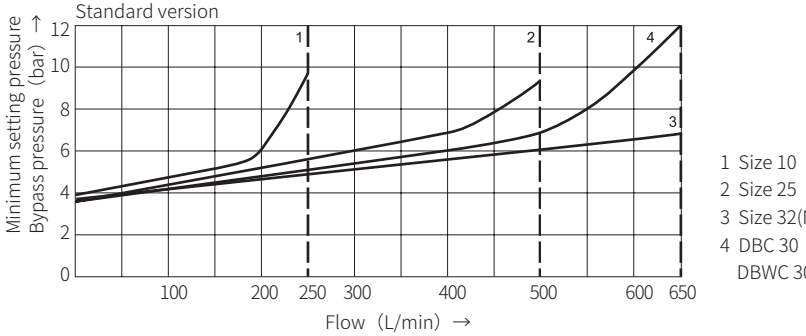
(Measured when using HLP46, ϑ_{oil}= 40°C ±5°C)

Inlet pressure in relation to the flow-rate



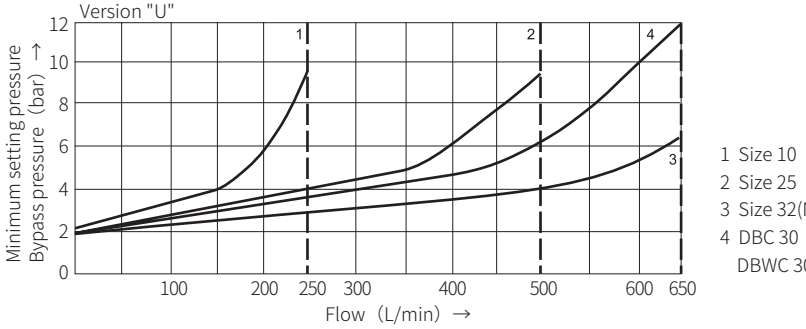
1 Size 10
2 Size 25
3 Size 32

Minimum setting pressure and bypass pressure in relation to the flow-rate
Standard version



1 Size 10
2 Size 25
3 Size 32(N)
4 DBC 30
DBWC 30

Minimum setting pressure and bypass pressure in relation to the flow-rate[1)]
Version "U"

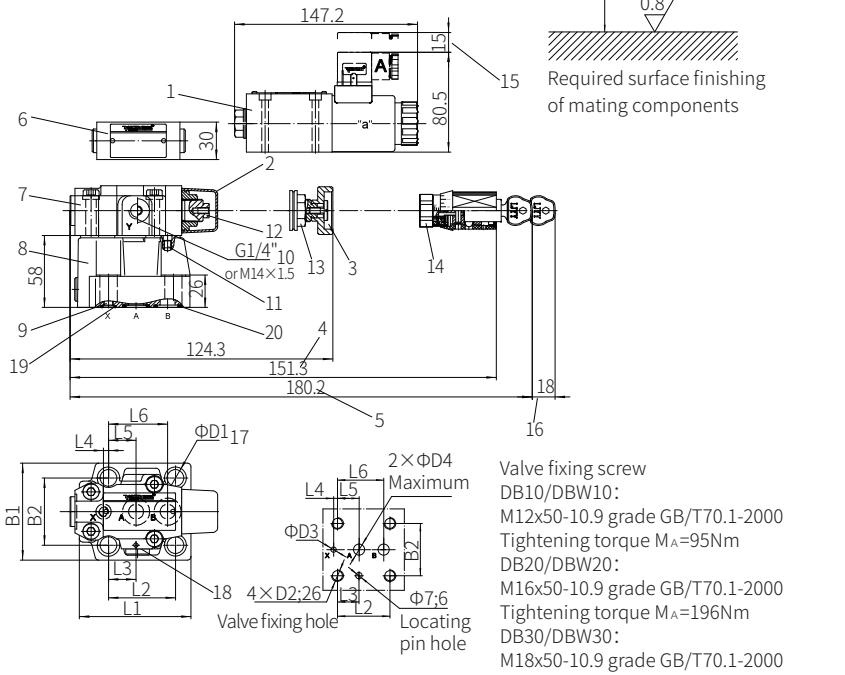


1 Size 10
2 Size 25
3 Size 32(N)
4 DBC 30
DBWC 30

Component size

Size unit: mm

Subplate mounting valve, model DB/DBW...-5XJ/...



Valve fixing screw
DB10/DBW10:
M12x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm
DB20/DBW20:
M16x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=196Nm
DB30/DBW30:
M18x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=260Nm

Model	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

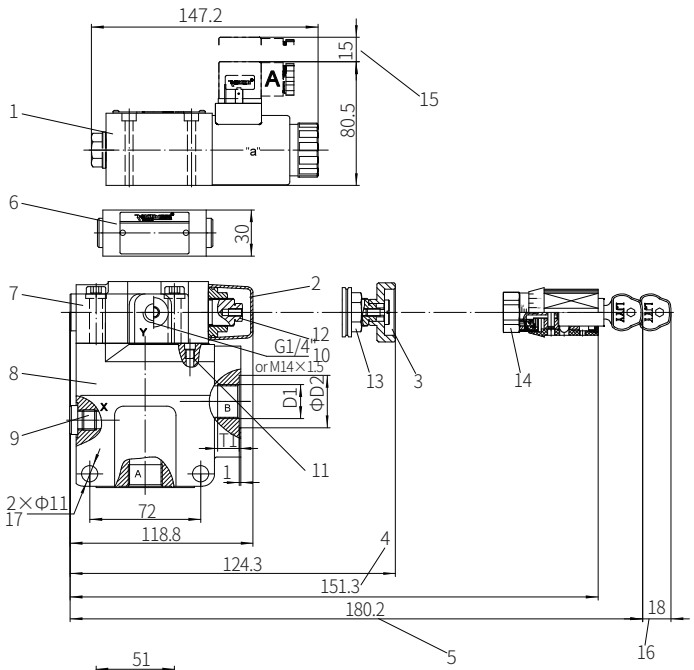
1 Solenoid valve
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 With switching shock damping valve, optional
7 Pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4"and M14x1.5 optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 Valve screw fixing holes
18 Locating pin hole
19 O-ring 9.25x1.78 (for port X)
20 DB/DBW10 :
O-ring 17.12x2.62 (for port A, B)
DB/DBW20 :
O-ring 28.17x3.53 (for port A, B)
DB/DBW30 :
O-ring 34.52x3.53 (for port A, B)

It must be ordered separately if connection subplate is needed.
Subplate model:
DB10/DBW10:
G545/01(G3/8") ; G545/02(M18x1.5)
G546/01(G1/2") ; G546/02(M22x1.5)
DB20/DBW20:
G408/01(G3/4") ; G408/02(M27x2)
G409/01(G1") ; G409/02(M33x2)
DB30/DBW30:
G410/01(G11/4") ; G410/02(M42x2)
G411/01(G11/2"); G411/02(M48x2)

Component size

Size unit: mm

Threaded connection valve, model DB/DBW...G...-5XJ/...



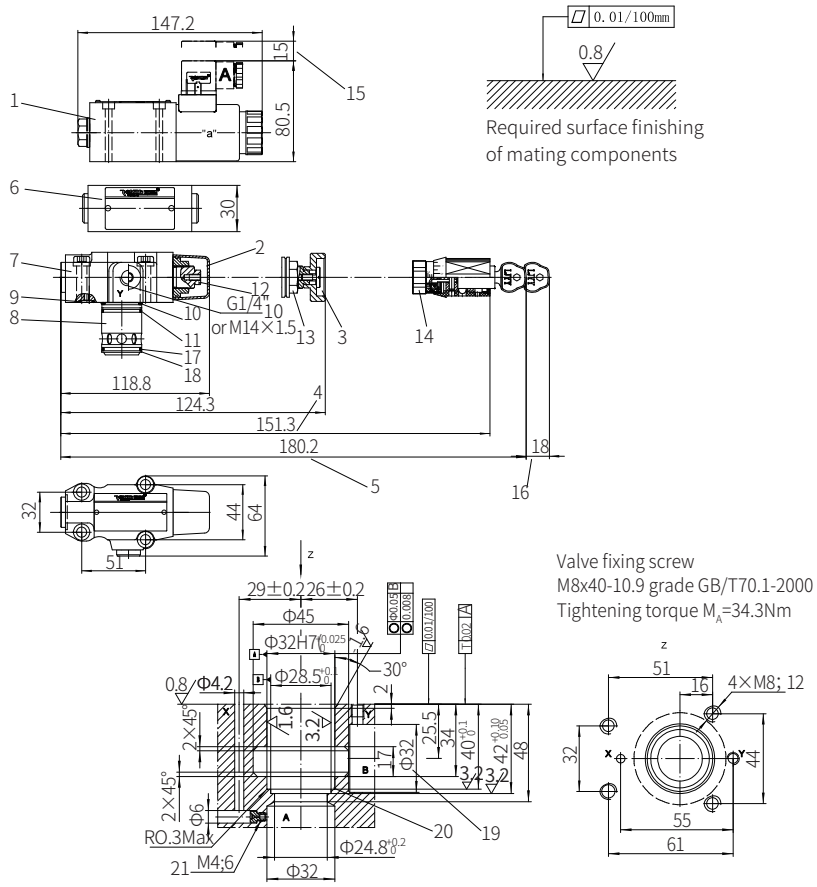
Model	D1	D2	T1
DB10G	G1/2; M22×1.5	34	14
DB15G	G3/4; M27×2	42	16
DB20G	G1; M33×2	47	18
DB25G	G11/4; M42×2	58	20
DB30G	G11/2; M48×2	65	22

1 Solenoid valve
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 With switching shock damping valve, optional
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and M14x1.5 optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 Valve screw fixing holes

Component size

Size unit: mm

Valve with (DB/DBWC10 or 30) or without (DBC/DBWC)



It must be ordered separately if connection subplate is needed.
G51/01 (G1/4") ; G51/02 (M14x1.5)

1 Solenoid valve
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 With switching shock damping valve, optional
7 Primary pilot valve
8 Main spool
9 O-ring 9.25x1.78
10 O-ring 28x2.65
11 O-ring 28x1.8
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Space required to remove the plug
16 Space required to remove the key
17 O-ring 27.3x2.4
18 Retainer ring 32x28.4x0.8
19 The Ø32 hole can intersect Ø45 hole at any position. Be careful not to damage oil port X and fixing holes.
20 The retainer ring and O-ring should be installed in this hole before installing main spool.
21 Throttle must be ordered separately.

02

Pilot Operated Pressure Reducing Valve

Model: DR10K...-3XJ

- ◆ Size 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 100 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Characteristic curve	03
Component size	04-05

Features

- ● Cartridge construction
- ● 4 pressure ratings
- ● 4 adjusting elements
- - Rotary knob
- - Adjusting screw with protective cap
- - Lockable rotary knob with scale
- - Rotary knob with scale

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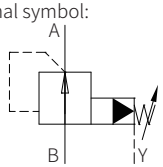
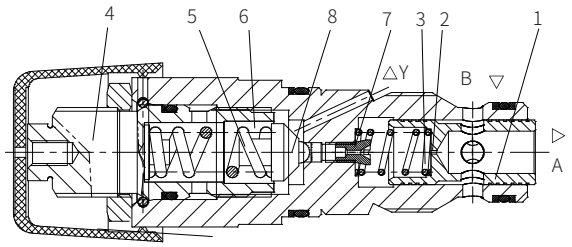
Function description, sectional drawing

The DR10K valve is pilot operated pressure reducing valve installed into the manifolds. It is used to reduce the system pressure. The secondary pressure is adjusted by means of adjusting elements (4).
At rest, the valve is normally open. The hydraulic oil can flow freely from port B to port A. The pressure at port A simultaneously acts on the main spool (1) and on the spring-loaded inner side of main spool (1) through the orifice (2). In addition, it acts on pilot poppet (8) through the orifice (7).
If the pressure at port A exceeds the setting value of the spring (5), the pilot poppet (8) opens. The hydraulic oil flows from spring chamber (3) to working port Y through orifice (7), pilot poppet (8) and spring chamber (6). The main spool (1) moves to the control position and keeps the pressure value set on spring (5) constant in port A. The pilot oil is always drained externally from the spring chamber (6) through port Y.
Note: The value in port Y must be increased to the setting pressure value.

Functional symbol:





Model DR10K5-3XJ/...YM

Models and specifications

DR | 10 | K | | -3XJ | | Y | M | | *

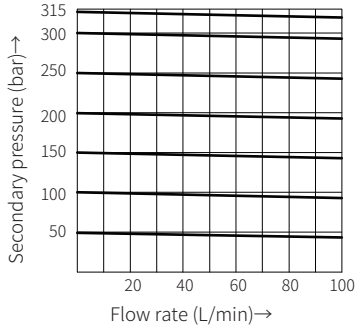
pilot operated pressure reducing valve	=DR
size 10	=10
cartridge type	=K
rotary knob	=4
adjusting screw with protective cap	=5
lockable rotary knob with scale	=6
rotary knob with scale	=7
30 to 39 series (30 to 39 series installation and connection size unchanged)	=3XJ
5=	pressure up to 50 bar
10=	pressure up to 100 bar
20=	pressure up to 200 bar
31.5=	pressure up to 315 bar
Y=	pilot oil supply internal drain external
M=	without check valve
No code=	NBR seals
V=	FKM seals
more information in text	

Technical parameters

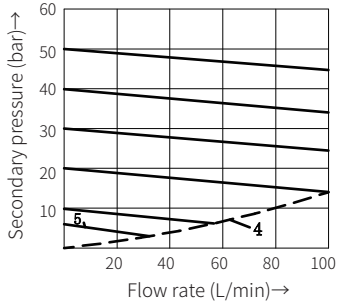
Working medium		Mineral oil - for NBR seals and FKM seals
		Phosphate - for FKM seals
Working medium temperature range °C		–30 to +80 (NBR seal)
		–20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Maximum working pressure	bar	315
Maximum adjusting pressure	bar	50; 100; 200; 315
Maximum flow	L/min	to 100
Weight	kg	about 0.2

Characteristic curve

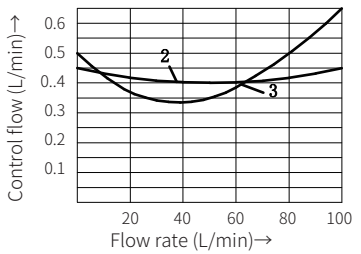
p_A-q_V characteristic curve



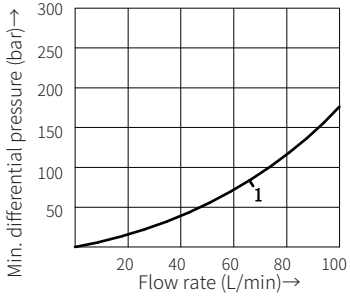
p_A-q_V characteristic curve to 50bar



$\triangle p(p_E-p_A)$ at q_V st-q_V characteristic curve



$\triangle p_{min}$-q_V characteristic curve

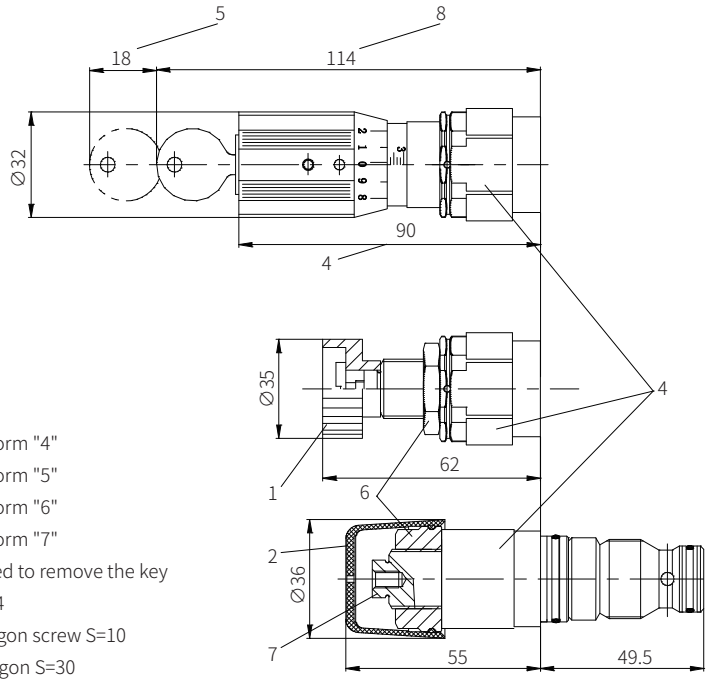


1 B to A 2 △p= 50 bar 3 △p = 250 bar
4 Actuator resistance depends on the system
5 Lowest settable secondary pressure p_A for all pressure ratings

Component size

Size unit: mm

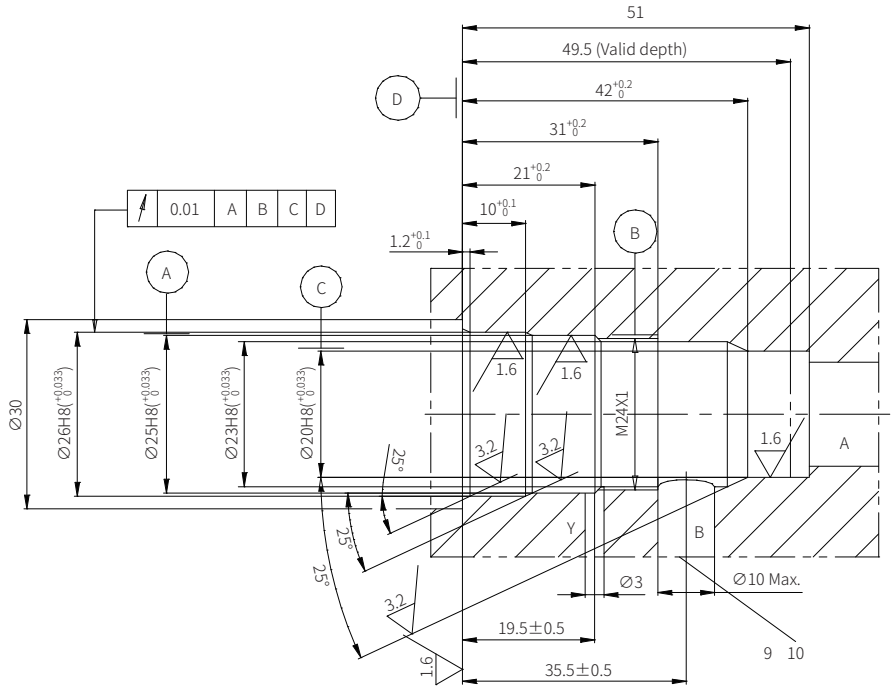
Model DR10K..-3XJ/...



1 Adjustment form "4"
2 Adjustment form "5"
3 Adjustment form "6"
4 Adjustment form "7"
5 Space required to remove the key
6 Lock nut S=24
7 Internal hexagon screw S=10
8 External hexagon S=30
Tightening torque M_A= 50 Nm
9 Port "Y " arranged around circumference as required
10 Port "B" arranged around circumference as required

Component size

Size unit: mm



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02

Modular Pressure Reducing Valve

Model: ZDR6DP0-4XJ

- Size 6
- Maximum working pressure 40 bar
- Maximum working flow 7L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Component size	03

Features

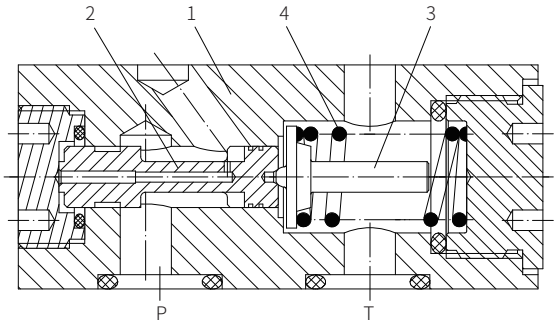
- Sandwich plate connection

Function description, sectional drawing

The ZDR6DP0...4XJ/40YM type reducing valve is modular direct-operated pressure reducing valve, it is used to reduce the system pressure. The valve is composed of valve body (1), valve spool (2), spring seat (3) and pressure spring (4).

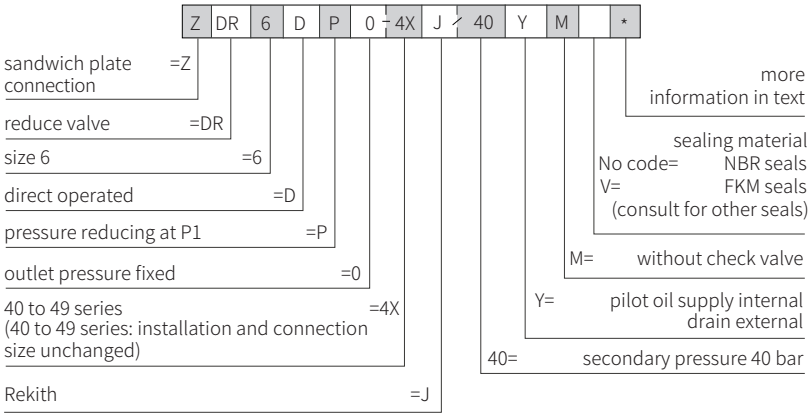
At rest, the valve is normally open and the oil can freely flow from port P1 to port P2. The pressure in port P2 acts on the piston area opposite to the pressure spring. If the pressure in port P2 continues to increase due to external force, the valve spool is moved still towards the pressure spring (4), then the oil at port P2 is connected to the oil tank through the shoulder on the control piston (2).

The sufficient oil flows back to the tank to prevent further pressure increase. The oil in the spring chamber is drained to the oil tank through the port T.



Model ZDR6DP0...4XJ/40YM

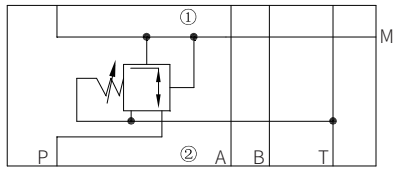
Models and specifications



Functional symbols

(①= Valve side, ②= Subplate side)

Model ZDR6DP0...-4XJ/...YM...



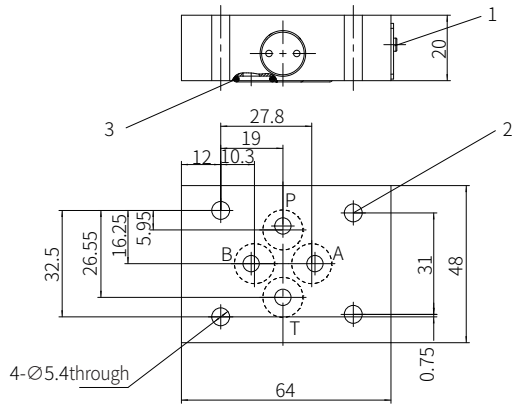
Technical parameters

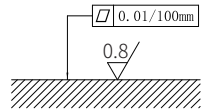
Medium		Mineral hydraulic oil or phosphate hydraulic oil
Working medium temperature range	°C	-30 to +80(NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Inlet pressure (outlet)	bar	to 300
Secondary pressure (outlet)	bar	to 40
Back pressure(port Y)	bar	to 160
Maximum working flow	L/min	7

Component size

Unit size: mm

Model ZDR6DP0...4XJ/40YM





Required surface finishing of mating components

1 Name plate
2 Valve fixing hole
3 O ring 9.25x1.78
(for oil port P, T, A, B)

02

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Modular Pressure Reducing Valve

Model: ZDR6D...4XJ

- Size 6
- Maximum working pressure 210 bar
- Maximum working flow 50 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Characteristic curve	05
Component size	06

Features

- Sandwich plate valve
- 2 kinds of pressure ranges
- 2 kinds of adjusting elements:
  Rotary knob
  Hexagon screw with sleeve and protective cap
- Pressure reducing in port A, B or P
- Check valve, optional

Function description, sectional drawing

The ZDR6D... reducing valve is a three-way direct operated pressure reducing valve with sandwich plate construction and reducing in the the secondary circuit. It is used for system pressure reducing.

The valve is composed of valve body (1), control spool (2), compression spring (3), adjusting element (4) and an optional check valve. The secondary pressure is set by the adjusting element (4).

Model DA

At rest, the valve is normally open, the fluid is flow freely from port A1 to port A2. The pressure in port A2 acts on the piston area opposite to the compression through the control channel (5). When the pressure at port A2 exceeds the set value of spring (3), the control spool (2) is moved to the control position, the pressure at port A2 remains stable. The signal and control oil are supplied internal from port A2 through the control channel (5).

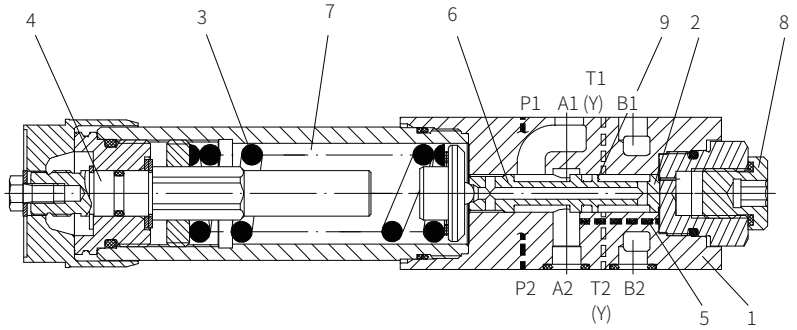
If the pressure at port A2 continues to increase due to external force acts on the actuator, the valve spool will still move towards the compression spring (3), then the port A2 is connected to the oil tank through the shoulder (9) on the control piston (2). The sufficient oil flows back to the tank to prevent further pressure increase. The oil in the spring chamber (7) is drained external to the oil tank through the orifice (6) to the port T.

The pressure gauge connection (8) is used for secondary pressure monitoring of the valve. In the version DA, the check valve can only be added to the oil port from A2 to A1 to ensure flow passage smoothly.

Model DP and DB

In model DP, the pressure is reduced in port P1, the signal and control oil are supplied internal from port P1.

In model DB, the pressure is reduced in port P1, but control oil is taken from port B. When the directional valve in position P to A, the pressure of port B must not exceed the set pressure. Otherwise, the pressure at port A will be decrease.



Model ZDR6DA1...4XJ/...YM

Models and specifications

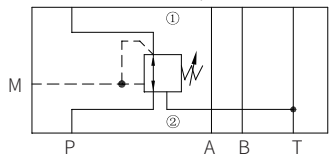
Z	DR	6	D		-	4X	J		Y			

- sandwich plate =Z
- reducing valve =DR
- size 6 =6
- direct operated =D
- pressure reducing in port A =A
  pressure reducing in port B =B
  pressure reducing in port P =P
- adjusting element
  rotary knob =1
  hexagon screw with sleeve and protective cap =2
- 40 to 49 series =4X
  (40 to 49 series: installation and connection size unchanged)
- Rekith =J
- more information in text
- sealing material
  No code= NBR seals
  V= FKM seals
  (consult for other seals)
- no code= with check valve only for version" A"
  M= without check valve
- Y= control oil supply internal and drain external
- 25= maximum secondary pressure 25bar
  75= maximum secondary pressure 75bar
  150= maximum secondary pressure 150bar
  210= maximum secondary pressure 210bar

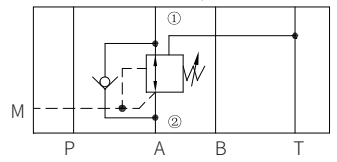
Functional symbols

(①= Valve side, ②= Subplate side)

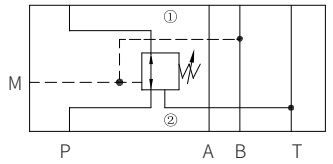
Model ZDR6DP...4XJ/...YM



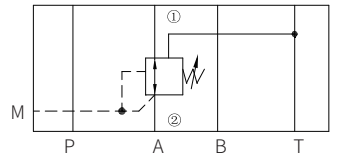
Model ZDR6DA...4XJ/..Y



Model ZDR6DB...4XJ/...YM



Model ZDR6DA...4XJ/...YM



Technical parameters

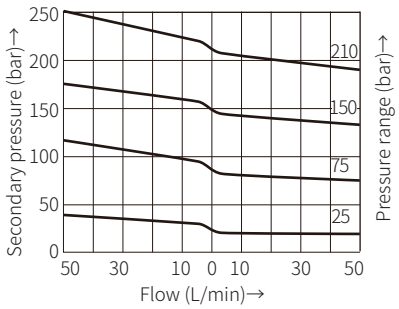
Installation position		optional
Environment temperature range		-30 to +80(NBR seal)
		-20 to +80 (FKM seal)
Weight	kg	1.2KG
Hydraulic		
Maximum working pressure	bar	315
Maximum secondary pressure	bar	25；75；150；210
Back pressure port T(Y)	bar	160
maximum flow	L/min	50
Pressure medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Pressure medium temperature range	°C	-30 to +80(NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil[3]		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

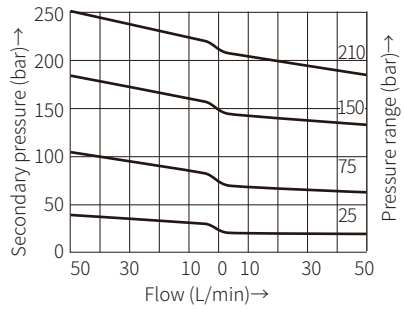
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Model ZDR6DA



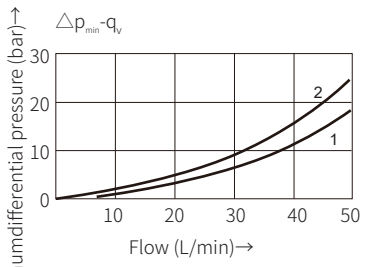
A2 to T(Y) A1 to A2

Model ZDR6DP and ZDR6DB

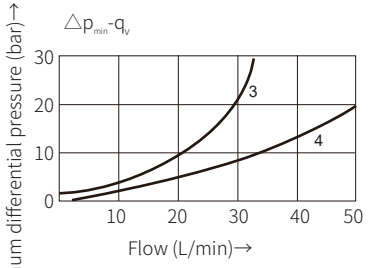


P1 to T(Y) P2 to P1

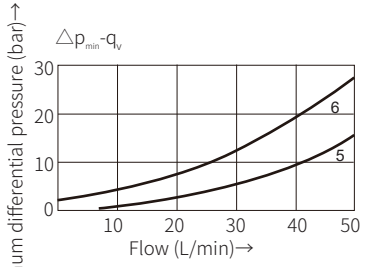
Note: When the set pressure is low, the characteristic curve remains within the corresponding pressure level range.



1 A1 to A2
2 A2 to T(Y) (the third route of flow)



3 A2 to A1 only flow via check valve
4 A2 to A1 only flow via check valve and completely opened control cross-section.



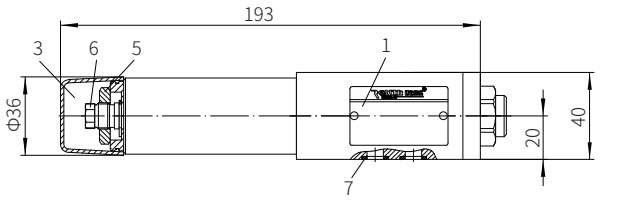
5 P2 to P1
6 P1 to T(Y)(the third route of flow)

The characteristic curves apply to the pressure at the valve output pressure = 0 bar across the entire flow range.

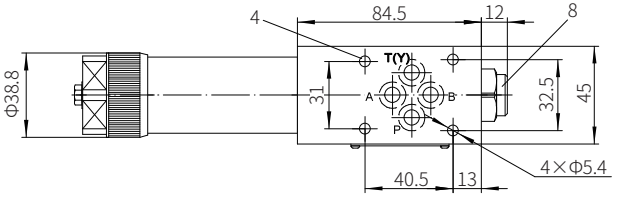
Component size

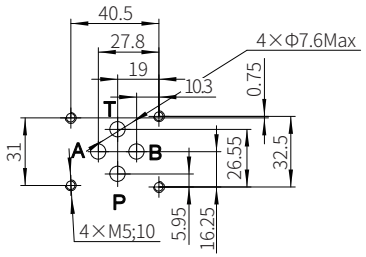
Size unit: mm

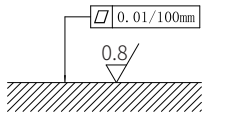
Model ZDR6DP and ZDR6DB



Model ZDR6DA







Required surface finishing of mating components

1 Name plate
2 Adjustment unit "1"
3 Adjustment unit "2"
4 Valve fixing hole
5 Locknut S=24
6 Internal hexagon adjusting screw S=10
7 O ring 9.25X1.78(for port P, A, B, T)
8 Pressure gauge connection:
G1/4 or M14x1.5, 12 deep

Valve fixing screw
M5-10.9 grade GB/T70.1-2000

Tightening torque M_A=7.8Nm

It must be ordered separately if connection subplate is needed
Subplate model:
G341/01 (G1/4"); G341/02(M14x1.5)
G342/01 (G3/8"); G342/02(M18x1.5)
G502/01 (G1/2"); G502/02(M22x1.5)

Modular Pressure Reducing Valve

Model: ZDR10D...5XJ

- Size 10
- Maximum working pressure 210 bar
- Maximum working flow 80 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Characteristic curve	04
Component size	05

Features

- Sandwich plate valve
- 2 kinds of adjusting elements:
  Rotary knob
  Hexagon screw with sleeve and protective cap
- Pressure reducing in port A, B or P
- Check valve, optional
- 4 pressure ratings

Function description, sectional drawing

The ZDR10D...5XJ/... reducing valve is direct operated pressure reducing valve with sandwich plate construction, it is used for system pressure reducing.

The valve is composed of valve body(1), control spool (2), compression spring (3), adjusting element (4) and an optional check valve.

Model ZDR10DA

At rest, the valve is normally open, the fluid flows freely from port A1 to A2. The pressure in port A2 acts on the spool face(2) opposite the compression spring (3) through the control channel (5). When the pressure at port A2 exceeds the set value of spring (3), the control spool (2) is moved to the control position, the pressure at port A2 remains stable. The working pressure and control oil are supplied internal from port A2 through the channel channel (5). If the pressure at port A2 continues to increase due to external force acts on the actuator, the control spool (2) will still move towards the compression spring (3), then the port A2 is connected to the oil tank through the shoulder (9) on the control spool (2) and valve body (1). The sufficient oil flows back to the tank to prevent further pressure increase. The oil in the spring chamber (7) is drained external to the oil tank through the port TA.

The pressure gauge connection (8) is used for secondary pressure monitoring of the valve.

Only in version "A", a check valve can be used for free flow back from port A2 to A1.

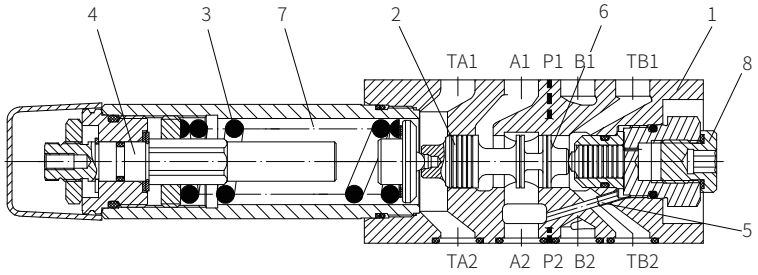
Model ZDR10DP and ZDR10DB

In model DP, the pressure is reduced in port P1, the signal and control oil are provided internally from port P1.

In model DB, the pressure is reduced in port P1, but the control oil is taken from port B.

Attention:

In model DB, when the directional valve in position P to A, the pressure of port B must not exceed the set pressure. Otherwise, the pressure at port A will be decrease. The check valve is only installed in version DA and allow oil flows freely from A2 to A1.



Model ZDR10DA1...5XJ/...YM

Models and specifications

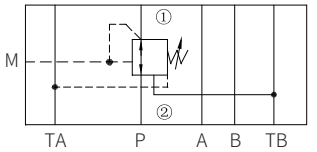
Z	DR	10	D			-5X	J		Y			*

- sandwich plate =Z
- reducing valve =DR
- size 10 =10
- direct operated =D
- pressure reducing in port A =A
  pressure reducing in port B =B
  pressure reducing in port P =P
- adjusting element
  rotary knob =1
  hexagon screw with sleeve and protective cap =2
  Lockable rotary knob with scale =3
- 50 to 59 series =5X
  (50 to 59 series: installation and connection size unchanged)
- J= Rekith
- 25= maximum secondary pressure 25bar
  75= maximum secondary pressure 75bar
  150= maximum secondary pressure 150bar
  210= maximum secondary pressure 210bar
- Y= control oil supply internal and drain external
- M= without check valve
  No code= with check valve (only with version "A")
- V= FKM seals
  No code= NBR seals
  sealing material (consult for other seals)
- more information in text

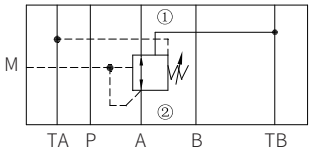
Functional symbols

(①= Valve side ②= Subplate side)

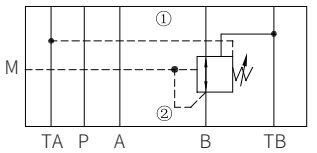
Model ZDR10DP...-5XJ/...YM



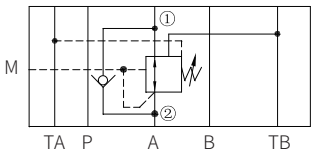
Model ZDR10DA...-5XJ/...YM



Model ZDR10DB...-5XJ/...YM



Model ZDR10DA...-5XJ/...Y



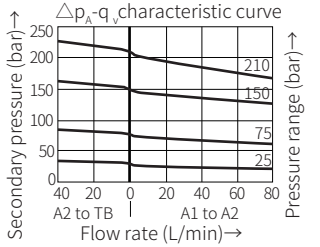
Technical parameters

Weight	Kg	about 2.8
Medium		Mineral hydraulic oil or phosphate hydraulic oil
Temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Maximum working pressure (inlet)	bar	315
Secondary pressure (outlet)	bar	to 25, to 75, to 150, to 210
Oil port back pressure T(Y)	bar	to 160
Maximum flow	L/min	80

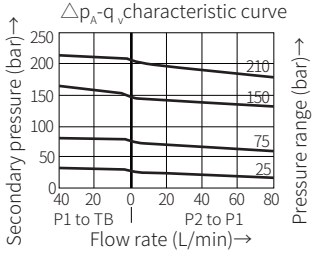
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Model ZDR 10 DA...-5X...
$\triangle p_A$-$q_v$characteristic curve

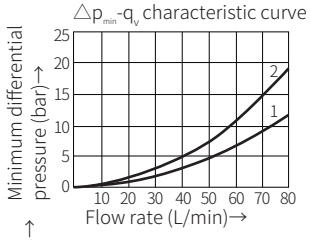


Model ZDR 10 DP...-5X/...and
ZDR 10 DB...-5X/...
$\triangle p_A$-$q_v$characteristic curve

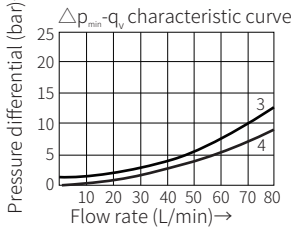


Note: When the set pressure is low, the characteristic curve remains within the corresponding pressure level range.

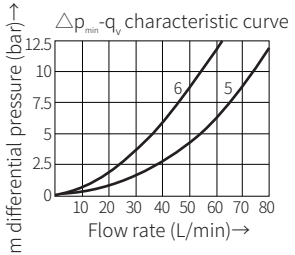
$\triangle p_{min}$-q_v characteristic curve



$\triangle p_{min}$-q_v characteristic curve



$\triangle p_{min}$-q_v characteristic curve



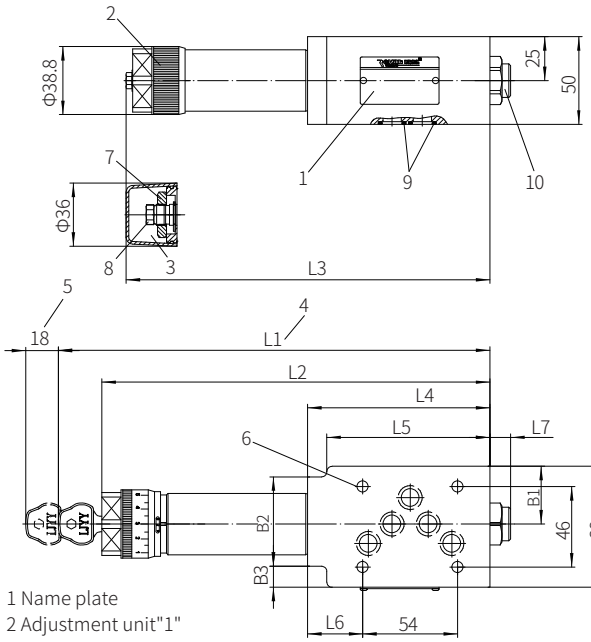
1 A1 to A2
2 A2 to TB (the third route of flow)
3 A2 to A1 only flow via check valve
4 A3 to A1 flow via check valve and completely opened control cross-section
5 P2 to P1
6 P1 to TB (the third route of flow)

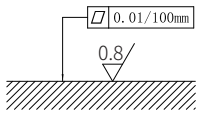
The characteristic curves apply to the pressure at the valve output pT = 0 bar across the entire flow range.

Component size

Size unit: mm

Model ZDR10...-5XJ/...

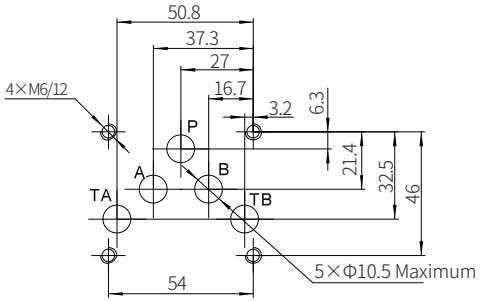




Required surface finishing of mating components

1 Name plate
2 Adjustment unit"1"
3 Adjustment unit"2"
4 Adjustment unit"3"
5 Space required to remove the key
6 Valve installation hole
7 Locknut S=24
8 Internal hexagon adjusting screw S=10
9 O ring 12x2 (for port P, A, B,T)
10 Pressure gauge connection:
G1/4 or M14x1.5; 12 deep

Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm



Version	L1	L2	L3	L4	L5	L6	L7	B1	B2	B3
"DA"	254	230	210	104	93	31.5	4	32.9	51	12
"DB" and "DP"	242	218	198	91	–	18.5	15	35	–	–

02

Direct Operated Pressure Reducing Valve

Model: DR5DP...1XJ

- Size 5
- Maximum working pressure 315 bar
- Maximum working flow 15 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- Mounting surface according to DIN 24340 form C
- Subplate mounting
- Panel mounting
- 5 pressure ratings
- 3 adjustment elements
- Check valve, optional

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Function description, sectional drawing

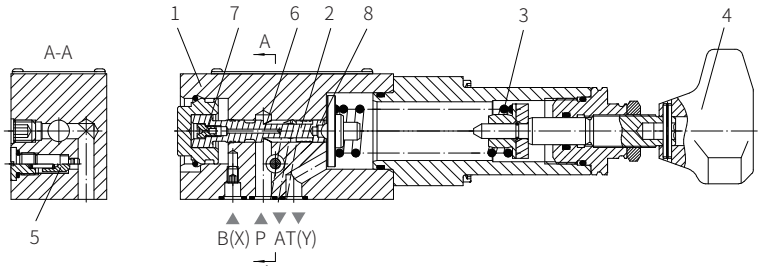
The DR5DP valve is a 3-way direct operated pressure reducing valve and used to reduce the pressure of circuit.

It is composed of valve body (1), control spool (2), compression spring (3), adjusting element (4) , and an optional check valve(5). The secondary pressure is set via the adjusting element (4).

At rest, the valve is normally open, the fluid can flow freely from port P to port A. The pressure at port A acts on the spool face of compression spring(3) via control line (6) and orifice(7). When the pressure at port A exceeds the setting value of the compression spring (3), the control spool (2) moves into the control position and the pressure at ports A remains constant. The control oil are supplied internally from port A, and also can be supplied externally via the port X.

If the pressure at port A continues to increase due to external force, the control spool (2) will still move towards the compression spring (3), then the port A is drained to the oil tank via the shoulder (8) to prevent further pressure increase. The control oil in the spring chamber is drained external to the oil tank through the port Y(T).

An optional check valve (5) allows the fluid to flow freely from port A to port P.



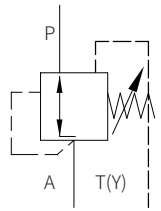
Model DR5DP-1-1XJ/

Models and specifications

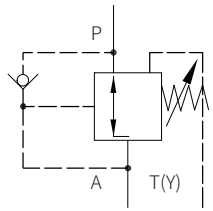
DR5DP ÷ 1X J / *

- subplate mounting =No code
- panel mounting =F
- direct operated pressure reducing valve, size 5
- rotary knob = 1
- adjusting screw with protective cap = 2
- lockable rotary knob with scale = 3
- 10 series =1X
  (10 to 19 series: installation and connection size unchanged)
- Rekith =J
- more information in text
- sealing material
  - No code= NBR seals
  - V= FKM seals
  - (consult for other seals)
- No code= with check valve
- M= without check valve
- Y= pilot oil supply internal, drain external
- XY= pilot oil supply external, drain external
- 25= maximum secondary pressure 25bar
- 75= maximum secondary pressure 75bar
- 150= maximum secondary pressure 150bar
- 210= maximum secondary pressure 210bar
- 315= maximum secondary pressure 315bar
  (315 bar only for type without check valve)

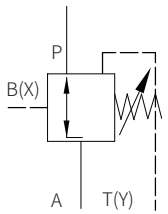
Functional symbols



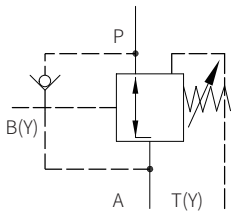
YM type
Without check valve
Pilot oil supply internal
Pilot oil drain external



Y type
With check valve
Pilot oil supply internal
Pilot oil drain external



XYM type
Without check valve
Pilot oil supply external
Pilot oil drain external



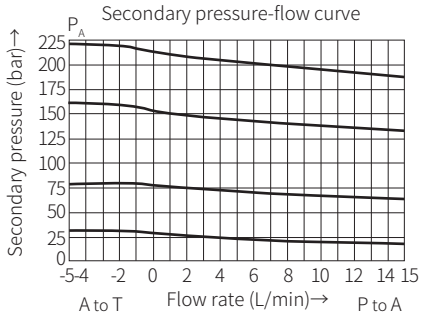
XY type
With check valve
Pilot oil supply external
Pilot oil drain external

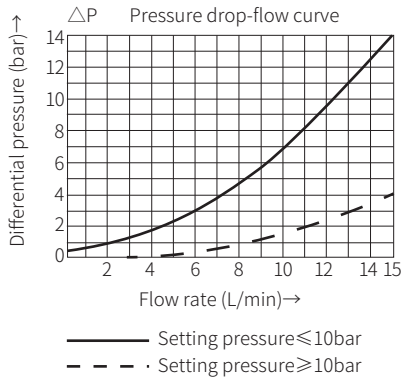
Technical parameters

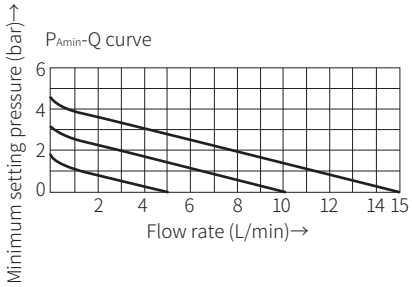
Hydraulic oil			Mineral oil(HL, HLP) according to DIN 51 524; Phosphate oil(HFD-R)
Hydraulic oil temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Viscosity range		mm^2/s	10 to 800
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Working pressure	port P	bar	to 315
Secondary pressure	port A	bar	to 25; to 75; to 150; to 210; to 315 (without check valve)
Backpressure	port T(Y)	bar	to 60
Maximum flow		L/min	to 15
Weight		Kg	about 1.2

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)





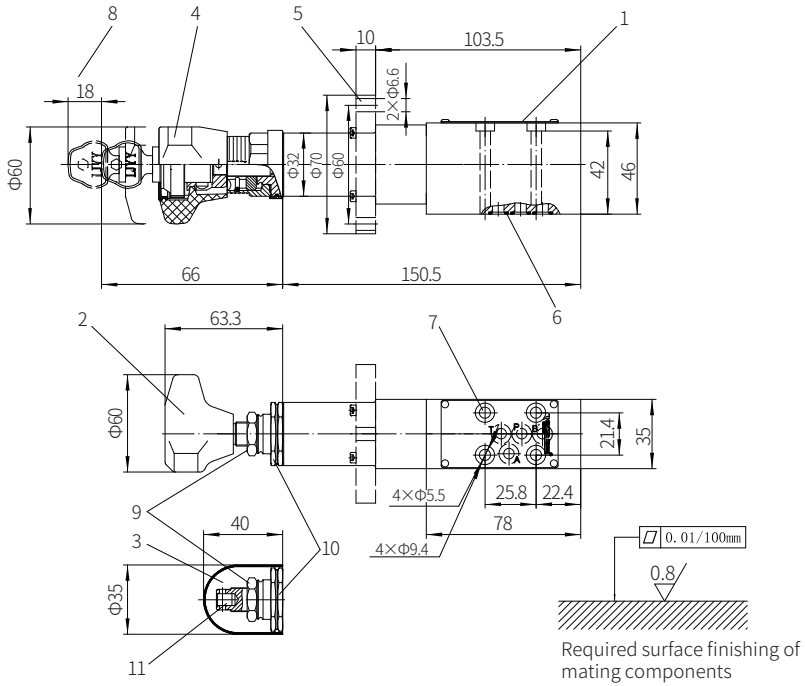


The P_{Amin}-Q curve represents the relationship between the minimum setting pressure and the flow-rate from P to A .
For example: when pressure is 25 bar and flow-rate is 10L/min, the pressure at port A is set 20 bar, when the secondary pressure increase to 23 bar, the flow-rate decreases to near zero.

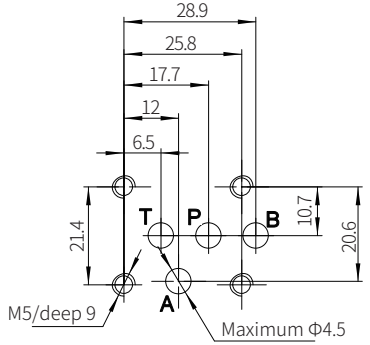
Component size

Size unit: mm

Model DR5DP...-1XJ/...



1 Name plate
2 Adjustment unit"1"
3 Adjustment unit"2"
4 Adjustment unit"3"
5 Panel mounting flange
6 O ring 7x1.5 (for oil port P, A, B, T)
7 Valve fixing screw hole
8 Space required to remove the key
9 Locknut S=24
10 Hexagon S=10
11 Internal hexagon adjusting screw S=6



Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G115/01 (G1/4") ; G115/02 (M14x1.5)

02

Direct Operated Pressure Reducing Valve

Model: DR6DP...5XJ

- Size 6
- Maximum working pressure 315 bar
- Maximum working flow 15 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- 5 pressure ratings
- 2 adjustment elements
  rotary knob
  internal hexagon screw with protective cap
- Check valve, optional

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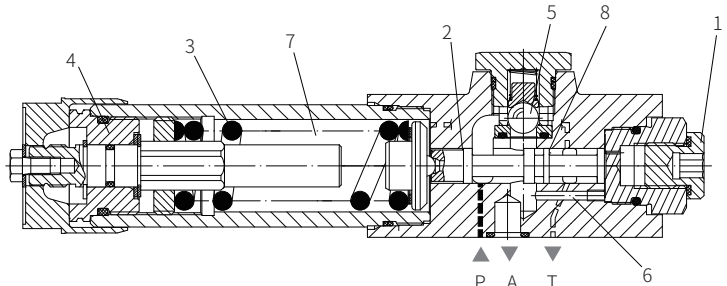
Function description, sectional drawing

The DR6DP valve is a 3-way direct operated pressure reducing valve and have relief function of the secondary pressure. It is used to reduce the system pressure. The secondary pressure is set via the adjusting element (4). At rest, the valve is normally open, the fluid can flow freely from port P to port A. The pressure at port A acts on the spool face of compression spring(3) via control line (6). When the pressure in port A exceeds the setting value of the compression spring (3), the control spool (2) moves into the control position and the pressure at port A remains constant. The control signal and control oil are supplied internally from port A via the control line (6).

If the pressure at port A continues to increase due to external forces acts on the actuator, the control spool (2) will still move towards the compression spring (3), then the port A is connected to the oil tank via the shoulder (8) at the control spool (2). The sufficient oil flows back to the tank to prevent further pressure increase at port A. The oil in the spring chamber (7) is drained external to the oil tank via port T(Y).

An optional check valve (5) allows the oil to flow freely from port A to port P, and the pressure gauge connection (1) is used for secondary pressure monitoring of the valve.



Model DR6DP1...-5XJ/...Y...

Models and specifications

DR6DP | - | 5X | J | | Y | | | *

direct operated pressure reducing valve size 6 =6

adjusting element
rotary knob =1
internal hexagon screw with protective cap =2

50 to 59 series =5X
(50 to 59 series: installation and connection size unchanged)

Rekith =J

maximum secondary pressure 25bar =25
maximum secondary pressure 75bar =75
maximum secondary pressure 150bar =150
maximum secondary pressure 210bar =210
maximum secondary pressure 315bar =315[1)]

Y= pilot oil supply internal
pilot oil drain external

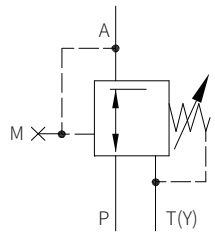
No code= with check valve
M= without check valve

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

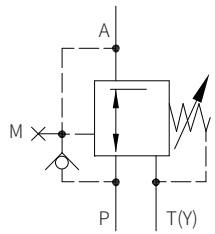
more information in text

1) Only with adjusting element “2”and without check valve

Functional symbols



YM type
Without check valve
Pilot oil supply internal
Pilot oil drain external



Y type
With check valve
Pilot oil supply internal
Pilot oil drain external

Technical parameters

Installation position			Optional
Environment temperature range		°c	-30 to +50 (NBR seal)
			-20 to +50 (FKM seal)
Weight		Kg	1.2
Hydraulic			
Maximum working pressure	Port P	bar	210,315
Maximum secondary pressure	Port A	bar	25,75,150,210,315
Maximum backpressure	Port T(Y)	bar	160
Maximum flow		L/min	60
Medium			Mineral oil (HL, HLP)[1)] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1)]; HEPG(Polyethyleneglycol)[2)] ; HEES (Synthetic Fats)[2]
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Hydraulic oil temperature range		°c	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Viscosity range[3)]		mm^2/s	10 to 800

1) For NBR seal and FKM seal.

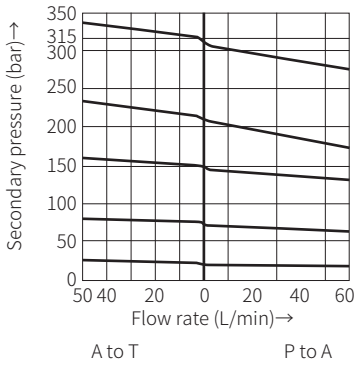
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

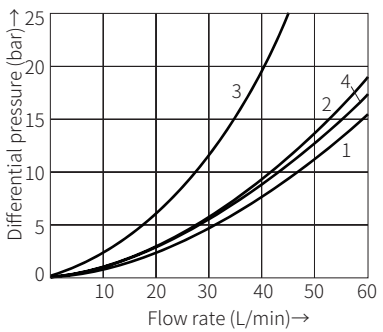
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△P_A- q_v-characteristic curve



△P_A- q_v-characteristic curve



Note:
When the setting pressure is low, the characteristic curve remains within the corresponding pressure level range.

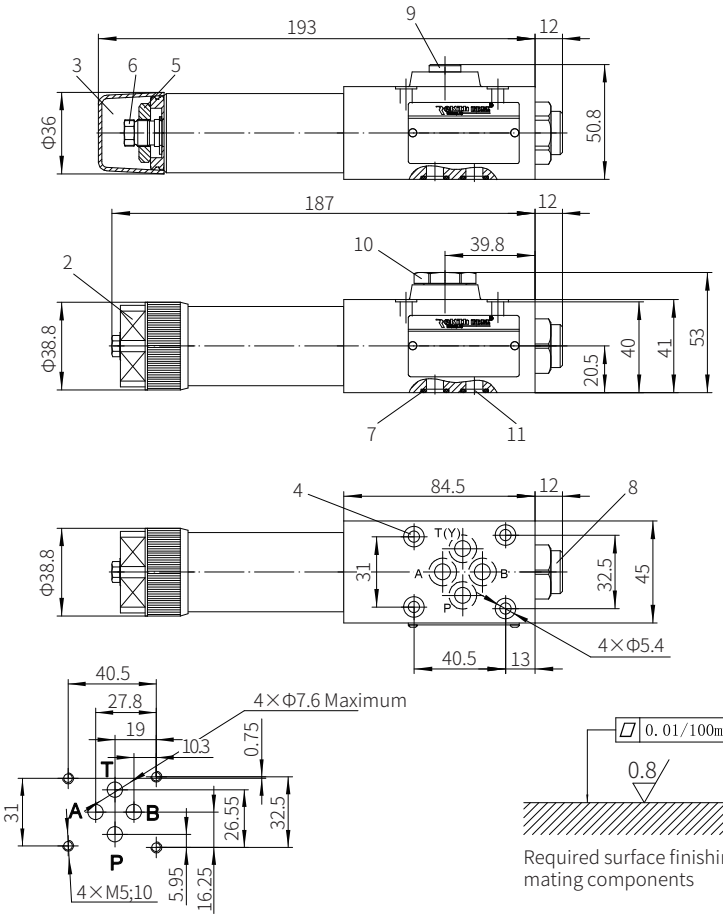
The characteristic curves are valid for an outlet pressure = 0 over the entire flow range!

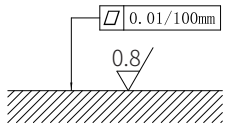
1 P to A (minimum pressure differential)
2 A to T(Y) (minimum pressure differential)
3 Δp only via check valve
4 Δp via check valve and completely opened control cross-section

Component size

Size unit: mm

Model DR6DP...-5XJ/...





Required surface finishing of mating components

1 Name plate
2 Adjustment unit"1"
3 Adjustment unit"2"
4 Valve fixing screw hole
5 Locknut S=24
6 Internal hexagon adjusting screw S=10
7 O ring 9.25x1.78 (for port P, A, B, T)
8 Pressure gauge connection G1/4 or M14X1.5, 12 deep
9 Without check valve
10 With check valve
11 Port B without function

Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

It must be ordered separately if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02(M14x1.5)
G342/01 (G3/8") ; G342/02(M18x1.5)
G502/01 (G1/2") ; G502/02(M22x1.5)

02

Direct Operated Pressure Reducing Valve

Model: DR10DP...4XJ

- Size 10
- Maximum working pressure 210 bar
- Maximum working flow 80 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- 4 pressure ratings
- 2 adjustment elements
  rotary knob
  internal hexagon screw with protective cap
- With pressure gauge connection
- Check valve, optional

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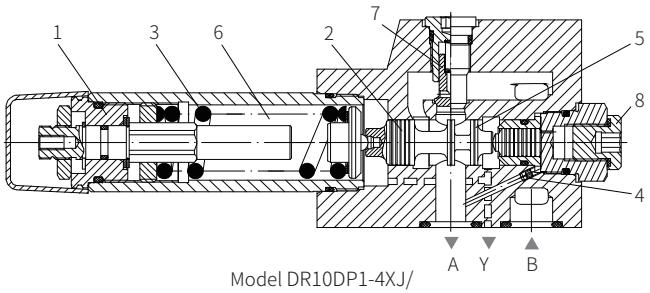
Function description, sectional drawing

The DR10DP valve is a 3-way direct operated pressure reducing valve and has relief function of reducing pressure to ensure a stable of the secondary pressure. It is used to reduce the pressure of circuit, the secondary pressure is set via the adjusting element (1).
At rest, the valve is normally open, the fluid can flow freely from port B to port A.The pressure at port A acts on the plunger(9) of compression spring(3) via control line (4). When the pressure in port A exceeds the setting value of the compression spring (3), the control spool (2) moves into the control position and the pressure at port A remains constant. The control oil are supplied internally from port A via the control line (4).
If the pressure at port A continues to increase due to external forces acts on the actuator, the control spool (2) will still move towards the compression spring (3), then the port A is connected to the oil tank via the shoulder (5) at the control spool (2). The sufficient oil flows back to the tank to prevent further pressure increase.
The leakage oil externally drain from the spring chamber (6) via channel T (Y).An optional check valve (7) allows the oil to flow freely from port A to port B.
A pressure gauge connection (8) allows for the control of the secondary pressure. The oil in the spring chamber (6) is drained external to the oil tank via port Y.
An optional check valve (7) allows the oil to flow freely from port A to port P, and the pressure gauge connection (1) is used for secondary pressure monitoring of the valve.



Model DR10DP1-4XJ/

Models and specifications

DR10DP | – | 4X | J | / | Y | | | *

direct operated pressure reducing valve size 10 =10

adjusting element
rotary knob =1
internal hexagon screw with protective cap =2

40 to 49 series =4X
(40 to 49 series: installation and connection size unchanged)

Rekith =J

maximum secondary pressure 25bar =25
maximum secondary pressure 75bar =75
maximum secondary pressure 150bar =150
maximum secondary pressure 210bar =210

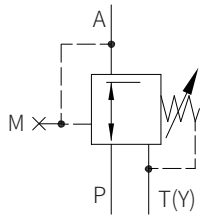
Y= pilot oil supply internal pilot oil drain external

No code= with check valve
M= without check valve

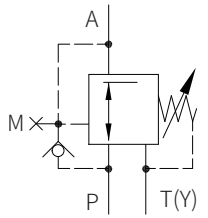
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

Functional symbols



YM type
Without check valve
Pilot oil supply internal
Pilot oil drain external



Y type
With check valve
Pilot oil supply internal
Pilot oil drain external

Technical parameters

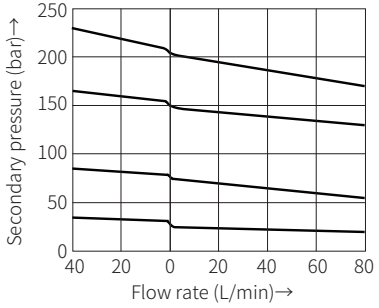
Installation position			Optional
Environment temperature range		°c	-30 to +50 (NBR seal)
		°c	-20 to +50 (FKM seal)
Weight		Kg	
Hydraulic			
Nominal pressure		bar	210
Maximum working pressure	Port B	bar	315
Maximum secondary pressure	Port A	bar	25; 75; 150; 210
Maximum backpressure	Port Y	bar	160
Maximum flow		L/min	80
Medium			Mineral oil (HL, HLP)[1] in accordance with DIN51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Hydraulic oil temperature range		°c	-30 to +80 (NBR seal)
		°c	-20 to +80 (FKM seal)
Viscosity range		mm^2/s	10 to 800
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

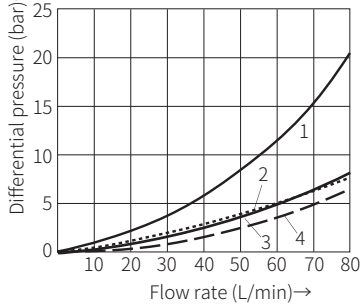
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△P_A- q_v-characteristic curve



A to Y | B to A

△P_A- q_v-characteristic curve



1 A to Y (minimum pressure differential)
2 B to A (minimum pressure differential)
3 △P only via check valve
4 △P only via check valve and completely opened control cross-section

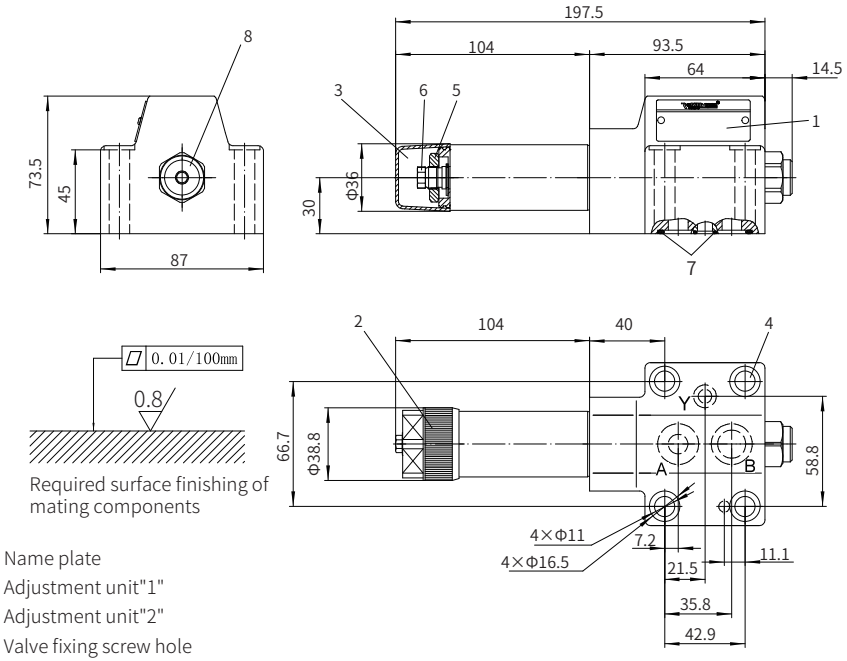
Note:
When the setting pressure is low, the characteristic curve remains within the corresponding pressure level range.

The characteristic curves are valid for an outlet pressure = 0 over the entire flow range!

Component size

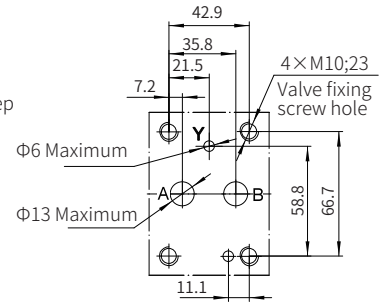
Size unit: mm

Model DR10DP…-4XJ/…



Required surface finishing of mating components

1 Name plate
2 Adjustment unit"1"
3 Adjustment unit"2"
4 Valve fixing screw hole
5 Locknut S=24
6 Internal hexagon adjusting screw S=10
7 O ring 17.12x2.62 (for port P, A, B, T)
O ring 8.75x1.8 (for port P, A, B, T)
8 Pressure gauge connection: G1/4 or M14x1.5, 12 deep



Valve fixing screw
M10x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

It must be ordered separately if connection subplate is needed.
Subplate type:
G460/01 (G3/8”); G460/02 (M18x1.5)
G461/01 (G1/2”); G461/02 (M22x1.5)

02

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Pilot Operated Pressure Reducing Valve

Model: DR...5XJ

- Size 10 to 32
- Maximum working pressure 315 bar
- Maximum working flow 400 L/min

Contents

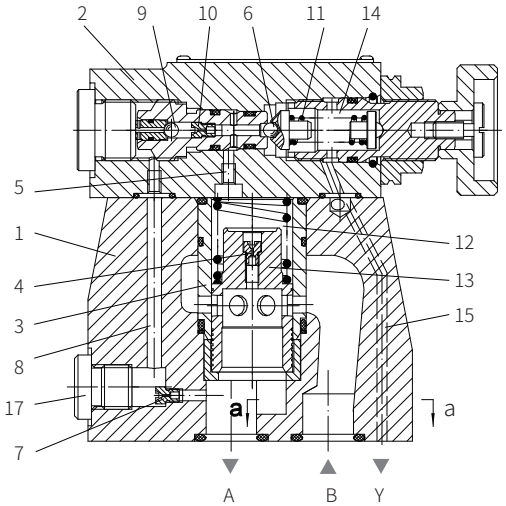
Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Characteristic curve	05-06
Component size	07-09

Features

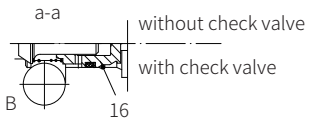
- For threaded connection
- For subplate mounting
- 4 adjusting elements
  rotary knob
  hexagon screw with sleeve and protective cap
  lockable rotary knob with scale
  rotary knob with scale
- 5 pressure ratings
- Check valve, optional
  (only for subplate mounting)

Function description, sectional drawing

The DR... valve is pilot operated pressure reducing valve, it is composed of the main valve (1) with main spool insert (3) and pilot control valve (2) with pressure adjusting element.
At rest, the valve is normally open. The fluid flows freely from port B to port A via the main spool insert (3). The pressure at port A acts on the lower main spool side. At the same time, the pressure acts on the spring-loaded side of the main spool (3) via the throttle (4) and the ball (6) in the pilot control valve (2) via the channel (5). It also acts on the ball (6) via throttle (7), control line (8), check valve (9) and throttle (10). Depending on the spring (11) setting, a pressure builds up in front of the ball (6), in the channel (5) and in the spring chamber(12) to keep the control spool (13) in opened position. The fluid can flow freely from port to port A via the main spool insert (3) until the pressure at port A exceeds the setting value of the spring (11) and opens the ball (6). The control spool (13) moves in closing direction.
The desired reduced pressure is achieved when there is a state of equilibrium between the pressure at port A and the setting pressure of the spring (11).
The control oil is drained from the chamber of spring (14) externally to the oil tank via the control line (15).
An optional check valve (16) allows the oil to flow freely from port A to port B, and the pressure gauge connection (17) is used for the reduced pressure monitoring in port A.



Model DR...-4-5XJ/



Models and specifications

DR | | | | | -5X | J | / | Y | | | | *

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code[3]= with chech valve
M= without check valve

pilot oil supply
pilot oil supply internal
Y= pilot oil return external

50= set pressure up to 50 bar
100= set pressure up to 100 bar
200= set pressure up to 200 bar
315= set pressure up to 315 bar

J= Rekith

5X= 50 to 59 series
(50 to 59 series installation and connection size unchanged)

complete valve =No code
pilot valve =C
without main spool insert
(no mark size)
pilot valve
with main spool insert =C
(mark size 30)

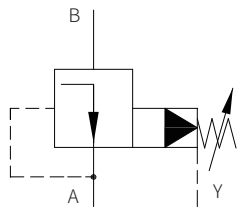
size	subplate mounting "⎯⎯"	threaded connection "G"
10	=10	=10 (G 1/2)
15		=15 (G 3/4)
20	=20	=20 (G 1)
25		=25(G 1 1/4)
32	=30	=30(G 1 1/2)

for subplate mounting = -
for threaded connection =G

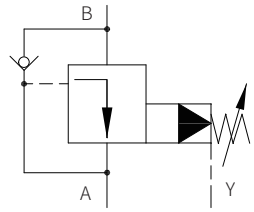
adjusting element
rotary knob =4
hexagon screw with sleeve and protective cap =5
lockable rotary knob with scale =6
rotary knob with scale =7

3) only for pilot valve with subplate mounting

Functional symbols



Model DR…-5XJ/YM…



Model DR...-5XJ/Y...
(only for subplate mounting)

Technical parameters

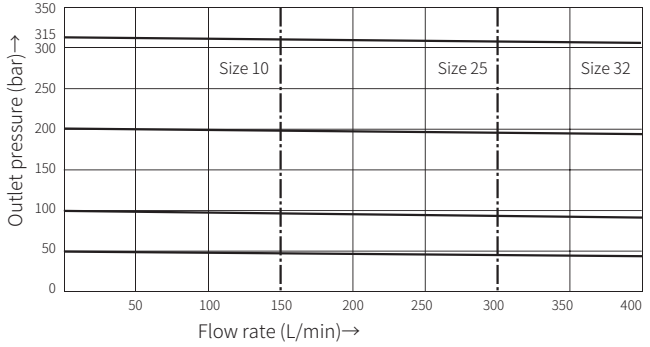
Overview							
Installation position			optional				
Environment temperature range		°C	-30 to +50 (NBR seal)				
		°C	-20 to +50 (FKM seal)				
Weight			DR10	DR15	DR20	DR25	DR30
Subplate mounting	DR…	kg	3.4	-	5.3	-	8.0
	DRC…	kg	1.2				
	DRC30…	kg	1.2				
Threaded connection	DR…G…	kg	5.3	5.2	5.1	5.0	4.8
Hydraulic							
Nominal pressure		bar	315				
Maximum working pressure	Port B	bar	315				
Maximum secondary pressure	Port A	bar	10 to 315				
Maximum backpressure	Port T(Y)	bar	315				
Setting pressure	Min.	bar	relate to flow				
	Max.	bar	50;100;200;315				
Maximum flow			DR10	DR16	DR20	DR25	DR32
Subplate mounting		L/min	150	-	300	-	400
Threaded connection		L/min	150	300	300	400	400
Medium			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]				
Hydraulic oil temperature range		°C	-30 to +80 (NBR seal)				
		°C	-20 to +80 (FKM seal)				
Viscosity range		mm^2/s	10 to 800				
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15				

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

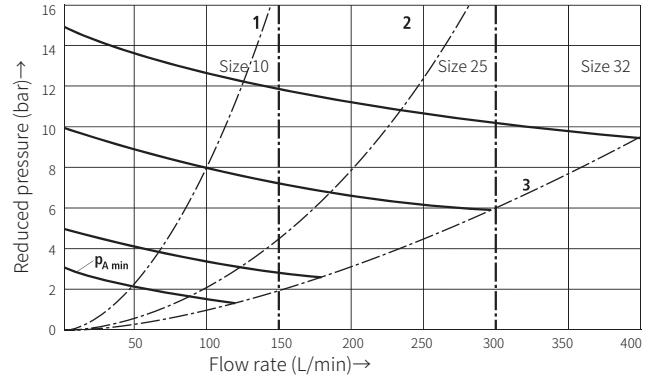
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

inlet pressure p_A-flow q_V(B→A)

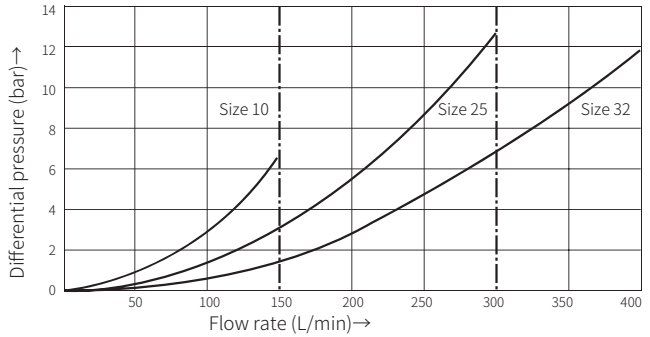


Minimum setting pressure p_{Amin}-flow q_V(B→A)



Performance limit
(system-dependent)
1=Size 10
2=Size 25
3=Size 30

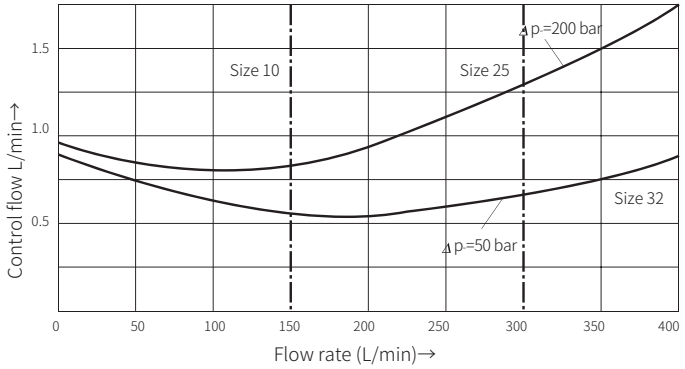
Δp-q_v-characteristic curves (B→A)(lowest setting pressure differential)



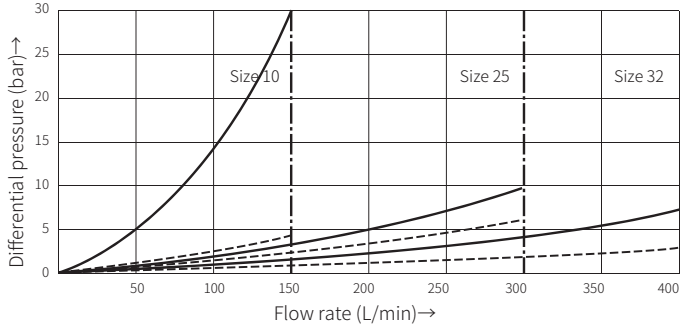
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Pilot flow depending on flow (B→A)and pressure differential



Δp·q_V-characteristic curves across the check valve (A→B)



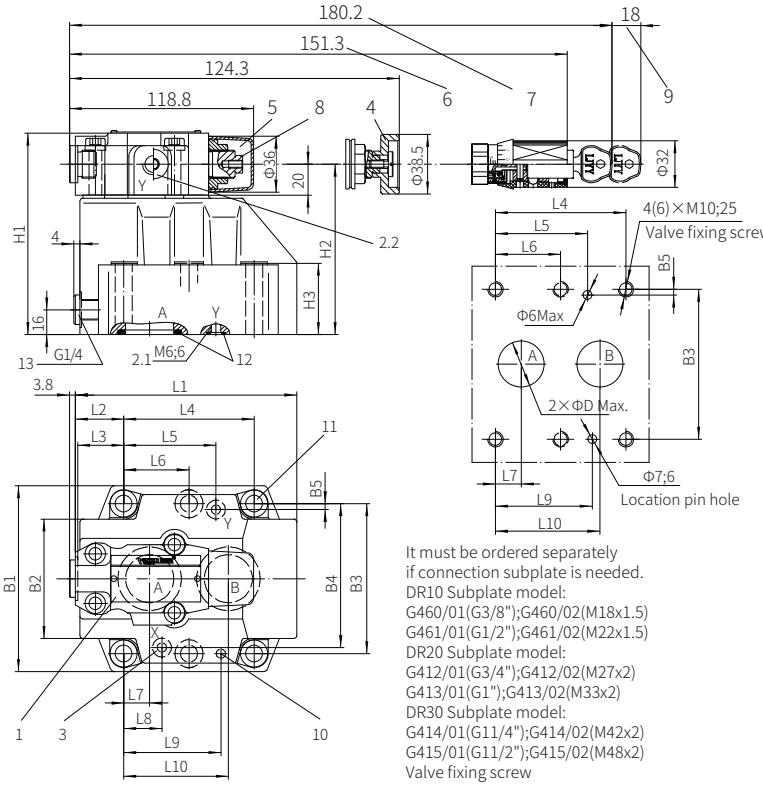
Flow resistance across check valve, main valve closed

Flow resistance across check valve with completely opened main valve

Component size

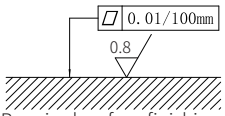
Size unit: mm

Subplate mounting valve, model DR…-5XJ/…



It must be ordered separately
if connection subplate is needed.
DR10 Subplate model:
G460/01(G3/8");G460/02(M18x1.5)
G461/01(G1/2");G461/02(M22x1.5)
DR20 Subplate model:
G412/01(G3/4");G412/02(M27x2)
G413/01(G1");G413/02(M33x2)
DR30 Subplate model:
G414/01(G11/4");G414/02(M42x2)
G415/01(G11/2");G415/02(M48x2)
Valve fixing screw
DR10:M10x50 DR20:M10x60
DR30:M10x70
10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

1 Name plate
2.1 Port Y for pilot oil drain external
2.2 Port Y for pilot oil drain external
(G1/4 or M14x1.5 opetional)
3 Port X no function (blind hole)
4 Adjustment form "4"
5 Adjustment form "5"
6 Adjustment form "6"
7 Adjustment form "7"
8 Hexagon S=10
9 Space required to remove the key
10 location pin hole
11 Valve fixing screw hole
4 pieces (DR10, DR20)
6 pieces (DR30)
12 O ring
13 Pressure gauge connection



Required surface finishing of mating components

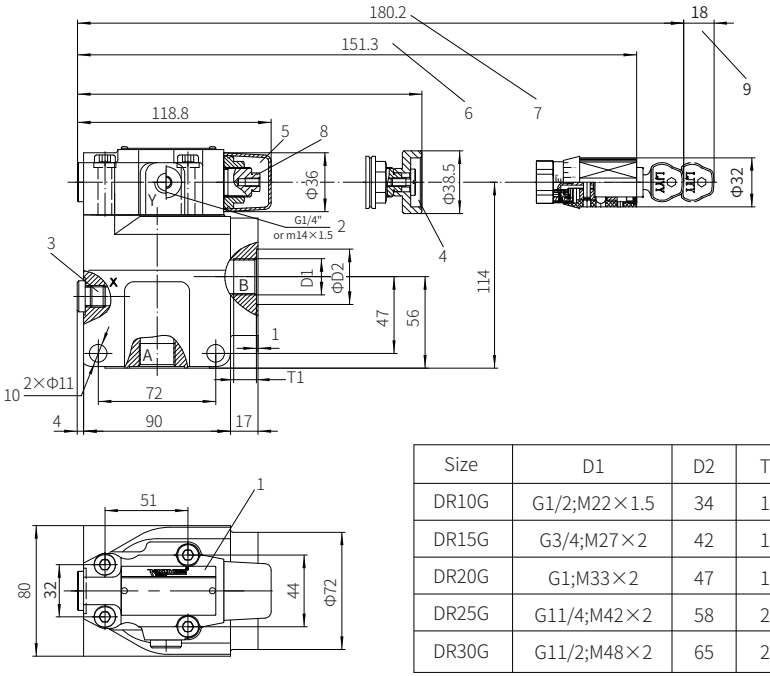
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	B1	B2
10	98.8	34.6	33.1	42.9	21.5	-	7.2	21.5	31.8	35.8	85	50
20	117.8	36.9	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	102	60
30	143	31.3	29.8	84.2	59.5	42.1	16.7	24.6	62.7	67.5	120	77

Size	B3	B4	B5	H1	H2	H3	D
10	66.7	58.8	7.9	112	92	26	13
20	79.4	73	6.4	122	102	36	22
30	96.8	92.8	3.8	130	110	46	30

Component size

Size unit: mm

threaded connection, Model DR...G-5XJ/



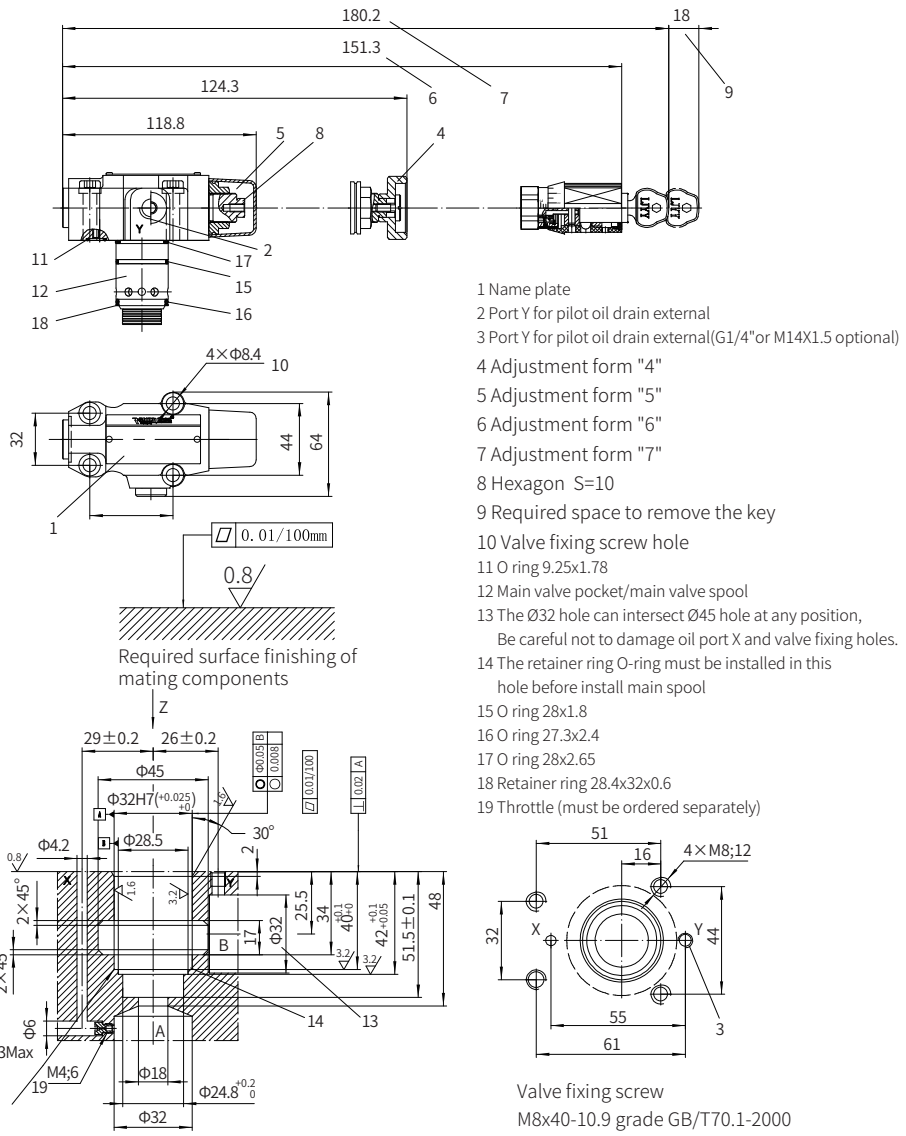
Size	D1	D2	T1
DR10G	G1/2;M22×1.5	34	14
DR15G	G3/4;M27×2	42	16
DR20G	G1;M33×2	47	18
DR25G	G11/4;M42×2	58	20
DR30G	G11/2;M48×2	65	22

1 Name plate
2 Port Y for pilot oil drain external
3 Pressure gauge connection
4 Adjustment form "4"
5 Adjustment form "5"
6 Adjustment form "6"
7 Adjustment form "7"
8 Hexagon S=10
9 Required space to remove the key
10 Valve fixing screw hole

Component size

Size unit: mm

With (DRC10 or 30) or without (DRC)



1 Name plate
2 Port Y for pilot oil drain external
3 Port Y for pilot oil drain external(G1/4"or M14X1.5 optional)
4 Adjustment form "4"
5 Adjustment form "5"
6 Adjustment form "6"
7 Adjustment form "7"
8 Hexagon S=10
9 Required space to remove the key
10 Valve fixing screw hole
11 O ring 9.25x1.78
12 Main valve pocket/main valve spool
13 The Ø32 hole can intersect Ø45 hole at any position, Be careful not to damage oil port X and valve fixing holes.
14 The retainer ring O-ring must be installed in this hole before install main spool
15 O ring 28x1.8
16 O ring 27.3x2.4
17 O ring 28x2.65
18 Retainer ring 28.4x32x0.6
19 Throttle (must be ordered separately)

Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=37Nm

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Pilot Operated Pressure Reducing Valve

Model: DR20K...-1XJ/DR...-4XJ

- Size 10, 20
- Maximum working pressure 315 bar
- Maximum working flow 160 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Characteristic curve	03-04
Component size	05

Features

- Cartridge construction
- Subplate mounting
- 4 pressure ratings
- 4 adjusting elements

Rotary knob
Adjusting screw with protective cap
Lockable rotary knob with scale
Rotary knob with scale

Function description, sectional drawing

The DR...4XJ valve is pilot operated pressure pressure reducing valve, it is used to reduce the system pressure. The valve is composed of the plug-in valve and valve body, and an optional check valve (only for subplate mounting).

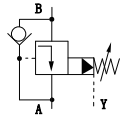
At rest, the valve is normally open. The fluid can flow freely from port B to port A via main spool (1). The pressure at port A is applied to the spring-loaded side of the main spool via the orifice (2). At the same time, the pressure acts on the side of the main spool (1) which is opposite to the spring via orifice (3) and (4). from the oil port A via the main spool with holes (2) and throttle holes (3) and (4).

If the pressure at port A exceeds the setting value of the spring (6), the pilot valve (5) opens. Then the fluid flows from spring-loaded side of the main spool (1) via the orifice (7) and poppet valve spool (5) to the spring chamber(8). The main spool (1) moves to the control position and keeps the pressure value set on spring(6) constant in port A.

The pilot control oil is always drained external from spring chamber (8) via the port Y (9). An optional check valve can be installed to allow the oil to flow freely from port A to port B in reverse direction.

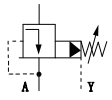
Functional symbols:

For subplate mounting

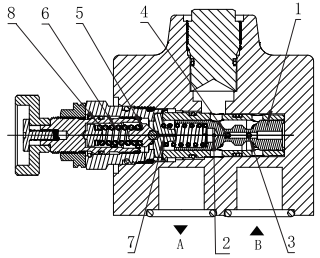


Model
DR...-4XJ/...Y

For subplate mounting
For manifold mounting



Model
DR...-4XJ/...YM
DR20...K-1XJ/...YM
(Cartridge type)



Models and specifications

DR | | | | Y | | * |

pilot operated
pressure reducing valve =DR

size	valve used for	
	subplate mounting	"K" type
10	=10	-
25	=20	=20

For subplate mounting =no code
manifold mounting(cartridge type) =K

adjusting element
rotary knob =4
adjusting screw with protective cap =5
lockable rotary knob with scale =6
rotary knob with scale =7

more information in text

No code= NBR seals
V= FKM seals

No code= with check valve (subplate mounting)
M= without check valve

50= set pressure up to 50bar
100= set pressure up to 100bar
200= set pressure up to 200bar
315= set pressure up to 315bar

1XJ= 10 to 19 series (K type)
(10 to 19 series: installation and connection size unchanged)

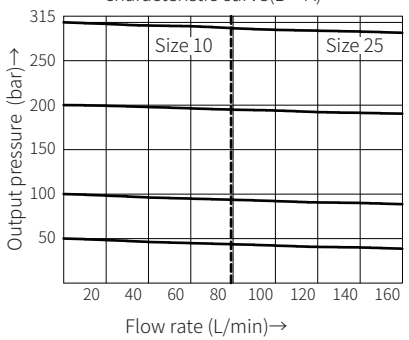
4XJ= 40 to 49 series
(40 to 49 series: installation and connection size unchanged)

Technical parameters

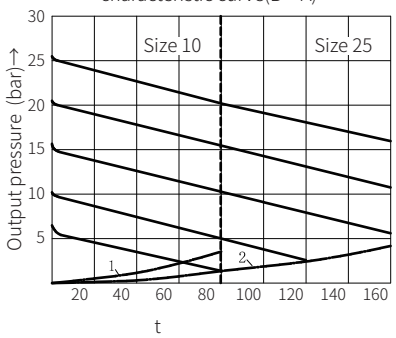
Medium		Mineral oil - for NBR seals and FKM seals
		Phosphate - for FKM seals
Working medium temperature range	°C	–30 to +80 (NBR seal)
		–20 to +80 (FKM seal)
Viscosity range	mm²/s	10 to 800
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Maximum working pressure	bar	315
Maximum adjusting pressure	bar	50; 100; 200; 315
Maximum flow	L/min	80 (size 10); 160 (size 25)

Characteristic curve

Output pressure p_A -flow q_v characteristic curve(B→A)



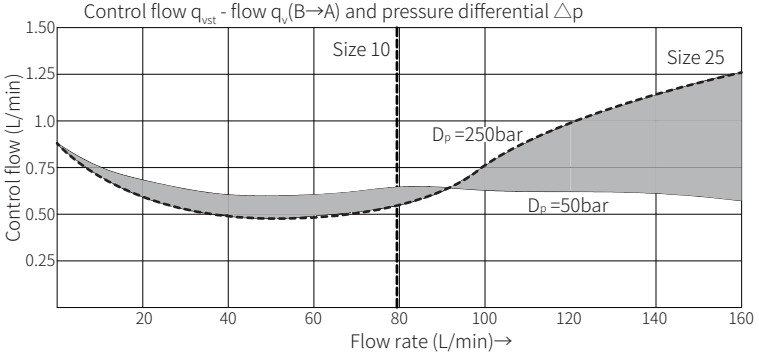
Minimum pressure p_{Amin}-flow q_v characteristic curve(B→A)



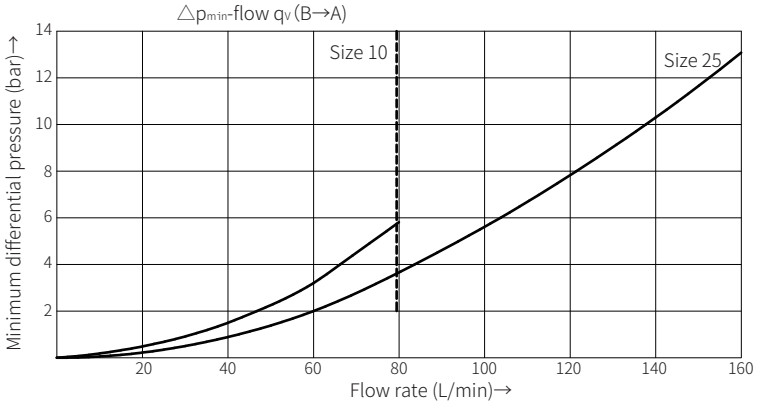
Performance limit
(system-dependent):
1 Size 10
2 Size 25

Characteristic curve

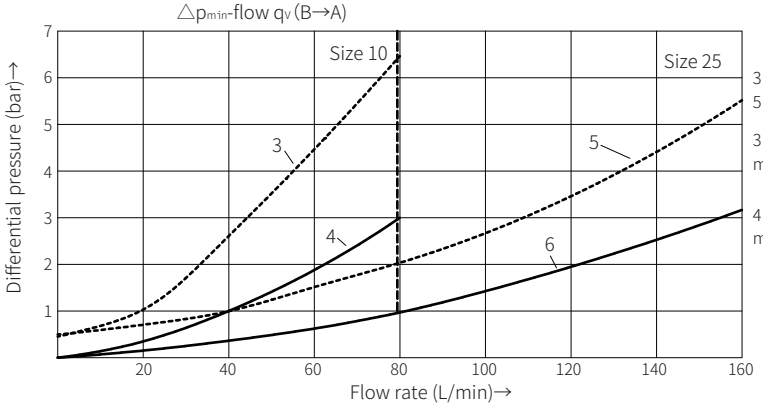
Control flow q_{vst} - flow q_v(B→A) and pressure differential △p



△p_{min}-flow q_V (B→A)



△p_{min}-flow q_V (B→A)



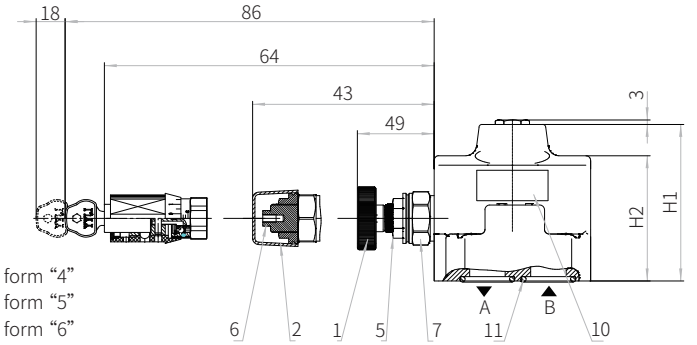
3 and 4 size 10
5 and 6 size 25

3 and 5
main stage closed

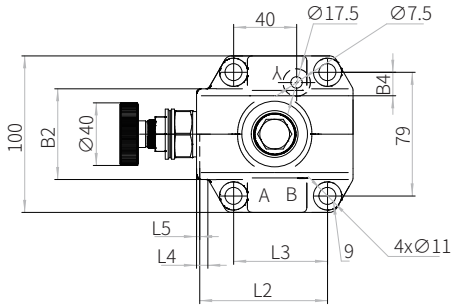
4 and 6
main stage fully open

Component size

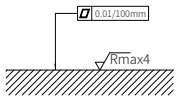
Size unit: mm



1 Adjustment form “4”
2 Adjustment form “5”
3 Adjustment form “6”
4 Adjustment form “7”
5 Locknut S=22
6 Hexagon screw S=10
7 Hexagon screw S=30
Tightening torque M_A=50Nm
8 Space required to remove the key
9 Valve fixing screw hole
10 Name plate
11 Same seal rings for port A and port B
12 Seal ring for port Y



Subplate use for
Valve size 10:
G460/01 (G3/8)
G461/01 (G1/2)
Valve size 20:
G412/01 (G3/4)
G413/01 (G1)
Valve fixing screw use for
Valve size 10: M10x40 DIN 912-10.9
Tightening torque M_A=75Nm
Valve size 20: M10x50 DIN 912-10.9
Tightening torque M_A=75Nm



Required surface finishing of mating components

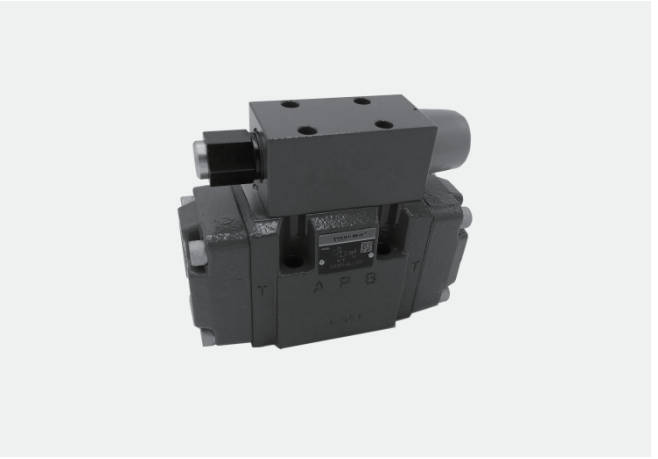
Model	L1	L2	L3	L4	L5	L6	B1	B2	B3	B4	H1	H2
DR10	95.5	79	42.9	23	2.5	21.5	85	49	66.7	7.9	71	60
DR20	96	79.5	60.3	7	4	39.7	100	58	79.4	6.4	96	78

Model	H3	H4	ØD1	ØD2	ØD3
DR10	26	26	35.5	21.8	15
DR20	26	40	41	34.8	25

02

3-Way Pressure Reducing Valve

Model: 3DR10P…6XJ/



- Size 10
- Maximum working pressure 315 bar
- Maximum working flow 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- Mounting surface according to DIN 24340 form A and ISO4401
- 4 pressure ratings
- 2 adjusting elements
  Rotary knob
  Adjusting screw with protective cap
- With pressure gauge connection

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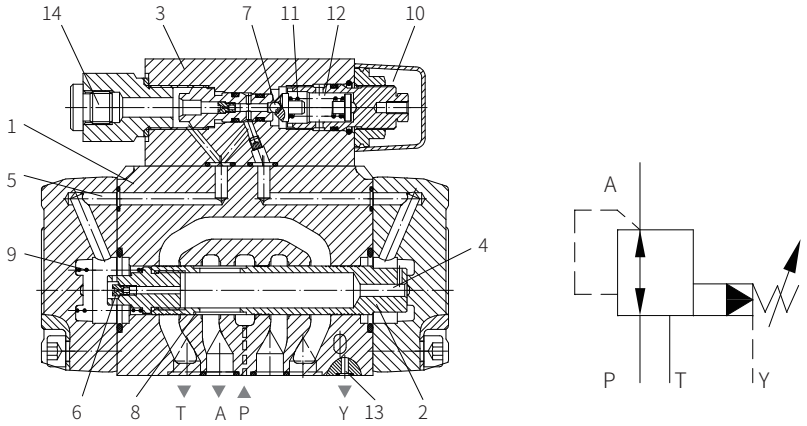
Function description, sectional drawing

The 3DR10P valve is 3-way pressure reducing valve with pressure limitation in the secondary circuit to ensure that the secondary pressure is stable. It is used to reduce the pressure in the hydraulic system.
The valve is composed of valve body(1), control spool (2) and pilot valve (3) with adjusting element (10). At rest, the valve is normally open, the fluid can flow freely from P to A. The pressure at port A acts to the spool area opposite to the compression spring (9) via control channel(4). Meanwhile, the fluid acts on the ball valve(7) of the pilot valve(3) via throttle (6) and channel (5). Based on the setting value of the spring (11), the pressure builds up in front of the ball (7) and in channel (5) to hold the control spool in the opening position. The oil can flow freely from port P to port A via control spool(2) until the pressure at port A exceeds the setting value of spring (11) and opens the ball valve (7). The control spool (2) moves to the close position. The required reduced pressure is achieved when a balance between the pressure at port A and the pressure setting value of spring (11) is reached.
If the pressure at port A continuously increases due to external forces, the control spool(2) is still moved towards to the compression spring (9). Thus port A is connected to port T via the control lands (8) of the control spool (2). Enough oil flows to tank to ensure that the pressure does not rise any further.
The pilot oil in the spring chamber (12) returns external via control line(13) to port Y, and then flow at zero pressure to tank. The pressure gauge connection (14) is used for the reduced pressure monitoring in port A.



Model 3DR10P5-6XJ/

Models and specifications

3DR | 10 | P | – | 6X | J | / | Y | / | *

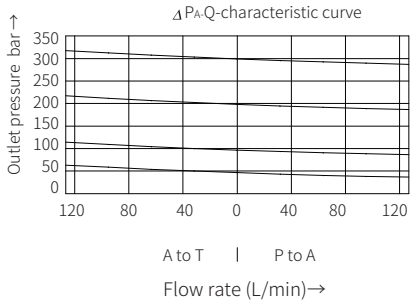
- 3-way pressure reducing valve
- size 10 =10
- subplate mounting =P
- rotary knob =4
- hexagon screw with sleeve and protective cap =5
- 60 to 69 series =6X
  (60 to 69 series: installation and connection size unchanged)
- J= Rektih
- 50= maximum secondary pressure 50 bar
- 100= maximum secondary pressure 100 bar
- 200= maximum secondary pressure 200 bar
- 315= maximum secondary pressure 315 bar
- Y= pilot oil drain external
- No code= NBR seals
- V= FKM seals
- (consult for other seals)
- sealing material
- more information in text

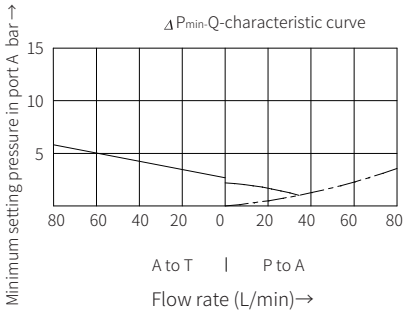
Technical parameters

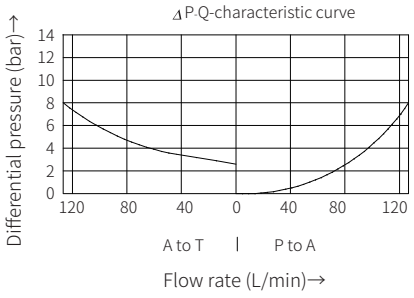
Medium			Mineral oil -used for NBR seals and FKM seals
			Phosphate -used for FKM seals
Hydraulic oil temperature range		°C	–30 to +80 (NBR seal)
			–20 to +80 (FKM seal)
Viscosity range		mm^2/s	10 to 800
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Nominal pressure			315
Maximum working pressure	port P	bar	315
Maximum working pressure	port A	bar	315
Maximum working pressure	port Y	bar	Separate and at zero pressure to tank
Setting pressure	Min.	bar	Depends on flow (see curves)
	Max.	bar	50; 100; 200; 315
Maximum flow		L/min	120
Weight		kg	about 6.5

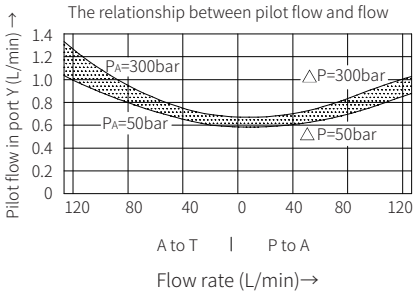
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



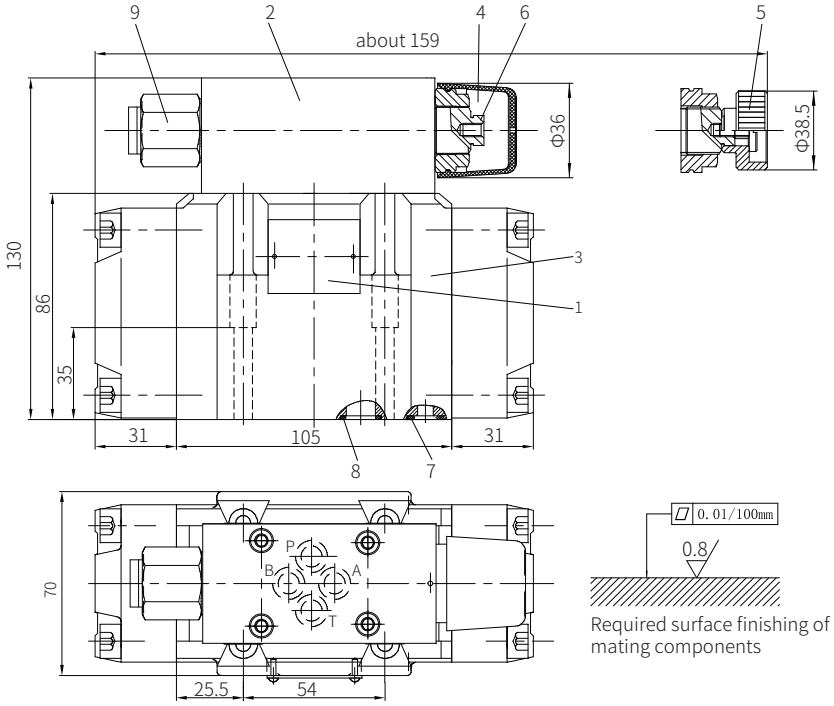






Component size

Size unit: mm

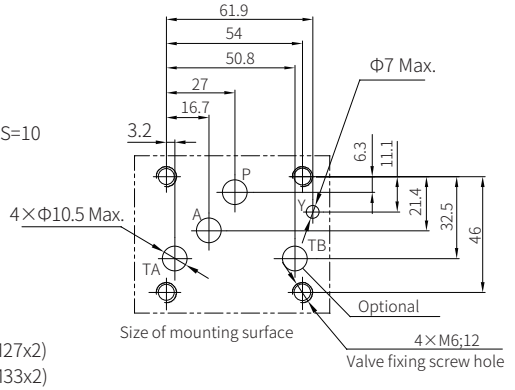


1 Name plate
2 Pilot valve body
3 Main valve body
4 Adjusting form "5"
5 Adjusting form "4"
6 Internal hexagon adjusting screw S=10
7 O ring 10.82x1.78 (X, Y)
8 O ring 12X2
(A2、B2、P2、TA2、TB2)
9 Pressure gauge connection G1/4

It must be ordered separately
if connection subplate is needed.

Model: G535/01(G3/4) G535/02 (M27x2)
G536/01(G1) G536/02 (M33x2)

Valve fixing screw:
4 pcs M6x45, GB/T70.1-10.9 grade
Tightening torque M_A=13.7Nm



02

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Direct Operated Pressure Sequence Valve

Model: DZ5DP...1XJ

- Size 5
- Maximum working pressure 315 bar
- Maximum working flow 30 L/min

Contents

Function description, sectional drawing	02
Functional symbols	02
Models and specifications	03
Characteristic curve	03
Technical parameters	04
Component size	04

Features

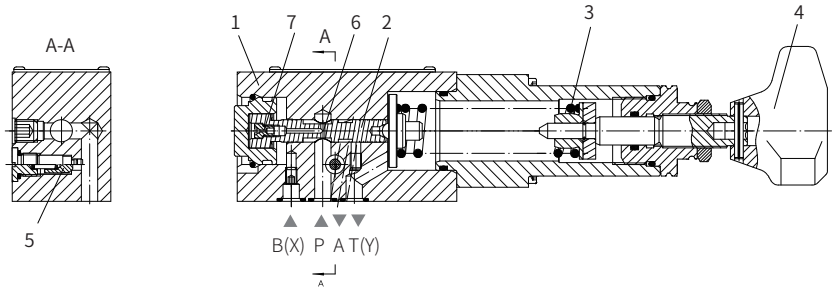
- Direct operated sequence valve
- 5 pressure ratings
- Subplate mounting
- Panel mounting
- 3 adjusting elements:

-Rotary knob
-Internal hexagon adjusting screw with protective cap
-Lockable rotary knob with scale

- Check valve, optional

Function description, sectional drawing

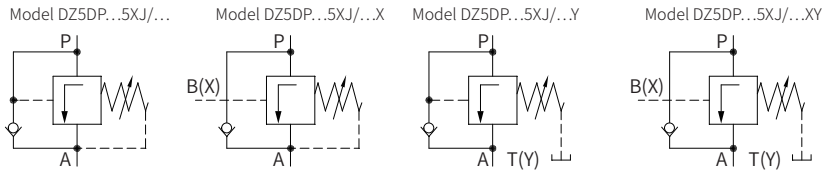
The DZ5DP pressure control valve is a direct operated sequence valve, it is used to set the pressure to supply oil to the secondary system.
The valve is composed of valve body (1), control spool (2), spring (3), pressure setting element (4) and optional check valve (5) as required, the pressure is setting via the pressure setting element (4).
The spring (3) holds the control spool (2) in the initial position. The pressure oil in port P acts to the spool area opposite to the spring (3) via the hole (6) and the throttle hole (7). When the pressure in port P reaches the setting value, the spool moves against the spring force so that the port P and the port A are connected. At that time, the oil flows into the system connected to port A, but the pressure in port P does not fall, and the control oil can also supply external via port X.
Depending on the application of the valve, the pilot oil can return externally via port Y(T) or internally. The check valve (5) is installed as required to allow the fluid flow back freely from port A to port P.



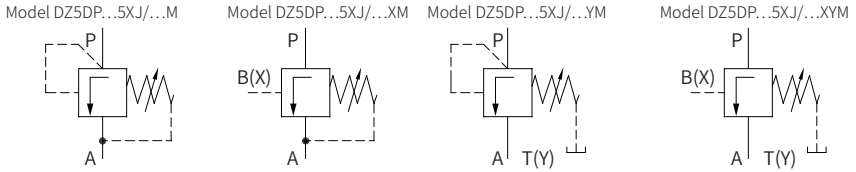
Model DZ5DP-1-1XJ/

Functional symbols

With check valve



Without check valve



Models and specifications

	DZ	5	D	P		-1X	J	/				*

subplate mounting =no code
panel mounting =F

size 5 =5

direct operated

subplate mounting =P

adjusting element
rotary knob =1
internal adjusting screw with protective cap =2
lockable rotary knob with scale =3

10 to 90 series =1X
(10 to 19 series: installation and connection size unchanged)

Rekith =J

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

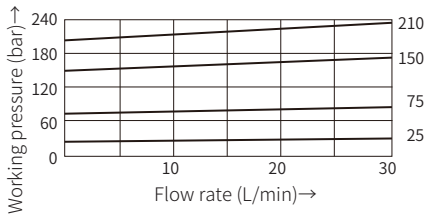
no code= with check valve
M= without check valve

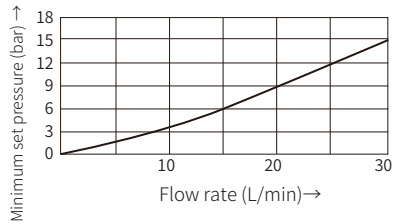
no code=pilot oil supply and drain internal
X= pilot oil supply external, drain internal
Y= pilot oil supply internal, drain external
XY= pilot oil supply and drain external

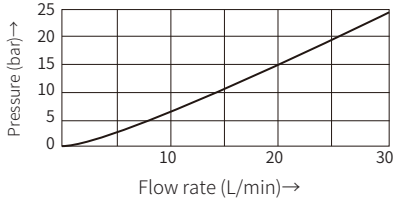
25= set pressure up to 25 bar
75= set pressure up to 75 bar
150= set pressure up to 150 bar
210= set pressure up to 210 bar
315= set pressure up to 315 bar
(315 bar only for type without check valve)

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)







Technical parameters

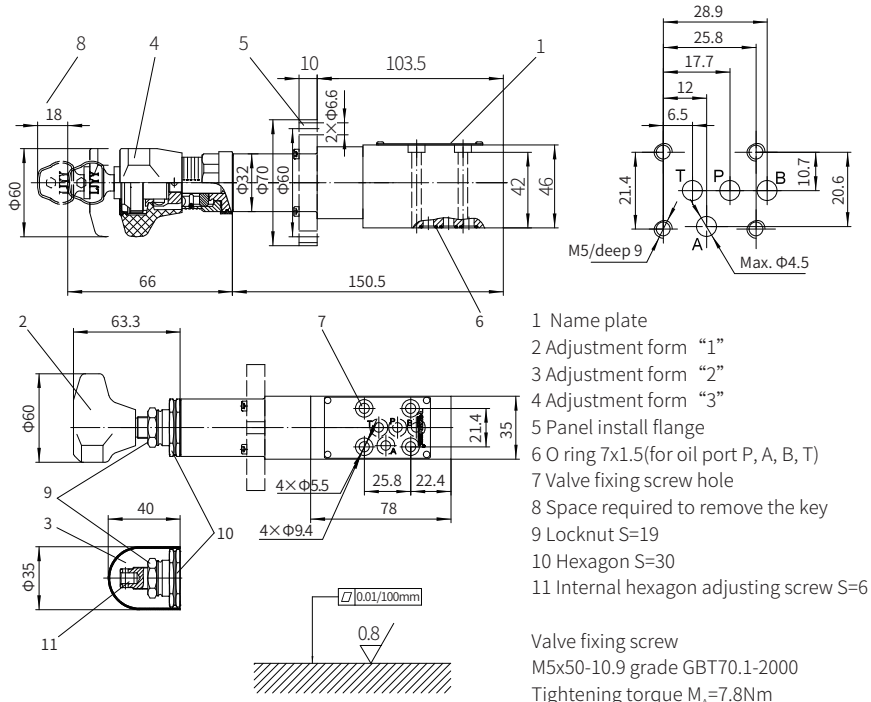
Inlet pressure port P, B(X)	bar	up to 210, without check valve up to 315
Outlet pressure (port A)	bar	to 315
Backpressure port T(Y)	bar	to 60
Maximum flow	L/min	to 30
Medium		Mineral hydraulic oil or phosphate hydraulic oil
Viscosity range	mm^2/s	10 to 800
Working medium temperature range °C		–30 to +80 (NBR seal) ; –20 to +80 (FKM seal)
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15

02

Component size

Size unit: mm

Model DZ5DP...1XJ



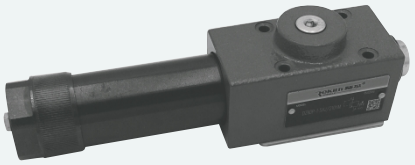
1 Name plate
2 Adjustment form "1"
3 Adjustment form "2"
4 Adjustment form "3"
5 Panel install flange
6 O ring 7x1.5(for oil port P, A, B, T)
7 Valve fixing screw hole
8 Space required to remove the key
9 Locknut S=19
10 Hexagon S=30
11 Internal hexagon adjusting screw S=6

Valve fixing screw
M5x50-10.9 grade GBT70.1-2000
Tightening torque M_A=7.8Nm
It must be ordered separately
if connection subplate is needed.
Subplate model:
G115/01(G1/4); G115/02(M14x1.5)

Required surface finishing of mating components

Direct Operated Pressure Sequence Valve

Model: DZ6DP...5XJ



- Size 6
- Maximum working pressure 315 bar
- Maximum working flow 60 L/min

Contents

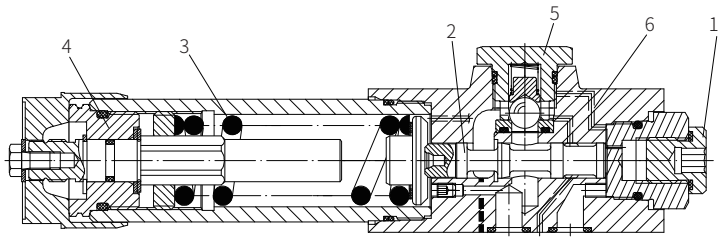
Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- Subplate mounting
- 5 pressure ranges
- 2 adjusting elements
  Rotary knob
  Adjusting screw with protective cap
- Check valve, optional

Function description, sectional drawing

The DZ6DP valve is direct operated sequence valve, it is used for sequence switching of the secondary circuit pressure. The sequence pressure is setting via the adjusting element (4).
The spring (3) holds control spool (2) in initial position, the valve is closed. The pressure in port P acts on the piston area of the control spool (2) via the control line (6) at the opposite of the spring (3). When the pressure in port P reaches the setting value of spring (3), the control spool (2) moves to the left to connect port P and port A, the pressure in port P not fall.
The control signal is obtained from port P internally via the control line (6) or externally via port B (X). Depending on the application of the valve, the leakage oil can return externally through port T (Y) or internally through port A.
Notice:
For internal drainage, the set opening pressure increases the pressure in port A. The fluid can flow freely from port A to port P via installing check valve (5) . Pressure gauge connection(1) is used to monitor the set sequential pressure.



Model DZ6DP1-5XJ/...Y...

Models and specifications

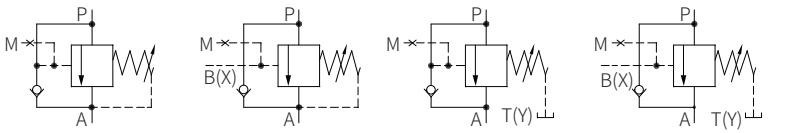
DZ | 6 | D | P | - | 5X | J | / | | | | | *

- pressure sequence valve
- size 6 =6
- direct operated
- subplate mounting =P
- adjusting element
  - rotary knob =1
  - adjusting screw with protective cap =2
- 50 to 59 series =5X
  (50 to 59 series: installation and connection size unchanged)
- Rekith =J
- more information in text
- sealing material
  - No code= NBR seals
  - V= FKM seals
  - (consult for other seals)
- no code= with check valve
- M= without check valve
- no code= pilot oil supply and drain internal
- X= pilot oil supply external, drain internal
- Y= pilot oil supply internal, drain external
- XY= pilot oil supply and drain external
- 25= set pressure up to 25 bar
- 75= set pressure up to 75 bar
- 150= set pressure up to 150 bar
- 210= set pressure up to 210 bar
- 315= set pressure up to 315 bar
  (315 bar only for type without check valve)

Functional symbols

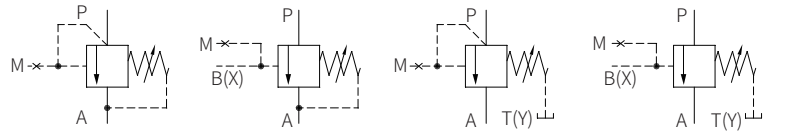
With check valve

Model DZ6DP...-5XJ/... Model DZ6DP...-5XJ/...X Model DZ6DP...-5XJ/...Y Model DZ6DP...-5XJ/...XY



Without check valve

Model DZ6DP...-5XJ/...M Model DZ6DP...-5XJ/...XM Model DZ6DP...-5XJ/...YM Model DZ6DP...-5XJ/...XYM



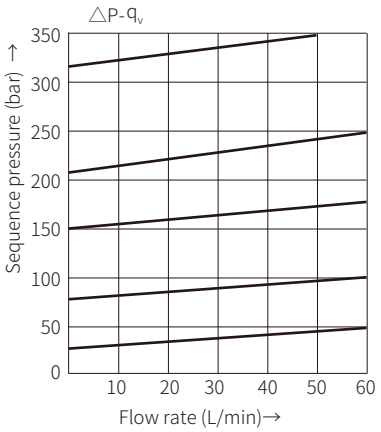
Technical parameters

Overview		
Installation position		Optional
Environment temperature range		–30 to +50 (NBR seal)
		–20 to +50 (FKM seal)
Weight	kg	1.2KG
Hydraulic		
Maximum working pressure	Port P, A, B (X) bar	315
Maximum secondary pressure	Port T(Y) bar	25;75;150;210;315
Maximum flow	L/min	60
Medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Hydraulic oil temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil[3]		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

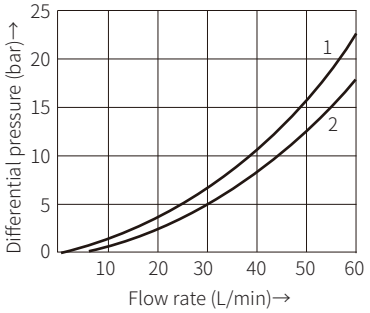
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



1 △P-q_v characteristic curve, flow from A to P via check valve

1 △P-q_v characteristic curve, P to A

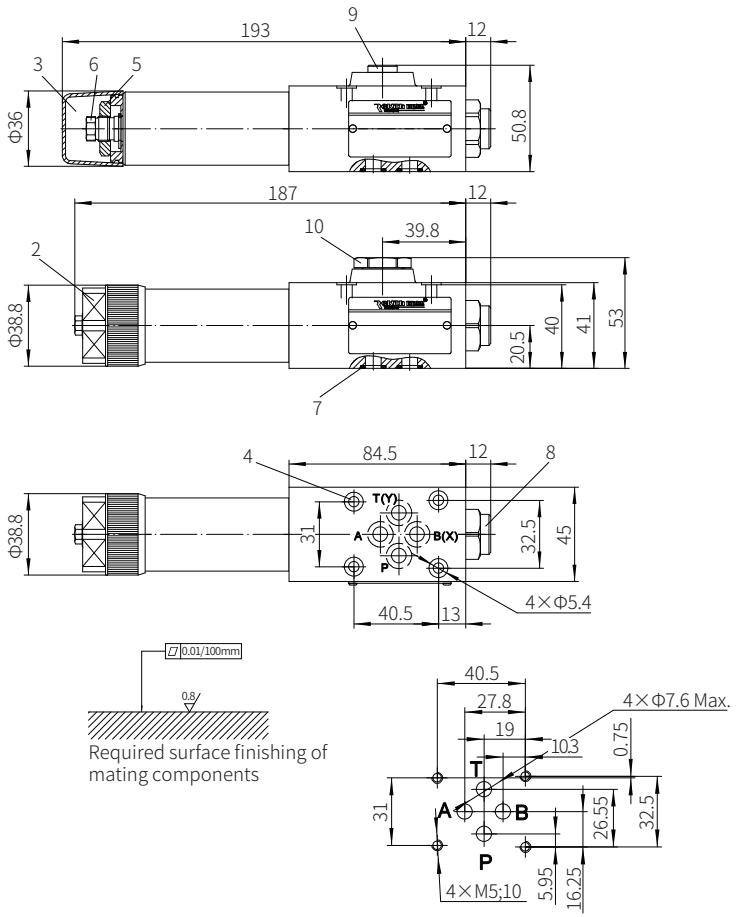


The characteristic curves are valid for an outlet pressure = 0 over the entire flow range!

Component size

Size unit: mm

Model DZ6DP...-5XJ/...



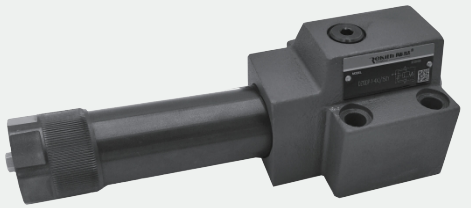
1 Name plate
2 Adjustment form “1”
3 Adjustment form “2”
4 Valve fixing screw hole
5 Locknut S=24
6 Internal hexagon adjusting screw S=10
7 O ring 9.25x1.78 (for oil port P, A, B, T)
8 Pressure gauge connection: G1/4 or M14x1.5; 12 deep
9 Without check valve
10 With check valve

Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
It must be ordered separately
if connection subplate is needed.
Subplate model:
G341/01 (G1/4") ; G341/02 (M14x1.5)
G342/01 (G3/8") ; G342/02 (M18x1.5)
G502/01 (G1/2") ; G502/02 (M22x1.5)

02

Direct Operated Pressure Sequence Valve

Model: DZ10DP...4XJ



- Size 10
- Maximum working pressure 210 bar
- Maximum flow rate 80 L/min

Contents

Function description, sectional drawing	02
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Characteristic curve	04
Component size	05

Features

- 4 pressure ranges
- 2 adjusting elements
  Rotary knob
  Adjusting screw with protective cap
- Check valve , optional

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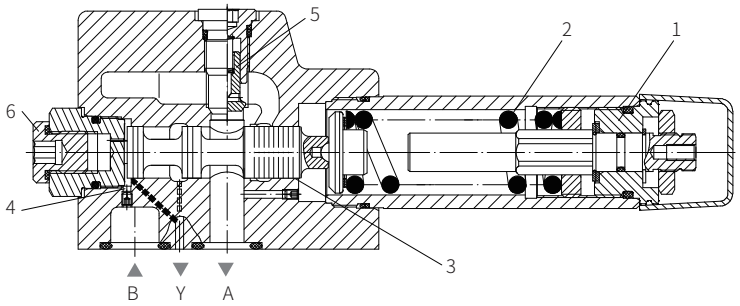
Function description, sectional drawing

The DZ10DP valve is direct operated sequence valve, it is used for sequence switching of the secondary circuit pressure. The sequence pressure is setting via the adjusting element (1).
The compression spring (2) holds the spool(3) in initial position, the valve is closed. The pressure in port A passes into the spool area via control line (4) to form a force which acts on the spool (3) opposite the compression spring (2). When the pressure reaches the setting value of the spring (2), the spool (3) is moved to connect port A and B. The systems connected with port B is sequenced while the pressure in port A will not drop. The control signal is obtained from port A via control line (4) or internally via port X. Based on the valve application, the leakage oil can return externally via port Y or internally via port B.

Notice!

For internal drainage, the set opening pressure increases the pressure in port B. The fluid oil can flow freely from port B to port A via installing check valve. Pressure gauge connection (6) is used to monitor the set sequential pressure.



Model DZ10DP1-4XJ/...XY...

Models and specifications

DZ10DP ÷ 4X J ⁄ *

direct operated sequence valve size 10

adjusting element
rotary knob = 1
adjusting screw with protective cap = 2

40 to 49 series =4X
(40 to 49 series installation and connection size unchanged)

Rekith = J

set pressure up to 25 bar = 25
set pressure up to 75 bar = 75
set pressure up to 150 bar = 150
set pressure up to 210 bar = 210

No code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

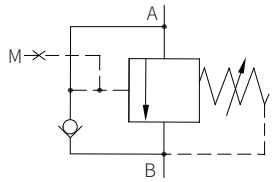
No code= with check valve
M= without check valve

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

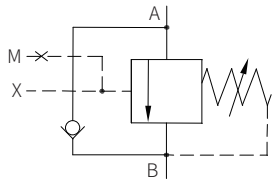
more information in text

Functional symbols

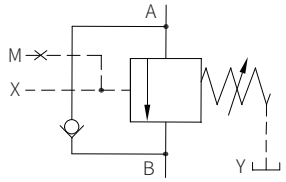
Model DZ10DP...-4XJ/...



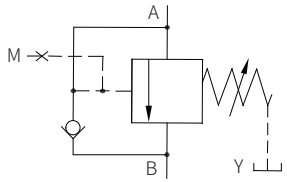
Model DZ10DP...-4XJ/...X



Model DZ10DP...-4XJ/...XY



Model DZ10DP...-4XJ/...Y



Technical parameters

Overview		
Installation position		optional
Environment temperature range	°C	–30 to +50 (NBR seal)
		–20 to +50 (FKM seal)
Weight	Kg	About 3

Hydraulic		
Maximum working pressure port P, A, B(X)	bar	to 210
port T(Y)	bar	to 160
Max. sequencing pressure (adjustable)	bar	to 25; to 75; to 150; to 210
Max. flow	L/min	to 80
Medium		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]
Hydraulic oil temperature range	°C	-30 to +80 (NBR seal)
	°C	-20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil[3]		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15

1) For NBR seal and FKM seal.

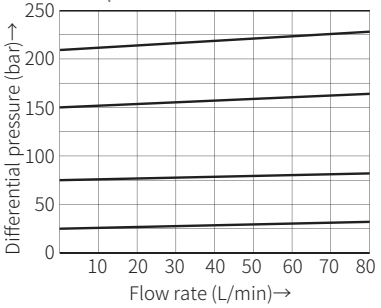
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

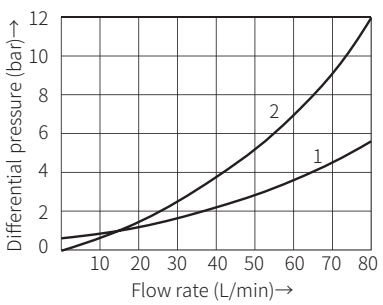
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_v characteristic curve



The characteristic curve is valid for an outlet pressure =0 over the entire flow range!

△p-q_v -characteristic curve



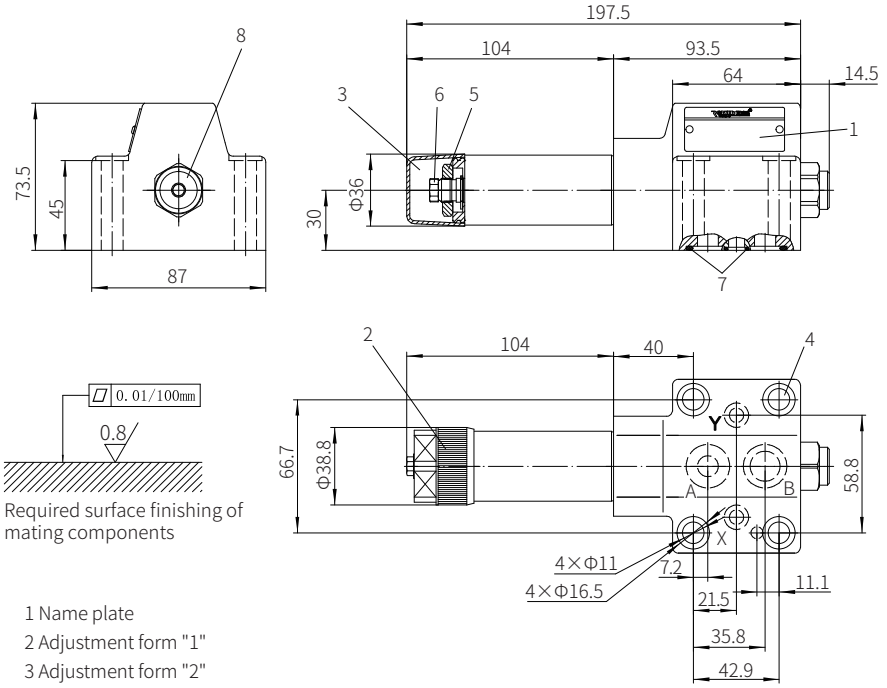
△p-q_v -characteristic curve, B to A via check valve

△p-q_v-characteristic curve, A to B

Component size

Size unit: mm

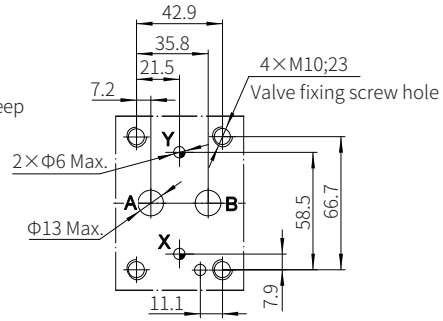
Model DZ10DP...-4XJ/...



1 Name plate
2 Adjustment form "1"
3 Adjustment form "2"
4 Valve fixing screw hole
5 Locknut S=24
6 Internal hexagon adjusting screw S=10
7 O ring 8.75x1.8 (for oil port X, Y)
8 Pressure gauge connection:G1/4 or M14x1.5; 12 deep

Valve fixing screw
M10x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

It must be ordered separately
if connection subplate is needed.
Subplate model:
G460/01 (G3/8"); G460/02 (M18x1.5)
G461/01 (G1/2"); G461/02 (M22x1.5)



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Modular Pressure Sequence Valve

Model: ZDZ6DP-1XJ

- Size 6
- Maximum working pressure 250bar
- Maximum flow rate 60L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Component size	04

Features

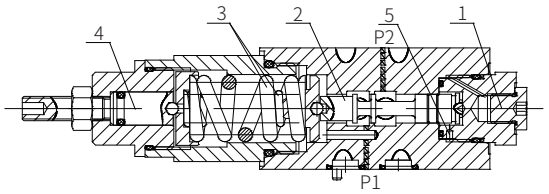
- Sandwich plate type
- Mounting surface according to DIN24340 A and ISO4401
- With pressure gauge connection

Function description, sectional drawing

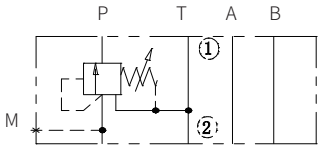
The ZDZ6D valve is sandwich plate type direct operated sequence valve, it is used for secondary circuit pressure dependent sequential switching.

The sequence pressure is setting via the adjusting element (4). The control spool(2) is hold in the initial position by the compression spring (3), the valve is closed. The pressure in port P1 acts on the spool area of the control spool (2) via the control line (5) opposite the compression spring.

When the pressure in port P1 exceeds the setting value of the spring (3), the control spool (2) moves toward the spring to open the port P. The fluid flows from P1 to P2. The pressure gauge connection (1) is installed to monitor the pressure of the sequence.



Functional symbol: (①= Valve side, ②= Subplate side)



Models and specifications

Z	DZ	6	D	P	2	1XJ	25	B	*

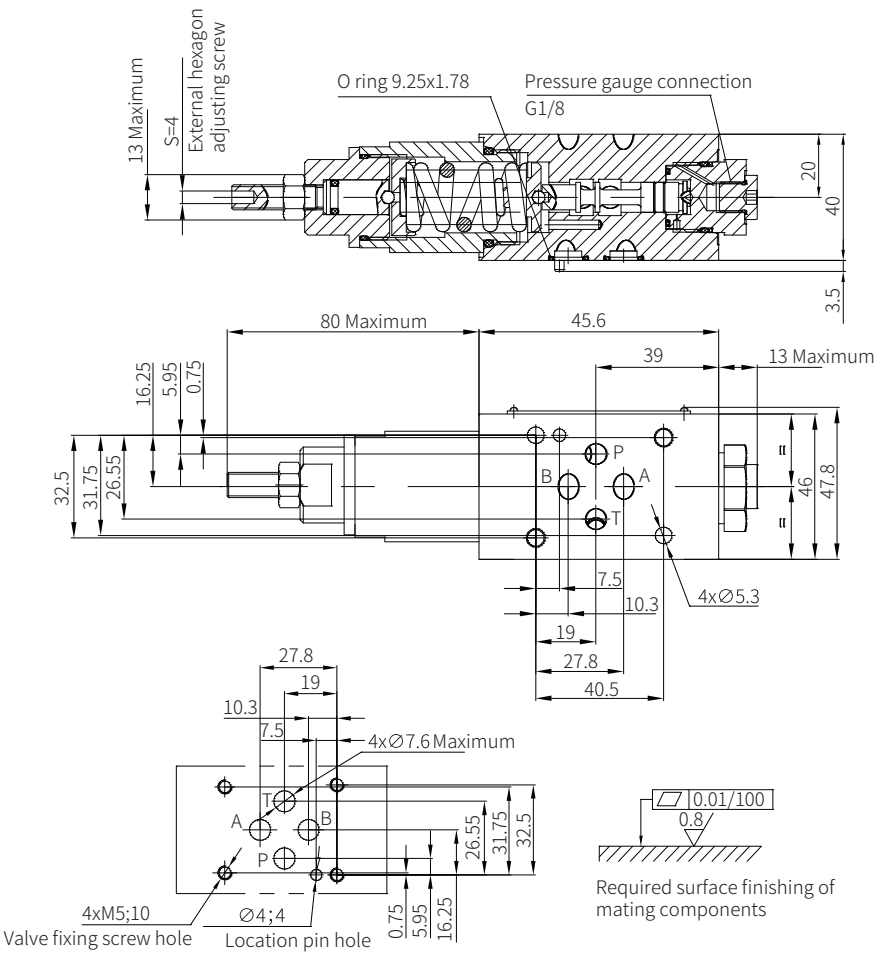
- sandwich plate valve=Z
- sequence valve =DZ
- size 6 =6
- direct operated =D
- pressure reducing in port P =P
- screw adjustment =2
- 1XJ= 10 to 19 series (10 to 19 series installation and connection size unchanged)
- 25= pressure adjusting range 20-250 bar
- B= pressure measurement port thread G1/8
- more information in text

Technical parameters

Medium		Mineral oil - for NBR seal and FKM seal
		Phosphate - for FKM seal
Hydraulic oil temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seals)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9 and ISO4406 Class 20/18/15
Maximum working pressure (inlet)	bar	315
Maximum sequencing pressure	bar	250
Minimum initial pressure	bar	20
Maximum flow	L/min	60

Component size

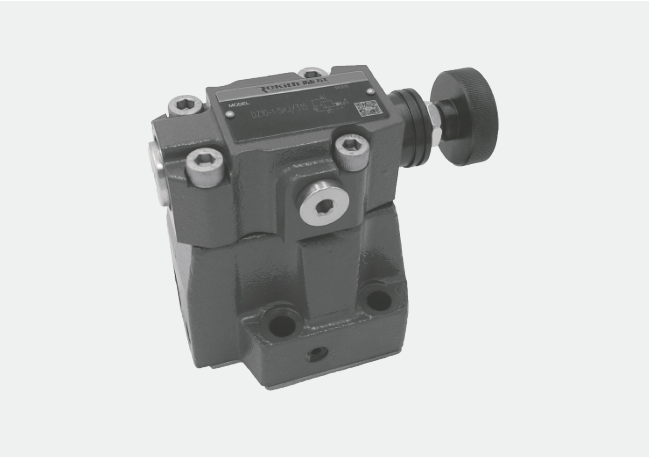
Size unit: mm



Valve fixing screw:
M5 -10.9 grade GB/T70.1, internal hexagon adjusting screw or LT30.02, stud with LT30.01 nut
Tightening torque M_A=7.8 Nm
The length is determined by the stacking height and it must be ordered separately.

Pilot Operated Pressure Sequence Valve

Model: DZ...5XJ



- Size 10, 25, 32
- Maximum working pressure 315 bar
- Maximum flow rate 600 L/min

Contents

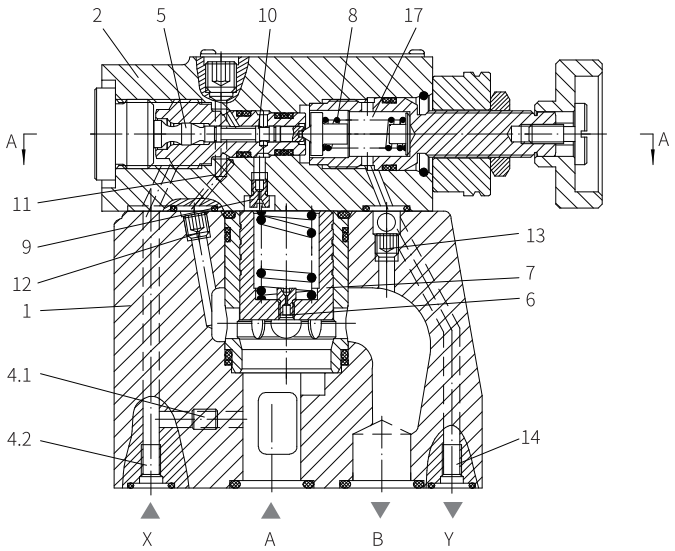
Function description, sectional drawing	02-03
Models and specifications	03
Functional symbols	04
Technical parameters	04
Characteristic curve	05-06
Component size	07-08

Features

- Use as pressure valve, sequence valve and bypass valve
- For subplate mounting
- 4 adjusting elements
  - Rotary knob
  - Adjusting screw with protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- 4 pressure ranges
- Check valve, optional

Function description, sectional drawing

The DZ pressure valve is pilot operated sequence valve, it is used for pressure dependent sequence switching of the secondary circuit. The valve is mainly composed of main valve (1) with main spool insert (7), pilot control valve (2) with pressure adjusting element, and an optional check valve(3).
The valve function varies according to pilot oil supply and drain configuration:
Preload valve model DZ...-5XJ/...(Control lines 4.1, 12 and 13 open; control lines 4.2, 14 and 15 closed)
The pressure in port A acts on the pilot spool (5) of the pilot valve(2) via the control line(4.1), and acts on the spring-loaded side of the main spool(7) via throttle (6) at the same time. When pressure exceeds the setting value of the spring (8), the pilot valve spool (5) is moved against spring (8). The control signal is obtained internally from port A via control line (4.1).
The fluid in spring chamber of main spool(7) via throttle (9), control shoulder (10), control lines (11) and (12) flow into port B. Thus, the pressure differential is formed at the main spool(7), the port A and port B is connected, and the setting value of the spring (8) remains unchanged. The leakage oil of the pilot valve spool (5) flows into port B internally via control line(13). An optional check valve (3) can be installed to allow the fluid flow freely from port B to port A.
Preload valve model DZ...-5XJ/..X...(Control lines 4.2, 12 and 13 open; control lines 4.1, 14 and 15 closed)
In principle, the function of this valve is same as model DZ... -5XJ/... but the signal is provided externally via control line (4.2) for model DZ....5XJ..X...

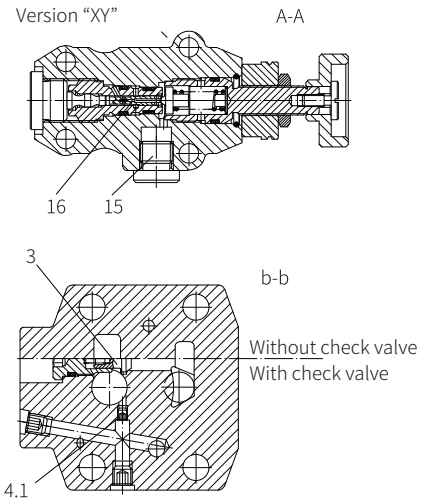


Version "...", "X" and "Y"

Function description, sectional drawing

Preload valve model DZ...-5XJ/..Y...(Control lines 4.1, 12, and 14 or 15 open; control lines 4.2 and 13 closed)
In principle, the function of this valve is same as model DZ... -5XJ/...
But for model DZ...5XJ...Y, the leakage at the pilot valve (5) must be drained to tank without pressure via control line (14) or (15), the pilot oil flows into port B via control line (12).
Preload valve model DZ...-5XJ/..XY...(Control lines 4.2, 14 or 15 open; control lines 4.1, 12 and 13 closed)

The pressure in port X acts on control piston (5) of pilot valve (2) via control line (4.2). At same time, the pressure in port A acts on spring chamber of main spool(7) via throttle (6). When the pressure in port X exceeds the setting value of the spring (8), the control piston (5) is moved against the spring (8), the fluid flows from spring chamber of main spool (7) to spring chamber (17) of pilot valve (2) via orifice (9) and hole (16). The pressure in spring chamber of main spool (7) decreases. Thus, the fluid can flow from port A to port B with minimum pressure lose. The control oil in spring chamber (17) should be drained to tank without pressure via control line (14) or (15). An optional check valve (3) can be installed to allow the fluid flow freely from port B to port A.



Models and specifications

DZ [ ] [ ] [ ] 5X J [ ] [ ] [ ] [*]

pilot valve =No code
pilot valve without main spool insert =C (no mark for size)
pilot valve with main spool insert =C (mark for size 30)

size 10 =10
size 20 =20
size 30 =30

adjusting element
rotary knob =1
adjusting screw with protective cap =2
lockable rotary knob with scale =3
rotary knob with scale =7

50 to 59 series =5X
(50 to 59 series installation and connection size unchanged)

Rekith =J

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

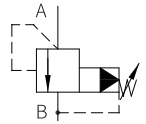
No code= with check valve
M= without check valve

pilot oil supply
No code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

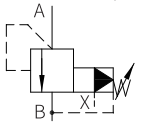
50= setting pressure up to 50 bar
100= setting pressure up to 100 bar
200= setting pressure up to 200 bar
315= setting pressure up to 315 bar

Functional symbols

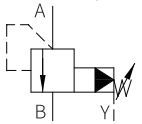
Model DZ...-5XJ/...M...
Model DZC...-5XJ/...M...



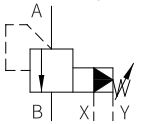
Model DZ...-5XJ/...XM...



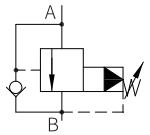
Model DZ...-5XJ/...YM...



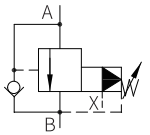
Model DZ...-5XJ/...XYM...
Model DZC...-5XJ/...XYM...



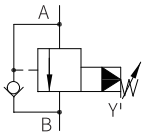
Model DZ...-5XJ/...



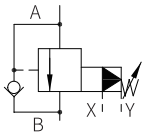
Model DZ...-5XJ/...X



Model DZ...-5XJ/...Y



Model DZ...-5XJ/...XY



Technical parameters

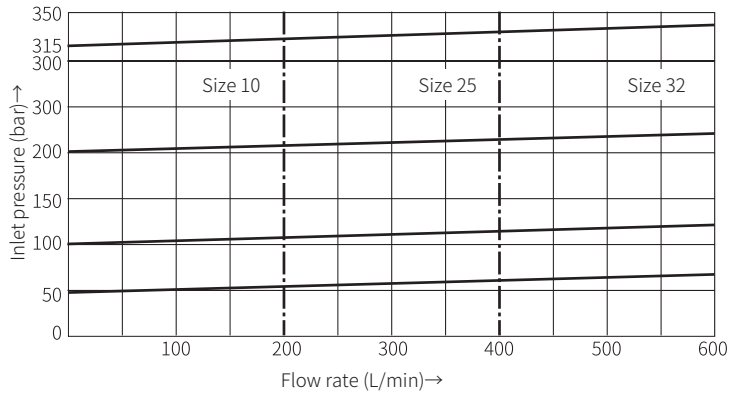
Installation position			Optional		
Environment temperature range		°C	-30 to +50 (NBR seal)		
			-20 to +50 (FKM seal)		
Weight	Size		10	25	32
	DZ...	kg	3.4	5.3	8.0
	DZC...	kg	1.2		
	DZC30...	kg	1.5		
Hydraulic					
Maximum working pressure	port A, B, X	bar	315		
Maximum backpressure	port T	bar	315		
Setting pressure	Minimum	bar	flow-related (see characteristic curve)		
	Maximum	bar	50; 100; 200; 315		
Maximum flow	Size		10	25	32
		L/min	200	400	600
Medium			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]		
Hydraulic oil temperature range		°C	-30 to +80 (NBR seal)		
		°C	-20 to +80 (FKM seal)		
Viscosity range		mm^2/s	10 to 800		
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effective oil filtration can prevent failure and increase the service life of the components.

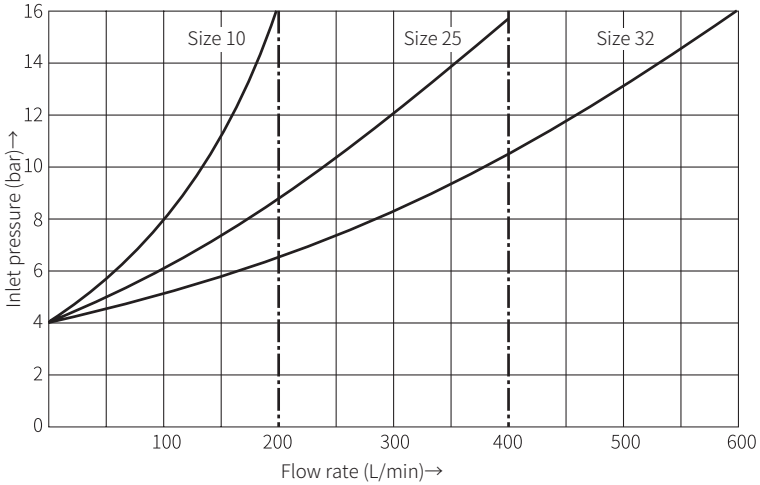
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Inlet pressure in relation to flow (A→B)



Minimum inlet pressure in relation to flow(A→B) (= bypass pressure , version "...X...")

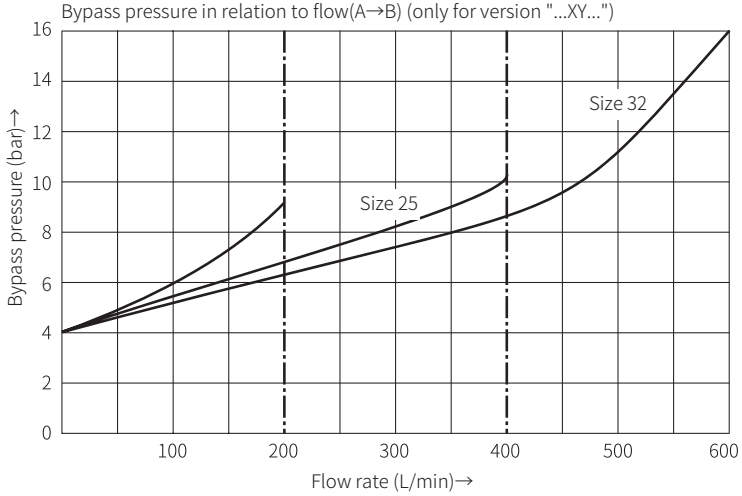


The curves are valid for outlet pressure PB=0 over the entire flow range.

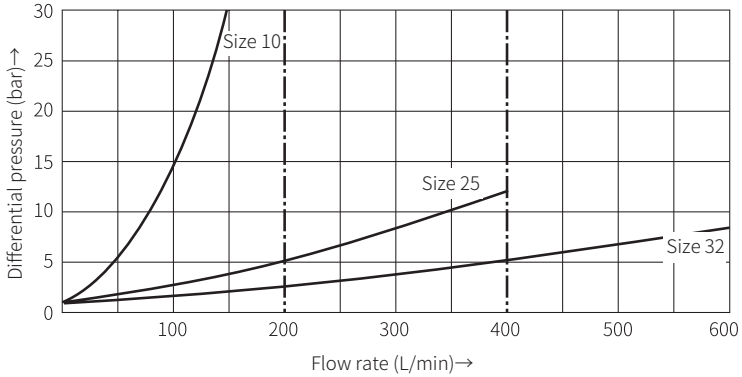
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Bypass pressure in relation to flow(A→B) (only for version "...XY...")



△P-q_v-characteristic curves via check valve (B→A)

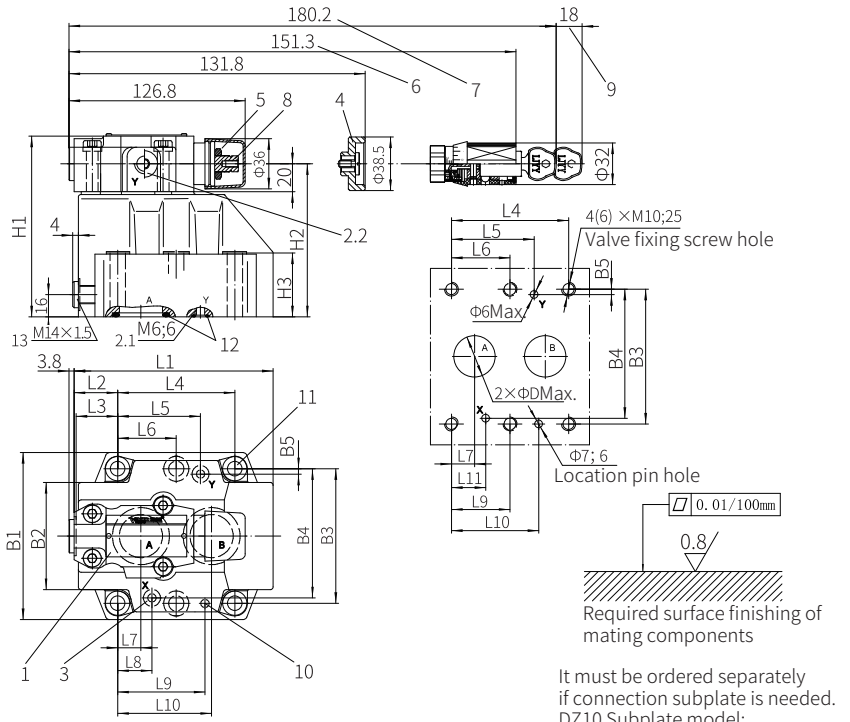


The curves are valid for outlet pressure PB=0 over the entire flow range.

Component size

Size unit: mm

Subplate mounting valve, type DZ...5XJ...



1 Name plate
2.1 Port Y for control oil drain external
2.2 Port Y for control oil drain external (G1/4 or M14x1.5 optional)
3 Port X(for supply external)
4 Adjustment form "1"
5 Adjustment form "2"
6 Adjustment form "3"
7 Adjustment form "7"
8 Hexagon S=10
9 Space required to remove the key
10 Location pin hole
11 Valve fixing screw hole
4 pcs (DR10, DR20)
6 pcs (DR30)
12 O ring
13 Pressure relay connection

It must be ordered separately if connection subplate is needed.
DZ10 Subplate model:
G460/01(G3/8"); G460/02(M18x1.5)
G461/01(G1/2"); G461/02(M22x1.5)
DZ20 Subplate model:
G412/01(G3/4"); G412/02(M27x2)
G413/01(G1"); G413/02(M33x2)
DZ30 Subplate model:
G414/01(G11/4"); G414/02(M42x2)
G415/01(G11/2"); G415/02(M48x2)
Valve fixing screw
DZ10: M10x50 DZ20: M10x60
DZ30: M10x70
10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

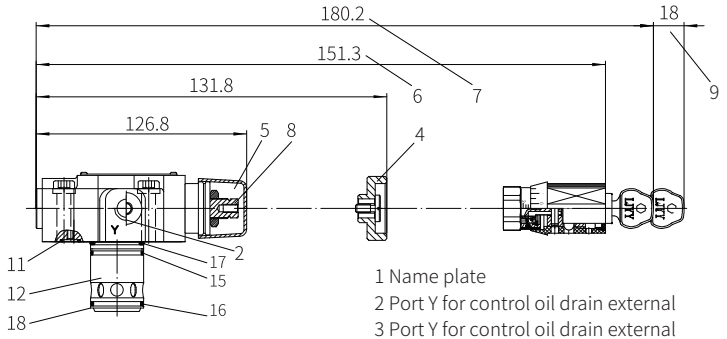
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	B1
10	98.8	34.6	33.1	42.9	21.5	-	7.2	21.5	31.8	35.8	21.5	85
20	117.8	36.9	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	20.6	102
30	143	31.3	29.8	84.2	59.5	42.1	16.7	24.6	62.7	67.5	24.6	120

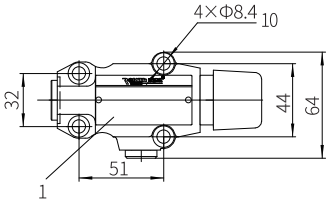
Size	B2	B3	B4	B5	H1	H2	H3	D
10	50	66.7	58.8	7.9	112	92	26	13
20	60	79.4	73	6.4	122	102	36	22
30	77	96.8	92.8	3.8	130	110	46	30

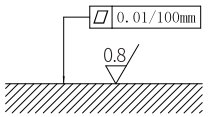
Component size

Size unit: mm

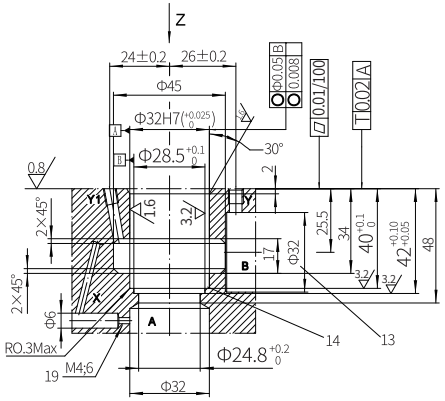
With (DZC10 or 30) or without DZC



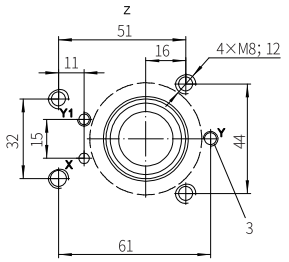




Required surface finishing of mating components



1 Name plate
2 Port Y for control oil drain external
3 Port Y for control oil drain external (G1/4 or M14x1.5 optional)
4 Adjustment form "1"
5 Adjustment form "2"
6 Adjustment form "3"
7 Adjustment form "7"
8 Hexagon S=10
9 Space required to remove the key
10 Valve fixing screw hole
11 O ring 9.25x1.78
12 Main valve insert
13 The ∅32 hole can intersect ∅45 hole at any position. Be careful not to damage oil port X and fixing holes
14 The retainer ring and O-ring should be installed in this hole before installing main spool.
15 O ring 28x1.8
16 O ring 28x2.65
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8
19 Without this hole when used as a bypass valve



Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

Pilot Operated Unloading Pressure Relief Valve

Model: DA/DAW...3XJ

- Size 10, 25, 32
- Maximum working pressure 315 bar
- Maximum flow rate 250 L/min

Contents

Function description, sectional drawing	02-03
Functional symbols	03
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Component size	07-08
Application example	09

Features

- For subplate mounting
- 3 adjusting elements
  Rotary knob
  Hexagon screw with sleeve and protective cap
  Lockable rotary knob with scale
- 3 pressure ranges
- Solenoid operated unloading by a built-on directional valve

Function description, sectional drawing

The DA/DAW pressure control valve is pilot operated pressure shut-off valve. It is used to switch the pump flow to pressureless bypass when the accumulator loading pressure is reached. The other applications of the valve is in high/low pressure pump system. In this application, the low pressure pump is switched to pressureless bypass when the pressure reaches the high pressure setting value.

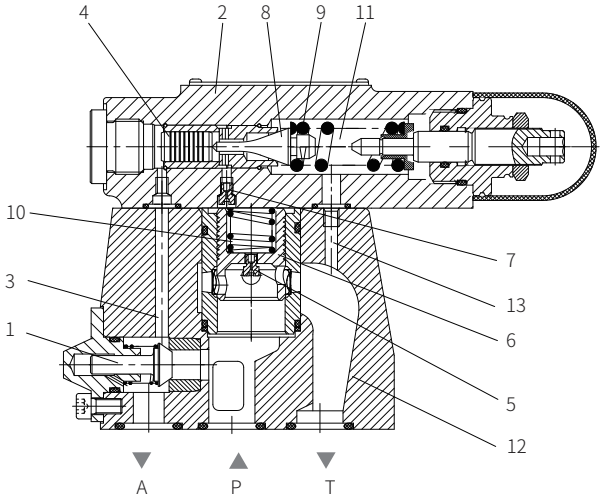
The valve is composed of main valve (12) with main spool assembly (6), pilot valve (2) with pressure adjusting element and check valve (1). For size 10 valve, the check valve (1) is installed in the main valve (12). For size 25 and 32, the check valve (1) is built into a separate subplate installed under the main valve (12).

Pressure shut-off valve mode DA

Diverting the pump flow from P to A - P to T.

The pump supply oil for hydraulic system (P to A) via check valve (1). The pressure in port A acts on pilot valve spool (4) via control line (3). At same time, pressure in port P passes to the spring chamber of main spool (6) and conical spool(8) of pilot valve (2) via orifices (5) and (7). The conical spool lifts off its valve seat against the spring (9) when the setting cut-off pressure of hydraulic system is reached. The fluid flows into spring chamber (11) via orifices (5) and (7), or the fluid returns to tank external via control line (13) in model DA...3XJ...Y.

Due to orifices (5) and (7), there is pressure drop in the main spool (6). Then the main valve spool (6) lifts off its seat and opens the connection from P to T. And the check valve (1) closes the connection from A to P. Now the poppet valve (8) is kept opening by the system pressure via pilot valve spool (4).



Model DA10-1-3XJ/

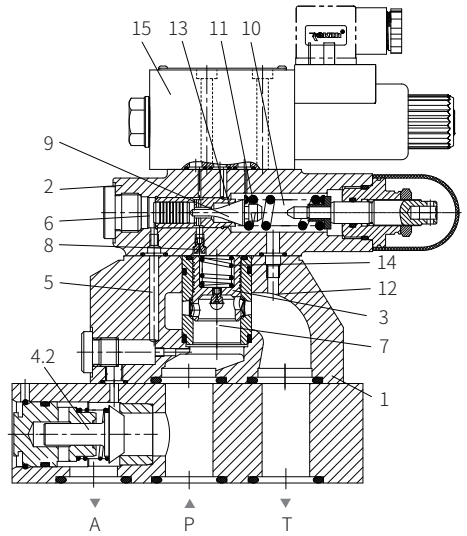
Function description, sectional drawing

Diverting the pump flow from P to T - P to A.

The area of the pilot valve spool (6) is 17% greater than the effective area of the conical spool (9), thus the effective force on the pilot valve spool (6) is 17% greater than the effective force on the conical spool (9). When the actuator pressure drop to equal the cut-off pressure of the valve that corresponds to the switching pressure differential, the spring (11) pushes the poppet valve (9) on to its seat. The pressure is built up on the spring loaded side of the main spool (3). In conjunction with spring (14), the main spool(3) is closed and the connection from port P to T is isolated. The pump flow passes again via the check valve (4) into the hydraulic system (P to A).

Pressure shut-off valve model DAW

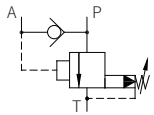
The function of this valve is basically the same as the DA valve but a solenoid valve (15) is installed on the pilot valve. The switch from P to A or P to T can be achieved under the set pressure by the pilot valve.



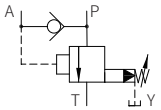
Model DAW20-1-3XJ/

Functional symbols

Model DA...-3XJ/...

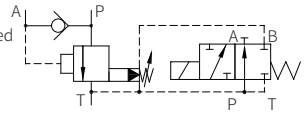


Model DA...-3XJ/...Y...



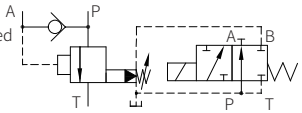
Model DAW...A...-3XJ/...

Normally closed



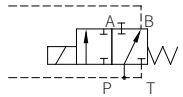
Model DAW...A...-3XJ/...Y...

Normally closed



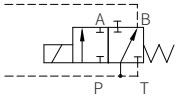
Model DAW...B...-3XJ/...

Normally open

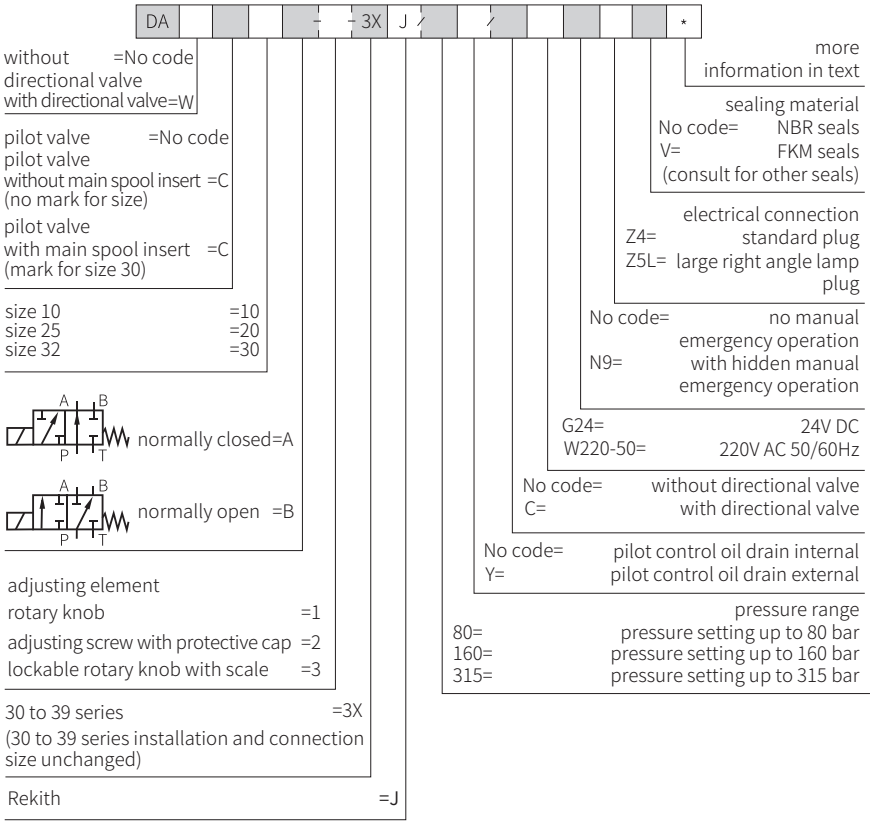


Model DAW...B...-3XJ/...Y...

Normally open



Models and specifications



Technical parameters

Size			Size 10	Size 25	Size 32
Weight	DA	kg	3.8	7.7	13.4
	DAW	kg	4.9	8.8	14.5
	DAC	kg	1.2		
	DAWC	kg	2.4		
	DAC30	kg	1.5		
	DAWC30	kg	2.7		
Installation position			Optional		
Hydraulic					
Maximum working pressure	Oil port P	bar	315		
	Oil port A	bar	315(after switching from P to T)		
Hydraulic oil			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]		
Oil temperature range		°C	-30 to +80 (NBR seal)		
		°C	-20 to +80 (FKM seal)		
Viscosity range		mm^2/s	10 to 800		
Maximum flow		L/min	40	100	250
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		
Maximum setting pressure		bar	80; 160; 315		

1) For NBR seal and FKM seal.

2) Only for FKM seal.

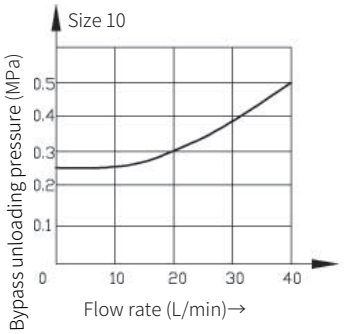
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

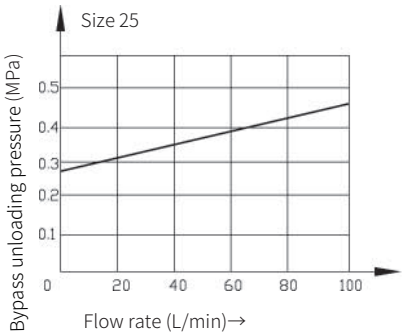
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Bypass pressure in relation to the pump flow q_{vp}(P→T)

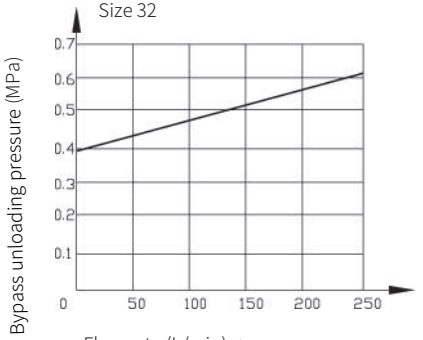
Size 10



Size 25

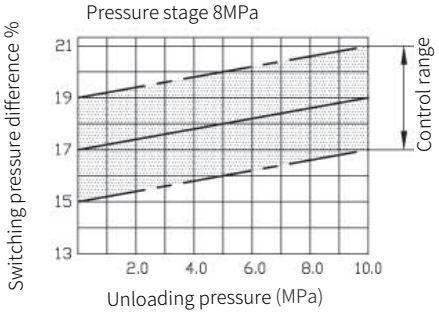


Size 32

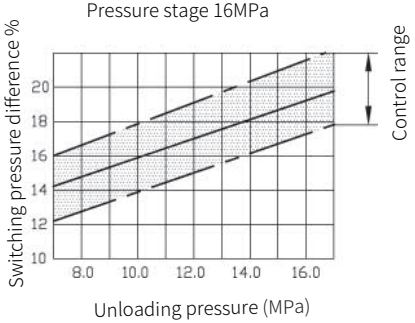


Switching pressure difference in relation to the unloading pressure (P→A)

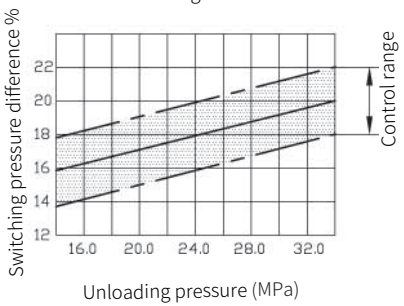
Pressure stage 8MPa



Pressure stage 16MPa



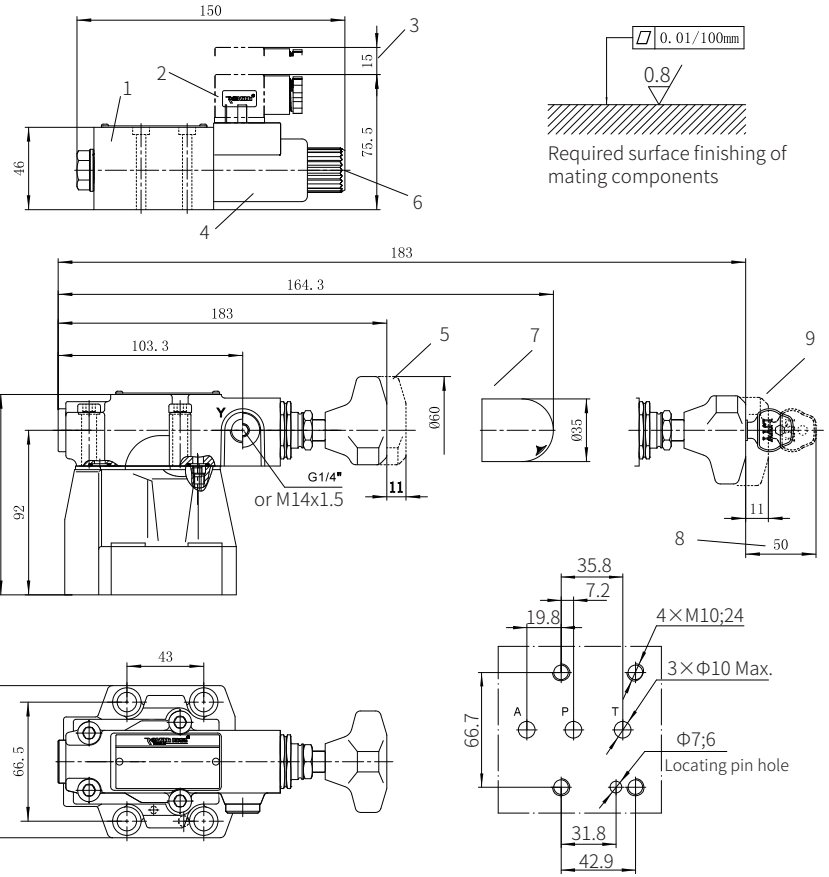
Pressure stage 31.5MPa



Component size

Size unit: mm

Model DA/DAW10...-3XJ/...



Required surface finishing of mating components

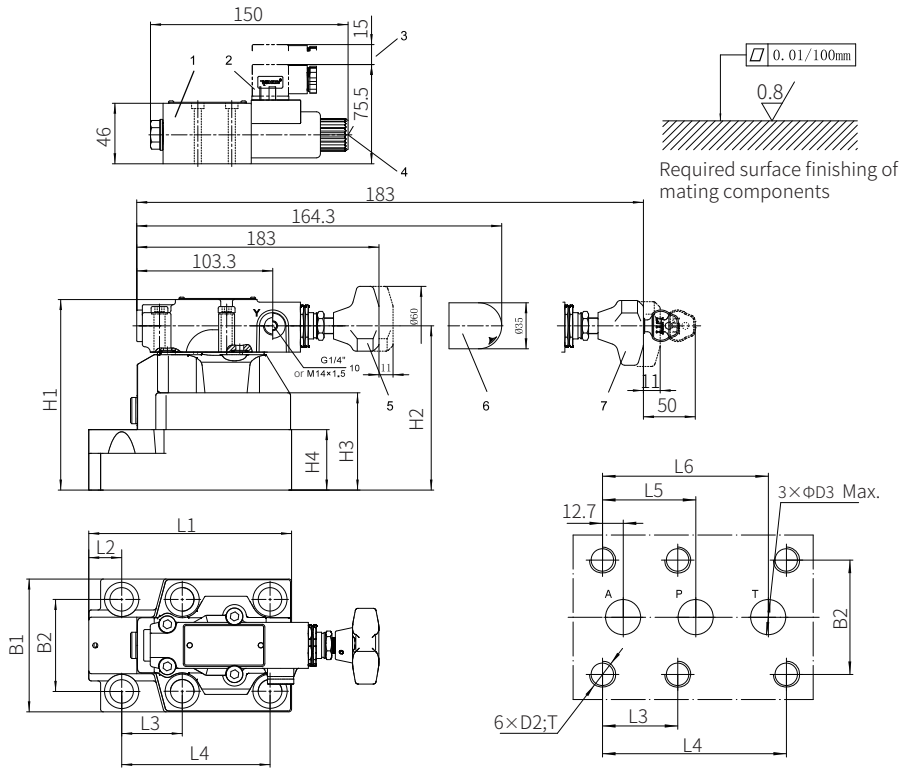
Valve fixing screw
M10x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
It must be ordered separately
if connection subplate is needed.
Subplate model:
G467/01; G467/02
G468/01; G468/02

1 Solenoid pilot valve
2 Plug
3 Space required to remove the plug
4 Solenoid
5 Adjustment form "1"
6 Hidden emergency operation
7 Adjustment form "2"
8 Space required to remove the key
9 Adjustment form "3"

Component size

Size unit: mm

Model DA/DAW20...-3XJ/...and DA/DAW30...-3XJ/...



Size	L1	L2	L3	L4	L5	L6	H1	H2	H3
25	162	25	46	112.7	57.1	101.6	144	124	72
32	198.7	41.5	50.8	139.7	63.5	127	165	145	93

Size	H4	B1	B2	D1	D2	D3	T
25	46	101	69.9	18	M16	22	34
32	67	116	82.5	20	M18	30	37

1 Solenoid pilot valve
2 Plug
3 Space required to remove the key
4 Hidden emergency operation
5 Adjustment form "1"
6 Adjustment form "2"
7 Adjustment form "3"

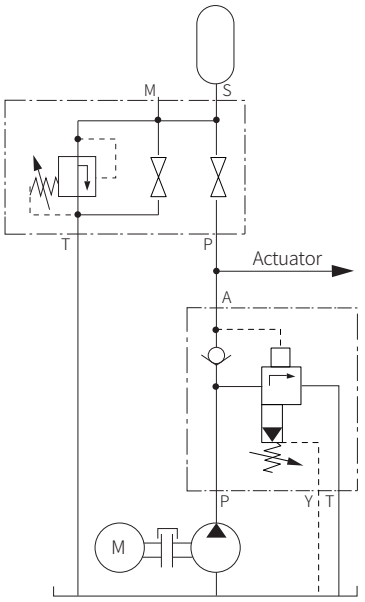
It must be ordered separately if connection subplate is needed.
Subplate model:
NG25: G469/01; G469/02; G470/01; G470/02
NG32: G471/01; G471/02; G472/01; G472/02

Valve fixing screw
NG25:
4xM16x100-10.9 grade
2xM16x60-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm

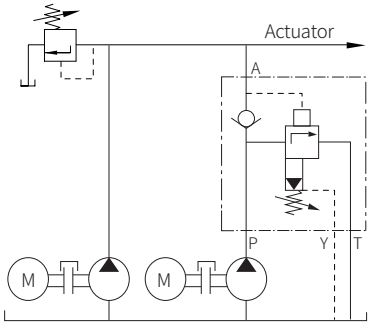
NG32:
4xM18x120-10.9 grade
2xM18x80-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

Application example

Hydraulic system with accumulator:
installation notes:
- The connection resistance between DA valve and accumulator must be as low as possible
The pilot valve of DA is separately connected to the accumulator when the resistance is high.



Hydraulic system with high and low pressure pump:
With high pump flow and small switching pressure differential values (10 %), "Y" version valves should preferably be used.



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Pilot Operated Unloading Pressure Relief Valve

Model: DA/DAW...5XJ

- Size 10, 25, 32
- Maximum working pressure 315 bar
- Maximum flow rate 240 L/min

Contents

Function description, sectional drawing	02-03
Functional symbols	03
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Component size	07-09
Application example	10

Features

- For subplate mounting
- For manifolds mounting
- 4 adjusting elements
  - Rotary knob
  - Adjusting screw with protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- 4 pressure ranges
- Solenoid operated unloading by a built-on directional valve

Function description, sectional drawing

The DA/DAW pressure control valve is pilot operated pressure shut-off valve. It is used to switch the pump flow to pressureless bypass when the accumulator loading pressure is reached. The other applications of the valve is in high/low pressure pump system. In this application, the low pressure pump is switched to pressureless bypass when the pressure reaches the high pressure setting value.

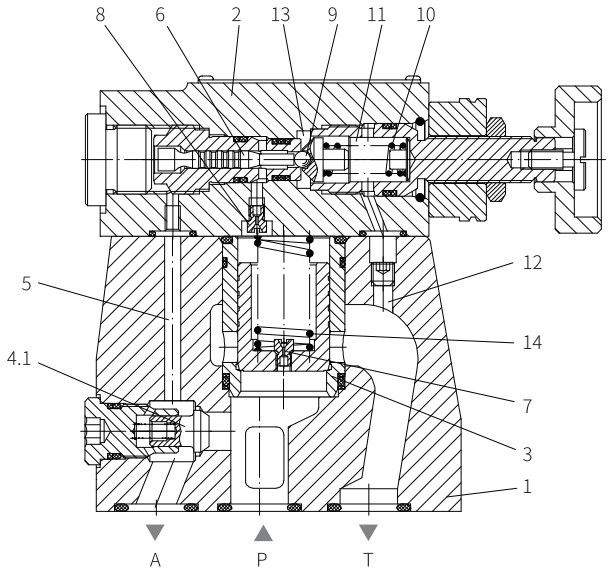
The valve is composed of main valve (1) with main spool assembly (3), pilot valve (2) with pressure adjusting element and check valve (4). For size 10 valve, the check valve (4.1) is installed in main valve (1). For size 25 and 32, the check valve (4.2) is built into a separate subplate installed under the main valve (1).

Pressure shut-off valve model DA

Diverting the pump flow from P to A - P to T

The pump supply oil for hydraulic system (P to A) via check valve (4.1). The pressure in port A acts on pilot valve spool (6) via control line (5). At same time, pressure in port P passes to the spring chamber of main spool (3) and conical spool (9) of pilot valve (2) via orifices (7) and (8). The conical spool lifts its valve seat against the spring force(10) when the setting cut-off pressure of the hydraulic system is reached. The fluid flows into spring chamber (11) via orifices (7) and (8), or the fluid returns to tank external via control line (12) in model DA...5XJ...Y.

Due to orifices (7) and (8), there is pressure drop in the main spool (3). The main spool (3) lifts off its seat and opens the connection from P to T. And the check valve (4) closes the connection from A to P. Now the poppet valve (9) is kept opening by the system pressure via pilot valve spool (6).



Model DA10-1-5XJ/

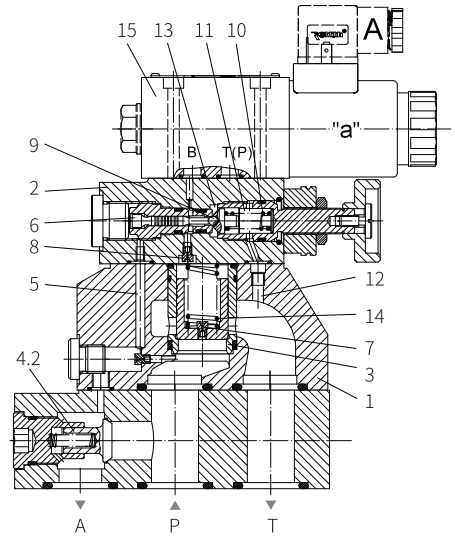
Function description, sectional drawing

Diverting the pump flow from P to T - P to A

The area of the pilot spool (6) is 10% or 17% greater than the effective area of the conical spool (9), thus the effective force on the pilot valve spool (6) is 10% or 17% greater than the effective force on the conical spool (9). When the actuator pressure drop to equal the cut-off pressure of the valve that corresponds to the switching pressure differential, the spring (10) pushes the poppet valve(9) on to its seat. The pressure is built up on the spring loaded side of the main spool (3). In conjunction with spring (14), the main spool (3) is closed and the connection from port P to T is isolated. The pump flow passes again via the check valve (4) into the hydraulic system (P to A).

Pressure shut-off valve model DAW

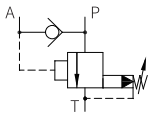
The function of this valve is basically the same as the DA valve. But a solenoid directional valve (15) can switch the setting shut-off pressure of the pilot valve (2) either from P to A or from P to T.



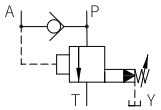
Model DAW20-1-5XJ/

Functional symbols

Model DA...-5XJ/...

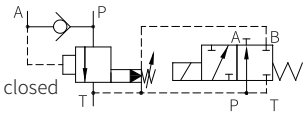


Model DA...-5XJ/...Y...



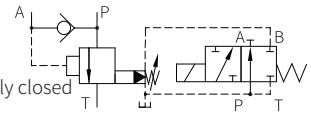
Model DAW...-5XJ/...

Normally closed



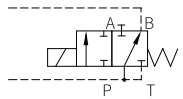
Model DAW...A...-5XJ/...Y...

Normally closed



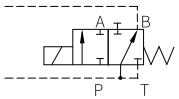
Model DAW...B...-5XJ/...

Normally open

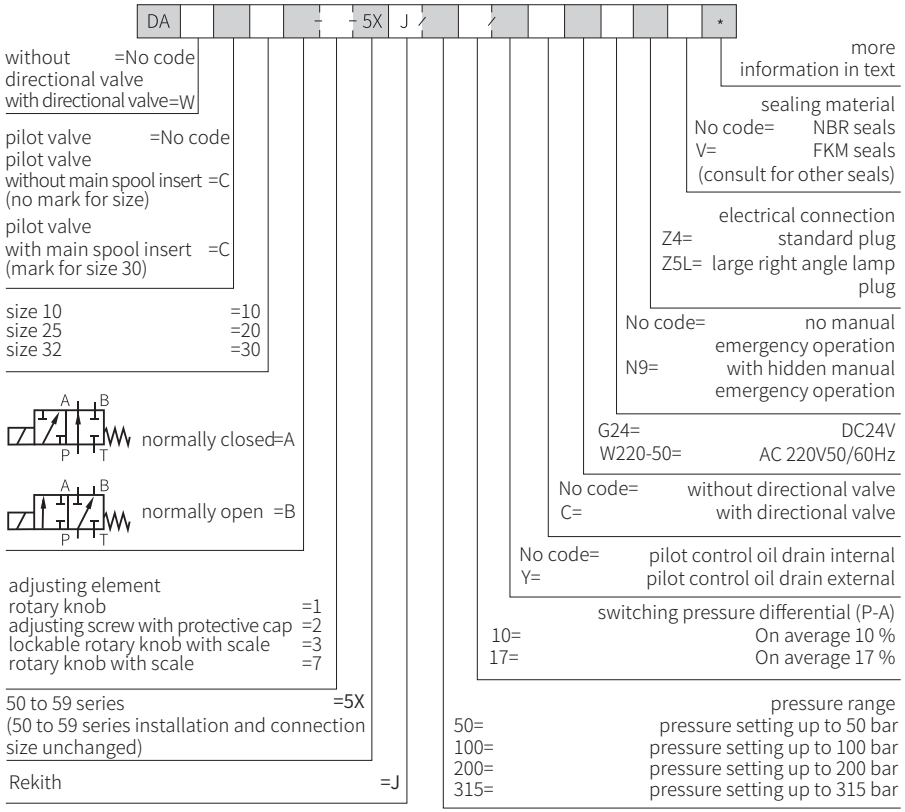


Model DAW...B...-5XJ/...Y...

Normally open



Models and specifications



02

Technical parameters

Size			Size 10	Size 25	Size 32
Weight	DA	kg	3.8	7.7	13.5
	DAW	kg	5.3	9.2	15
	DAC	kg	1.2		
	DAWC	kg	2.4		
	DAC30	kg	1.5		
	DAWC30	kg	2.7		
Installation position			Optional		
Hydraulic					
Maximum working pressure	Oil port P	bar	315		
	Oil port A	bar	315(after switching from P to T)		
Hydraulic oil			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]		
Oil temperature range		°C	-30 to +80 (NBR seal)		
		°C	-20 to +80 (FKM seal)		
Viscosity range		mm^2/s	10 to 800		
Maximum flow	Type 10%	L/min	40	80	120
	Type 17%	L/min	60	120	240
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		
Maximum setting pressure		bar	50；100；200；315		

1) For NBR seal and FKM seal.

2) Only for FKM seal.

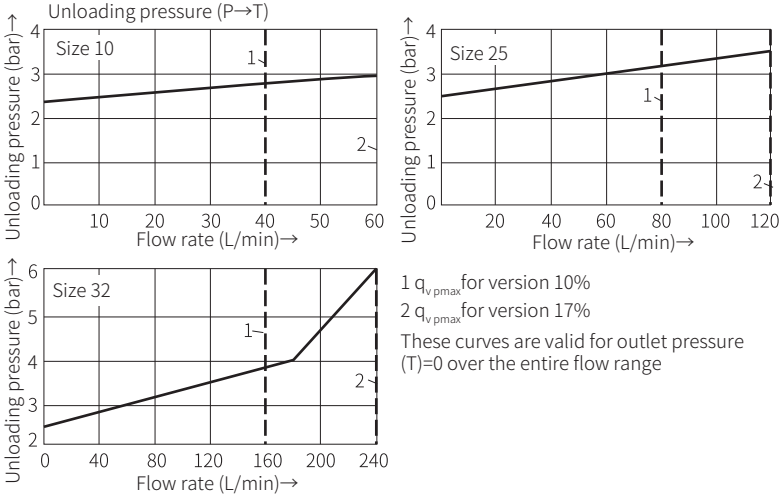
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

02

Characteristic curve

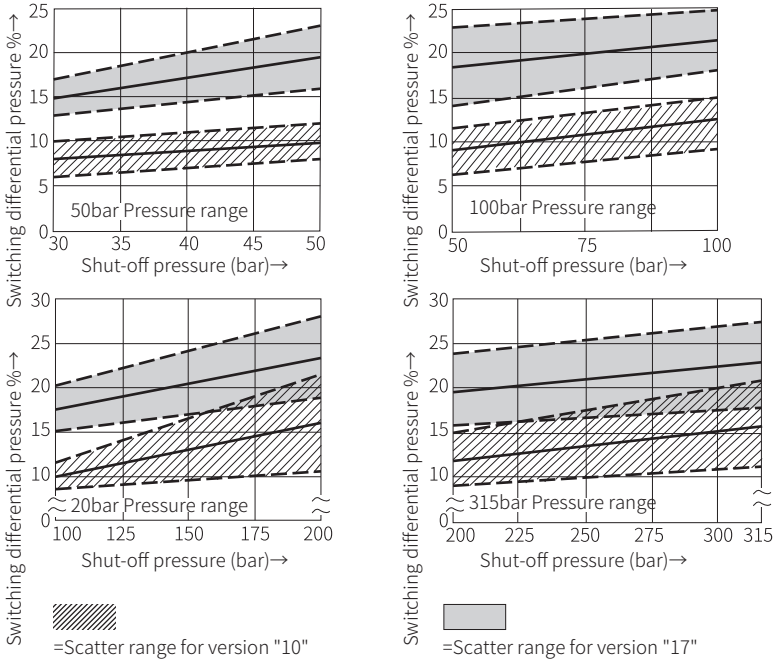
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Unloading pressure (P→T)



1 $q_{v\,pmax}$ for version 10%
2 $q_{v\,pmax}$ for version 17%
These curves are valid for outlet pressure (T)=0 over the entire flow range

Switching differential pressure in relation to shut-off pressure (P→A)



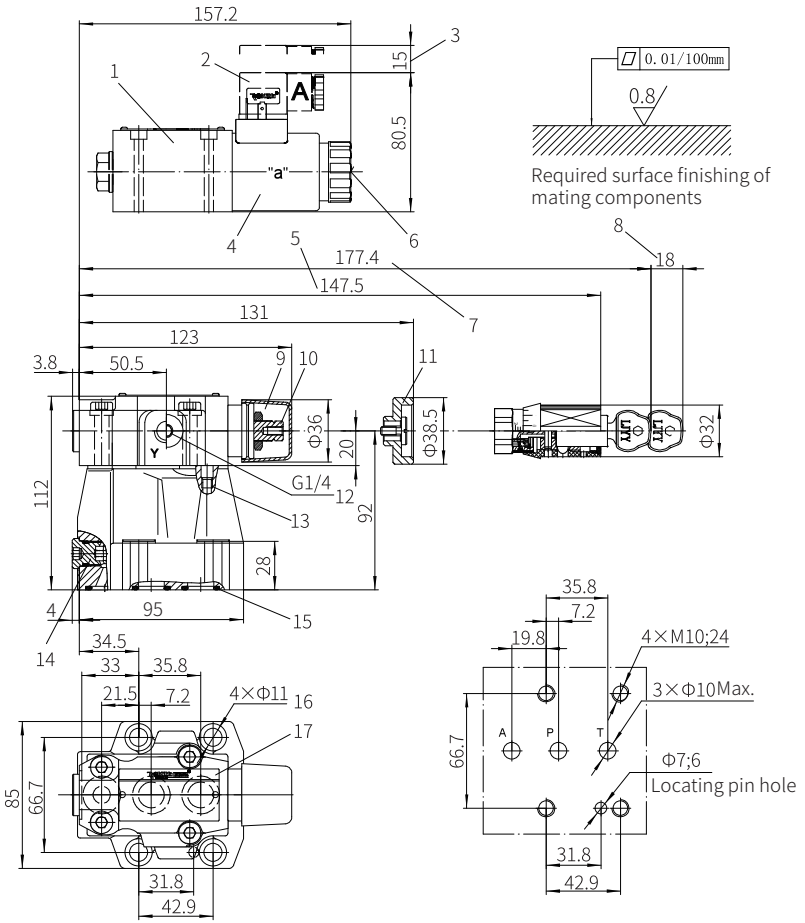
=Scatter range for version "10"

=Scatter range for version "17"

Component size

Size unit: mm

Model DA10/DAW10...-5XJ/...



Valve fixing screw
M10x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm

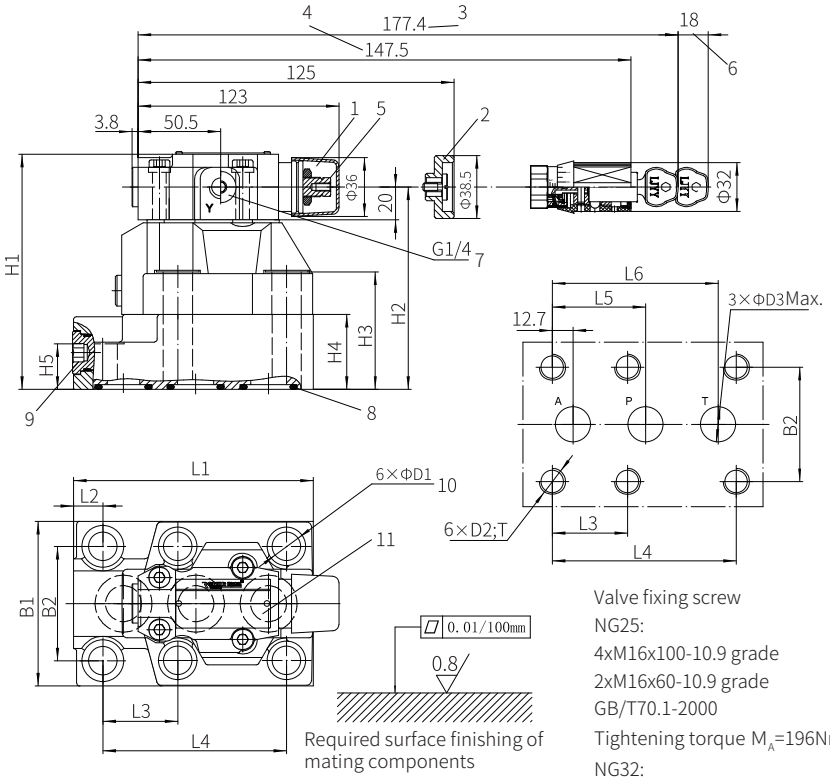
It must be ordered separately if connection subplate is needed.
Subplate model:
G467/01; G467/02
G468/01; G468/02

1 Solenoid pilot valve
2 Plug
3 Space required to remove the plug
4 Solenoid
5 Adjustment form "7"
6 Hidden emergency operation
7 Adjustment form "5"
8 Space required to remove the key
9 Adjustment form "2"
10 Hexagon S=10
11 Adjustment form "1"
12 Port Y for control oil drain external
13 Omitted with internal pilot oil drain
14 Built-in check valve
15 O ring 17.12x2.62
16 Valve fixing screw hole
17 Name plate

Component size

Size unit: mm

Model DA20...-5XJ/...and DA30...-5XJ/...



Required surface finishing of mating components

Size	L1	L2	L3	L4	L5	L6	H1	H2	H3
25	147	18	46	112.7	57.1	101.6	144	124	72
32	189.2	32	50.8	139.7	63.5	127	165	145	93
Size	H4	H5	B1	B2	D1	D2	D3	T	
25	46	28	101	69.9	18	M16	22	34	
32	67	45	116	82.5	20	M18	30	37	

It must be ordered separately
if connection subplate is needed.
Subplate model:
NG25: G469/01; G469/02; G470/01; G470/02
NG32: G471/01; G471/02; G472/02; G472/02

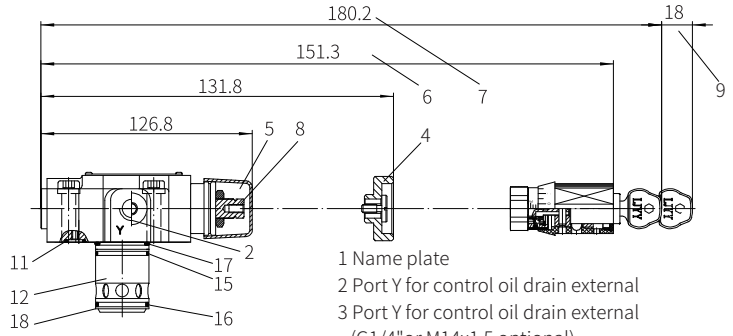
Valve fixing screw
NG25:
4xM16x100-10.9 grade
2xM16x60-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
4xM18x120-10.9 grade
2xM18x80-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

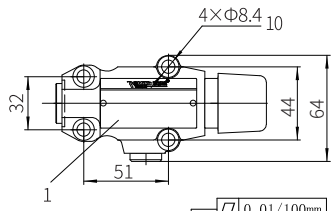
1 Adjustment form "1"
2 Adjustment form "2"
3 Adjustment form "5"
4 Adjustment form "7"
5 Hexagon S=10
6 Space required to remove the key
7 Port Y for control oil drain external
8 O ring
9 Built-in check valve
10 Valve fixing screw hole
11 Name plate

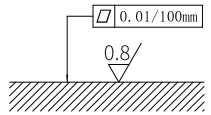
Component size

Size unit: mm

With (DAC30) or without (DAC)

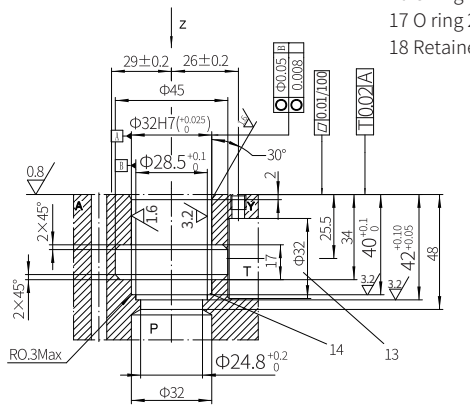


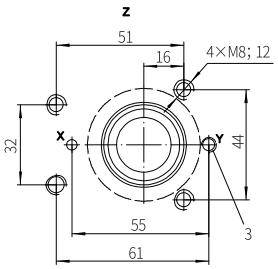




Required surface finishing of mating components

1 Name plate
2 Port Y for control oil drain external
3 Port Y for control oil drain external
(G1/4"or M14x1.5 optional)
4 Adjustment form "1"
5 Adjustment form "2"
6 Adjustment form "3"
7 Adjustment form "7"
8 Hexagon S=10
9 Space required to remove the key
10 Valve fixing screw hole
11 O ring 9.25x1.78
12 Main valve insert
13 The ∅32 hole can intersect ∅45 hole at any position
Be careful not to damage oil port X and fixing holes
14 The retainer ring and O-ring should be installed
in this hole before installing main spool.
15 O ring 28x1.8
16 O ring 28x2.65
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8

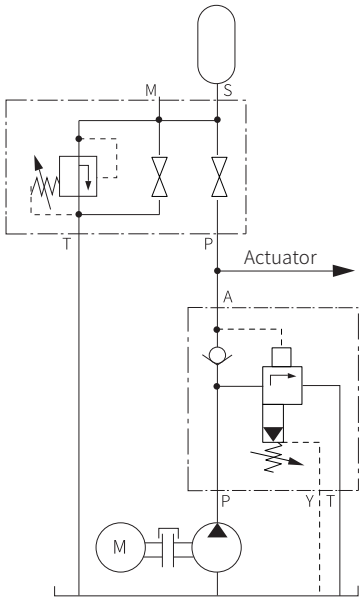




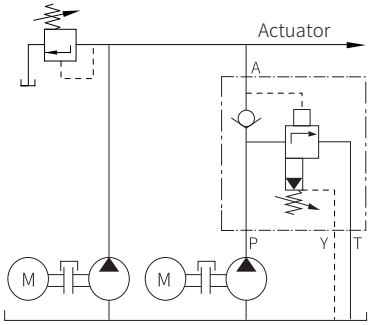
Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

Application example

Hydraulic system with accumulator:
installation notes:
-The connection resistance between DA valve and accumulator must be as low as possible
The pilot valve of DA is separately connected to the accumulator when the resistance is high.

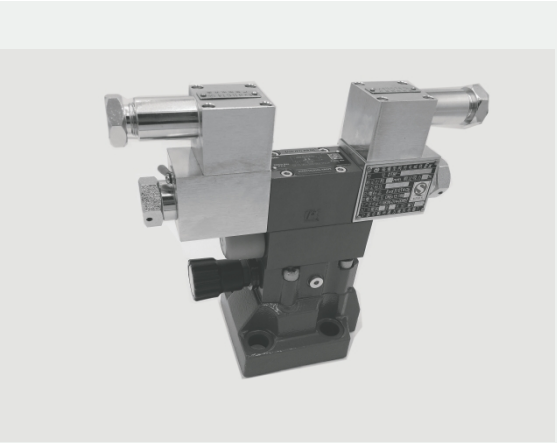


Hydraulic system with high and low pressure pump:
With high pump flow and small switching pressure differential values (10 %), "Y" version valves should preferably be used.



Explosion-proof Multistage Electro-hydraulic Pilot Relief Valve

Model: G-DB2U...-5XJ



- ◆ Size 10 to 32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum flow rate 600 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	05
Characteristic curve	05-06
Component size	07-09

Features

- ● Subplate mounting
- ● Threaded connection
- ● Cartridge connection
- ● Two-stage pressure setting
- ● Controlled by solenoid directional valve
- ● Pressure adjusting forms:

-Rotary knob
-Internal hexagon screw with protective cap
-Lockable rotary knob with scale.

Function description, sectional drawing

The G-DB2U...-5X/ valve is pilot controlled two-stage concentric type multistage relief valve (two-stage). The main valve and pilot valve are both seat valve. The valve is used to control the system pressure, and it may switch the system pressure to the secondary pressure by the solenoid directional valve.
G-DB2U valve mainly consists of main valve, 4/3-way(H type) or 4/2-way(D type) solenoid directional valve (size 6), and two pilot valves, the pilot valve (11) is a direct operated relief valve.

Model G-DB2U...H...-5XJ:

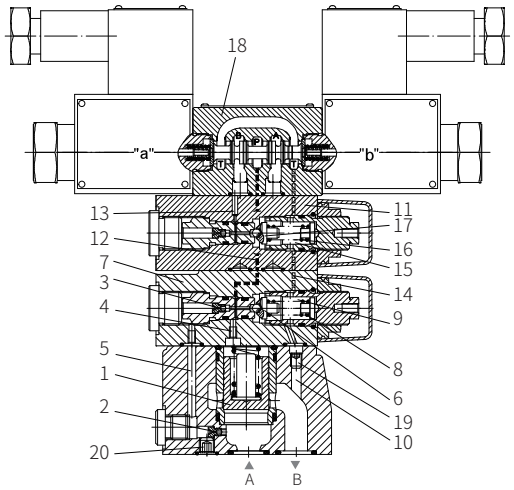
When the solenoid is de-energized, the fluid at port A of main valve acts on bottom of main spool (1), and via orifice (2), channel (5), orifice (3), channel (12), port P and T of pilot solenoid valve (18), spring chamber(15) of pilot valve (11), channel (14), spring chamber (9) of pilot valve (7), channel (10) back to tank (pilot oil drain internal), or via external outlet back to tank (pilot oil drain external). Thus, a differential pressure is formed on the main spool when the pressure oil flow through the orifices (2 and 3) and it opens the main spool to make the relief valve unloading.

When solenoid “b” is energized, the fluid of pilot solenoid valve (18) flows from P to A and B to T, at this time the pressure oil of the secondary pilot valve (11) via channel (13), port B and T of pilot solenoid valve, spring chamber (15), channel (14), spring chamber (9) and channel (10) back to tank, then the secondary pilot valve is unloading. The pressure oil of the pilot valve (7) acts on the valve spool (6) through orifice (3). When the system pressure exceeds the setting pressure of the spring (8), the valve spool (6) is opened, and the pressure oil at the upper end of the main spool flows back to the oil tank through channels (4 and 10) and spring chamber (9). In this way, a differential pressure is formed on the main spool and opens the main spool(1). The pressure oil flows from A to B at a set pressure as the primary pressure regulation.

When solenoid "a" is energized, it's a secondary pressure regulation under the same principle (note: the setting pressure of the secondary pilot valve should be less than the setting pressure of the primary pilot valve).

Model G-DB2U...D...-5XJ:

It is the primary pressure regulation when solenoid is de-energized, but the secondary pressure regulation when solenoid is energized. This valve doesn't have solenoid unloading function. The switch of different supply and drain modes can be achieved by assembling the conical plugs (19 and 20).



Model G-D-DB2U10-H-2-5XJ/

Models and specifications

DB | 2U | | | | | 5X | J | | | | | | *

explosion -proof class I =G1
explosion -proof class II =G2

pressure relief valve

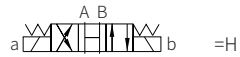
electro-hydraulic relief valve =No code
pilot valve with main valve spool assembly (plug-in) =C

two-staged pressure regulation

ordering code

size	subplate mounting	threaded connection
10	10	10(G1/2") or M22x1.5
15	–	15 (G3/4") or M27x2
20	20	20(G1") or M33x2
25	–	25(G1 1/4") or M42x2
32	30	30(G1 1/2") or M48x2

subplate mounting =No code
threaded connection =G



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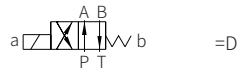


=D

adjusting element
rotary knob =1
internal hexagon screw with protective cap =2
lockable rotary knob with scale =3

50 to 59 series =5X
(50 to 59 series installation and connection size unchanged)

J= Rexroth

50= pressure setting up to 5MPa
100= pressure setting up to 10MPa
200= pressure setting up to 20MPa
315= pressure setting up to 31.5MPa
350= pressure setting up to 35MPa

No code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

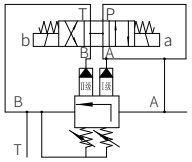
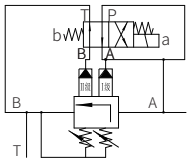
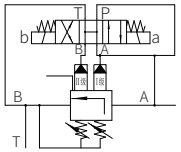
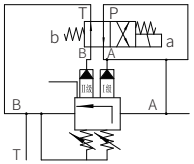
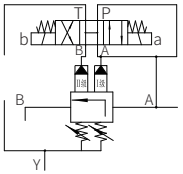
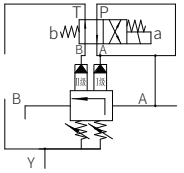
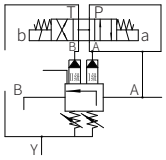
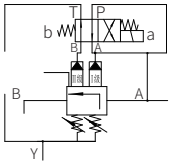
G24= 24V DC
B36= AC rectified 36V
B127= AC rectified 127V
B220= AC rectified 220V

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

* more information in text

Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Functional symbols

Supply and drain internal	DB2U...H.../... 	DB2U...D.../... 
Supply external and drain internal	DB2U...H.../...X 	DB2U...D.../...X 
Supply internal and drain external	DB2U...H.../...Y 	DB2U...D.../...Y 
Supply and drain external	DB2U...H.../...XY 	DB2U...D.../...XY 

Technical parameters

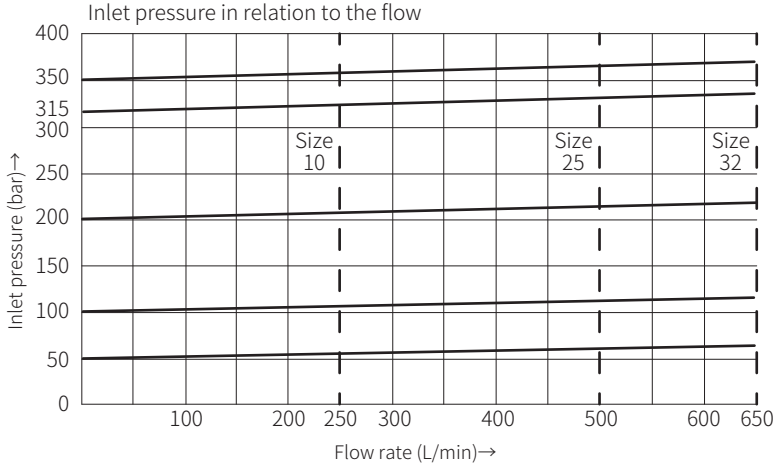
Size		10	15	20	25	30
Flow (L/min)	threaded connection valve	200		400		600
	subplate mounting valve	200	–	400	–	600
Working pressure MPa		Port A, B, X to 35				
Port Y back pressure MPa		to 31.5				
Minimum setting pressure MPa		Related to flow, see characteristic curve				
Maximum setting pressure MPa		35				
Medium		Mineral hydraulic oil or phosphate hydraulic oil				
Viscosity range mm^2/s		10 to 800				
Working medium temperature range °C		-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Solenoid valve characteristic		See G-4WE6 solenoid valve				

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The curve was measured at zero pressure for externally controlled oil leakage.
For internal control oil return, the pressure at port B is added to the command value.

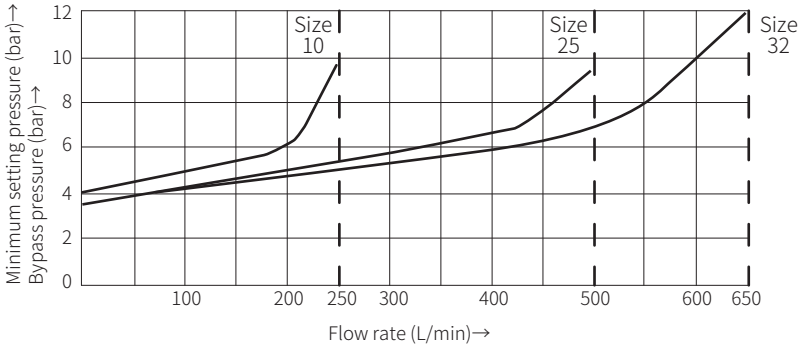
Inlet pressure in relation to the flow



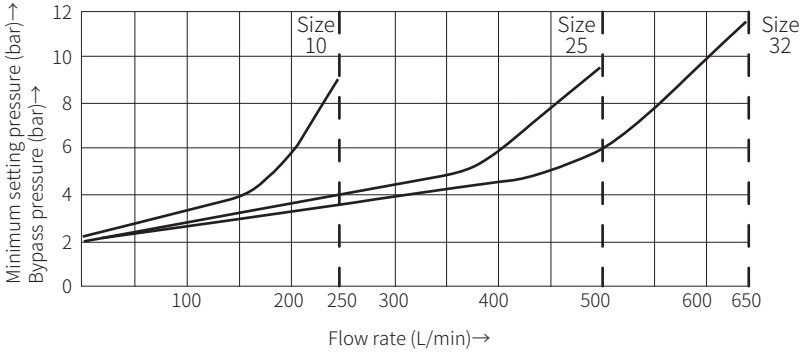
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Minimum setting pressure and bypass pressure in relation to the flow
- standard version



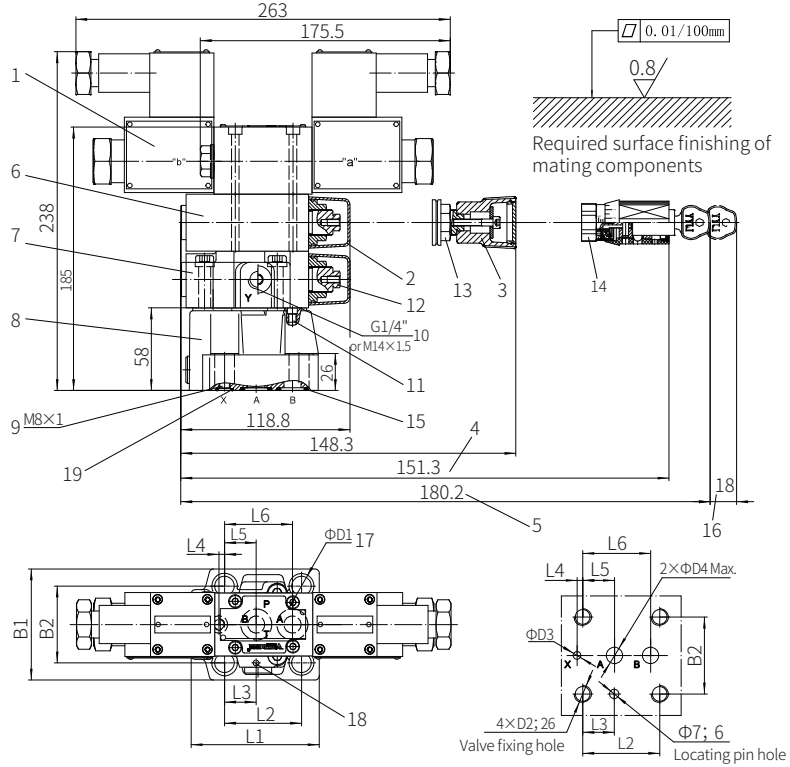
Minimum setting pressure and bypass pressure in relation to the flow
- "U" version



Component size

Size unit: mm

Subplate mounting valve model G-DB2U...-5XJ/...



Size	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

1 Solenoid directional valve
(type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain
(G1/4" and M14x1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 O ring 17.12x2.62(for port A, B)
16 Space required to remove the key
17 Valve fixing screw holes
18 Locating pin hole
19 O ring 9.25x1.78(for port X)

Valve fixing screw
NG10:
M12x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=95Nm
NG25:
M16x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
M18x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

It must be ordered separately if connection subplate is needed.

NG10 Subplate model:
G545/01 (G3/8") ; G545/02 (M18x1.5)
G546/01 (G1/2") ; G546/02 (M22x1.5)

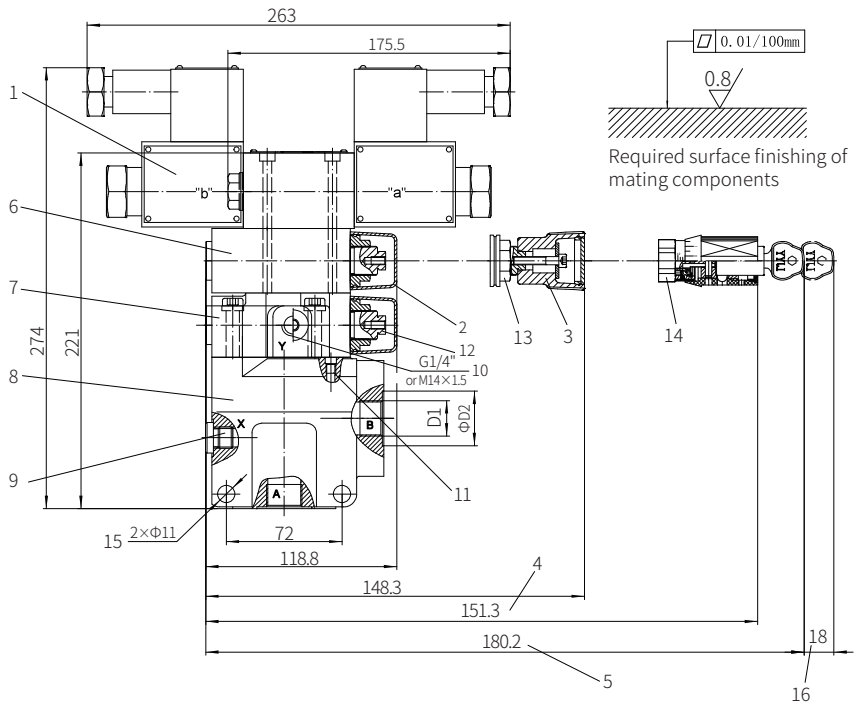
NG25 Subplate model:
G408/01 (G3/4") ; G408/02 (M27x2)
G409/01 (G1") ; G409/02 (M33x2)

NG32 Subplate model:
G410/01 (G11/4") ; G410/02 (M42x2)
G411/01 (G11/2") ; G411/02 (M48x2)

Component size

Size unit: mm

Threaded connection valve model G-DB2U...G...-5XJ/...



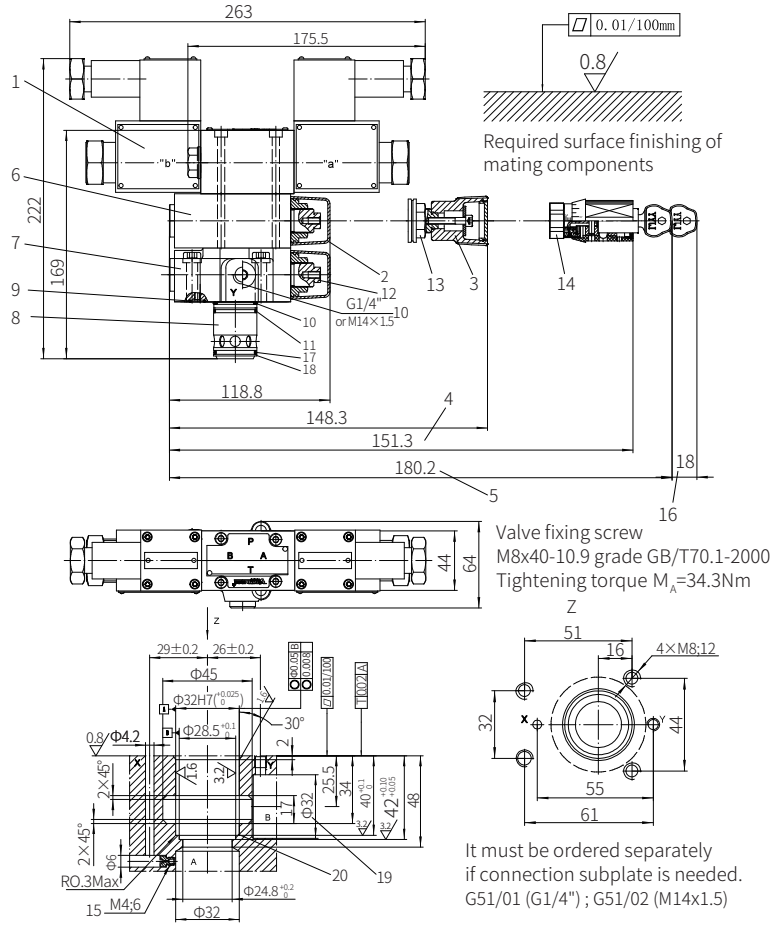
Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G11/4; M42x2	58	20
DB30G	G11/2; M48x2	65	22

1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and M14x1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Valve screw fixing holes
16 Space required to remove the key

Component size

Size unit: mm

With (G-DB2UC10 or 30) or without (G-DB2UC)



1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary pilot valve
7 Primary pilot valve
8 Main spool
9 O ring 9.25x1.78
10 O ring 28x2.65
11 O ring 28x1.8
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Throttle must be order separately
16 Space required to remove the key
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8
19 The Φ32 hole can intersect Φ45 hole at any position Be careful not to damage oil port X and fixing holes
20 The retainer ring and O-ring should be installed in this hole before install main spool position

02

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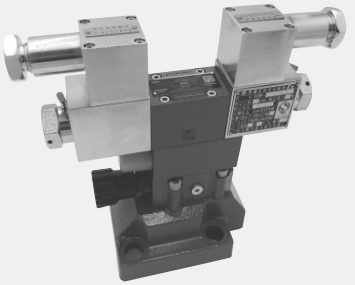
Explosion-proof Multistage Electro-hydraulic Pilot Relief Valve

Model: G-DB3U...-5XJ



- Size 10 to 30
- Maximum working pressure 350 bar
- Maximum flow rate 600 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	04
Characteristic curve	05
Component size	06-08

Features

- Subplate mounting
- Threaded connection
- Cartridge connection
- Two-stage or three-stage pressure setting
- Controlled by solenoid directional valve
- Pressure adjusting forms:

-Rotary knob
-Internal hexagon screw with protective cap
-Lockable rotary knob with scale

Function description, sectional drawing

The G-DB3U valve is a pilot controlled two-stage concentric type multistage relief valve (two or three stages).The main valve and pilot valve are both poppet valve structures. The valve is used to control the system pressure, and it may switch the system pressure to the tertiary or multistage pressure by the solenoid directional valve.

G-DB3U valve mainly consists of main valve, 43/-way or 4/2-way directional valve (size 6) and three pilot valves. The pilot valve I and II are direct operated relief valve.

When solenoid is de-energized, the pressure oil at port A is controlled by the pilot valve (7), it acts on bottom of main spool (1), and acts on the upper end of main spool and poppet valve (6) of pilot valve (7) via orifices (2 and 3) and channels (4 and 5). When the system pressure exceeds the setting pressure of the spring (8), the poppet valve (6) is opened, at the same time, the pressure oil at the upper end of the main spool flows back to the oil tank through the orifice (3), channel (5), spring chamber (9), and channel (10) (control oil drain internal type) or back to the oil tank through the external drain port (control oil drain external).

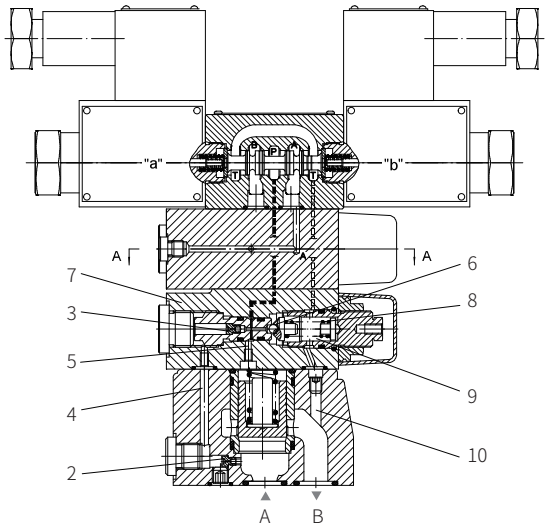
In this way, a differential pressure is formed on the main spool when the pressure oil flows through orifices(2 and 3) and it opens the main spool. The pressure oil flows from A to B at a set pressure.

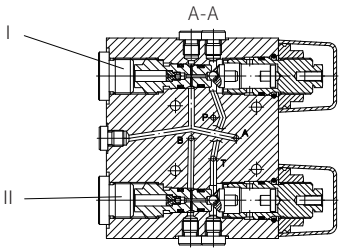
When solenoid “a” is energized, the pressure at port A is controlled by pilot valve II.

When solenoid “b” is energized, the pressure at port A is controlled by pilot valve I.

The setting pressure of pilot valve 7 must be higher than the setting pressure of pilot valves I and II.

There are four different models of control oil: supply and drain internal, supply internal and drain external, supply external and drain internal, supply and drain external. (See the symbols of control oil in details).





Model G-DB3U10-H-2-5XJ/

Models and specifications

DB – – 5X J – *

explosion -proof class I =G1
explosion -proof class II =G2

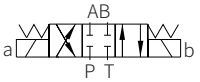
electro-hydraulic relief valve =No code

pilot valve with main valve spool assembly (plug-in) =C

three-staged pressure regulation

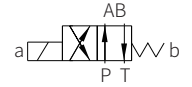
size	ordering code: subplate mounting	ordering code: threaded connection
10	10	10(G1/2") or M22x1.5
15	–	15 (G3/4") or M27x2
20	20	20(G1") or M33x2
25	–	25(G1 1/4") or M42x2
32	30	30(G1 1/2") or M48x2

subplate mounting =No code
threaded connection =G



=H

=E



=D

adjusting element
rotary knob =1
internal hexagon screw with protective cap =2
lockable rotary knob with scale =3

5X= 50 to 59 series
(50 to 59 series installation and connection size unchanged)

J= Rexroth

50= pressure setting up to 5MPa
100= pressure setting up to 10MPa
200= pressure setting up to 20MPa
315= pressure setting up to 31.5MPa
350= pressure setting up to 35MPa

No code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

G24= 24V DC
B36= AC rectified 36V
B220= AC rectified 220V
B127= AC rectified 127V

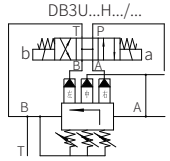
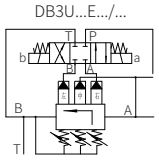
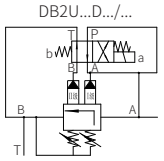
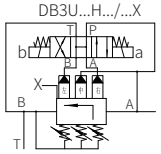
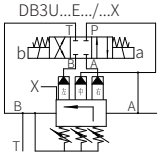
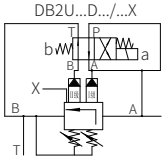
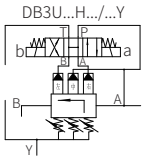
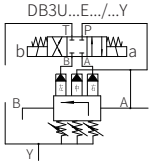
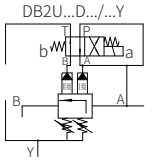
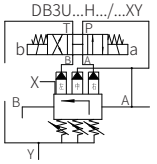
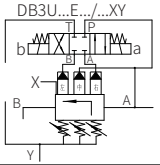
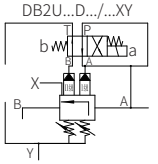
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Functional symbols

Supply and drain internal	DB3U...H.../...	DB3U...E.../...	DB2U...D.../...
Supply external and drain internal	DB3U...H.../...X	DB3U...E.../...X	DB2U...D.../...X
Supply internal and drain external	DB3U...H.../...Y	DB3U...E.../...Y	DB2U...D.../...Y
Supply and drain external	DB3U...H.../...XY	DB3U...E.../...XY	DB2U...D.../...XY

Technical parameters

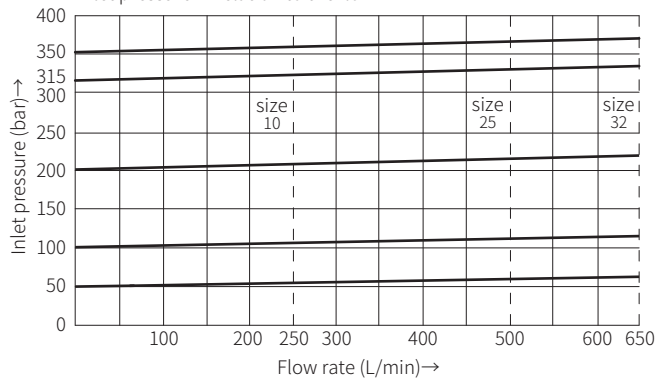
Size		10	15	20	25	30
Flow (L/min)	threaded connection valve	200		400		600
	subplate mounting valve	200	–	400	–	600
Working pressure MPa		Port A, B, X to 35				
Port Y back pressure MPa		to 31.5				
Minimum setting pressure MPa		Related to flow, see characteristic curve				
Maximum setting pressure MPa		35				
Medium		Mineral hydraulic oil or phosphate hydraulic oil				
Viscosity range mm²/s		10 to 800				
Working medium temperature range °C		-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Solenoid valve characteristic		See G-4WE6 solenoid valve				

Characteristic curve

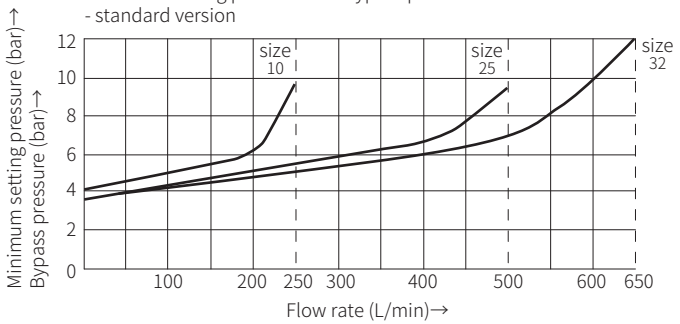
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The curve was measured at zero pressure for externally controlled oil leakage.
For internal control oil return, the pressure at port B is added to the command value.

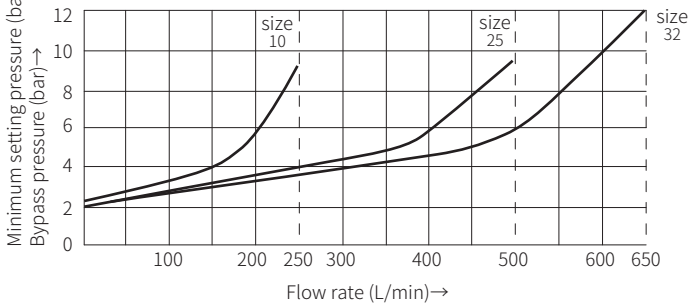
Inlet pressure in relation to the flow



Minimum setting pressure and bypass pressure in relation to the flow
- standard version



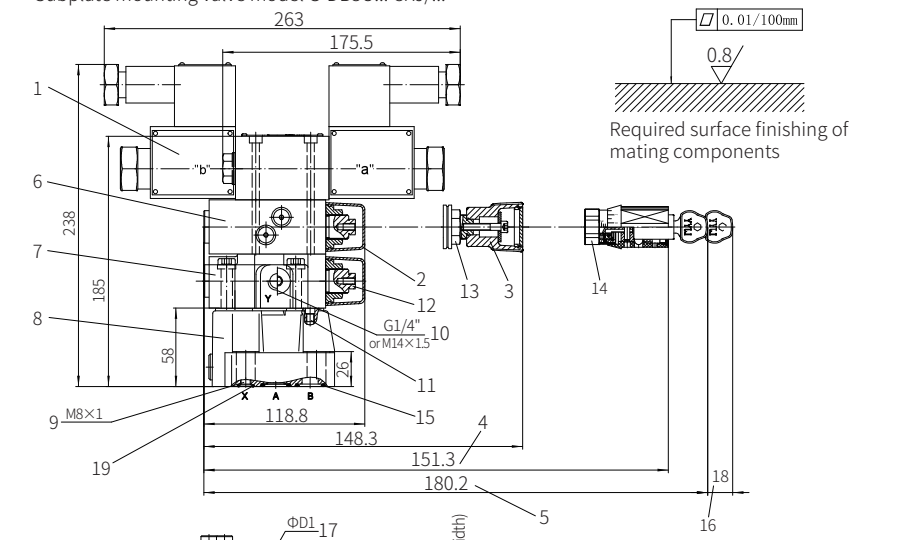
Minimum setting pressure and bypass pressure in relation to the flow
- "U" version



Component size

Size unit: mm

Subplate mounting valve model G-DB3U...-5XJ/...



Size	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

Valve fixing screw
NG10:
M12x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=95Nm
NG25:
M16x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
M18x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

1 Solenoid directional valve
(type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain
(G1/4" and M14x1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 O ring 17.12x2.62(for port A, B)
16 Space required to remove the key
17 Valve screw fixing holes
18 Locating pin hole
19 O ring 9.25x1.78(for port X)

It must be ordered separately if connection subplate is needed.

NG10 Subplate model:
G545/01 (G3/8") ; G545/02 (M18x1.5)
G546/01 (G1/2") ; G546/02 (M22x1.5)

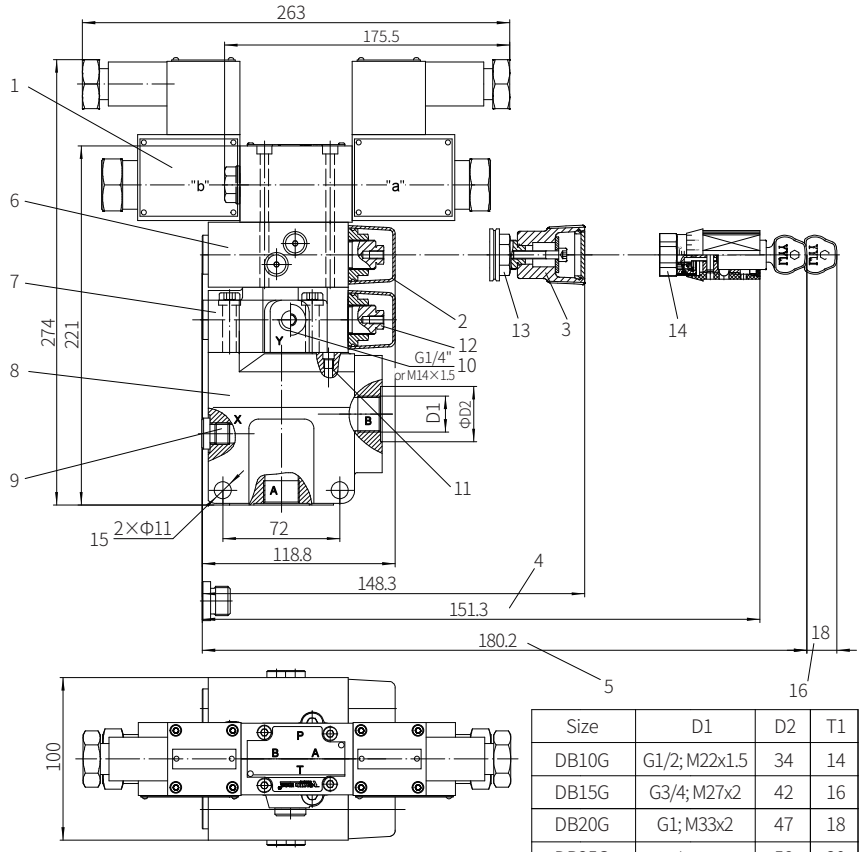
NG25 Subplate model:
G408/01 (G3/4") ; G408/02 (M27x2)
G409/01 (G1") ; G409/02 (M33x2)

NG32 Subplate model:
G410/01 (G11/4") ; G410/02 (M42x2)
G411/01 (G11/2") ; G411/02 (M48x2)

Component size

Size unit: mm

Threaded connection valve model G-DB3U...G...-5XJ/...



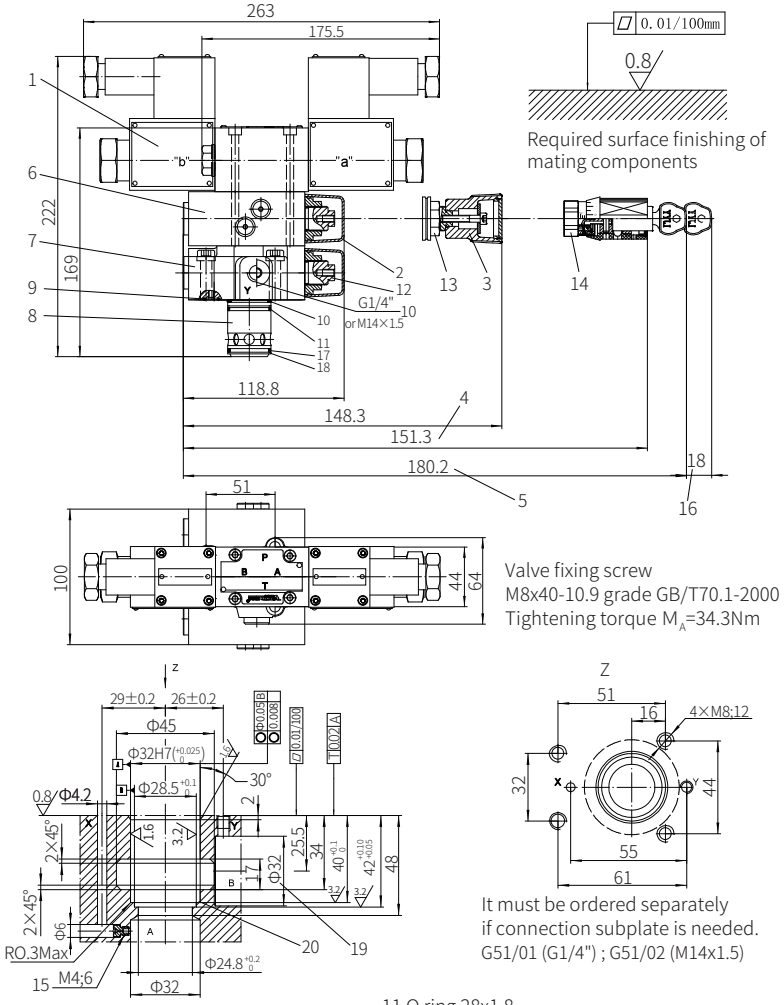
Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G11/4; M42x2	58	20
DB30G	G11/2; M48x2	65	22

1 Solenoid directional valve
(type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain
(G1/4" and M14x1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Valve screw fixing holes
16 Space required to remove the key

Component size

Size unit: mm

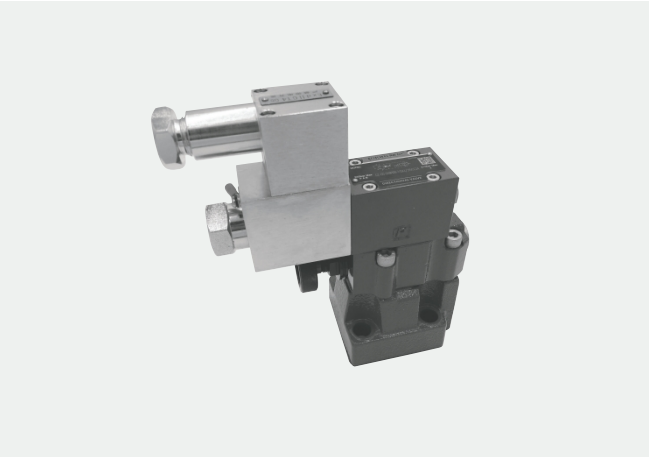
With (G-DBC3U10 or 30) or without (G-DBC3U)



1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main spool
9 O ring 9.25x1.78
10 O ring 28x2.65
11 O ring 28x1.8
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Throttle must be order separately
16 Space required to remove the key
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8
19 The Φ32 hole can intersect Φ45 hole at any position Be careful not to damage oil port X and fixing holes
20 The retainer ring and O-ring should be installed in this hole before install main spool position

Explosion-proof Solenoid Pilot Relief Valve

Model: G-DBW...5XJ



- Size 10 to 32
- Maximum working pressure 350 bar
- Maximum flow rate 650 L/min

Contents

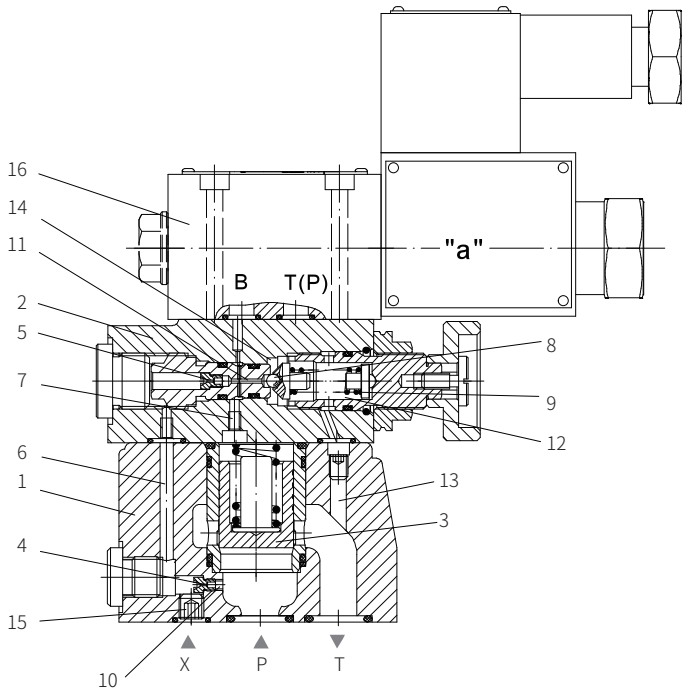
Function description, sectional drawing	02-03
Models and specifications	04-05
Functional symbols	06
Technical parameters	06
Characteristic curve	07
Component size	08-10

Features

- Subplate mounting, threaded connection, manifolds installation
- 5 setting pressure ranges
- Pressure adjusting elements:
  Rotary knob
  Inner hexagon screw with protective cap

Function description, sectional drawing

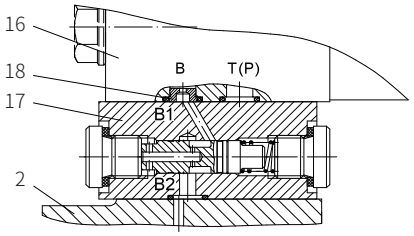
The G-DBW pressure control valve is pilot operated relief valve, it is used to limit and unload working pressure by solenoids.
The valve is basically composed of main valve (1) with main spool inserted (3) and pilot valve (2) with pressure adjustment element.
The pressure of port P acts on the main spool (3), meanwhile, the pressure is applied via control lines (6) and (7) with orifices (4) and (5) to the spring loaded side of the main spool (3) and on the ball (8) in the pilot valve (2). When the pressure in port P rises excess the spring setting pressure, the ball (8) overcomes the spring pressure (9) to open the pilot valve.
The signal is obtained internally via the control channels (10) and (6) from port P. The oil fluid on the spring loaded side of the main spool (3) flows into spring chamber (12) via control line (7), throttle (11) and ball (8). Thus, hydraulic oil external drain via control line (14) into the tank for model DBW...Y. Because of throttles (4) and (5), the pressure drop occurs at the main spool (3) and the connection from port P to port T is opened. The fluid flows from port P to port T while the setting working pressure is no changing. The pressure relief valve can unload or shift the different pressure (second pressure stage) by "X" port.



Model G-DBW10-1-5XJ/

Function description, sectional drawing

Solenoid pilot relief valve with switching shock damping(sandwich), model G-DBW.../..S...R12
The connection from B2 to B1 opens with delay when switching shock damping valve (17) used, it can prevent pressure peaks and unloading shocks in the return line. The valve is installed between pilot valve and directional control valve (16). The degree of damping (unloading shock) depends on the size of throttle (18). Throttle Ø1.2mm is used as standard size (ordering code...R12...).



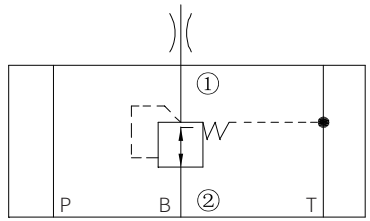
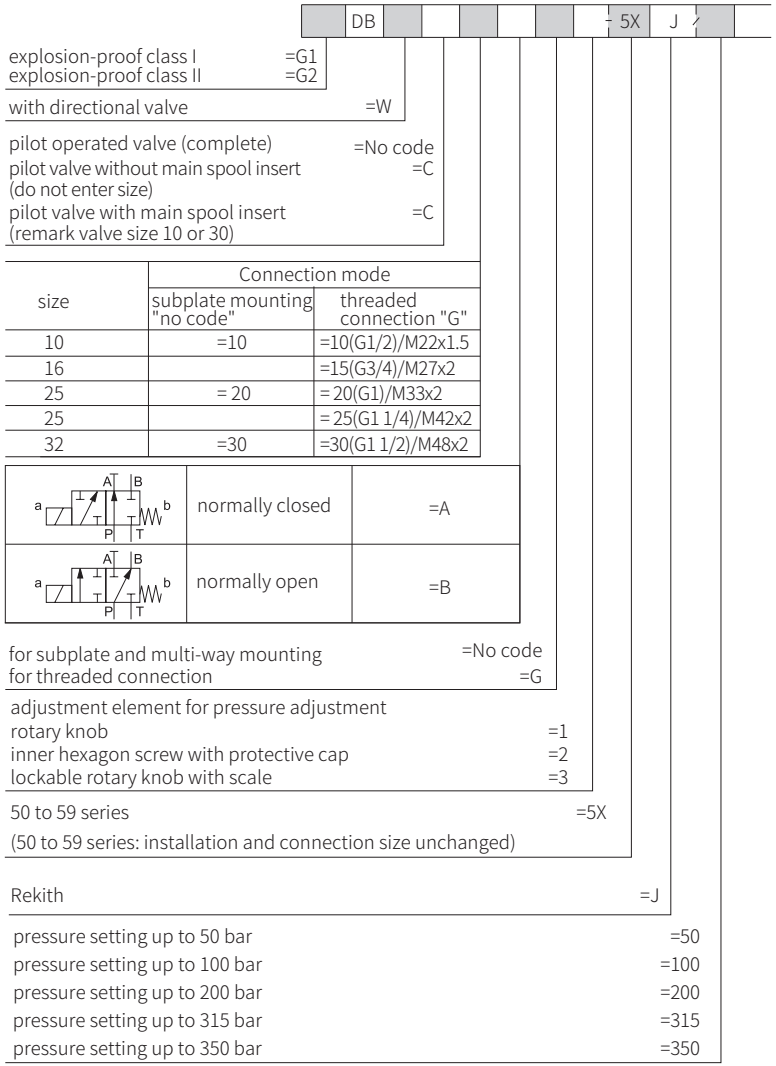


Illustration: directional valve opened

- The unloading function (directional valve function of DBW) cannot be used as safety function!
- When power off or cable breakage, Model DBW... B.. 5XJ/... should use the minimum setting pressure (circulation pressure).
- When power off or cable breakage, the pressure relief function of model DBW...A...5XJ/...is launched.
- The back pressure of pilot oil internal drain in port T or external drain in port Y is 1:1 added in pilot control pressure.

Models and specifications



explosion-proof class I =G1
explosion-proof class II =G2

with directional valve =W

pilot operated valve (complete) =No code
pilot valve without main spool insert (do not enter size) =C
pilot valve with main spool insert (remark valve size 10 or 30) =C

size	Connection mode	
	subplate mounting "no code"	threaded connection "G"
10	=10	=10(G1/2)/M22x1.5
16		=15(G3/4)/M27x2
25	= 20	= 20(G1)/M33x2
25		= 25(G1 1/4)/M42x2
32	=30	=30(G1 1/2)/M48x2

normally closed =A

normally open =B

for subplate and multi-way mounting =No code
for threaded connection =G

adjustment element for pressure adjustment
rotary knob =1
inner hexagon screw with protective cap =2
lockable rotary knob with scale =3

50 to 59 series =5X
(50 to 59 series: installation and connection size unchanged)

Rexroth =J

pressure setting up to 50 bar =50
pressure setting up to 100 bar =100
pressure setting up to 200 bar =200
pressure setting up to 315 bar =315
pressure setting up to 350 bar =350

Models and specifications

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code= G thread
2= metric thread
(G1/4)

R12= damping Φ1.2mm in port B of directional valve

G24= 24V DC
B36= AC rectified 36V
B127= AC rectified 127V
B220= AC rectified 220V

C= with solenoid directional valve size 6

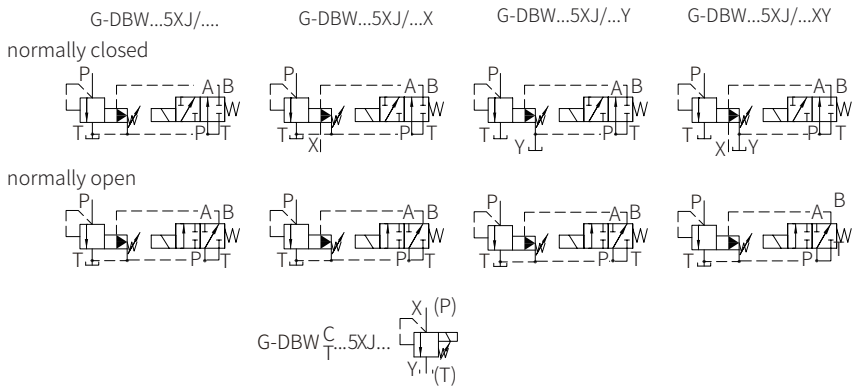
No code= without switching shock damping
S= with switching shock damping

No code= standard valve
U= minimum setting pressure, see characteristic curves

No code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

Note:
G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Functional symbols



Technical parameters

Installation position			Optional				
			G-DBW...10	G-DBW...15	G-DBW...20	G-DBW...25	G-DBW...30
Weight	Subplate mounting G-DBW	kg	About 5.6	–	About 6.5	–	About 7.9
	Threaded connection G-DBW..G..	kg	About 7.9	About 7.8	About 7.7	About 8.5	About 8.4
	Switching shock damping	kg	About 0.6				
Technical parameters of directional valve			Directional valve is explosion- proof solenoid directional valve. G-3WE6A for normally closed type; G-3WE6B for normally open type				

Hydraulic							
Maximum working pressure	port P, X	MPa	35.0				
	port T	MPa	21				
Maximum setting pressure		MPa	5.0; 10.0; 20.0; 31.5; 35.0				
Minimum setting pressure		MPa	Interrelated with flow (see the curve)				
Maximum flow	Subplate mounting	L/min	250	-	500	-	650
	Threaded connection	L/min	250	500	500	500	650
Oil fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]				
Oil temperature range		°C	-30 to +80 (NBR seal) -20 to +80 (FRM seal)				
Viscosity range		mm²/s	10 to 800				
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15				

1) For NBR seal and FKM seal.

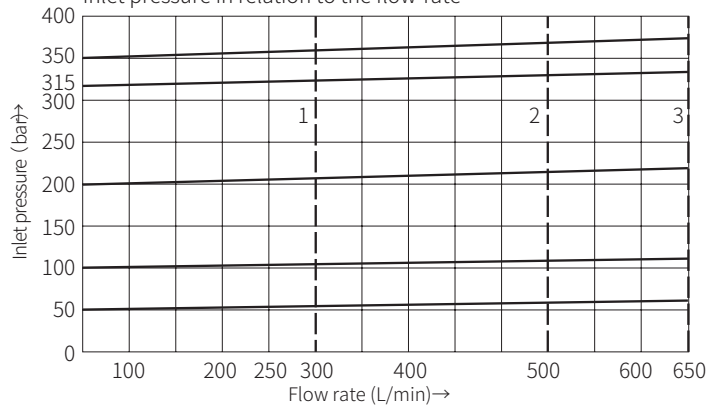
2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

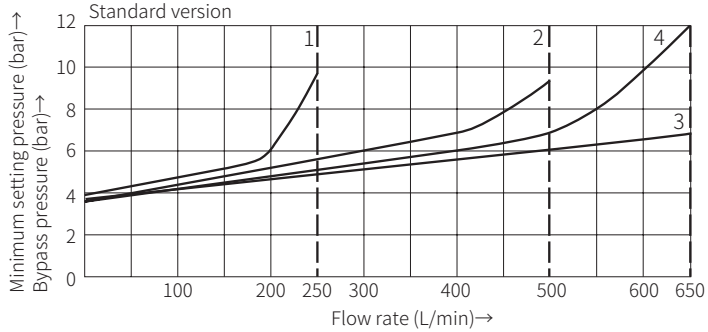
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Inlet pressure in relation to the flow-rate



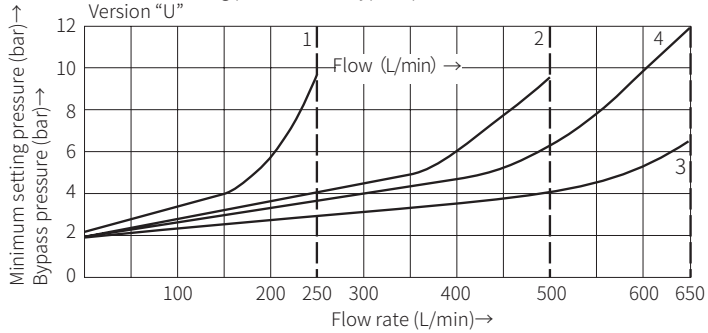
1 Size 10
2 Size 25
3 Size 32

Minimum setting pressure and bypass pressure in relation to the flow-rate
Standard version



1 Size 10
2 Size 25
3 Size 32(N)
4 DBC30
DBWC30

Minimum setting pressure and bypass pressure in relation to the flow-rate
Version “U”

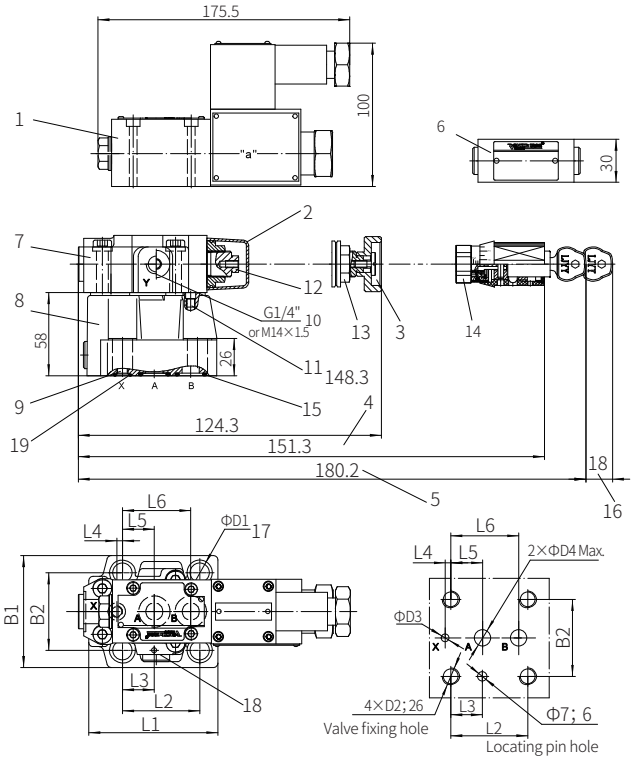


1 Size 10
2 Size 25
3 Size 32(N)
4 DBC30
DBWC30

Component size

Size unit: mm

Subplate mounting valve, model G-DBW...-5XJ/...



Valve fixing screw
NG10:
M12x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=95Nm
NG25:
M16x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
M18x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

Size	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

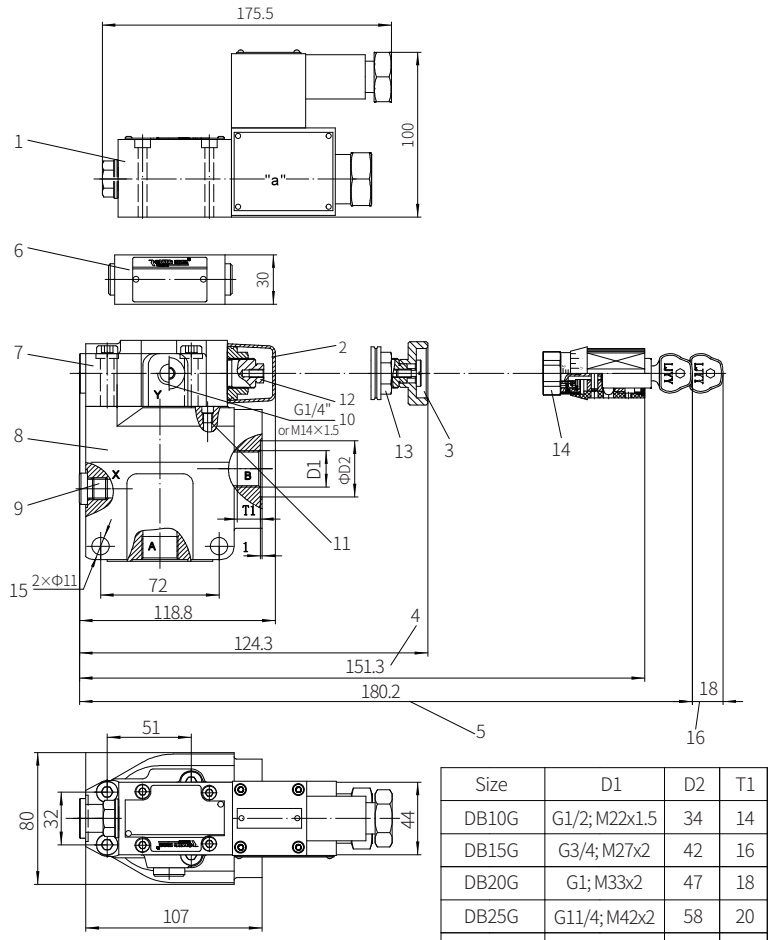
1 Solenoid valve
2 Adjustment form“2”
3 Adjustment form“1”
4 Adjustment form“3”
5 Adjustment form“7”
6 With switching shock damping valve, optional
7 Pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4"and M14x1.5 optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 O-ring 17.12x2.62 (for port A, B)
16 Space required to remove the key
17 Valve screw fixing holes
18 Locating pin hole
19 O-ring 9.25x1.78 (for port X)

It must be ordered separately if connection subplate is needed.
NG10 subplate model:
G545/01 (G3/8") ; G545/02 (M18x1.5)
G546/01 (G1/2") :G546/02 (M22x1.5)
NG25 subplate model:
G408/01 (G3/4") ; G408/02 (M27x2)
G409/01 (G1") ; G409/02 (M33x2)
NG32 subplate model:
G410/01 (G11/4") ; G410/02 (M42x2)
G411/01 (G11/2") ; G411/02 (M48x2)

Component size

Size unit: mm

Threaded connection valve, model G-DBW...-5XJ/...



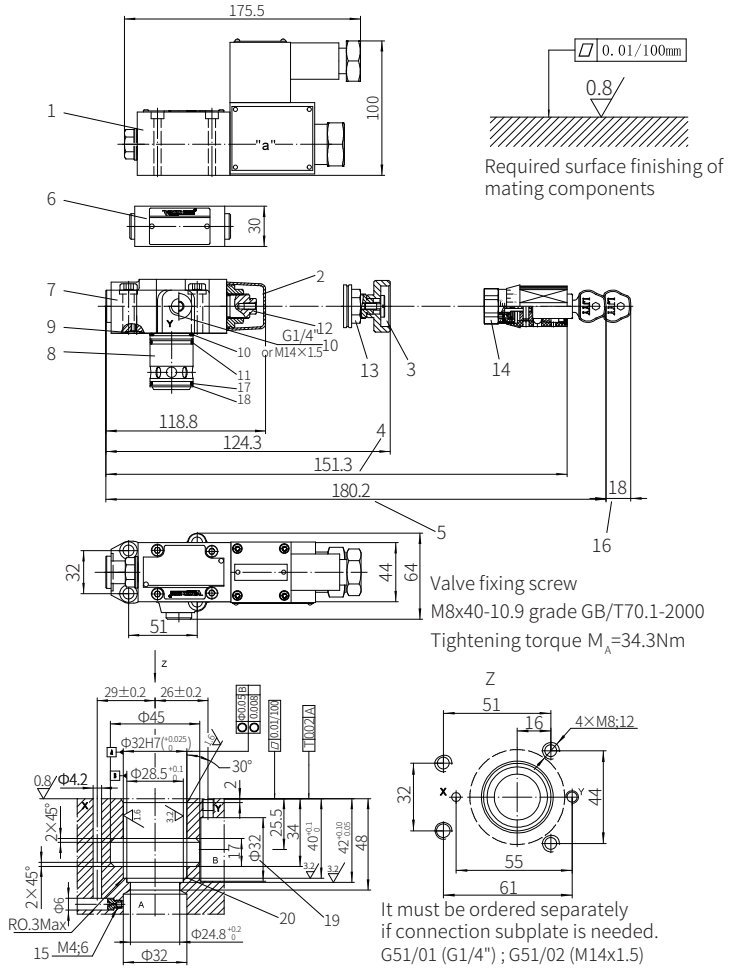
Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G11/4; M42x2	58	20
DB30G	G11/2; M48x2	65	22

1 Solenoid valve
2 Adjustment form“2”
3 Adjustment form“1”
4 Adjustment form“3”
5 Adjustment form“7”
6 With switching shock damping valve, optional
7 Pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4"and M14x1.5 optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Valve screw fixing holes
16 Space required to remove the key

Component size

Size unit: mm

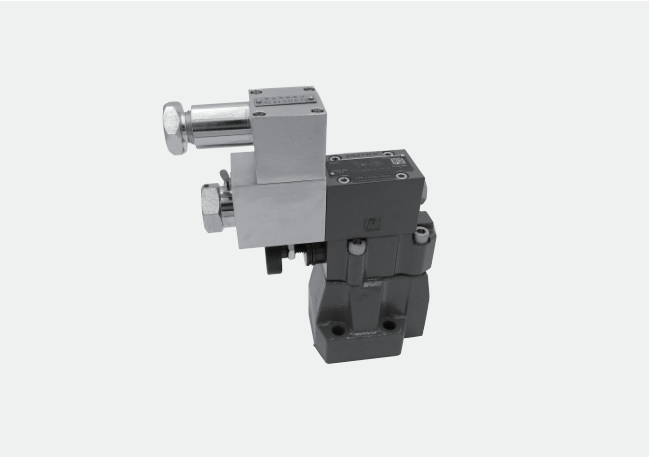
With(G-DBWC10 or 30) or without (G-DBWC)



1 Solenoid valve
2 Adjustment form“2”
3 Adjustment form“1”
4 Adjustment form“3”
5 Adjustment form“7”
6 With switching shock damping valve
7 Primary pilot valve
8 Main spool
9 O ring 9.25x1.78
10 O ring 28x2.65
11 O ring 28x1.8
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 Throttle must be ordered separately
16 Space required to remove the key
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8
19 The Ø32 hole can intersect Ø45 hole at any position. Be careful not to damage oil port X and fixing holes.
20 The retainer ring and O-ring should be installed in this hole before install main spool.

Explosion-proof Pilot Operated Unloading Pressure Relief Valve

Model: G-DAW...5XJ



- Size 10 to 32
- Maximum working pressure 315 bar
- Maximum flow rate 240 L/min

Contents

Function description, sectional drawing	02
Functional symbols	03
Models and specifications	03
Technical parameters	04
Characteristic curve	05
Component size	06-08
Application example	09

Features

- For subplate mounting
- For manifolds mounting
- 4 adjusting elements
- 4 pressure ranges
- Unload by the installed explosion-proof directional valve

Function description, sectional drawing

The G-DAW pressure control valve is pilot operated pressure shut-off valve. It is used to switch the pump flow to pressureless bypass when the accumulator loading pressure is reached. The other application of the valve is in high/low pressure pump system. In this application, the low pressure is switched to pressureless bypass when pressure reaches the high pressure setting value.

The valve is composed of main valve (1) with main spool assembly (3), pilot valve (2) with pressure adjusting element and check valve (4). For size 10 valve, the check valve (4) is installed in main valve (1). For size 25 and 32, the check valve (4) is built into a separate subplate installed under the main valve (1).

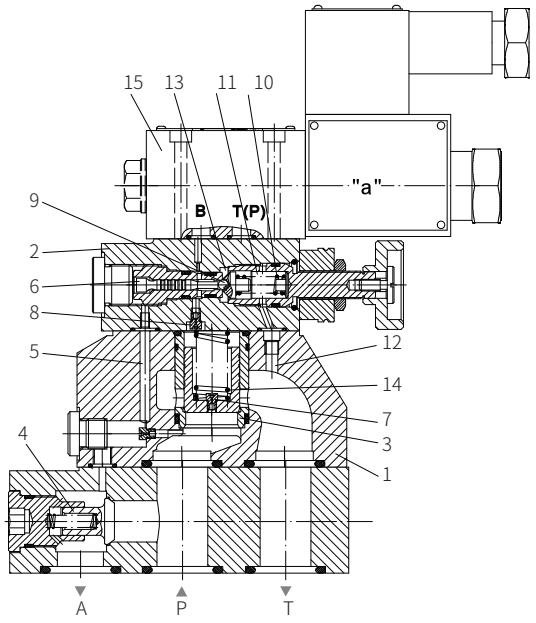
Diverting the pump flow from P to A - P to T

The pump supply oil for hydraulic system (P to A) via check valve (4). The pressure in port A acts on pilot valve spool (6) via control line (5). At same time, pressure in port P passes to the spring chamber of main spool (3) and conical spool (9) of pilot valve (2) via orifices (7) and (8). The conical spool lifts its valve seat against the spring force(10) when the setting cut-off pressure of the hydraulic system is reached. The fluid flows into spring chamber (11) via orifices (7) and (8), or the oil returns to tank external via control line (12) in model G- DAW...5XJ...Y.

Due to orifices (7) and (8), there is pressure drop in the main spool (3). The main spool (3) lifts off its seat and opens the connection from P to T. and the check valve (4) closes the connection from A to P. Now the poppet valve (9) is kept opening by the system pressure via pilot valve spool (6).

Diverting the pump fluid from P to T - P to A.

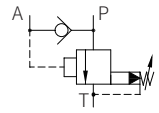
The area of the pilot spool (6) is 10% or 17% greater than the effective area of the conical spool (9) , thus the effective force on the pilot valve spool (6) is 10% or 17% greater than the effective force on the conical spool (9). When the actuator pressure drop to equal the cut-off pressure of the valve that corresponds to the switching pressure differential, the spring (10) pushes the poppet valve(9) on to its seat. The pressure is built up on the spring loaded side of the main spool (3). In conjunction with spring (14), the main spool (3) is closed and the connection from port P to T is isolated. The pump flow passes again via the check valve (4) into the hydraulic system (P to A). The solenoid direction valve (15) can switch the setting shut-off pressure of the pilot valve (2) either from P to A or P to T.



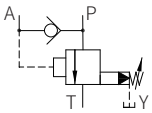
Model G-DAW20-1-5XJ/

Functional symbols

Model DA...-5XJ/...

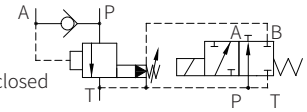


Model DA...-5XJ/...Y...



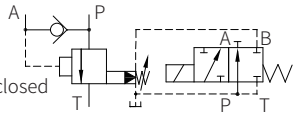
Model DAW...A....-5XJ/...

Normally closed



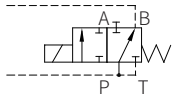
Model DAW...A...-5XJ/...Y...

Normally closed



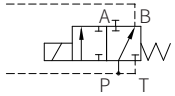
Model DAW...B....-5XJ/...

Normally open



Model DAW...B....-5XJ/...Y

Normally open



Models and specifications

DA | | | | - | 5X | J | | | |

Technical parameters

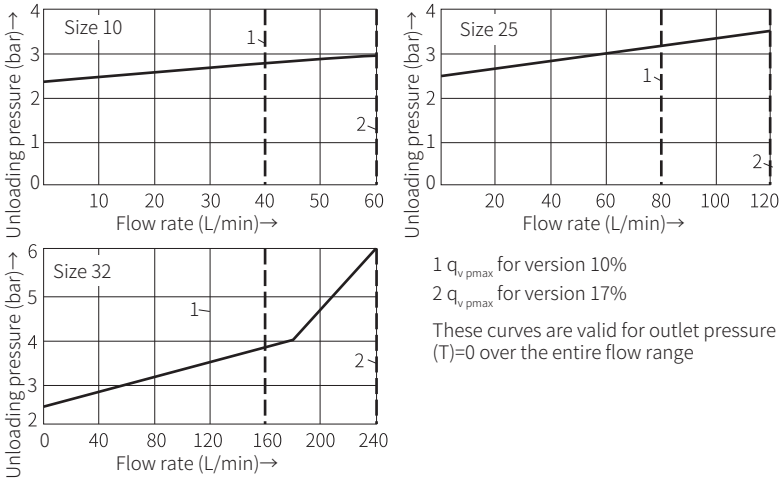
Hydraulic					
Maximum working pressure	port P	bar	315		
	port A	bar	315(after switching from P to T)		
Hydraulic oil			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]		
Oil temperature range		°C	-30 to +80 (NBR seal)		
		°C	-20 to +80 (FKM seal)		
Viscosity range		mm^2/s	10 to 800		
Maximum flow	Type 10%	L/min	40	80	120
	Type 17%	L/min	60	120	240
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		
Maximum setting pressure			50; 100; 200; 315		

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

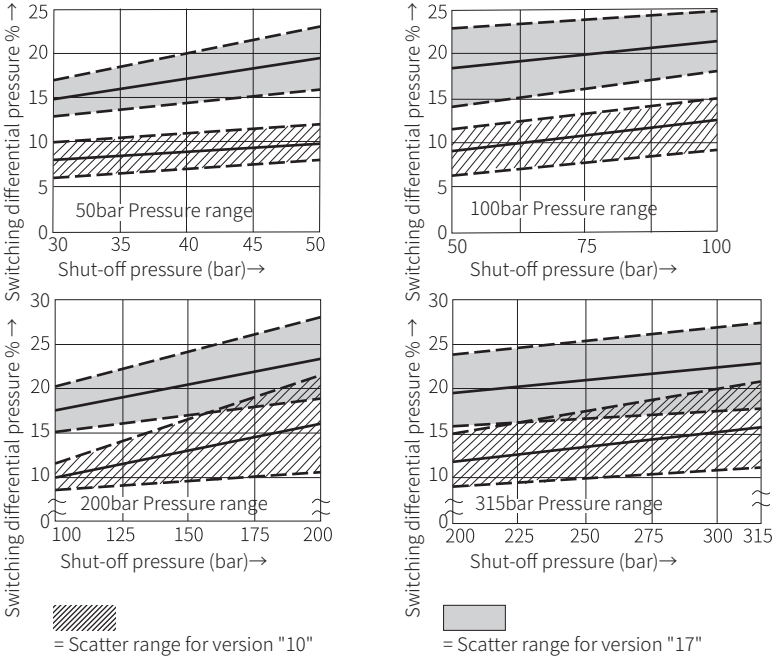
Unloading pressure (P→T)



1 $q_{v\,pmax}$ for version 10%
2 $q_{v\,pmax}$ for version 17%

These curves are valid for outlet pressure (T)=0 over the entire flow range

Switching differential pressure in relation to shut-off pressure (P→A)



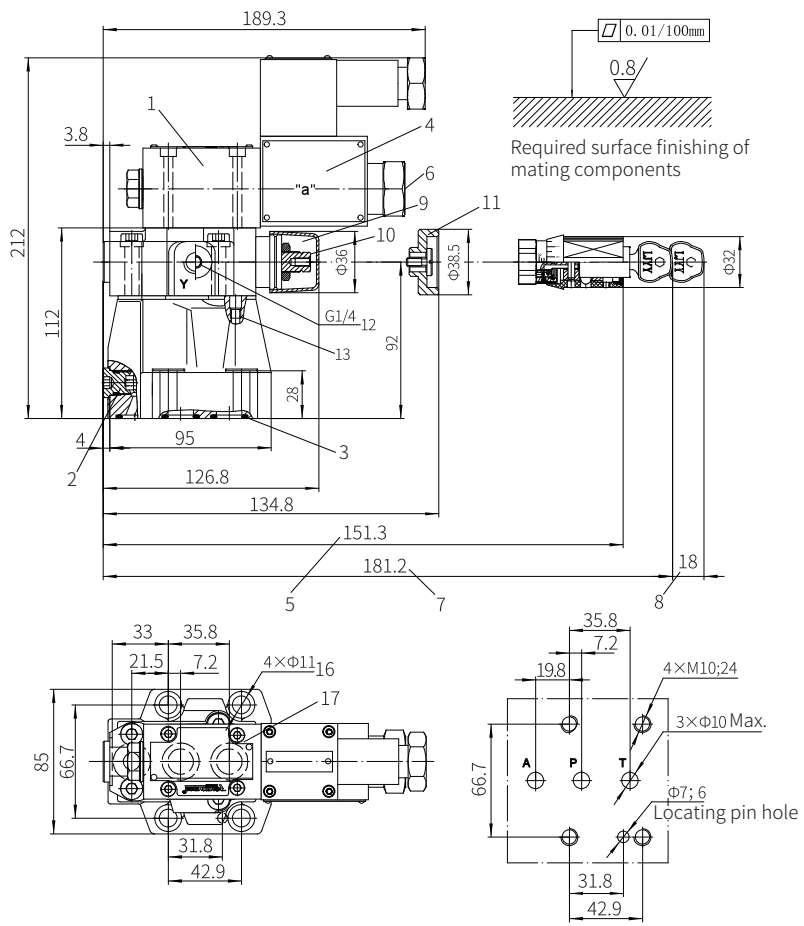
= Scatter range for version "10"

= Scatter range for version "17"

Component size

Size unit: mm

Model G-DAW10...-5XJ/...



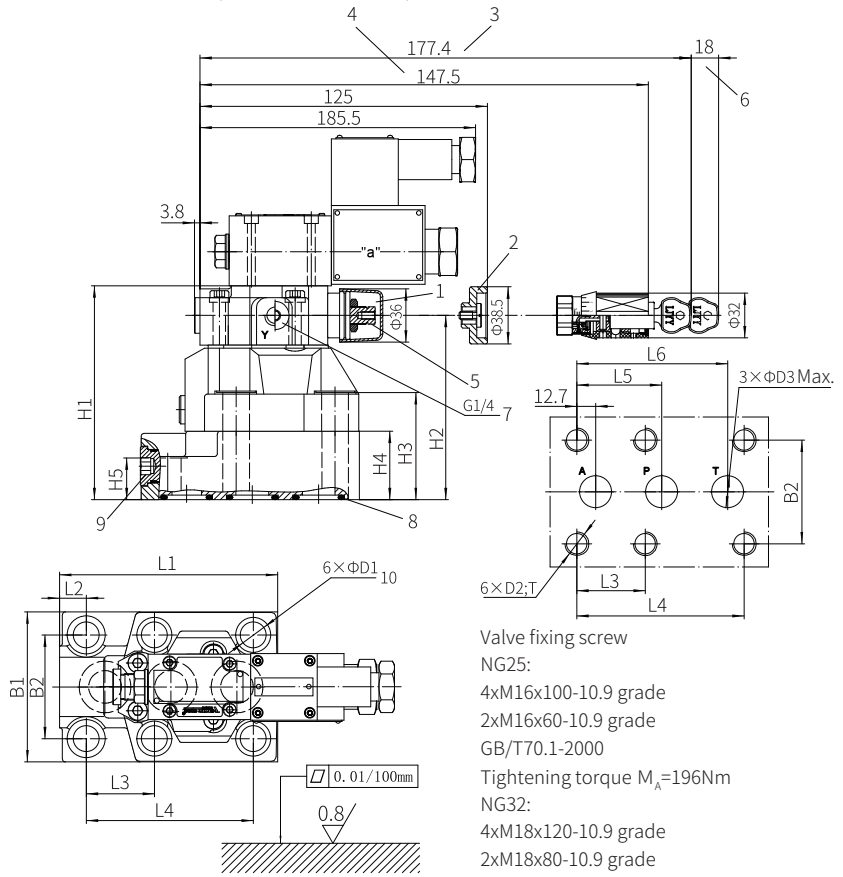
Valve fixing screw
M10x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=75Nm
It must be ordered separately if connection subplate is needed.
G467/01; G467/02
G468/01; G468/02

1 Solenoid pilot valve
2 Built-in check valve
3 O ring 17.12x2.62
4 Solenoid
5 Adjustment form“7”
6 Hidden emergency operation
7 Adjustment form “5”
8 Space required to remove the key
9 Adjustment form “2”
10 Hexagon S=10
11 Adjustment form "1"
12 Port Y for control oil drain external
13 Omitted with internal pilot oil drain

Component size

Size unit: mm

Model G-DAW20...-5XJ/...and G-DAW30...-5XJ/...



Valve fixing screw
NG25:
4xM16x100-10.9 grade
2xM16x60-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
4xM18x120-10.9 grade
2xM18x80-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

Size	L1	L2	L3	L4	L5	L6	H1	H2	H3
25	147	18	46	112.7	57.1	101.6	144	124	72
32	189.2	32	50.8	139.7	63.5	127	165	145	93

Size	H4	H5	B1	B2	D1	D2	D3	T
25	46	28	101	69.9	18	M16	22	34
32	67	45	116	82.5	20	M18	30	37

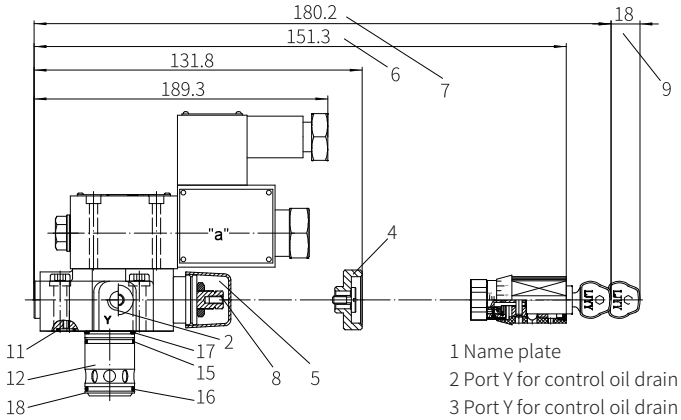
It must be ordered separately if connection subplate is needed.
Subplate model:
NG25: G469/01; G469/02; G470/01; G470/02
NG32: G471/01; G471/02; G472/01; G472/02

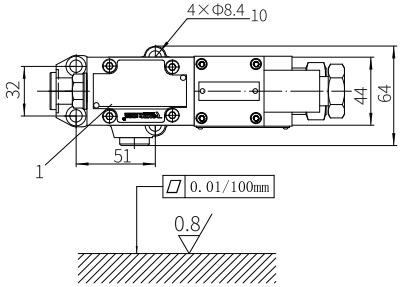
1 Adjustment form “1”
2 Adjustment form “2”
3 Adjustment form “5”
4 Adjustment form “7”
5 Hexagon S=10
6 Space required to remove the key
7 Port Y for control oil drain external
8 O ring
9 Built-in check valve
10 Valve fixing screw hole

Component size

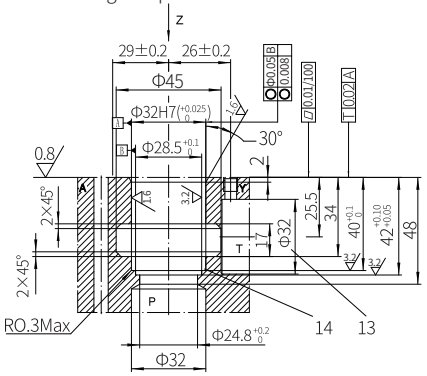
Size unit: mm

With (G-DAWC10 or 30) or without (G-DAWC)

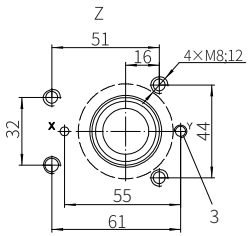




Required surface finishing of mating components



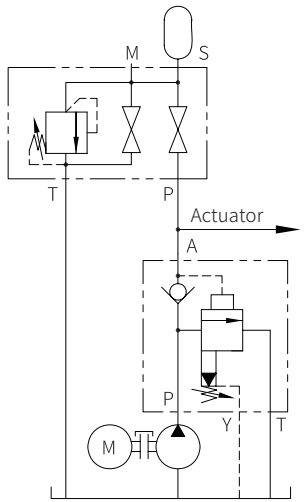
1 Name plate
2 Port Y for control oil drain external
3 Port Y for control oil drain external
(G1/4 or M14x1.5 optional)
4 Adjustment form “1”
5 Adjustment form “2”
6 Adjustment form “5”
7 Adjustment form “7”
8 Hexagon S=10
9 Space required to remove the key
10 Valve fixing screw hole
11 O ring 9.25x1.78
12 Main valve insert
13 The ∅32 hole can intersect ∅45 hole at any position
Be careful not to damage oil port X and fixing holes
14 The retainer ring and O-ring should be installed in this hole before installing main spool.
15 O ring 28x1.8
16 O ring 28x2.65
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8



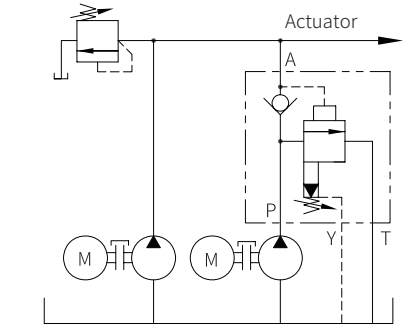
Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

Application example

Hydraulic system with accumulator:
installation notes:
- The connection resistance between DA valve and accumulator must be as low as possible
The pilot valve of DA is separately connected to the accumulator when the resistance is high.



Hydraulic system with high and low pressure pump:
With high pump flow and small switching pressure differential values (10 %), "Y" version valves should preferably be used.



02

Modular Balanced Valve

Model: PHF

- Size 6/10
- Maximum working pressure 350 bar
- Maximum flow rate to 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	03
Component size	04-05

Features

- Sandwich plate mounting
- Installation size to IS04413
- Variety pilot ratio, optional

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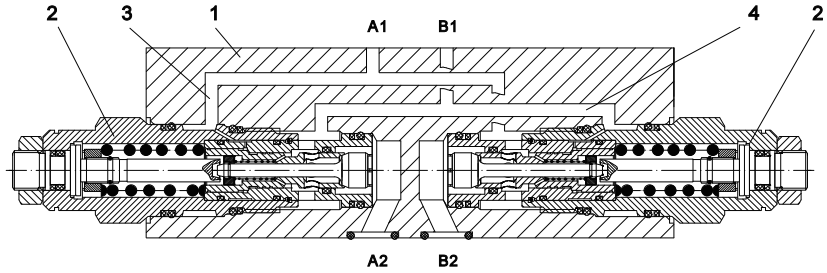
Function description, sectional drawing

The PHF valve is modular balance valve. It is composed of modular valve body (1) and two plug-in counterbalance valves (2).

Function:

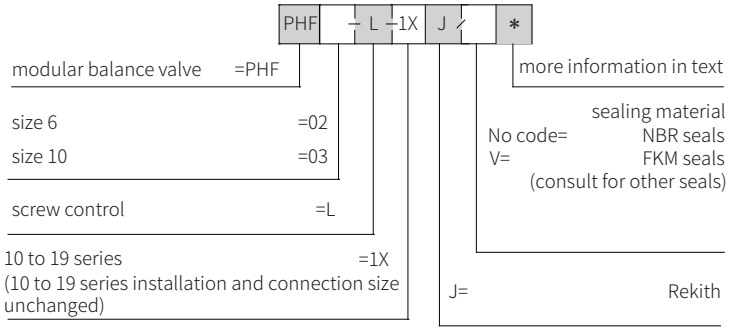
The valve allows the hydraulic oil to flow from A2 to A1(or from B2 to B1) to lift load and keep load position unchanged. By adjusting the pressure of the control line (3) or (4) to control the opening of the valve to make the load reduced smoothly at the required speed.

If the pressure in A2 or B2 exceeds the setting pressure due to, for example, external forces or thermal expansion, the balancing overflow function is opened to avoid damage of the hydraulic actuator because of overpressure. At this time, the setting pressure is generally more than 1.3 times of the opening pressure of the main relief valve of the system to ensure that the load lifted by the maximum working pressure is not reduced because of the overflow function in normal condition.



Model PHF02-L-1XJ

Models and specifications

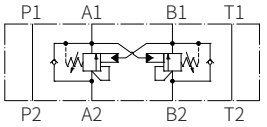


Note:

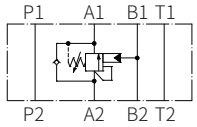
The default pilot ratio is 3:1, other pilot ratio please consult us

Functional symbols

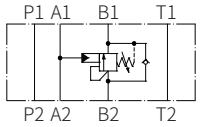
Model PHF02...



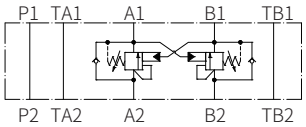
Model PHF02A...



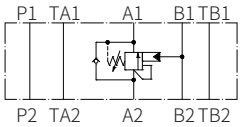
Model PHF02B...



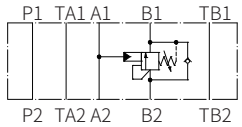
Model PHF03...



Model PHF03A...



Model PHF03B...



Technical parameters

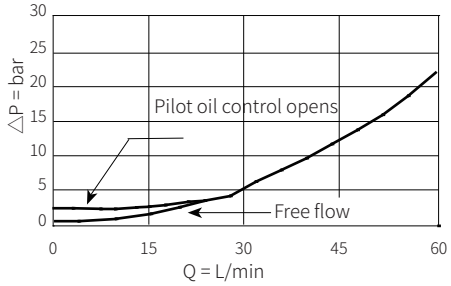
Medium		Mineral hydraulic oil or phosphate hydraulic oil
Temperature range	°C	-40 to +120 (NBR)
Viscosity range	mm^2/s	7.4 to 420
Maximum working pressure	bar	to 280[1)]
Inner leakage	drop/min	Max. 0.4
Setting pressure at port A2 or B2		The back pressure at A2 or B2 increases the setting pressure of the valve by an amount equivalent to the A2 or B2 back pressure x (1+ pilot ratio of the balance valve).
Pilot ratio		3:1
Flow	L/min	see characteristic curve

[1)] Set by factory when flow at 32.8m1/min

Characteristic curve

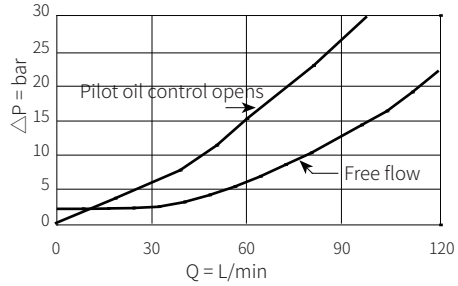
PHF02...

Free flow and piloted open pressure drop



PHF03...

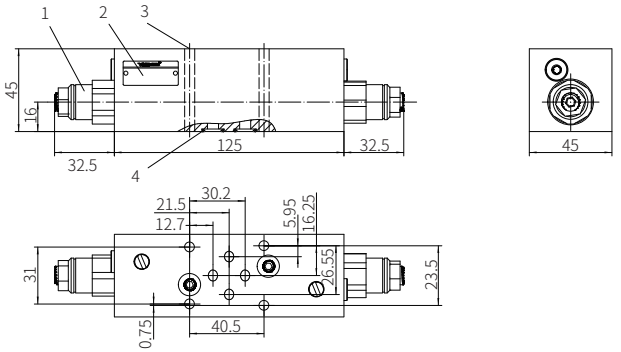
Free flow and piloted open pressure drop



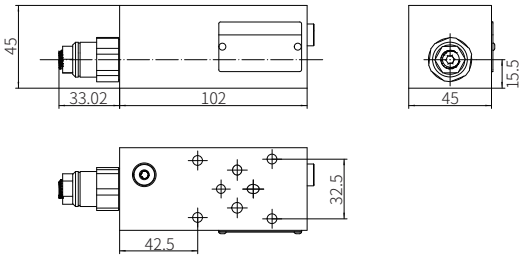
Component size

Size unit: mm

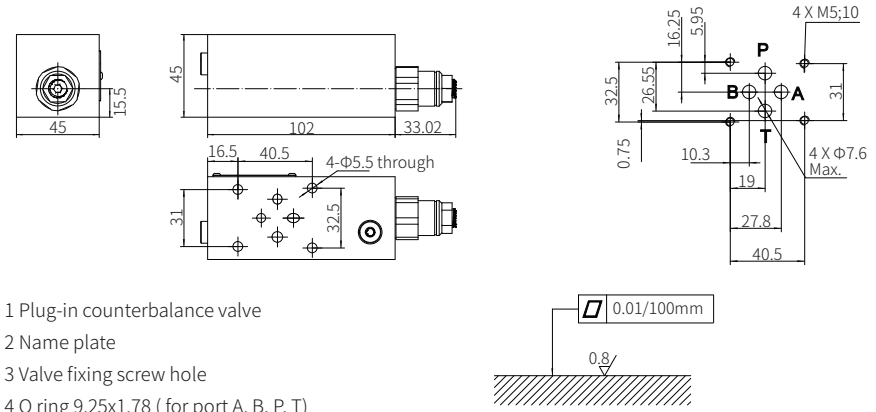
Model PHF02...-1XJ/...(two-way balance valve)



Model PHF02A...-1XJ/...(one-way balance valve)



Model PHF02B...-1XJ/...(one-way balance valve)



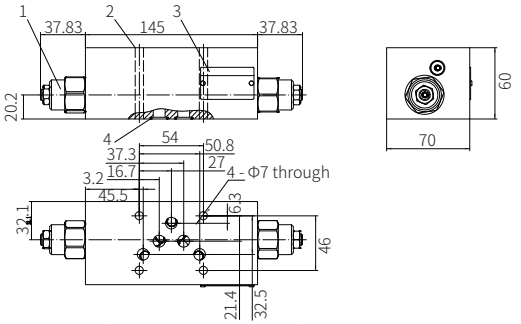
1 Plug-in counterbalance valve
2 Name plate
3 Valve fixing screw hole
4 O ring 9.25x1.78 (for port A, B, P, T)

Required surface finishing of mating components

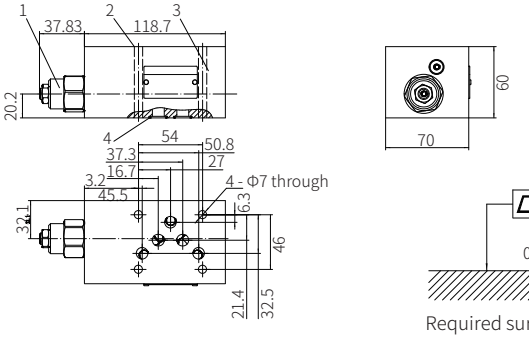
Component size

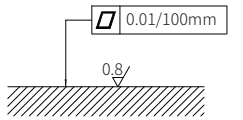
Size unit: mm

Model PHF03...-1XJ/...(two-way balance valve)



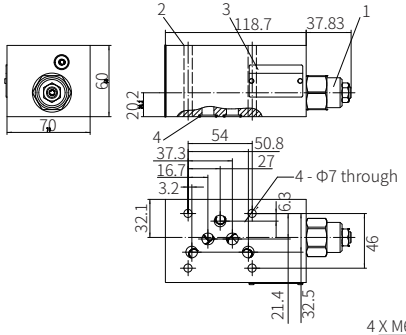
Model PHF03A...-1XJ/...(one-way balance valve)



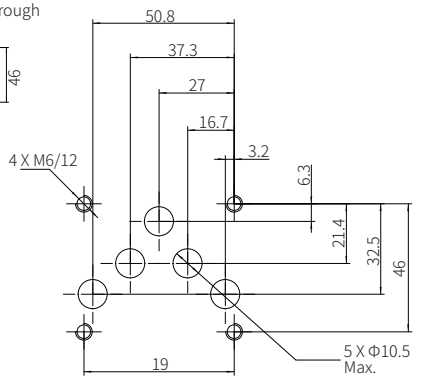


Required surface finishing of mating components

Model PHF03B...-1XJ/...(one-way balance valve)



1 Plug-in counterbalance valve
2 Name plate
3 Valve fixing screw hole
4 O ring 9.25x1.78 (for port A, B, P, T)



02

3 - Flow valves

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- Z2FS10...3XJ/Modular restrictive check valve 0583-0588
- Z2FS16...3XJ/Modular restrictive check valve 0589-0594
- Z2FS22...3XJ/Modular restrictive check valve 0595-0600
- DV/DRV...1XJ/Restrictor valve/check restrictor valve 0601-0608
- 2FRM5...3XJ/Two ways flow control valve 0609-0612
- 2FRM6...3XJ/Two ways flow control valve 0613-0620
- 2FRM...2XJ/Two ways flow control valve 0621-0628
- Z2FRM6...2XJ/Modular two ways flow control valve 0629-0636
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Restrictive Valve and Restrictive Check Valve

Model: MG/MK...1XJ

- Size 6 to 30
- Maximum working pressure 350 bar
- Maximum working flow 400 L/min

Contents

Function description, sectional drawing	02
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Component size	05

Features

- Suitable for direct in-line mounting
- Performance depends on pressure and viscosity

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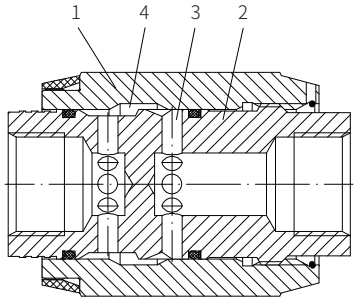
Function description, sectional drawing

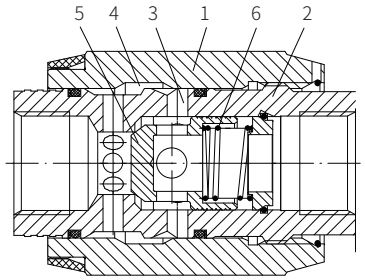
The MG and MK valve is a restrictive valve and restrictive check valve which is related to oil pressure and viscosity.

Model MG (restrictive valve)
This valve throttles in both flow directions. The hydraulic oil flows through side hole (3) to the throttling orifice (4) which is formed by valve body (2) and adjusting sleeve (1). The cross-section of the throttling orifice (4) can be adjusted infinitely by rotating the adjusting sleeve (1).

Model MK (restrictive check valve)
When the fluid flows through the valve in throttling direction, the pressure oil and spring (6) presses the spool (5) onto the valve seat, then the connection is blocked. The hydraulic oil flows through the side hole (3) to the throttling orifice (4) which is formed by valve body (2) and adjusting sleeve (1).
In the opposite direction, the pressure acts on the face of the spool (5) to open the check valve and allow the fluid to flow through the check valve without throttling. At the same time, parts of the hydraulic oil flows through the annular groove to achieve the desired self-cleaning effect.

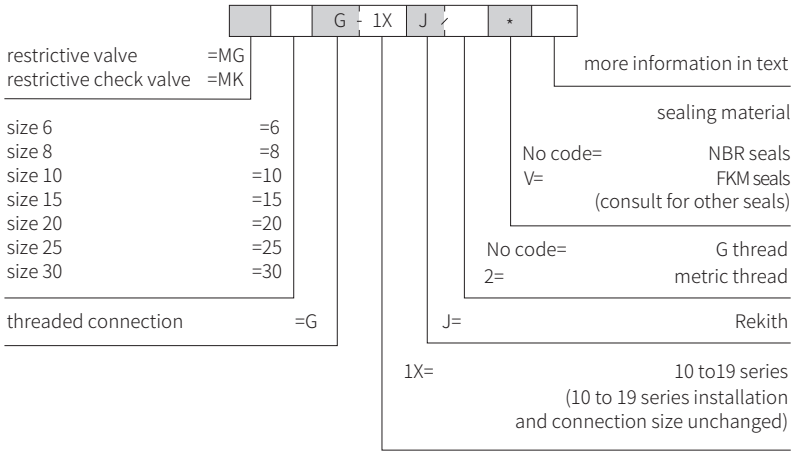


Restrictive valve MG

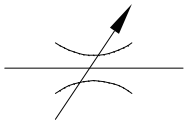


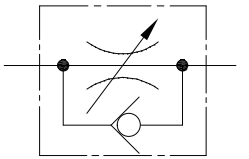
Restrictive check valve MK

Models and specifications



Functional symbols


Model MG


Model MK

Technical parameters

Overview								
Installation position		Optional						
Environment temperature range	°C	-20 to +50						
Weight		6	8	10	15	20	25	30
	kg	0.3	0.4	0.7	1.1	1.9	3.2	4.1
Hydraulic								
Maximum working pressure	bar	315						
Cracking pressure MK model	bar	0.5						
Maximum flow	L/min	400						
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms Degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]						
Oil temperature range	°C	-30 to + 80 (NBR seal) , -20 to + 80 (FKM seal)						
Viscosity range	mm^2/s	10 to 800						
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 class 20 / 18 / 15						

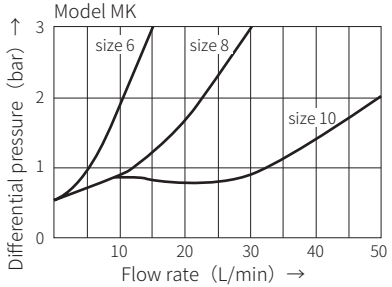
1) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

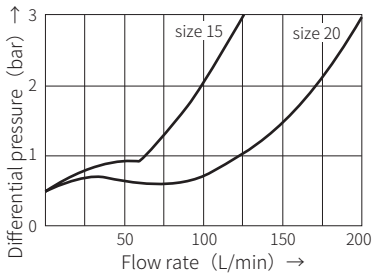
Characteristic curve

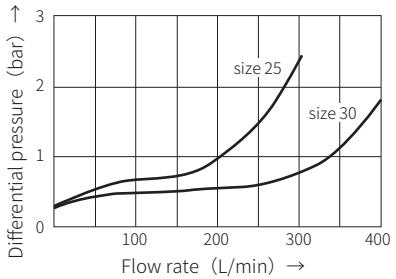
(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

△p-q_v-characteristic curve via the opened check valve with closed throttle

Model MK

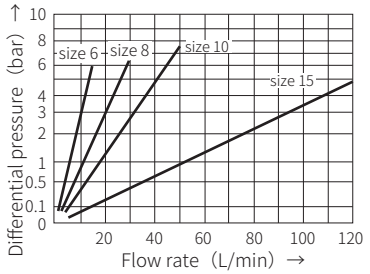


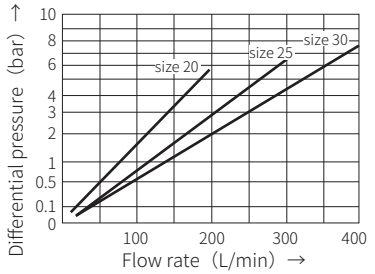




△p-q_v-characteristic curve via the opened throttle

Model MG and MK

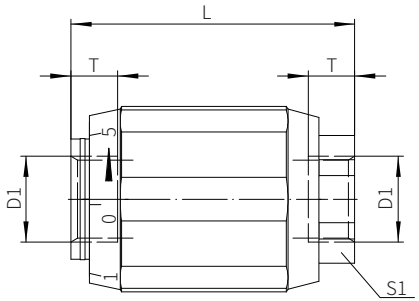


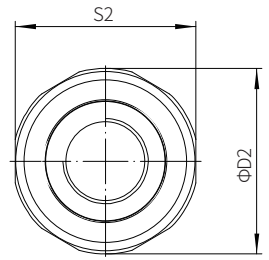


Component size

Size unit: mm

Model MK and MG





Size	D1		D2	L1	S1	S2	T1
	G	Metric					
6	G1/4	M14×1.5	34	65	22	32	12
8	G3/8	M18×1.5	38	65	24	36	12
10	G1/2	M22×1.5	48	80	30	46	14
15	G3/4	M27×2	58	100	41	55	16
20	G1	M33×2	72	110	46	70	18
25	G1 1/4	M42×2	87	130	55	85	20
30	G1 1/2	M48×2	93	150	60	90	22

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Modular Restrictive Check Valve

Model: Z2FS6...4XJ

- ◆ Size 6
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 80 L/min

Contents

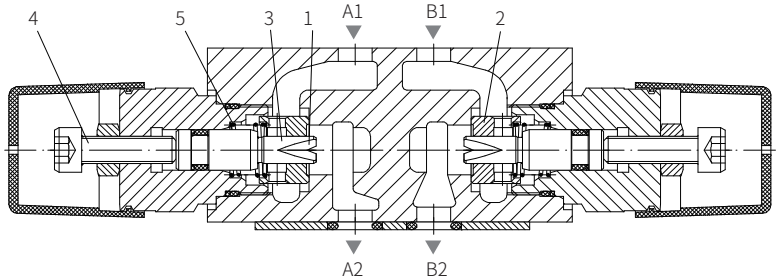
Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- ● Modular type valve
- ● 3 types of adjustment elements
-Adjusting screw with inner hexagonal locknut and protective cap
-Lockable knob with scale
-Rotary knob with scale
- ● Used to limit the main flow or control flow of two working oil ports
- ● Used for meter-in or meter-out control

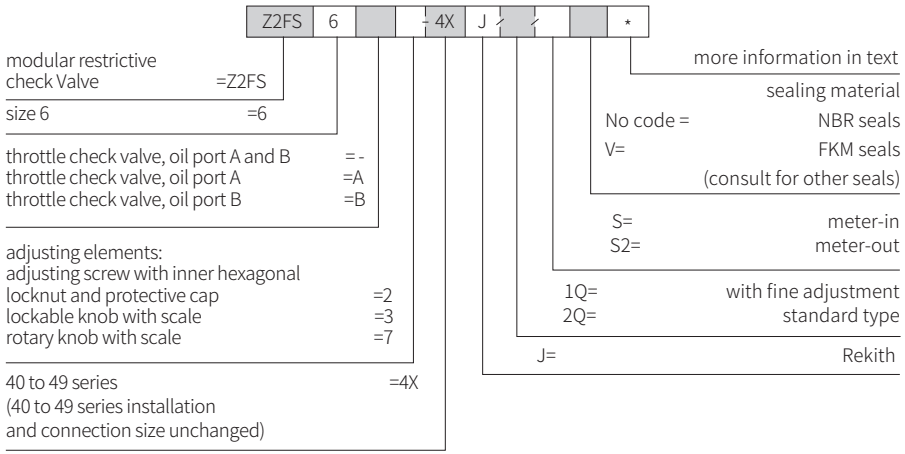
Function description, sectional drawing

The Z2FS6 type valve is a double throttle check valve with a stacked design.
This valve is used to limit the main flow or control flow of one or two working oil ports. Two symmetrically arranged throttle check valves limit the flow in one direction (by adjusting the throttle valve core) and allow free flow in the opposite direction.
For meter-in control the oil fluid flows from port A1 to A2 through the throttle port (1) which is made of the valve seat (2) and throttle spool (3). The throttle spool (3) can be axially adjusted via the adjusting screw (4) to adjust throttle port (1) .
The fluid flowing back from the working oil port A2 opens the valve seat (2) against the force of spring (5) to make the valve to act as a check valve and allow free-flow. According to the installation position of the valve, the throttling effect can be meter-in or meter-out control.
Main flow limit (Z2FS6.../2Q)
To change velocity of the actuator (mains flow control), the double throttle/check valve is installed between the directional control valve and the subplate.
Control flow limit (Z2FS6.../1Q)
In the pilot operated directional control valves, the double throttle/check valve is installed between the pilot valve and the main valve to control damping adjustment (control flow limit).



Model Z2FS6-2-4XJ/(meter-in control)

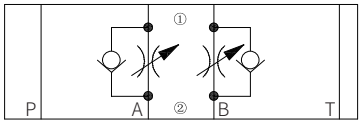
Models and specifications



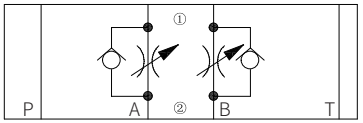
Functional symbols

(①=Valve side ②=Subplate side)

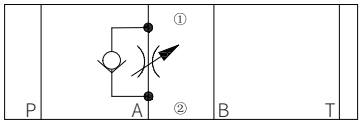
Model Z2FS6-...-4XJ/...(meter-in control)



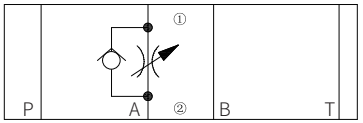
Model Z2FS6-...-4XJ/...(meter-out control)



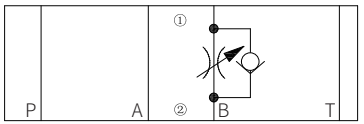
Model Z2FS6A...-4XJ/...(meter-in control)



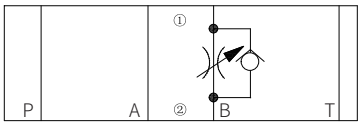
Model Z2FS6A-...-4XJ/...(meter-out control)



Model Z2FS6B...-4XJ/...(meter-in control)



Model Z2FS6B-...-4XJ/...(meter-out control)



Technical parameters

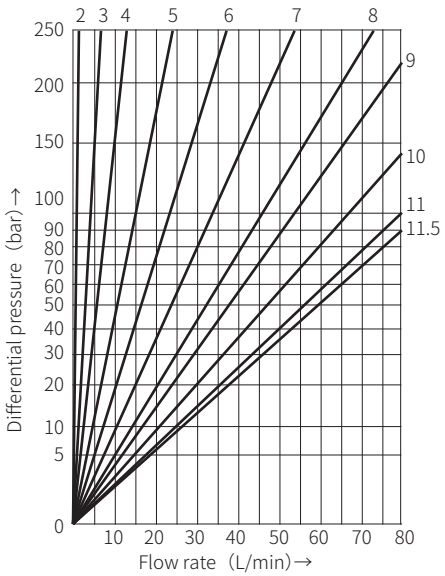
Overview		
Installation position		optional
Environment temperature range	°C	-30 to +50 (NBR seal)
		-20 to +50 (FKM seal)
Weight	kg	0.8
Hydraulic		
Maximum working pressure	bar	inlet port to 315
Maximum flow	L/min	80
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms Degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1] HEPG(Polyethylene glycol)[2] HEES (synthetic ester)[2]
Oil temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil [3]		The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

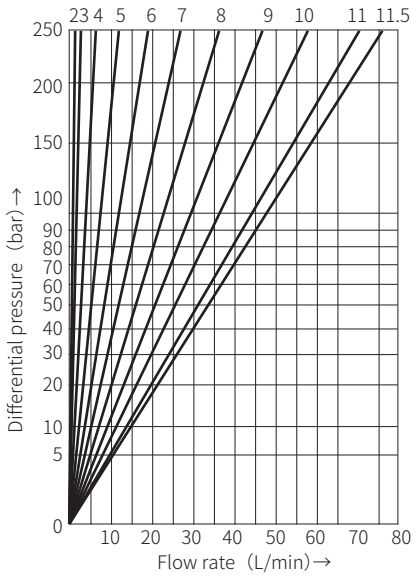
Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

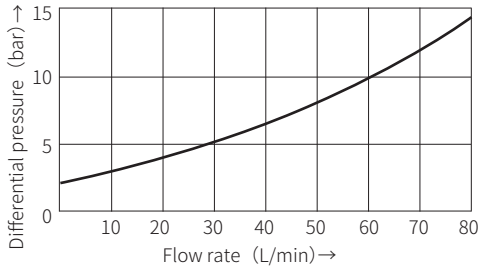
Δp-qv characteristic curve Z2FS6... -4XJ/2QV
Throttle setting in turns



Δp-qv characteristic curve Z2FS6... -4XJ/1QV
Throttle setting in turns



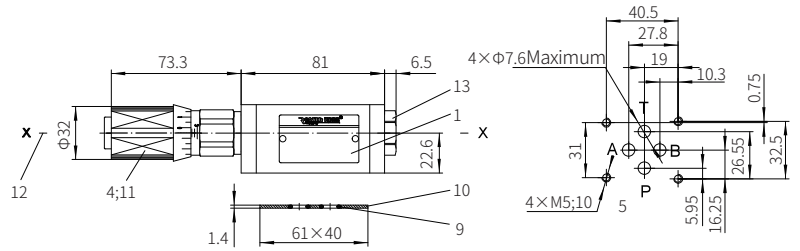
Δp-qv characteristic curve via check valve (throttle valve closed)



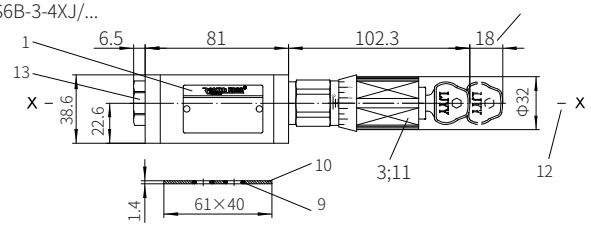
Component size

Size unit: mm

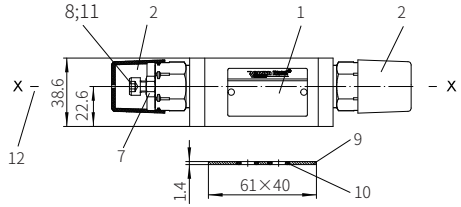
Model 2FS6A-7-4XJ/...

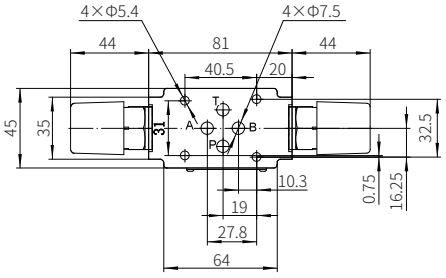


Model Z2FS6B-3-4XJ/...



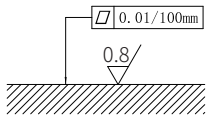
Model Z2FS6-2-4XJ/...





Valve fixing screw
M5-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
The length is determined by the stacking height and must be ordered separately.

1 Name plate
2 Adjustment form "2"
3 Adjustment form "3"
4 Adjustment form "7"
5 Space required to remove key
6 Mounting hole of valve
7 Locking nut S =10
8 Inner hexagonal adjusting screw S =5
9 O-ring 9.25x1.78 (for oil port P, A, B, T)
10 O-ring plate
11 For all adjustment forms
Turn anti-clockwise= increases flow
Turn clockwise= decreases flow
12 Rotate the valve 180 ° around the "X-X" axis to change it from meter-in to meter-out
13 End cover S = 22



Required surface finishing of mating components

Modular Restrictive Check Valve

Model: Z2FS10...3XJ

- ◆ Size 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 160 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Functional symbols	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- ● Modular type valve
- ● 3 types of adjustment elements
-Adjusting screw with inner hexagonal locknut and protective cap
-Lockable knob with scale
-Rotary knob with scale
- ● Used to limit the main flow or control flow of two working oil ports
- ● Used for meter-in or meter-out control

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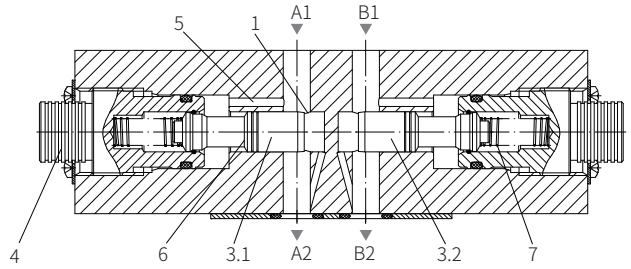
Function description, sectional drawing

The Z2FS10 type valve is a double throttle check valve with a stacked design.
This valve is used to limit the main flow or control flow of one or two working oil ports. Two symmetrically arranged throttle check valves limit the flow in one direction (by adjusting the throttle valve core) and allow free flow in the opposite direction.
For meter-in control the oil fluid flows from port A1 to A2 through the throttle port (1) which is made of the valve body (2) and throttle spool (3.1). The throttle spool (3.1) can be axially adjusted via the adjusting screw (4) to adjust throttle port (1). At the same time, the oil at port A1 flows through the oil hole to the spool (6) and results a pressure which force the throttle spool (3.1) in the throttle position together with the spring force.
The oil flowing back from the working oil port B2 opens the throttle spool (3.2) against the force of spring (7) to make the valve to act as a check valve and allow free-flow. According to the installation position of the valve, the throttling effect can be meter-in or meter-out control.
Main flow limit
To change velocity of the actuator (mains flow control), the double throttle/check valve is installed between the directional control valve and the subplate.
Control flow limit
In the pilot operated directional control valves, the double throttle/check valve is installed between the pilot valve and the main valve to control damping adjustment (control flow limit).



Model Z2FS10-5-3XJ/(meter-in control)

Models and specifications

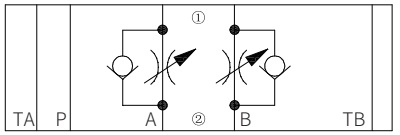
Z2FS | 10 | | - | 3X | J | | | *

modular restrictive check Valve =Z2FS
size 10 =10
throttle check valve, oil port A and B = -
throttle check valve, oil port A =A
throttle check valve, oil port B =B
adjusting elements
lockable knob with scale =3
Adjusting screw with inner hexagonal locknut and protective cap =5
Rotary knob with scale =7
30 to 39 series (30 to39 series installation and connection size unchanged) =3X
J= Rekith
S= meter-in control on side A (...A.-3X/S) meter-in control on side B (...B.-3X/S)
S2= meter-out control on side A (...A.-3X/S2) meter-out control on side B (...B.-3X/S2)
No code= NBR seals
V= FKM seals
(consult for other seals)
sealing material
more information in text

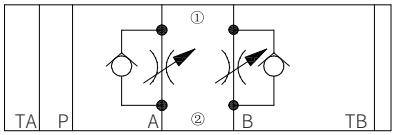
Functional symbols

(①=Valve side ②=Subplate side)

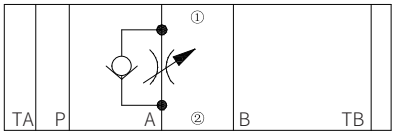
Model Z2FS10-...-3XJ/...(meter-in control)



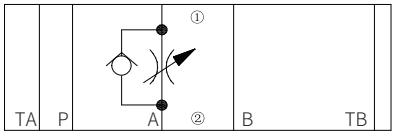
Model Z2FS10-...-3XJ/...(meter-out control)



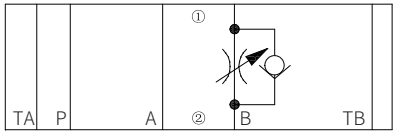
Model Z2FS10A-...-3XJ/...(meter-in control)



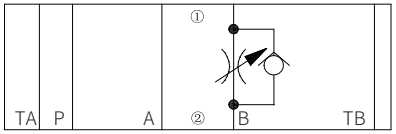
Model Z2FS10A-...-3XJ/...(meter-out control)



Model Z2FS10B-...-3XJ/...(meter-in control)



Model Z2FS10B-...-3XJ/...(meter-out control)



Technical parameters

Overview		
Installation position		Optional
Environment temperature range	°C	-30 to +50 (NBR seal)
		-20 to +50 (FKM seal)
Weight	kg	about 3.1
Hydraulic		
Maximum working pressure	bar	to 315
Maximum flow	L/min	160
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]
Pressure medium temperature range	°C	-20 to +80
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil[3]		The maximum allowable pollution level of oil is ISO4406 class 20 / 18 / 15

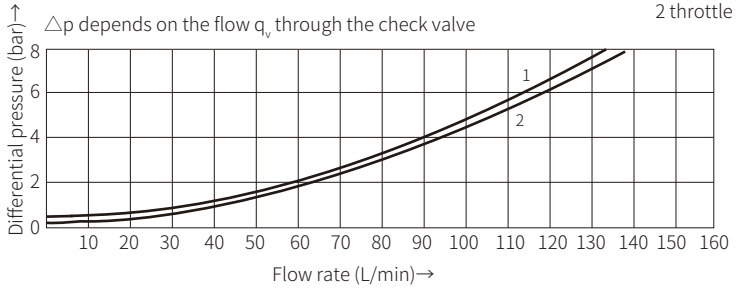
1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

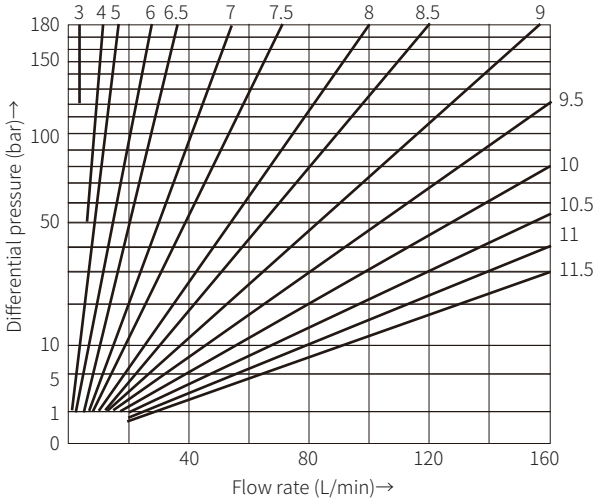
(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

1 throttle valve closed
2 throttle valve opened

△p depends on the flow q_v through the check valve



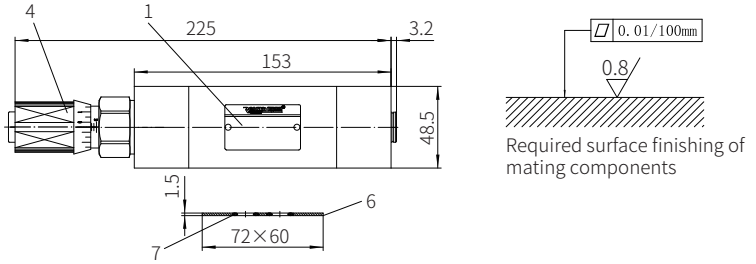
The pressure drop △p depends on the flow q_v at a constant throttle setting



Component size

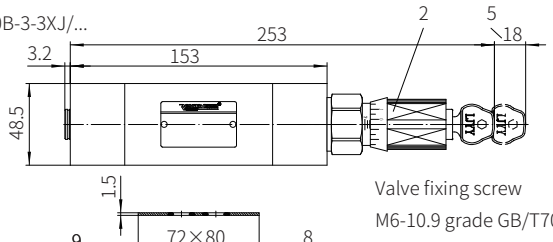
Size unit: mm

Model Z2FS10A-7-3XJ/...



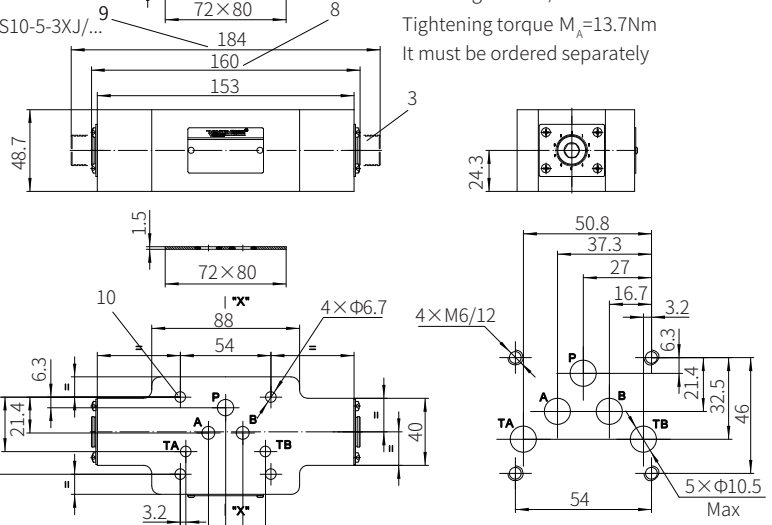
Required surface finishing of mating components

Model Z2FS10B-3-3XJ/...



Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm
It must be ordered separately

Model Z2FS10-5-3XJ/...



1 Name plate
2 Adjustment form“3”
3 Adjustment form“5”
4 Adjustment form“7”
5 Space required to remove key
6 O-ring plate
7 O-ring 12x2
8 Size for valve with minimum throttle port
9 Size for valve with maximum throttle port
10 Valve fixing screw hole
11 Rotate the valve 180 ° around the X-X axis to change it from meter-in to meter-out

Modular Restrictive Check Valve

Model: Z2FS16...3XJ

- Size 16
- Maximum working pressure 315 bar
- Maximum working flow 250 L/min

Contents

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Characteristic curve	04
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Features

- Modular type valve
- Used to limit the main flow or control flow of two working oil ports
- Used for meter-in or meter-out control

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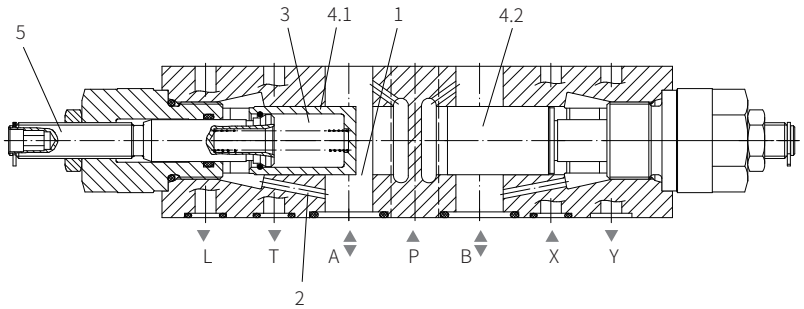
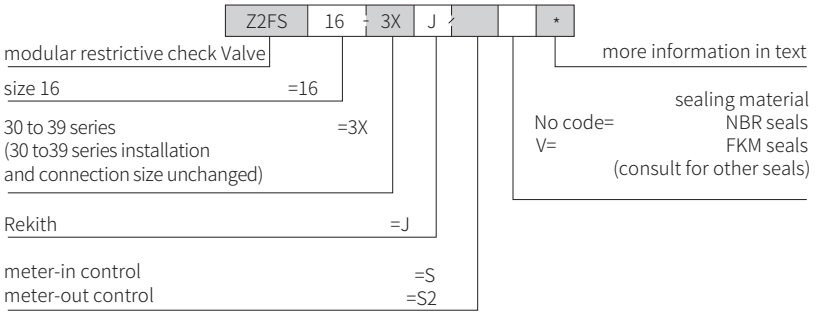
Function description, sectional drawing

The Z2FS16 type valve is a double throttle check valve with a stacked design.
This valve is used to limit the main flow or control flow of one or two working oil ports. Two symmetrically arranged throttle check valves limit the flow in one direction (by adjusting the throttle valve core) and allow free flow in the opposite direction.
For meter-in control the oil fluid flows from oil port A to working oil port through the throttle port (1). The throttle spool (4.1) can be axially adjusted via the adjusting screw (5) to adjust throttle port (1) . At the same time, the oil at port A flows through the channel (2) to the spring loading side (3) of the throttle spool (4.1), and results a pressure which force the throttle spool (4.1) in the throttle position together with the spring force.
The fluid flows back from the actuator to push the throttle spool (4.2) to allow oil flow freely and the valve acts as a check valve at this time. Depending on the model (S or S2), the throttle effect can be meter-in or meter-out control.



Model Z2FS16-3XJ/S...(meter-in control)

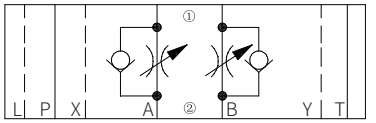
Models and specifications



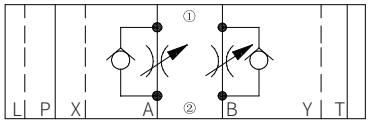
Functional symbols

(①=Valve side ②=Subplate side)

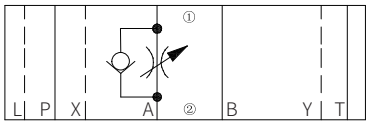
Model Z2FS16-...-3XJ/S...(meter-in control S)



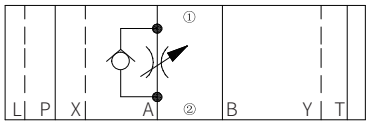
Model Z2FS16-...-3XJ/S2...(meter-out control S2)



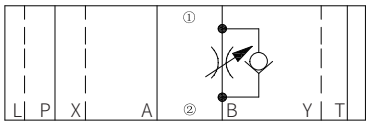
Model Z2FS16A-...-3XJ/S...(meter-in control S)



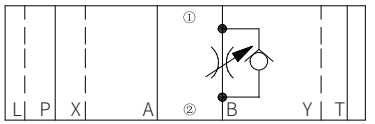
Model Z2FS16A-...-3XJ/S2...(meter-out control S2)



Model Z2FS16B-...-3XJ/S...(meter-in control S)



Model Z2FS16B-...-3XJ/S2...(meter-out control S2)



Technical parameters

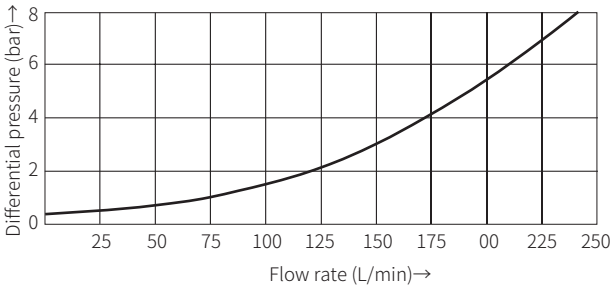
Overview		
Installation position		Optional
Environment temperature range	°C	-30 to +50 (NBR seal)
		-20 to +50 (FKM seal)
Weight	kg	about 4.7
Hydraulic		
Maximum working pressure	bar	to 315
Maximum flow	L/min	to 250
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]
Pressure medium temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	2.8 to 380
Cleanliness of oil[3]		The maximum allowable pollution level of oil is ISO4406 class 20 / 18 / 15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

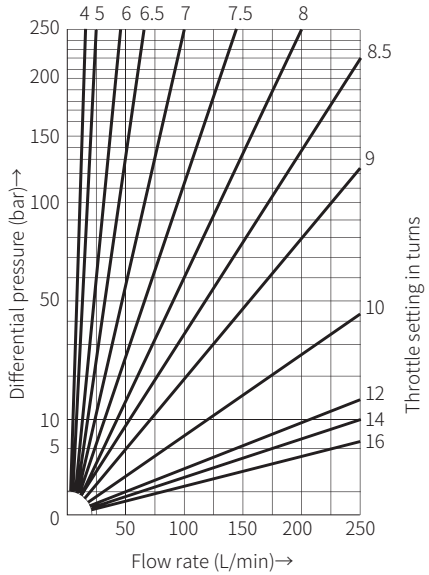
Characteristic curve

(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

The pressure drop △p depends on the flow q_v through the check valve



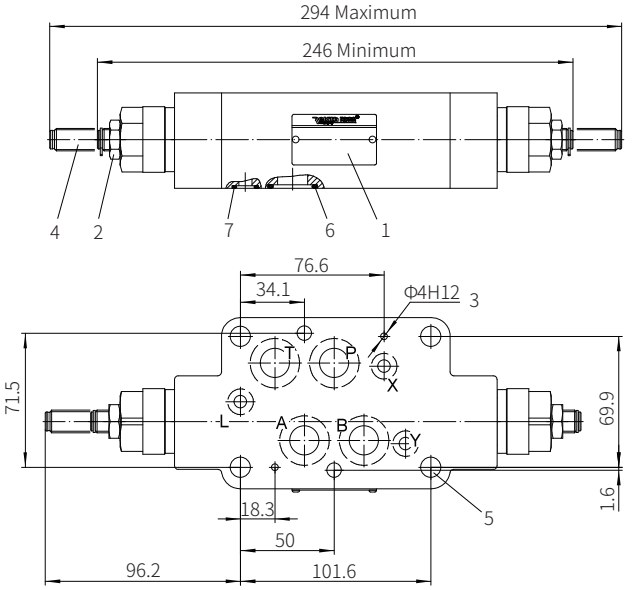
The pressure drop △p depends on the flow q_v at a constant throttle setting



Component size

Size unit: mm

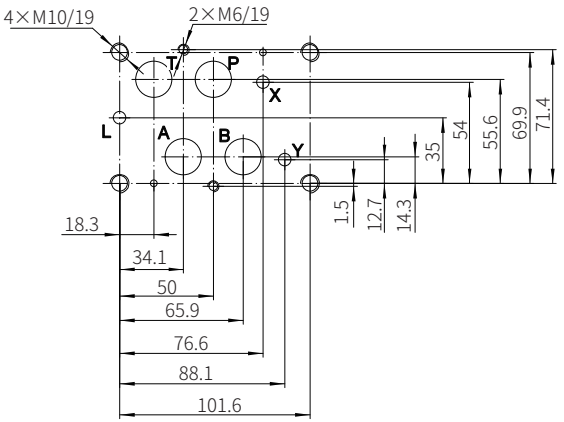
Model Z2FS16...-3XJ/...



Required surface finishing of mating components

Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm
M10-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
It must be ordered separately

1 Name plate
2 Hexagon nut, SW=19
3 Two locating pin holes
4 Screw for changing flow cross-section
(Inner hexagon screw, S=6)
Turn anti-clockwise= increases flow
Turn clockwise= decreases flow
5 Valve fixing screw hole
6 O ring 21.89x2.62
(for oil port P, A, B, T)
7 O ring 12x2
(for oil port X, Y, L)



03

Modular Restrictive Check Valve

Model: Z2FS22...3XJ

- ◆ Size 22
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 360 L/min

Contents

Function description, sectional drawing	02
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Technical parameters	03
Characteristic curve	04
Component size	05

Features

- ● Modular type valve
- ● Used to limit the main flow or control flow of two working oil ports
- ● Used for meter-in or meter-out control

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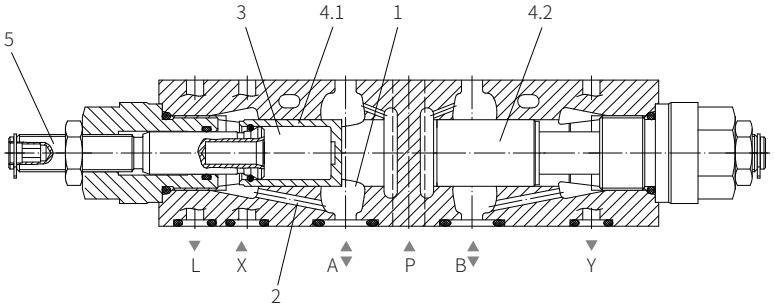
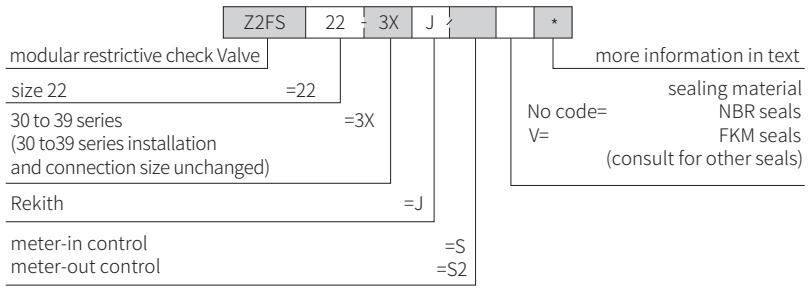
Function description, sectional drawing

The Z2FS22 type valve is a double throttle check valve with a stacked design.
This valve is used to limit the main flow or control flow of one or two working oil ports. Two symmetrically arranged throttle check valves limit the flow in one direction (by adjusting the throttle valve core) and allow free flow in the opposite direction.
For meter-in control the oil fluid flows from port A to working oil port through the throttle port (1). The throttle spool (4.1) can be axially adjusted via the adjusting screw (5) to adjust throttle port (1) . At the same time, the oil at port A flows through the channel (2) to spring loading side (3) of the throttle spool (4.1), and results a pressure which force the throttle spool (4.1) in the throttling position together with the spring force.
The fluid flows back flow from the actuator to push the throttle spool (4.2) to allow oil flow freely and the valve acts as a check valve at this time. Depending on the model (S or S2), the throttle effect can be meter-in or meter-out control.
Main flow limit
To change velocity of the actuator, the double throttle check valve is installed between the subplate and the directional valve.



Model Z2FS22-3XJ/S... (meter-in control)

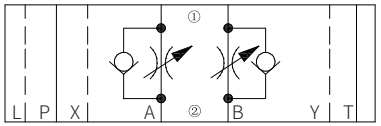
Models and specifications



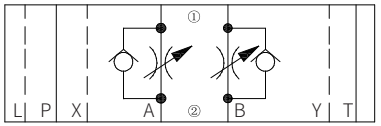
Functional symbols

(①=Valve side ②=Subplate side)

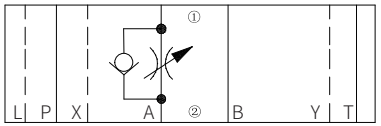
Model Z2FS22-...-3XJ/S...(meter-in control S)



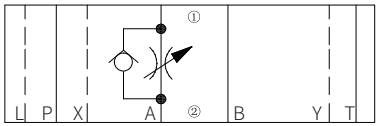
Model Z2FS22-...-3XJ/S2...(meter-out control S2)



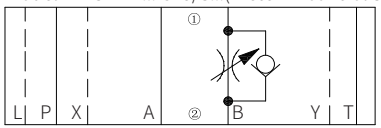
Model Z2FS22A-...-3XJ/S...(meter-in control S)



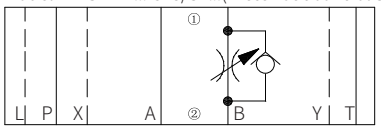
Model Z2FS22A-...-3XJ/S2...(meter-out control S2)



Model Z2FS22B-...-3XJ/S...(meter-in control S)



Model Z2FS22B-...-3XJ/S2...(meter-out control S2)



Technical parameters

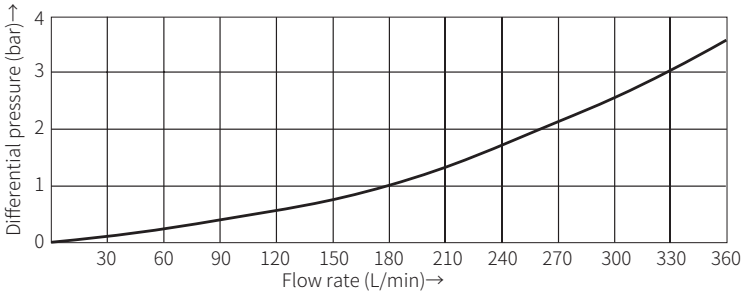
Overview		
Installation position		Optional
Environment temperature range	°C	-30 to +50 (NBR seal)
		-20 to +50 (FKM seal)
Weight	kg	about 8
Hydraulic		
Maximum working pressure	bar	to 315
Maximum flow	L/min	to 360
Oil fluid		Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]
Pressure medium temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	2.8 to 380
Cleanliness of oil[3]		The maximum allowable pollution level of oil is ISO4406 class 20 / 18 / 15

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

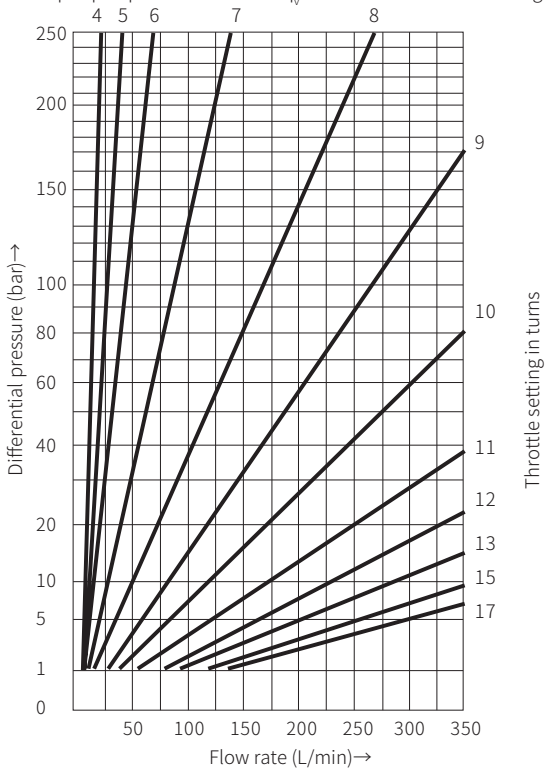
Characteristic curve

(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

The pressure drop △p depends on the flow q_v through the check valve



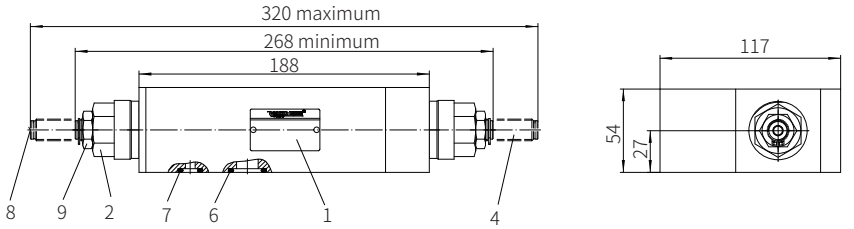
The pressure drop △p depends on the flow q_v at a constant throttle setting

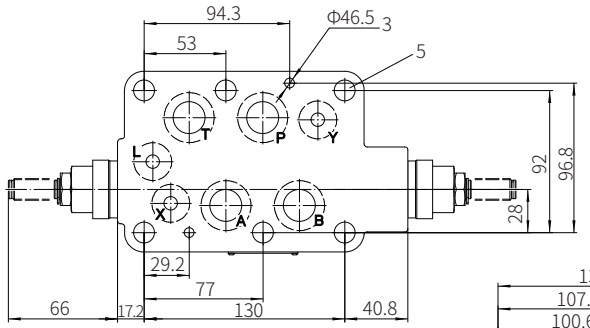


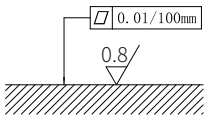
Component size

Size unit: mm

Model Z2FS22...-3XJ/...







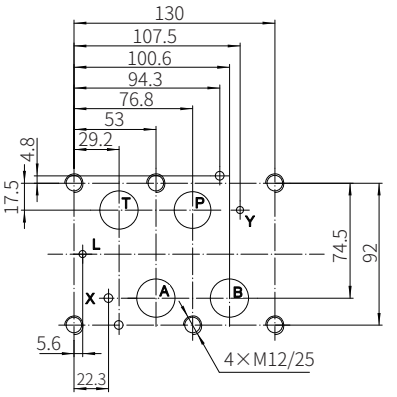
Required surface finishing of mating components

Valve fixing screw

M12-10.9 grade GB/T70.1-2000

Tightening torque M_A=95Nm

It must be ordered separately



1 Name plate
2 Hexagon nut, SW=22
3 Two locating pin holes
4 Screw for changing flow cross-section
Turn anti-clockwise= increases flow
Turn clockwise= decreases flow

5 Valve fixing screw hole
6 O ring 27×3
(for oil port P, A, B, T)
7 O ring 19×3
(for oil port X, Y, L)
8 Inner hexagon screw, S=6

03

Restrictor Valve/Check Restrictor Valve

Model: DV(P)/DRV(P)...1XJ

- ◆ Size 6 to 30
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 375 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Technical parameters	03
Characteristic curve	04
Component size	05-07

Features

- ● Subplate mounting
- ● Threaded connection
- ● Adjusting spool in closed position without leakage from port A to port B

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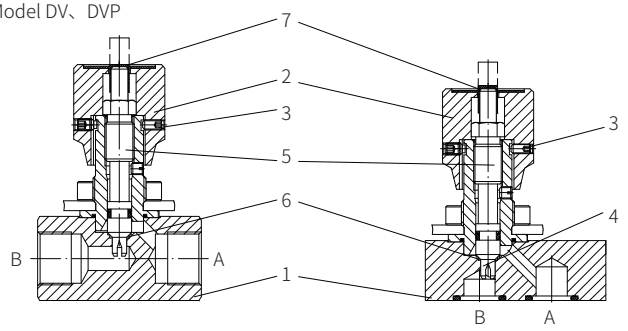
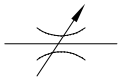
Function description, sectional drawing

The DV(P) type restrictor valve is used to set the precise oil flow, and also can be used as a shut-off valve.
The DRV (P) type check restrictor valve is used to set precise oil flow in one direction and allow oil to flow back freely in the opposite direction. It is composed of valve body (1) and adjusting knob (2) with locking device (3).
When turning the adjusting knob (2) anticlockwise, the spindle (4) with throttle rod (5) decreases the flow cross section (6) until it is completely closed without leakage. The area of coloured triangle (7) indicates how far the valve is open (the larger the coloured triangle is and the greater the opening is).
The setting flow is fixed by locking device (3).

Model DV、DVP

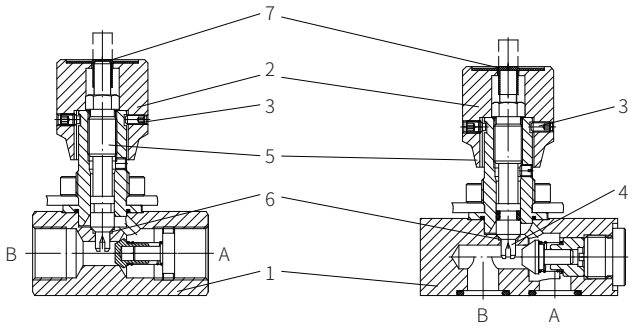


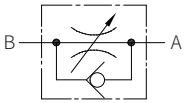
Functional symbol



Model DV

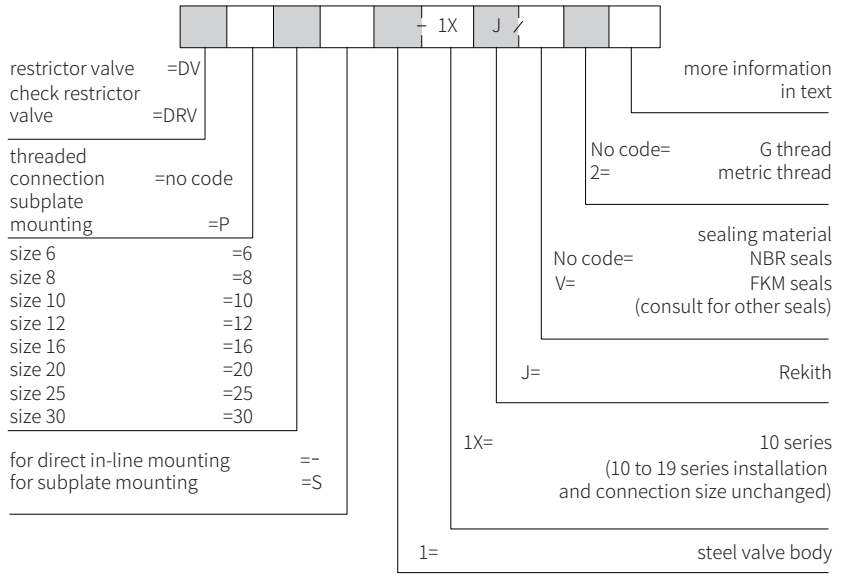
Model DRV、DRVP





Model DRV

Models and specifications



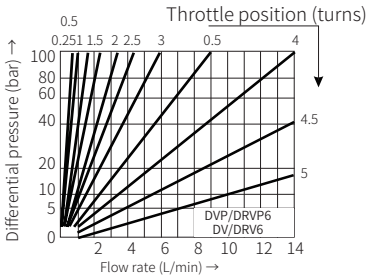
Technical Parameters

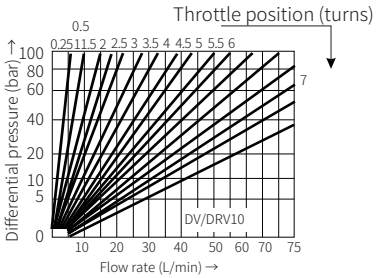
size		6	8	10	12	16	20	25	30
Maximum working pressure (bar)		350							
Cracking pressure of check valve (bar)		0.5							
Weight (kg)	DV	0.12	0.25	0.40	0.70	1.20	2.10	2.80	3.50
	DVP	0.25	0.45	0.75	1.00	2.40	3.60	6.00	10.90
	DRV	0.13	0.30	0.45	0.80	1.30	2.40	3.50	4.60
	DRVP	0.26	0.50	0.80	1.10	2.50	3.90	6.70	11.00
Hydraulic oil		Mineral oils according to DIN 51524 and 51525: Phosphate esters							
oil temperature range (°C)		-30 to +80 (NBR seal) -20 to +80 (FKM seal)							
Viscosity range (mm^2/s)		2.8 to 500							
Installation position		Optional							

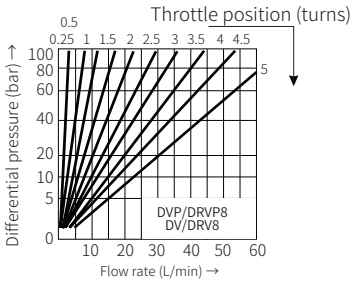
Characteristic curve

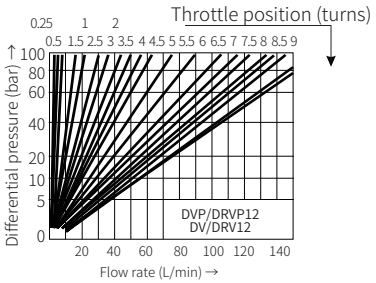
(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

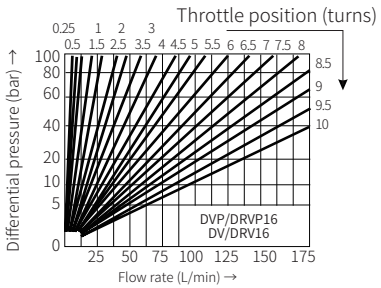
Flow direction: A to B, the relationship between differential pressure △P and flow Q at the fixed throttle position

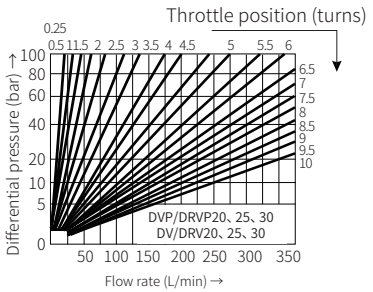




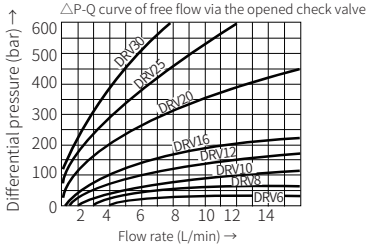








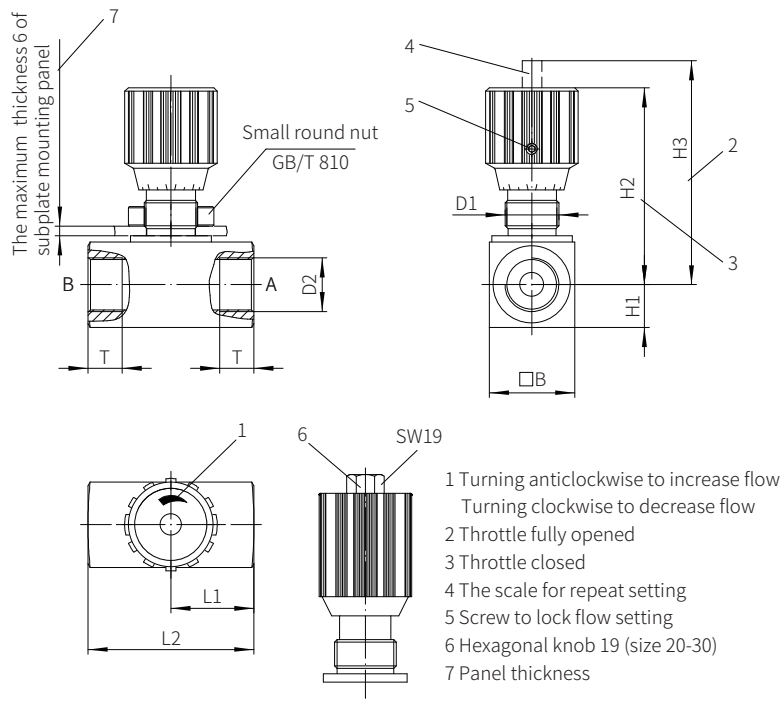
Model DRV
Flow direction: B to A
△P-Q curve of free flow via the opened check valve



Component size

Size unit: mm

Threaded connection (Model DV/DRV)



1 Turning anticlockwise to increase flow
Turning clockwise to decrease flow
2 Throttle fully opened
3 Throttle closed
4 The scale for repeat setting
5 Screw to lock flow setting
6 Hexagonal knob 19 (size 20-30)
7 Panel thickness

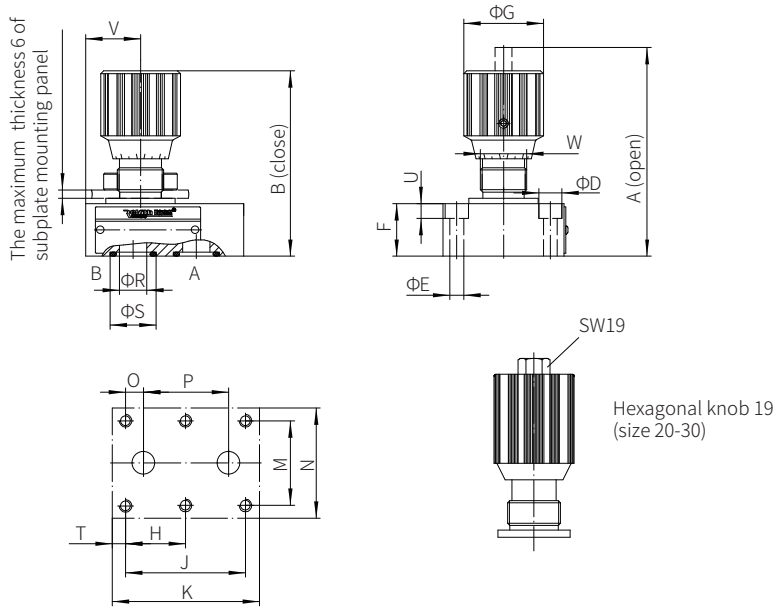
Note: For size L1 and L2, the left is size for DV, the right is size for DRV.

Size	□B	D1	D2		T	H1	H2	L1		L2	
6	16	M14X1.5	G1/8"	M10X1	8	8	53.5	19	26	38	45
8	25	M18X1.5	G1/4"	M14X1.5	12	12.5	66.8	24	33.5	48	55
10	30	M18X1.5	G3/8"	M18X1.5	12	15	69.3	29	41	58	65
12	35	M22X1.5	G1/2"	M22X1.5	14	17.5	80.7	34	44	68	73
16	45	M22X1.5	G3/4"	M27X2	16	22.5	85.7	39	57	78	88
20	50	M33X2	G1"	M33X2	18	25	135.6	54	77	108	127
25	60	M33X2	G11/4"	M42X2	20	30	140.6	54	93	108	143
30	70	M33X2	G11/2"	M48X2	20	35	145.6	54	108	108	143

Component size

Size unit: mm

Subplate mounting (Model DVP)



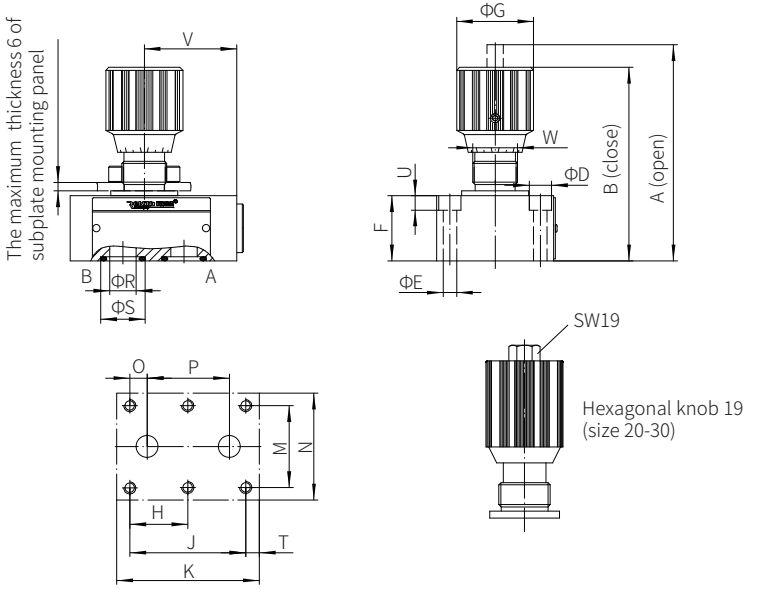
Size	A	B	D	E	F	G	H	J	K	M
6	70.5	63.5	11	6.6	18	24	-	19	35	28.5
8	82.2	74.3	11	6.6	20	24	-	35	47.5	33.5
10	87.2	79.2	11	6.6	25	29	-	33.5	51	38
12	100.2	88.2	11	6.6	25	29	-	38	75	44.5
16	105	93.2	14	9	30	38	38	76	93.5	54
20	166.6	115.6	14	9	45	38	47.5	95	111	60
25	166.6	115.6	18	11.5	45	49	60	120	143	76
30	171.6	160.6	20	14	50	49	71.5	143	171	92

Size	N	O	P	R	S	T	U	V	W
6	41.5	1.6	16	5	12.2	8	7	11	M14X1.5
8	46	4.5	25.5	7	13.7	6.5	7	13.5	M18X1.5
10	51	4	25.5	10	15.7	8.5	7	16	M18X1.5
12	57.5	4	30	13	21.8	18.5	7	26	M22X1.5
16	70	11.4	54	16	24.5	8.5	9	23.5	M22X1.5
20	76.5	19	57	22	31.5	8	9	34	M33X2
25	100	20.6	79.5	28.5	39.2	11	11	45	M33X2
30	115	23.8	95	31	41	15	13	39	M33X2

Component size

Size unit: mm

Subplate mounting (Model DRVP)



Size	A	B	D	E	F	G	H	J	K	M
6	75.5	68.5	11	6.6	23	24	-	19	41.5	28.5
8	86.2	78.3	11	6.6	24	24	-	35	63.5	33.5
10	89.2	81.2	11	6.6	27	29	-	33.5	70	38
12	107.2	95.2	11	6.6	32	29	-	38	80	44.5
16	120	108.2	14	9	45	38	38	76	104	54
20	171.6	120.6	14	9	50	38	47.5	95	127	60
25	179.6	128.6	18	11	58	49	60	120	165	76
30	196.6	185.6	20	14	75	49	71.5	143	188	92

Size	N	O	P	R	S	T	U	V	W
6	41.5	1.6	16	6	12.2	16.1	8	29.5	M14X1.5
8	46	4.5	25.5	8	13.7	14.3	10	42.5	M18X1.5
10	51	4	25.5	10	15.7	18.5	7	45	M18X1.5
12	57.5	4	30	13	21.8	21	7	45.5	M22X1.5
16	70	11.4	54	17	24.5	16	12	54	M22X1.5
20	76.5	19	57	22	31.5	30	12	70	M33X2
25	100	20.6	79.5	28.5	39.2	28	13	83	M33X2
30	115	23.8	95	31	41	42.5	13	87.5	M33X2

Two Ways Flow Control Valve

Model: 2FRM5...3XJ

- Size 5
- Maximum working pressure 210 bar
- Maximum working flow 15 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Characteristic curve	03
Component size	04

Features

- Optional pressure compensator stroke limiter
- Start-up jump reduction
- Lockable knob
- Flow control in both direction by means of rectifier sandwich plate

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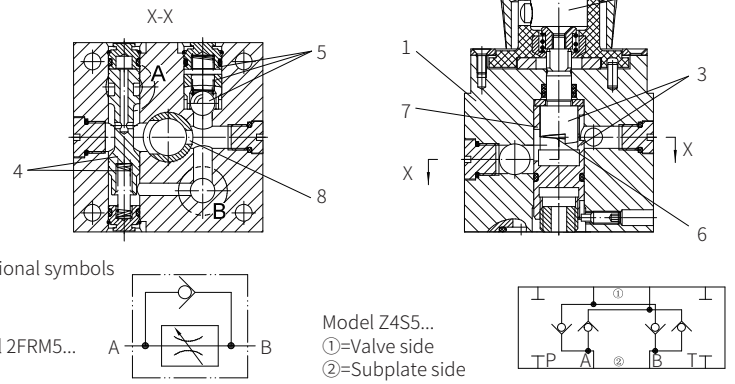
Function description, sectional drawing

2FRM model flow valve is two ways flow control valve. This valve mainly includes the valve body (1), the adjusting element (2), the throttle body (3), optional pressure compensator (4) with stroke limiter and check valve (5), it is used for the throttling of the flow from A to B at throttle port (6).
The curve bolt (7) can adjust the throttling cross section. The pressure compensator needs to be connected to keep the flow constant at the throttle port (8) and without affection of pressure. The orifice is designed with sharp edges, so the throttling is not easily affected by temperature. The free flow return from B to A is via the check valve (5).
The rectifier sandwich plate Z4S5-1XJ/ is installed under the flow valve to control the flow in both directions of the flow valve.



Models and specifications

Two ways flow control valve

2FRM5 - 3X / J / *

3X series (30 to 39 series installation and connection size unchanged) =3X
rekith =J

nonlinearity
0.2L/min=0.2Q
0.6L/min=0.6Q
1.2L/min=1.2Q
3L/min=3Q
6L/min=6Q

nonlinearity
10L/min=10Q
15L/min=15Q

flow direction A → B

No code = pressure compensator, without stroke limiter
B= pressure compensator, witht stroke limiter

more information in text

sealing material
No code = NBR seals
V= FKM seals
(consult for other seals)

Rectifier sandwich plate

Z4S5 - 1X / J / *

1X series (10 to 19 series installation and connection size unchanged) =1X
rekith =J

more information in text

sealing material
No code = NBR seals
V= FKM seals
(consult for other seals)

Technical parameters

Oil fluid	Mineral hydraulic oil or phosphate ester hydraulic oil
Oil temperature range °C	-30 to +80 (NBR seals)
	-20 to +80 (FKM seals)
Viscosity range mm^2/s	10 to 800

Rectifier sandwich plate

Rated flow	L/min	15
Working pressure	bar	to 210
Cracking pressure	bar	1
Weight	kg	0.6

Two ways flow control valve

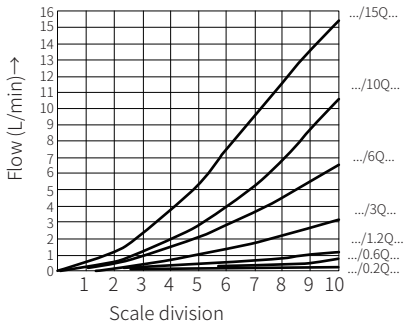
Maximum flow	L/min	0.2	0.6	1.2	3.0	6.0	10.0	15.0
△P with free return flow B → A qv-dependent	bar	0.5	0.5	0.6	0.9	1.8	3.6	6.7
Flow control: Temperature stability		±5%	±3%	±2%				
Flow control: Pressure stability (to △P=210)	bar	±2%					±4%	
Working pressure at port A	bar	to 20						
Minimum pressure drop	bar	3 to 5					6 to 8	
Degree of contamination	µm	25(Q<5L/min)		10(Q<0.5L/min)				
Weight	kg	1.6						

For the application of other technical conditions, please consult us.

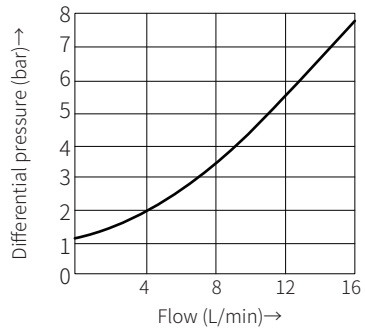
Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

Scale value A→B:



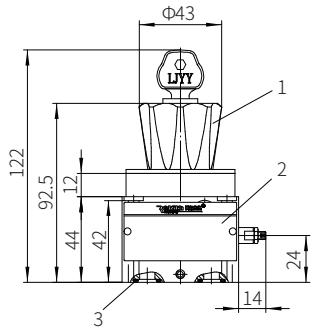
Pressure drop of the rectifier sandwich plate

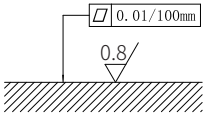


Component size

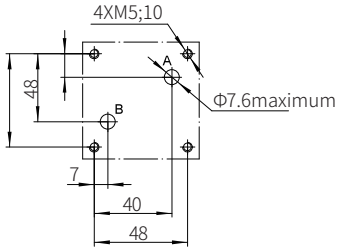
Size unit: mm

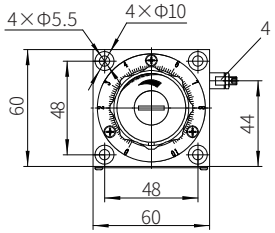
Model 2FRM5-3XJ/...





Required surface finishing of mating components



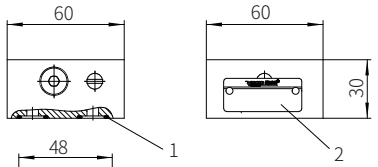


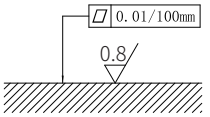
O ring 12x2 (for oil port A, B)
M5x50-10.9 stage GB/T70.1-2000
Tightening torque M_A=7.8Nm
Subplate model:
G44/01(G1/4") ; G44/02(M14x1.5)
G45/01(G1/2") ; G45/02(M22x1.5)

Component size

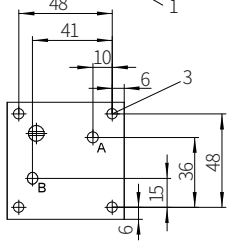
Size unit: mm

Model Z4S5-1XJ/...





Required surface finishing of mating components



1 O ring 12x2 (for oil port A, B)
2 Name plate
3 Valve fixing screw hole

Two Ways Flow Control Valve

Model: 2FRM6...3XJ

- Size 6
- Maximum working pressure 315 bar
- Maximum working flow 32 L/min

Contents

Function description, sectional drawing	02-03
Functional symbols	03-04
Models and specifications	04
Technical parameters	05
Characteristic curve	06
Component size	07-08

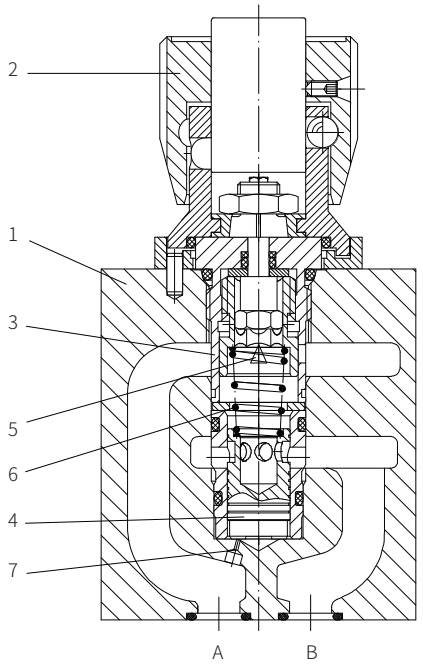
Features

- Optional pressure compensator closed externally
- Subplate mounting
- Optional check valve
- Rotary knob with scale
- Optional lock

Function description, sectional drawing

The 2FRM6 flow control valve is a two-way flow control valve. It is used to keep the constant flow and independent of pressure and temperature. The valve mainly consists of the valve body (1), rotary knob (2), orifice (3), pressure compensator (4) and an optional check valve.

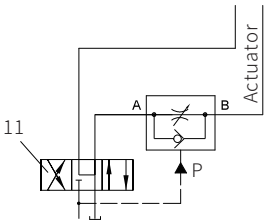
Flow control valve model: 2FRM6B... -3X/ ...MV
(without external closing, without check valve)
The flow from the oil port A to B is throttled at the throttle position (5). The throttle cross-section is adjusted by turning the rotary knob (2). In order to keep the flow constant and independent of pressure, a pressure compensator (4) is required to be installed in port B downstream of the throttle position (5).
The compression spring (6) presses the orifice (3) and pressure compensator (4) to their limited positions respectively and thus keeps the pressure compensator (4) in the open position when there is no flow through the valve. When the fluid flows through the valve, the pressure at port A acts to the pressure compensator (4) through the orifice (7). The pressure compensator (4) moves to the compensation position until force balance. If the pressure in oil port A increases, the pressure compensator (4) moves to the closed direction until the force balance is reached again.
Because the pressure compensator continuously acts as compensation, the flow can be maintained. In order to control the flow in both directions, the rectifier sandwich plate Z4S6 can be installed under the flow control valve.

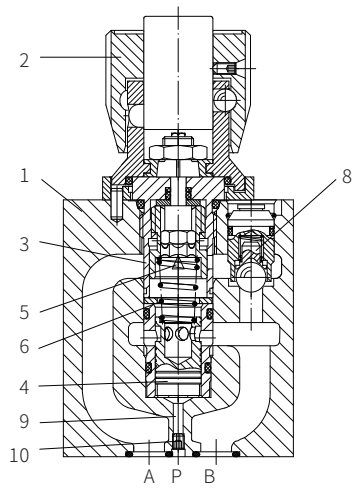


Model 2FRM6B76-3XJ/...M

Function description, sectional drawing

This flow valve is provided with the possibility of an external closing of the pressure compensator (4) through channel P(9).
The external pressure acting in the channel (9) via orifice (10) to hold the pressure compensator (4) closed against the force of the spring (6). When the direction valve (11) in the middle position is switched from P to B, the valve can be used same load compensation function as model 2FRM6B to avoid the jump at start-up. This version with external closing of the compensator can only be used for the supply control. The fluid flows freely from port B to A through the check valve (8).

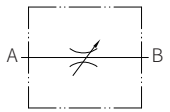
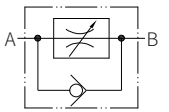
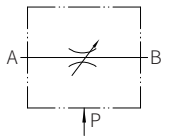
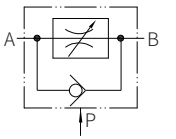




Model 2FRM6A76-3XJ/...R

Functional symbols

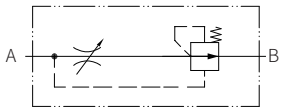
Two ways flow control valve (simplified)

Without check valve without external closing	With check valve without external closing	Without check valve with external closing	With check valve with external closing
			
Model 2FRM6B...-3XJ/...M	Model 2FRM6B...-3XJ/...R	Model 2FRM6A...-3XJ/...M	Model 2FRM6A...-3XJ/...R

Functional symbols

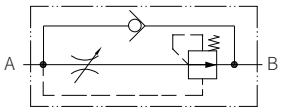
Two-way flow control valve (detailed)

Without check valve
without external closing



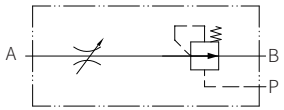
Model 2FRM6B...-3XJ/...M

With check valve
without external closing



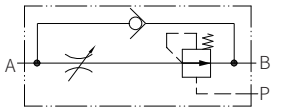
Model 2FRM6B...-3XJ/...R

Without check valve
with external closing



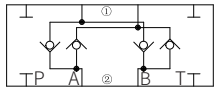
Model 2FRM6A...-3XJ/...M

With check valve
with external closing



Model 2FRM6A...-3XJ/...R

Rectifier sandwich plate (①= Valve side, ②= Subplate side)



Model Z4S6-1XJ...

Models and specifications

Two ways flow control valve

2FRM | 6 | | | 6 - 3X | J / | | | V | | *

- two ways flow control valve
- size 6 =6
- with external closing of the pressure compensator (suppression of jump at start) =A
- without external closing of the pressure compensator =B
- adjusting element
  - lockable rotary knob with scale =3
  - rotary knob with scale =7
- zero position of marking at oil port P =6
- 30 to 39 series =3X
  (30 to 39 series installation and connection size unchanged)
- Rekith =J
- more information in text
- No code= / /60= no locating pin holes / with locating pin holes
- sealing material
  - No code = NBR seals
  - V= FKM seals
  - (consult for other seals)
- R= with check valve
- M= without check valve
- flow (A→B)
  - 0.2Q= to 0.2L/ min
  - 0.6Q= to 0.6L/ min
  - 1.5Q= to 1.5L/ min
  - 3Q= to 3.0L/ min
  - 6Q= to 6.0L/ min
  - 10Q= to 10.0L/min
  - 16Q= to 16.0L/ min
  - 25Q= to 25.0L/ min
  - 32Q= to 32.0L/ min

Models and specifications

Rectifier sandwich plate

Z4S6 - 1X | J / | *

- rectifier sandwich plate size 6
- 1X series (10 to 19 series installation and connection size unchanged) =1X
- Rekith =J
- more information in text
- sealing material
  - No code = NBR seals
  - V= FKM seals
  - (consult for other seals)

Technical parameters

Installation position				optional						
Environment temperature range			℃	-20 to +50						
Weight	2FRM 6 A...; 2FRM 6 B...		Kg	about 1.3						
	2FRM 6 SB		Kg	about 1.5						
Hydraulic										
Maximum working pressure oil port A			bar	315						
Differential pressure for free flow from B to A				See characteristic curve						
Minimum pressure drop			bar	6 to 14						
Pressure stability at 315bar			%	$\pm 2(q_{v\,max})$						
Flow	$q_{v\,max}$		L/min	0.2	0.6	1.5	3.0	6.0	10.0	16.0	25.0	32.0
	$q_{v\,min}$	to 100 bar	cm^3/min	15	15	15	15	25	50	70	100	250
	$q_{v\,min}$	to 315 bar	cm^3/min	25	25	25	25	25	50	70	100	250
Oil fluid				Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1] HEPG(Polyethylene glycol)[2] HEES (synthetic ester)[2]								
Oil fluid temperature range			℃	-20 to +80						
Viscosity range			mm^2/s	10 to +800						
Cleanliness of oil				The maximum allowable pollution level of oil is ISO4406 Class 20/18/15						

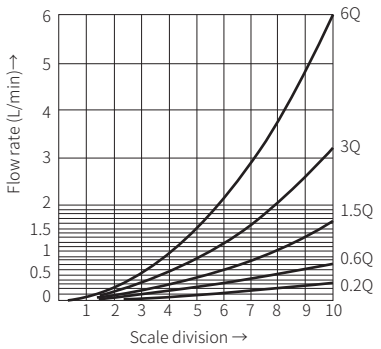
1) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

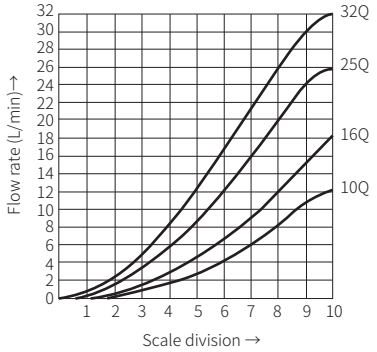
Attention! There is a significant loss of pressure from port P of the valve to port A of the flow control valve.

Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

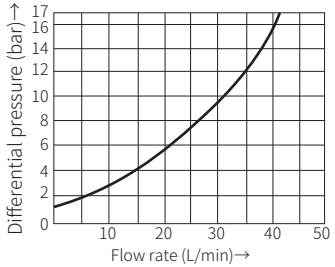
Relationship between flow and set scale (flow control from A to B)



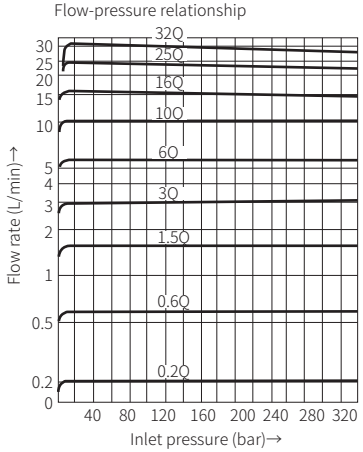


△ p- q_v- Characteristic curve B to A

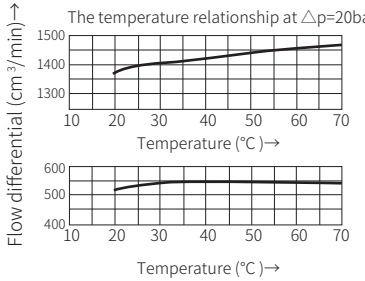
throttle valve closed

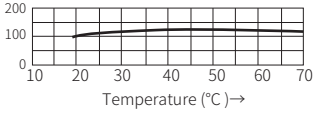


Flow-pressure relationship



The temperature relationship at △p=20bar

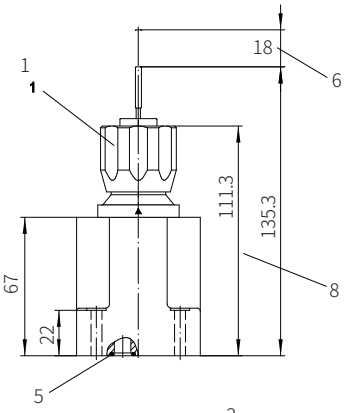


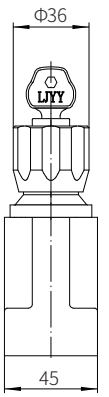


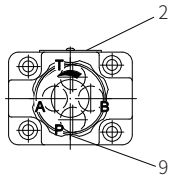
Component size

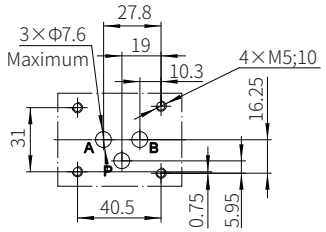
Size unit: mm

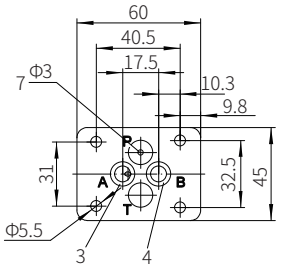
Model 2FRM6...-3XJ/...

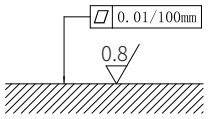












Required surface finishing of mating components

1 Lockable rotary knob with scale (adjusting form “3”)
2 Name plate
3 Inlet oil port “A”
4 Outlet oil port “B”
5 O-ring 9.25x1.78 (for oil port A, B, P, T)
6 Space required to remove key
7 Hole for model 2FRM6B is not drilled (without external connection)
8 Rotary knob with scale (adjusting form “7”)
9 Position of the marking at port P

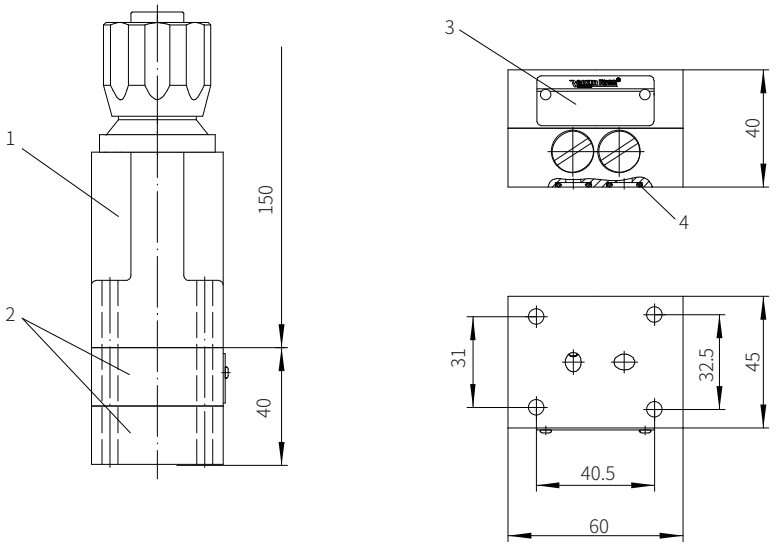
Valve fixing screw
Without rectifier sandwich plate
M5×30-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm
With rectifier sandwich plate
M5x70-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Subplate model:
G341/01 (G1/4")
G342/01 (G3/8")
G502/01 (G1/2")

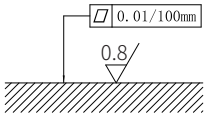
Component size

Size unit: mm

Rectifier sandwich plate Z4S6-1XJ/...



1 2-way flow control valve
2 Rectifier sandwich plate
3 Name plate
4 O-ring 9.25x1.78(for oil port A、B)



Required surface finishing
of mating components

Attention:

The rectifier sandwich plate type Z4S6-1XJ/... can not be connected with the flow control valve 2FRM6A...-3XJ/... with external connection of the pressure compensator.

Two Ways Flow Control Valve

Model: 2FRM...2XJ

- Size 10 to 16
- Maximum working pressure 315 bar
- Maximum working flow 160 L/ min

Contents

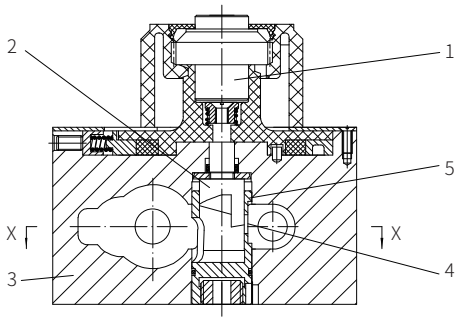
Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Characteristic curve	05
Component size	06-07

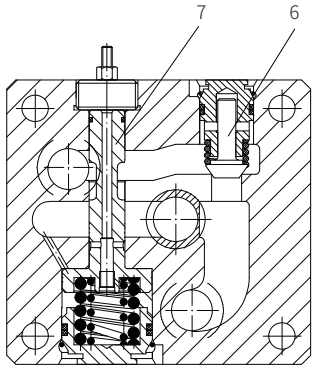
Features

- Optional pressure compensator stroke limiter
- Start-up jump reduction
- Lockable knob
- Flow control in both direction by means of rectifier sandwich plate

Function description, sectional drawing

2FRM model flow valve is two ways flow control valve which is composed of the pressure reducing valve and the throttle valve in series.
When the oil fluid flows into the valve, it is reduced pressure through the pressure reducing valve first and then throttled by the throttle valve. The flow of the flow valve is stable and unaffected by load changing because of the pressure compensation provided from the pressure reducing valve to the throttle valve. At the same time, the orifice is designed into thin blade shape to make little influence to the flow by temperature changing. When the flow valve and check valve is connected in parallel, the oil fluid can flow back in the opposite direction.
The rectifier sandwich plate Z4S is installed under the flow valve, it can stabilize the flow in both directions of the flow valve.





X-X section

1 Adjusting element
2 Throttle rod
3 Valve body
4 Orifice
5 Valve sleeve
6 Check valve
7 Reducing valve

Models and specifications

Two ways flow control valve

2FRM – 2X J / *

size 10 =10
size 16 =16

2X series, (20 to 29 series installation and connection size unchanged) =2X

Rekith =J

flow range A → B

size 10 linear	to 2L/min	=2L
	to 5L/min	=5L
	to 10L/min	=10L
	to 16L/min	=16L
	to 25L/min	=25L
	to 35L/min	=35L
	to 50L/min	=50L
size 16 linear	to 40L/min	=40L
	to 60L/min	=60L
	to 80L/min	=80L
	to 100L/min	=100L
	to 125L/min	=125L
	to 160L/min	=160L

more information in text

sealing material
No code = NBR seals
V= FKM seals
(consult for other seals)

No code= pressure compensator, without stroke limiter
B= pressure compensator, witht stroke limiter

Rectifier sandwich plate

Z4S – 1X J / *

size 10 =10
size 16 =16

1X series (10 to 19 series installation and connection size unchanged) =1X

Rekith =J

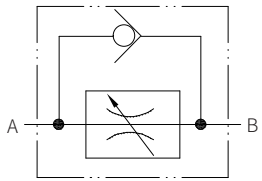
more information in text

sealing material
No code = NBR seals
V= FKM seals
(consult for other seals)

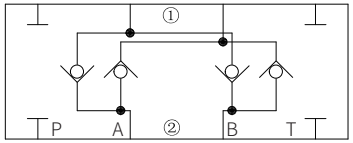
Functional symbols

(①=Valve side ②=Subplate side)

Model 2FRM...



Model Z4S...



Technical parameters

Overview

Oil fluid	Mineral hydraulic oil or phosphate ester hydraulic oil
Oil temperature range °C	-30 to +80 (NBR seals) -20 to +80 (FKM seals)
Viscosity range mm^2/s	10 to 800

Rectifier sandwich plate

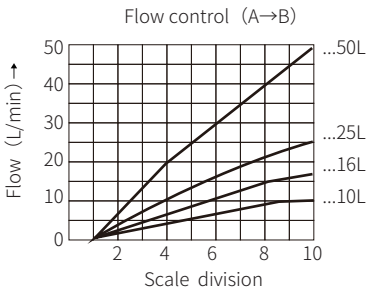
Rated flow L/min	Size 10	Size 16
	50	160
Working pressure Mpa	to 31.5	
Weight kg	Size 10	Size 16
	3.2	9.3

Maximum flow L/min		Size 10				Size 16		
		10	16	25	50	60	100	160
△ P with free return flow B → A		Size 10				Size 16		
q_v-dependent bar		2.0	2.5	3.5	6.0	2.8	4.3	7.3
Flow control	Temperature stability -20~70 °C	±2% (Qmax)						
	Pressure stability (to △P=315) bar	±2% (Qmax)						
Working pressure at port A bar		to 315						
Minimum pressure drop bar		Size 10				Size 16		
		3...12				5...12		
Degree of contamination µm		25 (Q<5L/min)				10 (Q<0.5L/min)		
Weight kg		Size 10				Size 16		
		5.6				11.3		

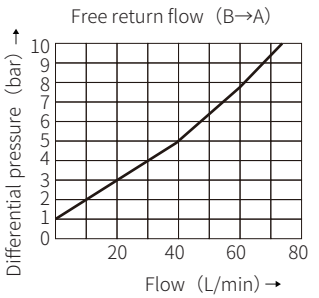
Characteristic curve

(Measured when using HLP 46, ϑ_{oil} = 40°C ± 5°C)

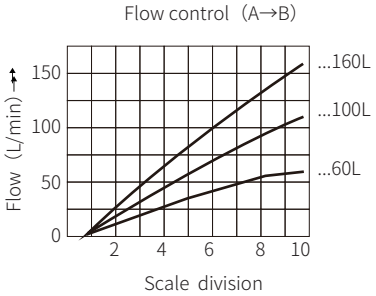
Size 10



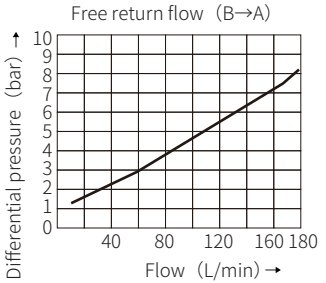
Size 10



Size 16

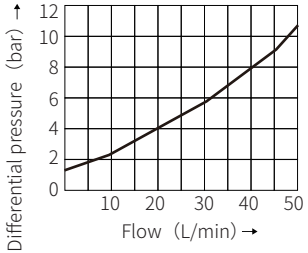


Size 16

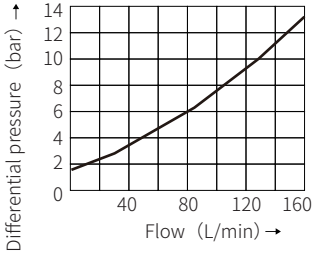


Rectifier sandwich plate

Size 10 Flow from A → B (B → A)
The pressure drop is same in both directions of flow



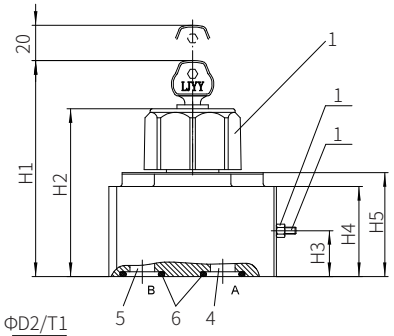
Size 16

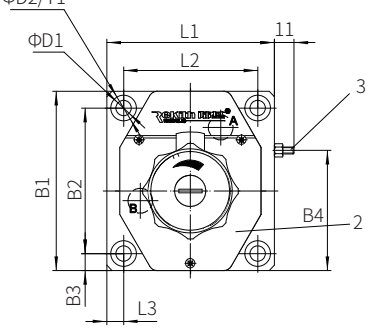


Component size

Size unit: mm

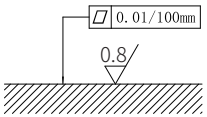
Model 2FRM10-2XJ/...and 2FRM16-2XJ/...





1 Adjustable handle with lock
2 Name plate
3 Stroke limiter of pressure reducing valve
4 Inlet "A"
5 Outlet "B"
6 O ring
NG10: 18.66x3.53
NG16: 26.58x3.53

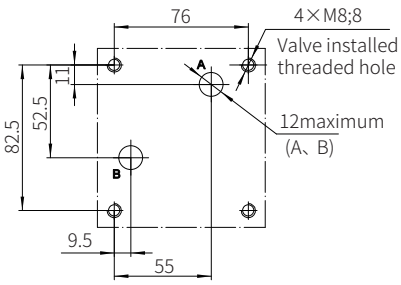
Valve fixing screw
Size 10
M8x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm
Size 16
M10x80-10.9 stage GB/T70.1-2000
Tightening torque M_A=60Nm
Subplate model:
Size 10: G279/01; G279/02
G280/01; G280/02
Size 16: G281/01; G281/02
G282/01; G282/02



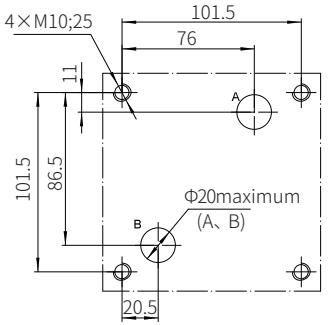
Required surface finishing of mating components

Size	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	L1	L2	L3	T1
10	101.5	82.5	9.5	68	9	15	125	95	26	51	60	95	76	9.5	13
16	123.5	101.5	11	81.5	11	18	147	117	34	72	82	123.5	101.5	11	12

2FRM10 mounting surface dimensions



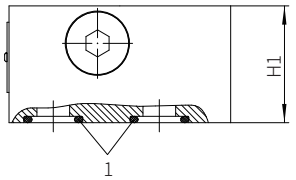
2FRM16 mounting surface dimensions

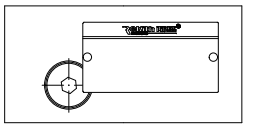


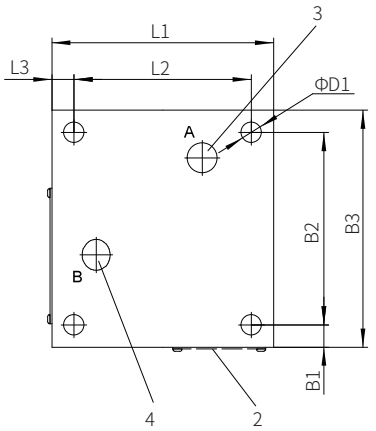
Component size

Size unit: mm

Model Z4S10-1XJ.../Z4S16-1XJ/...

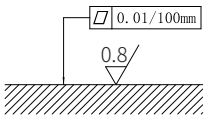






1 O ring
NG10: 18.66x3.53
NG16: 26.58x3.53
2 Name plate position at Z4S16
3 Inlet "A"
4 Outlet "B"

Valve fixing screw
Size 10
M8x100-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm
Size 16
M10x160-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm



Required surface finishing of mating components

Size	B1	B2	B3	D1	H1	L1	L2	L3
10	9.5	82.5	101.5	9	50	95	76	9.5
16	11	101.5	123.5	11	85	123.5	101.5	11

03

Modular Two Ways Flow Control Valve

Model: Z2FRM6...2XJ

- ◆ Size 6
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 32 L/min

Contents

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Models and specifications	03
Functional symbols	03
Technical parameters	04
Characteristic curve	04
Component size	05-07

Features

- ● Modular type valve
- ● Porting pattern to DIN24340 form A, without locating hole (standard)
- ● Porting pattern to ISA04401 and CETOP-RP 121H
- ● With 1 or 2 flow control cartridges
- ● Internal hexagonal adjusting type

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Function description, sectional drawing

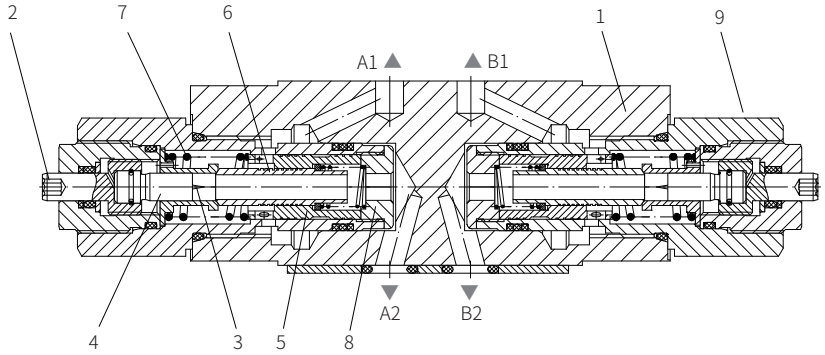
The Z2FRM6 valve is modular type two-way flow control valve and the 2FRM6K valve is cartridge type two-way flow control valve.

The Z2FRM6 flow control valve is used to maintain constant flow and independent of the pressure and temperature. It mainly includes the valve body (1) and one or two flow control valve model 2FRM6K (9).

The throttling of the flow from the oil port A2/B2 (A) to the oil port A1/B1 (B) occurs at the throttle area (3). The throttle rod (4) is driven by the adjustment element (2). In order to keep the flow in the oil port A1/B1(B) constant and independent of pressure, a pressure compensator (5) is required to be installed downstream of the throttle area (3). The compression spring (7) presses the pressure compensator (5) against the plug screw (8) and holds the pressure compensator in the open position when there is no flow through the valve. When the fluid flow through the valve, the pressure at oil port A2/B2(A) acts to the pressure compensator (5). Then the pressure compensator (5) moves until the forces balance.

If the pressure on the oil port A2/B2 (A) increases, the pressure compensator (5) moves to the closed direction until force balance is reached again. Because the pressure compensator (5) continuously acts as compensation, the flow can be maintained.

The fluid flows freely from oil port A1/B1 (B) to A2/B2 (A) via check valve (6).



Model Z2FRM6C2-2XJ/...R...

Models and specifications

Modular two ways flow control valve model 2FRM6

Z2FRM	6		B	2	-	2X	J	/		R		*

- modular two ways flow control valve: Z2FRM
- size 6: 6
- flow control function (meter-out control) in: oil port A =A; oil port B =B; oil port A and B =C; oil port T =T
- without external closing of the pressure compensator: B
- internal hexagonal adjusting element: 2
- 2X= (20 to 29 series installation and connection size unchanged): 2X
- J=: J
- flow A→B: 6Q= to 6L/min; 32Q= to 32L/min
- R=: R
- No code = NBR seals; V= FKM seals (consult for other seals): sealing material
- more information in text: *

Flow control valve model 2FRM6K

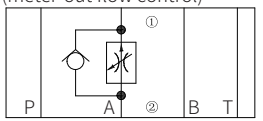
2FRM	6	K	2	-	1X	J	/		R		*

- flow control valve: 2FRM
- size 6: 6
- insert cartridge type: K
- internal hexagonal adjusting element: 2
- 10 to 19 series (10 to 19 series installation and connection size unchanged): 1X
- J=: J
- flow A→B: 6Q= to 6L/min; 32Q= to 32L/min
- R=: R
- No code = NBR seals; V= FKM seals (consult for other seals): sealing material
- more information in text: *

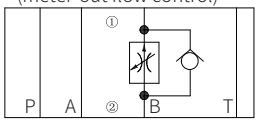
Functional symbols

(①=Valve side ②=Subplate side)

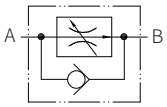
Model Z2FRM6A-...
(meter-out flow control)



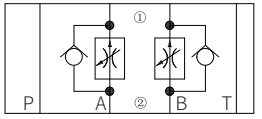
Model Z2FRM6B-...
(meter-out flow control)



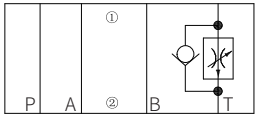
Model 2FRM6K...



Model Z2FRM6C-...
(meter-out flow control)



Model Z2FRM6T-...
(T port flow control)



Technical parameters

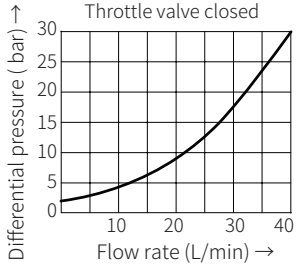
	Modular flow control valve model Z2FRM6	Flow control valve model 2FRM6K	
Installation type	Flat installation	installation position: optional	
Connection type	Indirect connection via a subplate or oil block, mounting surface according to DIN 24 340A, ISO4401 and CETOP-RP 121H		
weight kg	1.3 (flow control function at oil ports A, B or T)	0.2	
	1.5 (flow control function at oil ports A and B)		
Maximum working pressure bar	315		
Working medium	Minerals; Phosphate ester		
Working medium temperature range °C	-20 to +80		
Viscosity range mm^2/s	10 to 800		
Flow range L/min	0.05 to 6； 0.25 to 32		
Cleanliness of oil	The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		
Minimum pressure difference bar	18 (2FRM6K type flow control valve)		
Pressure stability △P=315bar %	±3 (Qmax)		

03

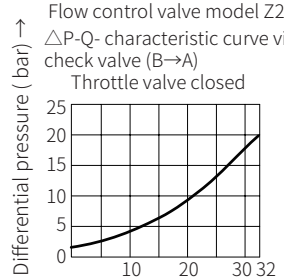
Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)

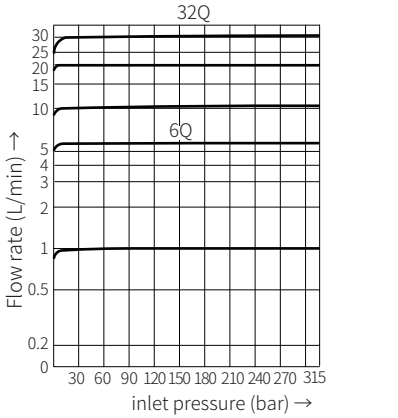
Modular flow control valve model Z2FRM6
△P-Q- characteristic curve via check valve
Throttle valve closed



Flow control valve model Z2FRM6K
△P-Q- characteristic curve via check valve (B→A)
Throttle valve closed



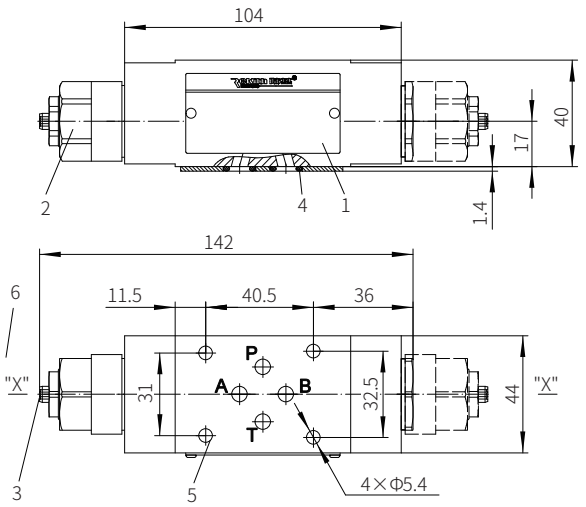
The relationship between flow Q and inlet pressure P



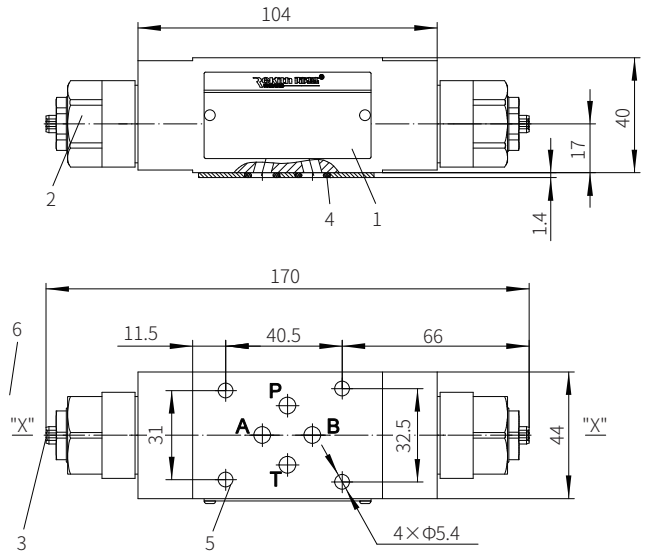
Component size

Size unit: mm

Model Z2FRM6A2-2XJ/...R...and Z2FRM6B2-2XJ/...R...



Model Z2FRM6C2-2XJ/...R...

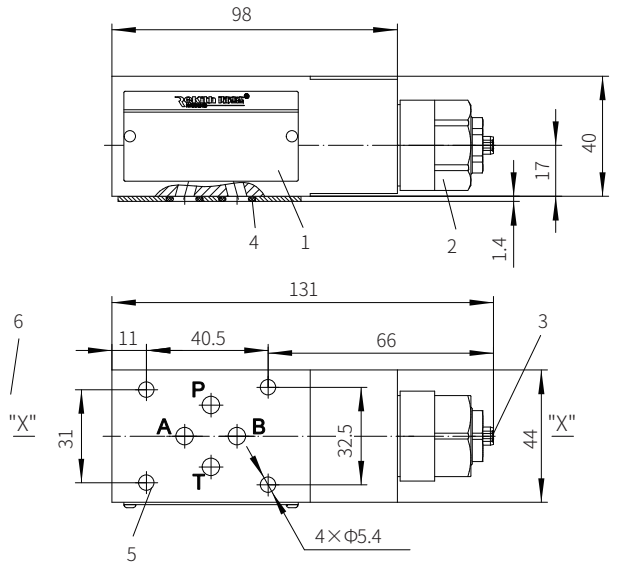


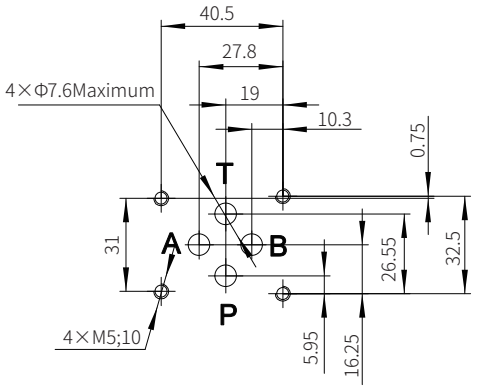
03

Component size

Size unit: mm

Model Z2FRM6T2-2XJ/...R...





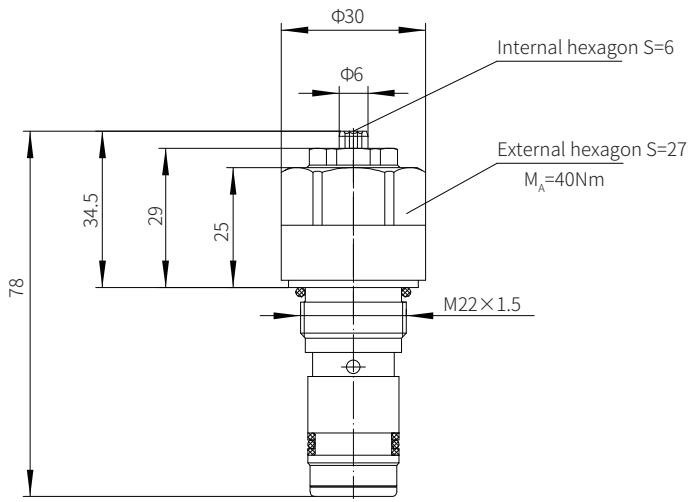
1 Name plate
2 Flow control cartridge valve model 2FRM6K
3 Adjustment element, internal hexagon S3
4 O-ring 9.25x1.78
5 Valve fixing screw hole
6 Rotate the valve around the "X" - "X" axis to change it from meter-out to meter-in, and from port T flow control to port P flow control

Valve fixing screw
Tightening torque M_A=7.8Nm
M5-10.9 grade GB/T70.1-2000
The length is determined by the stacking height and must be ordered separately

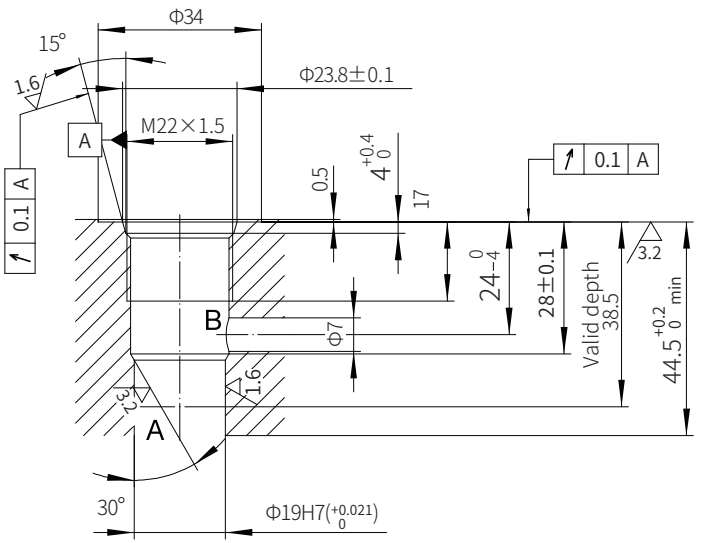
Component size

Size unit: mm

Model 2FRM6K... 1XJ/...



Insert hole



Modular Two Ways Flow Control Valve

Model: Z2FRM10...2XJ

- ◆ Size 10
- ◆ Maximum working pressure 210 bar
- ◆ Maximum working flow 60 L/min

Contents

Function description, sectional drawing	02
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Characteristic curve	04
Component size	05-07

Features

- ● Modular type valve
- ● Porting pattern to DIN24340 form A, without locating hole (standard)
- ● Porting pattern to ISA04401 and CETOP-RP 121H
- ● With 1 or 2 flow control cartridges
- ● Internal hexagonal adjusting type

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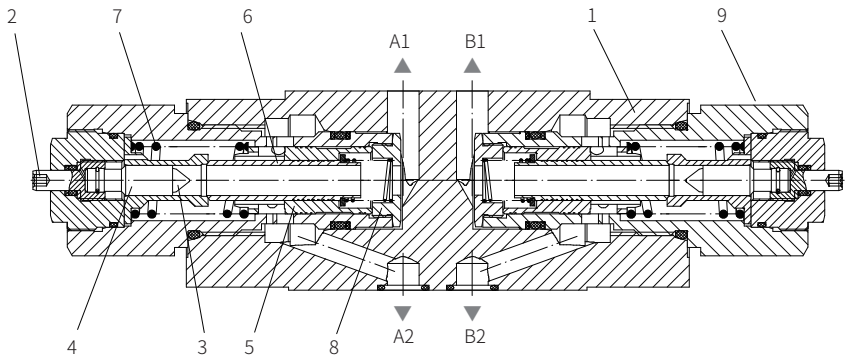
Function description, sectional drawing

The Z2FRM10 valve is modular type two-way flow control valve and the 2FRM10K valve is cartridge type two-way flow control valve.

The Z2FRM10 flow control valve is used to maintain constant flow and independent of the pressure and temperature.It mainly includes the valve body (1) and one or two flow control valve model 2FRM10K (9).

The throttling of the flow from the oil port A1/B1(A) to the oil port A2/B2(B) occurs at the throttling area (3). The throttle rod (4) is driven by the adjusting element (2). In order to keep the flow in the oil port A2/B2(B) constant and independent of pressure, a pressure compensator (5) is required to be installed downstream of the throttling area (3). The compression spring (7) presses the pressure compensator (5) against the plug screw (8) and holds the pressure compensator in the open position when there is no flow through the valve. the pressure compensator (5) remains open. If the flow passes through the valve, the pressure of oil port A1/B1(A) will act on the pressure compensator (5). When the fluid flow through the valve, the pressure at oil port A1/B1(A) acts on the pressure compensator (5). Then the pressure compensator (5) moves until the force balance. If the pressure on the oil port A1/B1(A) increases, the pressure compensator (5) moves to the closed direction until force balance is reached again. Because the pressure compensator (5) continuously acts as compensation, the flow can be maintained.

The fluid flows freely from oil port A2/B2(B) to A1/B1(A) via check valve (6).



Model Z2FRM10C2-2XJ/...R...

Models and specifications

Modular two ways flow control valve model Z2FRM10

Z2FRM	10		2	2X	J		R		*

- modular flow control valve
- size10 =10
- flow control function (meter-out control) in
  - oil port A =A
  - oil port B =B
  - oil port A and B =C
  - oil port T =T
- internal hexagonal adjusting element =2
- 2X= 20 to 29 series (20 to 29 series installation and connection size unchanged)
- J= Rekith
- flow A→B 60Q= to 60L/min
- R= with check valve
- sealing material: No code= NBR seals; V= FKM seals (consult for other seals)
- * more information in text

Flow control valve model 2FRM10K

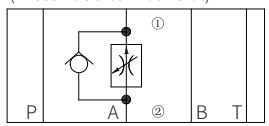
2FRM	10	K	2	1X	J		R		*

- flow control valve
- size10 =10
- insert cartridge type =K
- internal hexagonal adjusting element =2
- 10 to 19 series (10 to 19 series installation and connection size unchanged) =1X
- J= Rekith
- flow A→B 60Q= to 60L/min
- R= with check valve
- sealing material: No code= NBR seals; V= FKM seals (consult for other seals)
- * more information in text

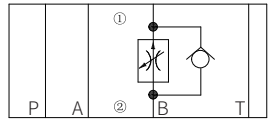
Functional symbols

(①= Valve side, ②= Subplate side)

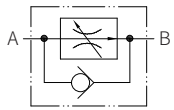
Model Z2FRM10A-...
(meter-out flow control)



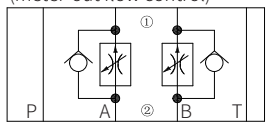
Model Z2FRM10B-...
(meter-out flow control)



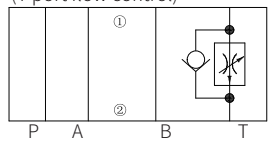
Model 2FRM10K...



Model Z2FRM10C-...
(meter-out flow control)



Model Z2FRM10T-...
(T port flow control)



Technical parameters

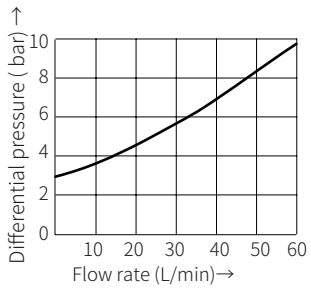
	Modular flow control valve model Z2FRM10	Flow control valve model 2FRM10K	
Installation type	Flat installation	Installation position: optional	
Connection type	Indirect connection via a subplate or oil block, mounting surface according to DIN 24 340A, ISA04401 and CETOP-RP 121H		
weight kg	4.7 (flow control function at oil port A, B or P)	0.6	
	5.3(flow control function at oil port A and B)		
Maximum working pressure bar	210		
Working medium	Minerals; Phosphate ester		
Working medium temperature range	-20 to +80		
Viscosity range mm^2/s	10 to 800		
Flow range L/min	0.5 to 60		
Cleanliness of oil	The maximum allowable pollution level of oil is NAS 16389 and ISO4406 Class 20 / 18 / 15		
Minimum pressure difference bar	1.8 (2FRM10K type flow control valve)		
Pressure stability △p=210bar %	±3 (Qmax)		

Characteristic curve

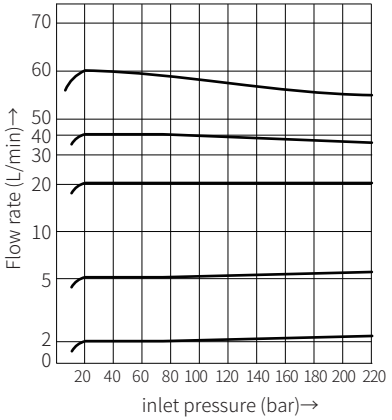
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△P-Q- Characteristic curve via check valve (A→B)

Throttle valve closed



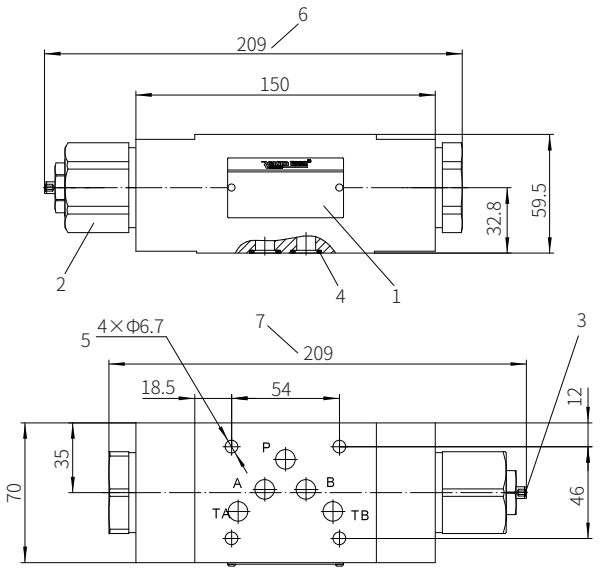
The relationship between flow Q and inlet pressure P



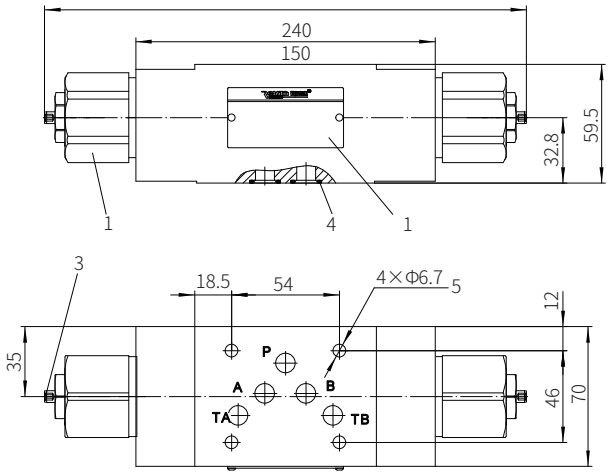
Component size

Size unit: mm

Model Z2FRM10A2-2XJ/...R... and Z2FRM10B2-2XJ/...R...



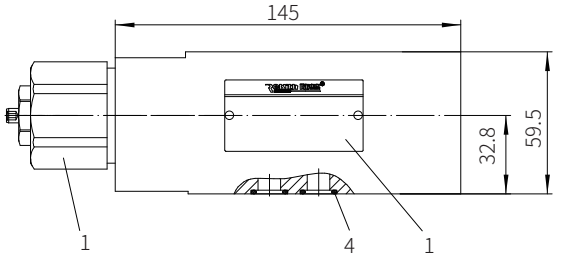
Model Z2FRM10C2-2XJ/...R...

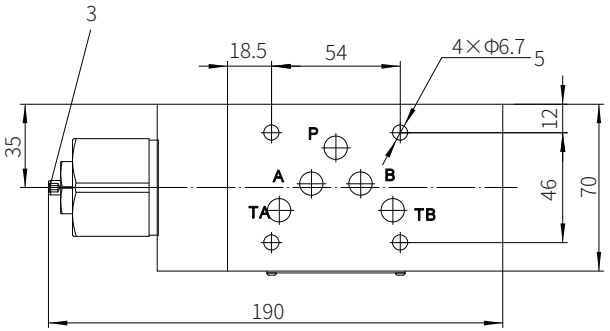


Component size

Size unit: mm

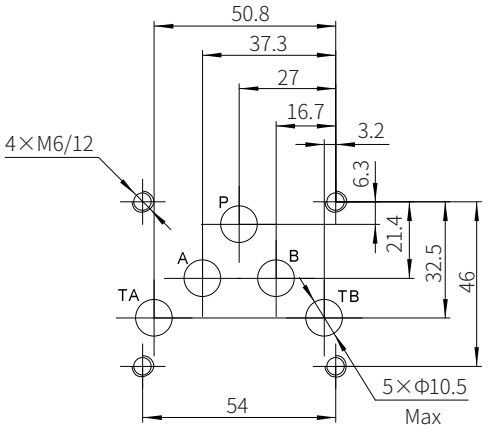
Model Z2FRM10T2-2XJ/...R...





1 Name plate
2 Hexagon S=41
3 Inner hexagon S=3
4 O-ring 12x2
5 Valve fixing screw hole
6 Model Z2FRM10A2
7 Model Z2FRM10B2

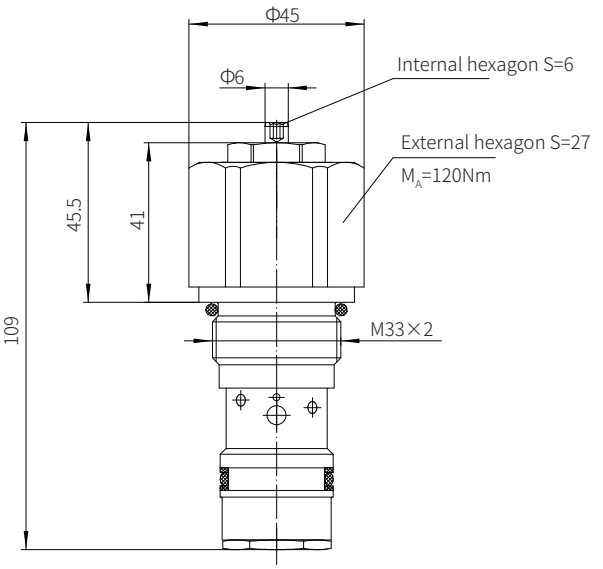
Valve fixing screw
M6-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm
Must be ordered separately



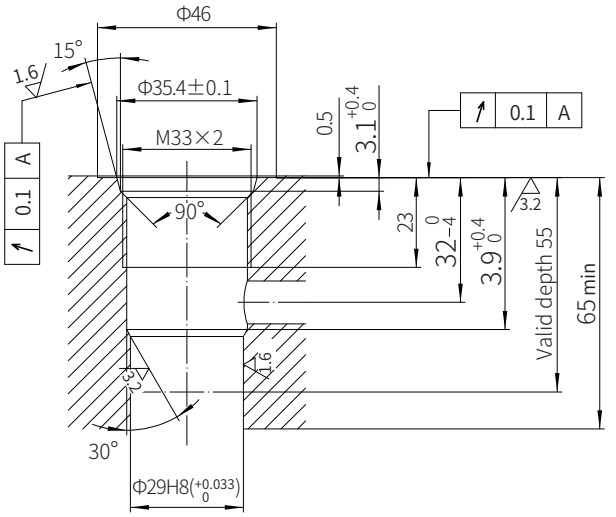
Component size

Size unit: mm

Model 2FRM10K...XJ/...



Insert hole



Balanced Valve

Model: FD...1XJ

- ◆ Size 12/16/25/32
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 560 L/min

Contents

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Characteristic curve	05
Component size	06-09

Features

- ● Pilot operated check valve no leakage
- ● The balanced valve controls the return flow Q2 according to the flow Q1 on the opposite side of the actuator
  With cylinders the area ratio (Q2=Q1ϕ) must be considered
- ● By-pass valve, flow freely in the opposite direction
- ● External superimposed secondary pressure relief valve (for flange connection only)

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Function description, sectional drawing

The balanced valve is used to prevent "out of control" of hydraulic cylinder or motor caused by load in hydraulic system. It can also prevent pipe bursting.
The balanced valve mainly includes the valve body (1), main spool (2), pilot part (3), control spool (4), damping spool (5) and orifice (6).
When lifting load, the fluid flows from A to B to open the main spool (2). If the load pressure fails (e.g. pipe break), the main spool closes immediately as the chamber (8) is connected with load pressure.

Lowering the load (circuit examples)

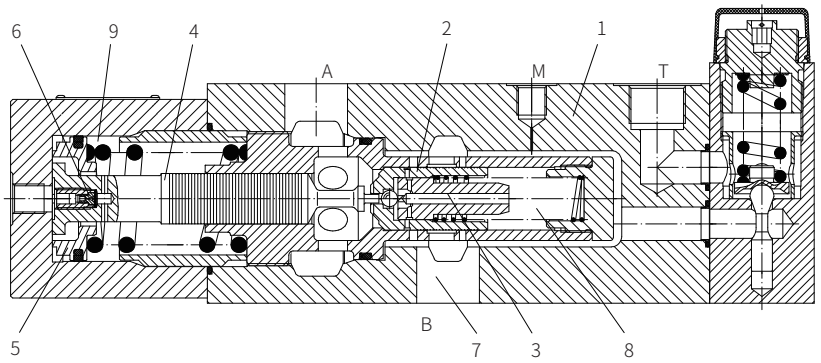
The direction of flow is from B o A. Port A is connected to tank through the directional valve. The piston rod side of the cylinder has a flow applied which corresponds to the working condition. The relationship between the control pressure at port X and the load pressure at port B is 1:20.

When the control pressure is reached, the main spool opens. The pilot body (3) is lifted off its seat by the control spool (4), and the chamber (8) is de-compressed by its inner hole and port A to tank. At the same time, the load pressure in port B doesn't act on the chamber (8) any more due to the longitudinal movement of the pilot part (3) within the main spool. Then the main spool (2) is unloaded. The reverse side of the control spool (4) at the main spool (2) lies against the collar of the damping spool (5).

To open the main spool, the control pressure in port X depends on the spring in the chamber (9). When the valve open, the pressure is 20bar, and it is 50bar when fully open. The relationship between the opening area, cracking pressure and differential pressure determines the flow to the actuator via the connection of B to A. It depends on the inlet flow on the other side of the actuator to prevent the actuator "runaway". The operation of the controlled lowering is not affected even if there is a pipe break between the directional valve and port A in the balanced valve.

Note on the opening and closing times of balanced valve:

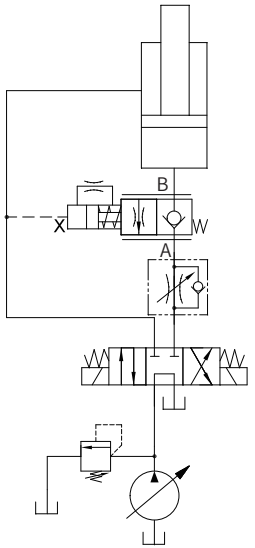
- Throttling of the opening sequence is via orifice (6) in the control spool (4) and both sides of the damping spool (5).
- The closing of the balanced valve is almost no throttling.
- When being used together with cylinder, a throttle check valve (meter-out control) can be set in the control line of port X to affect the closing time.
- When being used together with the motor, a throttle check valve should not be set in the control line of port X, in this condition it is recommended to control the closing time of the direction valve.



Circuit examples

Cylinder with single rod

For safety, a closed center directional valve should be always used.

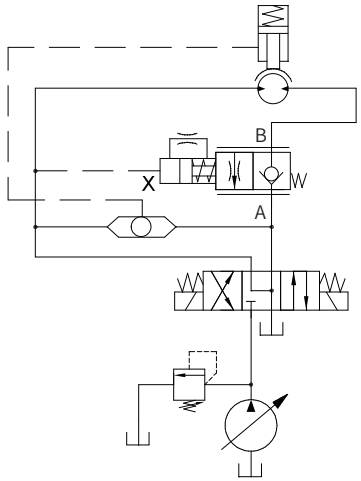


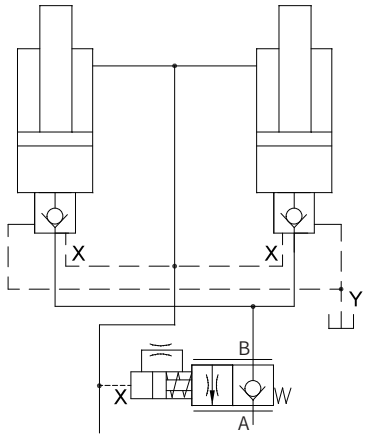
Note:

Two balanced valves can not be used to control two mechanically synchronized cylinder as it is impossible to maintain the same synchronized pressure in two cylinders. Therefore, it is necessary to install two hydraulic operated check valves type SL in the cylinder, and the balanced valve is installed in the common line. In this case, the load pressure can not exceed 200bar.
In order to avoid shaking caused by the loss of pressure at control port X because of fast falling speed, it is recommended to install a throttle check valve at port A of the balanced valve to limit the falling speed.

Hydraulic motor

To make sure the brake can be operated, the two oil ports of the directional valve must be connected to the tank in the neutral position. If the brake is externally operated, then it could use a closed central directional valve.





Models and specifications

FD [ ] [ ] - 1X J [ ] [ ] [ ] [ ] [ ] *

size 12 =12
size 16 =16
size 25 =25
size 32 =32

manifold mounting =K
subplate mounting =P
SAE flange connection =F

without secondary pressure relief valve=A
with secondary pressure relief valve =B
(for SAE flange connection only)

10 to 19 series =1X
(10 to 19 series installation
and connection size unchanged)

B00= without orifice
B30= orifice Φ0.3 (FD12;16)
B40= orifice Φ0.4 (FD25)
B60= orifice Φ0.6 (FD32)
(other orifice on required)

the working pressure of the
secondary pressure relief valve
(SAE connection only)

No code = NBR seals
V= FKM seals
(consult for other seals)
sealing material

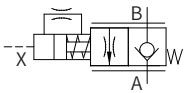
No code = G thread
2= metric thread

more information
in text

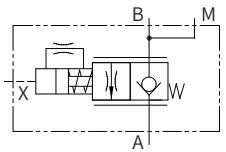
J= Rexroth

Functional symbols

Without secondary pressure relief valve



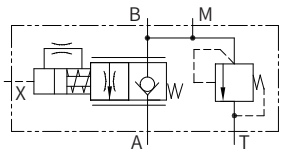
Valve model:
FD12KA 1XJ/B30
FD16KA 1XJ/B30
FD25KA 1XJ/B40
FD32KA 1XJ/B60



Valve model:
FD12PA 1XJ/B30
FD16PA 1XJ/B30
FD25PA 1XJ/B40
FD32PA 1XJ/B60

FD12FA 1XJ/B30
FD16FA 1XJ/B30
FD25FA 1XJ/B40
FD32FA 1XJ/B60

With secondary pressure relief valve



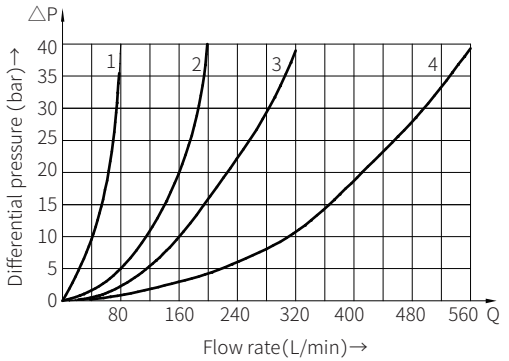
Valve model:
FD12FB 1XJ/B30
FD16FB 1XJ/B30
FD25FB 1XJ/B40
FD32FB 1XJ/B60

Technical parameters

Working pressure, oil port A、X	bar	to 315
Working pressure, oil port B	bar	to 420
Pilot pressure, oil port X (Flow control range)	bar	Minimum 20 to 35, maximum 315
Cracking pressure, A to B	bar	2
Setting pressure for secondary pressure relief valve	bar	to 400
Flow	L/min	80 (size 12), 200 (size 16), 320 (size 25), 560 (size 32)
Area ratio of pre-opening		$\frac{\text{Poppet seat area}}{\text{Area of pilot spool}} = \frac{1}{20}$
oil temperature range	°C	-30 to +80 (NBR seal), -20 to +80 (FKM seal)
Viscosity range	mm^3/s	10 to 800
Hydraulic oil		Mineral hydraulic oil or phosphate hydraulic oil

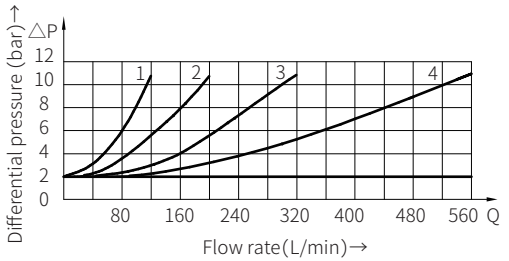
Characteristic curve

(Measured when using HLP 46, ϑ_{oil}= 40°C ± 5°C)



Characteristic curve for differential pressure and flow rate,
measured at the throttle position:
Throttle fully open (Px=60bar)
B→A

1=size 12
2=size 16
3=size 25
4=size 32

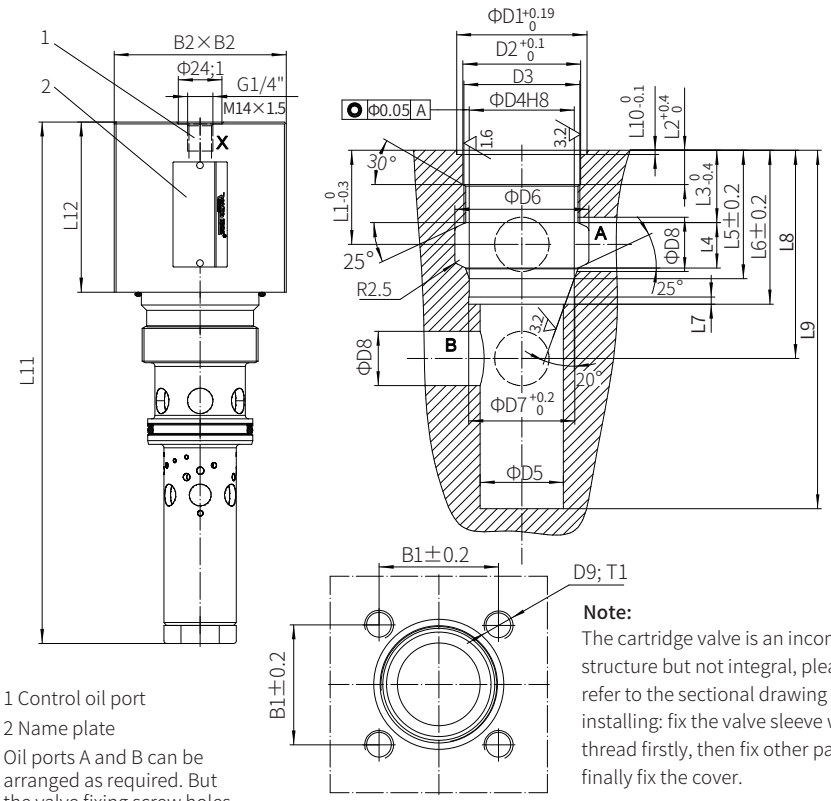


Characteristic curve for differential pressure and flow rate,
measured over the check valve
A→B

Component size

Size unit: mm

Valves for manifold mounting (cartridge valves)



1 Control oil port

2 Name plate

Oil ports A and B can be arranged as required. But the valve fixing screw holes must not be damaged.

Note:

The cartridge valve is an incompact structure but not integral, please refer to the sectional drawing when installing: fix the valve sleeve with thread firstly, then fix other parts, finally fix the cover.

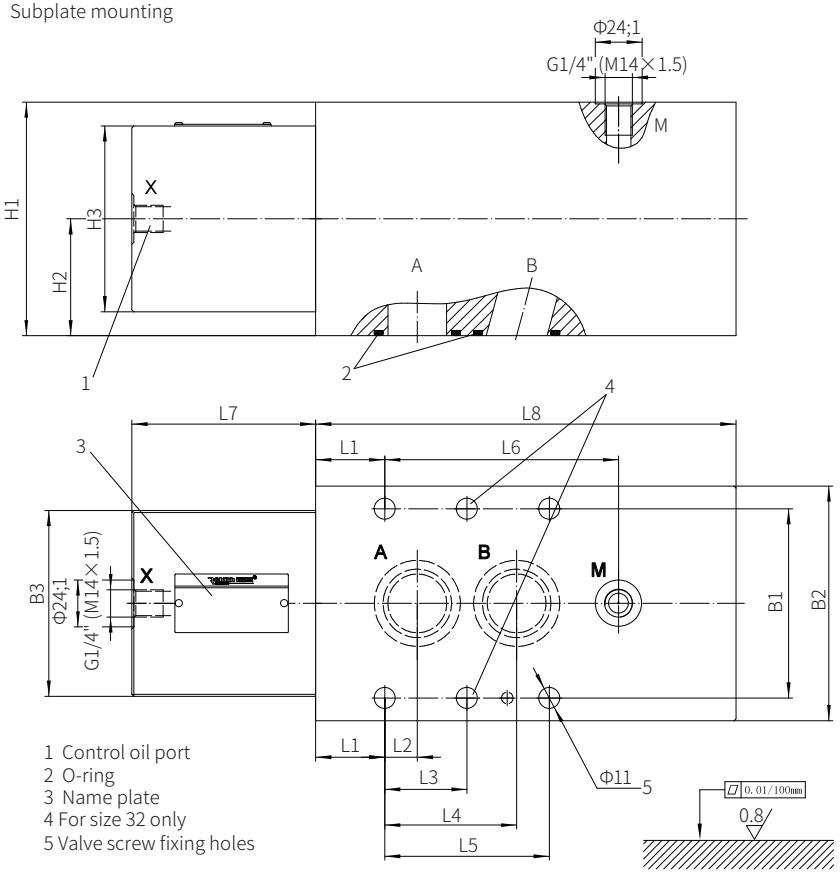
Model	B1	B2	D1	D2	D3	D4	D5	D6	D7	D8	D9	T1	L1	L2	L3	L4	L5
FD12KA	48	70	54	46	M42x2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.5
FD16KA	48	70	54	46	M42x2	38	34	46	38.6	16	M10	16	39	16	32	15.5	50.6
FD25KA	56	80	60	54	M52x2	48	40	60	48.6	25	M12	19	50	19	39	22	65
FD32KA	66	95	72	65	M64x2	58	52	74	58.6	30	M16	23	52	19	40	25	71

Model	L6	L7	L8	L9	L10	L11	L12	Valve fixing screw/Tightening torque	M_A(Nm)	Weight
FD12KA	60	3	78	128	2.3	191	65	four M10x70 GBT70.1-10.9	60	3.5kg
FD16KA	60	3	78	128	2.3	191	65	four M10x70 GB/T70.1-10.9	60	3.5kg
FD25KA	80	4	105	182	2.3	253	75	four M12x80 GB/T70.1-10.9	95	5.6kg
FD32KA	85	4	115	198	2.3	289	94	four M16x100 GB/T70.1-10.9	196	8.0kg

Component size

Size unit: mm

Subplate mounting



1 Control oil port
2 O-ring
3 Name plate
4 For size 32 only
5 Valve screw fixing holes

Required surface finishing of mating components

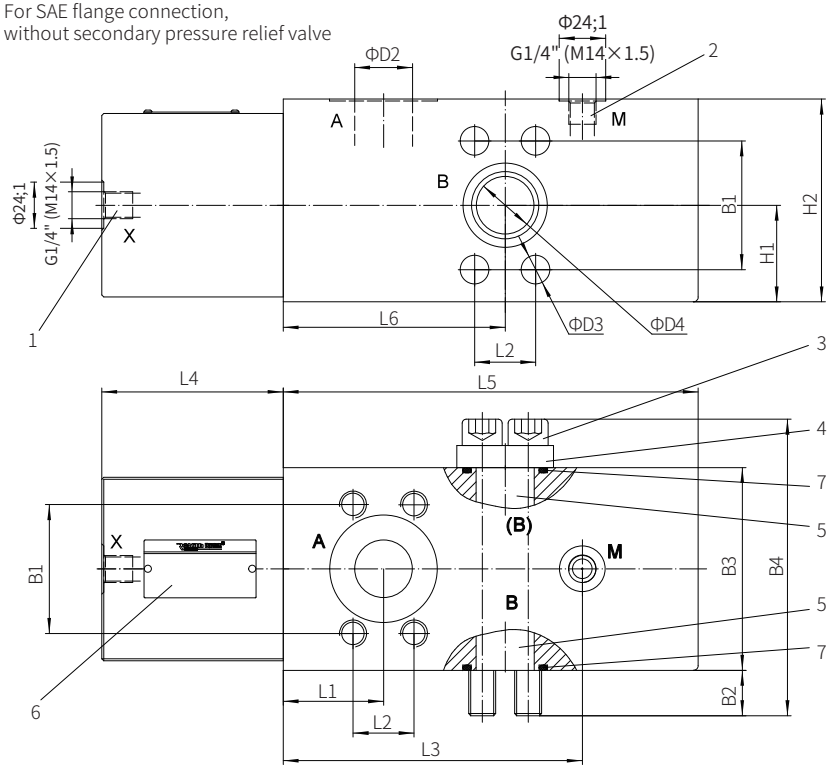
Model	B1	B2	B3	H1	H2	H3	L1	L2	L3	L4	L5	L6
FD12PA	66.7	85	70	85	42.5	70	31.8	7.2	-	35.8	42.9	73.2
FD16PA	66.7	85	70	85	42.5	70	31.8	7.2	-	35.8	42.9	73.2
FD25PA	79.4	100	80	100	50	80	38.9	11.1	-	49.2	60.3	109.1
FD32PA	96.8	120	95	120	60	95	35.3	16.7	42.1	67.5	84.2	119.7

Model	L7	L8	Valve fixing screw/Tightening torque	M_A(Nm)	Weight
FD12PA	65	140	four M10x100 GB/T70.1-10.9	60	9.3kg
FD16PA	65	140	four M10x100 GB/T70.1-10.9	60	9.3kg
FD25PA	75	200	four M10x120 GB/T70.1-10.9	60	18kg
FD32PA	94	215	four M10x140 GB/T70.1-10.9	60	28kg

Component size

Size unit: mm

For SAE flange connection,
without secondary pressure relief valve



1 Control oil port
2 Measuring port
3 Flange fixing screw
4 Blanking flange
5 Optional port B
6 Name plate
7 O-ring

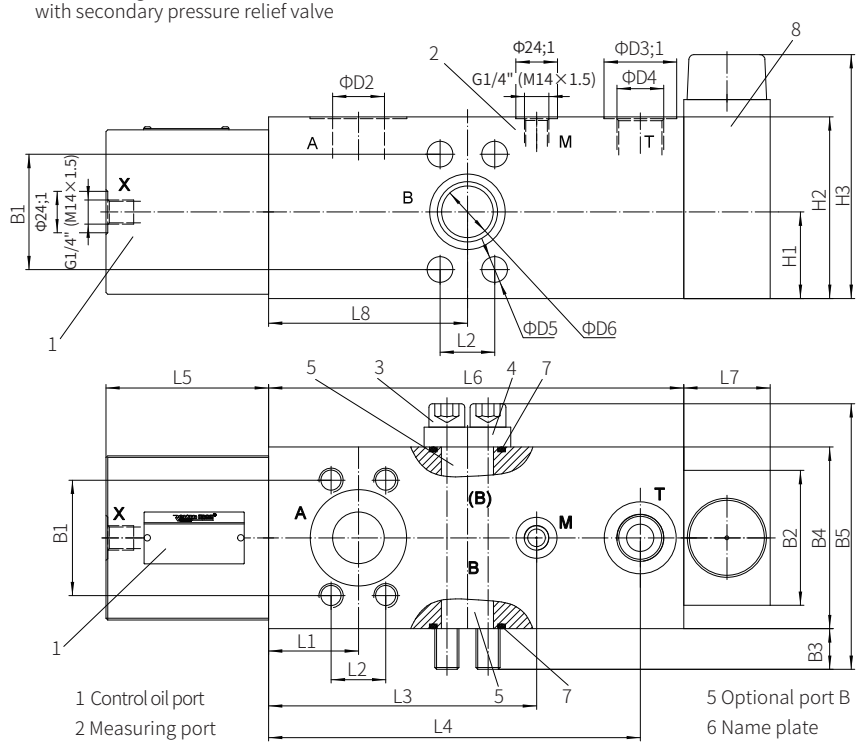
Model	B1	B2	B3	B4	D1	D2	D3	D4	D5	H1	H2	L1	L2	L3	L4
FD12FA	50.8	16.5	72	110	43	18	10.5	18	M10	36	72	39	23.8	105	65
FD16FA	50.8	16.5	72	110	43	18	10.5	18	M10	36	72	39	23.8	105	65
FD25FA	57.2	14.5	90	132	50	25	13.5	25	M12	45	90	50	27.8	148	75
FD32FA	66.7	20	105	154	56	30	15	30	M14	50	105	52	31.8	155	94

Model	L5	L6	T1	Weight	O-ring (7)	Valve fixing screw
FD12FA	140	78	15	7.2kg	25x3.5	4 pcs M10x100 GB/T70.1-10.9
FD16FA	140	78	15	7.2kg	25x3.5	4 pcs M10x100 GB/T70.1-10.9
FD25FA	200	105	18	16kg	32.92x3.53	4 pcs M12x120 GB/T70.1-10.9
FD32FA	215	115	21	23kg	37.7x3.53	4 pcs M14x140 GB/T70.1-10.9

Component size

Size unit: mm

For SAE flange connection,
with secondary pressure relief valve



1 Control oil port
2 Measuring port
3 Flange fixing screw
4 Blanking flange
5 Optional port B
6 Name plate
7 O-ring
8 Safety valve

Model	B1	B2	B3	B4	B5	D1	D2	D3	D4		D5	D6	D7	H1	H2	H3	L1
									G	Metric							
FD12FB	50.8	49	16.5	72	110	43	18	34	G1/2	M22x1.5	10.5	18	M10	36	72	118	39
FD16FB	50.8	49	16.5	72	110	43	18	34	G1/2	M22x1.5	10.5	18	M10	36	72	118	39
FD25FB	57.2	78	14.5	90	132	50	25	42	G3/4	M27x2	13.5	25	M12	45	90	145	50
FD32FB	66.7	78	20	105	154	56	30	42	G3/4	M27x2	15	30	M14	50	105	145	52

Model	L2	L3	L4	L5	L6	L7	L8	T1	Weight	O-ring (7)	valve fixing screw
FD12FB	23.8	105	141.5	65	162	38	78	15	9kg	25x3.5	4 pcs M10x100
FD16FB	23.8	105	141.5	65	162	38	78	15	9kg	25x3.5	4 pcs M10x100
FD25FB	27.8	148	198	75	225	50	105	18	20kg	32.92x3.53	4 pcs M12x120
FD32FB	31.8	155	215	94	240	50	115	21	28kg	37.7x3.53	4 pcs M14x140

03

4 - Proportional valves

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- 4WRKE...3XJ/Electro-hydraulic proportional directional valve 0707-0722
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- 3DREP(E)6...2XJ/3-way proportional pressure reducing valve 0773-0780
- DRE/DREM...6XJ/Pilot operated proportional reducing valve 0781-0790
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Proportional flow control valve
- 2FRE6...2XJ/2-way proportional flow control valve 0801-0808
- 2FRE...4XJ/2-way proportional flow control valve 0809-0818

Servo valve
- 4WRPEH6...2XJ/Proportional direction valve 0819-0828
- 4WRPEH10...2XJ/Proportional directional valve 0829-0838

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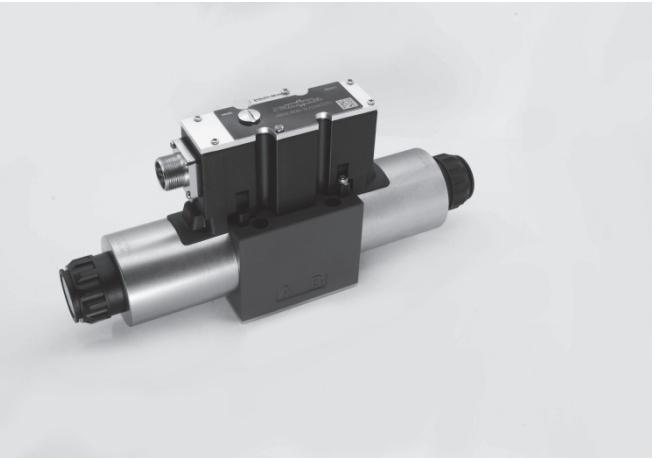
Proportional Directional Valve

Model: 4WRA(E)...2XJ



- Size 6 and 10
- Maximum working pressure 315 bar
- Maximum working flow 42 L/min (size 6)
  75 L/min (size 10)

Contents

Function description, sectional drawing	02-03
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Component size	10-13
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Features

- Proportional direction valve with direct operated proportional solenoid
- For subplate mounting
- Control the direction and flow
- Spring centred control spool
- Both valves and proportional amplifiers from the same supplier

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Function description, sectional drawing

The 4WRA(E) valve is a 4/2-way and 4/3-way proportional directional valve with direct operated and subplate mounting. It is actuated by proportional solenoids with central thread and detachable coil. The control of the solenoids can be achieved through external amplifier (4WRA) or internal amplifier (4WRAE).

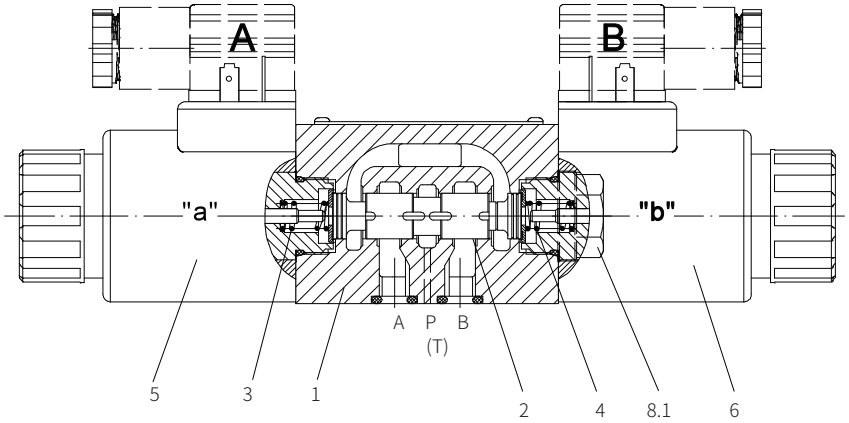
Structure:

The valves consist of:

- Valve body with mounting surface (1)
- Control spool (2) with compression springs (3 and 4)
- Solenoids (5 and 6) with central thread
- Optional amplifier (7)

Operating principle:

- When the solenoids (5 and 6) are de-energized, the compression springs (3 and 4) hold the control spool (2) in the central position.
- After the proportional solenoid is energized, it will directly push the control spool (2), e.g. energization of solenoid “b” (6):
→The control spool (2) is pushed to the left in proportion to the electrical input signal.
→At this time, P to A and B to T are connected through the orifice formed by the spool and the valve body with progressive flow characteristics.
- De-energization of solenoid (6)
→The control spool (2) is pushed back to the center position by the compression spring (3).



Model 4WRA6...2XJ

Function description, sectional drawing

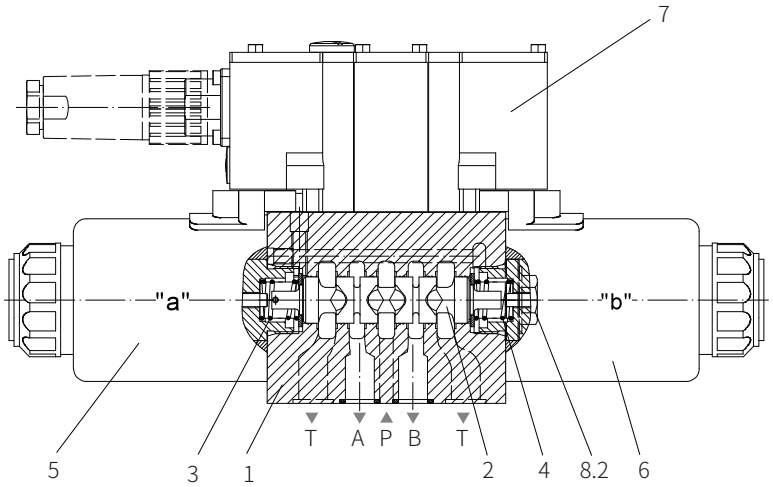
Two Position Valves:

(Model 4WRA...A...)

In principle, the function of this valve is similar to the valve with three-position, but it is installed with solenoid “a” only. A plug (8.1 for NG6 and 8.2 for NG10) is installed instead of the proportional solenoid "b".

Note for model 4WRA- 2XJ/...

It must be avoided to drain all the oil in the return line. If necessary, a back pressure valve is to be installed in the circuit (back pressure about 2 bar).



Model 4WRAE10...-2XJ/

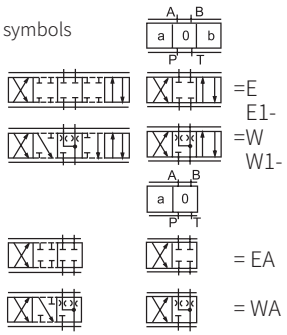
Models and specifications

4WRA | | | | - 2X | J | - G24 | | - | | | *

without amplifier =No code
with amplifier =E

size 6 =6
size 10 =10

symbols



with symbols E1— and W1—:
P→A: q_{vmax} B→T: $q_v/2$
P→B: $q_v/2$ A→T: q_{vmax}

note:
For spools W and WA, when in neutral position, a connection from A to T and B to T with 3% around of the relevant nominal cross-section.

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

electrical connection for 4WRAE
A1= command value input ± 10 V
F1= command value input 4 to 20mA
No code= for 4WRA

electrical connections
K4= for model 4WRA... without plug in connector
K31= for model 4WRAE... with plug-in connector

No code= no special protection

G24= 24V DC

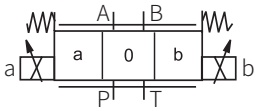
J= Rekith

2X= 20 to 29 series
(20 to 29 series installation and connection size unchanged)

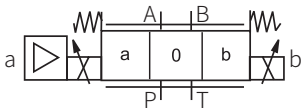
nominal flow rate at valve pressure difference △ P=10bar
size 6
07= 7 L/min
15= 15 L/min
30= 26 L/min
size 10
30= 30 L/min
60= 60 L/min

Functional symbols

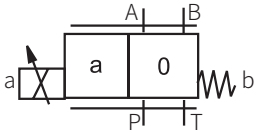
Without amplifier
Model 4WRA...



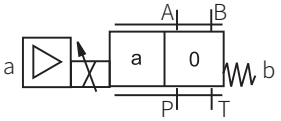
With amplifier
Model 4WRAE...



Model 4WRA...EA...; 4WRA...WA...



Model 4WRAE...EA...; 4WRAE...WA...



Technical parameters

Overview				
Size			6	10
Installation position			Optional, firstly horizontal	
Storage temperature range		°C	-20 to +80	
Environment temperature range	4WRA	°C	-20 to +70	
	4WRAE	°C	-20 to +50	
Weight	4WRA	kg	2.0	6.6
	4WRAE	kg	2.2	6.8
Hydraulic (measured when using HLP46, ϑ_{oil}=40°C ± 5°C)				
Maximum working pressure	Oil port A, B, P	bar	315	
	Oil pot T	bar	210	
Nominal flow rate q_v nom at Δ P=10 bar		L/min	7, 15, 26	30, 60
Maximum permissible flow		L/min	42	75
Pressure medium			Mineral oil (HL, HLP)[1] to DIN 51524; Biology can quickly decompose Oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2]; HEES (Synthetic Fats)[2]	
Oil temperature range		°C	-20 to +80 (preferably +40 to +50)	
Viscosity range		mm^2/S	20 to 380 (preferably 30 to 46)	
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15	
Hysteresis		%	⩽5	
Reversal span		%	⩽1	
Sensitivity		%	⩽0.5	

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

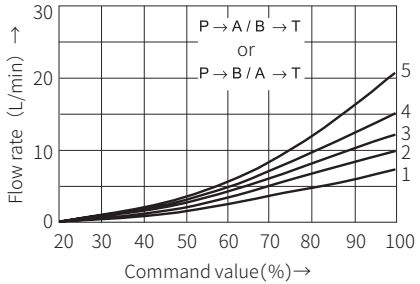
Technical parameters

Electrical				
Size			6	10
Voltage type			DC	
Command value signal voltage input "A1"		V	±10	
For 4WRAE	current input "F1"	mA	4 to 20	
Maximum current per solenoid		A	2.5	3.3
Solenoid coil	Cold value at 20°C	Ω	2	
resistance	Maximum warm value	Ω	3	
Power rate		%	100	
Maximum coil temperature		°C	150	
Electrical connection	4WRA		With component plug and plug-in connector to DINEN 175301-803 or ISO4400	
	4WRAE		With component plug and plug-in connector to DINEN 175201-804	
Valve protection to EN60529			IP65, plug installed and locked	

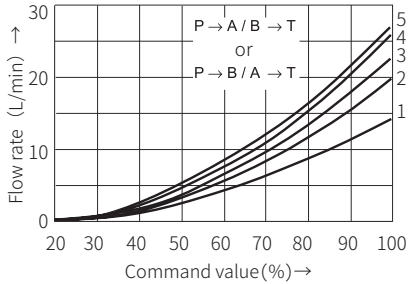
Characteristic curve

Size 6 (measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The nominal flow rate 7 L/min at 10 bar valve pressure difference



The nominal flow rate 15 L/min at 10 bar valve pressure difference

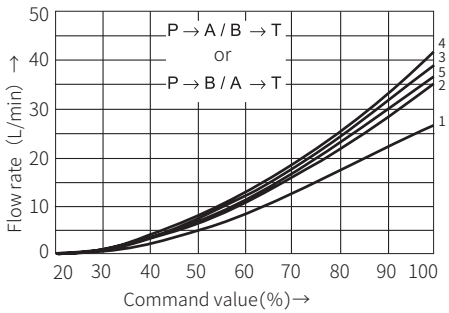


Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Size 6

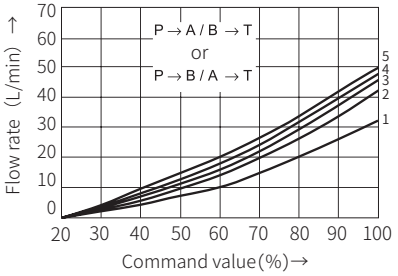
The nominal flow rate 30L/min at 10 bar valve pressure difference



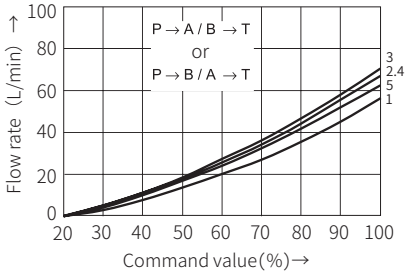
1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant
△P =valve pressure difference (inlet pressure P_p minus load pressure P_L and minus return oil pressure P_T)

Size 10

The nominal flow rate 30 L/min at 10 bar valve pressure difference



The nominal flow rate 60 L/min at 10 bar valve pressure difference



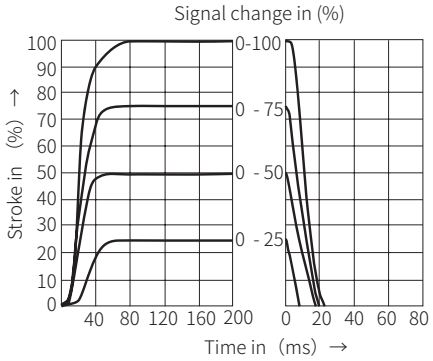
1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

△P=valve pressure difference (inlet pressure P_p minus load pressure P_L and minus return oil pressure P_T)

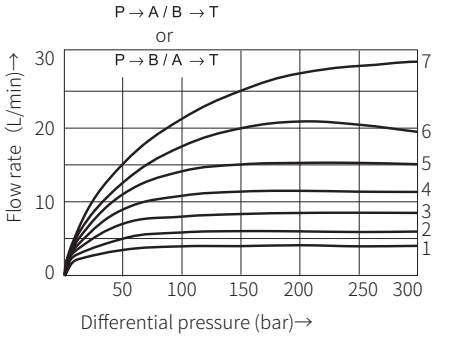
Characteristic curve

Size 6 (measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

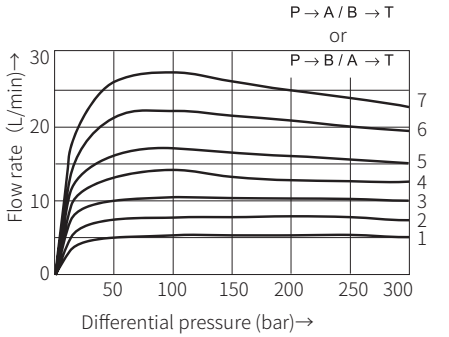
Transition performance of the valve when the input signal is a step signal



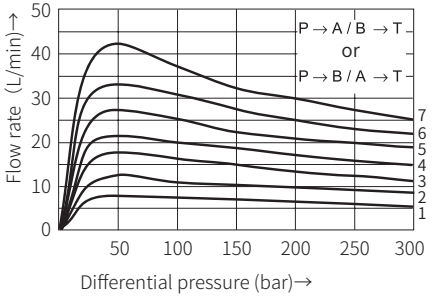
Power limit with a nominal flow rate of 7L/min



Power limit with a nominal flow rate of 15L/min



Power limit with a nominal flow rate of 30L/min



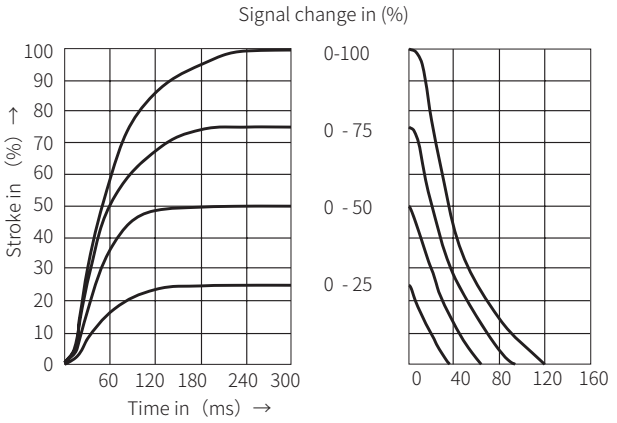
1 Command value=40 %
2 Command value=50 %
3 Command value=60 %
4 Command value=70 %
5 Command value=80 %
6 Command value=90 %
7 Command value=100 %

If the power limit of the valve is exceeded,
the movement of the spool will become unstable

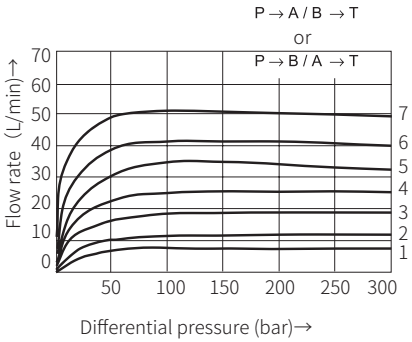
Characteristic curve

Size 10 (measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

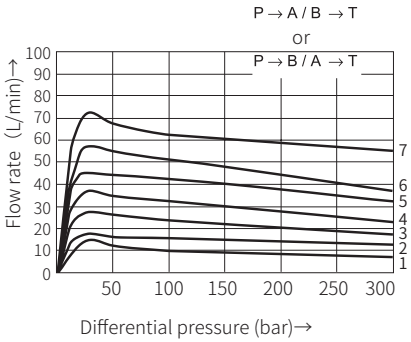
Transition performance of the valve when the input signal is a step signal



Power limit with a nominal flow rate of 30L/min



Power limit with a nominal flow rate of 60L/min



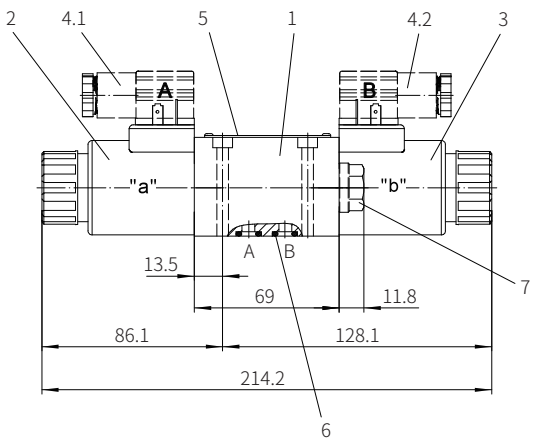
1 Command value=40 %
2 Command value=50 %
3 Command value=60 %
4 Command value=70 %
5 Command value=80 %
6 Command value=90 %
7 Command value=100 %

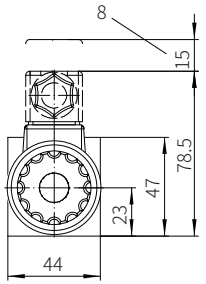
If the power limit of the valve is exceeded,
the movement of the spool will become unstable

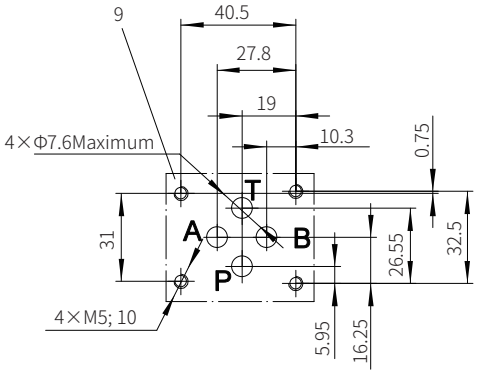
Component size

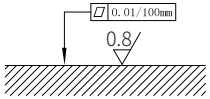
Size unit: mm

Model 4WRA6...-2XJ/...









Required surface finishing of mating components

Valve fixing screw

M5x50-10.9 grade GB/T70.1-2000

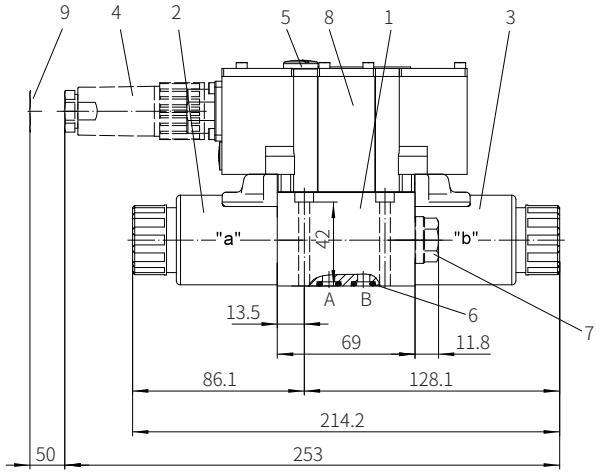
Tightening torque M_A=7.8Nm

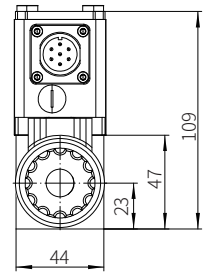
1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid“b”
4.1 Grey plug “A”
4.2 Black plug “B”
5 Name plate
6 O-ring 9.25x1.78 (for oil port P, A, B, T)
7 Plug for valve with one solenoid
(Two-position valve, symbol EA or WA)
8 Space required to remove the plug
9 Valve connection surface

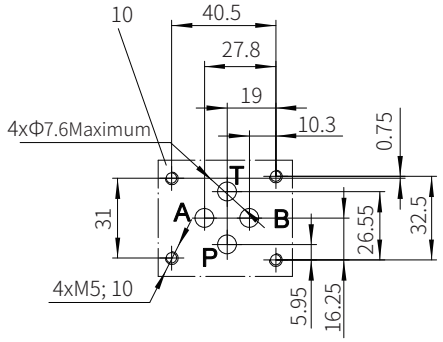
Component size

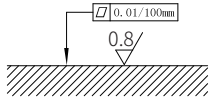
Size unit: mm

Model 4WRAE6...-2XJ/...









Required surface finishing of mating components

Valve fixing screw

M5x50-10.9 grade GB/T70.1-2000

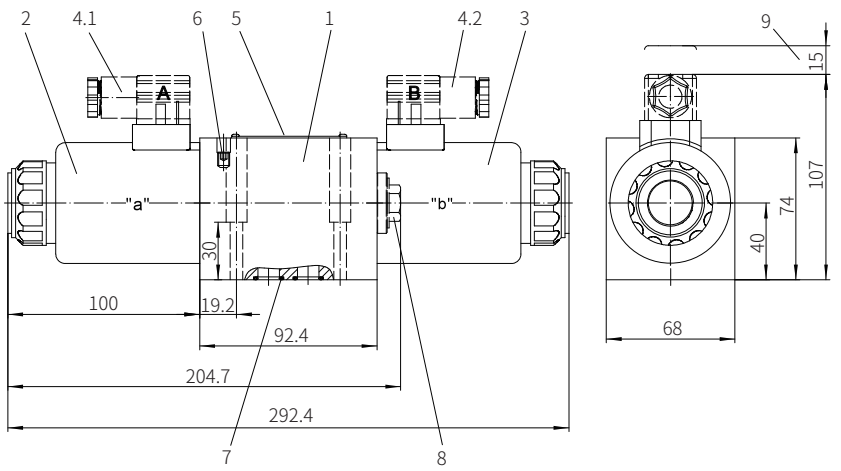
Tightening torque M_A=7.8Nm

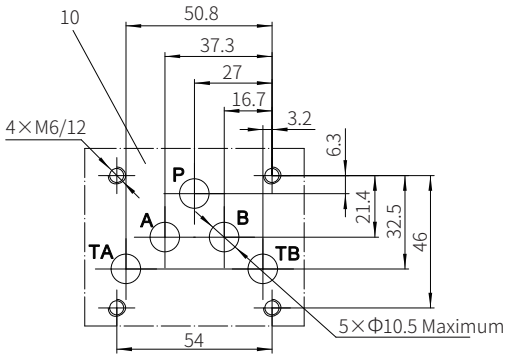
1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid“b”
4 Plug
5 Name plate
6 O-ring 9.25x1.78 (for oil port P, A, B, T)
7 Plug for valve with one solenoid
(Two-position valve, symbol EA or WA)
8 Space required to remove the plug
9 Valve connection surface

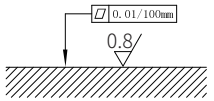
Component size

Size unit: mm

Model 4WRA10...-2XJ/...







Required surface finishing of mating components

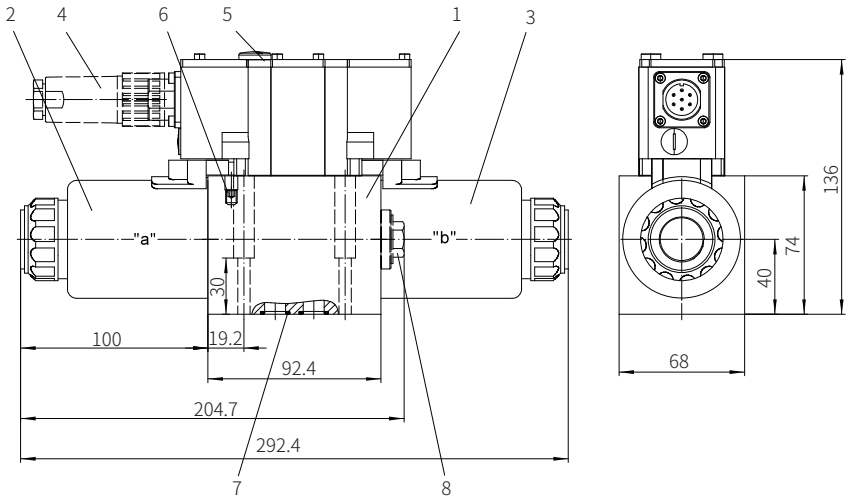
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

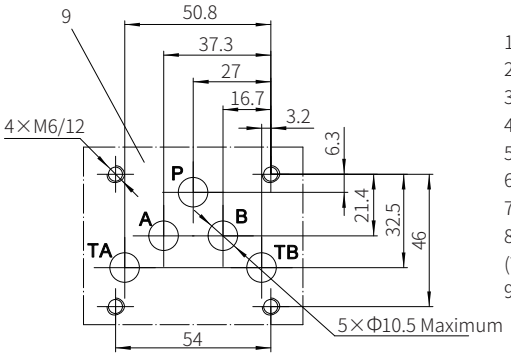
1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid“b”
4.1 Grey plug "A"
4.2 Black plug "B
5 Name plate
6 Valve bleed screw
7 O-ring 12x12 (for oil port P, A, B, T)
8 Plug for valve with one solenoid
(Two-position valve, symbol EA or WA)
9 Space required to remove the plug
10 Valve connection surface

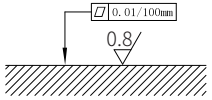
Component size

Size unit: mm

Model 4WRAE10...-2XJ/...







Required surface finishing of mating components

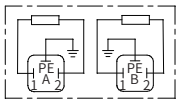
1 Valve body
2 Proportional solenoid “a”
3 Proportional solenoid “b”
4 Plug
5 Name plate
6 Valve bleed screw
7 O-ring 12x12 (for oil port P, A, B, T)
8 Plug for valve with one solenoid
(Two-position valve, symbol EA or WA)
9 Valve connection surface

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

Electrical connections

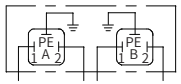
Model 4WRA...2XJ/...(Without built-in amplifier)

Component plug connection form



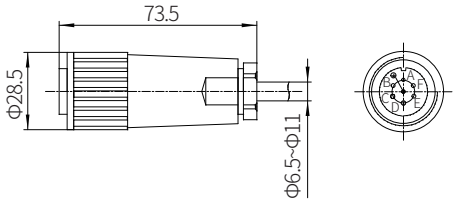
The plug-in connector to DINEN 175301-803 or ISO4400

Component plug connection form



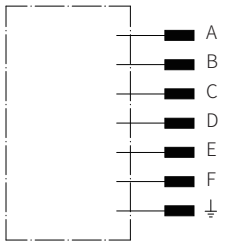
Model 4WRAE...2XJ/...(With built-in amplifier)

The plug-in connector to DINEN 175201-804



Model 4WRAE...(With built-in amplifier)

Terminal identification of plugs



Terminal identification	contact	A1 signal	F1 signal
Supply voltage	A	24VDC(19~35V)	
	B	GND	
	C	no connection[1)]	
Differential amplifier input	D	±10V, Re>50K Ω	4~20mA, Re>100 Ω
	E	Reference potential	
	F	no connection[1)]	

Command value:

A positive command value 0 to +10V (or 12 to 20mA) at D and E causes a flow from P to A and B to T.
A negative command value 0 to -10V (or 12 to 4mA) at D and E causes a flow from P to B and A to T.
For valves only with one solenoid in side "A" (symbols EA and WA), a positive command value at D and E causes a flow from P to B and A to T.

Connecting cable:

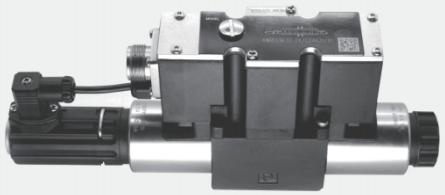
Recommendation:

Cable length up to 25m, model LiYCY 5x0.75mm²
Cable length up to 50m, model LiYCY 5x1.0mm²
The external diameter of the cable is 6.5 to 11mm
The connection of screen to PE on the supply side only.

[1)] Contacts C and F are not allowed to be connected together.

Proportional Directional Valve

Model: 4WRE(E)...2XJ



- ◆ Size 6 and 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 80 L/min (size 6)
  180 L/min (size 10)

Contents

Function description, sectional drawing	02-03
Functional symbols	03
Models and specifications	04
Technical parameters	05
Characteristic curve	06-11
Component size	12-15
Electrical connections	16-17

Features

- ● proportional directional valve with direct operated proportional solenoid
- ● For subplate mounting
- ● Control the direction and flow
- ● Spring centred control spool
- ● Internal amplifier, current input A1 or F1, optional
- ● Operated by proportional solenoids with thread and detachable coil
- ● Both valves and proportional amplifiers from the same supplier

Function description, sectional drawing

The 4WRE(E) valve is a 4/2-way and 4/3-way proportional directional valve with direct operated and subplate mounting. It is actuated by proportional solenoids with central thread and detachable coil.The control of the solenoids can be achieved through an external amplifier (4WRE) or internal amplifier (4WREE).

Structure:

The valves consist of:

- Valve body with mounting surface (1)
- Control spool (2) with compression springs (3 and 4) and spring seats (X1 and X2)
- Solenoids (5 and 6) with central thread
- Position sensor (7)
- Optional amplifier (8)
- Mechanical zero adjustment (9) accessible by Pg13.5, electrical zero point adjustment (10) accessible by Pg7 for model 4WREE

Operating principle:

- When the solenoids (5 and 6) are de-energized, the compression springs (3 and 4) hold the control spool (2) in the central position between spring seats (X1 and X2)
- After the proportional solenoid is energized, it will directly push the control spool (2), e.g. energization of solenoid "b" (6):

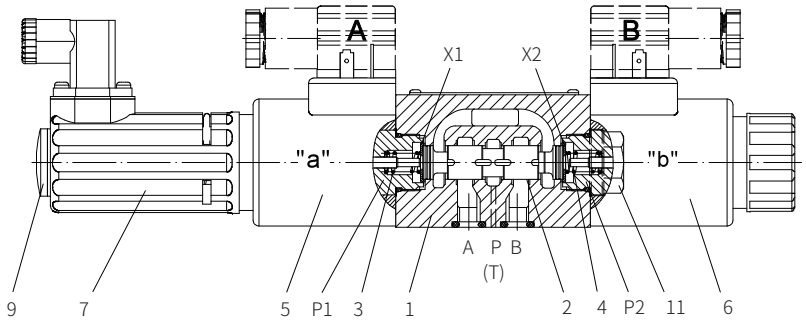
→The control spool (2) is pushed to the left in proportion to the electrical input signal

→At this time, P to A and B to T are connected through the throttle formed by the spool and the valve body with progressive flow characteristics

- De-energization of solenoid (6)

→The control spool (2) is pushed back to the center position by the compression spring (3)

In the de-energized condition, the spool (2) is held in the mechanical central position via the reset springs. There is no related to the hydraulic central position for the spool symbol “V”. When the valve control loop is closed, the spool is in the hydraulic central position.



Model 4WRE6...2XJ

Function description, sectional drawing

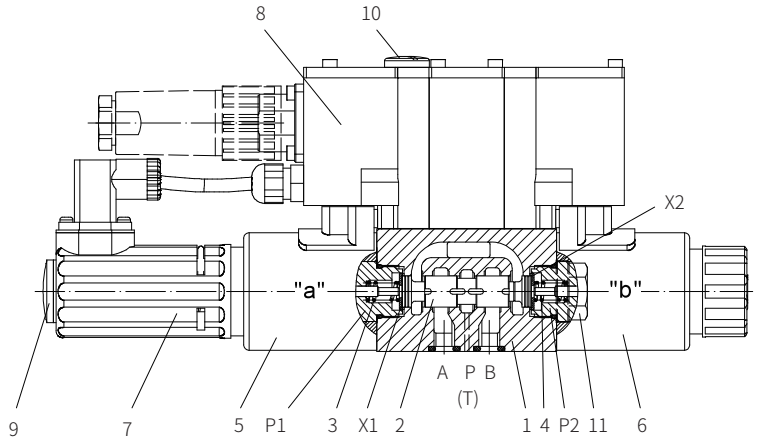
Two Position Valves:

(Mode l4WRE...A...)

In principle, the function of this valve is similar to the valve with three-position, but it is installed with solenoid "a" only. A plug 8.1 is installed instead of the proportional solenoid “b”.

Note for model 4WRE6...- 2XJ/...:

It must be avoided to drain all the oil in the return line. If necessary, a back pressure valve is to be installed in the circuit (back pressure about 2 bar).

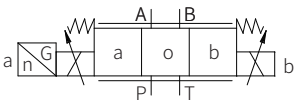


Model 4WREE6...-2XJ/

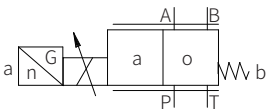
Functional symbols

Without amplifier

Model 4WRE...-2XJ/...

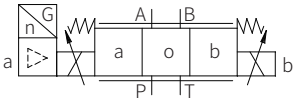


Model 4WRE...A-2XJ/...

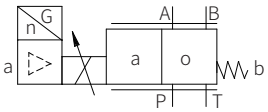


With amplifier

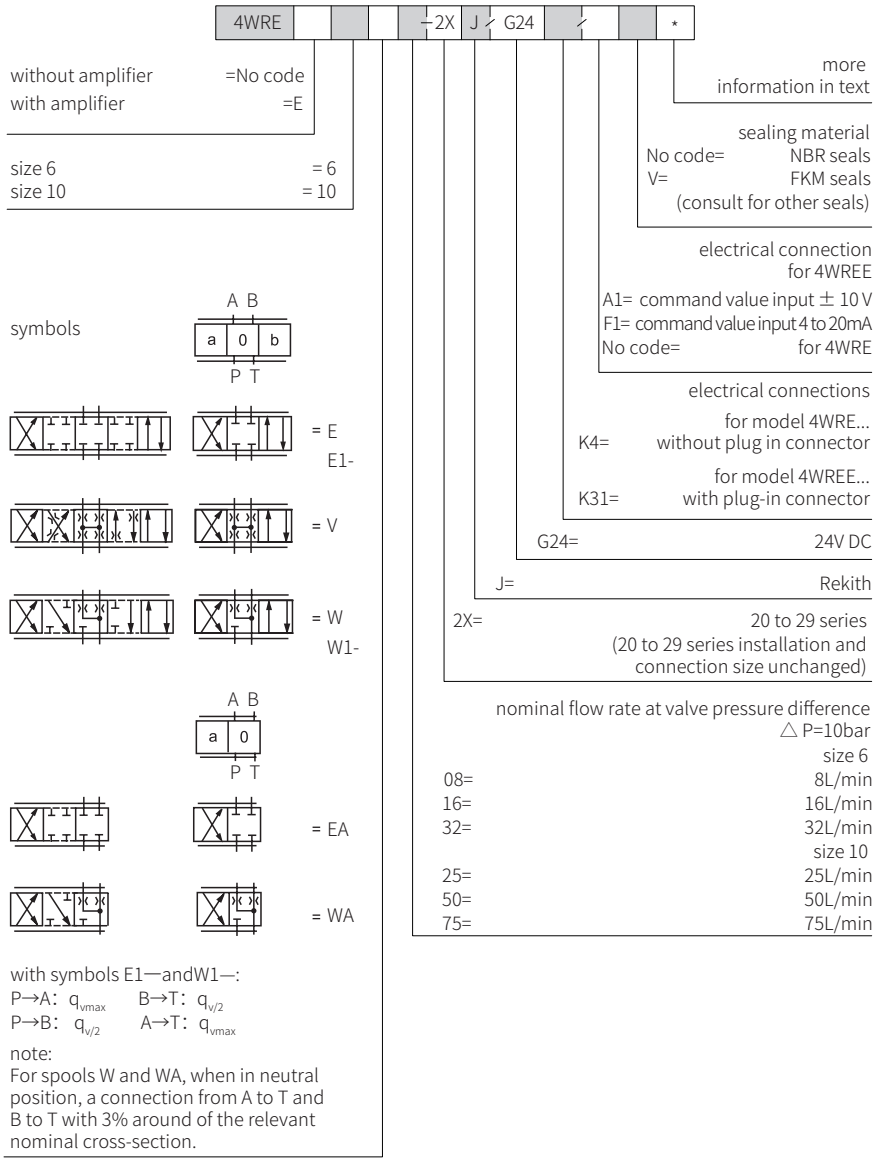
Model 4WREE...-2XJ....



Model 4WREE...A-2XJ...



Models and specifications



with symbols E1—andW1—:
P→A: q_{vmax} B→T: $q_{v/2}$
P→B: $q_{v/2}$ A→T: q_{vmax}

note:
For spools W and WA, when in neutral position, a connection from A to T and B to T with 3% around of the relevant nominal cross-section.

Technical parameters

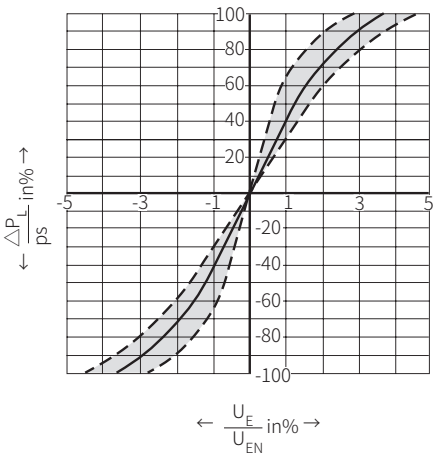
Overview				
Size			6	10
Installation position			Optional, firstly horizontal	
Storage temperature range		°C	-20 to +80	
Environment	4WRE	°C	-20 to +70	
Temperature range	4WREE	°C	-20 to +50	
Weight	4WRE	kg	2.2	6.3
	4WREE	kg	2.4	6.5
Hydraulic (measured at pressure P=100bar and using HLP46, ϑ_{oil}=40°C ± 5°C)				
Maximum working pressure	Oil port A, B, P	bar	315	
	Oil pot T	bar	210	
Nominal flow rate q_v nom at	△P=10bar	L/min	8, 16, 32	25, 50, 75
Maximum permissible flow		L/min	80	180
Pressure medium			Mineral oil (HL, HLP) to DIN 515241; Biology can quickly decompose Oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]	
Oil temperature range		°C	-20 to +80 (preferably +40 to +50)	
Viscosity range		mm^2/S	20 to 380 (preferably 30 to 46)	
Cleanliness of oil			The maximum allowable pollution level of oil is to ISO4406 class 20/18/15	
Hysteresis		%	⩽0.1	
Reversal span		%	⩽0.05	
Response sensitivity		%	⩽0.05	
Zero shift upon		%/10K	0.15	
change of hydraulic oil temperature and working temperature		%/100 bar	0.1	
The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.				
Electrical				
Size			6	10
Voltage type			DC	
Command value signal for 4WREE	voltage input "A1"	V	±10	
	current input "F1"	mA	4 to 20	
Solenoid coil resistance	Cold value at 20°C	Ω	2.7	3.7
	Maximum warm value	Ω	4.05	5.55
Power rate		%	100	
Maximum coil temperature		°C	150	
Electrical connection	4WRE		With component plug and plug-in connector to DINEN 175301-803 or ISO4400	
	4WREE		With component plug and plug-in connector to DINEN 175201-804	
Valve protection to EN60529			IP65, plug installed and locked	

Characteristic curve

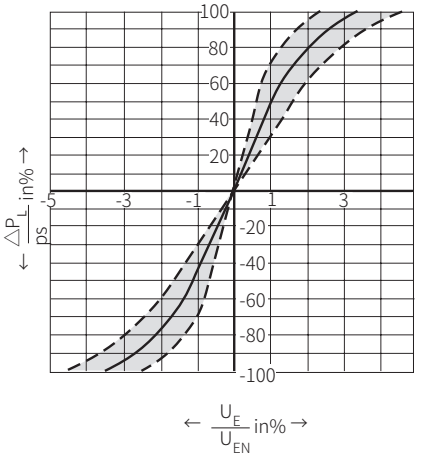
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Pressure-input signal characteristic curve (symbol V), p_S= 100 bar Size 6 and 10

Size 6

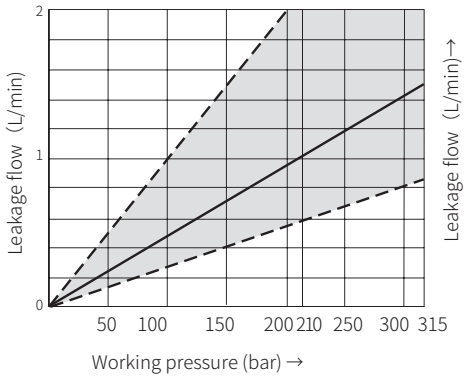


Size 10

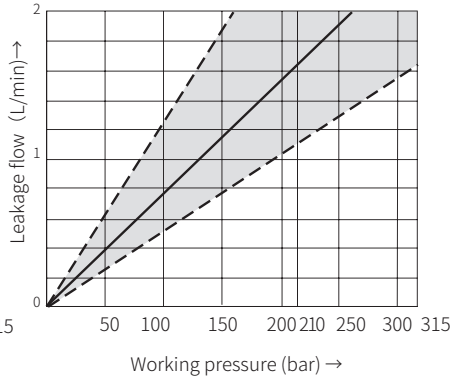


Leakage flow characteristic curve with the spool in the central position

Model 4WREE6V32



Model 4WREE10V75

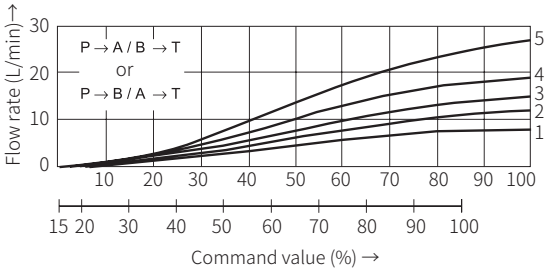


Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

The nominal flow rate 8L/min at 10 bar valve pressure difference

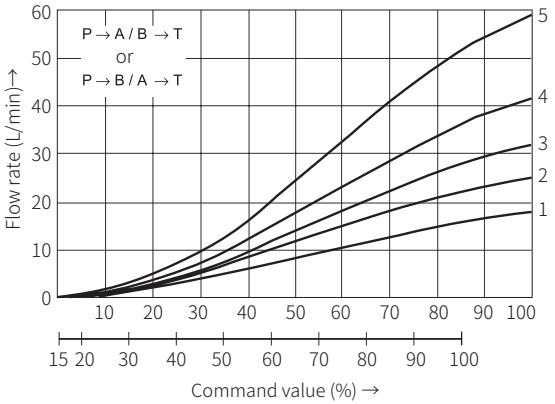
Size 6



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

Symbol "V"
Symbols "E" and "W"

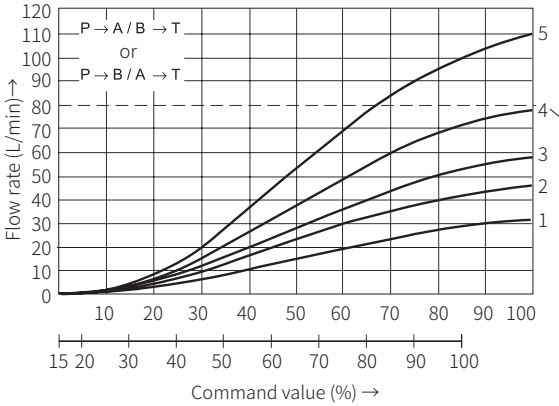
The nominal flow rate 16L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

Symbol "V"
Symbols "E" and "W"

The nominal flow rate 32L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

Maximum permissible flow

△P=valve pressure difference (inlet pressure P_P minus load pressure P_L and minus return oil pressure P_T)

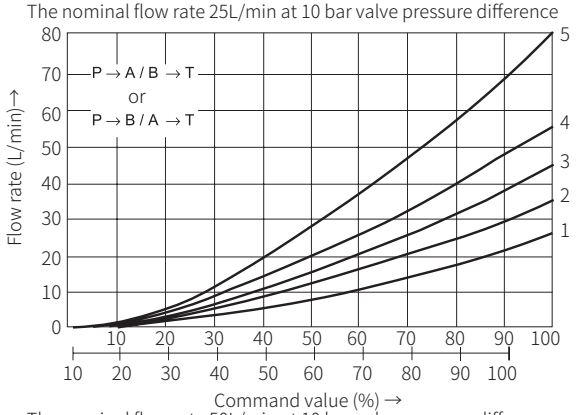
Symbol "V"
Symbols "E" and "W"

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Size 10

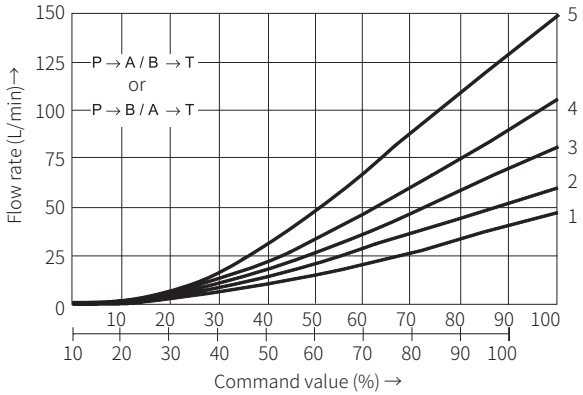
The nominal flow rate 25L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

Symbol "V"
Symbols "E" and "W"

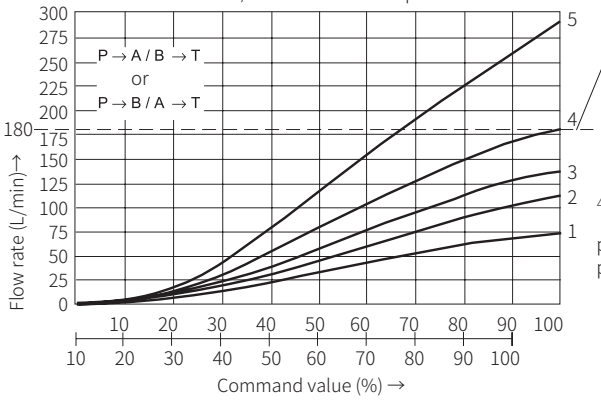
The nominal flow rate 50L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

Symbol "V"
Symbols "E" and "W"

The nominal flow rate 75L/min at 10 bar valve pressure difference



Maximum permissible flow

1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

△P=valve pressure difference (inlet pressure P_p minus load pressure P_L and minus return oil pressure P_T)

Symbol "V"
Symbols "E" and "W"

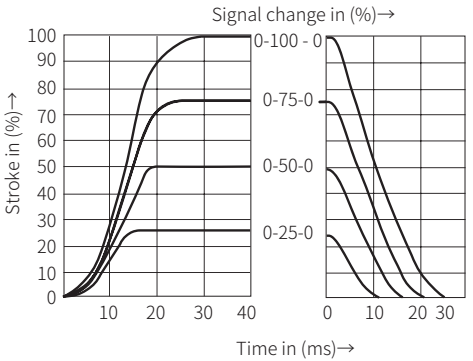
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C and Ps=10bar)

Transition performance of the valve when the input signal is a step signal: model 4WREE

Size 6

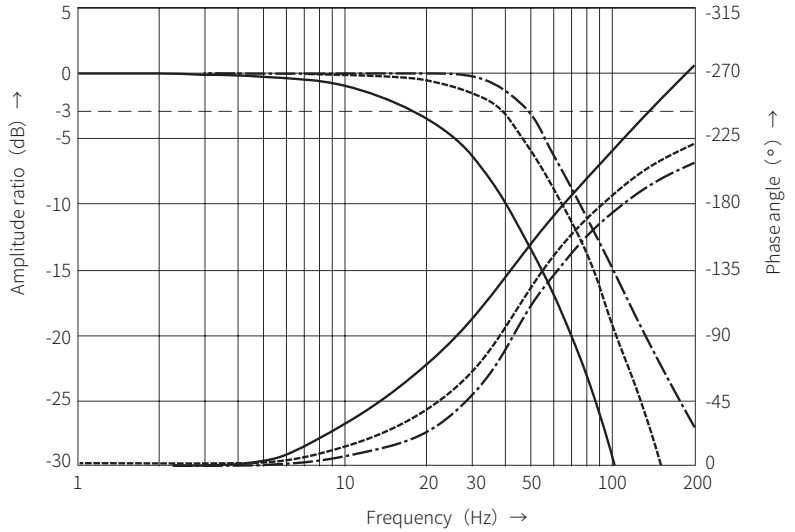
4/3 valve type
Symbol "E"



Frequency response: model 4WREE
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C and Ps=10bar)

Size 6

4/3 valve type
Symbol "V"



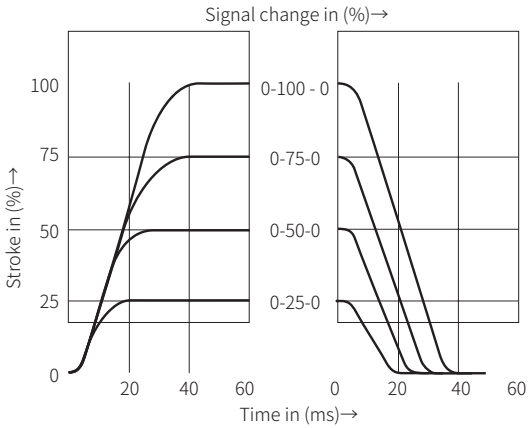
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C and Ps=10bar)

Transition performance of the valve when the input signal is a step signal: model 4WREE

Size 10

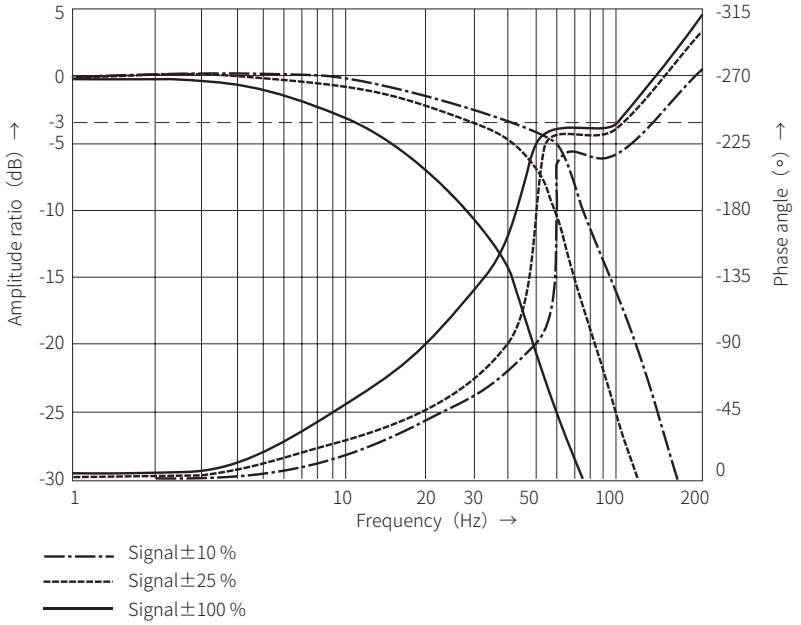
4/3 valve type
Symbol "E"



Frequency response: model 4WREE
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C and Ps=10bar)

Size 10

4/3 valve type
Symbol "V"

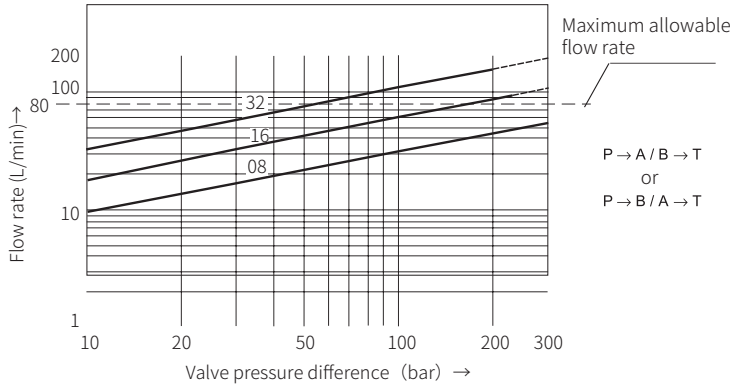


Characteristic curve

Flow: model 4WREE (Measured when using HLP46, ϑ_{oil} =40°C ± 5°C and Ps=10bar)

Size 6

The load function with maximum valve opening,
nominal flow 8L/min, 16L/min, and 32L/min.
symbol "V

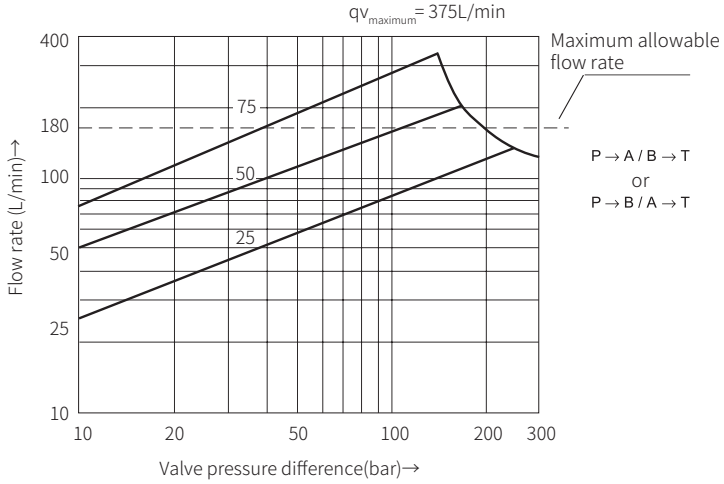


Need to consider the maximum allowable flow rate of 80 L/min!

Flow: model 4WREE (Measured when using HLP46, ϑ_{oil} =40°C ± 5°C and Ps=10bar)

Size 10

The load function with maximum valve opening,
nominal flow 25L/min, 50L/min, and 75L/min.
symbol "V

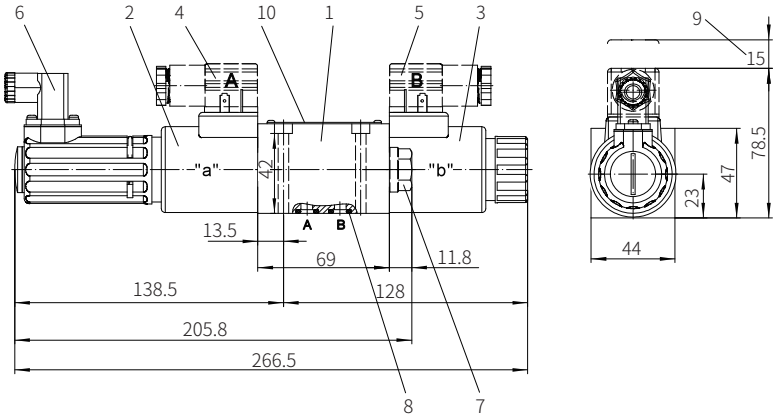


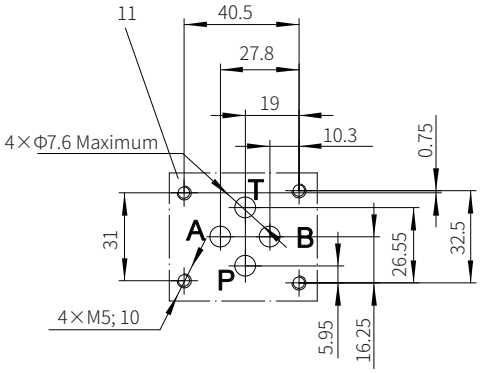
Need to consider the maximum allowable flow rate of 80 L/min!

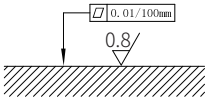
Component size

Size unit: mm

Model 4WRE6...-2XJ/...







Required surface finishing of mating components

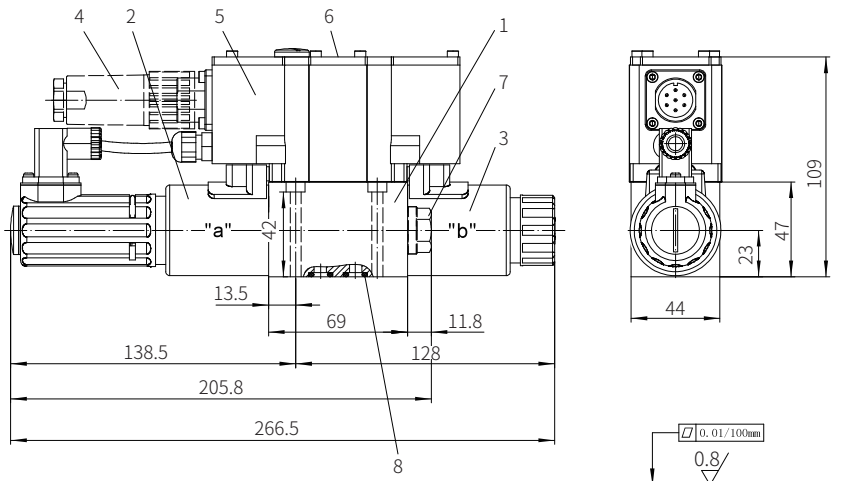
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

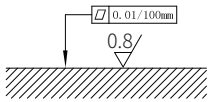
1 Valve body
2 Proportional solenoid “a” with inductive position sensor
3 Proportional solenoid “b”
4 Grey plug “A”
5 Black plug “B”
6 Inductive position sensor plug
7 Plug for valve with one solenoid (two-position valve, symbol EA or WA)
8 O-ring 9.25x1.78 (for oil port P, A, B, T)
9 Space required to remove the plug
10 Name plate
11 Valve connection surface

Component size

Size unit: mm

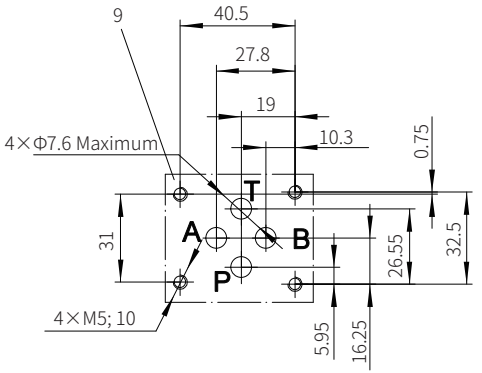
Model 4WREE6...-2XJ/...





Required surface finishing of mating components

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

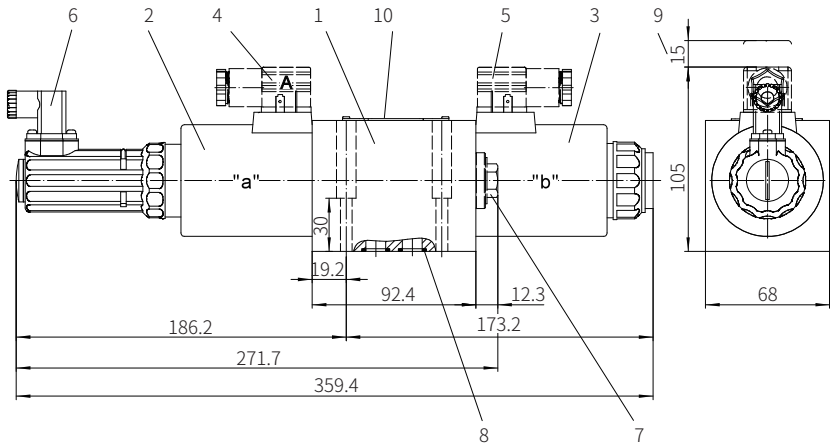


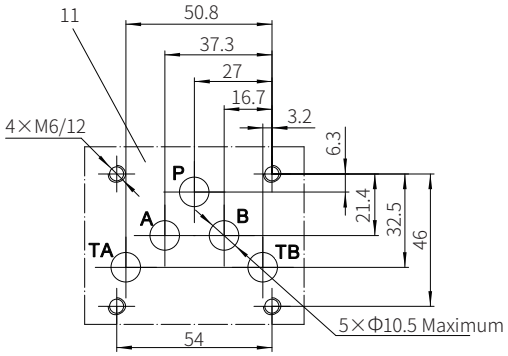
1 Valve body
2 Proportional solenoid “a” with inductive position sensor
3 Proportional solenoid “b”
4 Plug
5 Amplifier (OBE)
6 Name plate
7 Plug for valve with one solenoid (two-position valve, symbol EA or WA)
8 O-ring 9.25x1.78 (for oil port P, A, B, T)
9 Valve connection surface

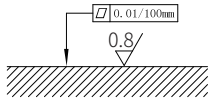
Component size

Size unit: mm

Model 4WRE10...-2XJ/...







Required surface finishing of mating components

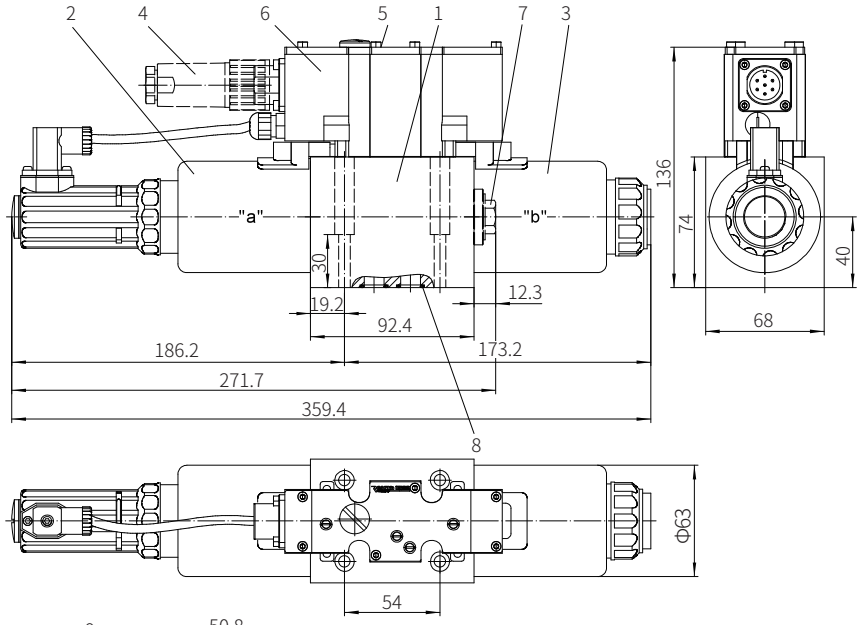
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

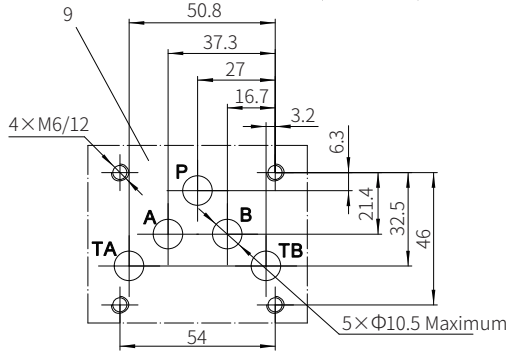
1 Valve body
2 Proportional solenoid “a” with inductive position sensor
3 Proportional solenoid “b”
4 Grey plug “A”
5 Black plug “B”
6 Inductive position sensor plug
7 Plug for valve with one solenoid (two-position valve, symbol EA or WA)
8 O-ring 12x2 (for oil port P, A, B, T)
9 Space required to remove the plug
10 Name plate
11 Valve connection surface

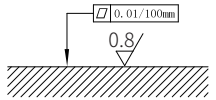
Component size

Size unit: mm

Model 4WREE10...-2XJ/...







Required surface finishing of mating components

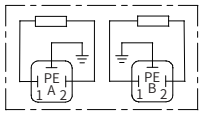
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

1 Valve body
2 Proportional solenoid “a” with inductive position sensor
3 Proportional solenoid “b”
4 Plug
5 Name plate
6 Amplifier
7 Plug for valve with one solenoid (two-position valve, symbol EA or WA)
8 O-ring 12x2 (for oil port P, A, B, T)
9 Valve connection surface

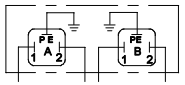
Electrical connections

Model 4WRE...2XJ/...(Without built-in amplifier)

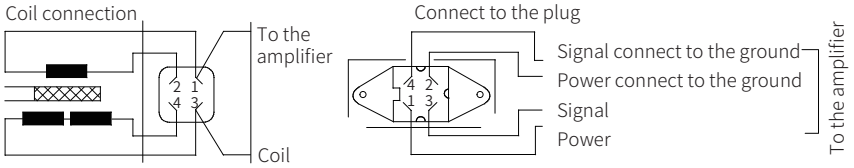
Component plug connection form
The plug-in connector
to DIN175301-803 or
ISO4400



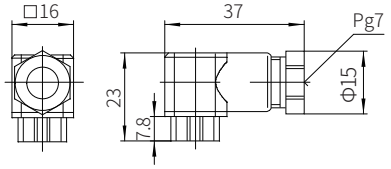
Component plug connection form



Inductive position sensor

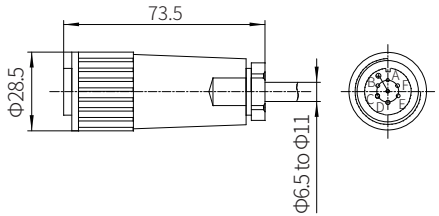


Plug connector 4-pin Pg7-G4W1F
Connecting cable:
Recommendation:
Cable length up to 50m, model
LiYCY 4x0.25mm²
The connection of screen to PE
on the supply side only.



Model 4WREE...2XJ/...(With built-in amplifier)

The plug-in connector to DINEN 175201-804



Electrical connections

Model 4WREE...(With built-in amplifier)

Plug allocation

Terminal identification	Contact	A1 signal	F1 signal
Supply voltage	A	24VDC (u (t) =19.4 to 35V), Imax=2A	
	B	0V	
Reference potential (actual value)	C	Reference contact F, Re>50K Ω	Reference contact F, Re>10K Ω
Differential amplifier input	D	±10V, Re>50K Ω	4 to 20mA, R>100Ω
	E	Reference potential command value	
Measurement output (actual value)	F	Actual value ± 10V (limit load 5mA)	Actual value 4 to 20mA (maximum load resistance 300 Ω)
	PE	Connected with the valve body and cooling element	

Command value:

A positive command value 0 to +10V (or 12 to 20mA) at D and E causes a flow from P to A and B to T.
A negative command value 0 to -10V (or 12 to 4mA) at D and E causes a flow from P to B and A to T.
For valves only with one solenoid in side "A" (symbols EA and WA), a positive command value at D and E causes a flow from P to B and A to T.

Actual value:

A positive actual value 0 to +10V (or 12 to 20mA) at F and C causes a flow from P to A and B to T.
A negative actual value 0 to -10V (or 4 to 12mA) at F and C causes a flow from P to B and A to T.
For valves only with one solenoid in side "A" (symbols EA and WA), a positive actual value at F and C causes a flow from P to B and A to T.

Connecting cables:
Recommended:

Cable length up to 25m, model LiYCY 5x0.75mm²
Cable length up to 50m, model LiYCY 5x1.0mm²
The external diameter of the cable is 6.5 to 11mm
The connection of screen to PE on the supply side only.

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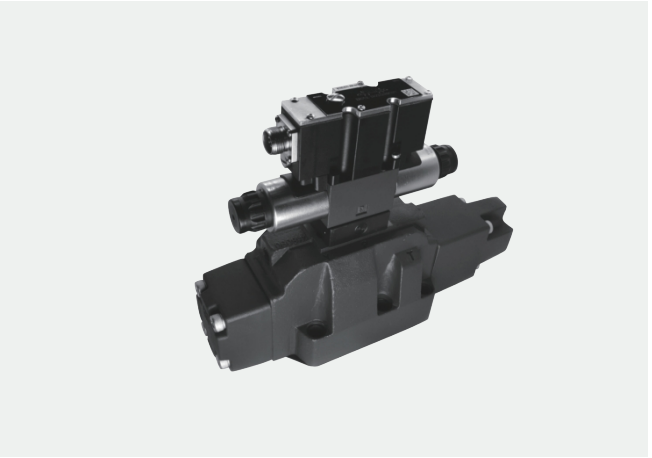
Electro-hydraulic Proportional Directional Valve

Model: 4WRZ(E)...7XJ



- Size 10 to 32
- Maximum working pressure 350 bar
- Maximum working flow 1600 L/min

Contents

Function description, sectional drawing	02-04
Functional symbols	04
Models and specifications	05
Technical parameters	06-07
Characteristic curve	08-11
Component size	12-15
Electrical connections	16
Control oil supply	17

Features

- Pilot operated proportional directional valve
- Control the direction and size of the flow
- For subplate mounting
- Spring centred control spool
- Operation by proportional solenoids with central thread and detachable coil
- Both valves and proportional amplifiers from the same supplier

Function description, sectional drawing

Pilot control valve model 3DREP6...

This pilot valve is a three-way pressure reducing valve controlled by a proportional solenoid. It converts an input signal into a proportional pressure output signal and is used for all valves model 4WRZ...

The proportional solenoids are adjustable, DC wet pin solenoids with central threads and detachable coils. The solenoids are controlled by external amplifier (model WRZ...) or internal amplifier (mode 4WRZE...)

Structure:

The valves consist of:

- Valve body with mounting surface (1)
- Control spool (2) with pressure measuring spools (3 and 4)
- Solenoids (5 and 6) with central threads
- Optional amplifier (7)

Operating Principle:

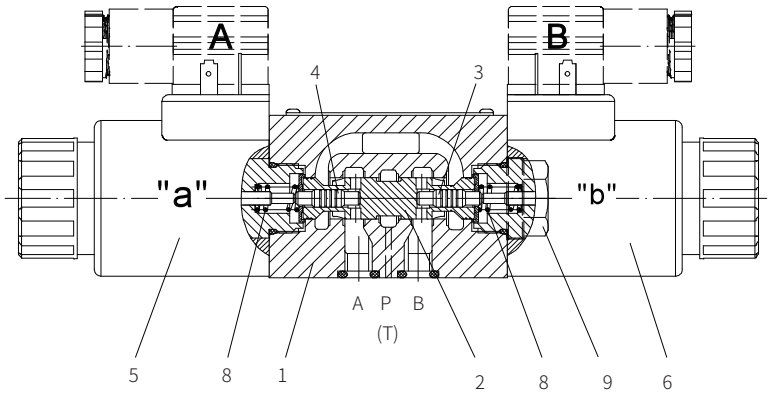
- When the solenoids (5and6) are de-energized, the compression spring (8) holds the control spool (2) in the central position.
- After the proportional solenoid is energized, it will directly push the control spool (2), e.g. energization of the solenoid "b" (6):

→The control spool (2) and pressure measuring spool (3) are pushed to the left in proportion to the electrical input signal.

→At this time, P to A and B to T are connected through the throttle formed by the spool and the valve body with progressive flow characteristics.

- De-energization of solenoid (6)

→The control spool (2) is pushed back to the central position by the compression spring (8). In the central position of the pilot valve, A and B are connected to T, that means the hydraulic fluid can flow to the tank directly.

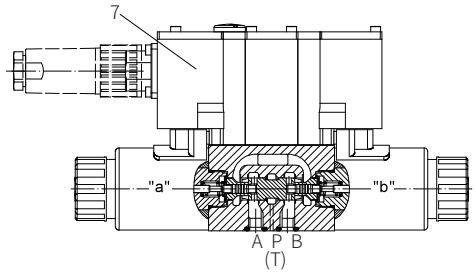


Model 3DREP6...-2XJ/

Function description, sectional drawing

Note for model 3DREP6...

It must be avoided to drain all the oil in the return line. If necessary, a back pressure valve is to be installed in the circuit (back pressure about 2 bar).



Model 3DREPE6...-2XJ/

Two position valve (model 3DREP... B...)

In principle, the function of this valve is similar to the valve with three-position. The two position valve is installed with solenoid "a" (5) only, and a screw plug (9) is installed at the position of the second solenoid.

Pilot operated proportional directional valve model 4WRZ...

The 4WRZ valve is pilot operated 4-way directional valve which is controlled by proportional solenoids, it controls the direction and size of the flow.

Structure:

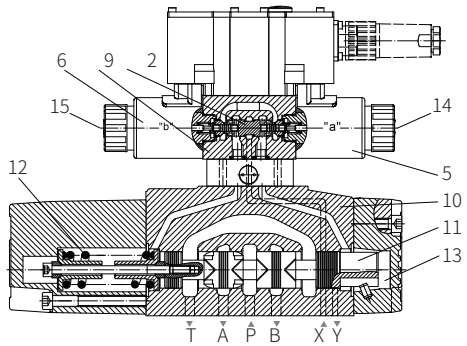
The valves consist of:

- Pilot control valve (9) with proportional solenoids (5 and 6)
- Main valve (10) with main valve spool (11) and compression spring (12)

Operating principle:

When the solenoids (5 and 6) are de-energised, the compression spring (12) holds the main valve spool (11) in the central position.

→The action of the main valve spool (11) is controlled by the pilot valve (9), the main valve spool is proportional moved, e.g. by means of solenoid "b" (6).



Model 4WRZE16..-7XJ/..

→Firstly, the control spool (2) is pushed to the right, the pilot oil is fed through the pilot valve (9) into the pressure chamber (13) and moves the main spool (11) in proportion to the electrical input signal.

- At this time, P to B and A to T are connected through the throttle formed by the spool and the valve body with progressive flow characteristics.
- The pilot oil required for the pilot valve can be supplied internally through port P or externally through port X.

→When the solenoid (6) is de-energized, the control spool (2) and main valve spool (11) will return to the central position.

- Depending on the different position of the main valve spool, P to A and B to T or P to B and A to T are connected. The optional manual emergency operations (14 and 15) with protective cap allow the pilot valve (2) to move when the solenoid is not energized.

Attention! Inadvertent activation of manual emergency operation may cause the equipment movement out of control.

Function description, sectional drawing

Externally controlled pilot operated proportional directional valve, model 4WRH...

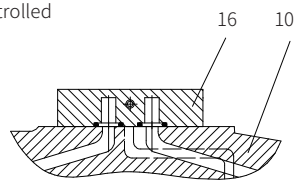
The model WRH... is a pilot proportional directional valve controlled by an external pressure regulating valve.

Structure:
The valves consist of:

- Main valve (10) with main valve spool (11) and compression spring (12)
- Adapter board (16)

Working principle:

- The adapter board (16) connects the control port A to control port T (Y) and the control port B to port P (X). The pilot pressure of the main valve must not exceed 25 bar.



Model 4WRH...-7XJ/

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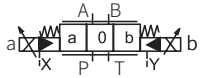
Functional symbols

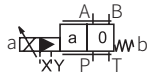
With electro-hydraulic operation and for external amplifier

Model 4WRZ...-7XJ/...

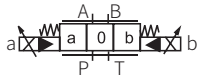


X=external
Y=external

Model 4WRZ...A-7XJ/...

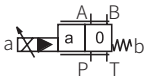


Model 4WRZ...-7XJ/...ET...



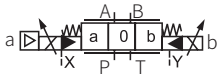
X=internal
Y=internal

Model 4WRZ...A...-7XJ/...ET...



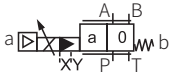
With electro-hydraulic operation and for integrated amplifier

Model 4WRZE...-7XJ/...

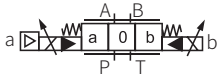


X=external
Y=external

Model 4WRZE...A-7XJ/...

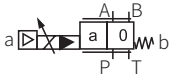


Model 4WRZE...-7XJ/...ET...



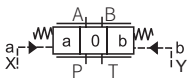
X=internal
Y=internal

Model 4WRZE.A...-7XJ/...ET...



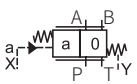
With hydraulic operation

Model 4WRH...7XJ/...



X=external
Y=external

Model 4WRH...A...7XJ/...



Models and specifications

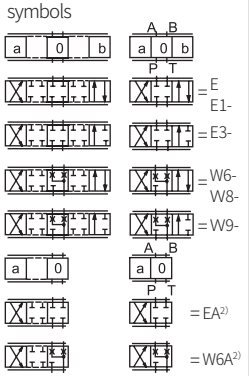
4WR_ – 7X J / / / *

hydraulic operation =H
electro-hydraulic operation =Z

for external electronics =No code
with integrated electronics =E

size 10 =10
size 16 =16
size 25 =25
size 32 =32

symbols



with symbols E1- and W8-:
P→A: q_{vmax}
B→T: $q_{v/2}$
P→B: $q_{v/2}$
A→T: q_{vmax}

with symbols E3- and W9-:
P→A: q_{vmax} B→T: closed
P→B: $q_{v/2}$ A→T: q_{vmax}
(When forming a differential circuit, the bottom interface of the hydraulic cylinder should be connected to port A)

note: For spools W6-, W8-, W9 and W6A, when in neutral position, a connection from A to T and B to T with less than 2% of the relevant nominal cross-section.

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code= without pressure reducing valve
D3[1] = with pressure reducing valve ZDR6DP0-4X/40YM-W80 (fixed setting)

electrical connection
For 4WRZE:
A1= command value input ± 10 V
F1= command value input 4 to 20mA
No code= for WRZ and WRH

K4= electrical connections for model 4WRZ... without plug in connector
K31= for model 4WRZE... plug-in connector

supply and drain of pilot oil
No code= pilot oil supply external drain external
E= pilot oil supply internal drain external
ET= pilot oil supply internal drain internal
T= pilot oil supply external drain internal

No code= without special protection

No code= no manual emergency operation
N9= with hidden manual emergency operation

electronic control supply voltage
G24= 24V DC (standard)

6E= pilot valve, proportional solenoid with detachable coil

J= Rexroth

7X= 70 to 79 series (installation and connection size unchanged)

nominal flow rate at valve pressure difference △ P=10bar

25=	50=	85=	size 10
100=	150=		size 16
220=	325=		size 25
360=	520=		size 32

1) Not used for 4WRH and 4WRZ without pilot valve
2) Not applicable for model 4WRH

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Technical parameters

Overview						
Valve model			.WRZ		.WRZE	
Installation position			Optional, firstly horizontal			
Storage temperature range		°C	-20 to +80			
Environment temperature range		°C	- 20 to + 70		- 20 to + 50	
Weight -Subplate mounting	size 10	kg	7.8		8.0	
	size 16	kg	13.4		13.6	
	size 25	kg	18.2		18.4	
	size 32	kg	42.2		42.2	

Hydraulic (Measured at pressure P=100 bar and using HLP46, ϑ_{oil}=40°C ± 5°C)						
size		size	10	16	25	32
Working pressure - Pilot valve	External pilot oil supply	bar	30 to 100			
	Internal pilot oil supply	bar	100 to 315 with "D3"	100 to 350 with "D3"		
Main valve port P, A, B		bar	Up to 315	Up to 350	Up to 350	Up to 350
Return flow pressure	Port T (port R) (External pilot oil drain)	bar	Up to 315	Up to 250	Up to 50	Up to 150
	Port T (Internal pilot oil drain)	bar	Up to 30	Up to 30	Up to 30	Up to 30
	Port Y	bar	Up to 30	Up to 30	Up to 30	Up to 30
Flow of the main valve		L/min	Up to 170	Up to 460	Up to 870	Up to 1600
Control oil flow in port X and Y with stepped input signal (0 →100 %)		L/min	3.5	5.5	7	15.9
Pilot oil volume for reversing of the main valve 0 →100 %		cm^3	1.7	4.6	10	26.5
Fluid		°C	Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]			
Oil temperature range			-20 to +80 (preferably +40 to +50)			
Viscosity range		mm^2	20 to 380 (preferably 30 to 46)			
The maximum allowable pollution degree of the oil	- Pilot valve		Class 18/16/13			
	- Main valve		Class 20/18/15			
Hysteresis		%	⩽ 6			

The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effective oil filtration can prevent failure and increase the service life of the components.

Technical parameters

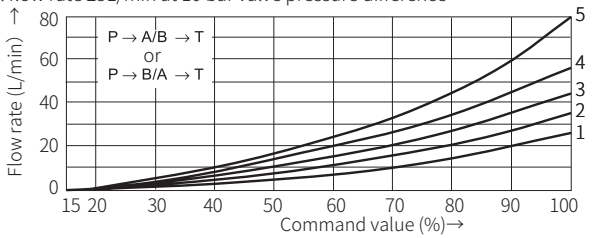
Electrical				
Valve model			.WRZ	.WRZE
Valve protection to EN60529			IP65, plug installed and locked	
Voltage type			DC	
Command value overlap		%	15	
Maximum current		A	1.5	2.5
Solenoid coil resistance	Cold value at 20°C	Ω	4.8	2
	Maximum warm value	Ω	7.2	3
Power rate		%	100	
Maximum coil temperature		°C	150	
Electrical connection	WRZ		With component plug and plug-in connector to DINEN 175301-803	
	WRZE		With component plug and plug-in connector to DINEN 175201-804	
Control electronics				
Internal amplifier for model 4WRZE...			Integrated in the valve	
Current consumption	I_{max}	A	-	1.8
	Impulse current	A	-	3
Command value signal	Voltage input "A1"	V	-	±10
	Current input "F1"	mA	-	4 to 20
External amplifier for model 4WRZ...				
Modular amplifier			RT-PVDA-OX-D2-30-CN-A1/F1	

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

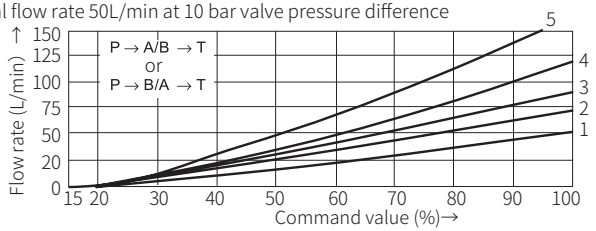
Size 10

The nominal flow rate 25L/min at 10 bar valve pressure difference



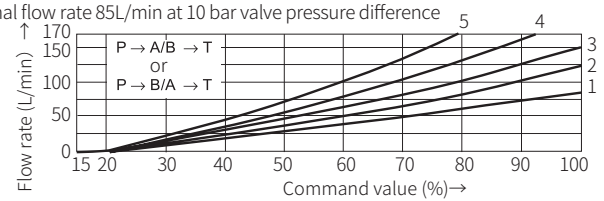
1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

The nominal flow rate 50L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

The nominal flow rate 85L/min at 10 bar valve pressure difference

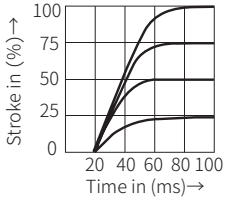


1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

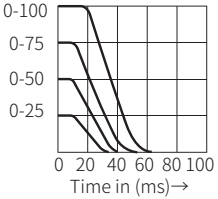
△P=valve pressure difference (inlet pressure P_P minus load pressure P_L and minus return oil pressure P_T)

Transition performance of the valve when the input signal is a step signal, measured at Pst=50 bar

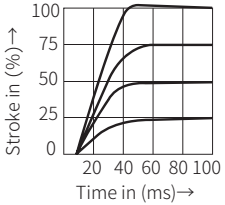
Model 4WRZ...



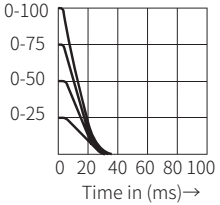
Signal change in (%)



Model 4WRZE...



Signal change in (%)

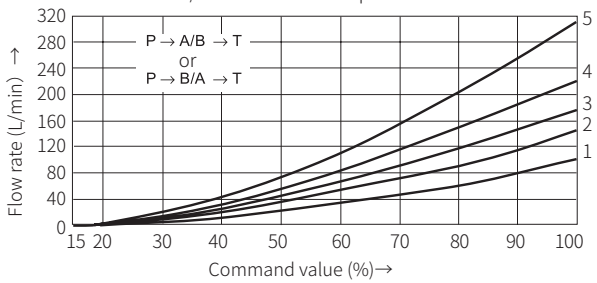


Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

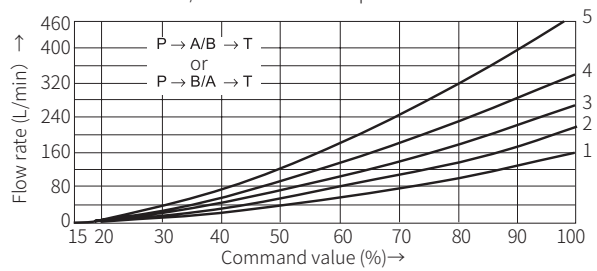
Size 16

The nominal flow rate 100L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

The nominal flow rate 150L/min at 10 bar valve pressure difference

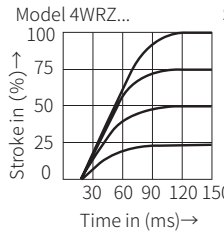


1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

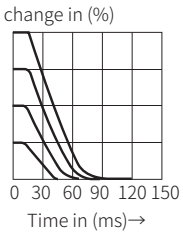
△P=valve pressure difference (inlet pressure P_P minus load pressure P_L and minus return oil pressure P_T)

Transition performance of the valve when the input signal is a step signal, measured at Pst=50 bar

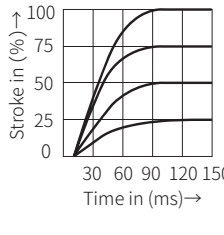
Model 4WRZ...



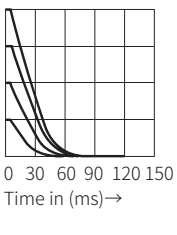
Signal change in (%)



Model 4WRZE...



Signal change in (%)

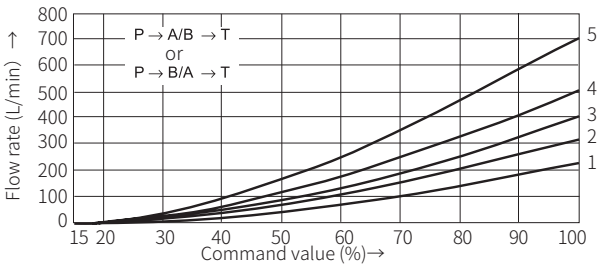


Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

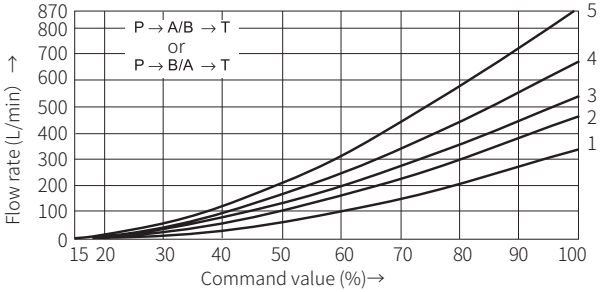
Size 25

The nominal flow rate 220L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

The nominal flow rate 325L/min at 10 bar valve pressure difference

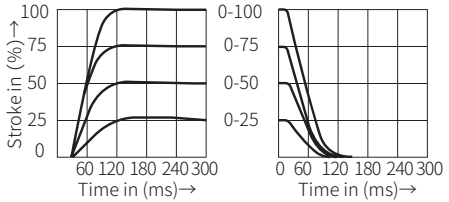


1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

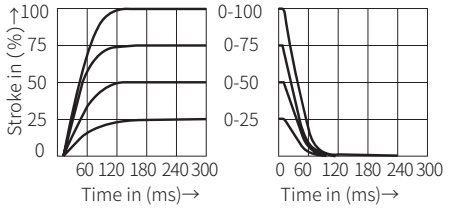
△P=valve pressure difference (inlet pressure P_P minus load pressure P_L and minus return oil pressure P_T)

Transition performance of the valve when the input signal is a step signal, measured at P_{st}=50 bar

Model 4WRZ... Signal change in (%)



Model 4WRZE... Signal change in (%)

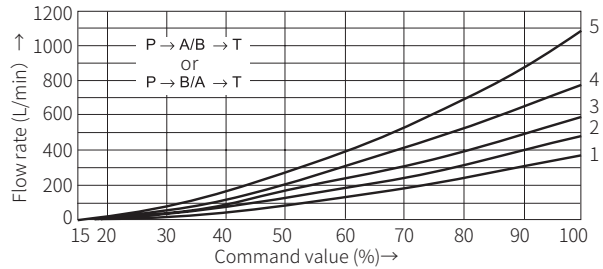


Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

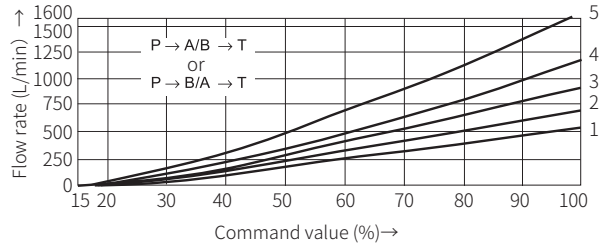
Size 32

The nominal flow rate 360L/min at 10 bar valve pressure difference



1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

The nominal flow rate 520L/min at 10 bar valve pressure difference

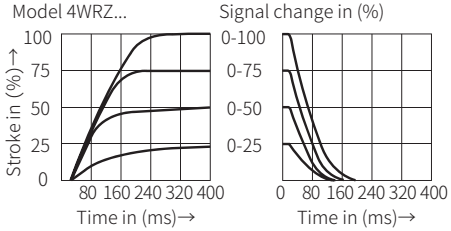


1 △P=10 bar constant
2 △P=20 bar constant
3 △P=30 bar constant
4 △P=50 bar constant
5 △P=100 bar constant

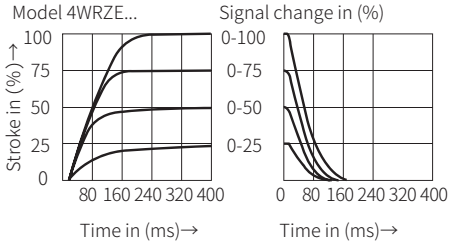
△P=valve pressure difference (inlet pressure P_P minus load pressure P_L and minus return oil pressure P_T)

Transition performance of the valve when the input signal, measured at P_{st}=50 bar

Model 4WRZ... Signal change in (%)



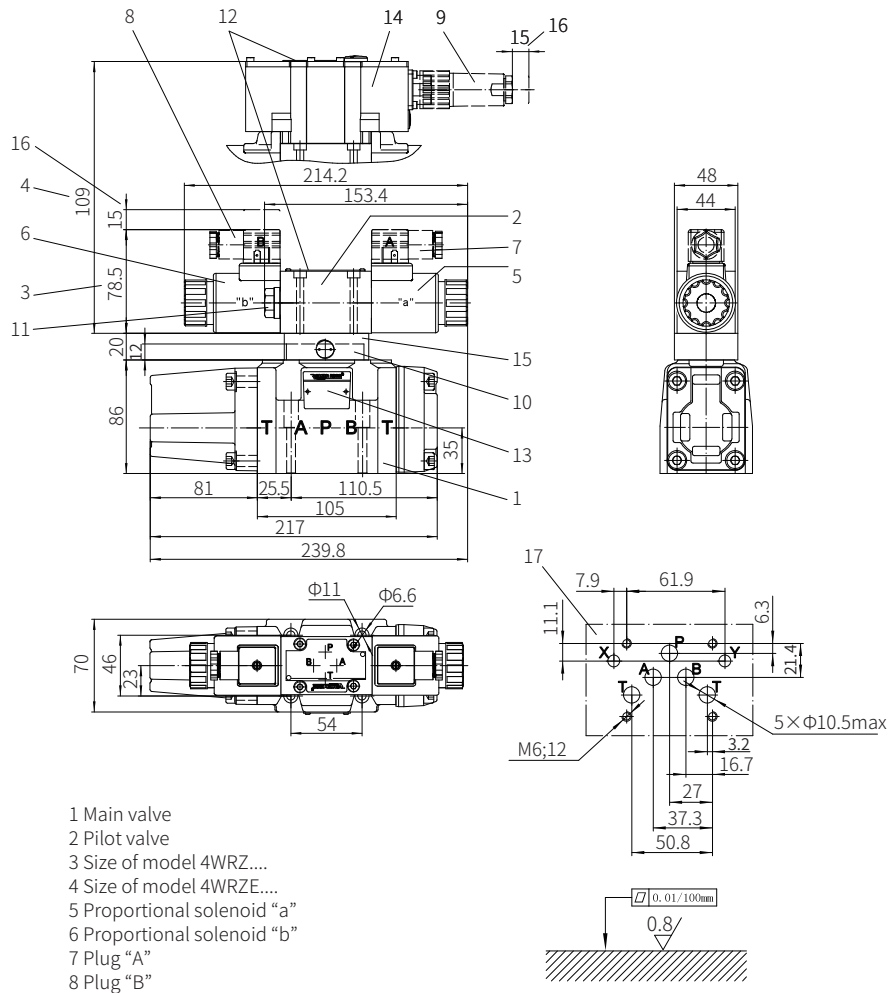
Model 4WRZE... Signal change in (%)



Component size

Size unit: mm

Model 4WRZ(E)10...-7XJ/...



1 Main valve
2 Pilot valve
3 Size of model 4WRZ....
4 Size of model 4WRZE....
5 Proportional solenoid “a”
6 Proportional solenoid “b”
7 Plug “A”
8 Plug “B”
9 Plug-in connector
10 Interconnection plate (for 4WRH...)
11 Plug for valve with one solenoid
12 Name plate for pilot valve
13 Name plate for main valve
14 Built-in amplifier (OBE)
15 Pressure reducing valve “D3”
16 Space required to remove the plug
17 Valve connection surface

Required surface finishing of mating components

Valve fixing screw

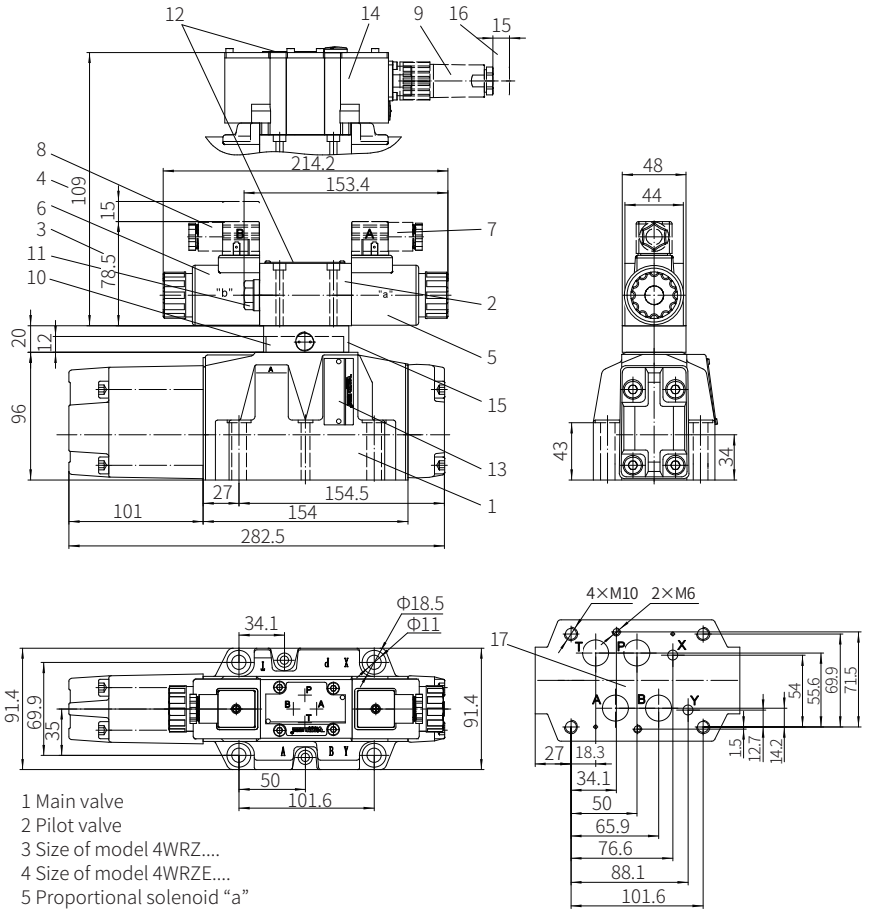
M6x40-10.9 grade GB/T70.1-2000

Tightening torque M_A=13.7Nm

Component size

Size unit: mm

Model 4WRZ(E)16...-7XJ/...



1 Main valve
2 Pilot valve
3 Size of model 4WRZ....
4 Size of model 4WRZE....
5 Proportional solenoid “a”
6 Proportional solenoid “b”
7 Plug “A”
8 Plug “B”
9 Plug-in connector
10 Interconnection plate (for 4WRH...)
11 Plug for valve with one solenoid
12 Name plate for pilot valve
13 Name plate for main valve
14 Built-in amplifier (OBE)
15 Pressure reducing valve “D3”
16 Space required to remove the plug
17 Valve connection surface

Required surface finishing of mating components

Valve fixing screw

4xM10x60-10.9 grade GB/T70.1-2000

Tightening torque M_A=60Nm

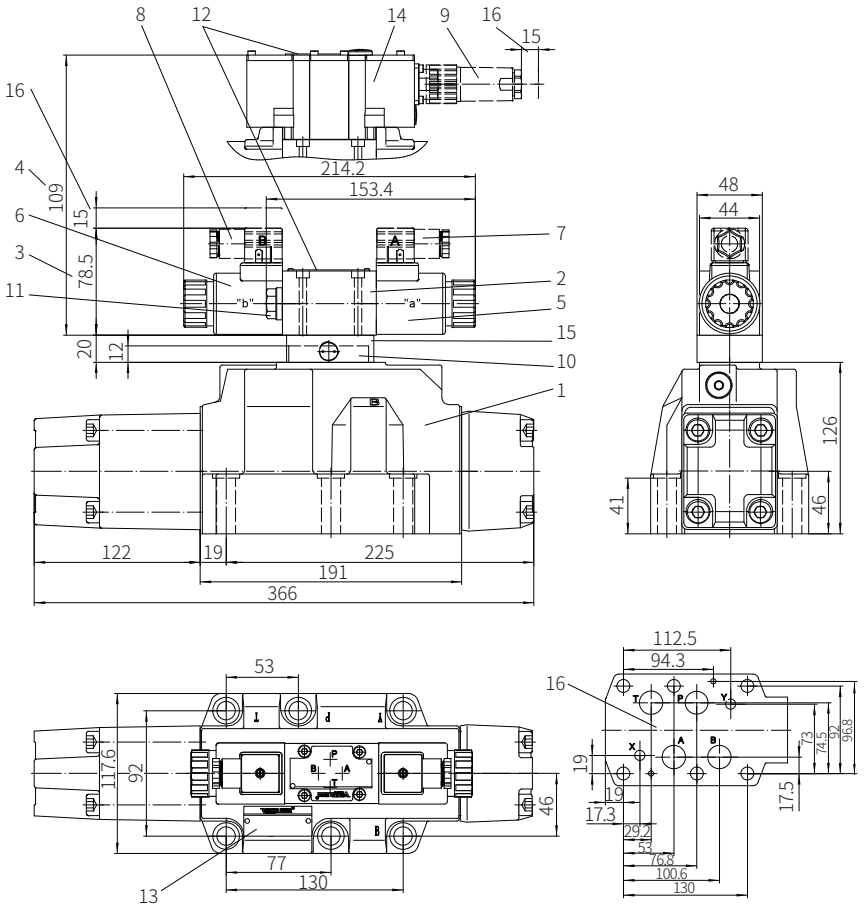
2xM6x55-10.9 grade GB/T70.1-2000

Tightening torque M_A=13.7Nm

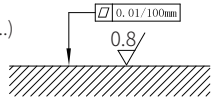
Component size

Size unit: mm

Model 4WRZ(E)25...-7XJ/...



1 Main valve
2 Pilot valve
3 Size of model 4WRZ....
4 Size of model 4WRZE....
5 Proportional solenoid “a”
6 Proportional solenoid “b”
7 Plug “A”
8 Plug “B”
9 Plug-in connector
10 Interconnection plate (for 4WRH...)
11 Plug for valve with one solenoid
12 Name plate for pilot valve
13 Name plate for main valve
14 Built-in amplifier (OBE)
15 Pressure reducing valve “D3”
16 Space required to remove the plug
17 Valve connection surface



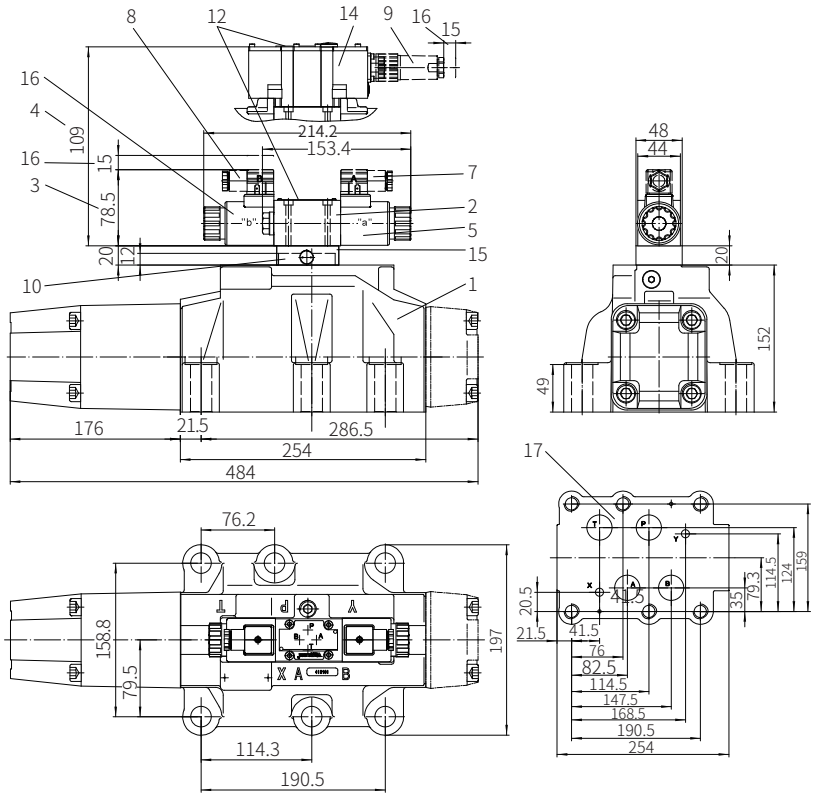
Required surface finishing of mating components

Valve fixing screw
6xM12x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=95Nm

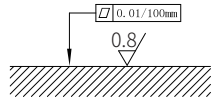
Component size

Size unit: mm

Model 4WRZ(E)32...-7XJ/...



1 Main valve
2 Pilot valve
3 Size of model 4WRZ....
4 Size of model 4WRZE....
5 Proportional solenoid “a”
6 Proportional solenoid “b”
7 Plug “A”
8 Plug “B”
9 Plug-in connector
10 Interconnection plate (for 4WRH...)
11 Plug for valve with one solenoid
12 Name plate for pilot valve
13 Name plate for main valve
14 Built-in amplifier (OBE)
15 Pressure reducing valve “D3”
16 Space required to remove the plug
17 Valve connection surface



Required surface finishing of mating components

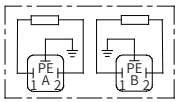
Valve fixing screw
6xM20x80-10.9 grade GB/T70.1-2000
Tightening torque M_A=373Nm

Electrical connections

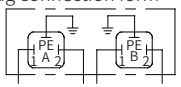
Model 4WRZ...2XJ/...(Without built-in amplifier)

Component plug connection form

The plug-in connector to DINEN 175301-803 or ISO4400

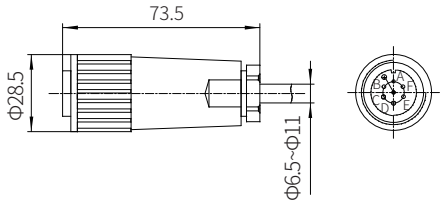


Component plug connection form



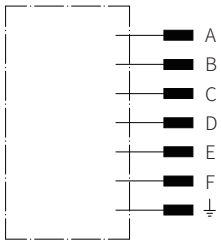
Model 4WRZE...2XJ/...(With built-in amplifier)

The plug-in connector to DINEN 175201-804



Model 4WRZE...(With built-in amplifier)

Terminal identification of plugs



Terminal identification	Contact	A1 signal	F1 signal
Supply voltage	A	24VDC(19~35V)	
	B	GND	
	C	no connection[1)]	
Differential amplifier input	D	±10V，Re>50K Ω	4~20mA，Re>100 Ω
	E	Reference potential	
	F	no connection[1)]	

Command value:

A positive command value 0 to 10V (or 12 to 20mA) at D and E causes a flow from P to A and B to T.

A negative command value 0 to -10V (or 12 to 4mA) at D and E causes a flow from P to B and A to T.

For valves only with one solenoid in side "A" (symbols EA and WA), a positive command value at D and E causes a flow from P to B and A to T.

Connecting cable:

Recommendation:

Cable length up to 25m, model LiYCY 5x0.75mm²

Cable length up to 50m, model LiYCY 5x1.0mm²

The external diameter of the cable is 6.5 to 11mm

The connection of screen to PE on the supply side only.

[1)]Contacts C and F are not allowed to be connected together.

Control oil supply

Model 4WRZ... -.../ pilot oil supply external
Model 4WRH... -.../ pilot oil drain external

In this construction, the pilot oil is supplied from a separate control circuit (supply external).
The pilot oil return via port Y separately (drain external) but not through the port "T" of main valve.

Model 4WRZ... -.../...E...pilot oil supply internal
pilot oil drain external

In this construction, the pilot oil is supplied from port P of the main valve
(supply internal).
The pilot oil return via port Y separately (drain external) but not through port T of main valve.
Ports "Y" in the subplate is closed.

Model 4WRZ... -.../...ET...pilot oil supply internal
pilot oil drain internal

In this construction, the pilot oil is supplied from port P of the main valve (supply internal).
The pilot oil return to port T of main valve directly (drain internal).
Ports "X" and "Y" in the subplate are both closed.

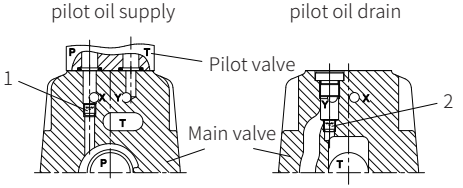
Model 4WRZ... -.../...T...pilot oil supply external
pilot oil drain internal

In this construction, the pilot oil is supplied from a separate control circuit (supply external).
The pilot oil return to port T of the main valve (drain internal).
Port "Y" in the subplate is closed.

1 and 2: Plug M6

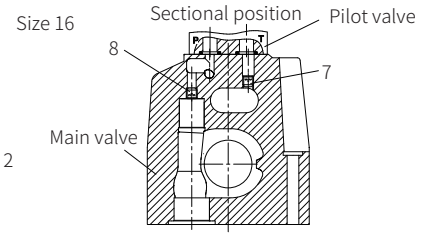
Size 10

Sectional position



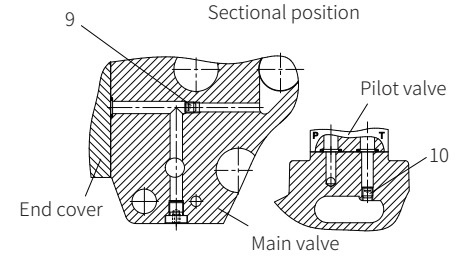
Pilot oil supply external: 1 closed
internal: 1 open
Pilot oil return external: 2 closed
internal: 2 open

Size 16



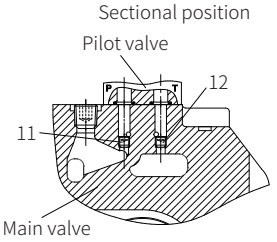
Pilot oil supply external: 8 closed
internal: 8 open
Pilot oil return external: 7 closed
internal: 7 open

Size 25



Pilot oil supply external: 9 closed
internal: 9 open
Pilot oil return external: 10 closed
internal: 10 open

Size 32



Pilot oil supply external: 11 closed
internal: 11 open
Pilot oil return external: 10 closed
internal: 10 open

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Electro-hydraulic Proportional Directional Valve

Model: 4WRKE...3XJ

- Size 10 to 32
- Maximum working pressure 350 bar
- Maximum working flow 1600 L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04
Functional symbols	05
Technical parameters	06
Characteristic curve	07-11
Component size	12-15
Electrical connections	16

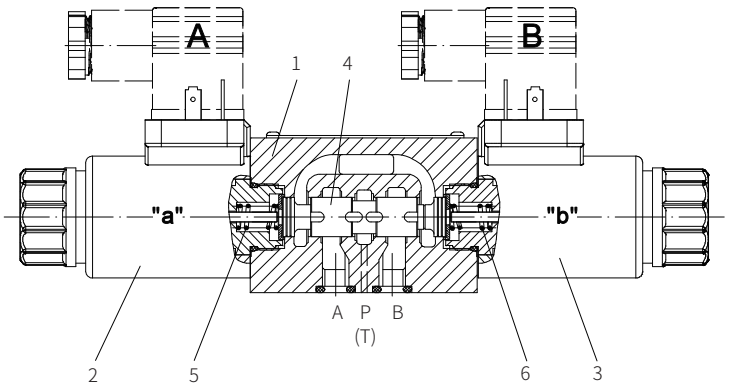
Features

- Pilot operated two-stage proportional directional valve
- For subplate mounting
- Control the direction and size of the flow
- Operation by proportional solenoids
- Spring centred main control spool
- Electrical position feedback
- Main stage with position closed-loop control
- Internal amplifier

Function description, sectional drawing

Pilot control valve model 4WRAP6W7...3XJ/G24... (1st stage)
This valve is a direct operated proportional valve. The dimensions of control edge is designed and optimized for the use as a pilot control valve for proportional directional valves model 4WRKE.
The proportional solenoids are oil-immersed DC solenoids with detachable coils. They convert the electric current proportionally into mechanical force. The increase of electric current cause the correspondingly higher of solenoid force. During the whole adjustment stroke, the set solenoid force remains unchanged.

The pilot control valve mainly consists of the valve body (1), proportional solenoids (2 and 3), valve spool (4), and springs (5and 6).
When the solenoid is de-energised, the working oil ports are connected to the oil tank. If one of the two solenoids (2 or 3) is energised, the solenoid force moves the valve spool (4) against the spring (5 or 6). Once the overlap area is overcome, one of the two working oil ports connected to the oil tank is blocked and will connect to the pressure chamber. Then the fluid flows from P to the control chamber of the main stage.

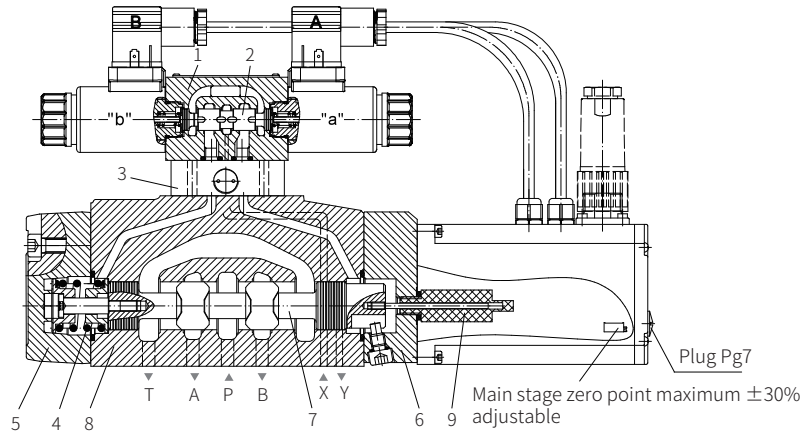


Model 4WRAP6W7-3XJ/G24...

Function description, sectional drawing

The 4WRKE valve is a two-stage proportional directional control valve. They control the size and direction of the flow. The main stage is position closed loop controlled so that the valve spool position is independent of the hydraulic force in larger flows.
The valve consists of the pilot control valve (1), valve body (8), main valve spool (7), covers (5and 6), centering spring (4), inductive position sensor (9), and pressure reducing valve (3).
If there is no input signal, the main valve spool (7) is held in the the central position by the centering spring (4). The two control chambers in the covers (5 and 6) are connected to the oil tank through the valve spool (2).
The main valve spool (7) is connected to the corresponding electronic amplifier through the induction position sensor (9), the change of position of the main valve spool (7) as well as the change of the command value at the summing point of the amplifier result in a differential voltage.

The control deviation is obtained by comparing the command value/ actual value through the electronic and a current is supplied to the proportional solenoid of the pilot valve (1).
The current induces solenoid force within the solenoid and transmit it to the solenoid push rod to push the control valve spool. The flow through the control port causes the main spool to move.
The main valve spool (7) with the solenoid core induction position sensor (9) continues to move until the actual value and command value are equal.
Under the condition of closed loop control, the main valve spool (7) is in force balanced and remained in the control position.
The changes of valve spool stroke and the control valve opening are proportional to the command value. The electronic control amplifier is built into the valve.
It must be avoided to drain all the oil in the return line. If necessary, a back pressure valve is to be installed in the circuit (back pressure about 2 bar).



Model 4WRKE16...-3XJ/

Valve characteristics

- The second stage is basically composed of our proportional valve components.
- The zero point adjustment of the "main stage zero point" is preset by the manufacturer, and can be adjusted within range of ± 30% of the nominal stroke through the potentiometer inside the electronic control. The integrated electronic control can be operated by removing the plug at the end of the valve cover.
- When replacing the pilot control valve or electronic controller, it must be readjusted.

Any adjustment must be carried out by trained experts.

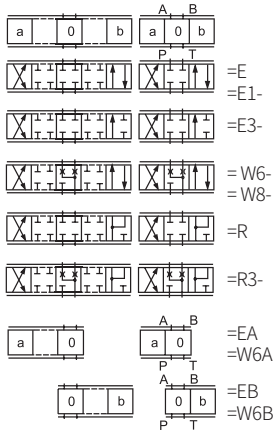
Models and specifications

4WRKE | | | | -3X | J | / | 6E | G24 | | K31 | / | | D3 | | *

Electrically operated, 2-stage proportional directional valve in 4-way with integrated amplifier

Size 10 =10
Size 16 =16
Size 25 =25
Size 32 =32

symbols



with symbols E1- and W8-:
P→A: q_{Vmax} B→T: $q_{v/2}$
P→B: $q_{v/2}$ A→T: q_{Vmax}

with symbols R and R3:
P→A : q_{Vmax} B→P: $q_{v/2}$
P→B: q_{Vmax} A→T: q_{Vmax}

note:
For spools W6, W8 and R3, when in neutral position, a connection from A to T and B to T with 2% around of the relevant nominal cross-section.

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

D3= With pressure reducing valve ZDR6DP0-4X/40YM-W80 (fixed setting)

Electrical connection
A1=Command value/actual value ±10V
F1= Command value /actual value 4 to 20 mA

Electrical connection
K31= With component plug and plug-in connector to DIN EN 175201-804

supply and drain of pilot oil
No code= pilot oil supply external drain external
E= pilot oil supply internal drain external
ET= pilot oil supply internal drain internal
T= pilot oil supply external drain internal

Supply voltage
G24= 24V DC

6E= proportional solenoid with detachable coil

J= Rekith

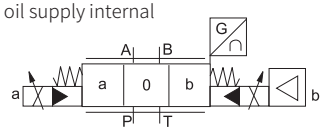
3X= 30 to 39 series
(30 to 39 series installation and connection size unchanged)

Characteristic curve form
L= Linear

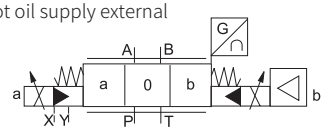
Nominal flow rate-reference characteristic curve
25= or 50= or 100= Size 10
125= or 200= Size 16
220= or 350= Size 25
400= or 600= Size 32

Functional symbols

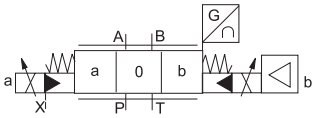
Model 4WRKE...-3XJ...ET...
pilot oil supply internal



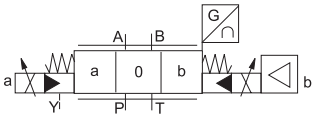
Model 4WRKE...-3XJ...
pilot oil supply external



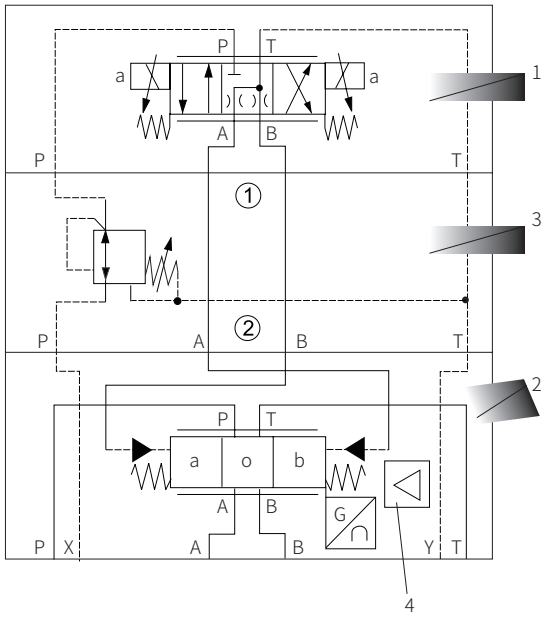
Model 4WRKE-3XJ...T...
pilot oil supply external and drain internal



Model 4WRKE...-3XJ...E...
pilot oil supply internal and drain external



Functional symbols detailed:
1、Pilot control valve, model 4WRAP6...
2、Main valve
3、Pressure reducing valve, model ZDR6DP0-4XJ/40YM-W80
4、Integrated electronic controller



Technical parameters

Overview						
Size			10	16	25	32
Installation and commissioning			Optional, firstly horizontal			
Storage temperature range		°C	-20 to +80			
Environment temperature range		°C	-20 to +50			
Weight		kg	8.7	11.2	16.8	31.5
Hydraulic (Measured at pressure P=100 bar and using HLP46, ϑ_{oil}=40°C ± 5°C)						
Working pressure	Pilot control valve Pilot oil supply	bar	25 to 315			
	Main valve oil ports A, B, P	bar	Up to 315	Up to 350	Up to 350	Up to 350
Return flow pressure	Port T Pilot oil drain, internal	bar	Static <10 (pilot valve)			
	Pilot oil drain, external	bar	Up to 315	Up to 250	Up to 250	Up to 250
	Port Y	bar	Static <10 (pilot valve)			
Nominal flow rate q_{vnom} ± 10% (at Δ P=10bar) △P=valve pressure differential		L/min	25 50 100	- 125 180	- 220 350	- 400 600
Flow of the main valve (maximum permissible flow)		L/min	170	460	870	1600
Control oil flow in port X and Y with stepped input signal (0 to 100 %) (315 bar)		L/min	4.1	8.5	11.7	13
Fluid			Mineral oil (HL, HLP) to DIN 515241; Biology can quickly decompose oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]			
The maximum allowable pollution degree of the oil According to ISO 4406 (c)	Pilot valve		Class 17/15/12[3]			
	Main valve		Class 120/18/15[3]			
Oil temperature range		°C	-20 to +80 (preferably +40 to +50)			
Viscosity range		mm^2/s	20 to 380 (preferably 30 to 45)			
Hysteresis		%	⩽1			
Response sensitivity		%	⩽0.5			
Electrical						
Voltage type			DC			
Signal type			Analog			
Maximum power		W	72 (average=24W)			
Electrical connection			With plug-in connector to DINEN 175201-804			
Valve protection to EN 60529			IP65, plug installed and locked			
Electric controller			Integrated in the valve			

1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Characteristic curve

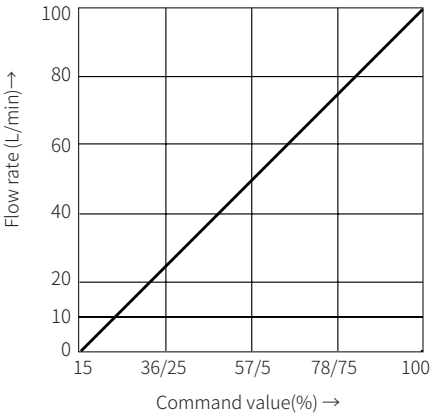
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Flow-command value characteristic curve, e.g.

P → A /B → T: 10bar pressure differential (symbols E and W6)
P → A or A → T: 5bar pressure drop

Applicable to functional symbol E..., W... and R...

The characteristic curve of the valve spool is L

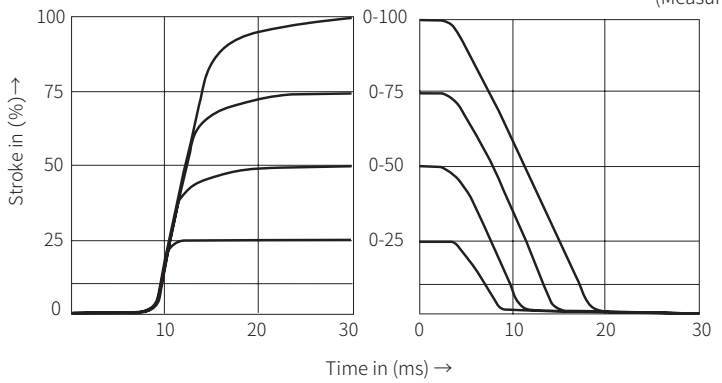


Characteristic curve

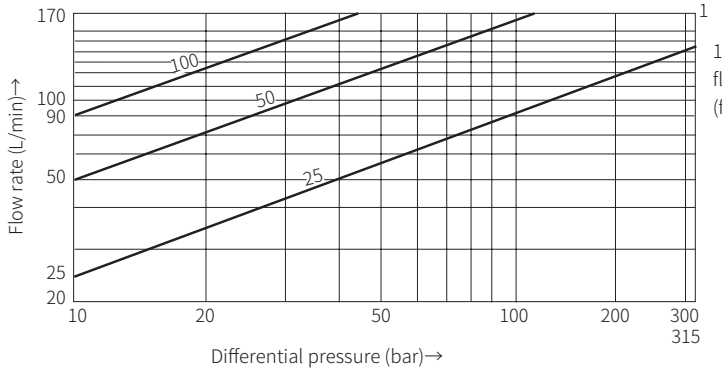
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Transition performance of the valve when the input signal is a step signal — Size 10

(Measured at P_{st}=100bar)



Flow load curve at maximum valve opening
(Tolerance ± 10%)

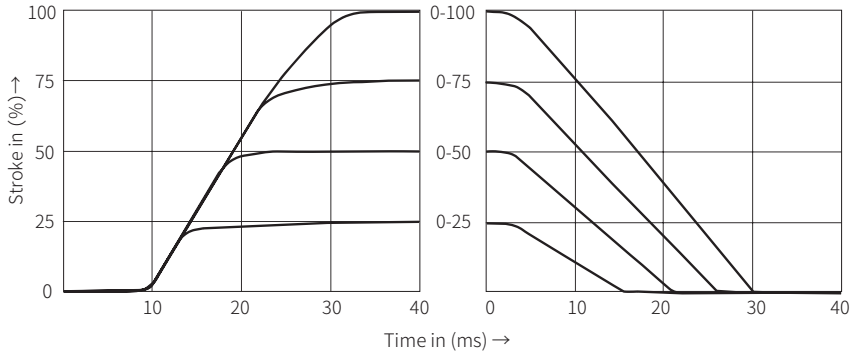


Characteristic curve

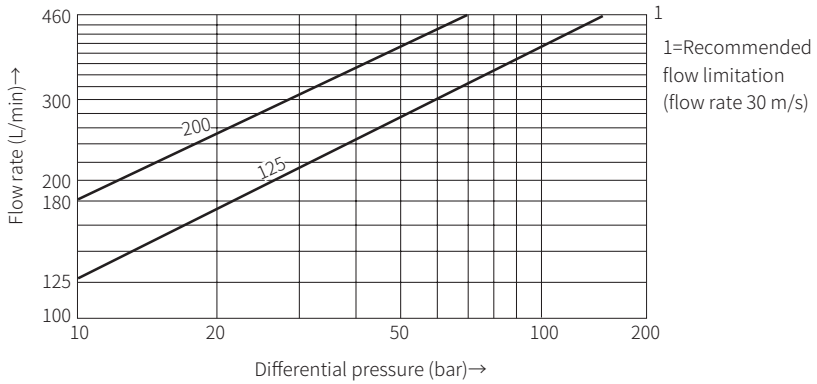
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Transition performance of the valve when the input signal is a step signal — Size 16

Signal change in (%) (Measured at P_{st}=100bar)



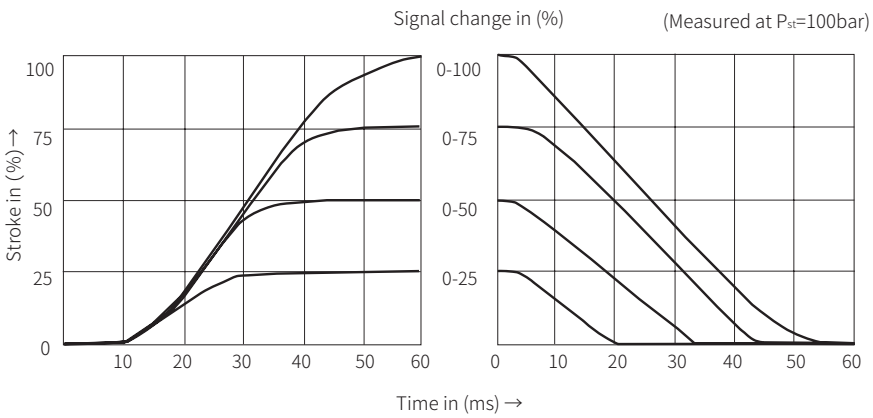
Flow load curve at maximum valve opening
(Tolerance ± 10%)



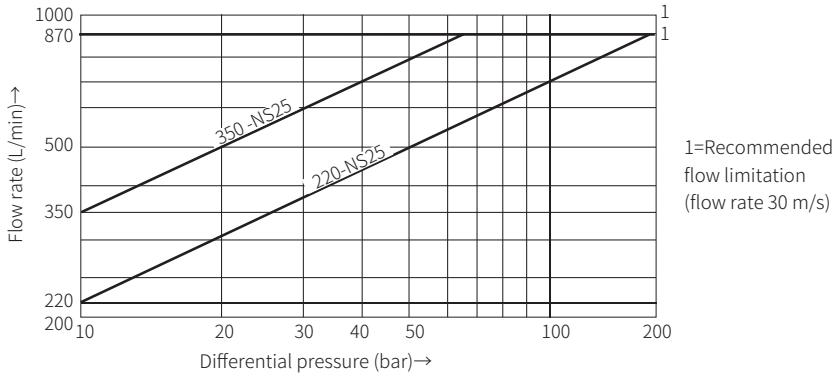
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Transition performance of the valve when the input signal is a step signal — Size 25



Flow load curve at maximum valve opening
(Tolerance ± 10%)

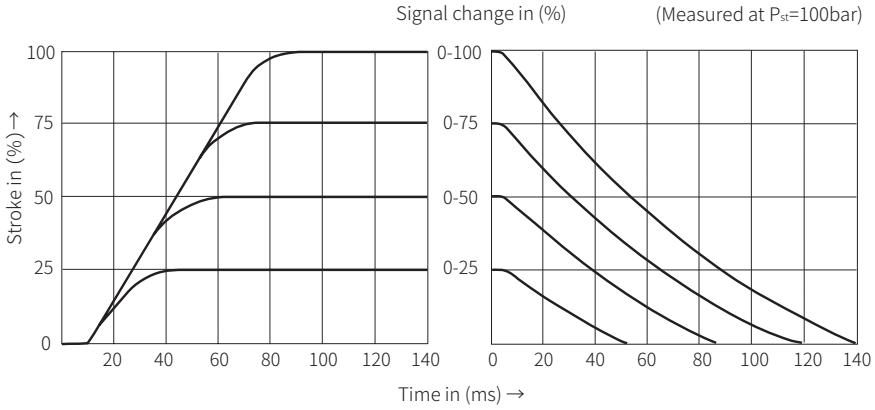


1=Recommended flow limitation (flow rate 30 m/s)

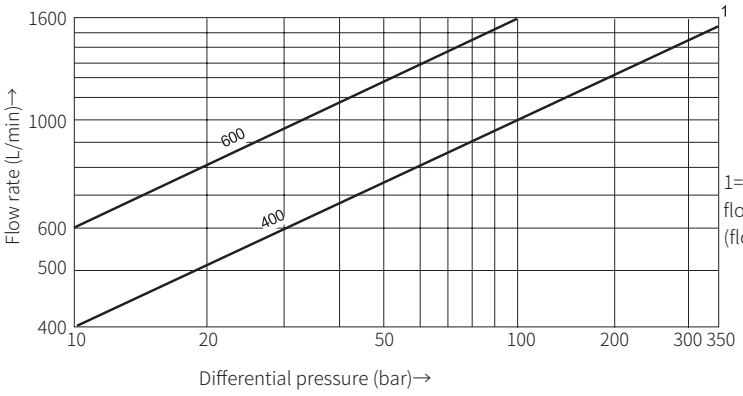
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Transition performance of the valve when the input signal is a step signal — Size 32



Flow load curve at maximum valve opening
(Tolerance ± 10%)

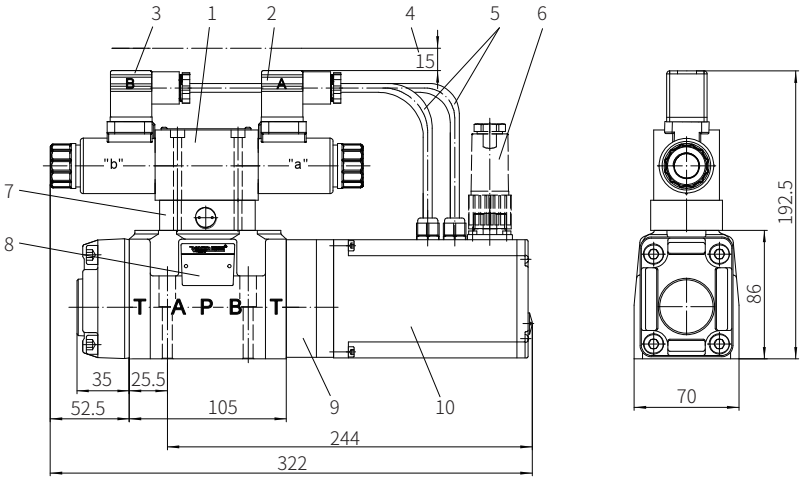


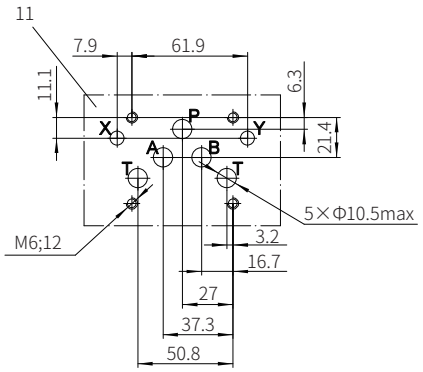
1=Recommended flow limitation (flow rate 30 m/s)

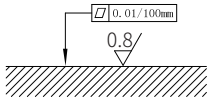
Component size

Size unit: mm

Model 4WRKE10...-3XJ/...







Required surface finishing of mating components

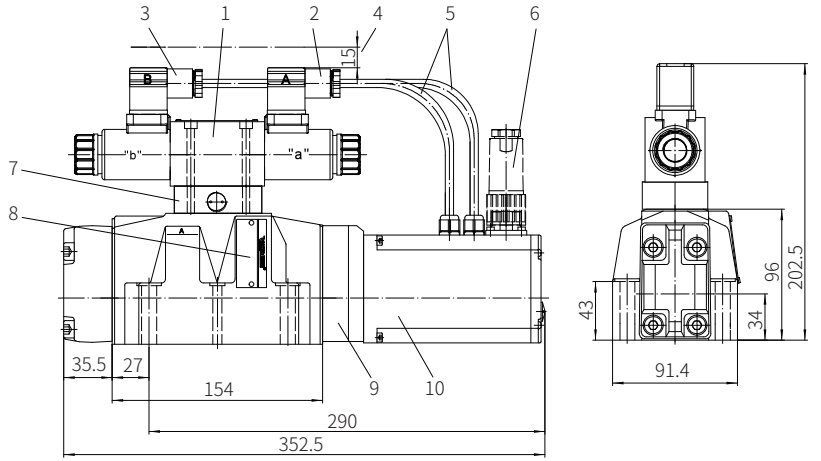
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

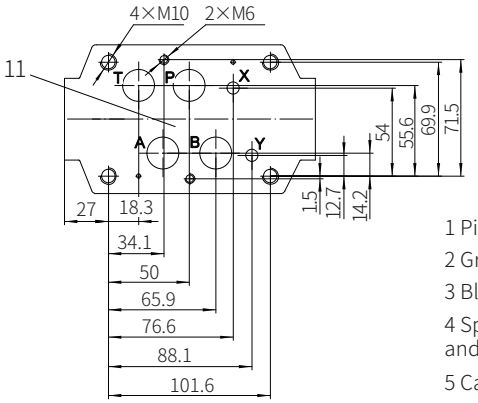
1 Pilot control valve
2 Grey plug “A”
3 Black plug “B”
4 Space required to connect cable and remove plug
5 Cable
6 Plug-in connector
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Integrated amplifier
11 Valve connection surface

Component size

Size unit: mm

Model 4WRKE16...-3XJ...





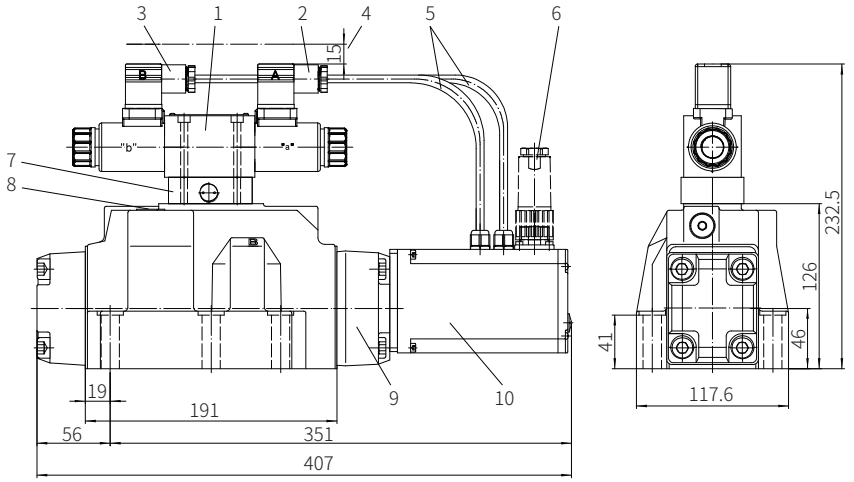
Valve fixing screw
4xM10x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=60Nm
2xM6x55-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

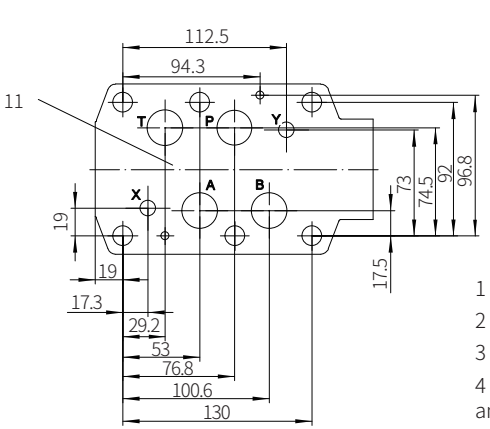
1 Pilot control valve
2 Grey plug “A”
3 Black plug “B”
4 Space required to connect cable and remove plug
5 Cable
6 Plug-in connector
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Integrated amplifier
11 Valve connection surface

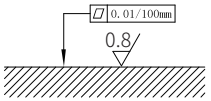
Component size

Size unit: mm

Model 4WRKE25...-3XJ/...







Required surface finishing of mating components

Valve fixing screw

6xM12x60-10.9 grade GB/T70.1-2000

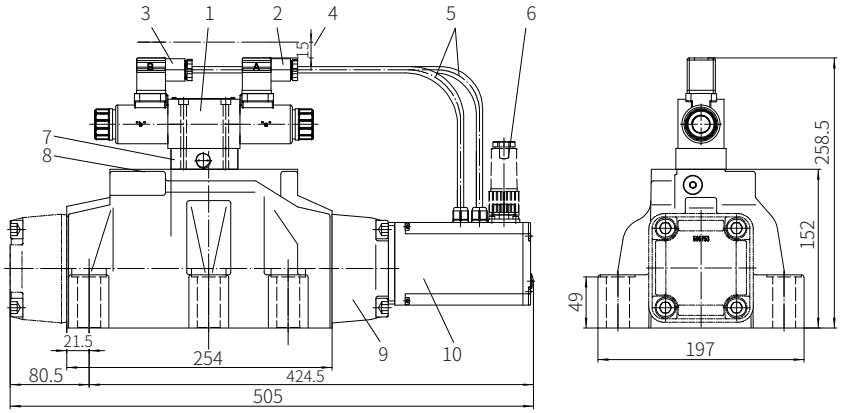
Tightening torque M_A=95Nm

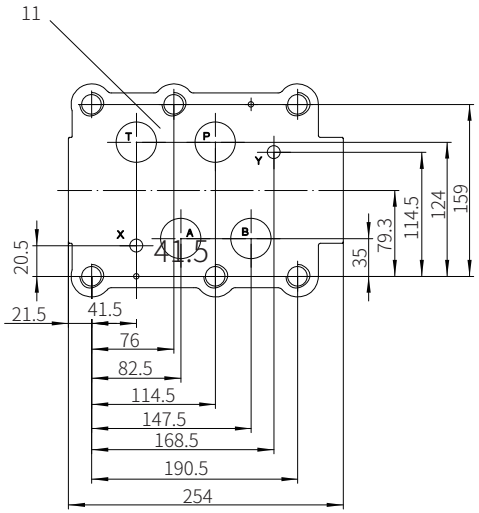
1 Pilot control valve
2 Grey plug “A”
3 Black plug “B”
4 Space required to connect cable and remove plug
5 Cable
6 Plug-in connector
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Integrated amplifier
11 Valve connection surface

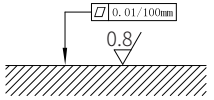
Component size

Size unit: mm

Model 4WRKE32...-3XJ/...







Required surface finishing of mating components

Valve fixing screw

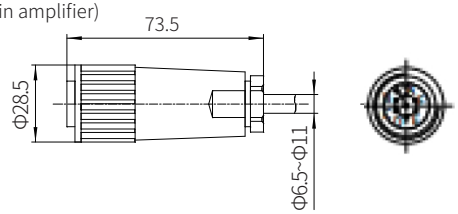
6x20x80-10.9 grade GB/T70.1-2000

Tightening torque M_A=373Nm

1 Pilot control valve
2 Grey plug “A”
3 Black plug “B”
4 Space required to connect cable and remove plug
5 Cable
6 Plug-in connector
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Integrated amplifier
11 Valve connection surface

Electrical connections

Model 4WRKE...-3XJ/...(With built-in amplifier)



Plug settings refer to the built-in amplifier block diagram.

The plug-in connector to DINEN 175201-804

Plug allocation

Terminal identification	Contact	Signal type
Supply voltage	A	24VDC (u (t) =18 to 35V) , I_{max}=1.5 A, Impulse load≤3A
	B	0V
Reference potential (actual value)	C	Reference potential actual value (contact F)
Differential amplifier input (command value)	D	±10V or 4~20mA
	E	0V reference potential command value
Measurement output (actual value)	F	±10V or 4~20mA
	PE	Connected with the valve body and cooling element

Command value:

A positive command value 0 to 10V (or 12 to 20mA) at D and E causes a flow from P to A and B to T.

A negative command value 0 to -10V (or 12 to 4mA) at D and E causes a flow from P to B and A to T.

For valves only with one solenoid in side "A" (symbols EA and WA), a positive command value at D and E causes a flow from P to B and A to T.

Connecting cable:

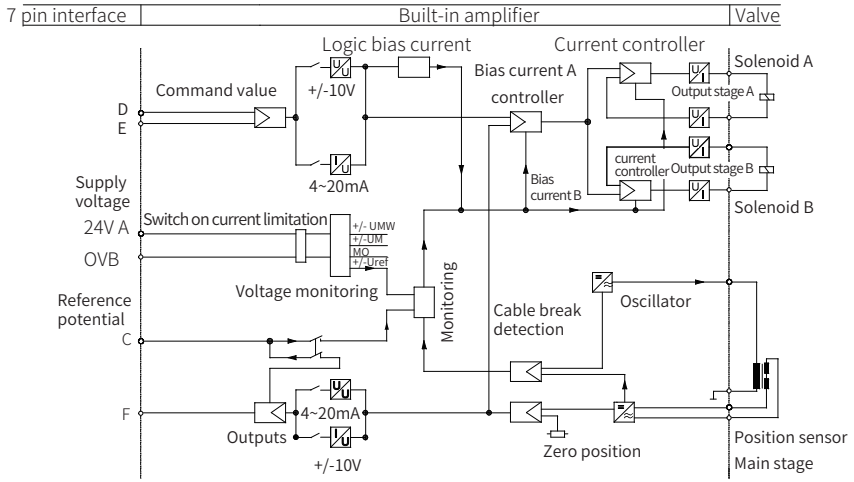
Recommendation:

Cable length up to 25m, model LiYCY 5x0.75mm² Cable length up to 50m, model LiYCY 5x1.0mm²

The external diameter of the cable is 6.5 to 11mm

The connection of screen to PE on the supply side only.

Wiring diagram/block diagram of integrated amplifier board (OBE)



Supply Pressure Compensator

Model: ZDC6XP-1XJ/...

- Size 6
- Maximum working pressure 315 bar
- Maximum working flow 26 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Technical parameter	03
Component size	04

Features

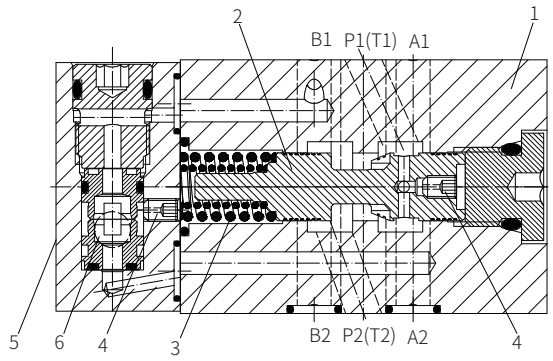
- Sandwich plate type
- Load compensation at the oil port P to A or P to B via built-in shuttle valve
- Two-way version"P"
- Flow control when work with proportional directional valves
- The mounting surface according to the standard DIN24 340 A

Function description, sectional drawing

The ZDC valve is a direct operated supply pressure compensator with two-way design. The valve is mainly composed of the valve body (1), control spool (2), pressure spring (3), two dampers (4), and end cover (5) with integral shuttle valve (6).

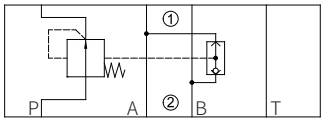
As same with all cross sections of throttle valve, the volume flow of proportional throttle valve and directional control valve depends on the differential pressure △P. The combination of the throttle valve and pressure compensator results the load-compensated electric flow control valve to keep the differential pressure △P at the throttle valve constant. The pressure difference is determined by the spring of the pressure compensator and depends on the select model when pressure between 8 and 25bar.

When the differential pressure from P1 to A1 or P1 to B1 is less than the spring force, the compression spring (3) holds the control spool (2) from P2 to P1 in the open position. If the differential pressure exceeds the spring force, the control spool (2) moves to the left until the differential pressure is restored.



Model ZDC6XP-1XJ/...

Functional symbol:



Models and specifications

ZDC | 6 | XP– | 1X | J | / | | *

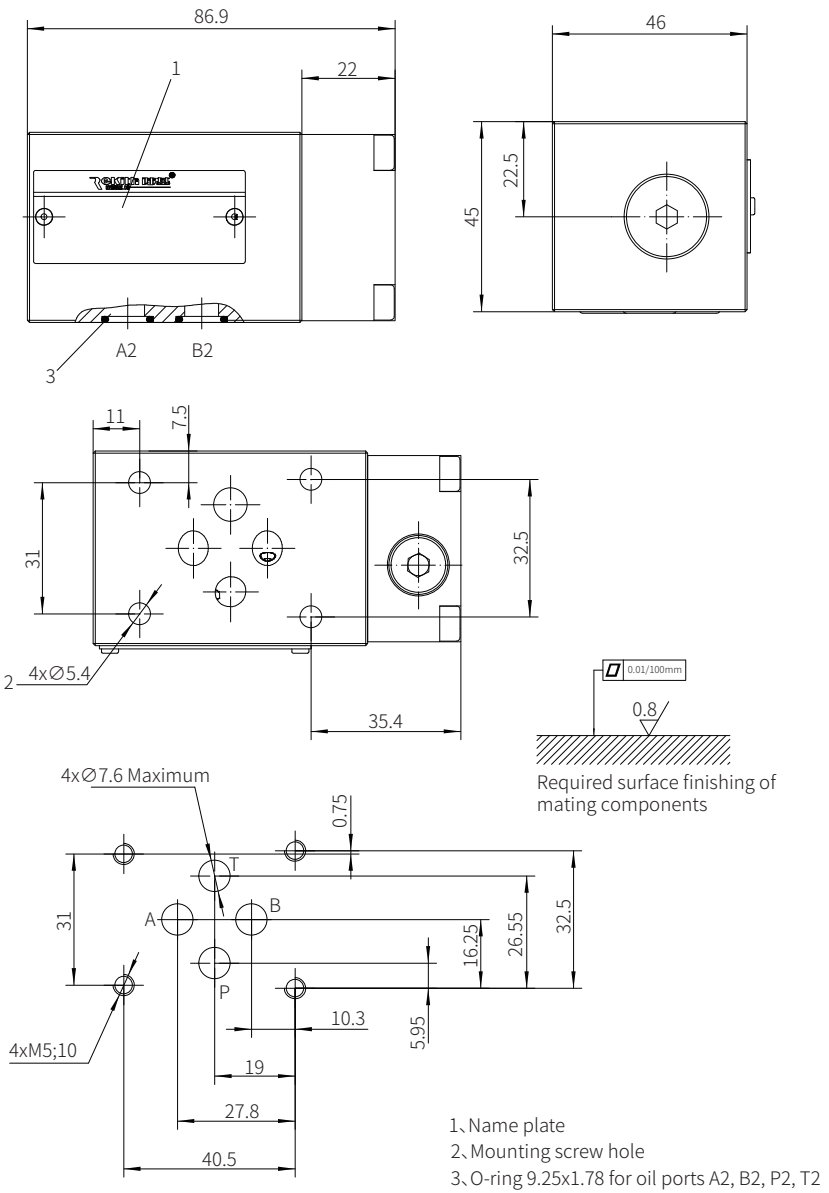
- size 6 =6
- two-way (reducing function) =XP
- 10 to 19 series =1X
  (10 to 19 series installation and connection size unchanged)
- Rekith =J
- 14bar= differential pressure
- sealing material
  - No code= NBR seals
  - V= FKM seals
  - (consult for other seals)
- more information in text

Technical parameters

Working medium		Mineral oil - for NBR seal and FKM seal
		Phosphate ester - for FKM seal
Working medium temperature range °C		-20 to +70
Viscosity range mm²/s		10 to 800
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class7
Working pressure bar		
	Oil port A, B, P	315
	Oil port T	210
Maximum flow L/min		26

Component size

Size unit: mm



1、Name plate
2、Mounting screw hole
3、O-ring 9.25x1.78 for oil ports A2, B2, P2, T2

Supply Pressure Compensator

Model: ZDC...2XJ

- ◆ Size 10、16
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 150 L/min

Contents

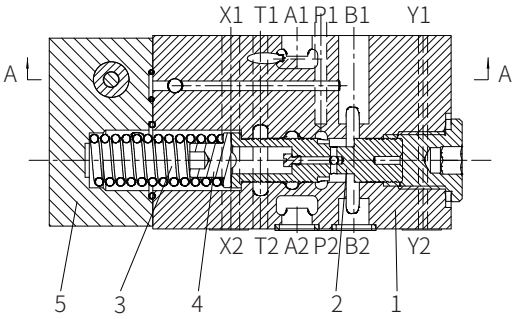
Function description, sectional drawing	02
Models and specifications	03
Technical parameters	03
Characteristic curve	04
Component size	05

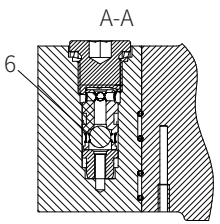
Features

- ● Sandwich plate type
- ● Two-way version "P"
- ● Flow control when work with proportional directional valves
- ● The mounting surface according to the standard DIN24 340 A

Function description, sectional drawing

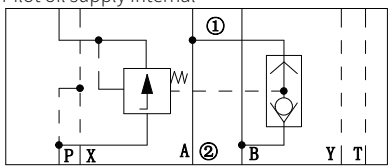
The ZDC...-2XJ valve is a direct operated supply pressure compensator with two-way design. It is used as a supply pressure compensator for load compensation in port P.
The valve is mainly composed of the valve body (1), control spool (2), the pressure spring (3) with the spring seat (4), and end cover (5) with the integral shuttle valve (6).
When the differential pressure from P1 to A1 or P1 to B1 is less than 10bar, the compression spring (3) holds the control spool (2) from P2 to P1 in the open position. If the differential pressure exceeds 10bar, the control spool (2) moves to the left until the differential pressure is restored.





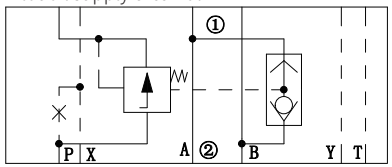
Functional symbols
(①= Valve side, ②= Subplate side)

Pilot oil supply internal



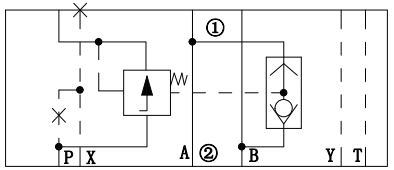
Model ZDC...P-2XJ/...

Pilot oil supply external



Model ZDC...P-2XJ/X

Oil port X at valve side closed
(size 10 only)



Model ZDC...P-2XJ/XL

Models and specifications

ZDC | | P | 2X | J | | | *

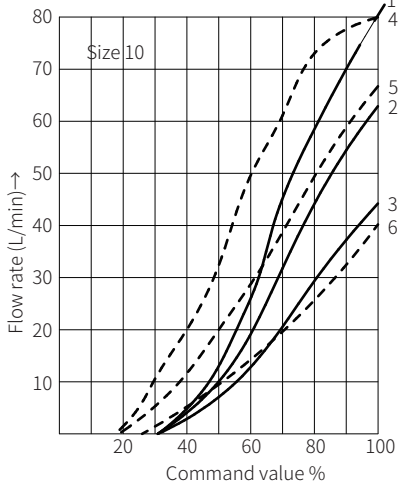
- pressure compensator =ZDC
- size 10 =10
  size 16 =16
- two-way (reducing function) =P
- 20 to 29 series =2X
  (20 to 29 series installation and connection size unchanged)
- Rekith =J
- pilot oil supply
  - No code= supply internal
  - X= supply external
  - XL= supply external
  - Oil port X at the valve side closed (size 10 only)
- sealing material
  - No code= NBR seals
  - V= FKM seals
  - (consult for other seals)
- more information in text

Technical parameters

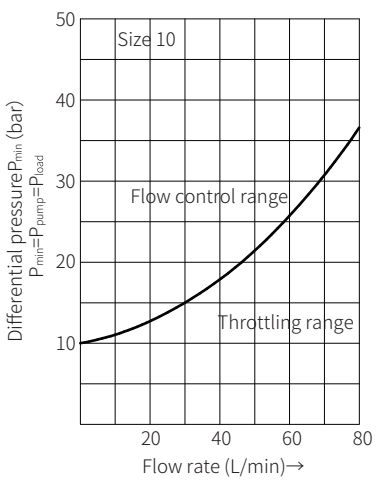
Working medium		Mineral oil - for NBR seal and FKM seal
		Phosphate ester - for FKM seal
Working medium temperature range °C		-20 to +70
Viscosity range	mm^2/s	10 to 800
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class7
Working pressure	bar	
	Oil port A, B, P	350
	Oil port T	250
	Oil port X	30 to 100
	Oil port Y	150; 30 (together with electro-hydraulic proportional directional valve)
Maximum flow	L/min	85 (size 10); 150 (size 16)

Characteristic curve

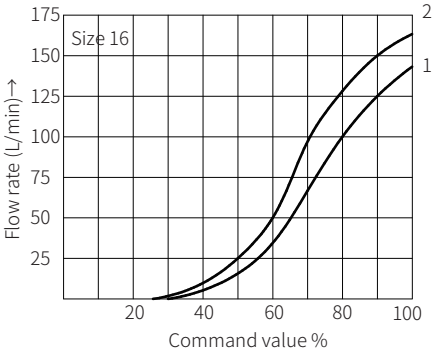
Flow control P to A, P to B

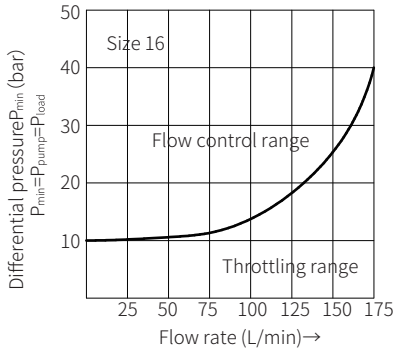


Inlet pressure P to A, P to B



1、For valve model 4WRZ 10...85	4、For valve model 4WRZ 10...64
2、For valve model 4WRZ 10...50	5、For valve model 4WRZ 10...32
3、For valve model 4WRZ 10...25	6、For valve model 4WRZ 10...16



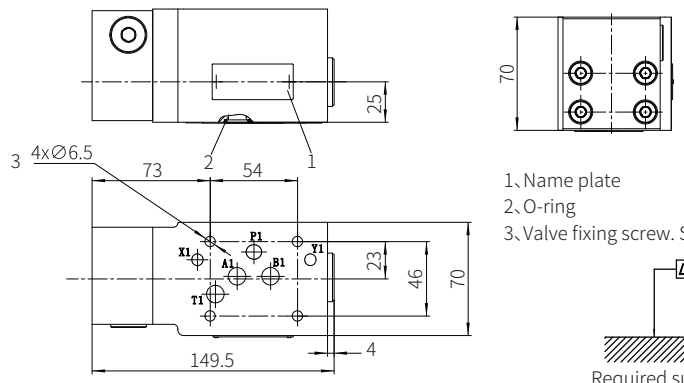


1、For valve model 4WRZ 16...100
2、For valve model 4WRZ 16...150

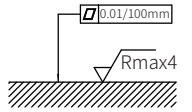
Component size

Size unit: mm

Size 10

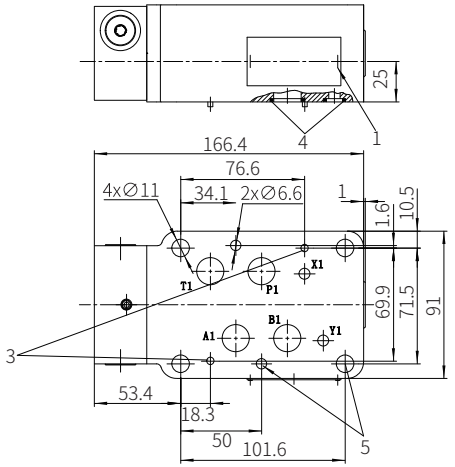


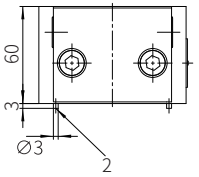
1、Name plate
2、O-ring
3、Valve fixing screw. See below table

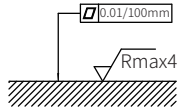


Required surface finishing of mating components

Size 16







Required surface finishing of mating components

1、Name plate 2、Locating pin 3、Locating pin hole	The fixing screws of the valves must be ordered separately	
4、O-ring	Size 10	Size 16
Oil port A2, B2, P2, T2	12x2	21.89x2.62
Oil port X2, Y2	12x2	12x2
Valve fixing screw	Hexagon screw DIN 912-10.9	
For tightening electro-hydraulic proportional directional valve Model WRZ...	4 pcs M6x115	4 pcs M0x120
	M_A=15.5Nm	M_A=75Nm
	—	2 pcs M6x120
For tightening proportional directional valve Model WRE...	—	M_A=15.5Nm
	4 pcs M6x120	—
	M_A=15.5Nm	—

04

Proportional Relief Valve

Model: DBET and DBETE

- Size 6
- Maximum working pressure 350 bar
- Maximum working flow 2 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Electrical connections	05
Characteristic curve	05-07
Component size	08-09

Features

- Direct actuated valve
- Operation by proportional solenoids with central thread and detachable coil
- For subplate mounting
- Model DBETE: internal integrated amplifier
- Model DBET: external control amplifier

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Function description, sectional drawing

Overview

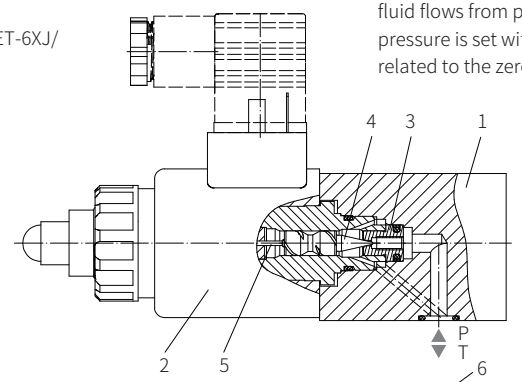
Model DBETE (Integrated Electronic Control)
The function and design of this valve are the same as the DBET type. There is an additional plug type proportional amplifier (6) on the proportional solenoid, which is included in the electronic control.
The plug (7) receives power and command value. The command value pressure characteristic curve is pre-set by the manufacturer based on the principle of minimum manufacturing tolerance. For more detailed instructions on integrated electronic controllers, please refer to the instructions.

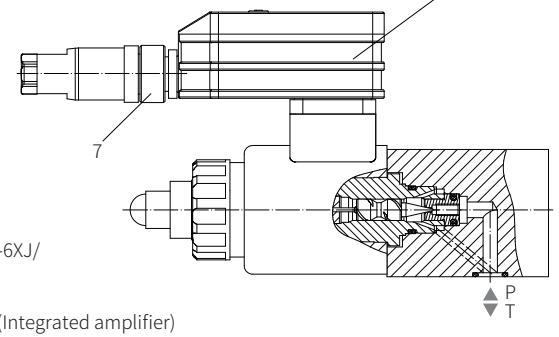
Operating Principle:

The system pressure is regulated by the command value of the electronic controller which supplies a current to the solenoid based on the command value. The proportional solenoid converts the current into mechanical force and acts on the poppet valve (4) through the armature pin (5), The poppet valve (4) presses on the valve seat (3) directly, thereby closing the connection from port P to T.
If the hydraulic force on the poppet valve (4) is equal to the solenoid force, then the valve controls the set pressure by lifting the poppet valve (4) off the valve seat (3), and thus allowing the pressure fluid flows from port P to T. The minimum setting pressure is set with minimum control current related to the zero command value.

04

Model DBET-6XJ/





Model DBETE-6XJ/

Model DBETE (Integrated amplifier)
The function and design of this valve is same as model DBET.
There is an additional plug type proportional amplifier (6) with electric controller on the proportional solenoid. The connector (7) receives power and command value. The command value pressure characteristic curve is pre-set based on the minimum manufacturing tolerance principle by the manufacturer. For more detailed information on the integrated amplifier, please refer to the instructions.

Models and specifications

DBET | — 6X | / | G24 | | | | | | *

proportional relief valve

external amplifier =No code
integrated amplifier =E

60 to 69 series =6X
(60 to 69 series installation and connection size unchanged)

Rekith =J

maximum pressure stage
up to 50bar =50
up to 100bar =100
up to 200bar =200
up to 315bar =315
up to 350bar =350

supply voltage
24VDC =G24

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

for model DBETE
A1= command value 0 to 10 V
F1= command value 4 to 20 mA

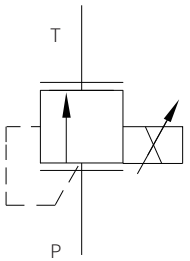
DBET electrical connection:
K4= Square socket without plug
Z4= Square socket with plug
DBETE electrical connection:
K31S= With 1.5 meter cable and tin on the end
K31C= With M12 × 1 aviation plug, 5-pin

No code= 1600mA coil
-8 800mA coil

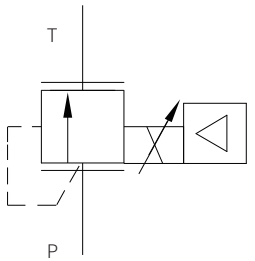
04

Functional symbols

external amplifier (model DBET)



integrated amplifier (model DBETE)



Technical parameters

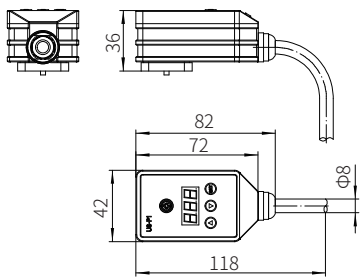
Overview		DBET	DBETE
Installation position		Optional	
Storage temperature range	°C	-20 to +80	
Environment temperature range	°C	-20 to +70	-20 to +50
Weight	kg	2.0	2.15

Hydraulic (measured when using HLP46, ϑ_{oil}=40°C ± 5°C)			DBET	DBETE
Maximum working pressure	Port P	bar	350	
Maximum adjustable pressure	Pressure stage 50	bar	50	
	Pressure stage 100	bar	100	
	Pressure stage 200	bar	200	
	Pressure stage 315	bar	315	
	Pressure stage 350	bar	350	
Minimum setting pressure (at command value 0V or 40 mA)		bar	See characteristic curves	
Return flow pressure	Port T	bar	Separate and at zero pressure to tank	
Maximum flow		L/min	2	
Linearity		%	±3.5 of maximum setting pressure	
Hysteresis		%	±2 of maximum setting pressure	
Repeatability		%	<±2 of maximum setting pressure	
Switching time		ms	30 to 150 (depending on system)	

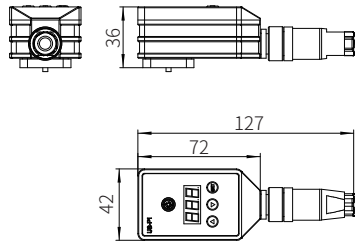
Electrical parameters		
Voltage type		24VDC
Minimum control current	mA	100
Maximum control current	mA	800 or 1600
Coil resistance	Ω	Cold value at 20°C 5.5 Ω, Maximum warm value: 8.05 Ω
Duty		Continuous
Electrical connections		Plug-in connector to DIN EN175301-803
Class of protection		IP65
Amplifier		RT-PQDA-1 (2) (external) US-P1 (plug type proportional amplifier)

Electrical connections

Model DBETE-6XJ/...K31S



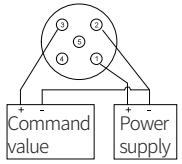
Model DBETE-6XJ/...K31C



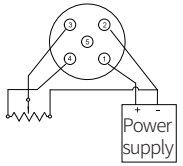
Terminal Definition

M12 plug terminal number (K31C type)	Cable color (K31S type)	Terminal Definition
1	Red	Power supply+
2	Black	Power supply -/ command value-
3	Yellow	Command value+
4	Blue	Reference voltage 5V
5	Green	-

Connection example: PLC input command



Connection example: Potentiometer input command

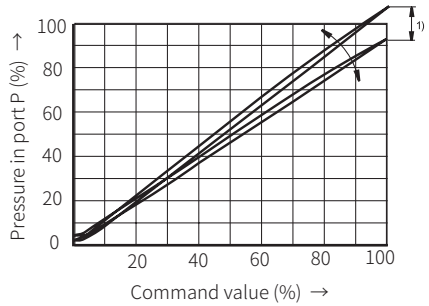


Characteristic curve

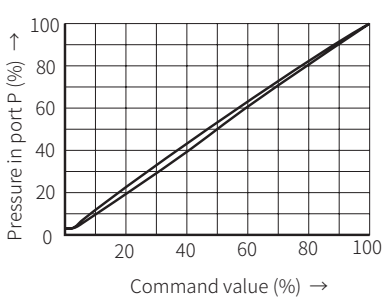
(measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Pressure in port P in relation to the command value (q_v=0.8L/min)

DBET



DBETE

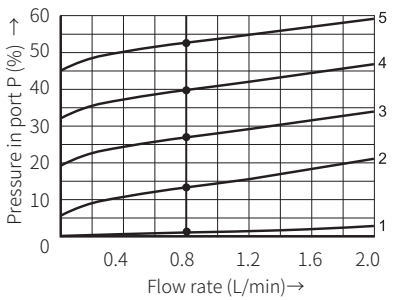


Characteristic curve

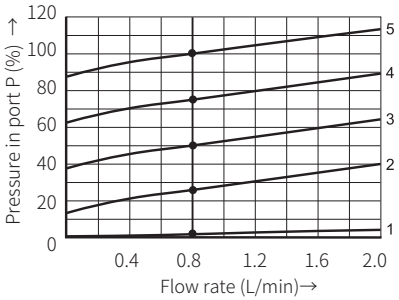
(measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Pressure in port P in relation to the flow rate

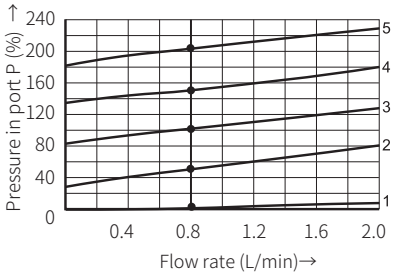
Pressure stage 50bar



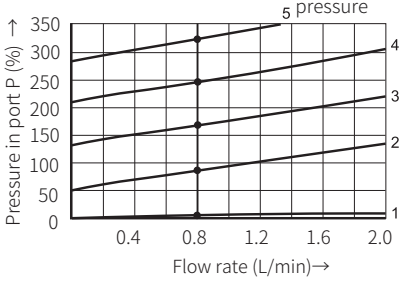
Pressure stage 100bar



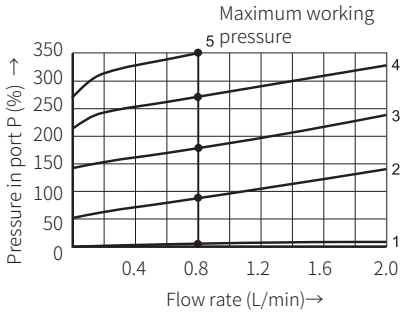
Pressure stage 200bar



Pressure stage 315[1] bar



Pressure stage 350bar



[1] For characteristic curve 5, the command value should not exceed the flow rate of 1.4L/min.

Valid for all pressure stage:
Curve 1=0% command value
Curve 2=25% command value
Curve 3=50% command value
Curve 4=75% command value
Curve 5=100% command value[2]

The characteristic curve is measured without any back pressure in port T (P_T=0 bar).

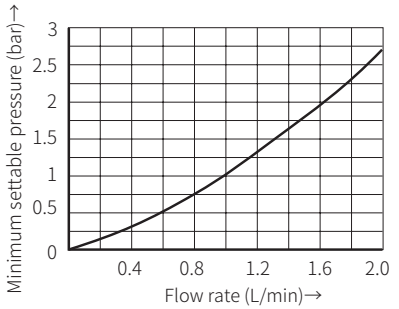
[2] For pressure stage 350 bar and characteristic curve 5, the command value should not exceed the flow rate of 0.8L/min

Characteristic curve

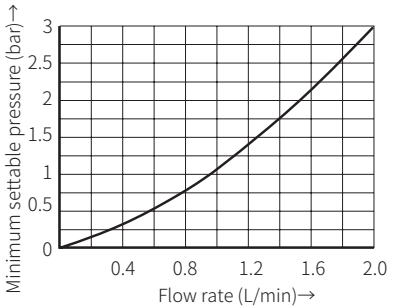
(measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Minimum settable pressure in port P with command value 0

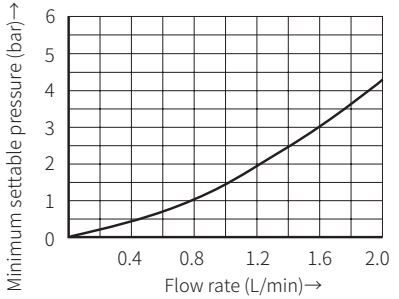
Pressure stage 50bar



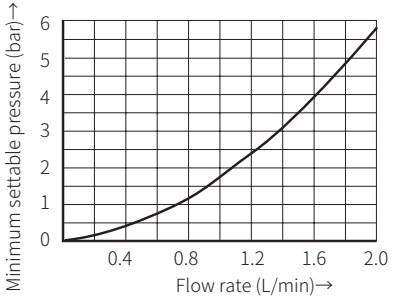
Pressure stage 100bar



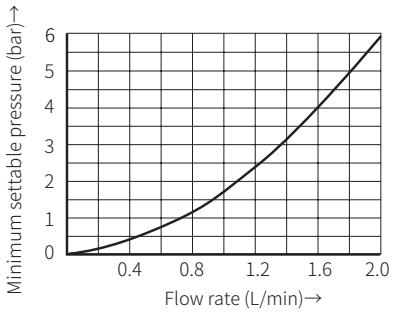
Pressure stage 200bar



Pressure stage 315bar



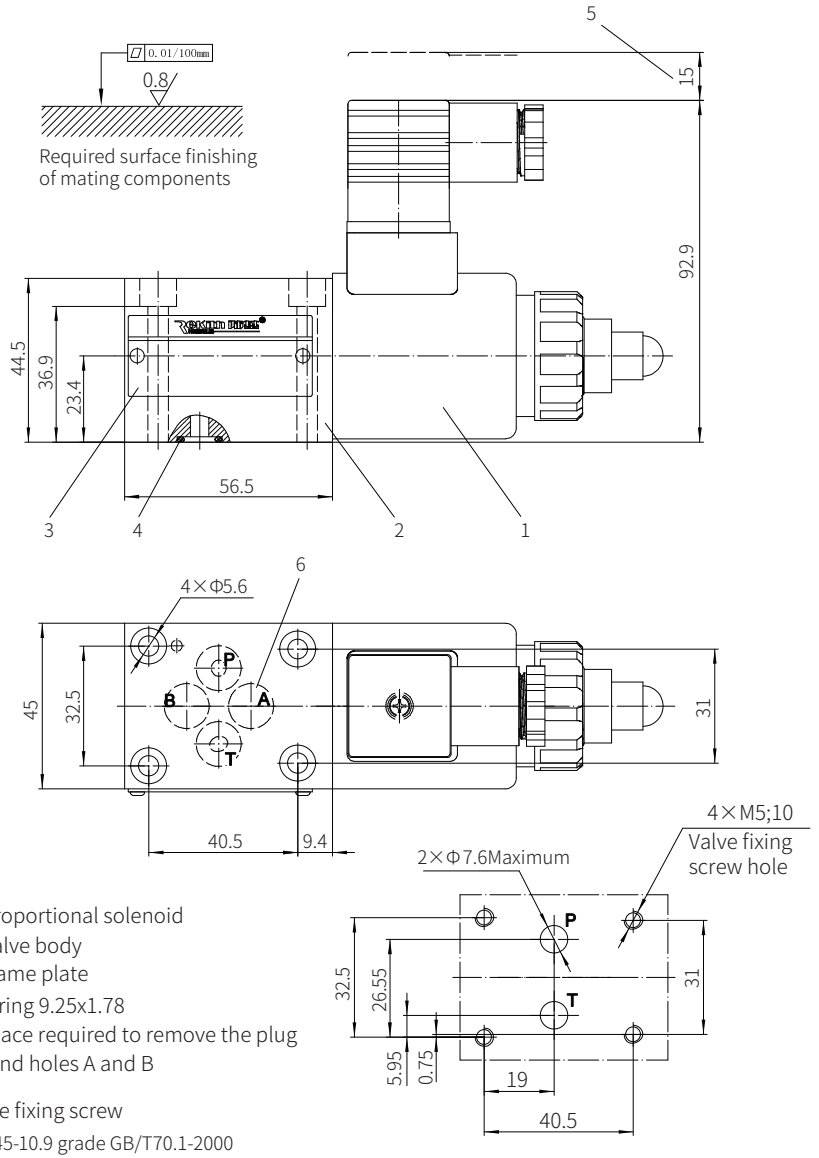
Pressure stage 350bar



Component size

Size unit: mm

Model DBET-6XJ/...



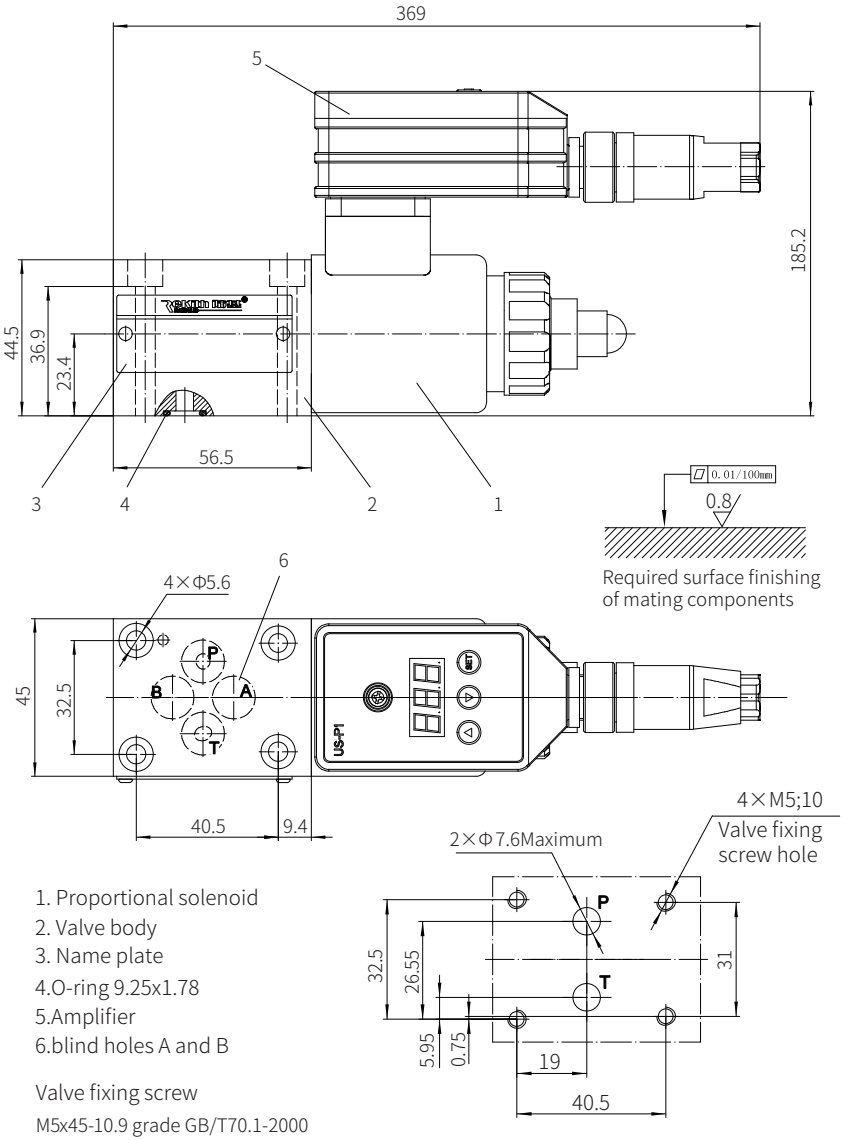
1. Proportional solenoid
2. Valve body
3. Name plate
4.O-ring 9.25x1.78
5.Space required to remove the plug
6.blind holes A and B

Valve fixing screw
M5x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Component size

Size unit: mm

Model DBETE-6XJ/...



1. Proportional solenoid
2. Valve body
3. Name plate
4.O-ring 9.25x1.78
5.Amplifier
6.blind holes A and B

Valve fixing screw
M5x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

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Direct Operated Proportional Relief Valve (with inductive position transducer)

Model: DBETR...1XJ

- Size 6
- Maximum working pressure 350 bar
- Maximum working flow 3 L/min

Contents

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Characteristic curve	06-07
Component size	08

Features

- Low hysteresis
- Good repeatability
- Electrical closed loop position control of spring pre-tension
- Both valves and proportional amplifiers from the same supplier

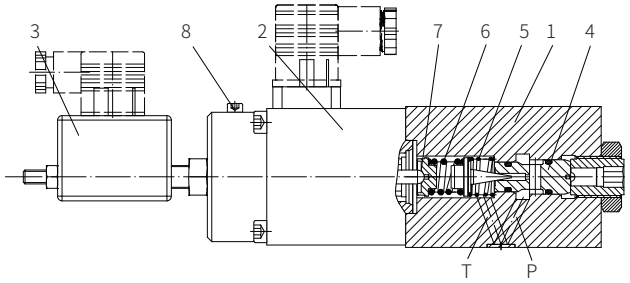
Function description, sectional drawing

The DBETR proportional relief valve is a remote control valve and direct operated pressure relief valve of poppet design. The valve adjusts the pressure in proportion to the electrical command value.
The valve consists of the valve body (1), proportional solenoid (2) with inductive positional transducer (3), valve seat (4) and valve poppet (5). The pressure is set by adjusting the command value potentiometer (0 to 9 V). Adjusting the command value causes tensioning of the compression spring (6) via controlling the electronic element and the proportional solenoid (2). Tensioning of the compression spring (6), i.e. the position of the spring plate (7) is measured by the inductive positional transducer (3). The deviations from the command value are corrected by the closed loop positional control. The use of this principle eliminates the effect of solenoid friction.

Advantages:
- Low hysteresis
- Good repeatability

When the command value of the proportional solenoid is zero or power failure or the cable breakage at the positional transducer, it must be adjusted to the minimum settable pressure.

Note!
In order to ensure optimum valve function of the valve, it should be bled when valve used:
– Remove item 8
– Fill the oil into the open screw hole at item 8
– Re-screw the item 8 when no more bubbles appear
– It must be avoid the emptying running of tank.
In some installation conditions, a back pressure valve is to be installed (back pressure approx. 2 bar).

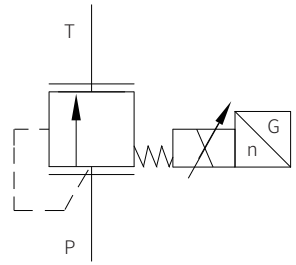


Models and specifications

DBETR - 1X | J | | G24 | K4 | | *

- proportional relief valve
- 10 to 19 series (10 to 19 series installation and connection size unchanged) =1X
- Rekith =J
- pressure stage: up to 30 bar =30; up to 80 bar =80; up to 180 bar =180; up to 230 bar =230; up to 315 bar =315; up to 350 bar =350
- Control electronics supply voltage 24V DC =G24
- K4= square socket without plug
- sealing material: No code= NBR seals; V= FKM seals (consult for other seals)
- more information in text

Functional symbols



Technical parameters

Electrical (solenoid)					
Supply voltage		V	24 DC		
Maximum power consumption		VA	50		
Coil resistance	Cold value at 20 °C	Ω	10		
	Maximum warm value	Ω	13.9		
Duty		%	100		
Electrical connections			With component plug to DIN EN 175301-803		
			Plug-in connector to DIN EN 175301-803		
Protection to EN 60529			IP65 with mounted and fixed plug-in connector		
Electrical (inductive position transducer)					
Coil resistance	Total resistance of the coils		1 and 2	2 and ⏚	⏚ and 1
	at 20°C	Ω	31.5	45.5	31.5
Electrical connections			With component plug		
			Plug-in connector with flat seal		
Inductivity		mH	6 to 8		
Oscillator frequency		KHz	2.5		
Protection to EN 60529			IP65 with mounted and fi xed plug-in connector		

Technical parameters

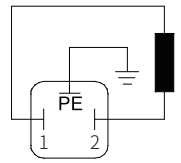
Overview				
Weight		Kg	4.0	
Installation position			Preferably horizontal	
Storage temperature range		°C	-20 to +80	
Environment temperature range		°C	-20 to +50	
Hydraulic (measured when using HLP46, t =40°C ± 5°C)				
Working pressure	Port P	bar	Up to 350	
	Port T, with pressure control	bar	Up to 2	
	Without pressure control, Port T	bar	Up to 100	
Maximum settable pressure	Pressure stage 30	bar	30	
	Pressure stage 80	bar	80	
	Pressure stage 180	bar	180	
	Pressure stage 230	bar	230	
	Pressure stage 315	bar	315	
	Pressure stage 350	bar	350	
Minimum settable pressure			(See p_{min}-q_v-characteristic curves)	
Maximum flow	Pressure stage 30	L/min	3	
	Pressure stage 80	L/min	3	
	Pressure stage 180	L/min	3	
	Pressure stage 230	L/min	3	
	Pressure stage 315	L/min	2	
	Pressure stage 350	L/min	2	
Fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]	
Fluid temperature range		°C	-20 to +80	
The maximum allowable pollution degree of the oil according to ISO 4406 (c)			Class 20/18/15[1]	
Viscosity range		mm^2/s	15 to 380	
Hysteresis		%	< 1 of max. settable pressure	
Repeatability		%	< 0.5 of max. settable pressure	
Linearity		%	< 1.5 of max. settable pressure	
Typical variation		%	± 3 of max. settable pressure	
Stepped response dependent on the system	$T_u + T_g$ (0 to 100 %),		$P_{min} - P_{max}$	$P_{max} - P_{min}$
	Pressure stage 30, 80, 180	ms	100	50
	Pressure stage 230, 315, 350	ms	150	100

The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components

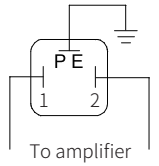
Electrical connections

Proportional solenoid

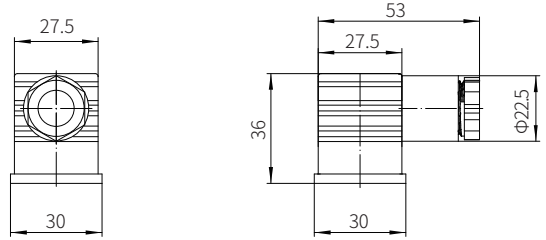
Connection at component plug



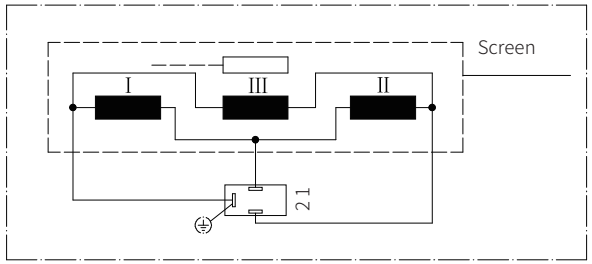
Connection at plug-in connector



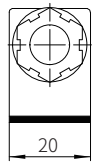
Plug-in connector

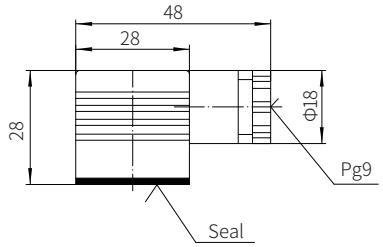


Inductive position transducer



Plug-in connector with flat seal

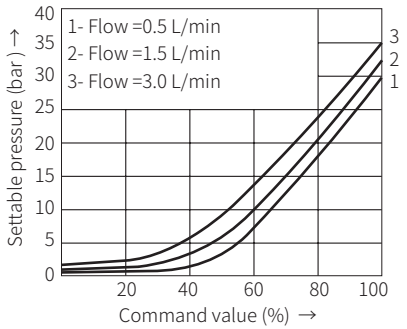




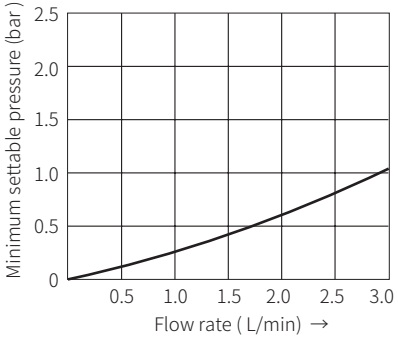
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

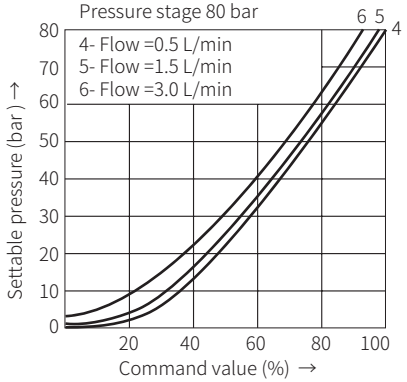
Pressure stage 30 bar



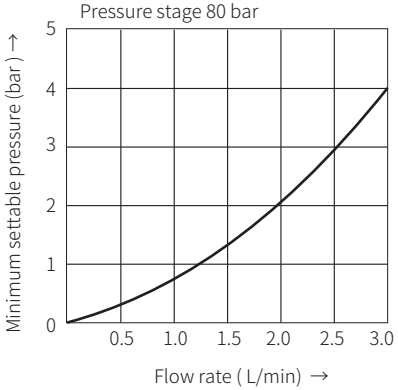
Pressure stage 30 bar



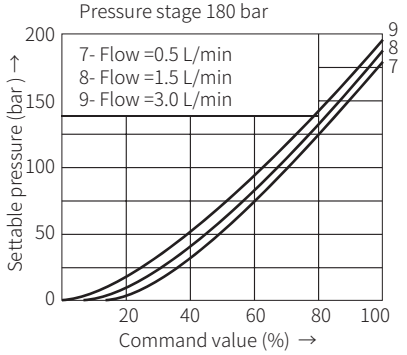
Pressure stage 80 bar



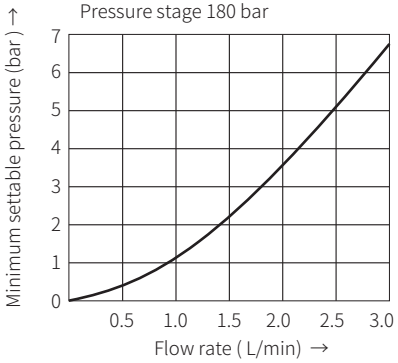
Pressure stage 80 bar



Pressure stage 180 bar



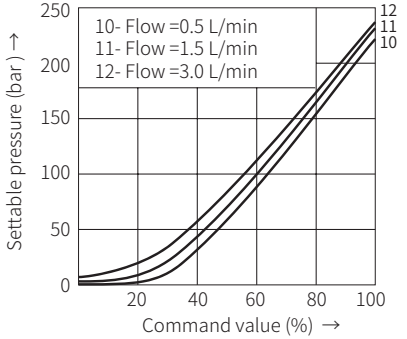
Pressure stage 180 bar



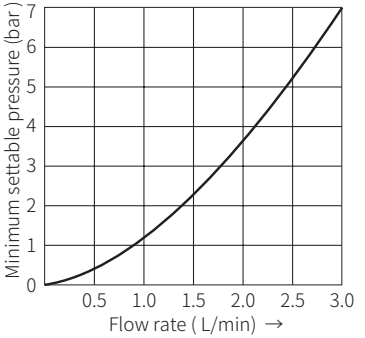
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

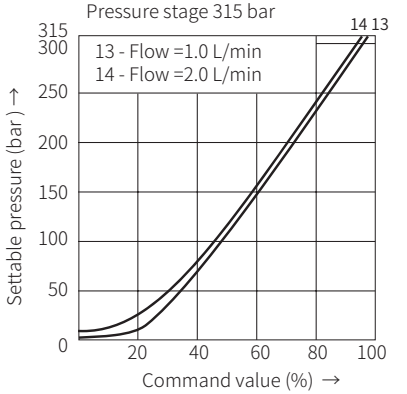
Pressure stage 230 bar



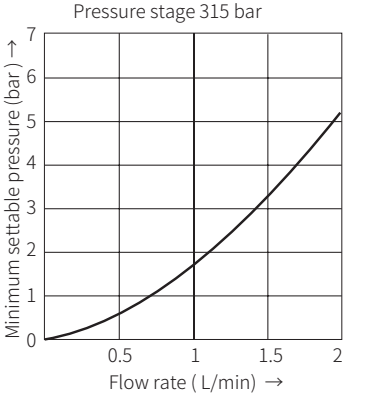
Pressure stage 230 bar



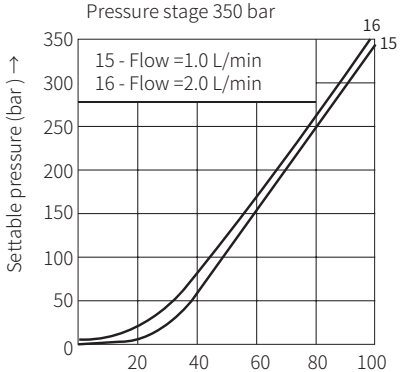
Pressure stage 315 bar



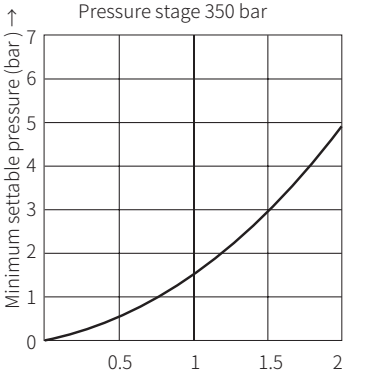
Pressure stage 315 bar



Pressure stage 350 bar

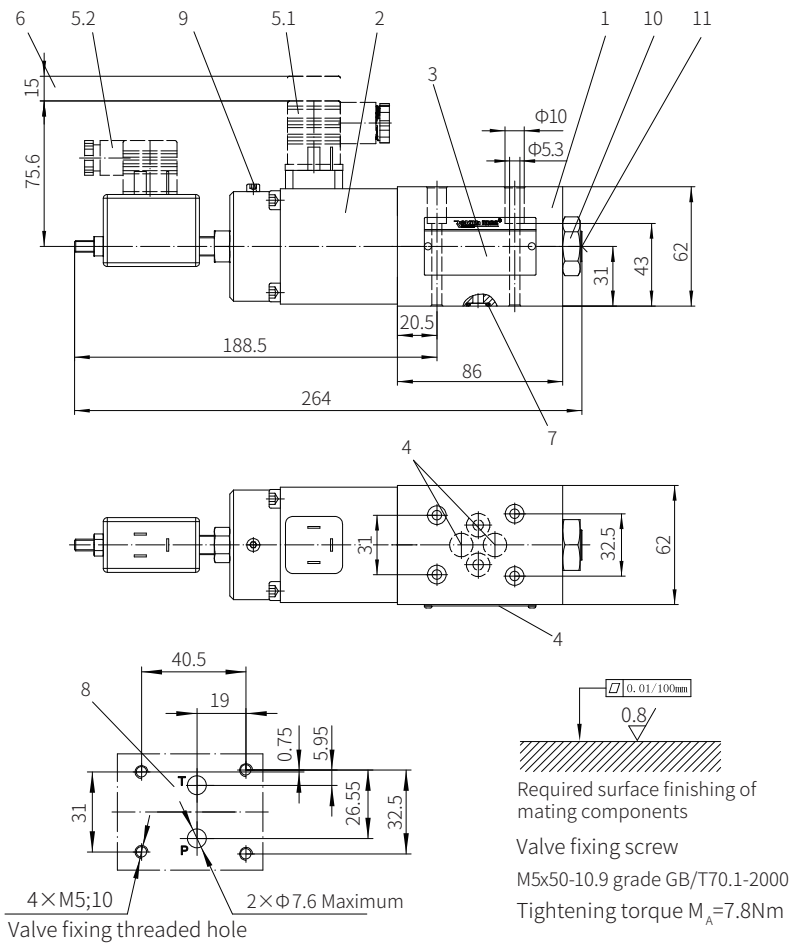


Pressure stage 350 bar



Component size

Size unit: mm

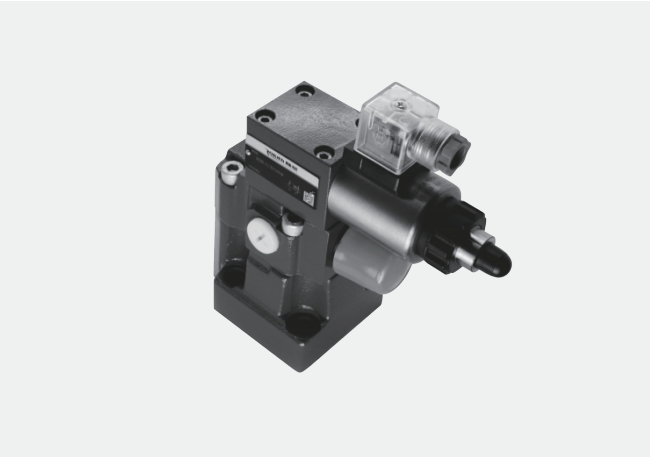


1 Valve body
2 Proportional solenoid with inductive position transducer
3 Name plate
4 Blind hole
5 Plug-in connector
6 Space required to remove the plug-in connector
7 Identical seal rings for P, T and blind hole
8 Machined valve mounting surface
Differences from the standard:
- Locating pin not present
- A and B ports not drilled

9 Bleed screw
10 Lock nut SW27
11 Internal hexagon SW8

Pilot Operated Proportional Relief Valve

Model: DBEM/DBEME...7XJ



- Size 10/25/32
- Maximum working pressure 350 bar
- Maximum working flow 700 L/min

Contents

Function description, sectional drawing	02-03
Functional symbols	03
Models and specifications	04
Characteristic curve	05
Technical parameters	06
Component size	07-11

Features

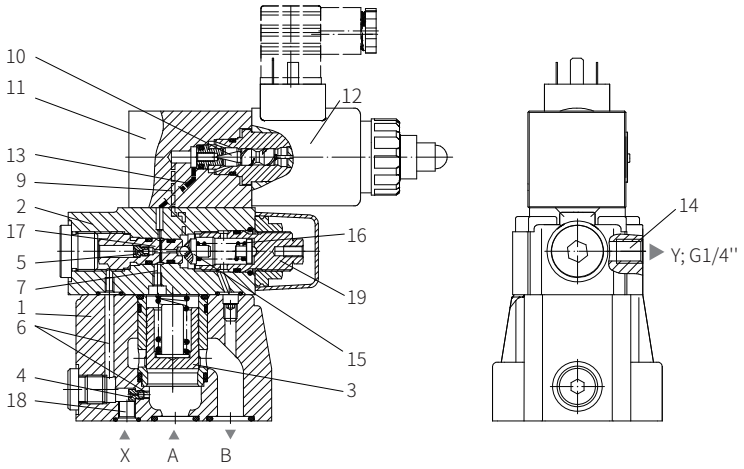
- For subplate mounting
- For installation in manifolds
- Maximum pressure limitation
- Both valves and proportional amplifiers from the same supplier

Function description, sectional drawing

The DBEM and DBEME valves are pilot operated proportional relief valves and used to limit the hydraulic system pressure. The pressure in hydraulic system can be adjusted according to the electric command value by these valves.
They basically consist of the main valve body (1) with main valve spool (3), pilot control valve (2) and the solenoid pilot valve (11).

Model DBEM
The pressure at the P port acts on the bottom of the main valve spool (3), and also acts on the spring loaded side of the main valve spool (3) by orifices (6,7) and plug-in damping (4,5). The pressure is applied to the needle valve (10) of the solenoid pilot valve (11) through the control hole (9) to counteract the output force of the proportional solenoid (12) according to the set value. If the hydraulic pressure exceeds the output force of the proportional solenoid, the needle valve (10) opens. The pilot oil flows into port Y through orifice (13) and returns to the oil tank.
Subsequently, The pressure drop is formed from orifices (6,7) and against the force of the return spring to lift the main valve spool (3). The port P is connected to port T. The main valve spool (3) controls the pressure at the P port.

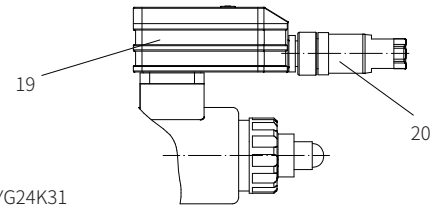
An additional spring loaded pilot control valve (2) is required to limit the maximum pressure (pressure protection function). The conical valve (15) and pilot valve seat (17) are closed due to the force of the spring (16).
If the pressure in the spring chamber of the main valve spool (3) exceeds the maximum allowable setting pressure of the valve, the conical valve (15) overcomes the force of the return spring to open and connect the oil circuit to the spring chamber. The pressure oil returns to the oil tank via port Y. The pressure drop is formed from orifices (6, 7) and overcome the force of the return spring to lift the main valve spool (3). The connection from port P to port T is opened. The main valve spool (3) controls the pressure at the port P.
The pre-set pressure can be reduced by the adjusting sleeve (19) if necessary. Port Y must return to the oil tank from the external pipeline, and there is no pressure in the return pipeline layer. The valve unloads and limits the maximum pressure through port X (18).



Model DBEME10-7XJ/...XYG24K4

Function description, sectional drawing

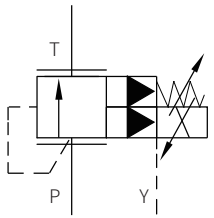
Model DBEME
The function and design of this valve is basically the same as model DBE/DBEM except electronic controller.
The electronic control position and integrated plug amplifier (19) receive power and command values by the plug-in plug (20).



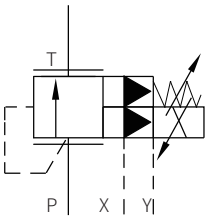
Model DBEME10-7XJ/...YG24K31

Functional symbols

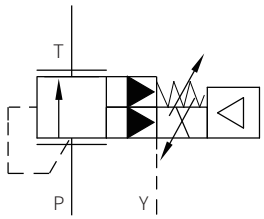
Model DBEM...7XJ/...Y...



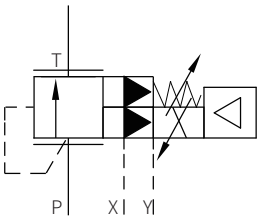
Model DBEM...7XJ/...XY...



Model DBEME...7XJ/...Y...



Model DBEME...7XJ/...XY...



Models and specifications

DBE | M | | | – 7X | J | / | | G24 | | / | | | *

with maximum pressure Limitation =M

external amplifier =No code
with integrated amplifier =E

size
NG10 =10
NG25 =20
NG32 =30

subplate mounting =No code
threaded connection =G

70 to 79 series =7X
(70 to 79 series installation and connection size unchanged)

Rekith =J

maximum pressure stage
to 50bar =50
to 100bar =100
to 200bar =200
to 315bar =315
to 350bar =350

Y= pilot oil supply internal and drain external
XY= pilot oil supply external and drain external

G24= supply voltage 24 VDC

No code= 1600mA coil
-8 800mA coil

DBEM electrical connection:
K4= square socket without plug
DBEME electrical connection:
K31S= with 1.5 meter cable and tin on the end
K31C= with M12x1 aviation plug, 5-pin

for model DBE(M)E
A1= command value 0 to 10 V
F1= command value 4 to 20 mA

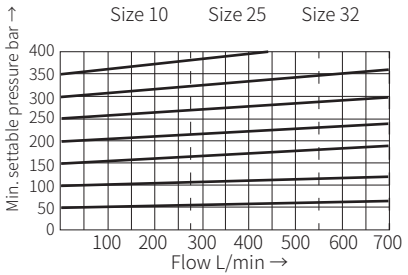
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

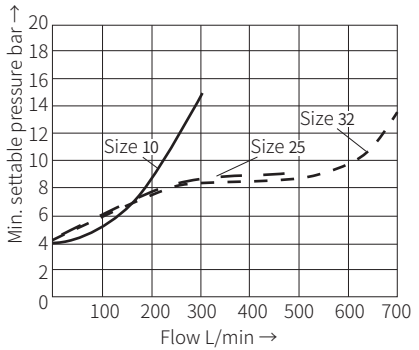
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

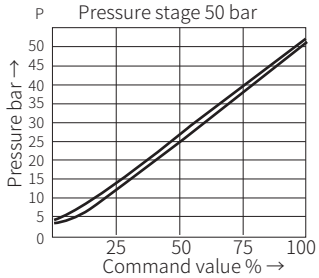
Settable pressure in relation to the flow



Minimum settable pressure at command value 0

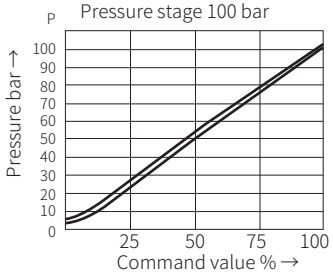


Pressure stage 50 bar

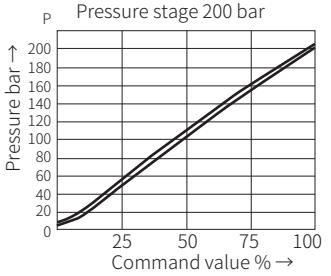


Command value pressure characteristic curve
(measured at a flow rate of 24L/min)

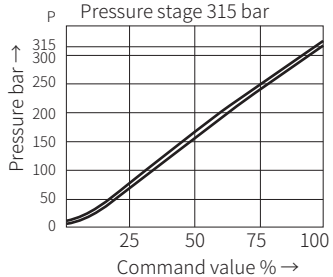
Pressure stage 100 bar



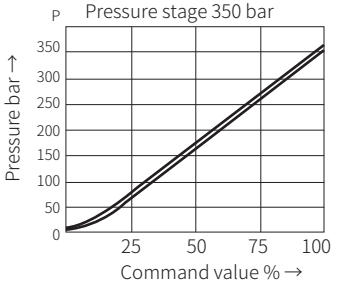
Pressure stage 200 bar



Pressure stage 315 bar



Pressure stage 350 bar



Technical parameters

(Test conditions: measured at v =40mm²/s, t=50°C)

Size				Size 10	Size 25	Size 32
Maximum working pressure	Oil ports P and X		bar	350		
	Oil port T		bar	315		
	Oil port Y		bar	zero pressure return oil tank Separately		
Maximum setting pressure	Pressure stage 50		bar	50		
	Pressure stage 100		bar	100		
	Pressure stage 200		bar	200		
	Pressure stage 315		bar	315		
	Pressure stage 350		bar	350		
Minimum setting pressure at command value zero			bar	See characteristic curve		
Maximum flow rate			L/min	275	550	700
Pilot flow rate			L/min	0.4 to 1	0.4 to 1.5	0.4 to 1.5
Fluid				Mineral hydraulic oil, phosphate ester hydraulic oil		
Oil temperature range			°C	-20 to +80		
Viscosity range			mm²/s	15 to 380		
Hysteresis (see command value pressure characteristic curve)			%	⩽ 5% of the maximum setting pressure		
Linearity			%	± 3.5 of the maximum setting pressure		
Manufacturing tolerance of the command value pressure characteristic curve, according to the hysteresis characteristic curve when pressure increasing	Model DBEM		%	± 5 of the maximum pressure regulation value		
	Model DBEME		%	± 1.5 of the maximum setting pressure		
Step response Tu+Tg	10 % →90 %		ms	~100 Measured with 0.2L of oil at port A		
	90 % →10 %		ms	~100		
Step response Tu+Tg	10 % →90 %		ms	~200 Measured with 5L of oil at port A		
	90 % →10 %		ms	~200		

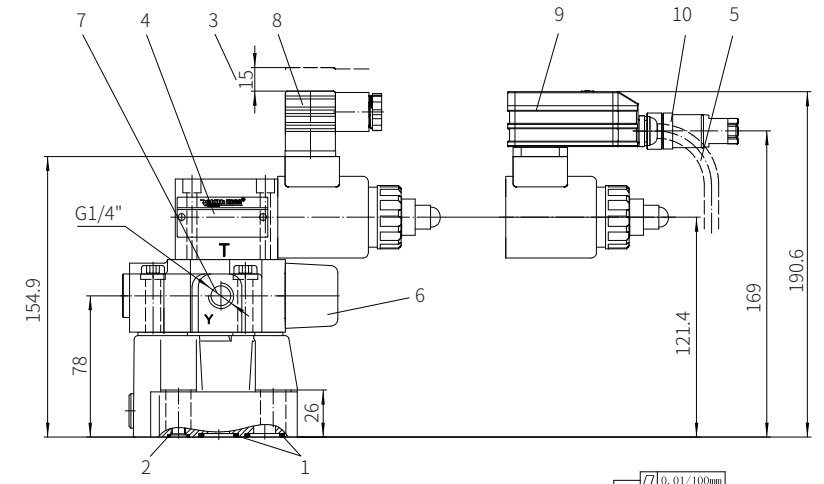
Electrical			G24	G24-8
Minimum control current		mA	⩽100	⩽100
Maximum control current		mA	1600 ± 10 %	800 ±5 %
Coil resistance	Cold value 20 °C	Ω	5.5	20.6
	Maximum hot value	Ω	8.05	33
Duty		%	100	100

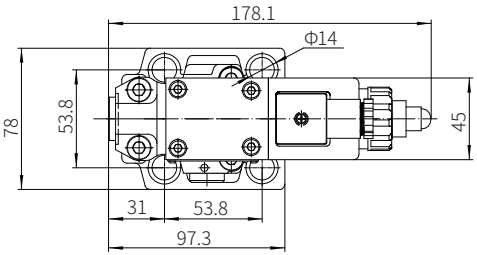
Electronic control unit (OBE)			
Voltage type	Nominal voltage	VDC	24
	Upper limit	VDC	35
	Lower limit	VDC	21
Current consumption		A	1.5
Demand power		A	2. Time interval
input	Voltage	V	0 to 10
	Current	mA	4 to 20
output	Measuring current	mV	1 mV ≙ 1 mA
Valve protection to EN60529			IP65

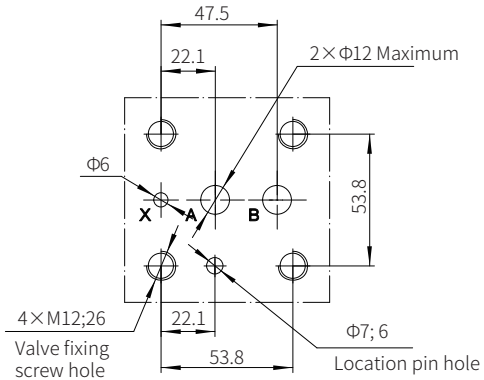
Component size

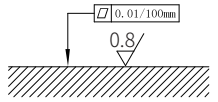
Size unit: mm

Model DBEM(E)10...-7XJ/...









Valve fixing screw

M12x50-10.9 grade GB/T70.1-2000

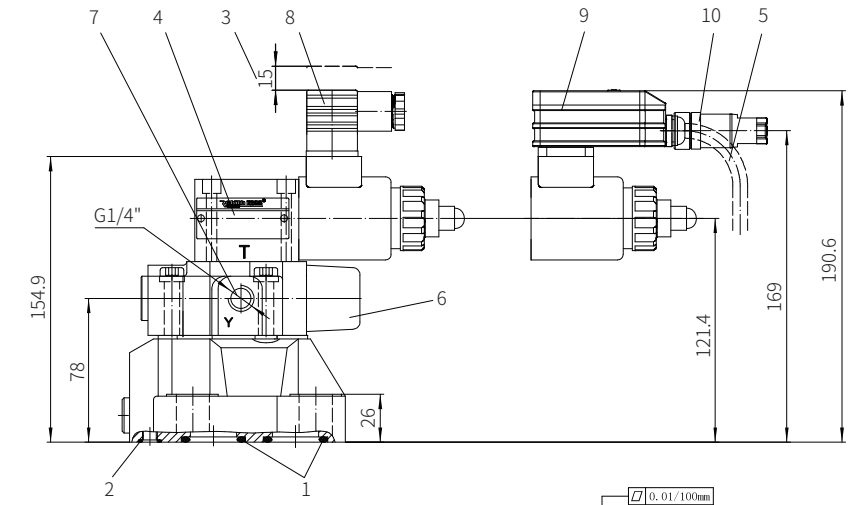
Tightening torque M_A=95Nm

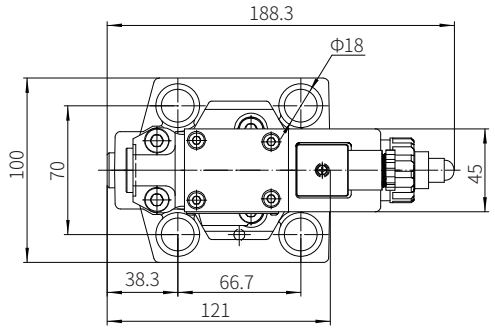
1 O-rings for ports P and T
2 O-ring for port X
3 Space required to remove the plug
4 Name plate
5 Cable (connection for integrated amplifier, optional)
6 Maximum pressure limitation
7 Pilot oil drain external, zero pressure return to oil tank separately
8 Plug for model DBEM
9 Integrated plug amplifier (OBE)
10 Plug for model DBEME

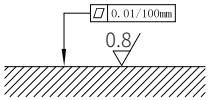
Component size

Size unit: mm

Model DBEM(E)20...-7XJ/...





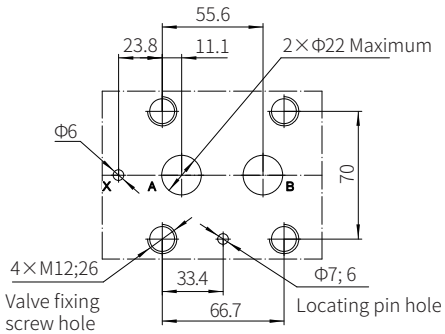


Required surface finishing of mating components

Valve fixing screw

M16x50-10.9 grade GB/T70.1-2000

Tightening torque M_A=196Nm

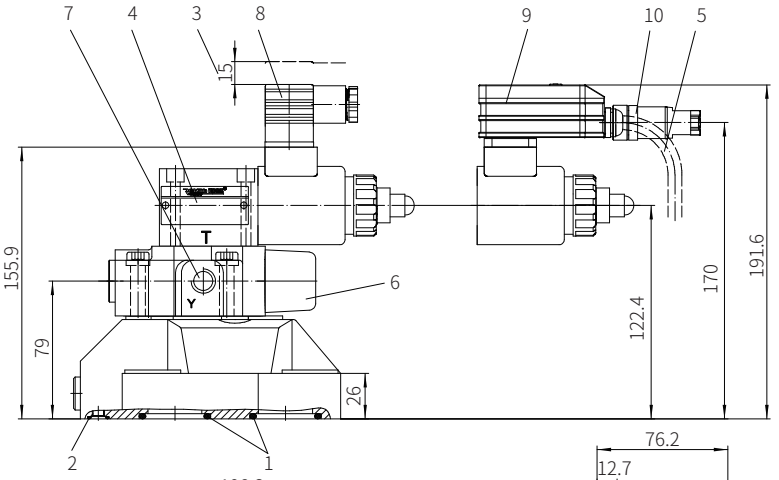


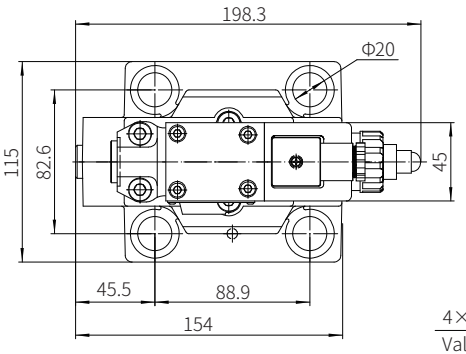
1 O-rings for ports P and T
2 O-ring for port X
3 Space required to remove the plug
4 Name plate
5 Cable (connection for integrated amplifier, optional)
6 Maximum pressure limitation
7 Pilot oil drain external, zero pressure return to oil tank separately
8 Plug for model DBEM
9 Integrated plug amplifier (OBE)
10 Plug for model DBEME

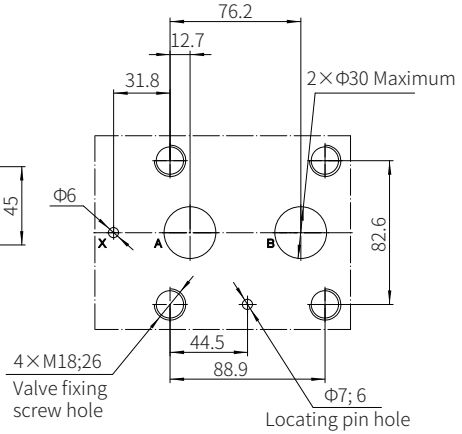
Component size

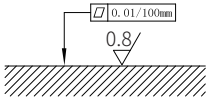
Size unit: mm

Model DBEM(E)30...-7XJ/...









Required surface finishing of mating components

Valve fixing screw

M18x50-10.9 grade GB/T70.1-2000

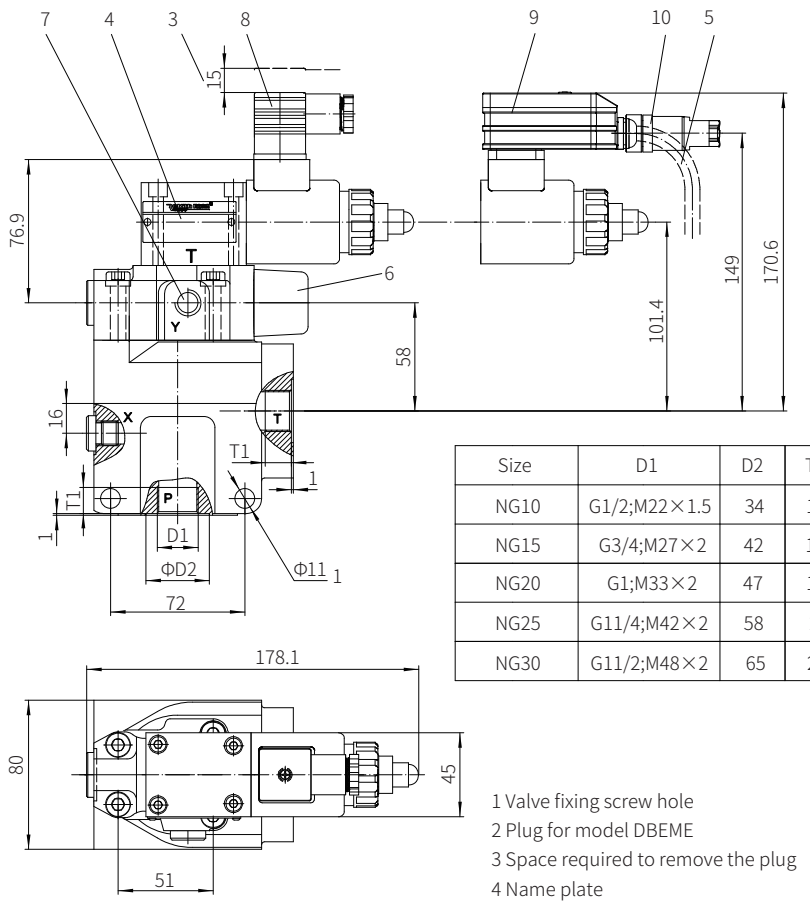
Tightening torque M_A=260Nm

1 O-rings for ports P and T
2 O-ring for port X
3 Space required to remove the plug
4 Name plate
5 Cable (connection for integrated amplifier, optional)
6 Maximum pressure limitation
7 Pilot oil drain external, zero pressure return to oil tank separately
8 Plug for model DBEM
9 Integrated plug amplifier (OBE)
10 Plug for model DBEME

Component size

Size unit: mm

Model DBEM (E)G



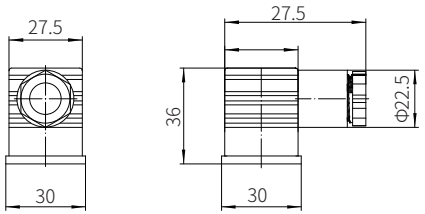
Size	D1	D2	T1
NG10	G1/2;M22×1.5	34	14
NG15	G3/4;M27×2	42	16
NG20	G1;M33×2	47	18
NG25	G11/4;M42×2	58	20
NG30	G11/2;M48×2	65	22

1 Valve fixing screw hole
2 Plug for model DBEME
3 Space required to remove the plug
4 Name plate
5 Cable (connection for integrated amplifier, optional)
6 Maximum pressure limitation
7 Pilot oil drain external, zero pressure return to oil tank separately
8 Plug for model DBEM
9 Integrated plug amplifier (OBE)

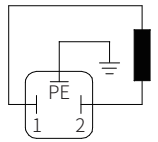
Component size

Size unit: mm

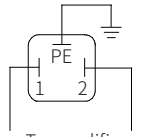
Model DBEM...7XJ/...K4
Plug -in connector to DIN 175301-803



Connection at component plug

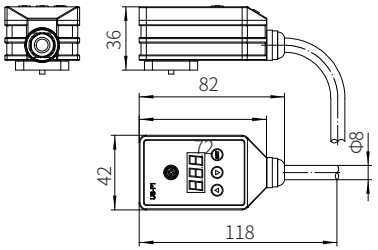


Connection at plug-in connector

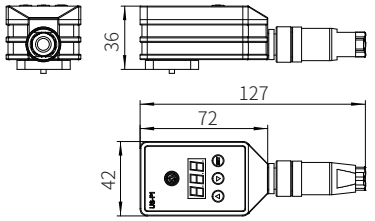


To amplifier

Model DBEM...7XJ/...K31S



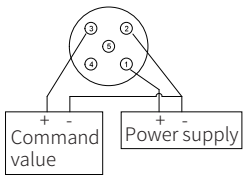
Model DBEME...7XJ/...K31C



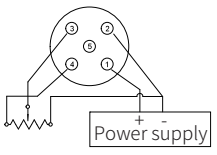
Terminal identification

M12 plug terminal number (K31C type)	Cable color (K31S type)	Terminal identification
1	Red	Power supply +
2	Black	Power supply -/command value -
3	Yellow	Command value +
4	Blue	Reference voltage 5V
5	Green	-

Connection example:
PLC example input command



Connection example:
Potentiometer input command



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Pilot Operated Proportional Relief Valve

Model: (Z)DBE/(Z)DBEE...1XJ

- Size 6
- Maximum working pressure 315bar
- Maximum working flow 30 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	04-05
Electrical connections	06
Characteristic curve	07-08
Component size	09-10

Features

- For limiting system pressure
- Operation by proportional solenoids
- Subplate mounting or sandwich plate connection
- Both valves and proportional amplifiers from the same supplier
- Model DBEE and ZDBEE with integrated amplifier:
- Low manufacturing tolerance of the command value-pressure characteristic curve
- The ramp signal generation time can be adjusted separately when the pressure increases or decreases

Function description, sectional drawing

Model DBE/ZDBE

The DBE and ZDBE proportional relief valves are operated by a proportional solenoid. These valves are used to limit the system pressure. It can adjust the system pressure steplessly to be limited based on the electrical command value.

The valve mainly consists of proportional solenoid (1), valve body (2), valve components (3), valve spool (4) and pilot cone head (8). The proportional solenoid converts the current into mechanical force proportionally. The increase in current intensity correspondingly causes an increase in the magnetic force. The armature cavity of the solenoid is filled with oil and maintains pressure balance.

The system pressure is set by the proportional solenoid (1) according to the command value. The pressure in port P acts on the right side of the valve spool (4). At the same time, the system pressure acts on the spring-loaded side of the valve spool (4) through the control line (6) with orifice (5). The system pressure acts on the pilot cone head (8) through another orifice (7) in relative to the mechanical force of the proportional solenoid (1). When the system pressure reaches the pre-set value, the pilot cone head (8) is lifted from the valve seat. Then the control oil can drain (according to the model) externally via port A(Y) or internally into the tank to limit the pressure on the spring-loaded side of the valve spool (4). If the system pressure continues to increase slightly, the higher pressure on the right will push the valve spool to the left to the control position P to T. At the minimum control current(corresponds to the command value of zero), the minimum setting pressure will be set.

Note:

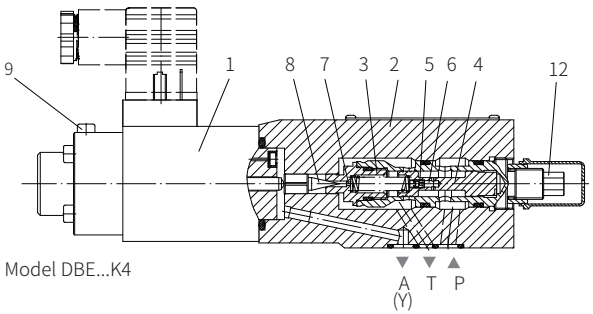
In order to ensure optimum valve function of the valve, it should be bled when valve used:

—Remove the bleed bolt (9),

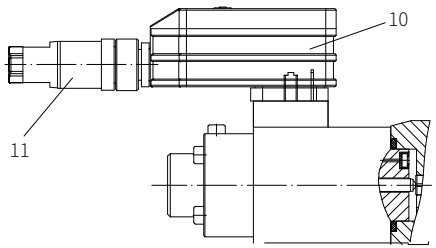
—Fill the oil into the screw hole at position 9,

—Re-screw the position 9 when no more bubbles appear.

—It must be avoided the emptying running of the tank. In some installation conditions, a back pressure valve is to be installed (back pressure about 2bar)



Model DBE...K4



In principle, the function and structure of this valve is similar to the valve DBE and ZDBE, but just take a connector (10) with integrated electronic (OBE) on the proportional solenoid.

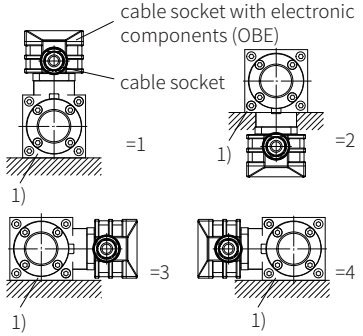
Both the supply power and command value voltage are configured on the cable socket (11).

Model DBEE...K31..and ZDBEE...K31...(with integrated electronic OBE)

Models and specifications

DBE | 6 | – | 1X | J | | G24 | | | *

- subplate mounting =No code; sandwich type =Z
- external amplifier =No code; integrated amplifier (OBE) =E
- size 6 =6
- subplate mounting =No code; sandwich type P→T =VP
- position of cable socket for model ZDBE
- position of cable socket with electronic components for model ZDBEE



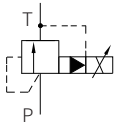
1) mounting surface (O-ring groove in valve body)

- more information in text
- sealing material: No code= NBR seals; V= FKM seals (consult for other seals)
- (Z)DBE electrical connection: K4= square socket without plug
- (Z)DBEE electrical connection: K31S= with 1.5 meter cable and tin on the end; K31C= with M12x1 aviation plug, 5-pin
- G24= supply voltage 24VDC
- No code= pilot oil drain internal (recommendation: subplate mounting up to q_{vmax}=15 L/min); Y= pilot oil drain external (only possible for subplate mounting)
- maximum pressure stage: 50= up to 50bar; 100= up to 100bar; 200= up to 200bar; 315= up to 315bar
- J= Rekith
- 1X= 10 to 19 series (10 to 19 series installation and connection size unchanged)

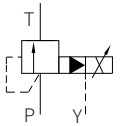
Functional symbols

Symbols for sandwich type valve: (①= Valve side, ②= Subplate side)

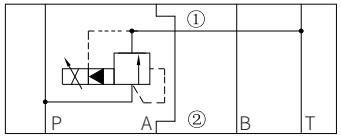
Model DBE6...



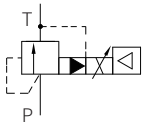
Model DBE6...Y...



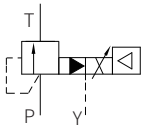
Model ZDBE6VP...



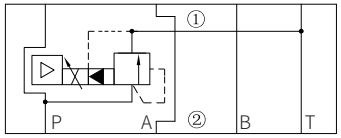
Model DBE6...



Model DBE6...Y...



Model ZDBEE6VP...



Technical parameters

Electrical			
Voltage type		V	24VDC
Minimum control current		mA	100
Maximum control current		mA	800 or 1600
Coil resistance	- Cold value at 20°C	Ω	19.5 (800mA), 5.4 (1600mA)
	- Maximum warm value	Ω	31 (800mA), 7.8 (1600mA)
Duty		%	100
Electrical connections	DBE and ZDBE		With component plug to DINEN 175301-803
			With cable plug to DINEN 175301-803[2)]
	DBEE and ZDBEE		With component plug to DINEN 175201-804
			With cable plug to DINEN 175201-804[2)]
Valve protection to EN60529			IP65, plug installed and locked

Technical parameters

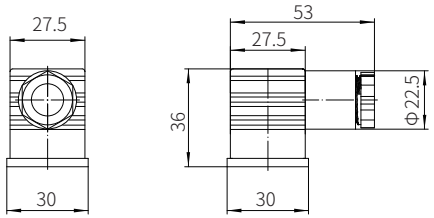
Overview			
Weight	DBE and ZDBE	kg	2.4
	DBEE and ZDBEE	kg	2.5
Installation position			Optional
Storage temperature range		°C	-20 to + 80
Environment temperature range	DBE and ZDBE	°C	-20 to +70
	DBEE and ZDBEE	°C	-20 to + 50

Hydraulic (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)			
Maximum working pressure	Port P; P1-P2 A1- A2; B1-B2	bar	315
	Port T	bar	50
Maximum adjustable pressure	Pressure stage 50	bar	50
	Pressure stage 100	bar	100
	Pressure stage 200	bar	200
	Pressure stage 315	bar	315
Minimum setting pressure at command value zero		bar	See characteristic curve on page 8
Return oil pressure at port A; external control oil return (Y)			Separate and at zero pressure to tank
Control oil flow rate		L/min	0.6 to 1.2
Maximum flow		L/min	30
Pressure medium			Mineral oil (HL, HLP)[1)] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1)]; HEPG(Polyethyleneglycol)[2)] ; HEES (Synthetic Fats)[2]
Oil temperature range		°C	-20 to ＋80
Viscosity range		mm^2/s	15 to 380
The maximum allowable pollution degree of oil to ISO4406(c)			Class 20 / 18 / 15
Hysteresis		%	± 1.5 of the maximum setting pressure
Repeatability		%	＜ ±2 of the maximum setting pressure
Linearity		%	± 3.5 of the maximum setting pressure
Manufacturing tolerance of command value pressure characteristic curve, according to the hysteresis characteristic curve when pressure increasing.	DBE and ZDBE	%	± 2.5 of the maximum setting pressure
	DBEE and ZDBEE	%	± 1.5 of the maximum setting pressure
Step response Tu+ Tg	10 %→ 90 %	ms	about 80] Dependent on equipment
	90 %→ 10 %	ms	about 50]

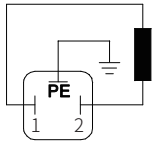
The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components

Electrical connections

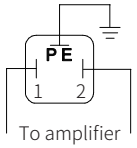
Model (Z) DBE...1XJ/...K4
Plug to DINEN 175301-803



Connection at component plug

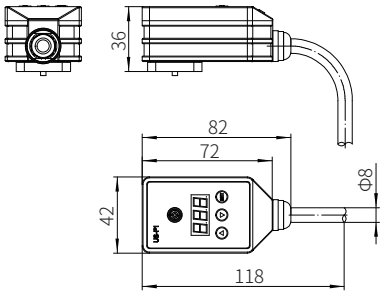


Connection at plug-in connector

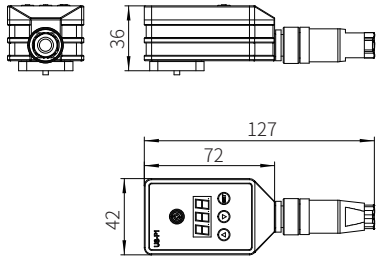


To amplifier

Model (Z)DBEE...1XJ/...K31S



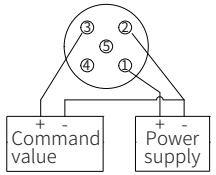
Model (Z)DBEE...1XJ/...K31C



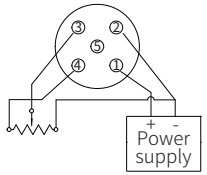
Terminal identification

M12 plug terminal number (K31C type)	Cable color (K31S type)	Terminal identification
1	Red	Power supply+
2	Black	Power supply -/ command value -
3	Yellow	Command value+
4	Blue	Reference voltage 5V
5	Green	-

Connection example:
PLC example input command



Connection example:
Potentiometer input command

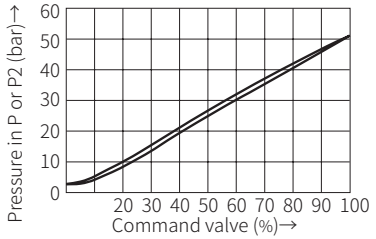


Characteristic curve

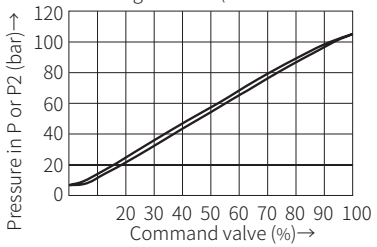
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Pressure in port P or P2(q_v=5L/min) depending on the command value

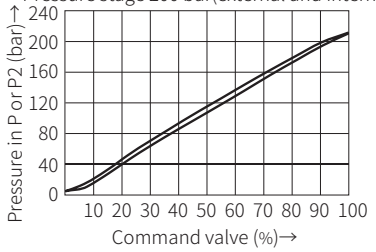
Pressure stage 50 bar(external and internal)



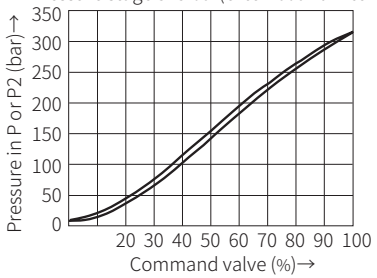
Pressure stage 100 bar(external and internal)



Pressure stage 200 bar(external and internal)

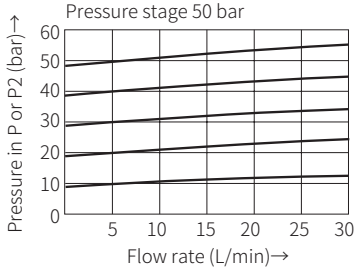


Pressure stage 315 bar(external and internal)

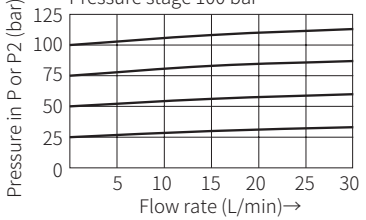


Pressure in port P or P2 depending on the flow q_v

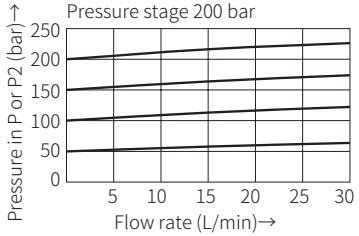
Pressure stage 50 bar



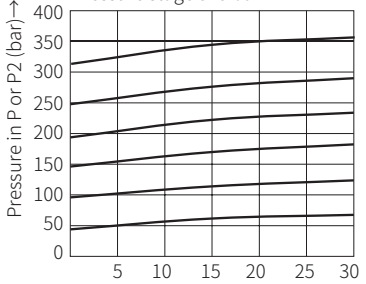
Pressure stage 100 bar



Pressure stage 200 bar



Pressure stage 315 bar



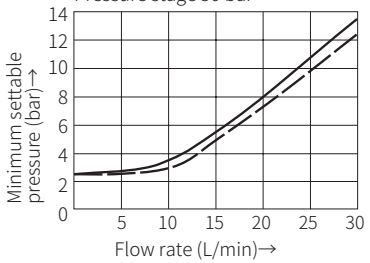
The characteristic curve is measured without back pressure in ports A (external control oil return) and T (internal control oil return). When the internal control oil returns, the pressure in port P or P2 will increase by the outlet pressure value in port T.

Characteristic curve

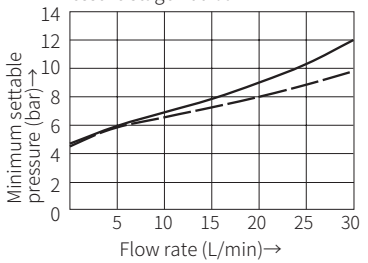
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Minimum settable pressure in port P or P2 with command value 0 Control oil return——internal ---external

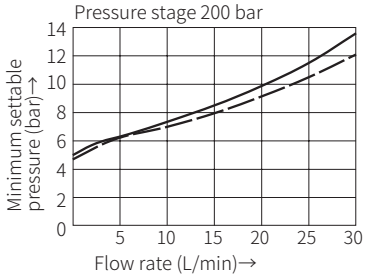
Pressure stage 50 bar



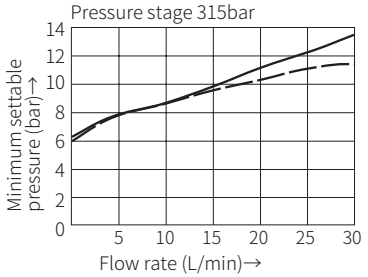
Pressure stage 100 bar



Pressure stage 200 bar

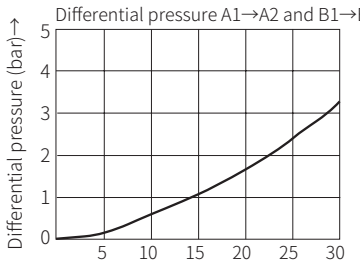


Pressure stage 315bar

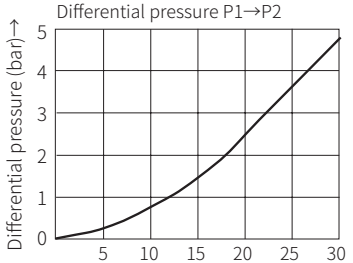


The characteristic curve is measured without back pressure in ports A (external control oil return) and T (internal control oil return). When the internal control oil returns, the pressure in port P or P2 will increase by the outlet pressure value in port T.

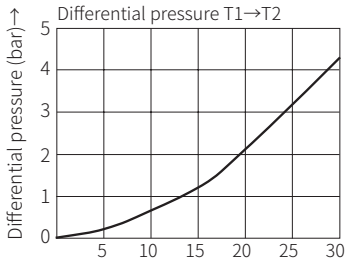
Differential pressure A1→A2 and B1→B2



Differential pressure P1→P2



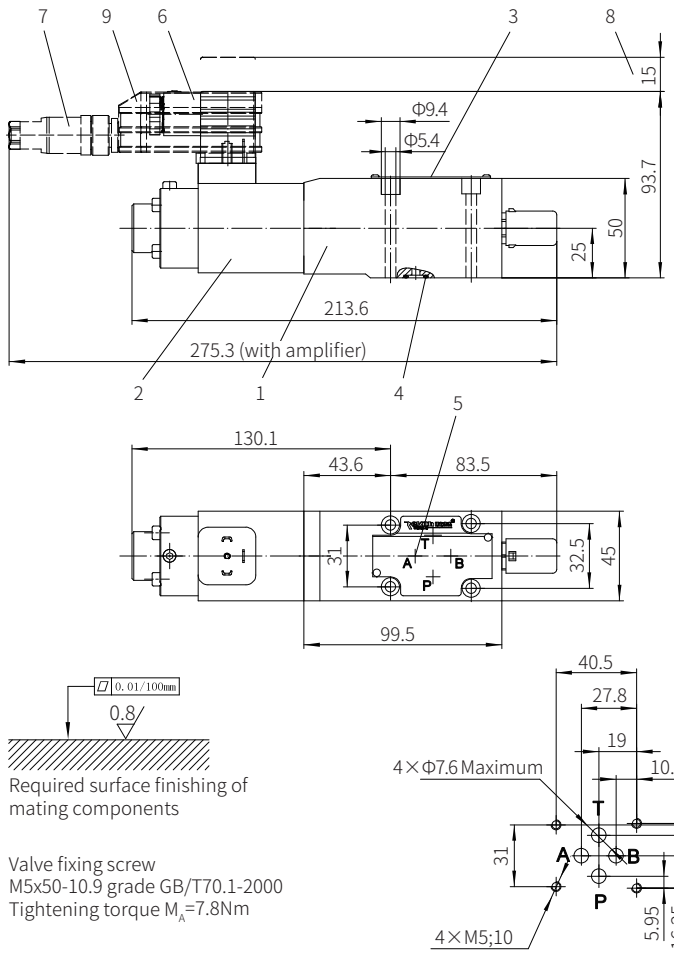
Differential pressure T1→T2



Component size

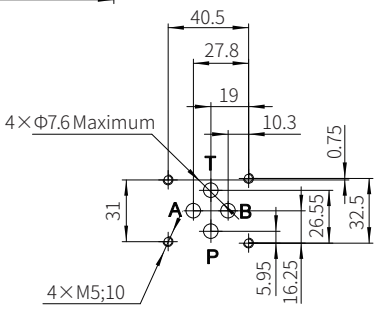
Size unit: mm

Model DBE, DBEE



Required surface finishing of mating components

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

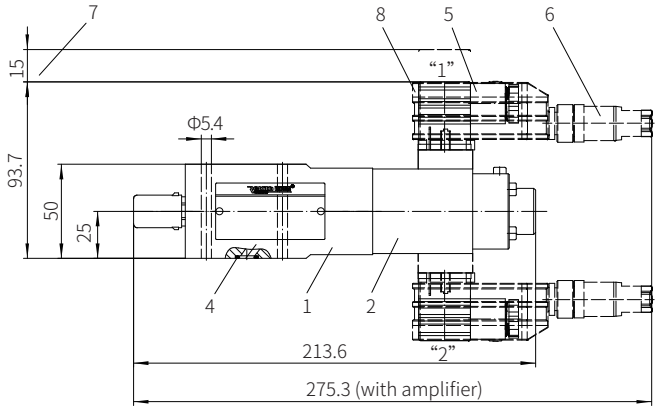


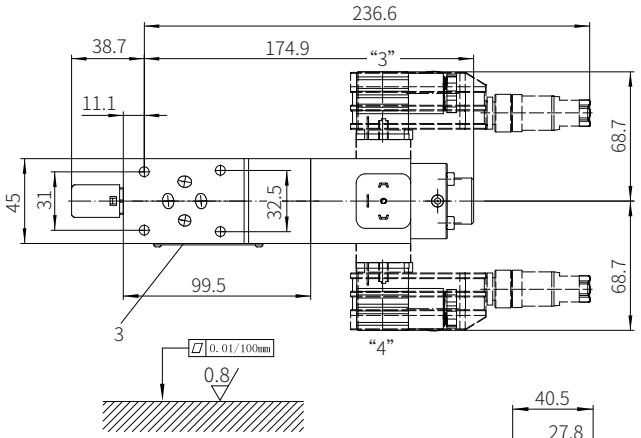
1 Valve body
2 Proportional solenoid
3 Name plate
4 Sealing rings for A, B, P, T
5 With version Y, pilot oil return external through port A (Y)
6 Socket for DBE
7 Connector for DBEE
8 Space required to remove the plug
9 Plug integrated amplifier (OBE)

Component size

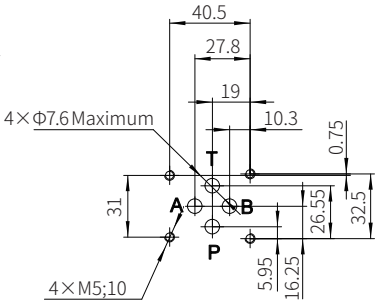
Size unit: mm

Model ZDBE, ZDBEE





Required surface finishing of mating components



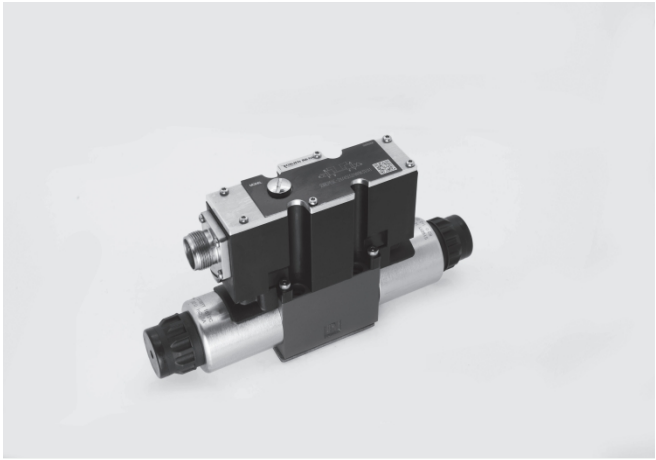
1 Valve body
2 Proportional solenoid
3 Name plate
4 Sealing rings for A, B, P, T
5 Socket for ZDBE
6 Connector for ZDBEE
7 Space required to remove the plug
8 Plug integrated amplifier (OBE)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Note: "1" to "4" is position for cable sockets or integrated amplifiers

3-Way Proportional Pressure Reducing Valve

Model: 3DREP(E)6...2XJ



- Size 6
- Maximum working pressure 100 bar
- Maximum working flow 15 L/min

Contents

Function description, sectional drawing	02
Functional symbols	03
Models and specifications	03
Technical parameters	04-05
Characteristic curve	05
Component size	06-07

Features

- Direct operated proportional valves for the control of the pressure and direction of a flow
- Operation by proportional solenoid with central thread and detachable coil
- For subplate mounting
- Spring centred control spool
- Model 3DREPE with integrated amplifier
- Model 3DREP with external amplifier
- Manual emergency operation, optional

Function description, sectional drawing

The 3DREP6 type 3-way pressure reducing valve is direct operated by proportional solenoid. It used to convert an electrical input signal into a proportional pressure output signal.The proportional solenoids are controllable wet pin DC solenoids with central thread and detachable coil. The solenoids are controlled by external amplifier (model 3DREP) or integrated amplifier (model 3DREPE).

The valves consist of:

- Valve body with mounting surface (1)
- Control spool (2) with pressure measuring spool (3)
- Solenoid with central thread (5) (6)
- Optional integrated amplifier (7)

Function:

- When the solenoid is de-energized, the control spool (2) is held in its neutral position by the compression spring.
- After one of solenoid is energized, the control spool(2) is directly actuated.

E.g. energization of solenoid "a" (6)

→ the pressure measuring spool (3) and the control spool (2) is pushed to the right in proportion to the electrical input signal.

→P to B and A to T are connected through the cross-sections with progressive flow characteristics.

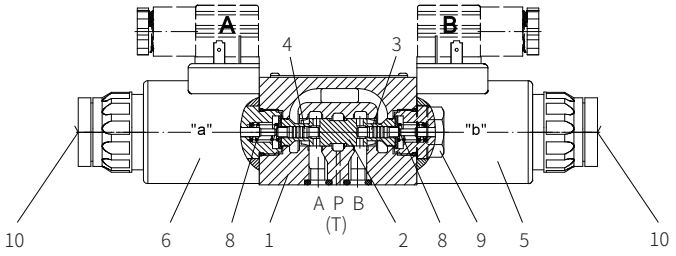
De-energization of solenoid (5).

→the control spool (2) is pushed back to the center position by the compression spring.

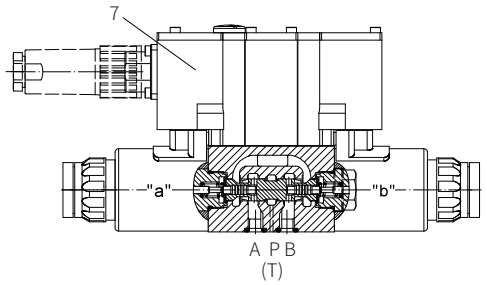
In the middle position the connections from A and B to T are open, therefore, the pressure oil can freely flow to tank. An optional manual emergency operation is required to move the control spool (2) without solenoid energization.

Attention:

The unconsciously activation of manual emergency operation can cause uncontrolled movement of equipment!



Model 3DREP6...-2XJ/...



Model 3DREPE6...-2XJ/...

Note:

To prevent leakage of tank lines, a back pressure valve is required to install (back pressure about 2 bar) according to the installation condition.

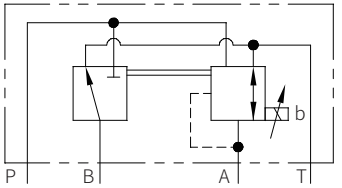
Valve with 2 positions:

(Model 3DREP.. A... or 3DREP.. B...)

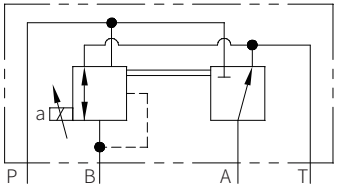
The function of this valve is basically the same as the valve with three positions, but the two position valve is only installed with solenoid "a" or "b", and with a plug (9) instead of the second solenoid.

Functional symbols

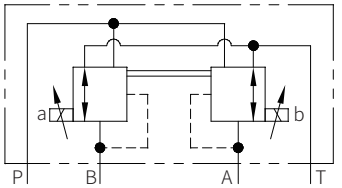
Model 3DREP...6A-2XJ/...E(detailed)



Model 3DREP...6B-2XJ/...E(detailed)

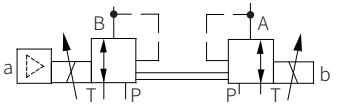


Model 3DREP...6C-2XJ/...E(detailed)



Example of valve with integrated control electronic

Model 3DREPE...6C-2XJ/...E(simplified)



Models and specifications

3DREP | 6 | 2X | J | E | G24 | | | | | *

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

for model 3DREPE
A1= command value 0 to 10 V
F1= command value 4 to 20 mA

3DREP electrical connection:
K4= square socket without plug
3DREPE electrical connection:
K31= with plug-in connector

No code= without manual emergency operation
N9= with manual emergency operation

No code= 1500mA coil
-8 800mA coil

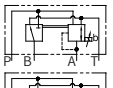
G24= power supply voltage 24V DC

E= proportional solenoid with detachable coil

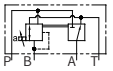
with external amplifier =No code
with integrated amplifier =E

size 6 =6

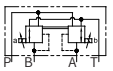
functional symbols



=A



=B



=C

20 to 29 series =2X
(20 to 29 series installation and connection size unchanged)

Rekith =J

pressure stage 16 bar =16
pressure stage 25 bar =25
pressure stage 45 bar =45

Technical parameters

Overview				
Valve model			3DREP	3DREPE
Installation position			optional, preferably horizontal	
Storage temperature range		°C	-20 to +80	
Environment temperature range		°C	-20 to +70	-20 to +50
Weight		kg	2.0	2.2
Hydraulic				
Working pressure range	Oil port P	bar bar bar	20 to 100 for pressure stage 16 30 to 100 for pressure stage 25 50 to 100 for pressure stage 45	
	Oil port T	bar	0 to +30	
Maximum flow		L/min	15 (△p=50bar)	
Pressure medium			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG (Polyethyleneglycol)[2] ; HEES (Synthetic Fats) [2]	
Oil temperature range		°C	-20 to +80 (preferably +40 to +50)	
Viscosity range		mm^2/s	20 to 380 (preferably 40 to 60)	
Cleanliness of oil to ISO			The maximum allowable pollution level of oil is ISO4406 Class C	
Hysteresis		%	⩽5	
Repeatability		%	⩽1	
Sensitivity		%	⩽0.5	
Reversal span		%	1	
Electrical, solenoid				
Valve model			3DREP	3DREPE
Voltage type			DC	
Command value signal	Voltage input "A1"	V	-	±10
Maximum current per solenoid		A	0.8 or 1.5	2.5
Solenoid coil resistance	Cold value at 20°C	Ω	4.8	2
	Max. warm value	Ω	7.2	3
Duty		%	100	
Coil temperature		°C	up to 150	
Electrical connections	3DREP		With component plug to DIN 175 301-803	
			With plug-in connector to DIN EN 175 301-803	
	3DREPE		With component plug to DIN 43 563-AM6-3	
			With plug-in connector to DIN 43 563-BF6-3	
Valve protection to DINEN 60 529/VDE 0470 part 1			IP65, plug installed and locked	

1)The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

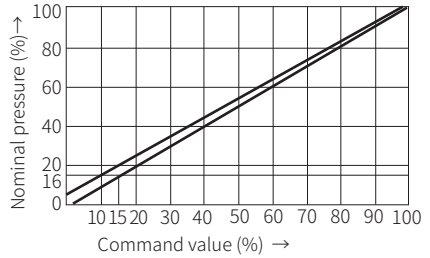
Technical parameters

Electrical, amplifier			
Integrated amplifier for model 3DREPE			Integrated in the valve
Supply voltage	Nominal voltage	VDC	24
	Lower limiting value	V	19
	Upper limiting value	V	35
Amplifier current consumption	/max	A	1.8
	Impulse current	A	4
Modular external amplifier for model 3DREP			RT-PVDA-0 X-D2-30-CN-A1/F1

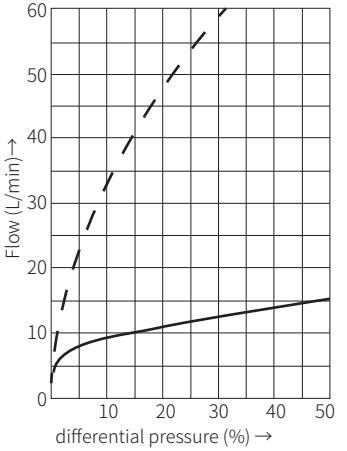
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

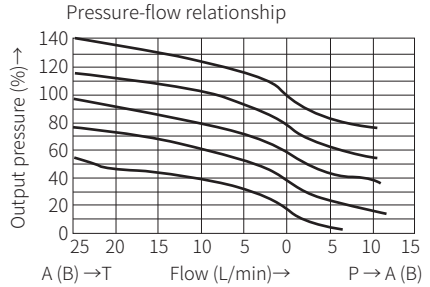
Pressure stage 16，25 and 45bar



Pressure stage 16，25 and 45bar



Pressure-flow relationship



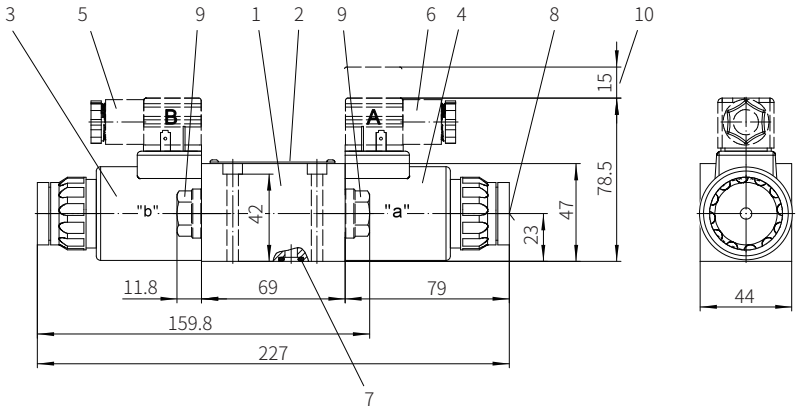
P → A or P → B

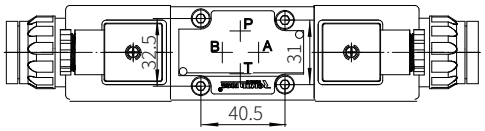
A → T or B → T

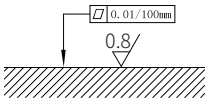
Component size

Size unit: mm

Model 3DREP6..-2XJ/..





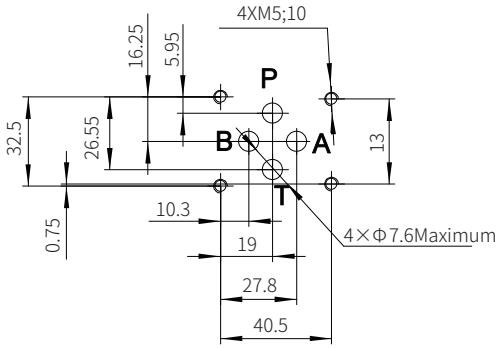


Required surface finishing of mating components

Valve fixing screw

M5x50-10.9 grade GB/T70.1-2000

Tightening torque M_A=7.8Nm

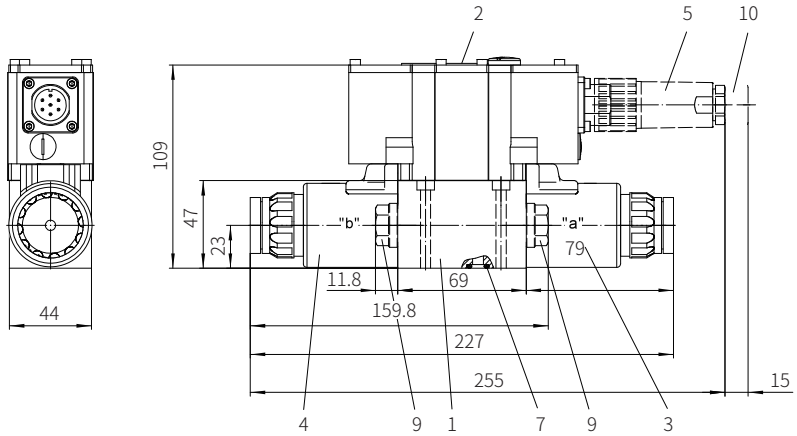


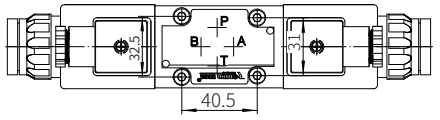
1 Valve body
2 Name plate
3 Proportional solenoid “b”
4 Proportional solenoid “a”
5 Black plug “B”
6 Grey plug “A”
7 O ring (for port P, A, B, T)
8 Manual emergency operation "N9"
9 Plug for valve with one solenoid
10 Space required to remove the plug

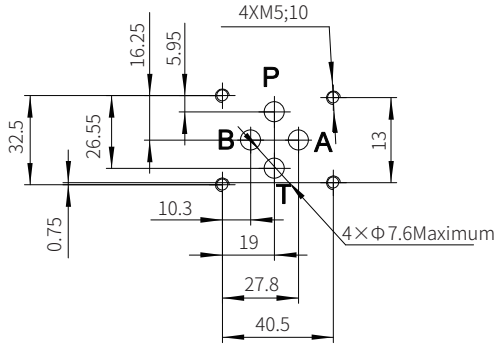
Component size

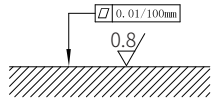
Size unit: mm

Model 3DREPE6..-2XJ/..









Required surface finishing of mating components

Valve fixing screw

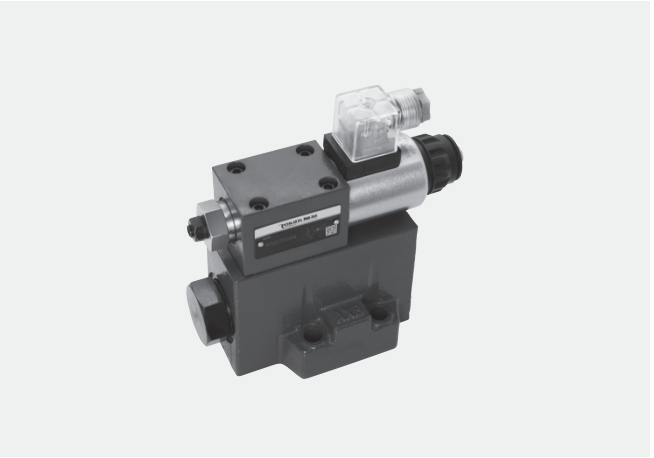
M5x50-10.9 grade GB/T70.1-2000

Tightening torque M_A=7.8Nm

1 Valve body
2 Name plate
3 Proportional solenoid “b”
4 Proportional solenoid “a”
5 Plug
6 O ring (for port P, A, B, T)
7 Manual emergency operation "N9"
8 Plug for valve with one solenoid
9 Space required to remove the plug

Pilot Operated Proportional Reducing Valve

Model: DRE/DREM...6XJ



- Size 10/25
- Maximum working pressure 315bar
- Maximum working flow 300 L/min

Contents

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Models and specifications	04
Technical parameters	05-06
Characteristic curve	06-07
Component size	08-09

Features

- Maximum pressure protection, optional
- Optional check valve for freely flow of oil in reverse direction
- For subplate mounting
- For installation in manifolds
- Both valves and proportional amplifiers from the same supplier

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Function description, sectional drawing

The DRE (M) valve is a pilot operated pressure reducing valve, it is used to reduce working pressure. The valve mainly consists of pilot valve (1) with proportional solenoids (2), main valve (3) with a main spool insert (4), and an optional check valve (5).

Model DRE

The pressure at port A acts on the surface (7) of the main spool via throttle (6). The pilot oil flows from port B through the throttle (8) to the constant flow controller (9) which can keep the pilot flow constant away from the pressure drop between port A and B. The pilot oil flows from the constant flow controller (9) to the spring chamber (10), via throttles (11 and 12) and valve seat (13) to port Y(14, 15, 16) and from there to the tank. The pressure required in port A is controlled by the relevant amplifier. The proportional solenoid pushes the conical valve (20) towards the valve seat (13) to limit the pressure of the spring chamber (10) to the setting value. If the pressure at Port A is lower than the setting value, the pressure difference in the spring chamber (10) pushes the main spool to the right, thereby the connection from Port B to Port A is opened.

When the required pressure in port A is achieved, the force at the main spool is balanced and the main spool is maintained in the working position.

The pressure in port A X spool area (7)= spring chamber (10) pressure X spool area - spring force (17). If the pressure built up by the pressure liquid column (e.g. cylinder piston to stop) at port A is to be reduced, it need to adjust a lower command value in the relevant amplifier, and then the lower pressure will be built up in the spring chamber (10).

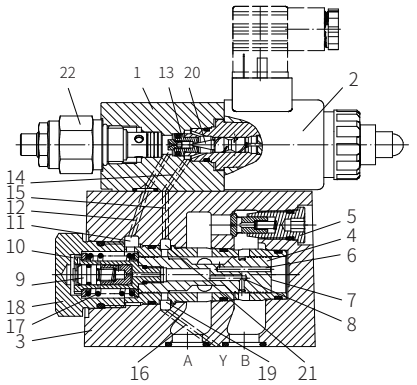
The higher pressure at port A acts on the face (7) of the main spool and pushes the main spool towards the plug (18). The connection from A to B is closed but A to Y is opened. The force of the spring (17) is used to balance the hydraulic pressure acting on the face (7) of the main spool. At this main spool position, the oil flows from port A to port Y through the control edge (19) into the return pipeline.

When the pressure at port A reduces to the pressure of the spring chamber (10) plus the pressure difference Δ p on the spring (17), the main spool at the control edge A to Y closes the large control bores in the socket. The remaining pressure difference about 10 bar for the set pressure at port A can only be unloaded by control channel (21), thus it can achieve a perfect transient response performance without pressure sudden changes.

To ensure the fluid flows freely from port A to port B, a check valve (5) can be selected. Parts of the oil from port A will flow into port Y through the control edge (19) of the main valve spool into the return pipeline.

Model DREM

To prevent the unexpected increase of the control current due to the proportional solenoid, which cause an increase in pressure at port A and may affect the safety of the hydraulic system, it can optionally to install a spring-loaded pressure relief valve as maximum pressure limitation (22) for maximum pressure protection of the system.

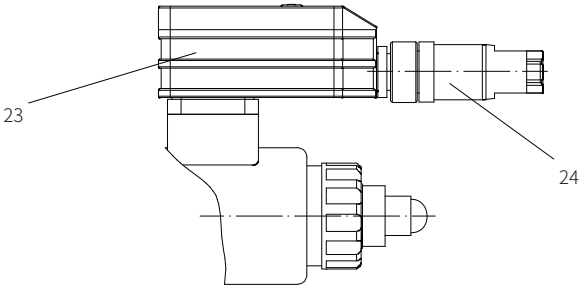


Model DREM- 6XJ/ YG24K24 (with check valve)

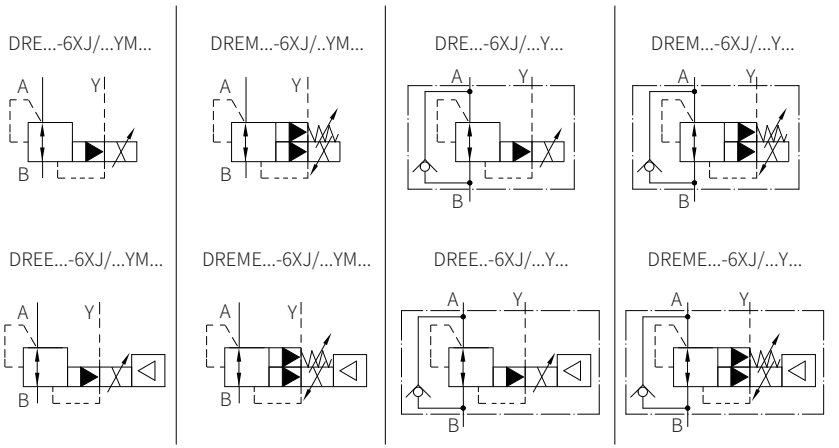
Function description, sectional drawing

Model DRE (M) E (with integrated amplifier)

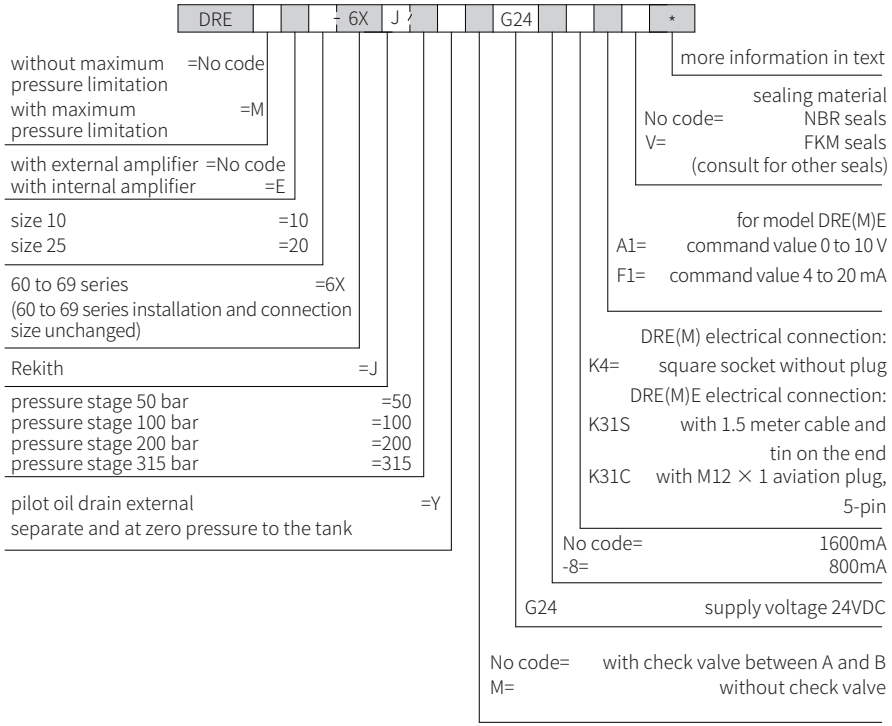
The function and design of this type valve is exactly the same as the DRE (M) valve if without integrated amplifier. The amplifier is located in the connector (23), and supplies power and receives the command value voltage by plug-in type (24). The set value - pressure characteristic curve is pre-set by the manufacturer based on the principle of minimum manufacturing tolerance.



Functional symbols



Models and specifications



Technical parameters

Overview				
Size		Size	10	25
Weight	DRE and DREM	Kg	4.7	6.0
	DREE and DREME	Kg	4.8	6.1
Installation position			Optional	
Storage temperature range		°C	-20 to +80	
Environment temperature range	DRE(M)	°C	-20 to +70	
	DRE(M)E	°C	-20 to +50	

Hydraulic (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)				
Size		Size	10	25
Working pressure	Oil ports A and B	bar	315	
	Oil port Y	bar	Separate and at zero pressure to tank (Internal pipe O ⩾ 5 mm, pipe length <2500 mm)	
Max. setting pressure in oil port A	Pressure stage 50	bar	50	
	Pressure stage 100	bar	100	
	Pressure stage 200	bar	200	
	Pressure stage 315	bar	315	
Min. setting pressure in port A at zero command value		bar	2	
Max. setting pressure limitation			Factory setting:	
	Pressure stage 50	bar	to 70 bar	
	Pressure stage 100	bar	to 130 bar	
	Pressure stage 200	bar	to 230 bar	
	Pressure stage 315	bar	to 350 bar	
Max. permissible flow of main valve		L/min	200	300
Pilot oil flow		L/min	0.8	
Fluid			Mineral oil (HL, HLP) according to DIN51524 phosphate ester (HFD-R)	
Oil temperature range		°C	-20 to +80	
Viscosity range		mm^2/s	15 to 380	
Hysteresis		%	±3.5 of Max. setting pressure	
Repeatability		%	<+2 of Max. setting pressure	
Linearity		%	+2 of Max. setting pressure	
Manufacturing tolerance of command value pressure characteristic curve, related to the hysteresis characteristic curve when pressure increasing	DRE(M)	%	±3.5 of Max. setting pressure	
	DRE(M)E	%	±1.5 of Max. setting pressure	
Step response Tu+Tg	10→90 %	ms	~130 measured when the fluid with 1L at port A	
	90→10 %	ms	~160	
Step response Tu+Tg	10→90 %	ms	~150 measured when the fluid with 5L at port A	
	90 →10 %	ms	~150	

Electrical			"G24"	"G24-8"
Minimum solenoid current		mA	⩽ 100	⩽ 100
Maximum solenoid current		mA	1600±10 %	800±5%
Coil resistance	Measured at 20°C	Ω	5.5	20.6
	Maximum value	Ω	8	33
Duty			100	100

Technical parameters

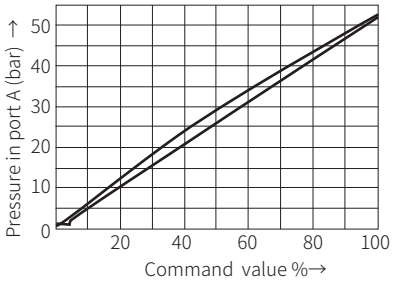
Electronic control unit (OBE)			
Supply voltage	Nominal voltage	VDC	24
	Lower limit value	VDC	21
	Upper limit value	VDC	35
Current consumption		A	⩽1.5
Required power		A	2, time interval
Input	Voltage	V	0 to 10
	Current	mA	4 to 20
Output	Measuring current	mA	1 mV ≙ 1 mA
Valve protection to EN60529			IP65

Characteristic curve

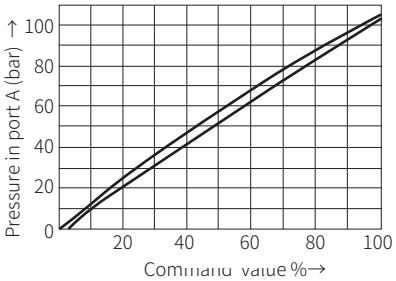
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Pressure in port A -command value

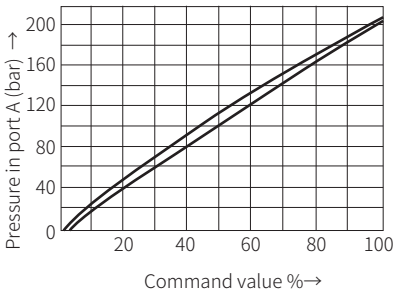
Pressure stage 50 bar



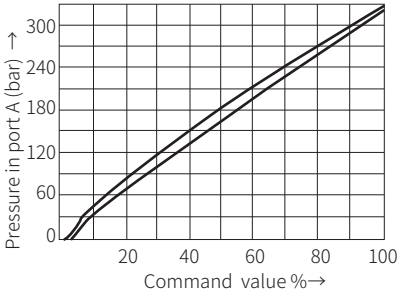
Pressure stage 100 bar



Pressure stage 200 bar



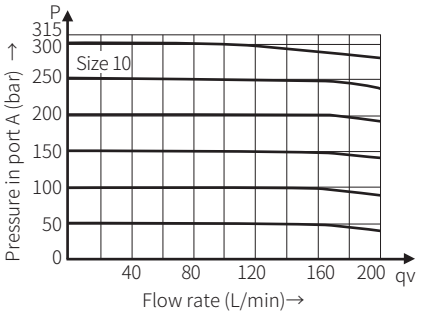
Pressure stage 315bar

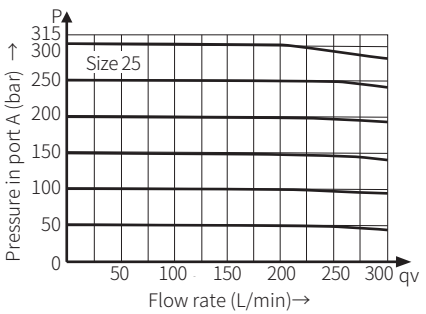


Characteristic curve

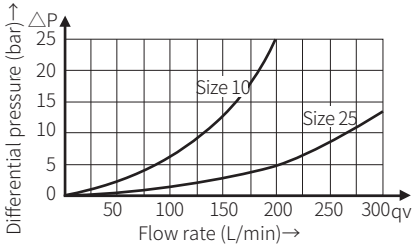
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Pressure in port A - flow qv

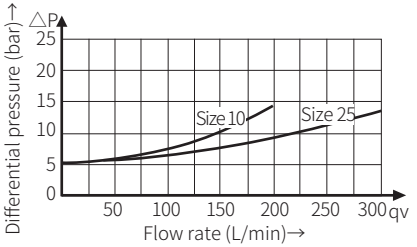




The pressure difference via the check valve from port A to port B



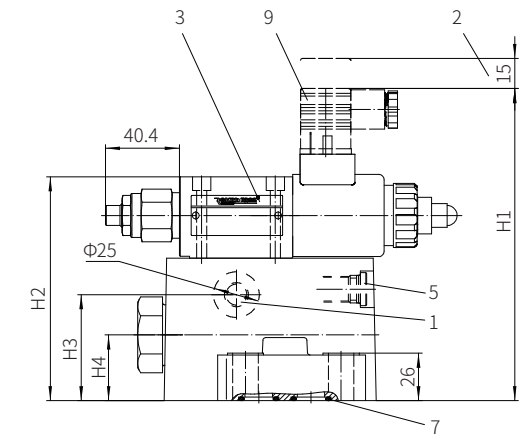
The pressure difference from port B to port A

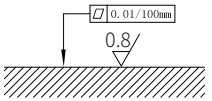


Component size

Size unit: mm

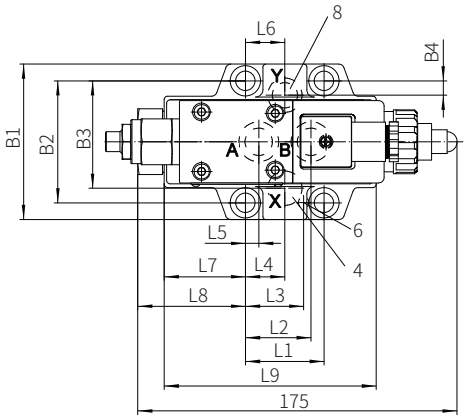
Model DRE(M)

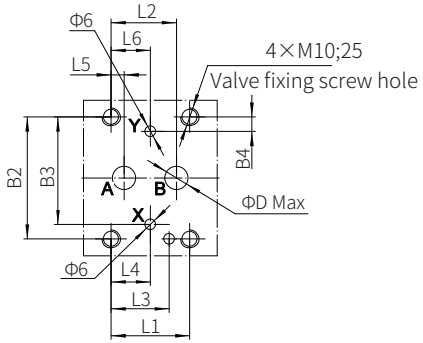




Required surface finishing of mating components

1 The oil port is closed. After removing the sealing plug, if the external pilot oil needs to be returned to the oil tank at zero pressure, this oil port can also be used to drain the oil
2 Space required to remove the plug
3 Name plate
4 Blind hole
5 Optional check valve
6 Locating pin hole
7 O-ring
8 Pilot oil always drain external separately and at zero pressure to the oil tank
9 Plug to DINEN175301-803





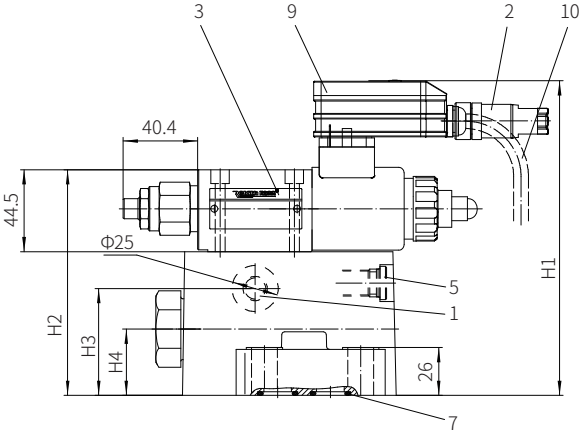
size	L1	L2	L3	L4	L5	L6	L7	L8	L9
10	42.9	35.8	31.8	21.5	7.2	21.5	44.5	59	116
25	60.3	49.2	44.5	20.6	11.1	39.7	27.3	41.8	116

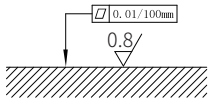
size	B1	B2	B3	B4	H1	H2	H3	H4	D
10	85	66.7	58.8	7.9	170.8	122.5	58	36	13
25	102	79.4	73	6.4	184.5	136.5	64	44	22

Component size

Size unit: mm

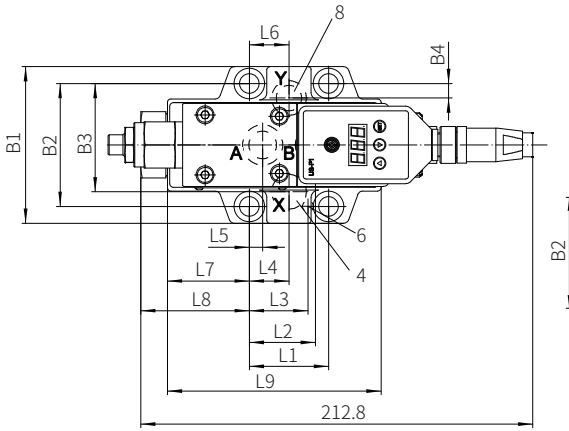
Model DRE(M)E

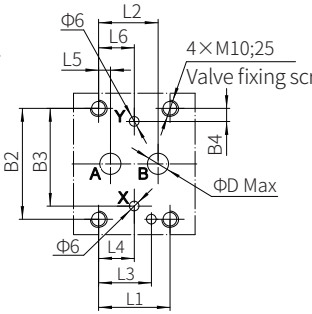




Required surface finishing of mating components

1 The oil port is closed. After removing the sealing plug, if the external pilot oil needs to be returned to the oil tank at zero pressure, this oil port can also be used to drain the oil
2 Plug
3 Name plate
4 Blind hole
5 Optional check valve
6 Locating pin hole
7 O-ring
8 Pilot oil always drain external separately and at zero pressure to the oil tank
9 Amplifier
10 Cable





size	L1	L2	L3	L4	L5	L6	L7	L8	L9
10	42.9	35.8	31.8	21.5	7.2	21.5	44.5	59	116
25	60.3	49.2	44.5	20.6	11.1	39.7	27.3	41.8	116

size	B1	B2	B3	B4	H1	H2	H3	H4	D
10	85	66.7	58.8	7.9	170.8	122.5	58	36	13
25	102	79.4	73	6.4	184.5	136.5	64	44	22

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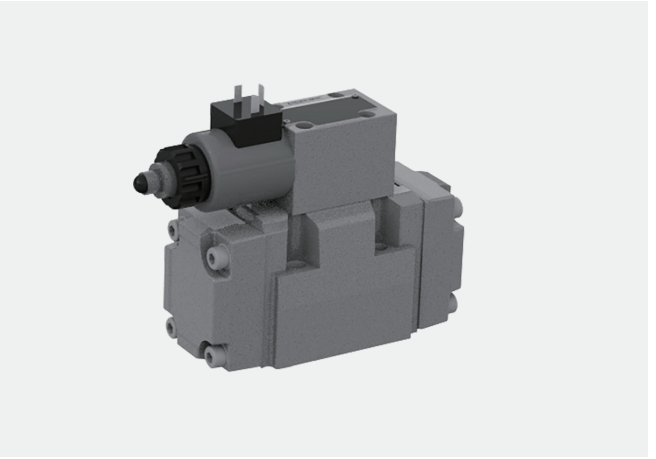
3-Way Proportional Pressure Reducing Valve

Model: 3DRE(M) and 3DRE(M)E... 7XJ



- Size 16
- Maximum working pressure 350bar
- Maximum working flow 125 L/min (size 10)
  300 L/min (size 16)

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04-05
Electrical connections	05-06
Characteristic curve	07
Component size	08-09
Control oil supply	10

Features

- 3 ways valve
- Operated by proportional solenoid with rotatable coil
- For subplate mounting
- Porting pattern to ISO4401
- Maximum pressure limitation, optional

Function description, sectional drawing

The 3DRE (M) and 3DRE (M) E type valves are solenoid operated pilot 3-way pressure reducing valves with pressure protective function for the actuator. They are used to reduce (P to A) and limit (A to T) the pressure of the system.

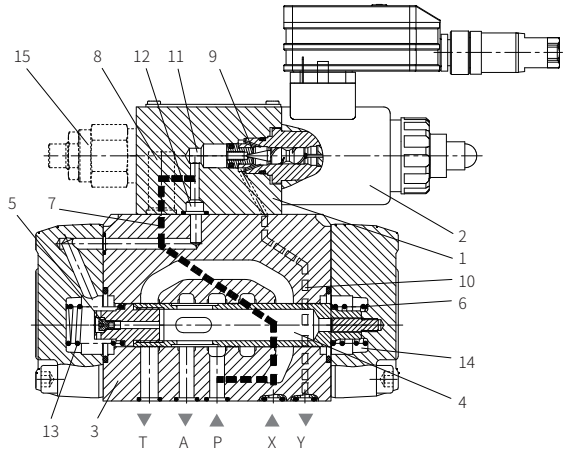
Structure:
The valve mainly consists of:
- Pilot valve (1) with proportional solenoid (2), and optional maximum pressure limitation (15)
- Main valve (3) with main spool (4)

Function:
- The reduced pressure is set through the pilot valve (1) in port A according to the set value.
- When pressure reducing in port P, the main spool (4) is hold in the central position by springs (5) and (6) to prevent a start-up jump during valve working.
- The control fluid flows from orifice (7) via the flow controller (8) and chamber (11) to the throttle gap (9), and via channel (10) to the port Y. This connection is to be led into the tank at zero pressure.

Pressure reducing:
- Build-up of the pilot pressure in the chamber (11) as a function of the command value.
- The pressure is formed by nozzle (12) in the spring chamber (13) and move the main spool (4) to the right, then the fluid flows from P to A.
- The actuator pressure in port A is available in the spring chamber (14).
- Increase the pressure in port A to the set pressure of the pilot valve (1) to move the main spool (4) to the left. The pressure in port A is almost same with the set pressure at the pilot valve (1).

Pressure limitation:
- If the pressure in port A exceeds the set value pressure of the pilot valve (1), then the main spool (4) continue moves to the left.
- The connection from A to T is open and the pressure in port A is limited to the set command value.

Model 3DREM:
In order to prevent an impermissible high control current on the proportional solenoid by means of hydraulic restraint, which will inevitably cause excessive pressure in port A, then you can optional install a spring-loaded pressure limiting valve as a maximum pressure limitation (15). The maximum pressure limitation can be pre-set according to the corresponding pressure rating (see "Technical Data").

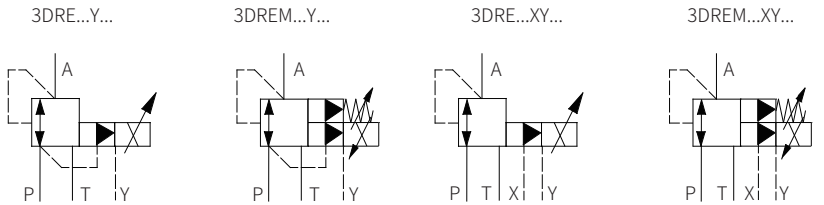


Models and specifications

3DRE | | | | P | 7X | J | | G24 | | | | *

- pilot proportional pressure reducing 3-way valve
- without max. pressure limitation =no code
- with max.pressure limitation =M
- with external amplifier =no code
- with internal amplifier =E
- size 10 =10
- size 16 =16
- subplate mounting =P
- 70 to 79 series (70 to 79 series installation and connection size unchanged) =7X
- Rekith =J
- Max. set pressure
  - up to 50bar =50
  - up to 100bar =100
  - up to 200bar =200
  - up to 315bar(for size 10 only) =315
- Y= pilot oil internal supply and external drain
- XY= pilot oil external supply and drain
- G24= voltage 24V DC
- no code= 1600mA
- -8= 800mA
- K31C= with M12×1 aviation plug, 5-pin
- K31S= with 1.5 meter cable and tin on the end
- K4= without plug in connector for model 3DRE(M)E
- electrical connection: for model 3DRE(M)
- A1= command value 0 to 10V
- F1= command value 4 to 20mA
- for 3DRE(M)E
- No code= NBR seals
- V= FKM seals
- sealing material (consult for other seals)
- more information in text

Functional symbols



Technical parameters

Overview				
Model			3DRE(M)	
Size			10	16
Installation position			Optional, firstly horizontal	
Weight		Kg	7.5	10.3
Storage temperature range		°C	-20...+80	
Environment temperature range		°C	-20...+70	
Hydraulic				
Maximum working pressure	Oil port P	bar	350	315
	Oil port A	bar	315	250
	Oil port T	bar	315	250
	Oil port X	bar	350	315
	Oil port Y	bar	Separate and at zero pressure to tank	
Maximum setting pressure in port A	Pressure stage 50	bar	50	50
	Pressure stage 100	bar	100	100
	Pressure stage 200	bar	200	200
	Pressure stage 315	bar	315	-
Minimum setting pressure[1]		bar	<5	<4
Maximum pressure limitation[2]	Pressure stage 50	bar	70	
	Pressure stage 100	bar	130	
	Pressure stage 200	bar	230	
	Pressure stage 315	bar	350	-
Maximum flow		L/min	125	300
Pilot flow		L/min	1.1	
Fluid			Mineral oil (HL,HLP) to DIN 51524, consult for other oils	
Fluid temperature range		°C	-20...+80	
Viscosity range		mm^2/s	15...380	
Max.allowable pollution degree of oil to			ISO 4406 (c) Class 20/18/15[3]	
Hysteresis		%	±3 of maximum setting pressure	
Repeatability		%	< ±2 of maximum setting pressure	
Linearity		%	±3.5 of maximum setting pressure	
Manufacturing tolerance of command value pressure characteristic curve	Command value 20%	%	< ±1.5 of maximum setting pressure	
	Command value 100%	%	< ±5 of maximum setting pressure	
Step response Tu+Tg	10...90%	ms	< 140	

1) In condition of no flow and command value is o in port A (see characteristic curve).

2) Unlimited adjustable, factory set.

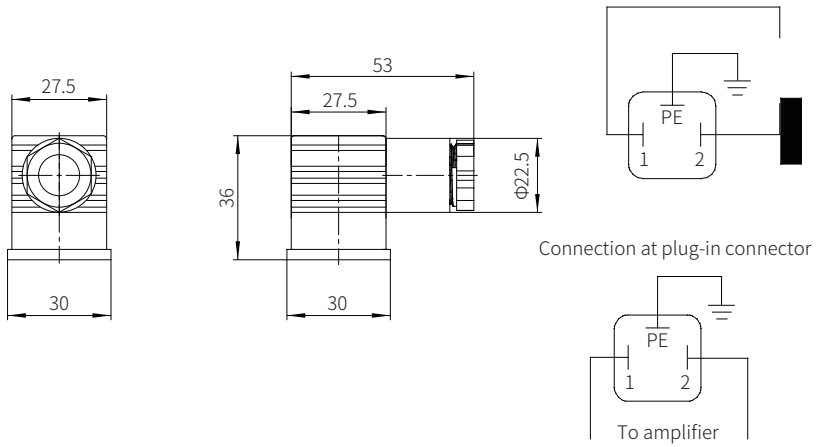
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Technical parameters

Electrical				
Model			"G24"	"G24-8"
Minimum control current		mA	⩽100	
Maximum control current		mA	1600±10%	800±10%
Coil resistance	Cold value 20 °C	Ω	5.5	20.6
	Maximum hot value	Ω	8.05	33
Duty		%	100	

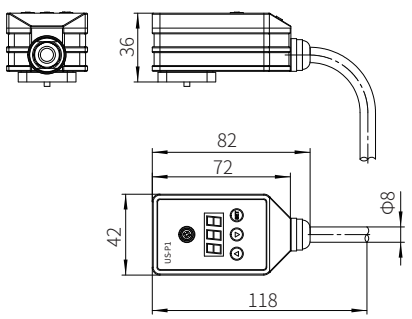
Electrical connections

For model 3DRE/3DREM (with external amplifier)
The plug-in connector to DIN EN 175301-803

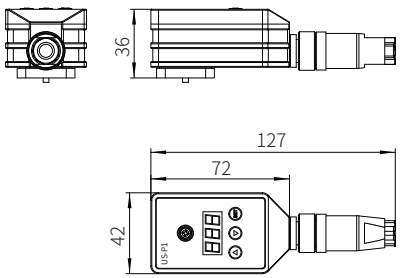


Electrical connections

Model 3DRE(M)E...7XJ/...K31S



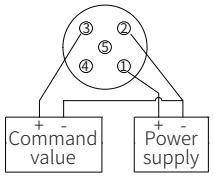
Model 3DRE(M)E...7XJ/...K31C



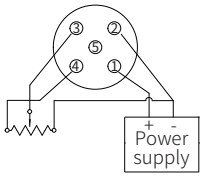
Terminal identification

M12 plug terminal number (K31C type)	Cable color (K31S type)	Terminal identification
1	Red	Power supply+
2	Black	Power supply -/ command value -
3	Yellow	Command value+
4	Blue	Reference voltage 5V
5	Green	-

Connection example: PLC example input command



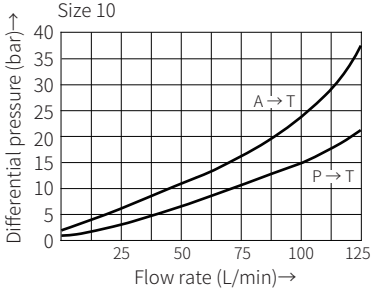
Connection example: Potentiometer input command



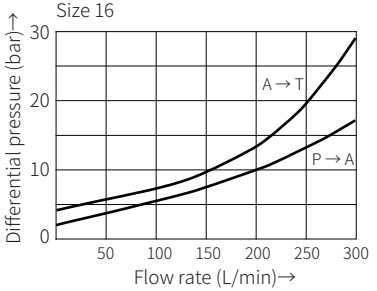
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Size 10

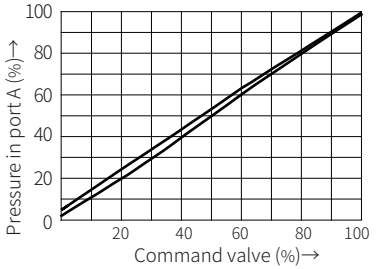


Size 16



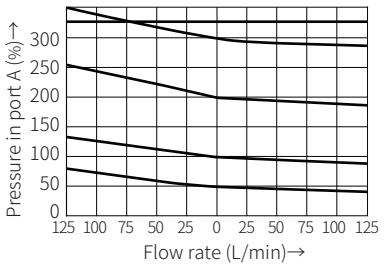
Pressure in port A-command valve (measured at flow 0L/min)

Size 10 -16

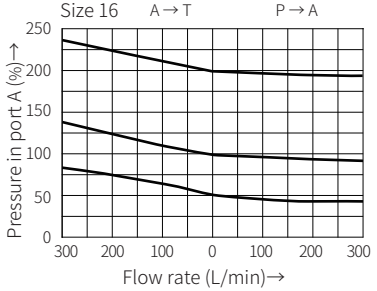


Pressure in port A - flow

Size 10 A → T P → A

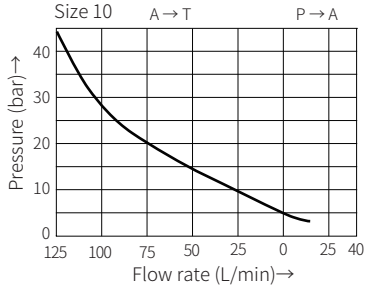


Size 16 A → T P → A

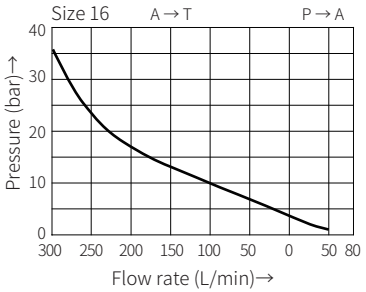


Min. set pressure - flow

Size 10 A → T P → A

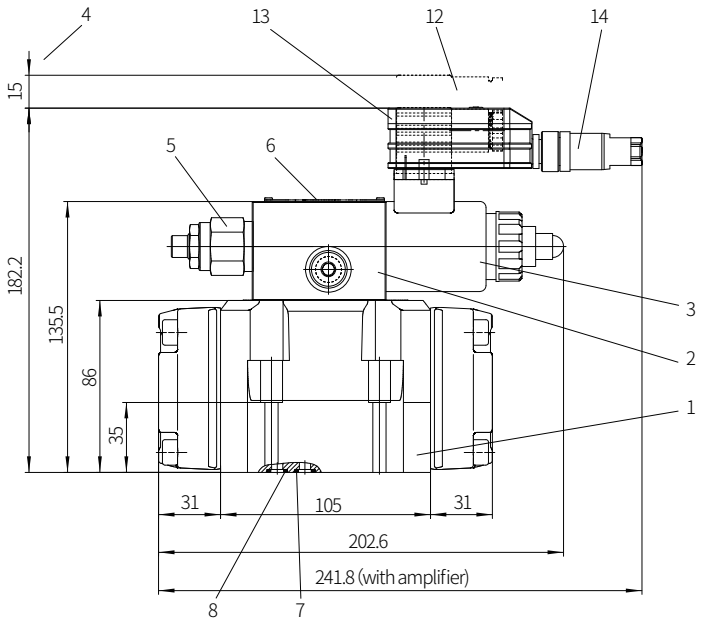


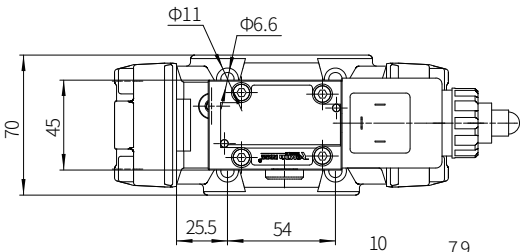
Size 16 A → T P → A

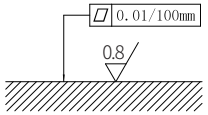


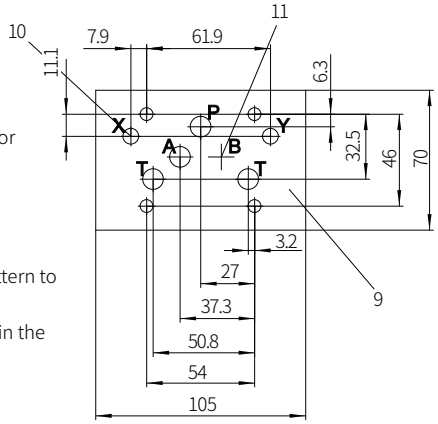
Component size

Size unit: mm





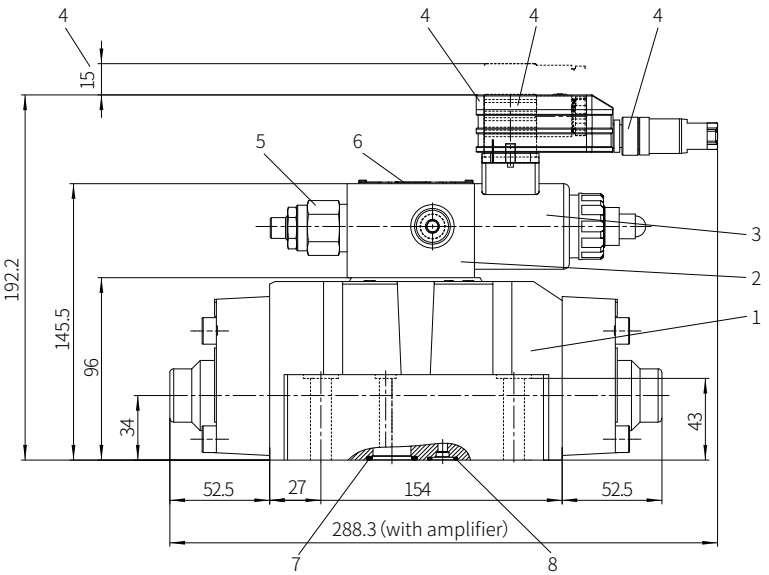


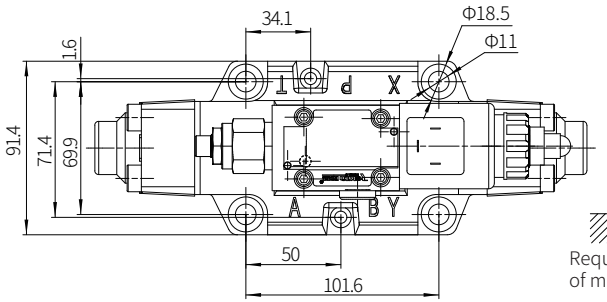


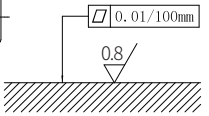
1 Main valve
2 Pilot valve
3 Proportional solenoid
4 Space required to remove the plug-in connector
5 Max. pressure limitation (model 3DREM...)
6 Name plate
7 O-ring 12x2 (for oil port P, A, B, T)
8 O-ring 12x2 (for oil port X, Y)
9 Machined valve mounting surface, porting pattern to DIN24340A, ISO 4401
10 When pilot oil supply internal (port Y), port X in the subplate must be closed
11 Port B in the subplate must be closed
12 Connector for model 3DRE (M)
13 Integrated electronic control with plug (3DREE、3DREME)

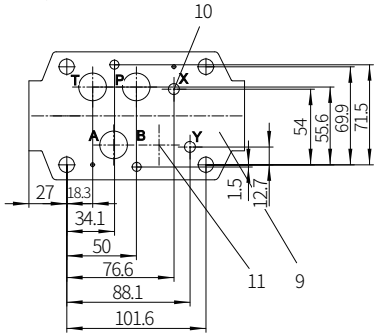
Component size

Size unit: mm









1 Main valve
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11 Port B in the subplate must be closed
12 Connector for model 3DRE (M)
13 Integrated electronic control with plug (3DREE、3DREME)

Control oil supply

Model 3DRE...-.../...XY Pilot oil external supply
Pilot oil external drain

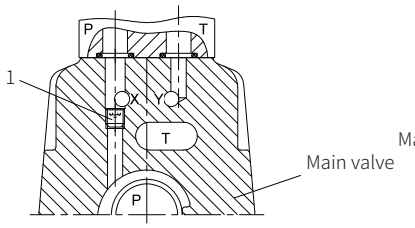
In this version, the pilot oil is supplied from a separate control circuit (external).
The pilot oil drain is not directed to the port T of the main valve, but return to the tank via port Y (external).

Model 3DRE...-.../...Y... Pilot oil external supply
Pilot oil external drain

In this version, the pilot oil is supplied from port P of the main valve (internal).
The pilot oil drain is not directed to the port T of the main valve, but return to the tank via port Y (external).
Port X in the subplate must be closed.

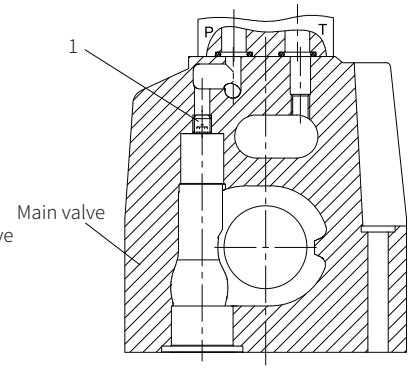
04

Size 10:



Pilot oil supply	external: 1 Closed internal: 1 Open
Pilot oil drain	external

Size 16:



Pilot oil supply	external: 1 Closed internal: 1 Open
Pilot oil drain	external

2-Way Proportional Flow Control Valve

Model: 2FRE6...2XJ

- Size 6
- Maximum working pressure 210bar
- Maximum working flow 25 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04-05
Characteristic curve	06-07
Component size	08

Features

- With pressure compensation for the pressure compensated control a flow
- Operation by proportional solenoid
- With electrical position feedback of control throttle
- The position transducer coil is axially adjusted to make the zero position adjustment of the throttle port easy (electrical, hydraulic)
- Flow control in both directions via rectifier sandwich plate

Function description, sectional drawing

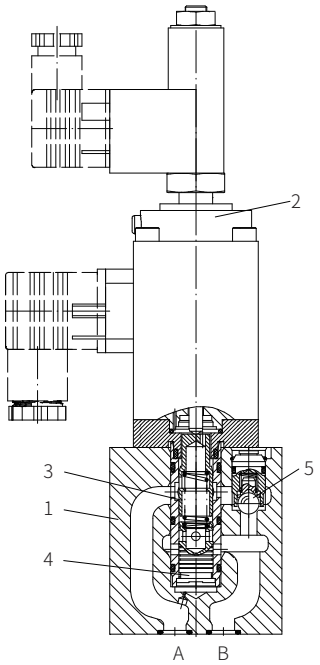
The 2FRE...proportional flow control valves have a 2-way function. They can control a corresponding flow independent of pressure and temperature according to the provided electrical command value. The valve basically consists of valve body (1), proportional solenoid with inductive position transducer (2), measurement orifice (3), pressure compensator (4), and optional check valve (6).

Proportional flow control valve model 2FRE6B-2XJ/ (without external closing, with check valve)

The setting of the flow (0 to 100%) is determined by the command value potentiometer. The applied command value adjusts the measurement orifice (3) via the amplifier and proportional solenoid. The position of the measurement orifice (3) is measured by the inductive position transducer. Any deviation from the command value is compensated through feedback control. The pressure compensator (4) keeps the pressure drop at the measurement orifice (3) at a constant value at all times. Therefore, the flow is load compensated. The low temperature drift is achieved due to the design of the measurement orifice.

With a command value of 0%, the measurement orifice is closed. In the case of a power failure or a cable break at the inductive position transducer, the measurement orifice closes. When the command value is 0%, it is possible a start-up without overshoot. The opening and closing of the measurement orifice can delay via two ramps in the proportional amplifier. Via the check valve (5) a free flow from B to A is possible.

By installing a rectifier sandwich plate Z4S6... under the proportional flow control valve, the flow from the actuator can be controlled in both directions.



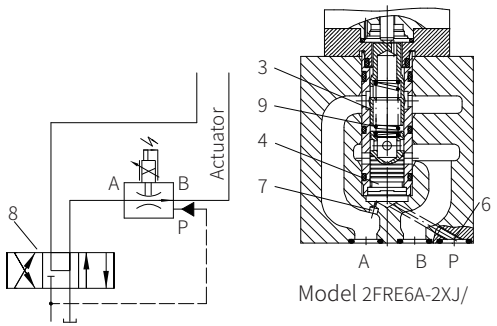
Model 2FRE6B-2XJ/

Proportional flow control valve model 2FRE6A-2XJ/ (with external closing, without check valve)

In principle, the function of this valve is similar with the valve 2FRE6B-2XJ/K4RV.

To suppress the start-up jump when the measurement orifice (3) (command value > 0%) is open, a closing of the pressure compensator (4) is provided via port P (6). The internal connection between port A and the pressure compensator (4) is blocked. Via the external port P (6), the pressure in port P of the directional valve (8) acts on the pressure compensator (4) and keeps it in its closed position against the spring force (7).

If the directional valve (8) is switched from P to B, the pressure compensator (4) moves from the closed position to the corresponding compensation position, thus start-up jump is avoided.



Model 2FRE6A-2XJ/

Models and specifications

Proportional flow control valve

2FRE | 6 | – | 2X | J | | | | * |

size 6 =6

with external closing of the pressure compensator (suppression of the start-up jump) =A

without external closing of the pressure compensator =B

20 to 29 series =2X
(20 to 29 series installation and connection size unchanged)

Rekith =J

rated flow A → B
to 3 L/min =3Q
to 6 L/min =6Q
to 10 L/min =10Q
to 16 L/min =16Q
to 25 L/min =25Q

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

R= with check valve
M= without check valve

Rectifier sandwich plate

Z4S | 6 | – | | J | | *

size 6 =6

10 to 19 series =1X
(10 to 19 series installation and connection size unchanged)

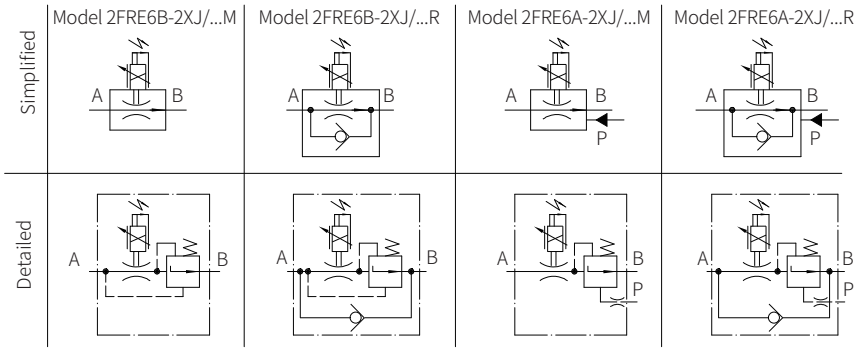
Rekith =J

more information in text

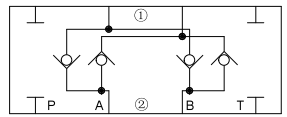
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

Functional symbols

Proportional flow control valve (simplified, detailed)



Rectifier sandwich plate
(①= Valve side, ②= Subplate side)



Technical Parameters

Overview							
Installation position			Optional				
Storage temperature range		°C	-20 to +80				
Environment temperature range		°C	-20 to +50				
Weight	Proportional flow control valve	Kg	1.8				
	Rectifier sandwich plate	Kg	0.9				
Hydraulic (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)							
Maximum working pressure	Port A	bar	to 210				
Flow	type		3Q	6Q	10Q	16Q	25Q
	$q_{v\,max.}$	L/min	3	6	10	16	25
	$q_{max.}$ to 100 bar	cm³/min	15	25	50	70	100
	to 210bar	cm³/min	25	25	50	70	100
Maximum leakage of flow when △p A →B with command value 0%	50 bar	cm³/min	4	4	6	7	10
	100 bar	cm³/min	5	5	8	10	15
	210 bar	cm³/min	7	7	12	15	22
Minimum pressure differential		bar	6 to 10				
Pressure differential with free return flow B → A			See characteristic curve				
Pressure and flow of: input/output pressure							
Temperature dependence Temperature drift, hydraulic and electric							
Fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]				
Cleanliness of oil[3]			The maximum allowable pollution level of oil is ISO 4406 (C): 20/18/15				
Oil temperature range		°C	20 to +80				
Viscosity range		mm²/s	15 to 380				
Hysteresis		%	< ±1 of $q_{v\,max}$				
Repetition accuracy		%	<1 of $q_{v\,max}$				
Manufacturing tolerance model 2FRE6...			⩽ ±3% with command value 33% ⩽ ±5% with command value 100%				
RT-MRPD1-150-30-CN-A1/F1		%	<1				

Hydraulic – Rectifier sandwich plate		
Working pressure	bar	to 210
Cracking pressure	bar	0.7
Nominal flow rate	L/min	25

1) For NBR seal and FKM seal.

2) Only for FKM seal.

3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Technical Parameters

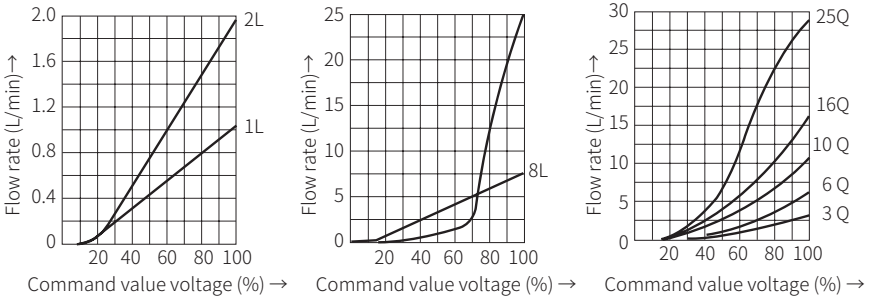
Electrical (proportional solenoid)			
Protection to DIN 40050			IP65 [2]
Voltage type			DC
Coil resistance	Cold value at 20°C	Ω	5.4
	Maximum warm value	Ω	8.2
Duty cycle			continuous
Maximum current per solenoid		A	1.5
Electrical connections			Plate connecter
			Connecting plug

Electrical (Inductive position transducer)				
Protection to DIN 40050		IP65		
Coil resistance (total resistance of the coils between....) at 20°C	Ω	1 and 2	2 and ⏚	1 and ⏚
		31.5	45.5	31.5
Electrical connections		plate connector GSA		
		Connecting plug GM209N		
Inductivity	mH	6 to 8		
Oscillator frequency	KHz	2.5		
Electrical position measurement system		Different throttle valves		
Nominal stroke	mm	3.5		

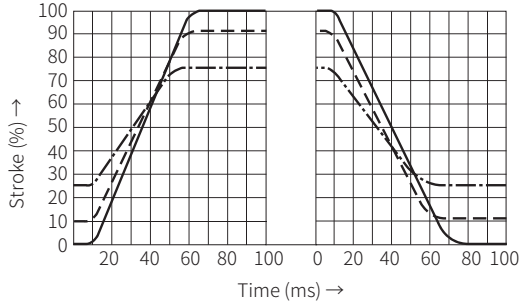
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

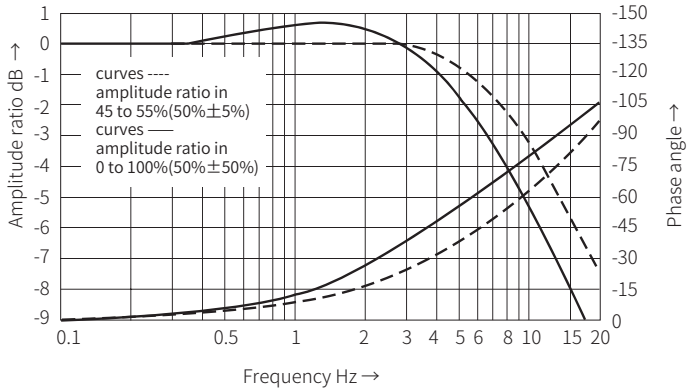
Command value voltage in relation to the flow
(Flow control of A → B); p_{nom}= 50bar



Dynamic response
Transition function with stepped command value modification; p_{nom}= 100 bar; type "25Q"



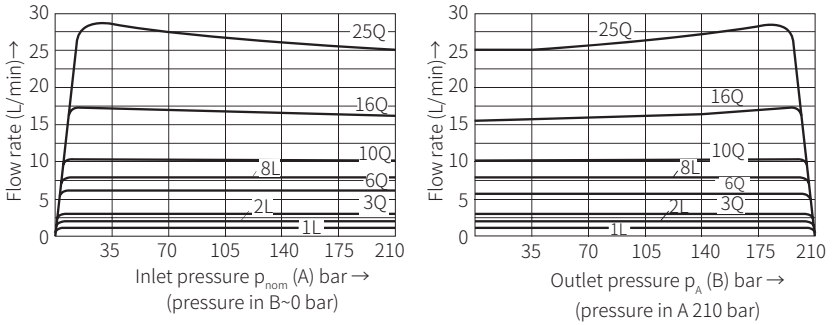
Frequency response characteristic curves; p_{nom} = 100 bar; type "25Q"



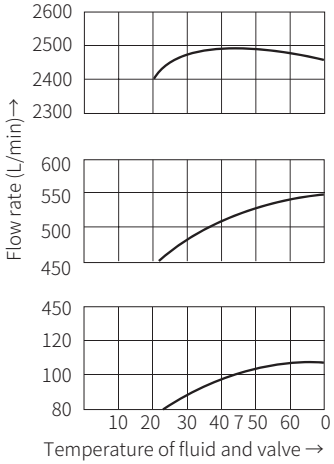
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

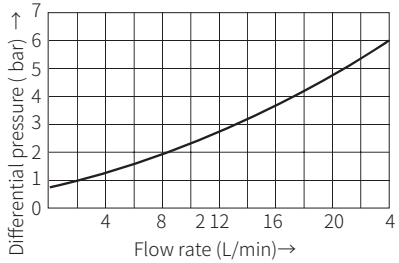
Proportional flow control valve
Pressure in relation to the flow rate



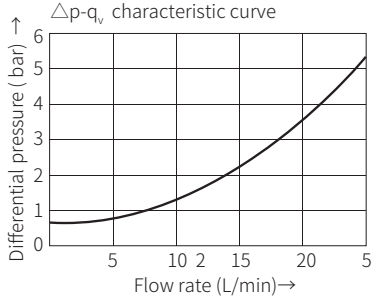
Temperature in relation to the flow rate
at △p= 30 bar



Pressure differential via check valve B → A
Throttle valve closed

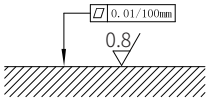


Rectifier sandwich plate
△p-q_v characteristic curve

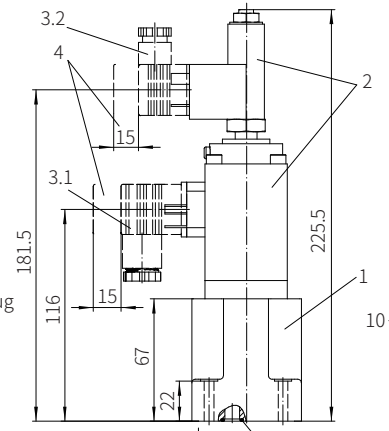


Component size

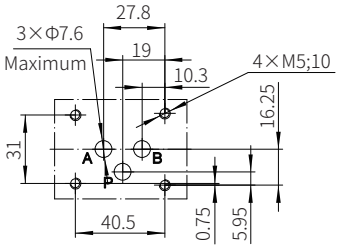
Size unit: mm

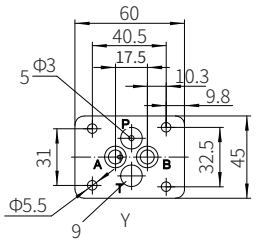


Required surface finishing of mating components

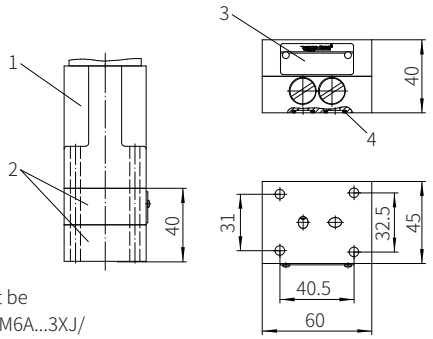


1 Valve body
2 Proportional solenoid with inductive position transducer
3 Connecting plug
4 Space required to remove the plug
5 Hole for model 2FRE6A...
6 O-ring 9.25x1.78
7 Port A
8 Port B
9 Blind hole
10 Name plate





Rectifier sandwich plate Z4S6-1XJ/...
1 Flow control valve
2 Rectifier sandwich plate
3 Name plate
4 O-ring 9.25x1.78
(for port A, B)



Note:
Rectifier sandwich plate Z4S6-1XJ/ cannot be connected with the flow control valve 2FRM6A...3XJ/ with external connection of the pressure compensator.

2-Way Proportional Flow Control Valve

Model: 2FRE...4XJ

- ◆ Size 10, 16
- ◆ Maximum working pressure 315bar
- ◆ Maximum working flow 160 L/min

Contents

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Technical parameters	04-05
Characteristic curve	06-08
Component size	09

Features

- ● With pressure compensation for the pressure compensated control a flow
- ● Operation by proportional solenoid
- ● With electrical position feedback of control throttler
- ● The position transducer coil is axially adjusted to make the zero position adjustment of the throttle port easy (electrical, hydraulic) without the need to adjust the electronics
- ● Minimum sample variation of valve 2FRE and proportional amplifiers

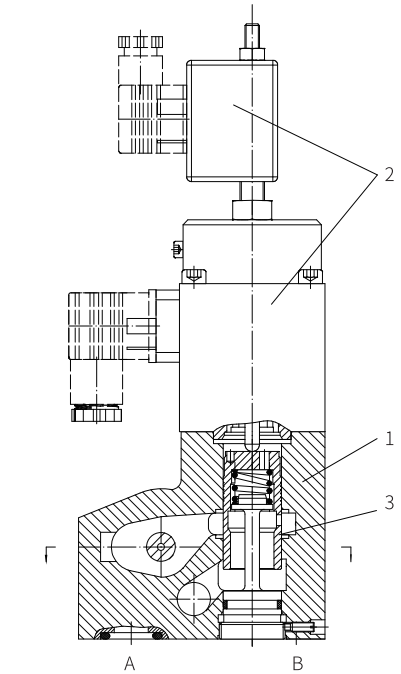
Function description, sectional drawing

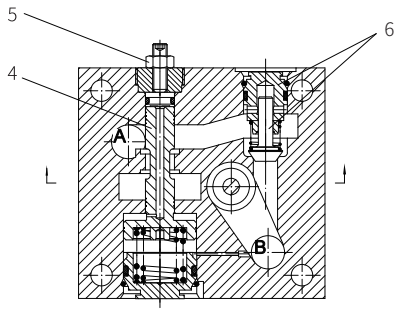
The 2FRE... proportional flow control valves have a 2-way function.They can control a corresponding flow with a large degree of compensation for pressure and temperature according to the provided electrical command value. The valve basically consists of valve body (1), proportional solenoid with inductive position transducer (2), measurement orifice (3), pressure compensator (4), stroke limiter (5) and optional check valve (6).

The setting of the flow rate (0 to 100%) is determined on the command value potentiometer. The setting of the flow (0 to 100%) is determined by the command value potentiometer. The applied command value adjusts the measurement orifice (3) via the amplifier and proportional solenoid. The position of the measurement orifice (3) is measured by the inductive position transducer. Any deviation from the command value is compensated through feedback control. The pressure compensator (4) keeps the pressure drop at the measurement orifice (3) at a constant value at all times. Therefore, the flow is load compensated. The low temperature drift is achieved due to the design of the measurement orifice.

With a command value of 0%, the measurement orifice is closed. In the case of a power failure or a cable break at the inductive position transducer, the measurement orifice closes. When the command value is 0%, it is possible a start-up without overshoot. The opening and closing of the measurement orifice can be delay via two ramps in the proportional amplifier. Via the check valve (6) a free flow from B to A is possible.

By installing a rectifier sandwich plate Z4S6...under the proportional flow control valve, the flow from the actuator can be controlled in both directions.





Models and specifications

Proportional flow control valve

2FRE | – | 4X | J | B | | *

- size 10 =10
- size 16 =16
- 40 to 49 series =4X (40 to 49 series installation and connection size unchanged)
- Rekith =J
- B= pressure compensator, with stroke limiter
- sealing material: No code= NBR seals; V= FKM seals (consult for other seals)
- more information in text

flow range A → B		
size 10		size 16
Linear	Increase by degrees	Linear
to 5L/min=5L to 10L/min=10L to 16L/min=16L to 25L/min=25L to 50L/min=50L to 60L/min=60L	to 5L/min=5Q to 10L/min=10Q to 16L/min=16Q to 25L/min=25Q	to 80L/min=80L to 100L/min=100L to 125L/min=125L to 160L/min=160L

Rectifier sandwich plate

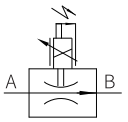
Z4S | – | 2X | / | J | *

- size 10 =10
- size 16 =16
- 20 to 29 series =2X (20 to 29 series installation and connection size unchanged)
- Rekith =J
- sealing material: No code= NBR seals; V= FKM seals (consult for other seals)
- more information in text

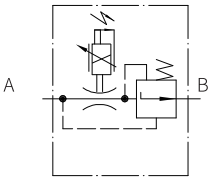
Functional symbols

Proportional flow control valve

Simplified

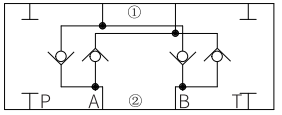


Detailed



Rectifier sandwich plate

(①= Valve side, ②= Subplate side)



Technical parameters

Overview										
Size			10					16		
Installation position			Optional							
Storage temperature range		°C	-20 to +80							
Environment temperature range		°C	-20 to +70							
Weight	Proportional flow control valve	kg	6.1					8.5		
	Rectifier sandwich plate	kg	3.2					9.3		
Hydraulic (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)										
Maximum working pressure	Port A	bar	to 315							
Flow $q_{v\,max.}$	Size	NS	10					16		
	Linear	L/min	10	16	25	50	60	80	100	125	160
	Progressive with rapid speed	L/min	40					-			
Minimum pressure differential		bar	3 to 8					6 to 10		
Pressure differential with free return flow B → A		bar	See characteristic curve							
Flow control temperature drift Hydraulic + electrical $\triangle q_v$/°C		%	0.1 of $q_{v\,max.}$							
Pressure compensator(to △p=315 bar)		%	± 2 of $q_{v\,max.}$							
Fluid			Mineral oil (HL, HLP)[1] in accordance with DIN 51524; Fast living organisms degraded oil according to VDMA 24568; HETG (Rapeseed oil)[1]; HEPG(Polyethyleneglycol)[2] ; HEES (Synthetic Fats)[2]							
Oil temperature range		°C	-20 to +80							
Viscosity range		mm^2/s	15 to 380							
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 class 20/18/15 (we recommend a filer with a minimum retention rate of 10)							
Hysteresis		%	< ±1 of $q_{v\,max}$							
Repeatability		%	<1 of $q_{v\,max}$							
Manufacturing tolerance	model 2FRE6...	%	⩽ ±2% with command value 33% ⩽ ±5% with command value 100%							
	amplifier RT-MRPD1-151-30-CN-A1/F1	%	< ±2							
Hydraulic – Rectifier sandwich plate										
Working pressure		bar	to 315							
Cracking pressure		bar	15							
Nominal flow	Size	NS	10					16		
		L/min	60					160		

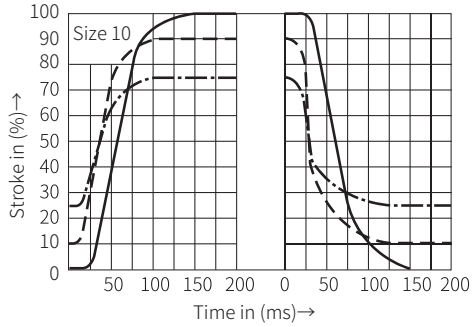
Technical parameters

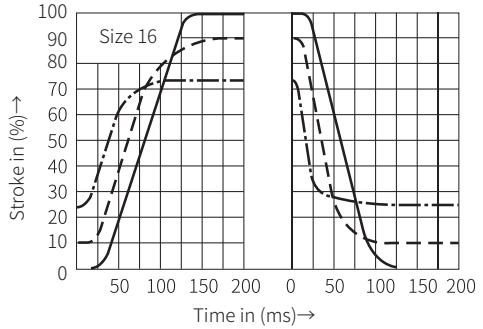
Electrical (proportional solenoid)					
Voltage type			DC		
Coil resistance	Cold value at 20°C	Ω	10		
	Maximum warm value	Ω	13.9		
Duty cycle		%	100		
Maximum current per solenoid		A	1.51		
Electrical connections			Component plug		
			Connecting plug		
Protection to DIN 40050			IP65		
Electrical (Inductive position transducer)					
Coil resistance (total resistance of the coils between....) at 20°C		Ω	1 and 2	2 and ⏚	1 and ⏚
			31.5	45.5	31.5
Electrical connections			Component plug		
			Connecting plug		
Inductivity		mH	6 to 8		
Oscillator frequency		KHz	2.5		
Electrical position measurement system			Different throttle valves		
Nominal stroke		mm	4		
Protection to DIN40050			IP65		

Characteristic curve

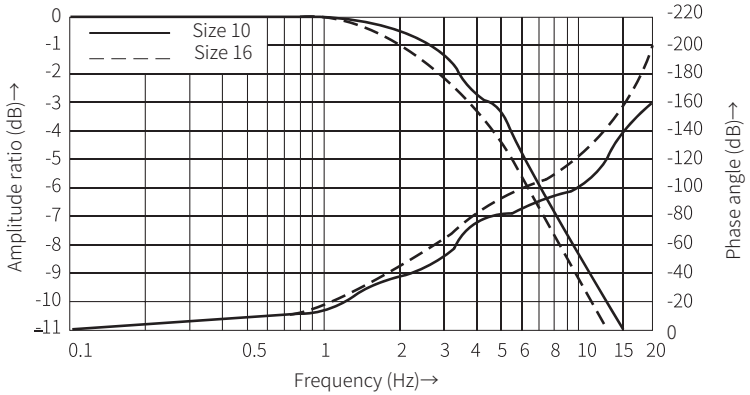
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C,
Pnom = 50 bar, Amplitude 0 → >100 %; size 10 type 60L and size 16 type 160L)

Transient function at stepped command value change





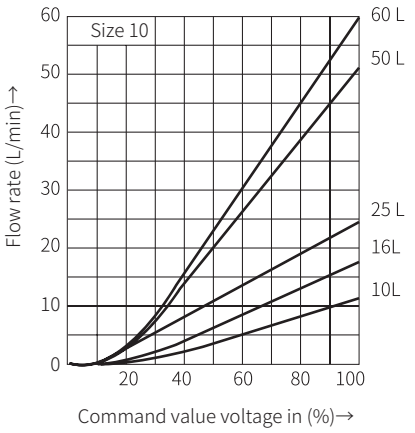
Frequency response characteristic curves

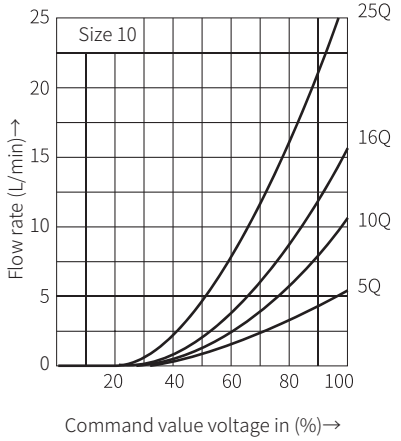


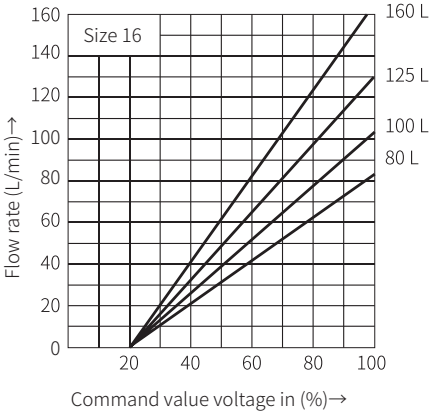
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Dependence of flow on command value voltage (flow control from A → B)



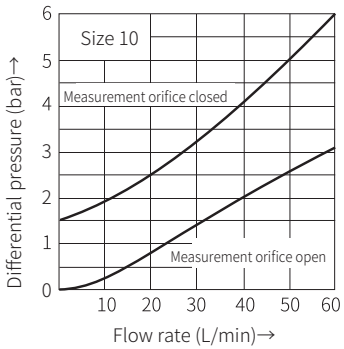


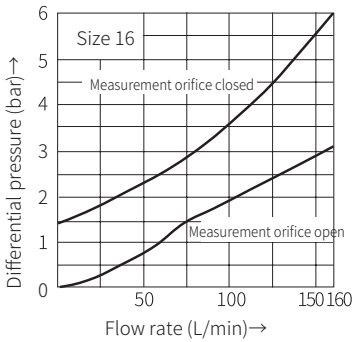


Characteristic curve

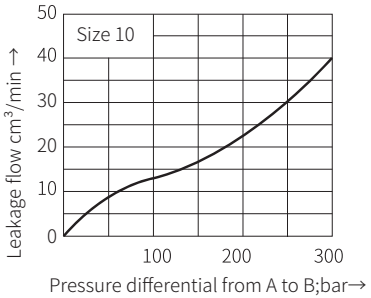
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

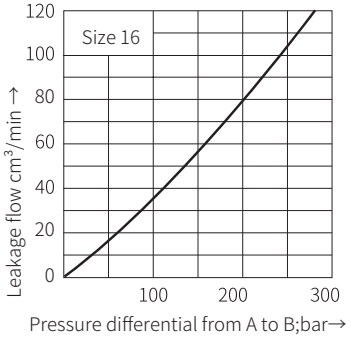
Pressure differential via check valve B → A





Leakage flow from A to B

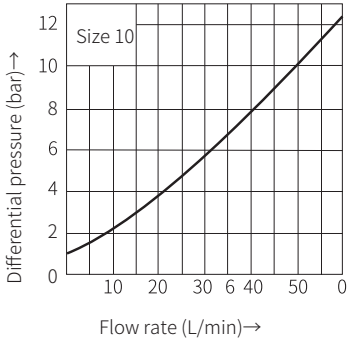


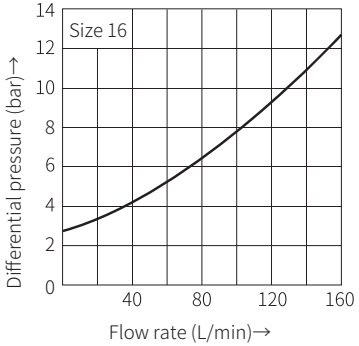


Rectifier sandwich plate

The pressure differential and flow relationship in two flow directions are the same

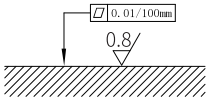
Flow from A → B (B → A)





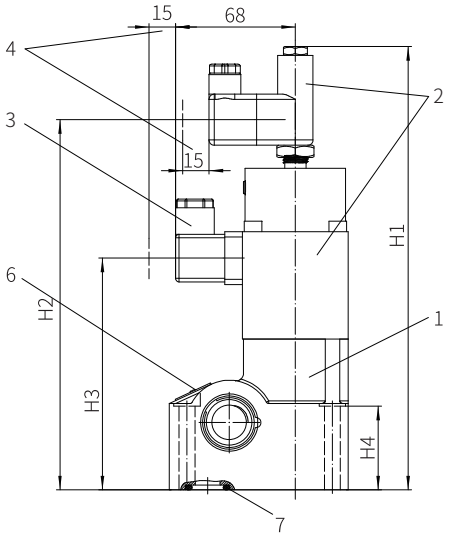
Component size

Size unit: mm

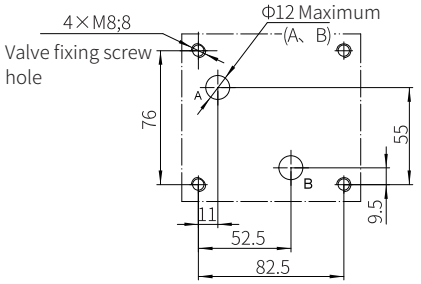


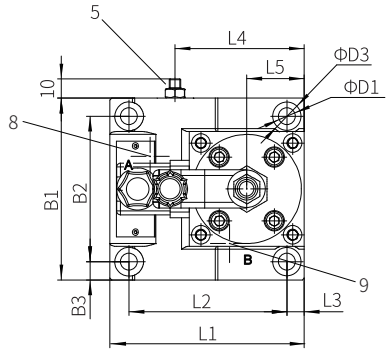
Required surface finishing of mating components

1 Valve body
2 Proportional solenoid with inductive position transducer
3 Connecting plug
4 Space required to remove the plug
5 Pressure compensator with stroke limiter
6 Name plate
7 O-ring
(NG10: 18.66x3.53; NG16: 26.58x3.53)
8 Port A
9 Port B

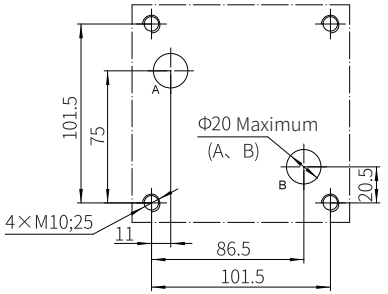


Mounting surface for size 10





Mounting surface for size 16



Size	B1	B2	B3	L1	L2	L3	L4
10	76	9.5	101.5	82.5	9	6	7.5
16	123.5	101.5	11	23.5	101.5	11	81.5

Size	L5	H1	H2	H3	H4	D1	D2
10	30	251.5	210	131.5	47.5	9	15
16	44	261.5	220	141.5	51	11	18

04

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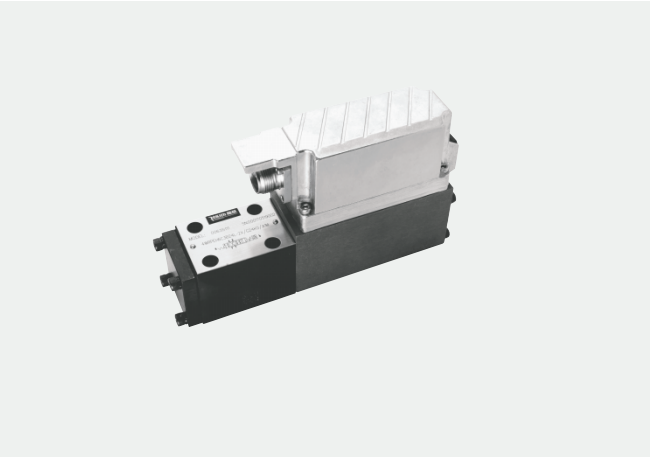
Proportional Directional Valve

Model: 4WRPEH6...2XJ



- ◆ Size 6
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 40 L/min

Contents

Function description, sectional drawing	02
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Functional symbols	03
Technical parameters	04
Electrical connections	05-07
Characteristic curve	08-09
Component size	10

Features

- ● Direct operated servo solenoid valve with control piston and valve sleeve, with servo performance
- ● Operated on one side, 4/4-fail-safe position in switched-off condition
- ● Control solenoid with built-in position feedback and integrated amplifier board (OBE), calibrated in the factory
- ● Electrical connection 6P+PE signal input differential amplifier with interface A1 (± 10V) or interface F1 (4... 20mA) (RS200 Ω)
- ● Electro-hydraulic controllers for production and testing systems
- ● Subplate mounting

Function description, sectional drawing

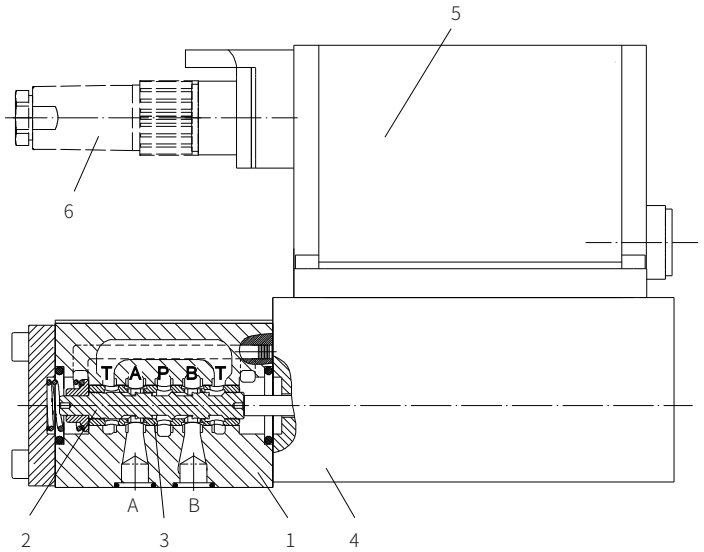
The 4WRPEH valve is high-performance servo proportional valve with zero cover structure on the valve spool and valve sleeve, and LVDT position transducer, it can regulate the directional and flow steplessly according to the input electrical signals.

The valve mainly consists of valve body (1), valve spool (2), valve sleeve (3), control solenoid with position transducer (4), and optionally integrated amplifier (5).

The valve drives the movement of the spool on one side through the proportional solenoid. The specified command value is compared with the actual position value in the integrated electronics (OBE). In case of control deviation, the stroke solenoid is activated, which adjusts the control spool against the spring due to the changed solenoid force. The stroke/control spool cross-section is regulated proportionally to the command value. When the command value presetting of 0V, the electronics adjusts the control spool against the spring to the central position. In deactivated condition, the spring is untensioned to a maximum and the valve is in fail-safe position.

When the solenoid switched off, the valve is moved to fail-safe position. And after powered on, the valve spool is pushed from the rest position to the required position according to the size of the input electrical signal to achieve free flow of oil from P to A and B to T, or P to B and A to T.

The 7-pin connector (6) is used for connecting power, analog signal input, and detection signals.



Model 4WRPEH6...-2XJ/

Models and specifications

4WRP | E | H | 6 | | B | | | -2X | J | G24 | K0 | | | *

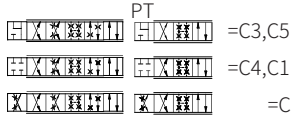
with integrated electronics =E

control piston valve sleeve =H

size 6 =6

symbols
four position four-way type

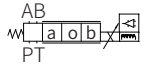
AB a o b PT



=C3,C5
=C4,C1
=C

with symbols C5 and C1[3] :
P→A: q_v B→T: $q_v/2$
P→B: $q_v/2$ A→T: q_v

Installation side of the inductive position transducer



(standard)=B

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

electrical connection
A1= command value input ±10V
F1= command value input 4 to 20 mA

K0= electrical connections without plug-in connector with component plug to DIN 43563-AM6

power supply to amplifier
G24= +24V DC

J= Rexroth

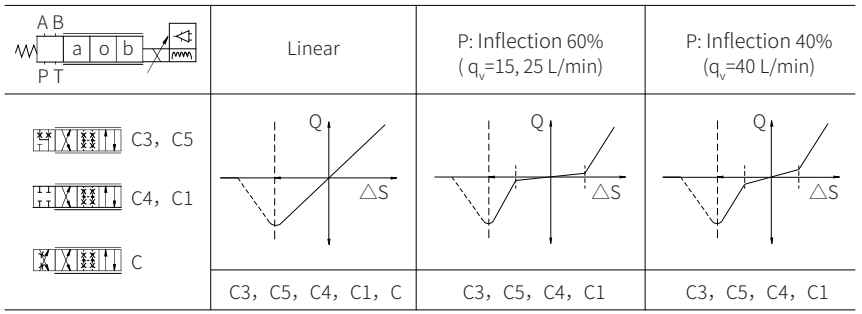
2X= 20 to 29 series
(20 to 29 series installation and connection size unchanged)

flow characteristic
L= linear
P= inflected characteristic curve[2]

nominal flow rate at 70 bar differential pressure (35 bar/throttle edge)
size 6
02=2 L/min 12=12 L/min 24=24 L/min 40[3]= 40 L/min
04=4 L/min 15[1]=15 L/min 25[1]= 25 L/min

1) only related to the flow characteristic "p"
2) Inflection 60% is for nominal flow rates of "15" and "25" with size 6, otherwise the inflection is 40%
3) q_v2:1 is only used for nominal flow rate=40L/min

Functional symbols



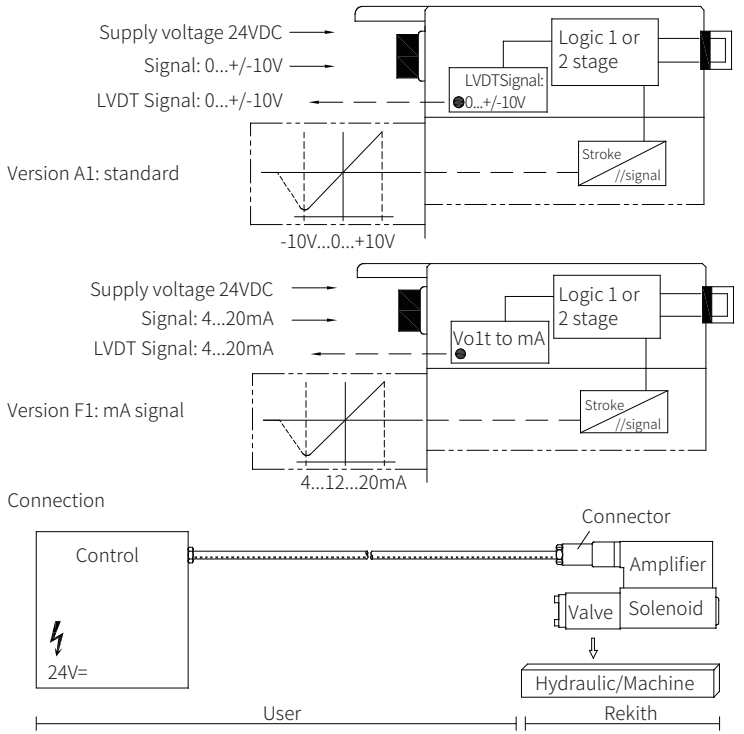
Technical parameters

Overview							
Structure			Direct operated spool valve with steel sleeve				
Actuation			Proportional solenoid valve with position controller, OBE				
Installation type			subplate mounting, porting pattern to ISO 4401 -03-02-05				
Installation position			Optional				
Environment temperature range		°C	-20 ~ +50				
weight		kg	2.75				
Vibration resistance (testing conditions)			Maximum 25g, space vibrating test in all directions (24h)				
Hydraulic (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)							
Fluid			Oil according to DIN 51524. For other oils, please consult our company				
Viscosity range	Recommended value	mm²/s	20…100				
	Maximum allowable value	mm²/s	10…800				
Oil temperature range		°C	-20 to +70				
The maximum allowable pollution level of oil to ISO 4406 (c)			Class 18/16/13[1)]				
Nominal flow rate (△p=35 bar per throttle edge)		L/min	2	4	12	24	40
Maximum working pressure		bar	Port A, B, P: 315				
			Port T: 250				
Leakage flow at 100 bar	Linear	cm³/min	<150	<180	<300	<500	<900
	Nonlinear	cm³/min	—	—	—	<300	<450
Static/dynamic							
Hysteresis		%	⩽0.2				
Response time for signal changes 0-100%		ms	10				
Zero drift			At △T=40 °C, zero drift <1%				
Zero position adjustment			Factory setting ±1%				

Electrical, amplifier integrated in valve		
Power on rate	%	100ED
Protection grade		IP65 (plug installed)
Connection		Plug-in connector 6P+PE, DIN 43563
Supply voltage		24V DC_{nom}
Terminal A		Min. 21VDC/max. 40VDC
Terminal B		0V (ripple max.2)
External fuse	A_F	2.5
Input, version "A1"		Analog differential signal input, Ri=100k Ω
Terminal D(U_E)		0...±10V
Terminal E		0V
Input, version "F1"		Load, Rsh=200 Ω
Terminal D(I_{D-E})		4...12...20mA
Terminal E(I_{D-E})		Current loop I_{D-E} feedback
Test signal, version "A1"		LVDT
Terminal F(UI_{test})		0….±10V
Terminal C		Reference 0V
Test signal, version "F1"		LVDT signal 4... (12).. 20 mA 200 ...500Ω
Terminal F(I_{F-C})		4... (12)... 20 mA (output current)
Terminal C(I_{F-C})		Current loop I_{F-C} feedback
Adjustment		Calibrate at the factory and see the characteristic curve of the valve

The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Electrical connections



Technical data for the cable:

Version: - Multi-core wire
- Litz wire structure, extra fine wire according to VDE 0295, class 6
- Protective earthing conductor, green-yellow
- Cu shielding braid

Wire number: - determined by the valve model, plug model, and signal arrangement

Line Ø: - 0.75 mm² to 20m of length
- 1.0 mm² to 40m of length

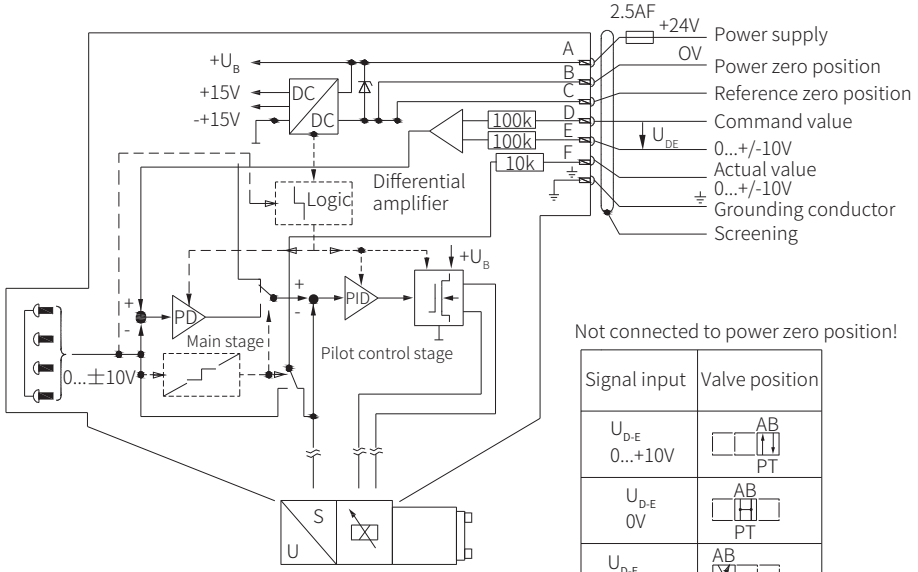
Outer Ø: - 9.4...11.8 mm
- 12.7...13.5mm

Note:

Supply voltage 24 V DC_{nom}
if the value falls below 18V, an internal fast switch-off is effected which can be compared with "Release OFF"
Additionally for version F1:
I_{D-E} ⩾ 3mA - valve is active
I_{D-E} ⩽ 2mA - valve is deactivated
Electric signals taken out via control electronics (e.g. actual value) may not be used for the switch-off of safety-relevant machine functions.
(See the European standard "Safety requirements for fluid power systems and their components - Hydraulics", EN 982.)

Electrical connections

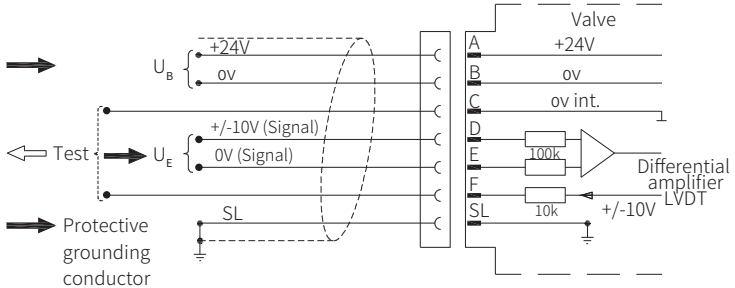
Integrated amplifier (OBE)
Circuit block diagram/wiring diagram
Model A1: U_{D-E} 0...±10V



Not connected to power zero position!

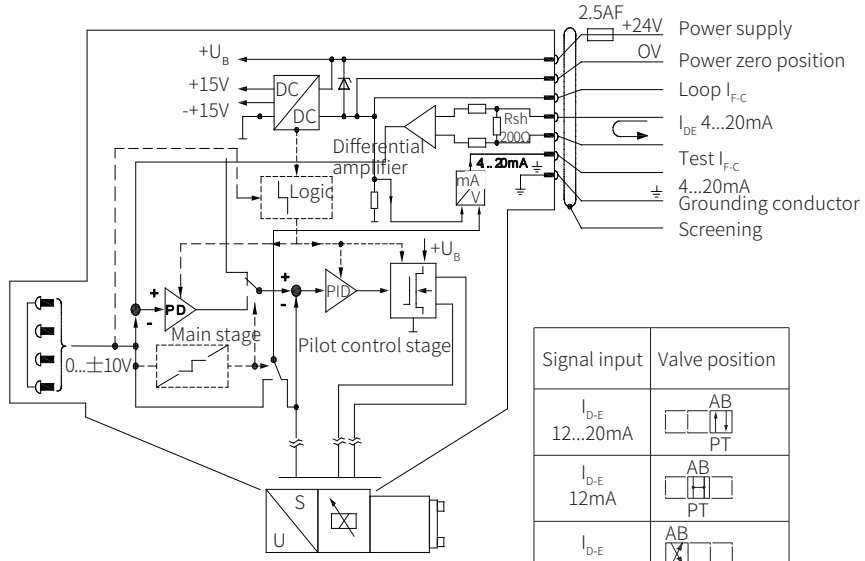
Signal input	Valve position
U_{D-E} 0...+10V	AB PT
U_{D-E} 0V	AB PT
U_{D-E} 0...-10V	AB PT

Terminal identification 6P+PE
Model A1: U_{D-E}±10V (Ri=100KΩ)



Electrical connections

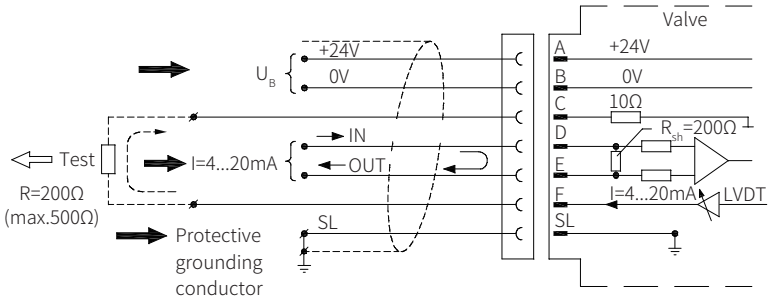
Integrated amplifier (OBE)
Circuit block diagram/wiring diagram
Model F1: I_{D-E} 4...20mA



Signal input	Valve position
I_{D-E} 12...20mA	AB PT
I_{D-E} 12mA	AB PT
I_{D-E} 4...12mA	AB PT

I_{D-E}≤2m A, Valve shut-off

Terminal identification 6P+PE
Model F1: I_{D-E}4...20mA (R_{sh}=200Ω)

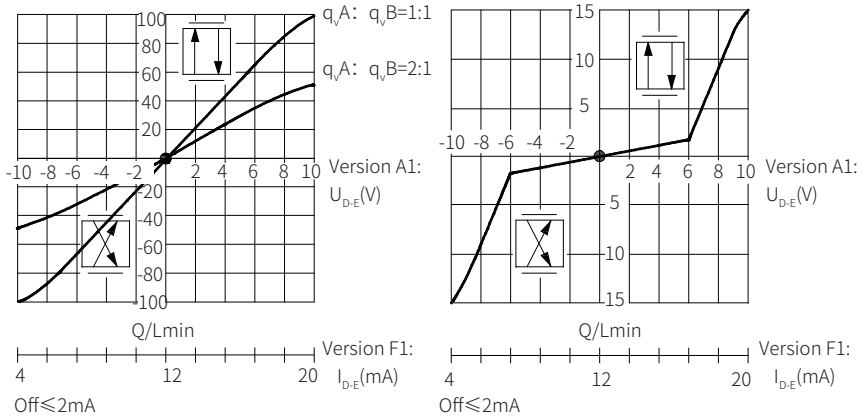


Characteristic curve

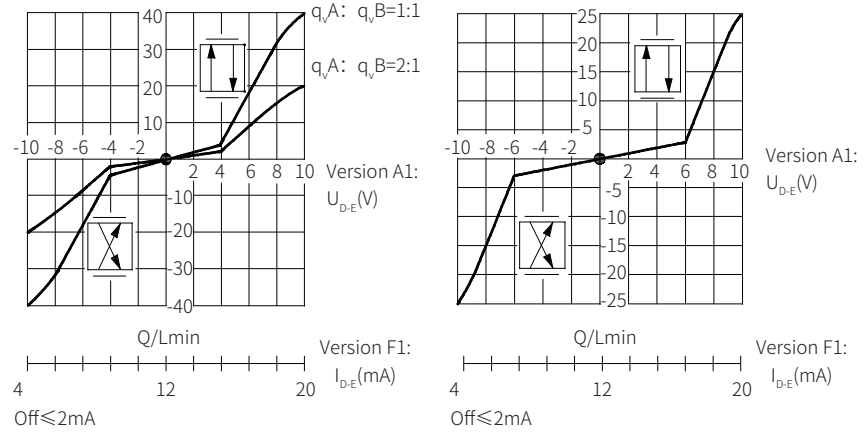
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Flow/signal function $q_v=f(U_{D-E})$, $q_v=f(I_{D-E})$

Linear characteristic curve (version "L")



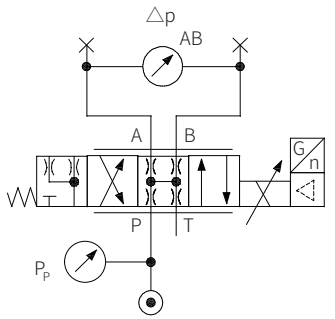
P: Inflection at 40%

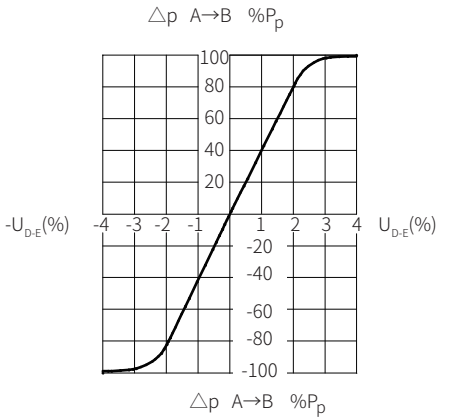


P: Inflection at 60%

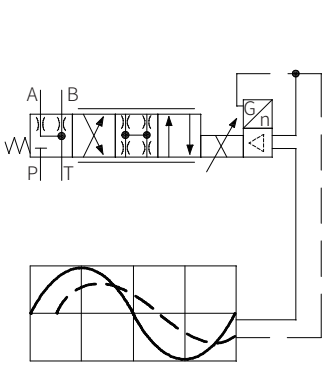
Characteristic curve

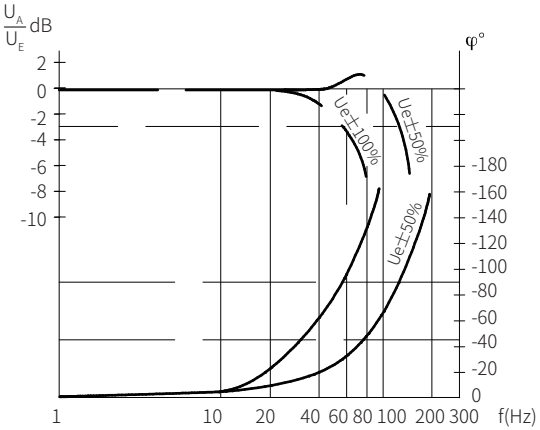
Pressure gain curve





Bode diagram



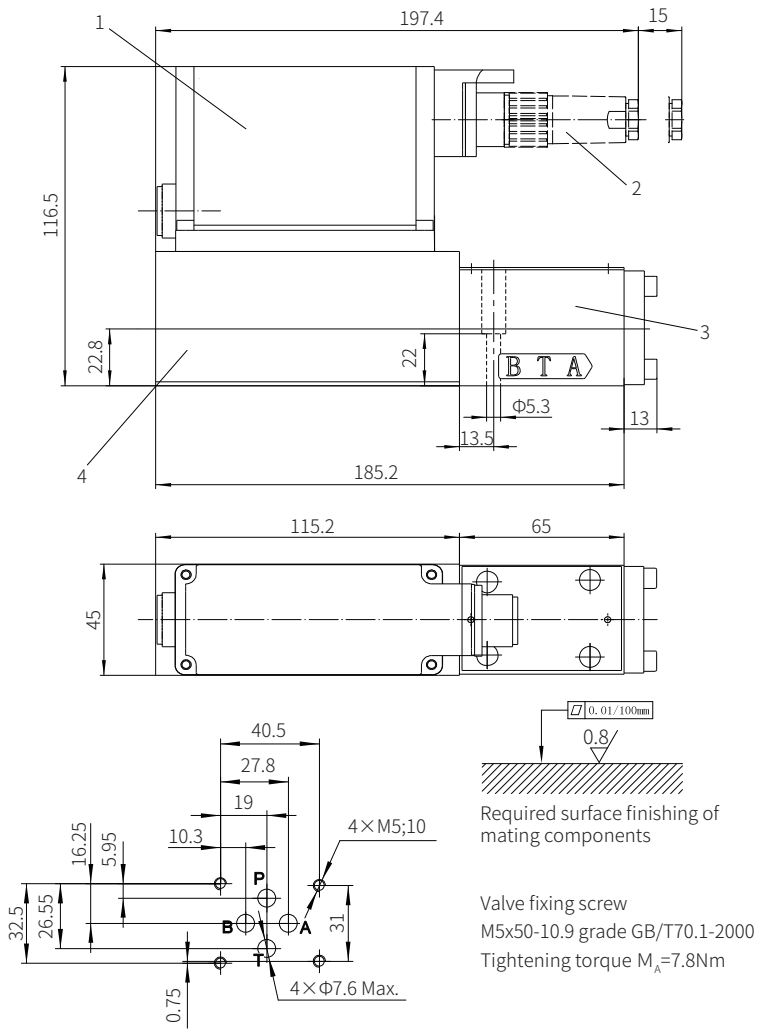


Amplitude
Phase

Amplitude
Phase

Component size

Size unit: mm



Required surface finishing of mating components

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

1 Integrated amplifier (OBE)
2 Connector
3 Valve body
4 Control solenoid with position transducer

Proportional Directional Valve

Model: 4WRPEH10...2XJ

- ◆ Size 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 100 L/min

Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	03
Technical parameters	04
Electrical connections	05-07
Characteristic curve	08-09
Component size	10

Features

- ● Direct operated servo solenoid valve with control piston and valve sleeve, with servo performance
- ● Operated on one side, 4/4-fail-safe position in switched-off condition
- ● Control solenoid with built-in position feedback and integrated amplifier board (OBE), calibrated in the factory
- ● Electrical connection 6P+PE signal input differential amplifier with interface A1 (± 10V) or interface F1 (4... 20mA) (RS200 Ω)
- ● Electro-hydraulic controllers for production and testing systems
- ● Subplate mounting

Function description, sectional drawing

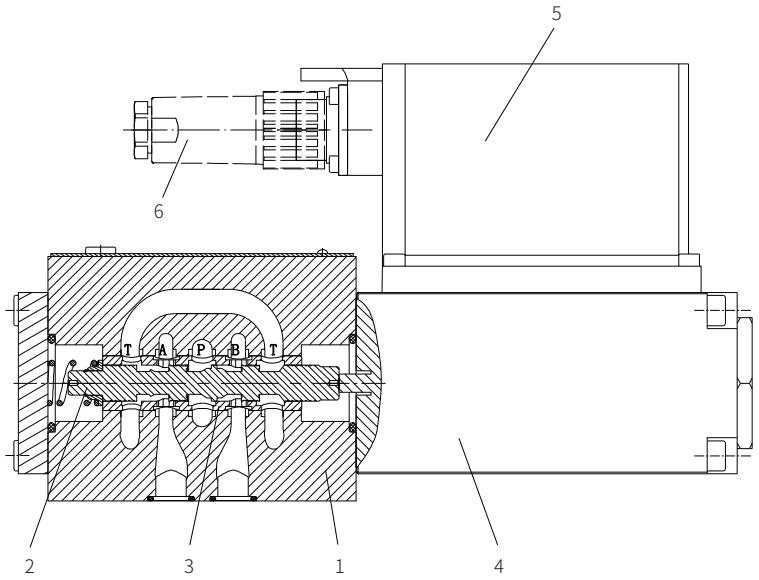
The 4WRPEH valve is high-performance servo proportional valve with zero cover structure on the valve spool and valve sleeve, and LVDT position transducer, it can regulate the directional and flow steplessly according to the input electrical signals.

The valve mainly consists of valve body (1), valve spool (2), valve sleeve (3), control solenoid with position transducer (4), and optionally integrated amplifier (5).

The valve drives the movement of the spool on one side through the proportional solenoid. The specified command value is compared with the actual position value in the integrated electronics (OBE). In case of control deviation, the stroke solenoid is activated, which adjusts the control spool against the spring due to the changed solenoid force. The stroke/control spool cross-section is regulated proportionally to the command value. When the command value presetting of 0V, the electronics adjusts the control spool against the spring to the central position. In deactivated condition, the spring is untensioned to a maximum and the valve is in fail-safe position.

When the solenoid switched off, the valve is moved to fail-safe position. And after powered on, the valve spool is pushed from the rest position to the required position according to the size of the input electrical signal to achieve free flow of oil from P to A and B to T, or P to B and A to T.

The 7-pin connector (6) is used for connecting power, analog signal input, and detection signals.



Model 4WRPEH10...-2XJ/...

Models and specifications

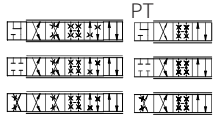
4WRP | E | H | 10 | | B | | – | 2X | J | G24 | K0 | | | |

with integrated electronics=E

control piston/valve sleeve =H
size 10 =10

symbols
four position four-way type

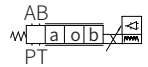
AB
a o b
PT



=C3,C5
=C4,C1
=C

with symbols C5 and C1:
P→A:qv B→T:qv/2
P→B:qv/2 A→T:qv

Installation side of the inductive position transducer



(standard)=B

more information in text

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

electrical connection
A1= command value input ±10V
F1= command value input 4 to 20 mA

K0= electrical connections without plug-in connector with component plug to DIN 43563-AM6

power supply to amplifier
G24= +24V DC

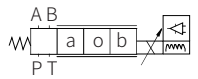
J= Rexroth

2X= 20 to 29 series
(20 to 29 series installation and connection size unchanged)

flow characteristic
L= Linear
P= Inflected characteristic curve

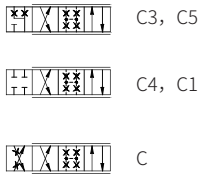
nominal flow rate at 70 bar differential pressure (35 bar/throttle edge)
size 10
50 = 50 L/min 100 = 100 L/min

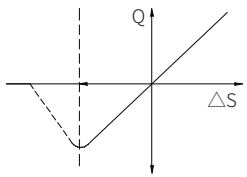
Functional symbols

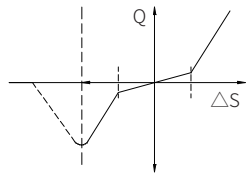


Linear

P: Inflection 40%







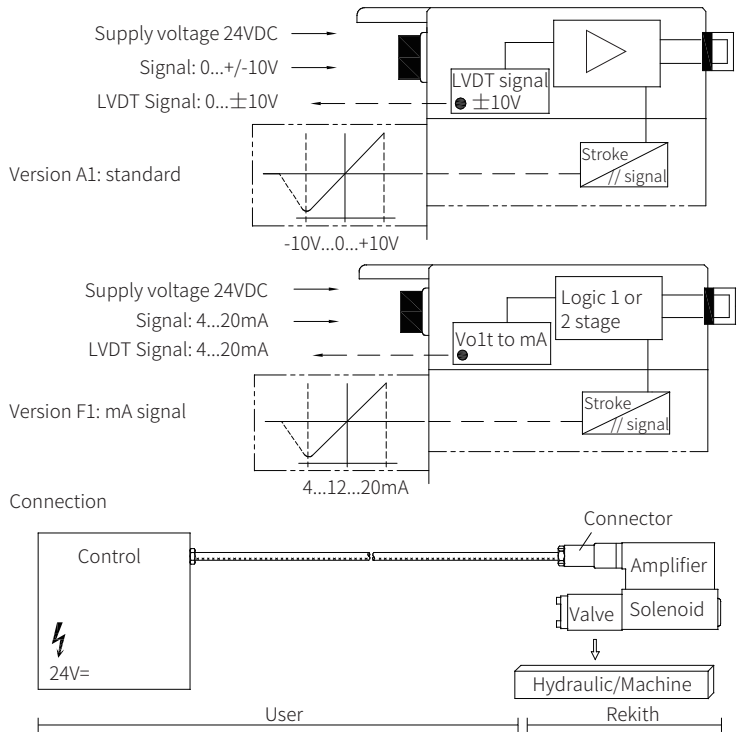
Technical parameters

Overview				
Structure			Direct operated spool valve with steel sleeve	
Actuation			Proportional solenoid valve with position controller, OBE	
Installation type			subplate mounting, porting pattern to ISO 4401 -03-02-05	
Installation position			Optional	
Environment temperature range		°C	-20 ~ +50	
weight		kg	2.75	
Vibration resistance (testing conditions)			Maximum 25g, space vibrating test in all directions (24h)	
Hydraulic (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)				
Fluid			Oil according to DIN 51524. For other oils, please consult our company	
Viscosity range	Recommended value	mm²/s	20…100	
	Maximum allowable value	mm²/s	10…800	
Oil temperature range		°C	-20 to +70	
The maximum allowable pollution level of oil to ISO 4406 (c)			Class 18/16/13[1)]	
Nominal flow rate (△p=35 bar/throttle edge)		L/min	50	100
Maximum working pressure		bar	Port A, B, P: 315	
			Port T: 250	
Leakage flow at 100 bar	Linear	cm³/min	<1200	<1500
	Nonlinear	cm³/min	<600	<600
Static/dynamic				
Hysteresis		%	⩽0.2	
Response time for signal changes 0-100%		ms	10	
Zero drift			At △T=40 °C, zero drift <1%	
Zero position adjustment			Factory setting ±1%	

Electrical, amplifier integrated in valve	
Power on rate %	100ED
Protection grade	IP65 (plug installed)
Connection	Plug-in connector 6P+PE, DIN 43563
Supply voltage	24V DC_{nom}
Terminal A	Min. 21VDC/max. 40VDC
Terminal B: 0V	0V (ripple max.2)
External fuse A_F	2.5
Input, version "A1"	Analog differential signal input, Ri=100k Ω
Terminal D(U_E)	0...±10V
Terminal E	0V
Input, version "F1"	Load, R_{sh}=200 Ω
Terminal D(I_{D-E})	4...12...20mA
Terminal E(I_{D-E})	Current loop I_{D-E} feedback
Test signal, version "A1"	LVDT
Terminal F(UI_{test})	0…±10V
Terminal C	Reference 0V
Test signal, version "F1"	LVDT signal 4... (12).. 20 mA 200 ...500Ω
Terminal F(I_{F-C})	4... (12)... 20 mA (output current)
Terminal C(I_{F-C})	Current loop I_{F-C} feedback
Adjustment	Calibrate at the factory and see the characteristic curve of the valve

The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Electrical connections



Technical data for the cable:

Version: - Multi-core wire
- Litz wire structure, extra fine wire according to VDE 0295, class 6
- Protective earthing conductor, green-yellow
- Cu shielding braid

Wire number: - determined by the valve model, plug model, and signal arrangement

Line Ø: - 0.75 mm² to 20 m of length
- 1.0 mm² to 40 m of length

OuterØ: - 9.4...11.8mm
- 12.7...13.5mm

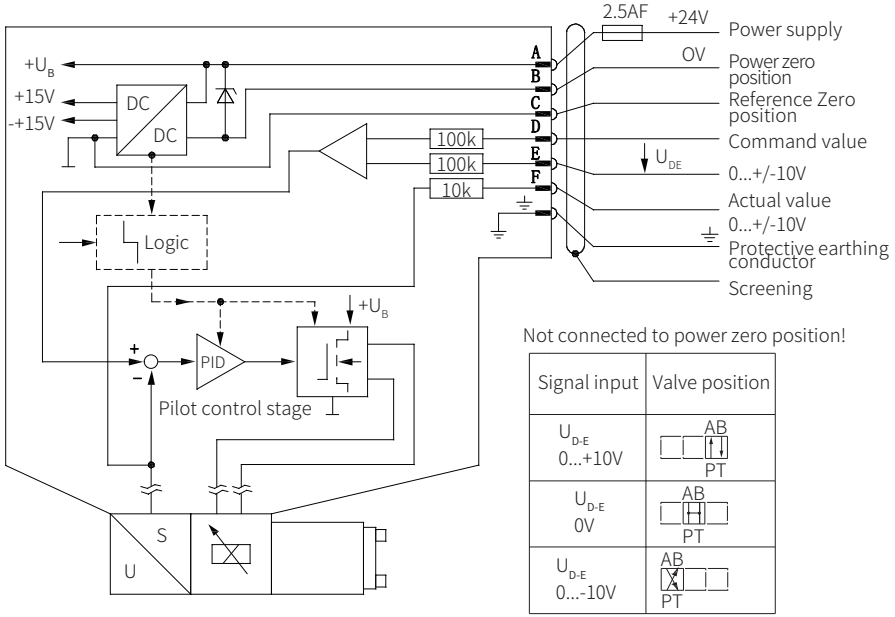
Note:

Supply voltage 24 V DC_{nom} if the value falls below 18V, an internal fast switch-off is effected which can be compared with "Release OFF"
Additionally for version F1:
I_{D-E} ⩾ 3mA - valve is active
I_{D-E} ⩽ 2mA - valve is deactivated
Electric signals taken out via control electronics (e.g. actual value) may not be used for the switch-off of safety-relevant machine functions.
(See the European standard "Safety requirements for fluid power systems and their components - Hydraulics", EN 982.)

Electrical connections

Built in amplifier

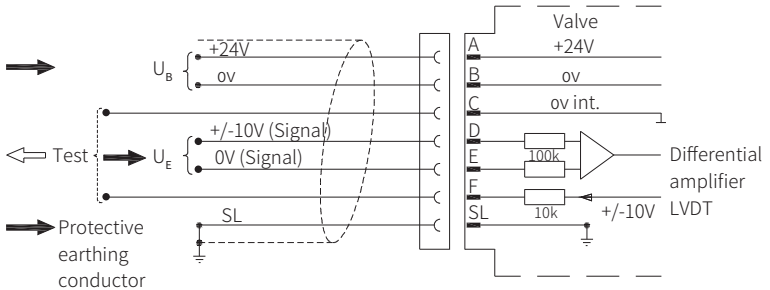
Circuit block diagram/wiring diagram
Model A1: U_{D-E} 0...±10V



Not connected to power zero position!

Signal input	Valve position
U_{D-E} 0...+10V	AB PT
U_{D-E} 0V	AB PT
U_{D-E} 0...-10V	AB PT

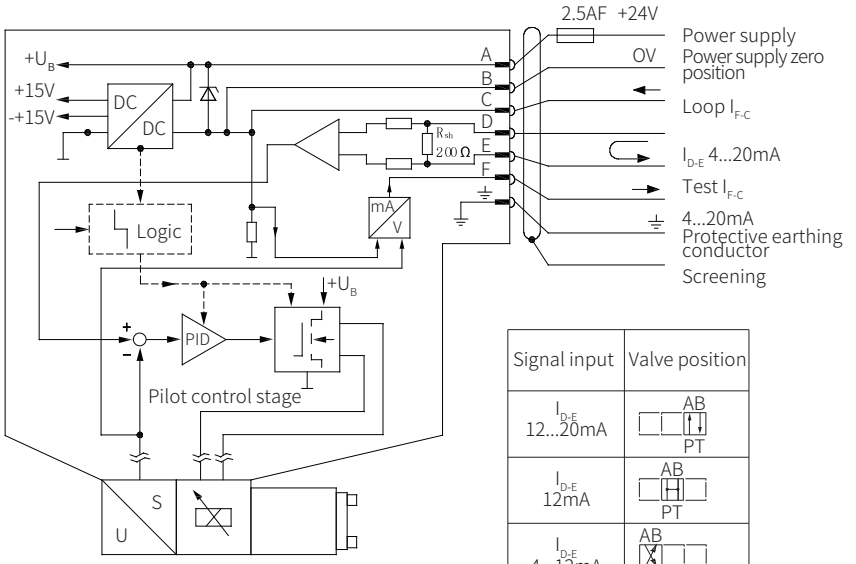
Terminal identification 6P+PE
Model A1: U_{D-E} 0...±10V



Electrical connections

Built in amplifier

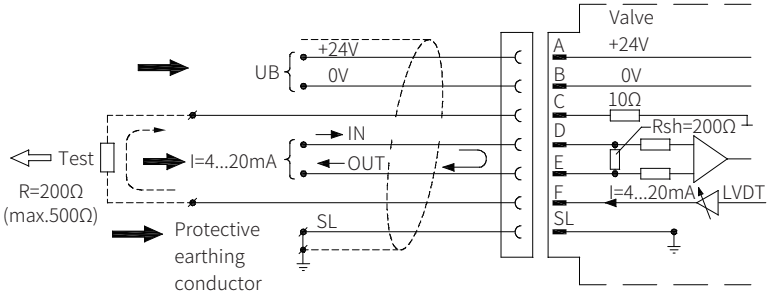
Circuit block diagram/wiring diagram
Model F1: I_{D-E} 4...20mA



Signal input	Valve position
I_{D-E} 12...20mA	AB PT
I_{D-E} 12mA	AB PT
I_{D-E} 4...12mA	AB PT

IDE⩽2m A, Valve shut-off

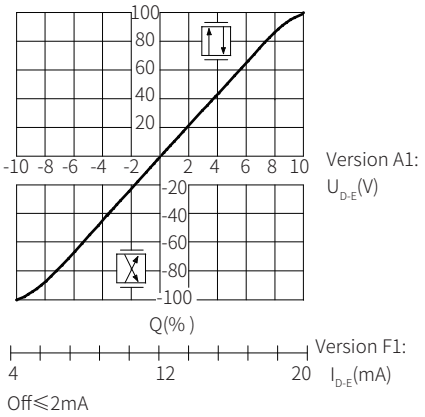
Terminal identification 6P+PE
Model F1: I_{D-E} 4...20mA



Characteristic curve

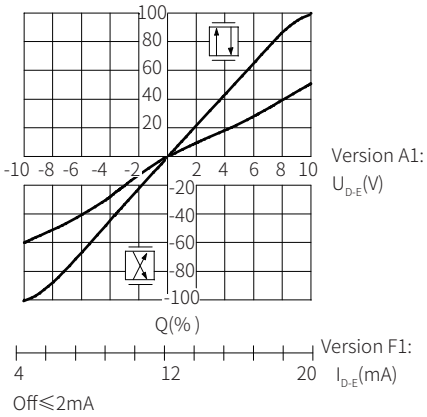
Flow-signal function $q_v=f(U_{D\text{-}E})$, $q_v=f(I_{D\text{-}E})$

L: Linear 1:1



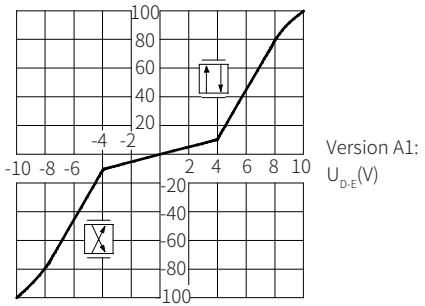
Off≤2mA

L: Linear 2:1

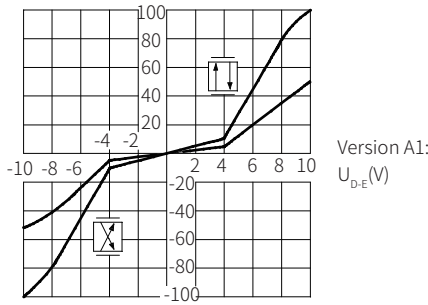


Off≤2mA

P: Inflection at 40%, 1∶1

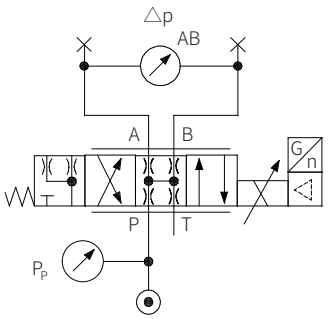


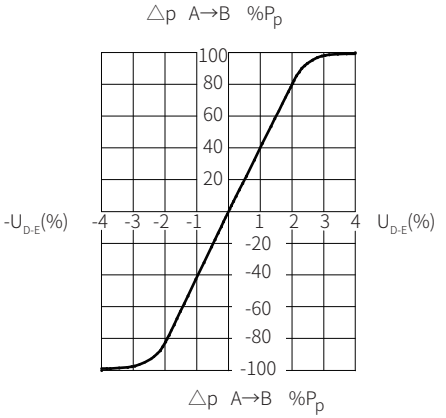
P: Inflection at 40%, 2∶1



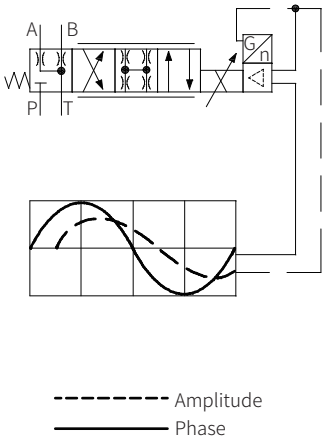
Characteristic curve

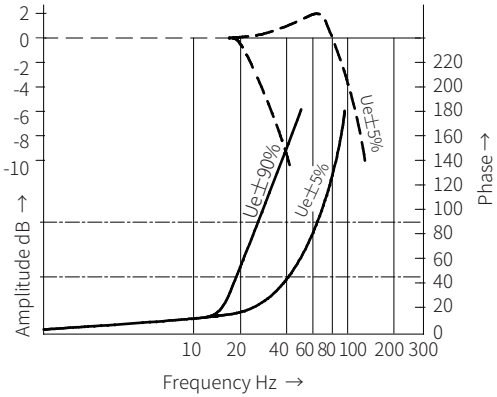
Pressure gain curve





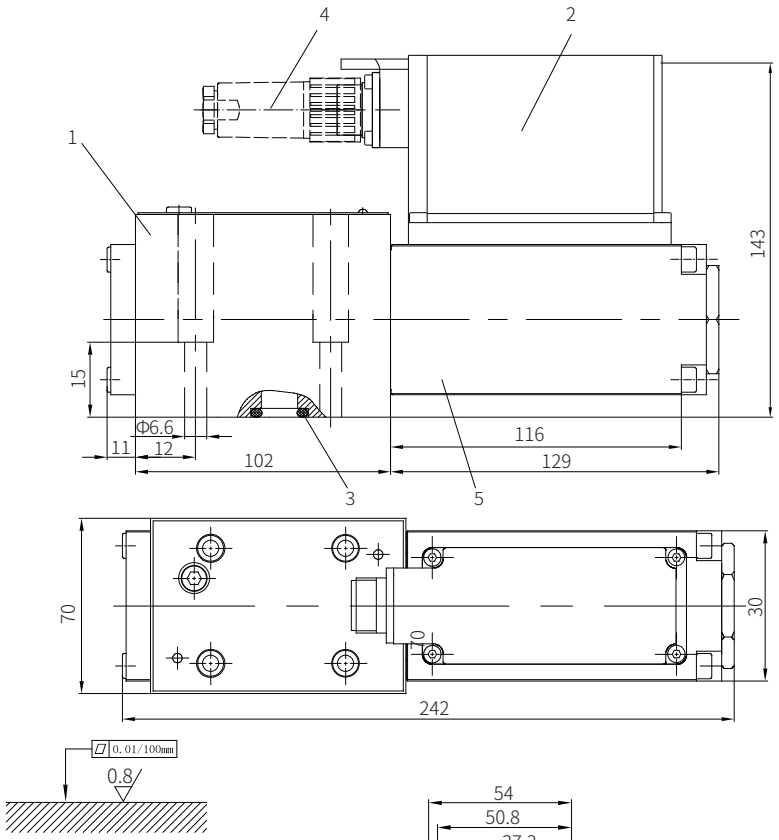
Bode diagram





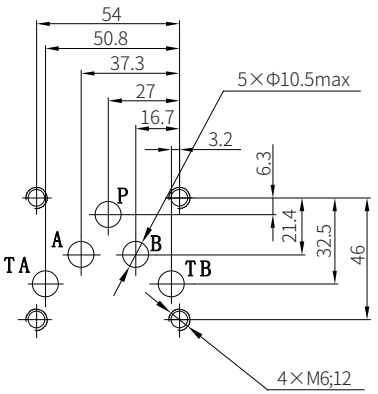
Component size

Size unit: mm



Required surface finishing of mating components

1 Valve body
2 Integrated amplifier (OBE)
3 O-ring 12x2 (for ports P, A, B, T)
4 Connector
5 Control solenoid with position transducer



Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

3-position, 4-way high-frequency valve, pilot operated with electrical position Feedback and integrated electronic control (OBE)

Model: 4WRTE...4XJ

- Size 10 to 32
- Maximum working pressure 350 bar
- Maximum working flow 1600 L/min

Contents

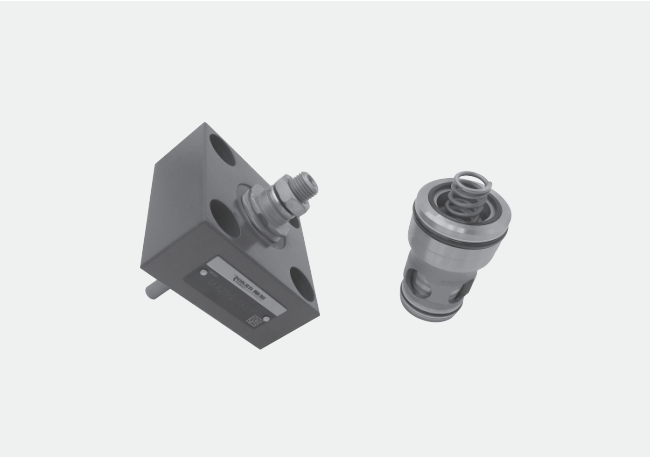
Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	05
Electrical connections	06
Characteristic curve	07-12
Component size	13-17

Features

- Pilot operated 2-stage directional control valve with electrical main spool position feedback and integrated electronic control unit (OBE)
- For position, pressure, force and speed closed loop control
- Pilot control valve:
Direct, Closed loop position control, with controlled pressure feedback
- Main stage: Self-centering, closed loop position control
- Integrated and closed-loop control electronics (OBE)
- Subplate mounting:
Porting pattern to ISO4401(Size 10 to 32)

2-way Logic Cartridge Valves Directional Function

Model: LC...7XJ(logic cartridge valves)
LFA...7XJ(control cover)



- ◆ Size 16/63
- ◆ Maximum working pressure 420 bar
- ◆ Maximum working flow 3000 L/min

Contents

Function description, sectional drawing	02
Component size	03
Logic cartridge valves models and specifications	04
Technical parameters	04-05
Characteristic curve	06
Characteristic curve for throttle selection	07
Ordering code for throttle	07
Valve fixing screw	08
Control cover "D"	09
Control cover "H."	10-11
Control cover "G"	12
Control cover "R" and "RF"	13
Control cover "WEA" and "WEB"	14-15
Control cover "WEMA" and "WEMB"	16-17
Control cover "WECA"	18-19
Control cover "GWA" and "GWB"	20-21
Control cover "KWA" and "KWB"	22-24

Features

- ● Valve poppet with or without damping nose
- ● 2 area ratios
- ● 4 types of springs
- ● 4 stroke limitations
- ● Control cover with integrated seat valve
- ● Control cover with integrated shuttle valve
- ● Control cover for set-up of directional spool valves with or without installed shuttle valve
- ● Control cover for set-up of directional seat valves with or without installed shuttle valve

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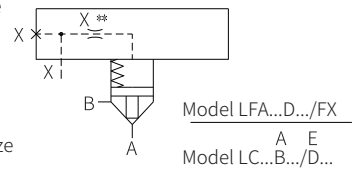
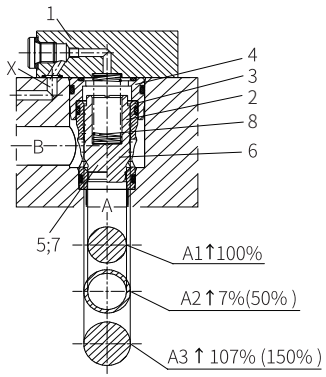
Function description, sectional drawing

The 2-way logic cartridge valves are designed as components for integrated blocks.The main valve component with oil ports A and B is installed into the control block in a receiving hole standardized according to DIN ISO 7368 and closed with a cover. In most cases, the control cover is the connection between the control side of the main valve component and the pilot valve.
By control with respective pilot control valves, the main valve component can be applied for pressure, directional and throttle functions or a combination of these functions. The special economical structural designs can be achieved by matching the size of various flows of the valves and the actuators. If the main valve component can undertake more than one function, the special economical structure can be achieved.



Directional function

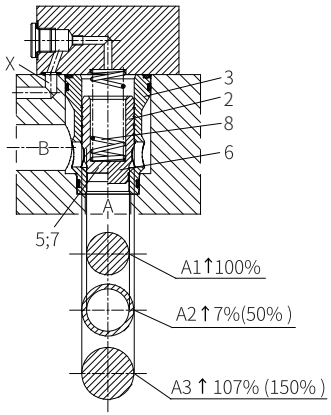
The 2-way logic cartridge valves generally consist of control cover (1) and cartridge element (2). The control cover contains control holes, optional stroke limitation according to function, hydraulic control directional seat valve or shuttle valve. In addition,the directional spool valve or directional seat valve can be installed onto the control cover. The cartridge element mainly includes valve sleeve (3), adjustment ring (4) (only applicable to size 32), seat valve (5), optional damping (7) and reset spring (8).



Size 16 to 32

Function

The function of 2-way logic cartridge valves depends on the pressure. Therefore, there are three important pressure-bearing areas A1, A2, A3 for actuation of the valve. The area of the valve seat A1 is taken as 100%. Depending on the type, the annulus area A2 is 7% or 50% of the area A1. Therefore, the area ratio A1:A2 is either 14.3:1 or 2:1. The area A3 is equal to A1+A2. Due to the different area ratios A1:A2, the annulus area A2 is also different. The area A3 may be 107% or 150% when 100% area at seat A1.



Size 40 to 63

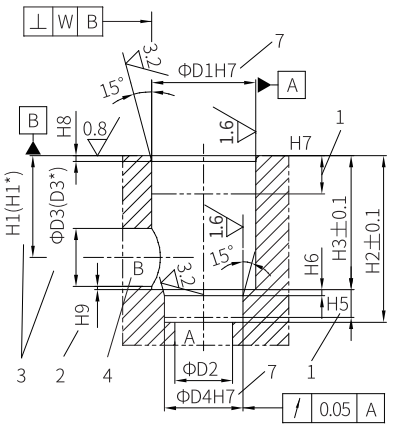
Basic application

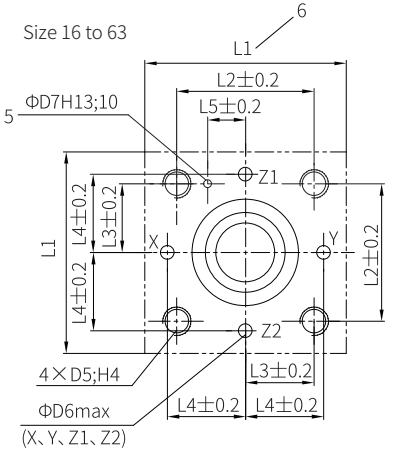
The areas A1 and A2 are operated in the opening direction. The area A3 and the spring are operated in the closing direction. The effective direction generated by the combination of the opening and closing directions determines the position of the spool of the 2-way logic cartridge valve.
The oil can flow from A to B or B to A through the 2-way logic cartridge valve. When the area A3 is compressed by the pilot oil of channel B or external pilot oil supply, the channel A is closed without leakage."

Component size

Size unit: mm

Control cover and installation hole according to ISO 7368

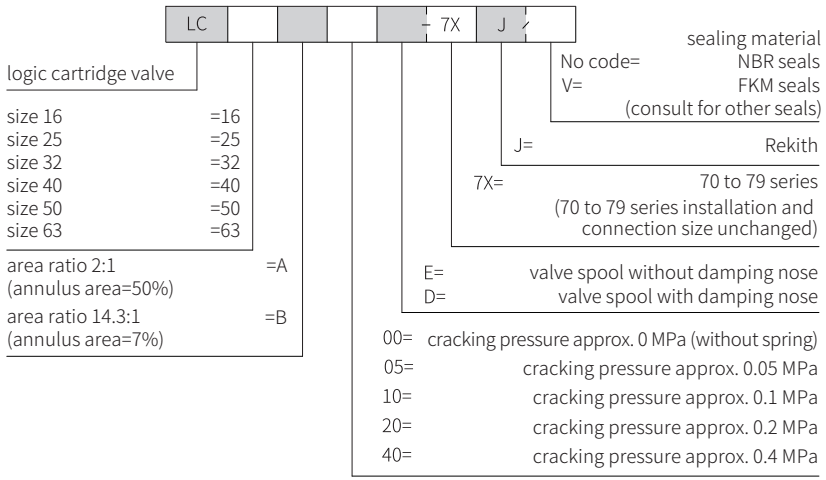




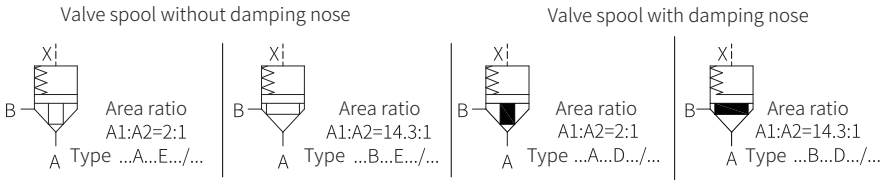
1 Depth of fit
2 Reference dimension
3 If the diameter of port B is not Φ D3 or （Φ D3 *), then the distance from the cover support surface to the center of the hole must be calculated.
4 Port B can be installed around the central axis of port A, but it must be ensured that the installation hole and pilot hole are not damaged
5 Locating pin hole
6 The length L1 (x-y axis of the hole) of the control cover (with directional valve) is 80mm for size 16.
7 If D ⩽ 45mm, H8 is allowed to be installed.

Size	16	25	32	40	50	63
ΦD1	32	45	60	75	90	120
ΦD2	16	25	32	40	50	63
ΦD3	16	25	32	40	50	63
ΦD4	25	34	45	55	68	90
ΦD5	M8	M12	M16	M20	M20	M30
ΦD6	4	6	8	10	10	12
ΦD7	4	6	6	6	8	8
H1	34	44	52	64	72	95
(H1*)	29.5	40.5	48	59	65.5	96.5
H2	56	72	85	105	122	155
H3	43	58	70	87	100	130
H4	20	25	35	45	45	65
H5	11	12	13	15	17	20
H6	2	2.5	2.5	3	3	4
H7	20	30	30	30	35	40
H8	2	2.5	2.5	3	4	4
H9	0.5	1	1.5	2.5	2.5	3
L1	65/80	85	102	125	140	180
L2	46	58	70	85	100	125
L3	23	29	35	42.5	50	62.5
L4	25	33	41	50	58	75
L5	10.5	16	17	23	30	38
W	0.05	0.05	0.1	0.1	0.1	0.2

Logic cartridge valves models and specifications



Logic cartridge valves functional symbols



Technical parameters

Maximum working pressure	without directional valve	bar	420
	port A, B, X, Z1, Z2	bar	315;350; 420 (dependent on the attached directional valve)
	port Y	bar	Depending on the return oil pressure of the directional valve
Pressure medium			Mineral oil - for NBR seal or FKM seal
			Phosphate ester - for FKM seal
Pressure medium temperature range		°C	–30 to +80 (NBR seal)
			–20 to +80 (FKM seal)
Viscosity range		mm^2/s	2.8 to 380
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 Class 20 / 18 / 15[1)]

[1)] The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Technical parameters

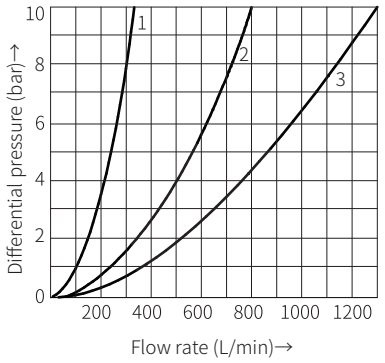
2-way logic cartridge valves-directional function

Area		Model	Size					
			16	25	32	40	50	63
A1	cm^2	LC..A..	1.89	4.26	6.79	11.1	19.63	30.2
		LC..B..	2.66	5.73	9.51	15.55	26.42	41.28
A2	cm^2	LC..A..	0.95	1.89	3.39	5.52	8.64	14
		LC..B..	0.18	0.43	0.67	1.07	1.85	2.90
A3	cm^2	LC..A..	2.84	6.16	10.18	16.62	28.27	44.2
		LC..B..	2.84	6.16	10.18	16.62	28.27	44.2
Stroke	cm	LC..E..	0.9	1.17	1.4	1.7	2.1	2.3
		LC..D..	0.9	1.17	1.4	1.9	2.3	2.8
Pilot volume	cm^3	LC..E..	2.56	7.21	14.3	28.3	59.4	102
		LC..D..	2.56	7.21	14.3	31.6	65.0	124
Theoretical pilot Flow [1)]	(L/min)	LC..E..	15.4	43.3	86	170	356	612
		LC..D..	15.4	43.3	86	190	390	744
Weight	kg	Logic cartridge valves LC	0.25	0.5	1.1	1.9	3.9	7.2
Cracking pressure bar Direction of flow A to B		LC..A 00..	0.02	0.02	0.05	0.05	0.05	0.07
		LC..A 05..	0.35	0.35	0.36	0.35	0.37	0.31
		LC..A 10..	0.70	0.68	0.72	0.71	0.67	0.64
		LC..A 20..	2.03	2.18	2.12	2.02	2.01	2
		LC..A 30..	—	—	—	—	—	—
		LC..A 40..	3.50	3.90	3.80	4.0	4.11	3.8
		LC..B 00..	0.01	0.02	0.04	0.04	0.04	0.05
		LC..B 05..	0.25	0.26	0.26	0.25	0.28	0.23
		LC..B 10..	0.49	0.50	0.51	0.51	0.48	0.47
		LC..B 20..	1.44	1.62	1.52	1.44	1.5	1.5
		LC..B 30..	—	—	—	—	—	—
		LC..B 40..	2.48	2.90	2.70	2.86	3.05	2.8
Cracking pressure bar Direction of flow B to A		LC..A 00..	0.04	0.05	0.1	0.1	0.1	0.14
		LC..A 05..	0.69	0.78	0.72	0.7	0.84	0.68
		LC..A 10..	1.38	1.53	1.42	1.43	1.47	1.37
		LC..A 20..	4.05	4.91	4.25	4.06	4.57	4.33
		LC..A 30..	—	—	—	—	—	—
		LC..A 40..	6.96	8.74	7.6	8.05	9.34	8.15
		LC..B 00..	0.24	0.25	0.5	0.5	0.5	0.8
		LC..B 05..	3.69	3.4	3.64	3.64	3.95	3.27
		LC..B 10..	7.43	6.69	7.24	7.37	6.88	6.62
		LC..B 20..	21.3	21.5	21.6	20.9	21.4	20.9
		LC..B 30..	—	—	—	—	—	—
		LC..B 40..	36.6	38.3	38.6	41.5	43.6	39.4

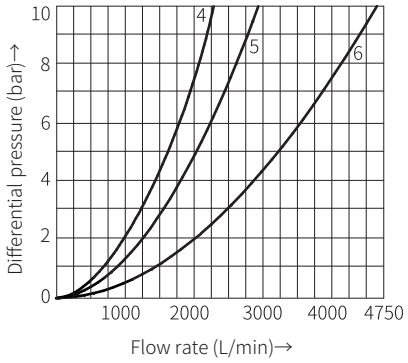
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Without damping nose

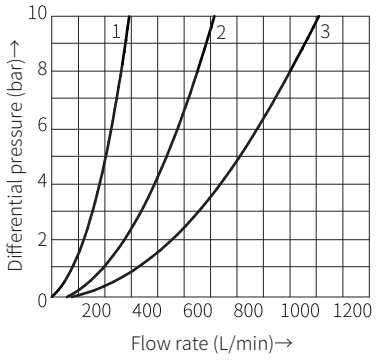


1 Size 16
2 Size 25
3 Size 32

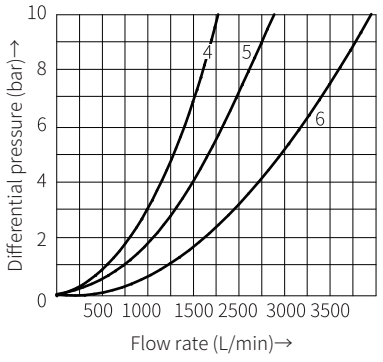


4 Size 40
5 Size 50
6 Size 63

With damping nose

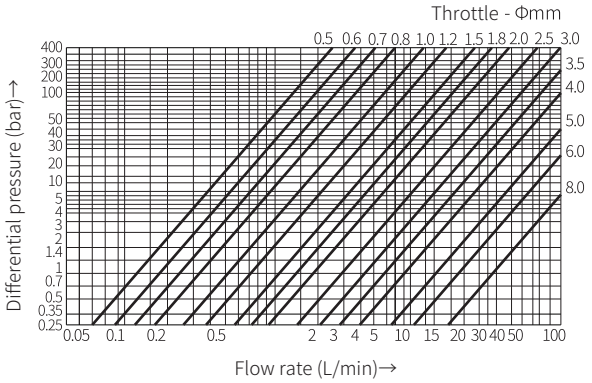


1 Size 16
2 Size 25
3 Size 32



4 Size 40
5 Size 50
6 Size 63

Characteristic curve for throttle selection



Thread	Throttle - Φmm
ZM6	0.5 to 3.0
ZM8	0.5 to 4.0
R3/8	0.8 to 6.0
R1/2	1.0 to 8.0

Ordering code for throttle

Nominal size	Thread / Throttle Φmm	Ordering code			
		ZM6	ZM8	R3/8	R3/8
	0.5	ZM6×1-Φ0.5	ZM8×1-Φ0.5	—	—
	0.6	ZM6×1-Φ0.6	ZM8×1-Φ0.6	—	—
	0.7	ZM6×1-Φ0.7	ZM8×1-Φ0.7	—	—
16	0.8	ZM6×1-Φ0.8	ZM8×1-Φ0.8	R3/8-Φ0.8	—
25	1	ZM6×1-Φ1.0	ZM8×1-Φ1.0	R3/8-Φ1.0	R1/2-Φ1.0
32	1.2	ZM6×1-Φ1.2	ZM8×1-Φ1.2	R3/8-Φ1.2	R1/2-Φ1.2
40	1.5	ZM6×1-Φ1.5	ZM8×1-Φ1.5	R3/8-Φ1.5	R1/2-Φ1.5
50	1.8	ZM6×1-Φ1.8	ZM8×1-Φ1.8	R3/8-Φ1.8	R1/2-Φ1.8
63	2	ZM6×1-Φ2.0	ZM8×1-Φ2.0	R3/8-Φ2.0	R1/2-Φ2.0
	2.5	ZM6×1-Φ2.5	ZM8×1-Φ2.5	R3/8-Φ2.5	R1/2-Φ2.5
	3	ZM6×1-Φ3.0	ZM8×1-Φ3.0	R3/8-Φ3.0	R1/2-Φ3.0
	3.5	—	ZM8×1-Φ3.5	R3/8-Φ3.5	R1/2-Φ3.5
	4	—	ZM8×1-Φ4.0	R3/8-Φ4.0	R1/2-Φ4.0
	5	—	—	R3/8-Φ5.0	R1/2-Φ5.0
	6	—	—	R3/8-Φ6.0	R1/2-Φ6.0
	8	—	—	—	R1/2-Φ8.0

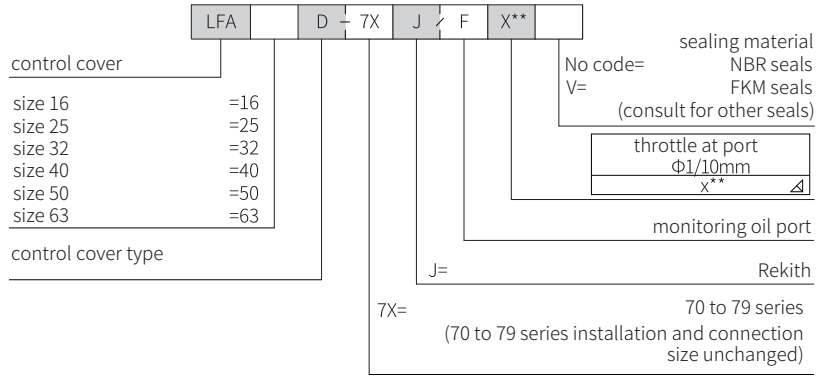
Valve fixing screw

Infernal hexagon according to GB/T70.1-10.9 grade (included in the supply list)

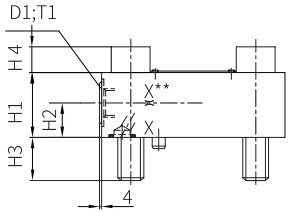
Size	Control cover type	Dimension	Quantity	Tightening torque M_A(Nm)	Size	Control cover type	Dimension	Quantity	Tightening torque M_A(Nm)
16	D	M8×40	4	34.3	40	D	M20×70	4	373
	G	M8×40				G	M20×70		
	GW A,GW B	M8×45				GW A,GW B	M20×70		
	H1,H2	M8×40				H1,H2	M20×110		
						R,RF	M20×70		
	KW A,KW B	M8×45				KW A,KW B	M20×70		
	W E A,W EB	M8×45				W E A,W EB	M20×70		
	W ECA	M8×40				W ECA	M20×70		
	W EM A,W EM B	M8×70				W EM A,W EM B	M20×70		
25	D	M12×50	4	95	50	D	M20×80	4	373
	G	M12×50				G	M20×80		
	GW A,GW B	M12×50				GW A,GW B	M20×80		
	H1,H2	M12×50				H2	M20×120		
	R,RF	M12×50				R,RF	M20×80		
	KW A,KW B	M12×50				KW A,KW B	M20×80		
	WEA,WEB	M12×50				WEA,W EB	M20×80		
	W ECA	M12×50				W EC A	M20×80		
	W EM A,W EM B	M12×50				W EM A,W EM B	M20×80		
32	D,G,R,RF GW A,GW B, KW A,KW B, W EA,W EB, W ECA, W EM A,W EM B	M16×60	4	196	63	D,G,R,RF GW A,GW B, KW A,KW B, W EA,W EB, W ECA, W EM A,W EM B	M30×100	4	1315
	H1,H2	M16×80				H2	M30×150		

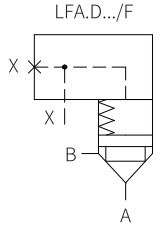
Control cover "D" with remote control

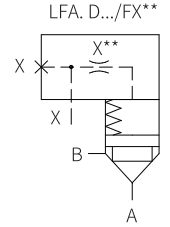
Size 16 to 63

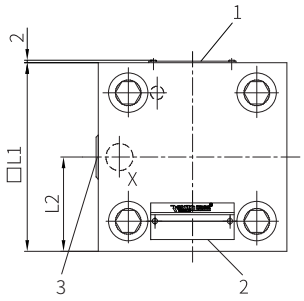


If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24









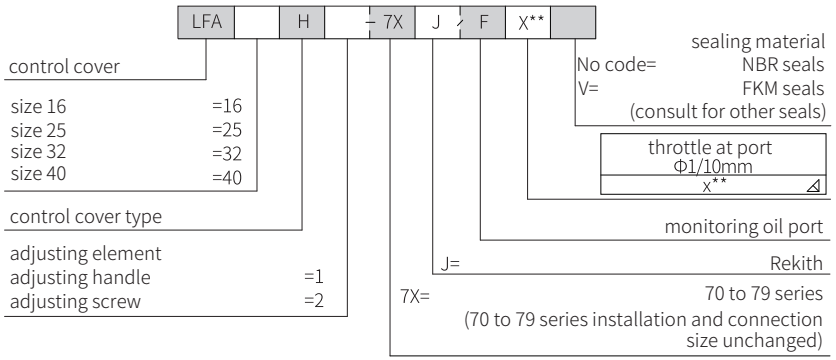
Size	16	25	32	40	50	63
D1	G1/8	G1/4	G1/4	G1/2	G1/2	G3/4
X**[1)]	ZM6	ZM6	ZM6	ZM8	ZM8	R3/8
H1	27	30	35	60	68	82
H2	12	16	16	30	32	40
H3	15	20	25	32	34	50
H4	6	12	16	—	—	—
L1	65	85	100	125	140	180
L2	32.5	42.5	50	72	80	90
T1	8	12	12	14	14	16
Weight kg	0.9	1.7	2.7	6.6	9.4	18.7

[1)] Ordering code of throttle see page 07/24

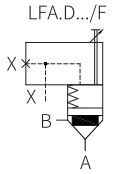
1 Name plate for size 16/25/32
2 Name plate for size 40/50/63
3 Optional port X used as threaded connection port

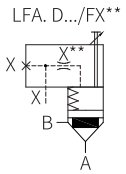
Control cover "H" with stroke limitation and remote control

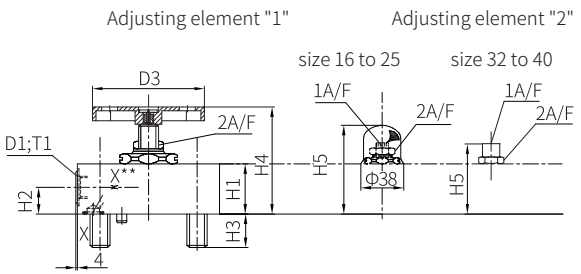
Size 16 to 40

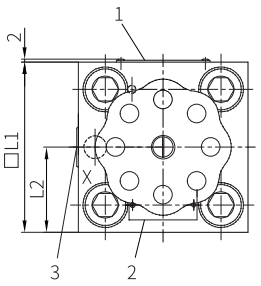


If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24









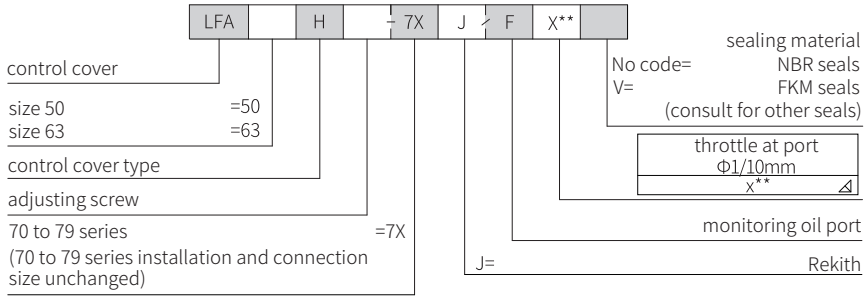
Size	16	25	32	40
D1	G1/8	G1/4	G1/4	G1/2
X**[1)]	ZM6	ZM6	ZM6	ZM8
D3	60	80	80	100
H1	35	40	75	95
H2	12	16	16	30
H3	15	24	28	32
H4max	90	95	120	160
H5max	76	80	100	146
□L1	65	85	100	125
L2	32.5	42.5	50	72
T1	8	12	12	14
1A/F[2)]	6	6	10	14
2A/F	21	22	27	46
Weight kg	1.3	2.3	5.5	11.2

[1)] Ordering code of throttle see page 07/24
[2)] Internal hexagon

1 Name plate for size 16/25/32
2 Name plate for size 40
3 Optional port X used as threaded connection port

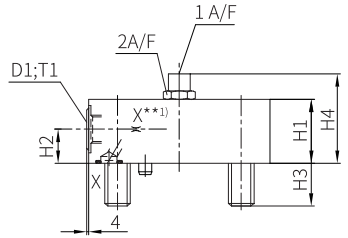
Control cover "H" with stroke limitation and remote control

Size 50 to 63

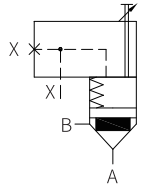


If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

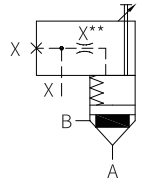
Adjusting element "2"

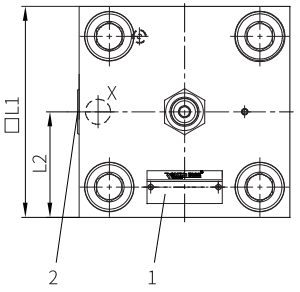


LFA.D.../F



LFA. D.../FX**





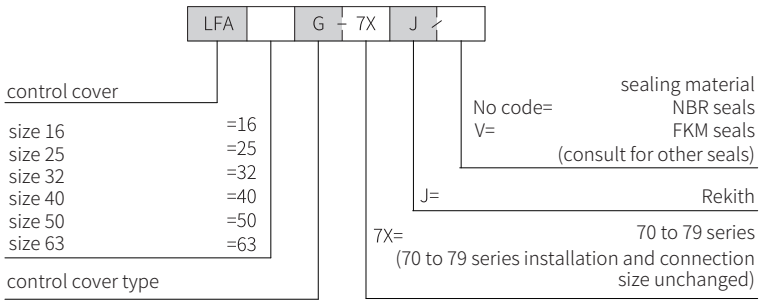
Size	50	63
D1	G1/2	G3/4
X**[1)]	ZM8	R3/8
H1	110	125
H2	32	40
H3	34	50
H4max	156	175
□L1	140	180
L2	80	90
T1	14	16
1A/F[2)]	17	24
2A/F	55	65
Weight kg	15.8	30.2

[1)] Ordering code of throttle see page 07/24
[2)] Internal hexagon

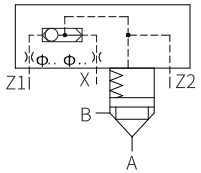
1 Name plate
2 Optional port X used as threaded connection port

Control cover "G" with integrated shuttle valve

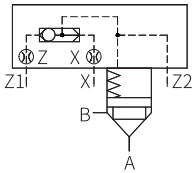
Size 16 to 63



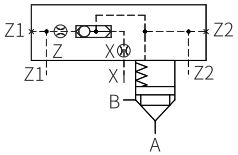
LFA.G ... size 16 to 32

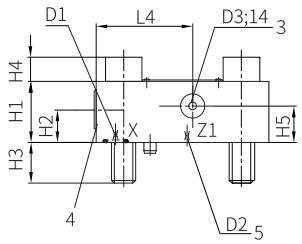


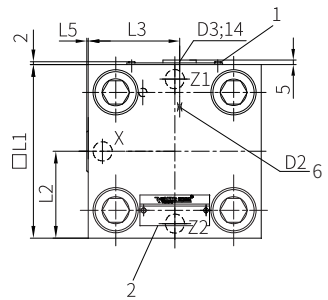
LFA.G... size 40



LFA.G ... size 50 and 63





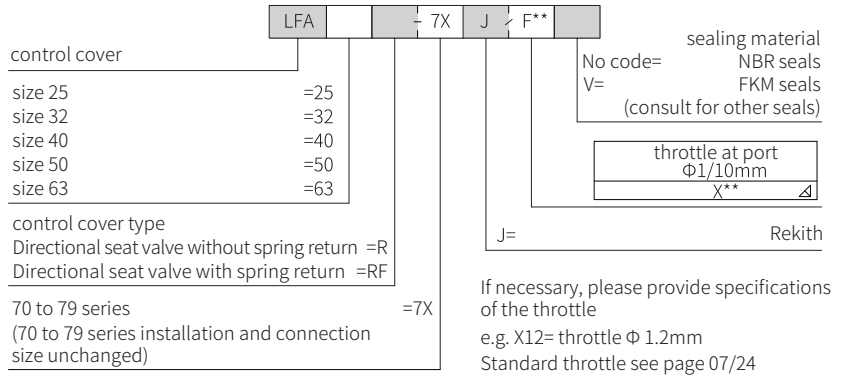


Size	16	25	32	40	50	63
D1[2]	Φ1.2	Φ1.5	Φ2.0	M6	M8×1	M8×1
D2[2]	Φ1.2	Φ1.5	Φ2.0	M6	M8×1	M8×1
D3	—	—	—	—	G1/2	G1/2
H1	35	30	35	60	68	82
H2	17	17	21.5	30	32	42
H3	15	24	28	32	34	50
H4	—	12	16	—	—	—
H5	—	—	—	—	32	40
L1	65	85	100	125	140	180
L2	36.5	45.5	50	62.5	70	90
L3	—	—	—	—	72	81
L4	—	—	—	—	72	90
L5	4.5	4	1	—	6	4

1 Name plate for size 16/25/32
2 Name plate for size 40/50/63
3 Optional ports Z1 and Z2 used as threaded connection ports for size 25/32/50/63
4 Shuttle valve
5 D2 for size 16 to 40

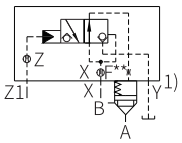
Control cover "R" and "RF" with integrated directional seat valve

Size 25 to 63

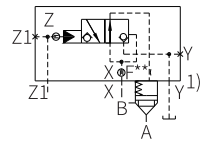


If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

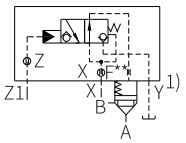
LFA.R... size 25 to 50



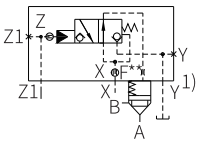
LFA.R... size 63



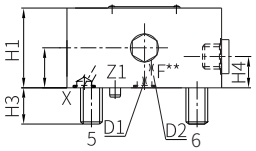
LFA.RF... size 25 to 50

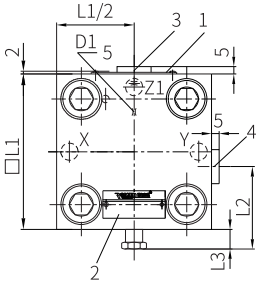


LFA.RF... size 63



Area ratio $\frac{A_{Z1}}{A_X} = \frac{3}{1}$





Size	Type	25	32	40	50	63
F**[2]		ZM6	ZM6	ZM8	ZM8	ZM8
H1		40	50	60	68	82
H2		20	26	30	34	40
H3		24	28	32	34	50
H4		15.5	26	30	34	40
□L1		85	100	125	140	180
L2		50	50	65.7	70	78.5
L3	R	3	3	4	4	–
	RF	18	18	25	25	16
Weight kg		2.1	3.6	6.7	9.5	18.3

[1] Maximum working pressure at port Y 5 bar
[2] Ordering code of throttle see page 07/24
1 Name plate for size 16/25/32
2 Name plate for size 40/50/63
3 Optional port Z1 used as threaded connection port for size 25 to 63
4 Optional port Z1 used as threaded connection port for size 25 to 63
5 D1 for size 25 to 50
6 D1 for size 63

Control cover "WEA" and "WEB" for set-up of a directional spool or diretional seat valve

Size 16 to 50

LFA | | – 7X | / A** | B** | P** | T** |

control cover

size 16	=16
size 25	=25
size 32	=32
size 40	=40
size 50	=50

control cover type

normally closed	=WEA
normally open	=WEB

7X= 70 to 79 series (70 to 79 series installation and connection size unchanged)

J= Rekith

sealing material

No code= NBR seals

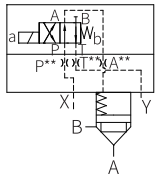
V= FKM seals (consult for other seals)

control type	throttle at port Φ1/10mm			
WEA	A**◿		P**◿	T**◿
WEB		B**◿	P**◿	T**◿

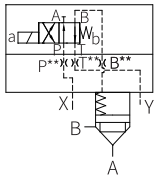
◿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

05

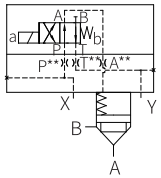
LFA.WEA...
size 16 to 32
Direction spool valve
model: 4WE6D



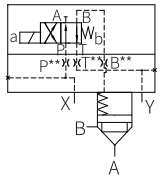
LFA.WEB...
size 16 to 32
Direction spool valve
model: 4WE6D

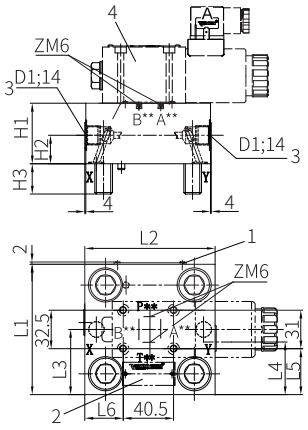


LFA.WEA...
size 40 to 50
Direction spool valve
model: 4WE6D



LFA.WEB...
size 40 to 50
Direction spool valve
model: 4WE6D





Size	16	25	32	40	50
D1	—	—	—	G1/2	G1/2
H1	40	40	50	60	68
H2	—	—	—	30	32
H3	15	24	28	32	34
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	—	—	—	72	80
L4	—	—	—	53	60
L5	17	27	34.5	47	54.5
L6	7	23.5	31	43.5	51
A**B** T**P**[1)]	ZM6	ZM6	ZM6	ZM6	ZM6
Weight kg	1.5	2.1	3.6	6.6	9.3

[1)] Ordering code of throttle see page 07/24
1 Name plate for size 16/25/32
2 Nameplate for size 40/50
3 Optional ports X and Y used as threaded connection ports for size 40/50
4 Direction spool valve 4WE6D and screw M5x50-10.9 GB T70.1 must be ordered separately

Control cover "WEA" and "WEB" for set-up of a directional spool or diretional seat valve

Size 63

LFA | 63 | – 7X | J / A** | B** | P** | T** |

control cover

size

control cover type

normally closed	=WEA
normally open	=WEB

7X= 70 to 79 series (70 to 79 series installation and connection size unchanged)

J= Rekith

sealing material

No code= NBR seals

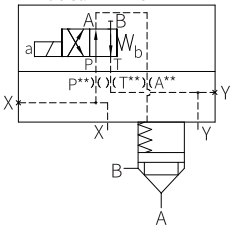
V= FKM seals (consult for other seals)

control type	throttle at port Φ1/10mm			
WEA	A**◿		P**◿	T**◿
WEB		B**◿	P**◿	T**◿

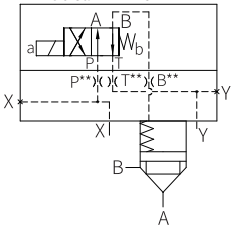
◿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

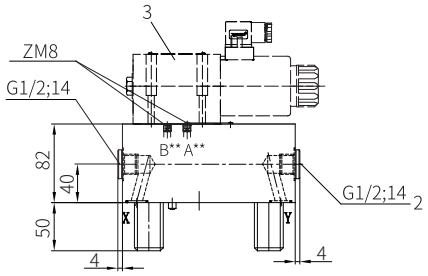
05

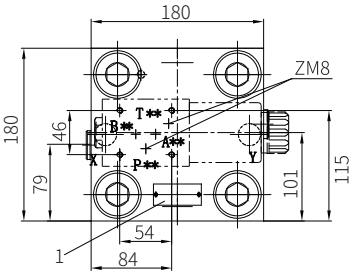
LFA.WEA...
Direction spool valve
model: 4WE10D



LFA.WEB...
Direction spool valve
model: 4WE10D







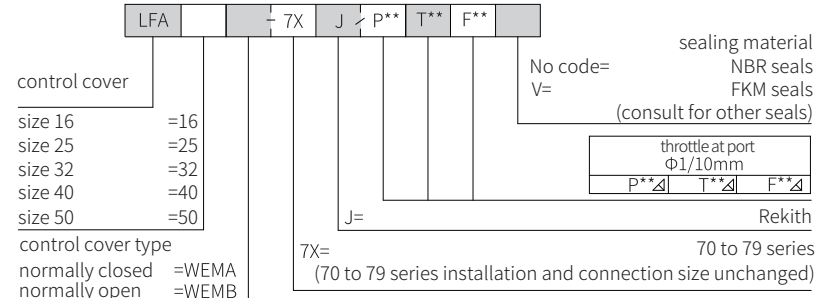
A**B** T**,P**[1)]	ZM8

1 Name plate
2 Optional ports X and Y used as threaded connection ports
3 Direction spool valve 4WE10D and screw M6x40-10.9 GB T70.1 must be ordered separately
Weight (kg): 18.6

[1)] Ordering code of throttle see page 07/24

Control cover "WEMA" and "WEMB" for set-up of a directional spool or diretional seat valve

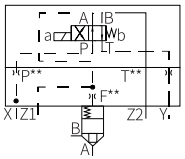
Size 16 to 50



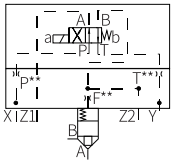
⊿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

05

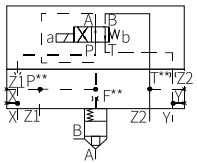
LFA.WEMA...
size 16 to 32
Direction spool valve
model: 4WE6D



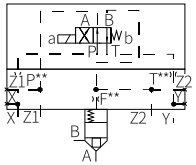
LFA.WEMB...
size 16 to 32
Direction spool valve
model: 4WE6D

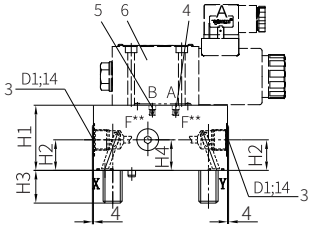


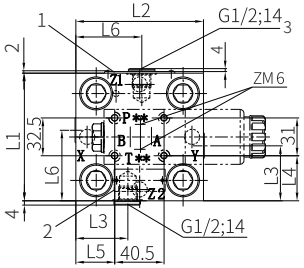
LFA.WEMA...
size 40 to 50
Direction spool valve
model: 4WE6D



LFA.WEMB...
size 40 to 50
Direction spool valve
model: 4WE6D







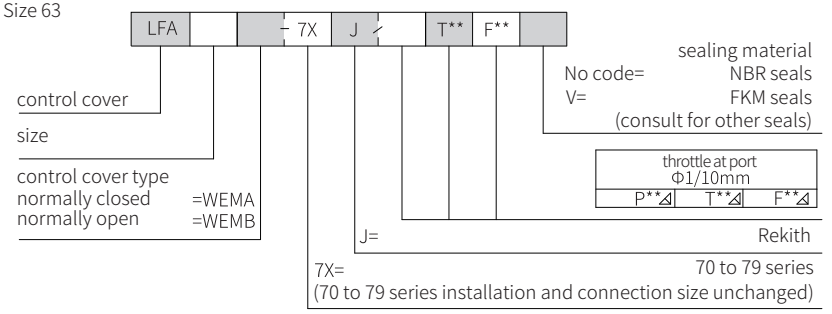
Size	16	25	32	40	50
D1	—	—	—	G1/2	G1/2
H1	65	40	50	60	68
H2	—	—	—	30	32
H3	15	24	28	32	34
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	—	—	—	53	60
L4	17	27	34.5	47	54.5
L5	7	23.5	31	43.5	51
L6	—	—	—	72	80
P** T** F**[1)]	ZM6	ZM6	ZM6	ZM6	ZM6
F**	2.3	2.1	3.6	6.6	9.3

[1)] Ordering code of throttle see page 07/24

1 Name plate for size 16/25/32
2 Name plate for size 40/50
3 2 Optional ports X and Y used as threaded connection ports for size 40/50
4 Plug ZM6 for model: ..WEMB... (port B with or without throttle F * *, port A with plug)
5 Plug ZM6 for model: ..WEMA... (port A with or without throttle F * *, port B with plug)
6 Direction spool valve 4WE6D and screw M5x50-10.9 GB T70.1 must be ordered separately

Control cover "WEMA" and "WEMB" for set-up of a directional spool or diretional seat valve

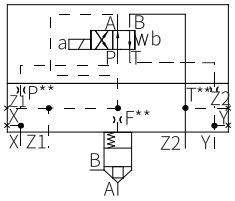
Size 63

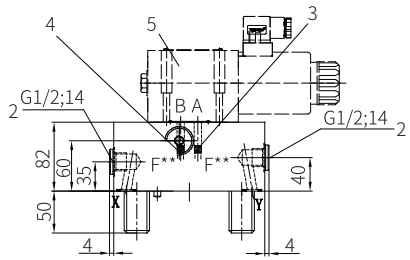


⊿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

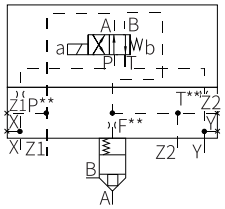
05

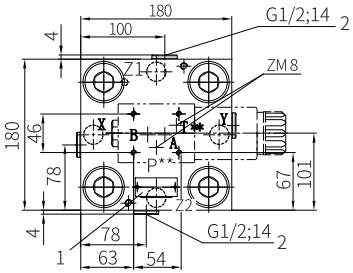
LFA.WEMA...
Direction spool valve
model: 4WE10D





LFA.WEMB...
Direction spool valve
model: 4WE10D





P**,T**,F**[1)]	ZM8

[1)] Ordering code of throttle see page 07/24

1 Name plate
2 Optional ports X/Y/Z1/Z2 used as threaded connection ports
3 Plug ZM8 for model: ..WEMB... (port B with or without throttle F * *, port A with plug)
4 Plug ZM8 for model: ..WEMA... (port A with or without throttle F * *, port B with plug)
5 Direction spool valve 4WE10D and screw M6x40-10.9 GB T70.1 must be ordered separately
Weight (kg): 18.6

Control cover "WECA" for set-up of a directional spool valve

Size 16 to 50

LFA | | WECA – 7X | J | / A** | B** | P** | T** |

control cover
size 16 =16
size 25 =25
size 32 =32
size 40 =40
size 50 =50
control cover type

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

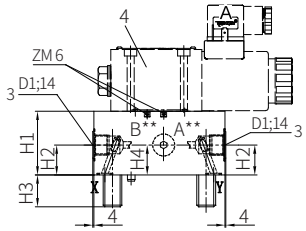
throttle at port Φ1/10mm
A**⊿ | B**⊿ | P**⊿ | T**⊿

J= Rekith

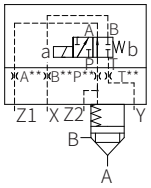
7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)

⊿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

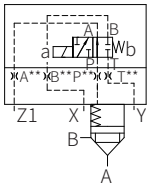
05



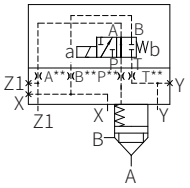
LFA16WECA...
Direction spool valve
model: 3WE6A

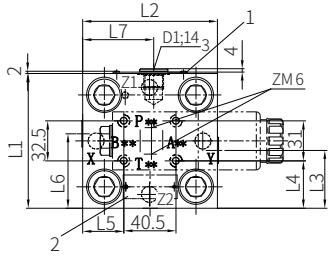


LFA...WECA...
size 25 and 32
Direction spool valve
model: 3WE6A



LFA...WECA...
size 40 and 50
Direction spool valve
model: 3WE6A





Size	16	25	32	40	50
D1	—	—	—	G1/2	G1/2
H1	40	40	50	60	68
H2	—	—	—	30	32
H3	15	24	28	32	34
H4	—	—	—	30	32
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	—	—	—	53	60
L4	17	27	34.5	47	54.5
L5	7	23.5	31	43.5	51
L6	—	—	—	62.5	70
L7	—	—	—	72	80
A**B** P**T**[1)]	ZM 6	ZM 6	ZM 6	ZM 6	ZM 6
Weight kg	1.5	2.1	3.6	6.6	9.3

1) Ordering code of throttle see page 07/24

1 Name plate for size 16/25/32
2 Name plate for size 40/50
3 Optional ports X/Y/Z1 used as threaded connection ports for size 40 and 50
4 Direction spool valve 3WE6A and screw M5x50-10.9 GB T70.1 must be ordered separately

Control cover "WECA" for set-up of a directional spool valve

Size 63

LFA | 63 | WECA – 7X | J | / A** | B** | P** | T** |

control cover
size
control cover type
70 to 79 series =7X
(70 to 79 series installation and connection size unchanged)

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

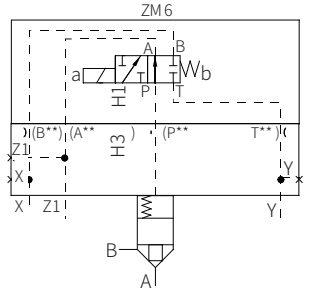
throttle at port Φ1/10mm
A**⊿ | B**⊿ | P**⊿ | T**⊿

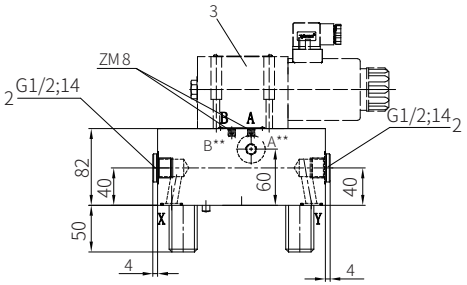
J= Rekith

⊿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

05

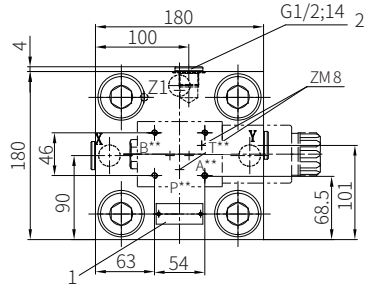
LFA63WECA...
Direction spool valve
model: 3WE10A





A**B** P**,T**1)	ZM8

1) Ordering code of throttle see page 07/24



1 Name plate
2 Optional ports X/Y/Z1/Z2 used as threaded connection ports
3 Direction spool valve 3WE10A and screw M6x40-10.9 GB T70.1 must be ordered separately

Control cover "GWA" and "GWB" for set-up of a directional spool or directional seat valve

Size 16 to 50

LFA | | | – 7X | J | / | A** | B** | P** | T** |

control cover

size 16	=16
size 25	=25
size 32	=32
size 40	=40
size 50	=50

control cover type

normally closed	=GWA
normally open	=GWB

7X= 70 to 79 series (70 to 79 series installation and connection size unchanged)

J= Rekith

sealing material

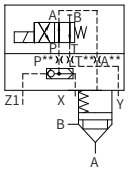
No code=	NBR seals
V=	FKM seals
	(consult for other seals)

control type	throttle at port Φ1/10mm			
GWA	A**◿		P**◿	T**◿
GWB		B**◿	P**◿	T**◿

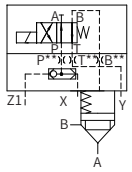
◿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

05

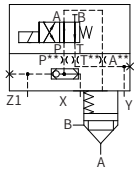
LFA.GWA...
size 16 to 32
Direction spool valve
model: 4WE6D



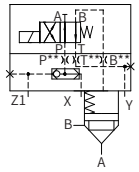
LFA.GWB...
size 16 to 32
Direction spool valve
model: 4WE6D

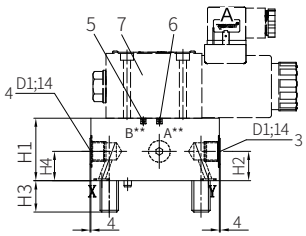


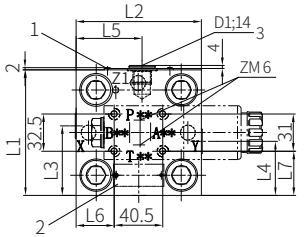
LFA.GWA...
size 40 and 50
Direction spool valve
model: 4WE6D



LFA.GWB...
size 40 and 50
Direction spool valve
model: 4WE6D







Size	16	25	32	40	50
D1	—	—	—	G1/2	G1/2
H1	40	40	50	60	68
H2	—	—	—	30	32
H3	15	24	28	32	34
H4	17	17	21.5	30	32
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	36.5	45.5	50	62.5	72
L4	—	—	—	53	60
L5	—	—	—	62.5	70
L6	7	23.5	31	43.5	51
L7	17	27	34.5	47	54.5
A**B** P**T**[1)]	ZM 6	ZM 6	ZM 6	ZM 6	ZM 6
Weight kg	1.5	2.1	3.6	6.6	9.3

1 Name plate for size 16/25/32
2 Name plate for size 40/50
3 Optional ports Y and Z1 used as threaded connection ports for size 40/50
4 Shuttle valve
5 Plug ZM6 for model: ..GWA...(port B with plug only)
6 Plug ZM6 for model: ..GWB...(port A with plug only)
7 Direction spool valve 4WE6D and screw M5x50-10.9 GB T70.1 must be ordered separately

Control cover "GWA" and "GWB" for set-up of a directional spool or directional seat valve

Size 63

LFA | | | – 7X | J | / | A** | B** | P** | T** |

control cover

size

control cover type

normally closed	=GWA
normally open	=GWB

70 to 79 series =7X
(70 to 79 series installation and connection size unchanged)

J= Rekith

sealing material

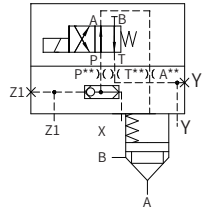
No code=	NBR seals
V=	FKM seals
	(consult for other seals)

throttle at port Φ1/10mm			
A**◿	B**◿	P**◿	T**◿

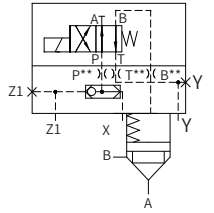
◿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

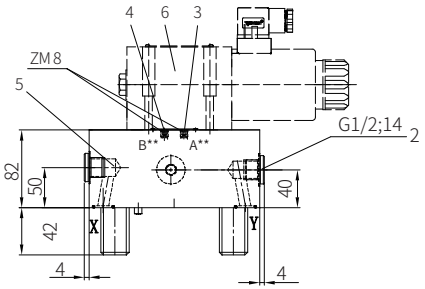
05

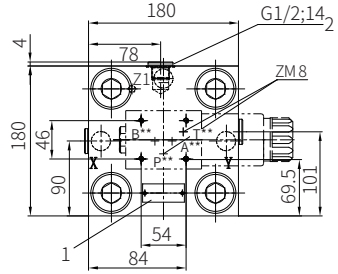
LFA.63GWA...
Direction spool valve
model: 4WE10D



LFA.63GWB...
Direction slide valve
model: 4W E10D







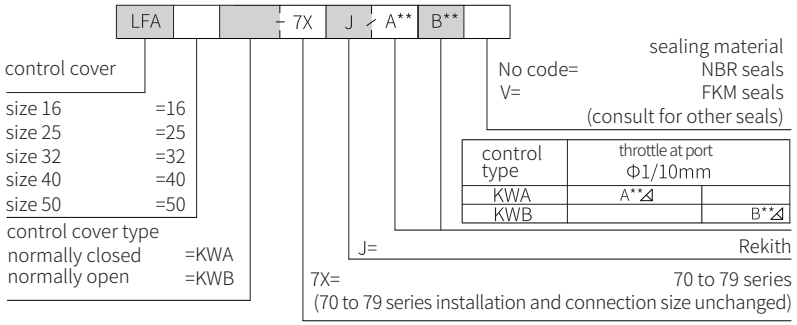
1 Name plate
2 Optional ports Y and Z1 used as threaded connection ports for size 40/50
3 Plug ZM8 for model: ..GWB...(port A with plug only)
4 Plug ZM8 for model: ..GWA...(port B with plug only)
5 Shuttle valve
6 Direction spool valve 4WE10D and screw M5x50-10.9 GB T70.1 must be ordered separately
Weight (kg): 18.6

A**B** P**,T**[1)]	ZM8

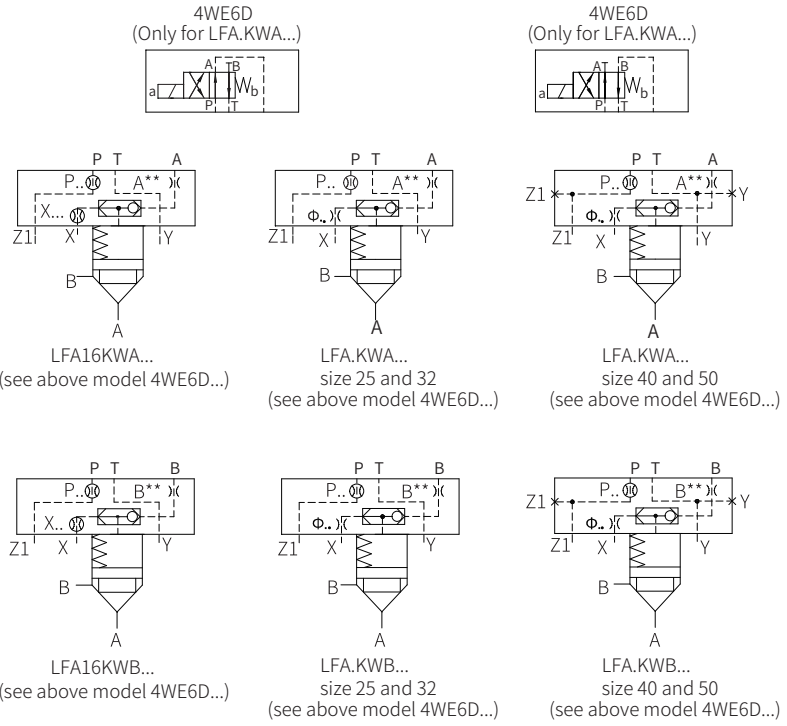
[1)] Ordering code of throttle see page 07/24

Control cover "KWA" and "KWB" for set-up of a directional spool or directional seat valve

Size 16 to 50

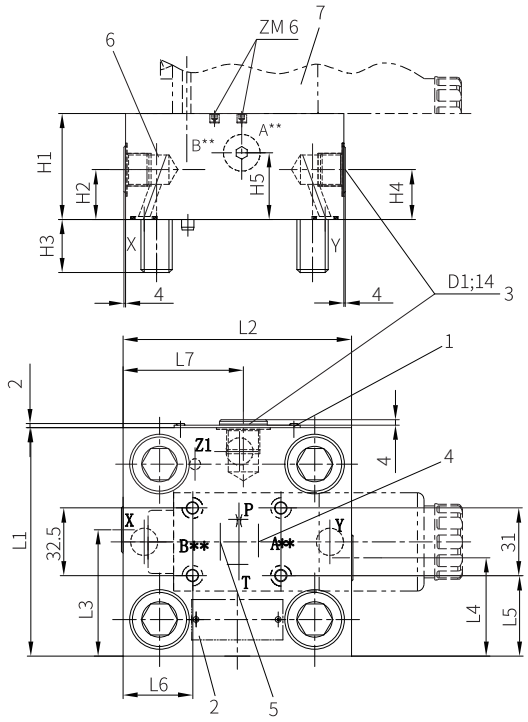


⊿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24



Control cover "KWA" and "KWB" for set-up of a directional spool or directional seat valve

Model ..KWA/..KWB..(size 16 to 50)



Size	16	25	32	40	50
D1	—	—	—	G1/2	G1/2
H1	40	40	50	60	68
H2	17	17	21.5	30	32
H3	15	24	28	32	34
H4	—	—	—	30	32
H5	—	—	—	30	50
L1	65	85	100	125	140
L2	80	85	100	125	140
L3	36.5	45.5	50	62.5	72
L4	—	—	—	53	60
L5	17	27	34.5	47	54.5
L6	7	23.5	31	43.5	51
L7	—	—	—	62.5	70
A**B**[1)]	ZM 6	ZM 6	ZM 6	ZM 6	ZM 6
Weight kg	1.5	2.1	3.6	6.6	9.3

1 Name plate for size 16/25/32
2 Name plate for size 40/50
3 optional ports Y and Z1 used as threaded connection ports for size 40/50
4 Plug ZM6 for model ..KWB...(port A with plug only)
5 Plug ZM6 for model ..KWA...(port B with plug only)
6 Shuttle valve
7 Direction spool valve 4WE6D and screw M5x50-10.9 GB T70.1 must be ordered separately

[1)]Ordering code of throttle see page 07/24

Control cover "KWA" and "KWB" for set-up of a directional spool or diretional seat valve

Size 63

LFA | 63 | – 7X | J | A** | B** | X**

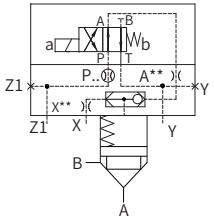
- control cover
- size
- control cover type
  - normally closed =KWA
  - normally open =KWB
- sealing material
  - No code= NBR seals
  - V= FKM seals
  - (consult for other seals)

control type	throttle at port Φ1/10mm	
KWA	A**⊿	
KWB		B**⊿

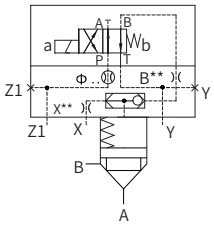
- J= Rekith
- 7X= 70 to 79 series (70 to 79 series installation and connection size unchanged)

⊿ If necessary, please provide specifications of the throttle
e.g. X12= throttle Φ 1.2mm
Standard throttle see page 07/24

LFA63KWA...
Direction spool valve
model: 4WE10D

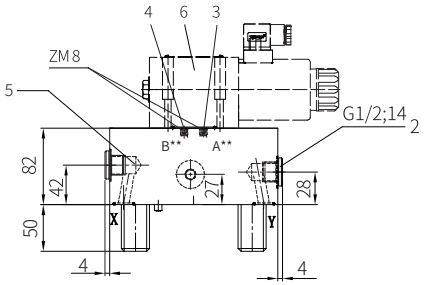


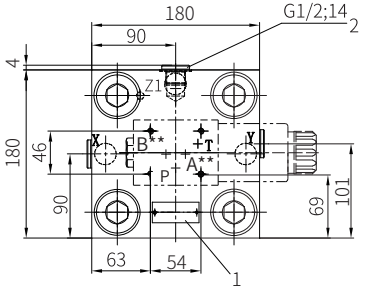
LFA63KWB...
Direction spool valve
model: 4WE10D



A**B**[1]	ZM8

[1] Ordering code of throttle see page 07/24





1 Name plate
2 Optional ports Y and Z1 used as threaded connection ports for size 40/50
3 Plug for model ..KWB...
4 Plug for model ..KWA...
5 Shuttle valve
6 Direction spool valve 4WE10D and screw M6x40-10.9 GB T70.1 must be ordered separately
Weight (kg): 18.6

2-way Logic Cartridge Valves Pressure Function

Model: LC...7XJ(logic cartridge valves)
LFA...7XJ(control cover)

- ◆ Size 16/63
- ◆ Maximum working pressure 420 bar
- ◆ Maximum working flow 2500 L/min

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Features

- ● Cartridge spool and various sleeves to meet relief and reducing function
- ● One sleeve with multi-spool in cartridge structure
- ● Area ratio 1:1 and 1.07:1
- ● Optional throttle
- ● Different cracking pressures

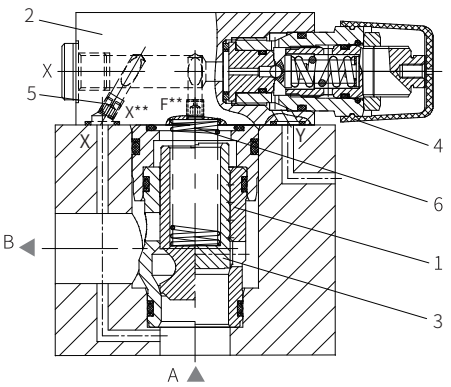
Function description, sectional drawing

General

The 2-way logic cartridge pressure valves are pilot operated poppet valves or spool valves. The main valve component is a logic cartridge valve (1) which is inserted into the standard hole according to DIN 7368 and sealed with control cover.

The pilot valve (4) is integrated into the control cover (2) or installed as pilot valve onto the control cover (2). Its mounting surface is in accordance with DIN24340(2).

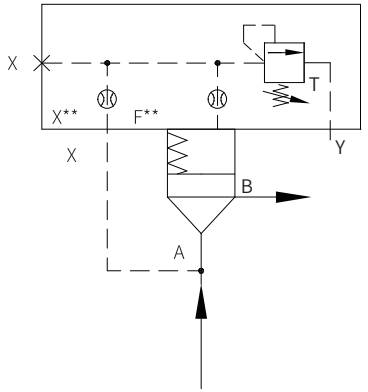
The different pressure functions can be realized by combining the logic cartridge valve and control cover.



Model LC..DB..D.. Model LC..DB..E..

Pressure relief function
Control cover LFA... DB...
Logic cartridge valve LC... DB...

The logic cartridge valve (1) (model LC... DB...) with pressure relief function is a seat valve with an area ratio 1:1 (no effective area at port B). The pressure acting at port A is fed to the spring cavity (6) of the main valve through the pilot oil supply orifice (5). When the pressure is lower than the setting pressure of the pilot valve (4), the hydraulic force on the main spool (3) is balanced and the spring force keeps the main valve closed. When the pressure reaches the set value, the main spool opens and limits the pressure at port A according to the pressure-flow characteristics.



Model LFA..DB..
Model LC..DB..

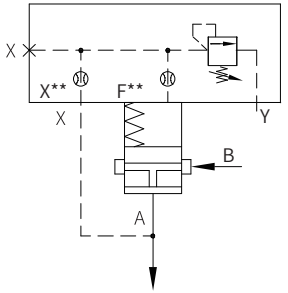
Function description, sectional drawing

Pressure reducing function

a)Normally open: Control cover LFA...DB...
Logic cartridge valve LC...DR...

The logic cartridge valve with pressure reducing function is seat valve with an area ratio of 1:1 (no effective area at port B). It adopts the control cover (model LFA...DB...) which has same function with the relief valve as pilot valve.

The pressure acting at port A is fed to the spring cavity of the main valve through the pilot oil supply orifice. When the pressure is lower than the setting pressure of the pilot valve, the hydraulic force on the main spool is balanced and the spring force keeps the main valve spool opens. The fluid can flow freely from B to A. When the pressure reaches the set value, the main spool closes and reducing the pressure at port A according to the pressure-flow characteristics.



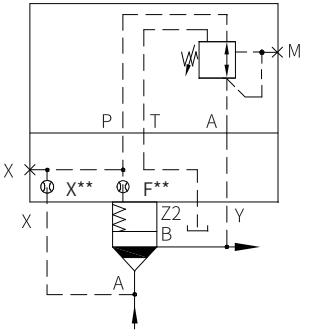
e.g. Model LFA..DB.. / Model LC..DR..

b) Normally closed: Control cover LFA...DR...
Logic cartridge valve LC...DB..D...

For the pressure reducing function with opening characteristics, a logic cartridge pressure relief valve (mode LC...DB..D...) and a control cover (model LFA...DR) with a pressure reducing valve as the pilot valve are used.

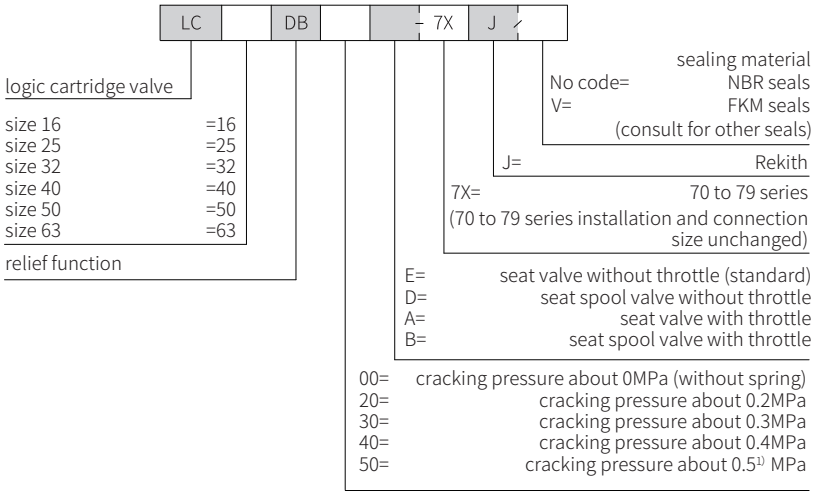
The pilot control oil supplied from port A flows into port B through the pilot oil supply orifice and the opened pilot reducing valve. The main spool is opened to allow freely flow from A to B. When the set pressure is reached, the main spool closes and reduces the pressure at port B according to the pressure-flow characteristics.

If the unexpected pressure increases on the pressure reducing side (port B), pressure relief via the third port of the pilot valve. By installing a directional valve, an additional isolating function can also be attained (model LFA...DRW...).



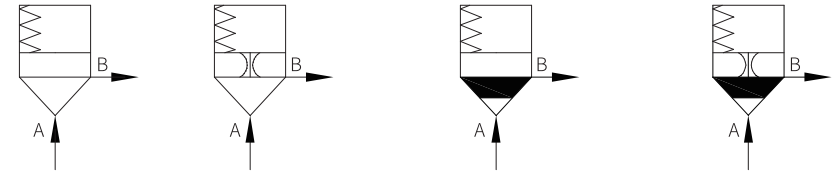
e.g. Model LFA..DR.. / Model LC..DB40D..

Logic cartridge valves models and specifications



1) Only for size 16, 25, 32

Logic cartridge valves functional symbols



Seat valve without throttle Type E

Seat valve with throttle Type A

Seat spool valve without throttle Type D

Seat spool valve with throttle Type B

Technical parameters

Working medium		Mineral oil - for NBR seal or FKM seal Phosphate ester - for FKM seal					
Working medium temperature range °C		30 to +80 (NBR seal) 20 to +80 (FKM seal)					
Viscosity range mm²/s		2.8 to 380					
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9 and ISO4406 Class 20 / 18 / 15					
2-way logic cartridge valve							
Maximum working pressure-oil port A and B bar		420					
Maximum flow (Recommended)	Size	16	25	32	40	50	63
	Logic cartridge seat valves "E" and "A" L/min	300	450	600	1000	1600	2500
	Logic cartridge spool valves "D" and "B" L/min	175	300	450	700	1400	1750

1) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

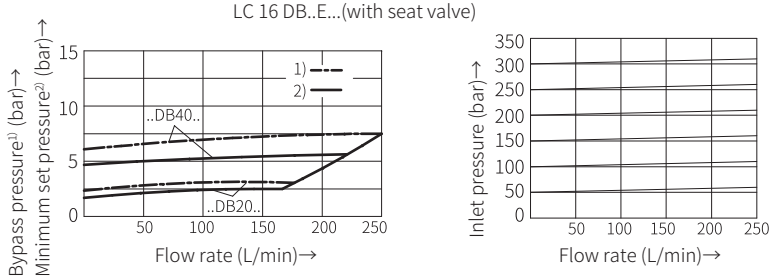
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

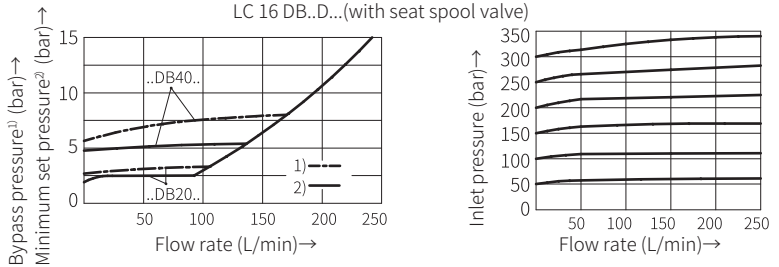
Size 16

The characteristic curve is measured when the external pilot oil drains at zero pressure.
When the internal pilot oil drains, the inlet pressure increases along with the pressure at port B.

LC 16 DB..E...(with seat valve)



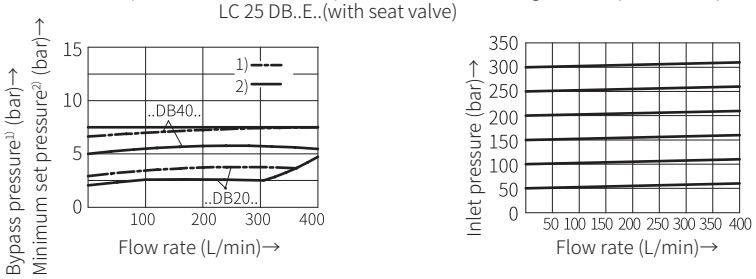
LC 16 DB..D...(with seat spool valve)



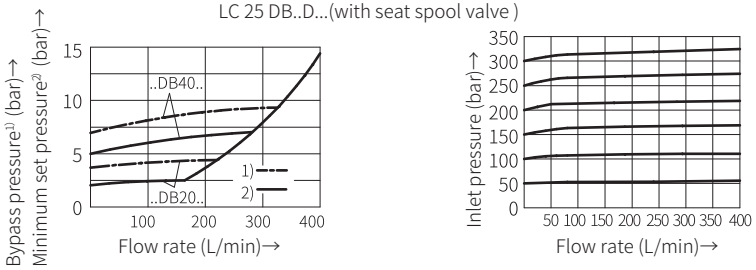
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)
Size 25
The characteristic curve is measured when the external pilot oil drains at zero pressure.
When the internal pilot oil drains, the inlet pressure increases along with the pressure at port B.

LC 25 DB..E..(with seat valve)



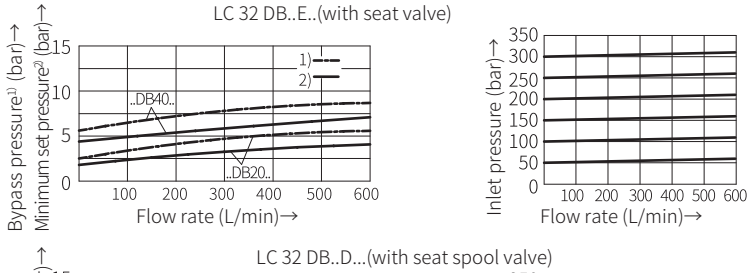
LC 25 DB..D...(with seat spool valve)



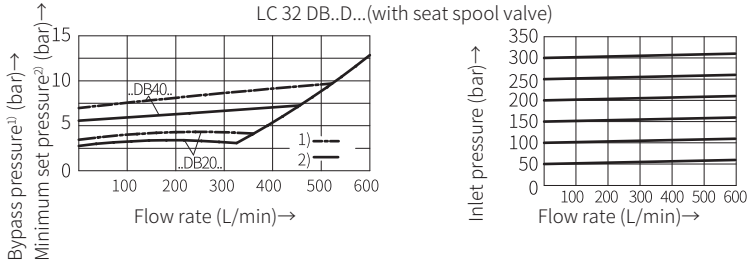
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)
Size 32
The characteristic curve is measured when the external pilot oil drains at zero pressure.
When the internal pilot oil drains, the inlet pressure increases along with the pressure at port B.

LC 32 DB..E..(with seat valve)



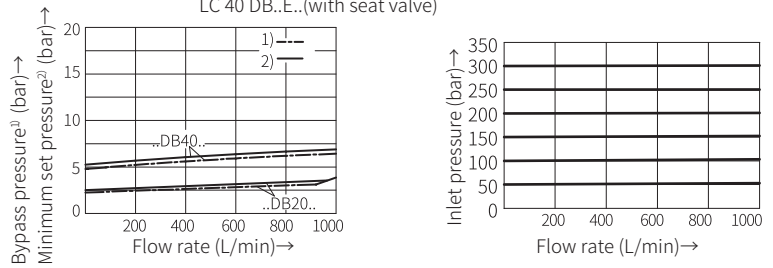
LC 32 DB..D...(with seat spool valve)



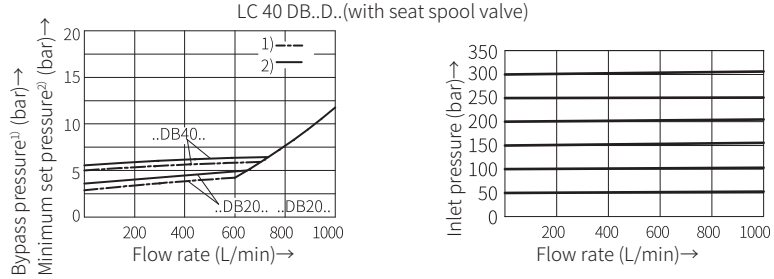
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)
Size 40
The characteristic curve is measured when the external pilot oil drains at zero pressure.
When the internal pilot oil drains, the inlet pressure increases along with the pressure at port B.

LC 40 DB..E..(with seat valve)



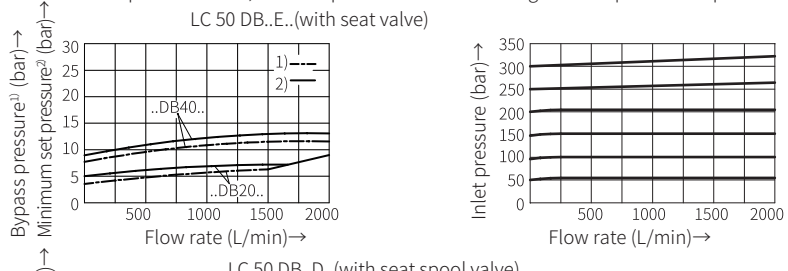
LC 40 DB..D..(with seat spool valve)



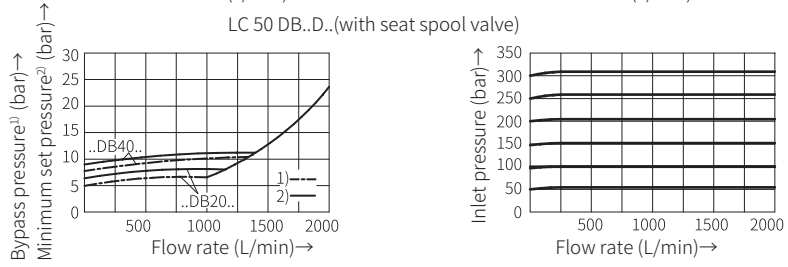
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)
Size 50
The characteristic curve is measured when the external pilot oil drains at zero pressure.
When the internal pilot oil drains, the inlet pressure increases along with the pressure at port B.

LC 50 DB..E..(with seat valve)



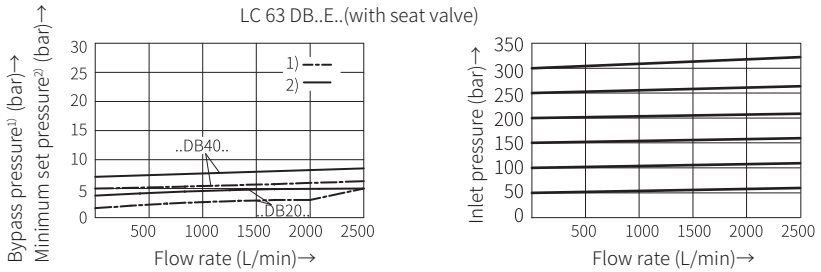
LC 50 DB..D..(with seat spool valve)



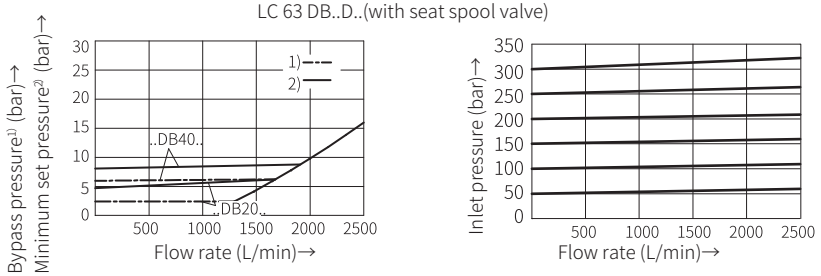
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)
Size 63
The characteristic curve is measured when the external pilot oil drains at zero pressure.
When the internal pilot oil drains, the inlet pressure increases along with the pressure at port B.

LC 63 DB..E..(with seat valve)



LC 63 DB..D..(with seat spool valve)



Technical parameters (Max. working pressure of pilot valve)

	Control cover		Maximum working pressure Y, T bar			Remark
	Size	Model	x	Pressure limitation	Static	
D BD.2K-20/...1)	16 to 32	DB, DBW, DBWD DBU2, DBBU3D, DBS	420	Zero pressure (up to about 2 bar)	315	Supply included
D BD.6K10/...2)	40 to 63		400		315	
.WE6...			350		21(=); 16(~)	Order separately

1)Possible pressure: 25, 50, 100, 200, 315, 400 2)Possible pressure: 25, 50, 100, 200, 315, 400

Technical parameters (model L F A... D B...)

Maximum working pressure	bar	420 Note: The maximum working pressure of the pilot valve must be considered!
Working medium		Mineral oil - for NBR seal or FKM seal
		Phosphate ester - for FKM seal
Working medium temperature range	°C	-30 to +80 (NBR seal))
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	2.8 to 380
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 class 9 and ISO4406 class 20 / 18 / 15

1) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Valve fixing screw (included in the supply list)

GB/T70.1 10.9 grade			
Size	Quantity	Dimension	Tightening torque (Nm)
16	4	M8×45	32
25		M12×50	110
32		M16×60	270
40		M20× 70	520

GB/T70.1 10.9 grade			
Size	Quantity	Dimension	Tightening torque (Nm)
50	4	M20×80	520
63		M30×100	1800
80		M24×120	900
100		M30×120	1800

Control cover "DB" with manual pressure regulation

.. DB... Type (size 16 to 63)

LFA | | DB | | – 7X | J | / | |

control cover
size 16 =16
size 25 =25
size 32 =32
size 40 =40
size 50 =50
size 63 =63

control cover type

adjusting element
rotary knob =1
hexagonal sleeve with protective cap =2
lockable rotary knob with scale =3
rotary knob with scale =4

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

Pressure rating

Size 16, 25, 32		Size 40, 50, 63	
025=	2.5MPa	025=	2.5MPa
050=	5MPa	050=	5MPa
100=	10MPa	100=	10MPa
200=	20MPa	200=	20MPa
315=	31.5MPa	315=	31.5MPa
420=	42MPa	400=	40MPa

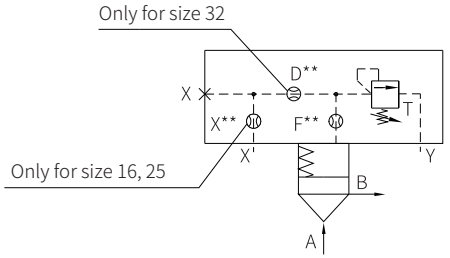
J= Rexroth

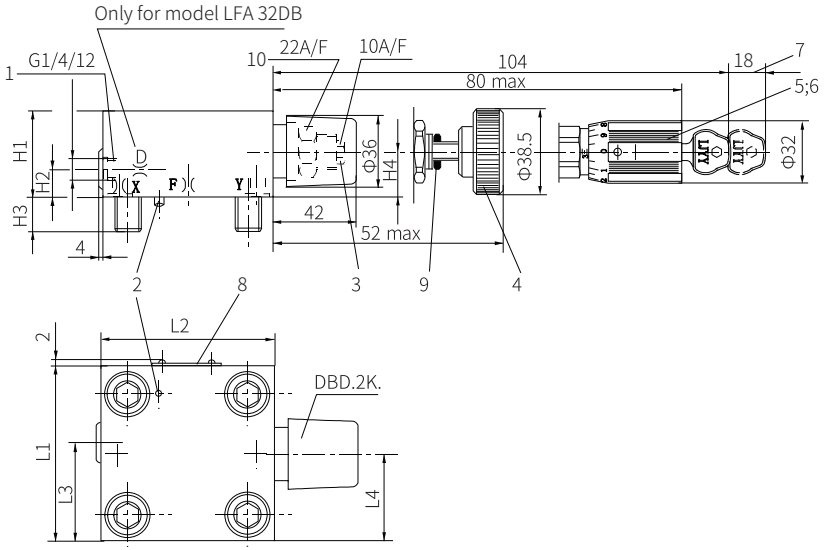
7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)

Control cover "DB" with manual pressure regulation

..DB...type (size 16, 25 and 32)

LFA..DB..-7X/..
Size 16, 25 and 32





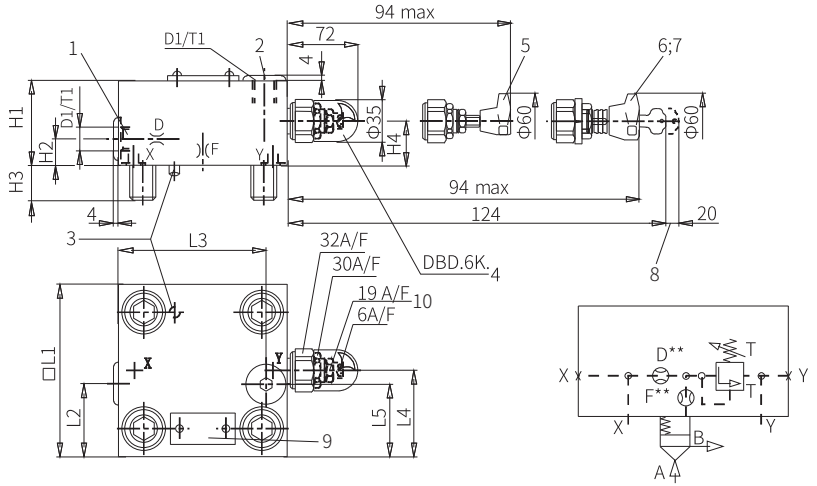
Size	16	25	32
H1	40	40	50
H2	17	19	26
H3	15	24	28
H4	19	19	26
L1	65	85	100
L2	80	85	100
L3	36.5	49	56.5
L4	32.5	45.5	53
Weight Kg	1.7	2.1	3.8

1 Optional port X used as threaded hole
2 Locating pin
3 Adjustment form "2"
4 Adjustment form "1"
5 Adjustment form "3"
6 Adjustment form "4"
7 Space required to remove the key
8 Name plate
9 Locking nut

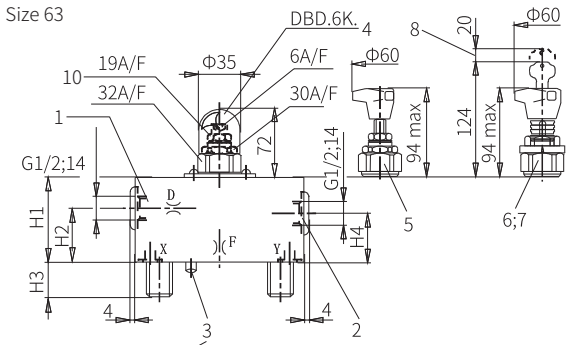
Control cover "DB" with manual pressure regulation

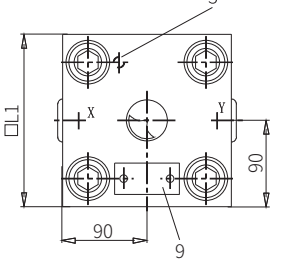
..DB...type (size 40, 50 and 63)

Size 40, 50



Size 63





LFA..DB.-7X/..
Size 40, 50 and 63

1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut

Size	40	50	63
D1	G1 /4	G1 /2	
H1	60	68	82
H2	28	19.5	30
H3	32	34	50
H4	27	35	50
□L1	125	140	180
L2	69	80	
L3	89	105	
L4	76	84	
L5	60	70	
T1	12	14	
Weight Kg	6.8	9.6	18.9

Control cover "DBW" and "DBS" with manual pressure regulation for electric unloading function

..DBW..;..DBS..type (size 16 to 63)

LFA | | | – 7X | J | /

control cover

size 16	=16
size 25	=25
size 32	=32
size 40	=40
size 50	=50
size 63	=63

control cover type

DBW

DBS(only for size 40, 50, 63)

adjusting element

rotary knob	=1
hexagonal sleeve with protective cap	=2
lockable rotary knob with scale	=3
rotary knob with scale	=4

J= Rekith

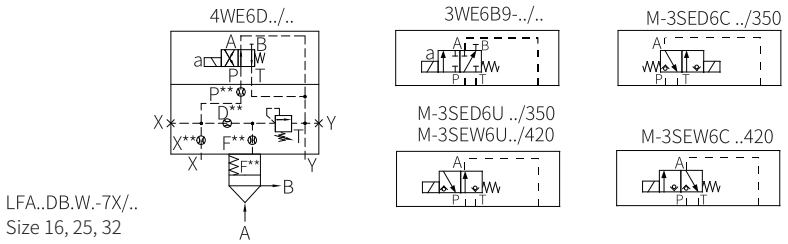
7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)

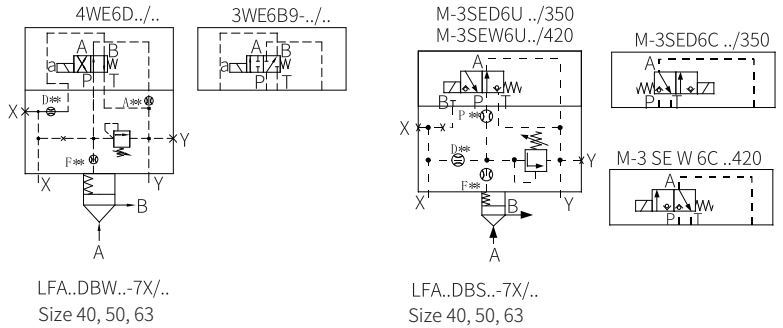
Pressure rating
(Maximum allowable pressure of pilot valve must be considered)

Size 16, 25, 32		Size 40, 50, 63	
025=	2.5MPa	025=	2.5MPa
050=	5MPa	050=	5MPa
100=	10MPa	100=	10MPa
200=	20MPa	200=	20MPa
315=	31.5MPa	315=	31.5MPa
420=	42MPa	400=	40MPa

No code= NBR seals
V= FKM seals
(consult for other seals)

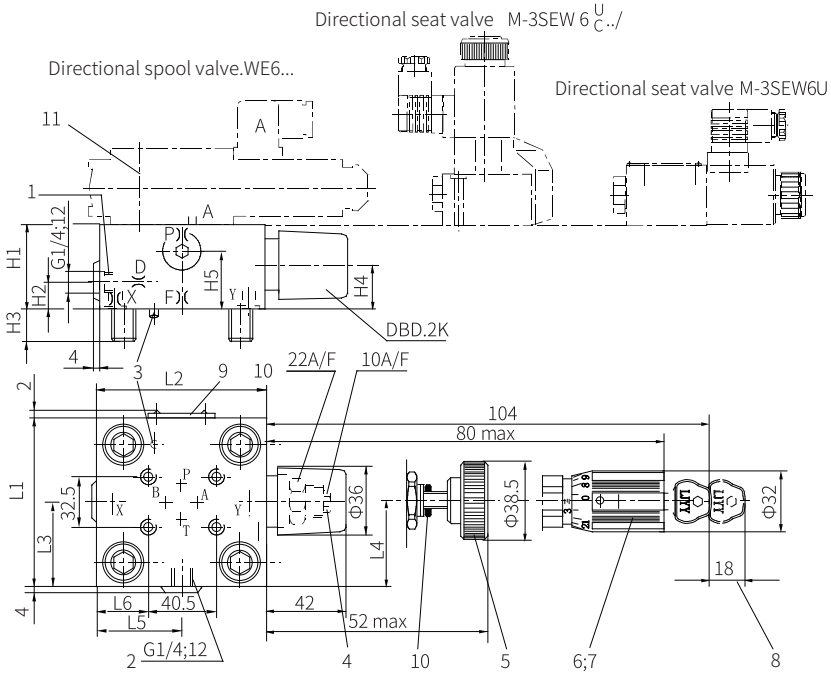
sealing material





Control cover "DBW" and "DBS" with manual pressure regulation for electric unloading function

..DBW..type (size 16 to 32)

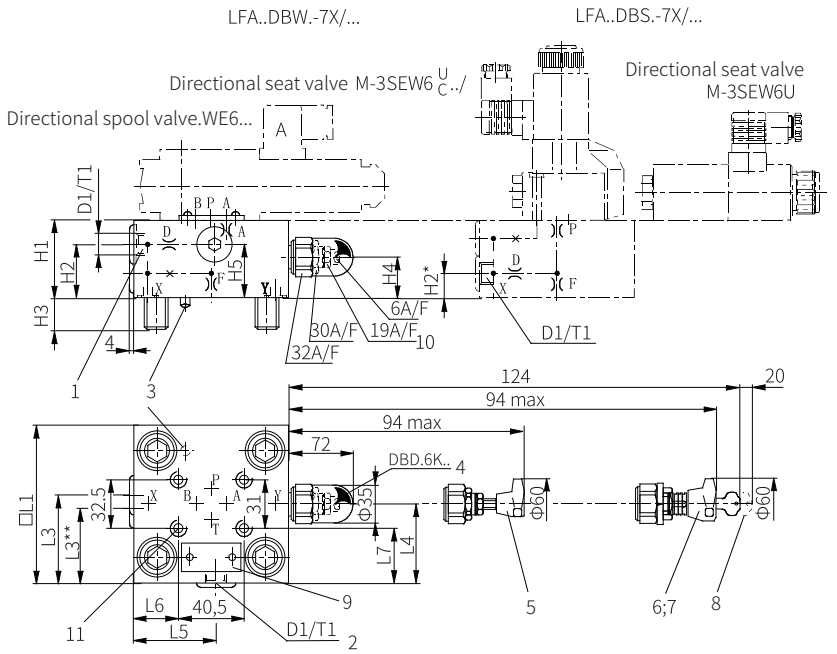


Size	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	Weight kg
16	40	17	15	19	28	65	80	36.5	32.5	35	7	17	1.7
25	40	19	24	19	28	85	85	49	45.5	36	8	27	2.1
32	50	26	28	26	37	100	100	56.5	53	57	31	34.5	38

1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 and screw M5x50-10.9 GB/T70.1 must be ordered separately

Control cover "DBW" and "DBS" with manual pressure regulation for electric unloading function

..DBW..;..DBS..type (size 40 to 50)

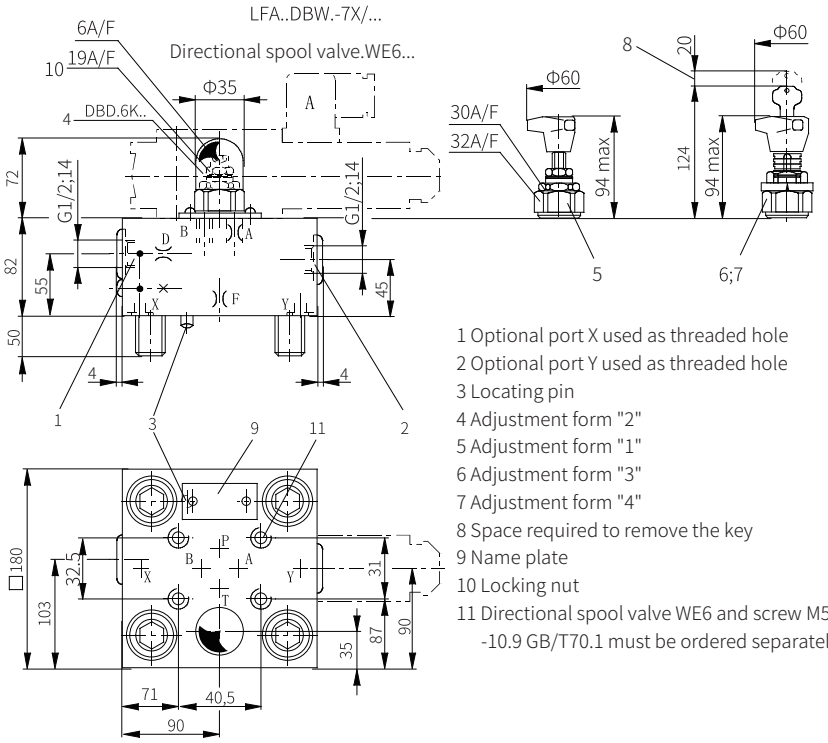


Size	D1	T1	H1	H2	H3	H4	H5	L1	L3	L4	L5	L6	L7	Weightkg
40	G1 /4	12	60	46	32	27	40	125	62.5	76	68	43.5	47	6.8
50	G1/2	14	68	51	34	35	50	140	67.5	84	74.5	51	54.5	9.6

1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 and screw M5x50-10.9 GB/T70.1 must be ordered separately

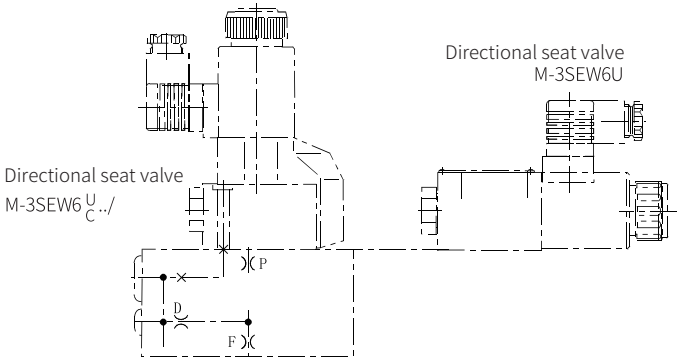
Control cover "DBW" and "DBS" with manual pressure regulation for electric unloading function

..DBW..;..DBS..type (size 63)



1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 and screw M5x50
-10.9 GB/T70.1 must be ordered separately

LFA..DBS.-.../...



Control cover "DBWD" with manual pressure regulation and isolation function

..DBWD...type (size 16 to 63)

LFA | | DBWD | – | 7X | J | / | |

control cover

size 16	=16
size 25	=25
size 32	=32
size 40	=40
size 50	=50
size 63	=63

control cover type

adjusting element

rotary knob	=1
hexagonal sleeve with protective cap	=2
lockable rotary knob with scale	=3
rotary knob with scale	=4

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

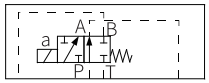
Pressure rating
(Maximum allowable pressure of pilot valve must be considered)

Size 16, 25, 32		Size 40, 50, 63	
025=	2.5MPa	025=	2.5MPa
050=	5MPa	050=	5MPa
100=	10MPa	100=	10MPa
200=	20MPa	200=	20MPa
315=	31.5MPa	315=	31.5MPa
420=	42MPa	400=	40MPa

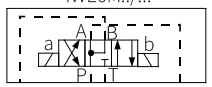
J= Rexroth

7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)

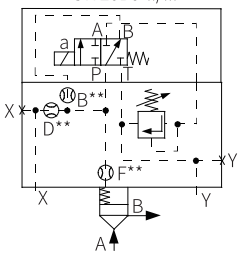
3WE6A../...



4WE6M../...

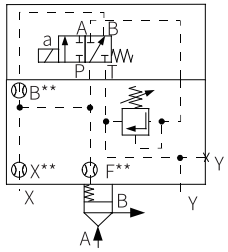


3WE6B9-../...



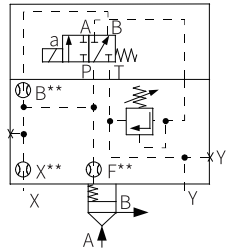
LFA..DBW D.-7X/...
Size 40, 50, 63

3WE6B9-../...



LFA..DBW D.-7X/...
Size 16

3WE6B9-../...

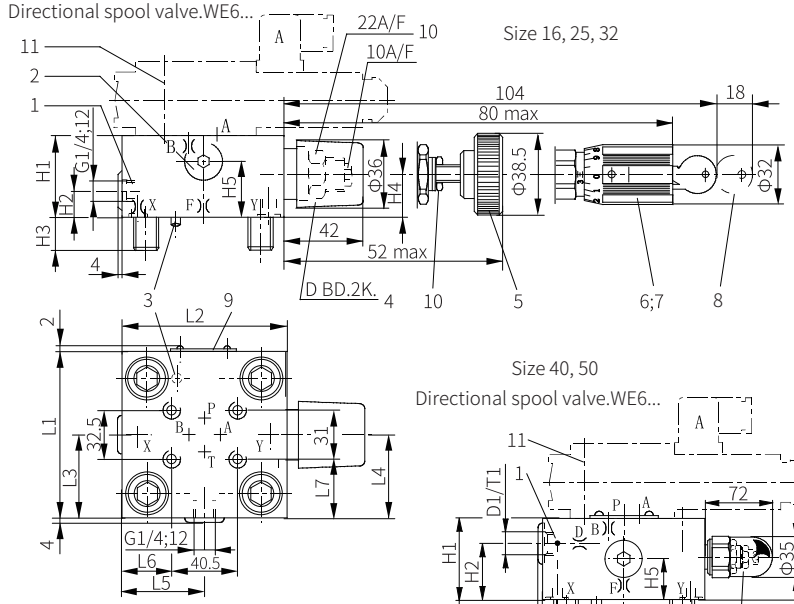


LFA..DBW D.-7X/...
Size 25, 32

Control cover "DBWD" with manual pressure regulation and isolation function

.. DBWD... type (size 16, 25, 32, 40, 50)

Directional spool valve.WE6...

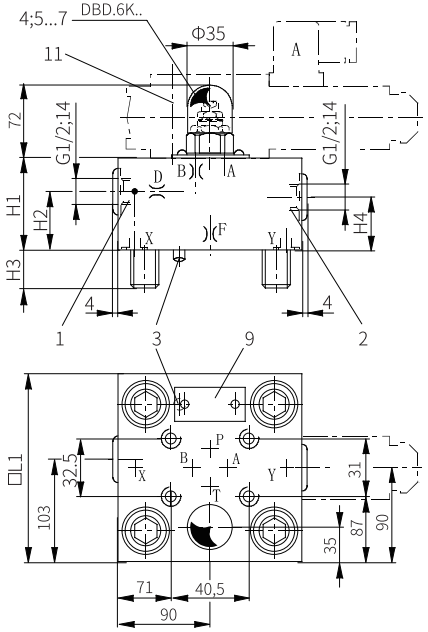


1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 and screw M5x50 -10.9 GB/T70.1 must be ordered separately

Control cover "DBWD" with manual pressure regulation and isolation function

.. DBWD... type (size 63)

Directional spool valve.WE6...



Size	16	25	32	40	50	63
D1				G1/4	G1/2	
H1	40	40	50	60	68	82
H2		19	26	46	50	55
H3	15	24	28	32	34	50
H4	19	19	26	27	35	45
H5	28	28	37	16	20	
L1	65	85	100			
□L1				125	140	180
L2	80	85	100			
L3		49	56.5	62.5	70	
L4	32.5	45.5	53	76	84	
L5	35	36	57	68	75	
L6	7	8	31	43.5	51	
L7	17	27	34.5	47	54.5	
T1				12	14	
L8						

Control cover "DBU2A" and "DBU2B" with two manual pressure regulation by electric selection

.. DBU2A...; DBU2B type (size 16 to 63)

LFA | | | – 7X | J | A... | |

control cover
size 16 =16
size 25 =25
size 32 =32
size 40 =40
size 50 =50
size 63 =63

control cover type
De-energized -DB1(4WE.. D) =DBU2A
De-energized - Open (4WE.. H) =DBU2A
De-energized -DBmax (4WE.. D) =DBU2B
(See symbols)

adjusting element
rotary knob =1
hexagonal sleeve with protective cap =2
lockable rotary knob with scale =3
rotary knob with scale =4

DBmax DB1

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

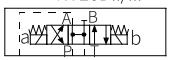
Pressure rating
(Maximum allowable pressure of pilot valve must be considered)

Size 16, 25, 32		Size 40, 50, 63	
025=	2.5MPa	025=	2.5MPa
050=	5MPa	050=	5MPa
100=	10MPa	100=	10MPa
200=	20MPa	200=	20MPa
315=	31.5MPa	315=	31.5MPa
420=	42MPa	400=	40MPa

J= Rekith

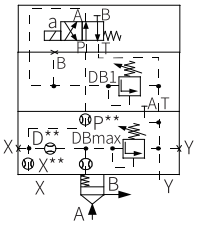
7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)

4WE6D../...



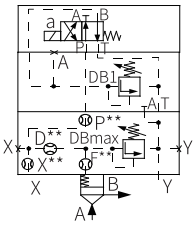
4WE6H../...

4WE6D../...



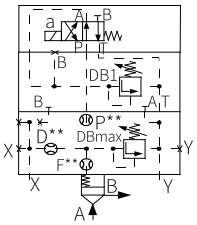
LFA..DBU2A.-7X/...
Size 16, 25, 32

4WE6D../...



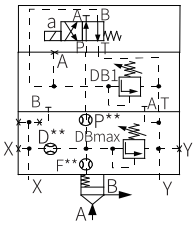
LFA..DBU2B.-7X/...
Size 16, 25, 32

4WE6D../...



LFA..DBU2A.-7X/...
Size 40, 50, 63

4WE6D../...

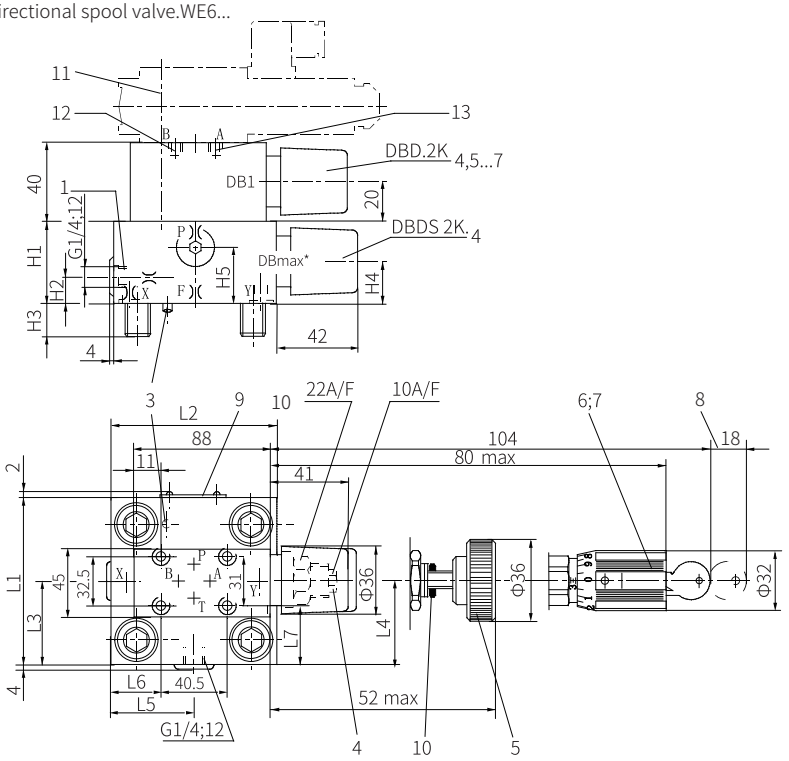


LFA..DBU2B.-7X/...
Size 40, 50, 63

Control cover "DBU2A" and "DBU2B" with two manual pressure regulation by electric selection

..DBU2A...; DBU2B type (size 16 to 32)

Directional spool valve.WE6...



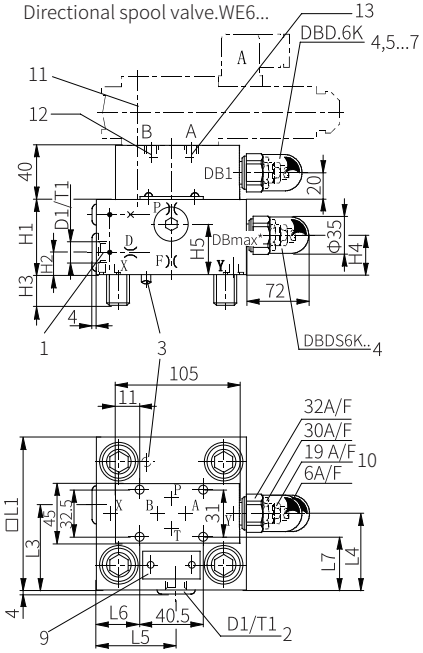
1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 must be ordered separately
Screw M5x90-10.9GB/T70.1 included in the supply list
12 Plug M6 for .DBU 2A
13 Plug M6 for .DBU 2B
*) For DBmax only adjustment form"2" is possible

Size	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	Weight kg
16	40	17	15	19	28	65	80	36.5	32.5	35	7	17	2.8
25	40	19	24	19	28	85	85	49	45.5	36	8	27	3.4
32	50	26	28	26	37	100	100	56.5	53	57	31	34.5	4.8

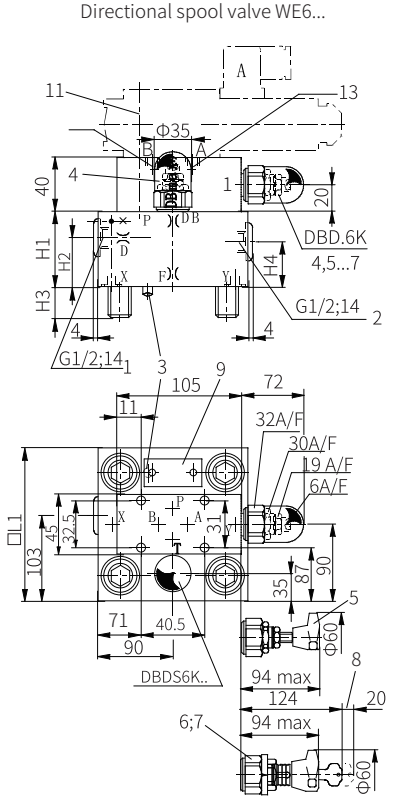
Control cover "DBU2A" and "DBU2B" with two manual pressure regulation by electric selection

..DBU2A...; DBU2B type (size 40 to 63)

Size 40, 50
Directional spool valve.WE6...



Size 63
Directional spool valve WE6...



1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 must be ordered separately
Screw M5x90-10.9GB/T70.1 included in the supply list
12 Plug M6 for .DBU 2A
13 Plug M6 for .DBU 2B
*) For DBmax only adjustment form"2" is possible

Size	D1	T1	H1	H2	H3	H4	H5	L1	L3	L4	L5	L6	L7	Weight kg
40	G1 /4	12	60	46	32	27	40	125	62.5	76	68	43.5	47	8.2
50	G1/2	14	68	19.5	34	35	50	140	80	84	74.5	51	54.5	11.1
63			82	55	50	45		180						20.4

Control cover "DBU3D" with three manual pressure regulation by electric selection

.. DBU3D... type (size 16 to 32)

LFA | DBU3D | – 7X | J | A... | B...

control cover

size 16	=16
size 25	=25
size 32	=32
size 40	=40
size 50	=50
size 63	=63

control cover type

adjusting element

rotary knob	=1
hexagonal sleeve with protective cap	=2
lockable rotary knob with scale	=3
rotary knob with scale	=4

*)Selecting the same adjusting element for DB1 and DB2

DBmax DB1 DB2

sealing material

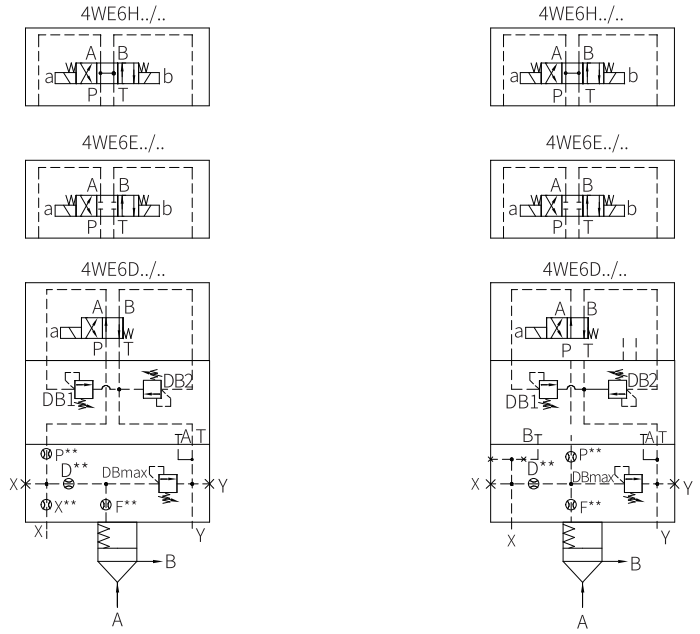
No code= NBR seals
V= FKM seals
(consult for other seals)

Pressure rating
(Maximum allowable pressure of pilot valve must be considered)

Size 16, 25, 32		Size 40, 50, 63	
025=	2.5MPa	025=	2.5MPa
050=	5MPa	050=	5MPa
100=	10MPa	100=	10MPa
200=	20MPa	200=	20MPa
315=	31.5MPa	315=	31.5MPa
420=	42MPa	400=	40MPa

J= Rekith

7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)



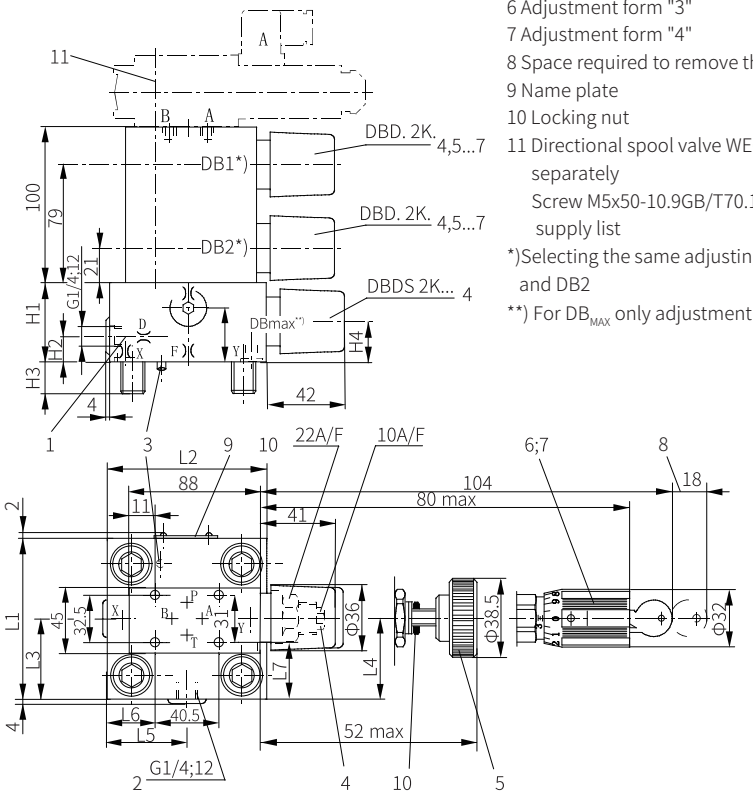
LFA..DBU3D..-7X/...
Size 16, 25, 32

LFA..DBU3D..-7X/...
Size 40, 50, 63

Control cover "DBU3D" with three manual pressure regulation by electric selection

.. DBU3D... type (size 16 to 32)

Directional spool valve 4WE6...



1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 must be ordered separately
Screw M5x50-10.9GB/T70.1 included in the supply list

*)Selecting the same adjusting element for DB1 and DB2

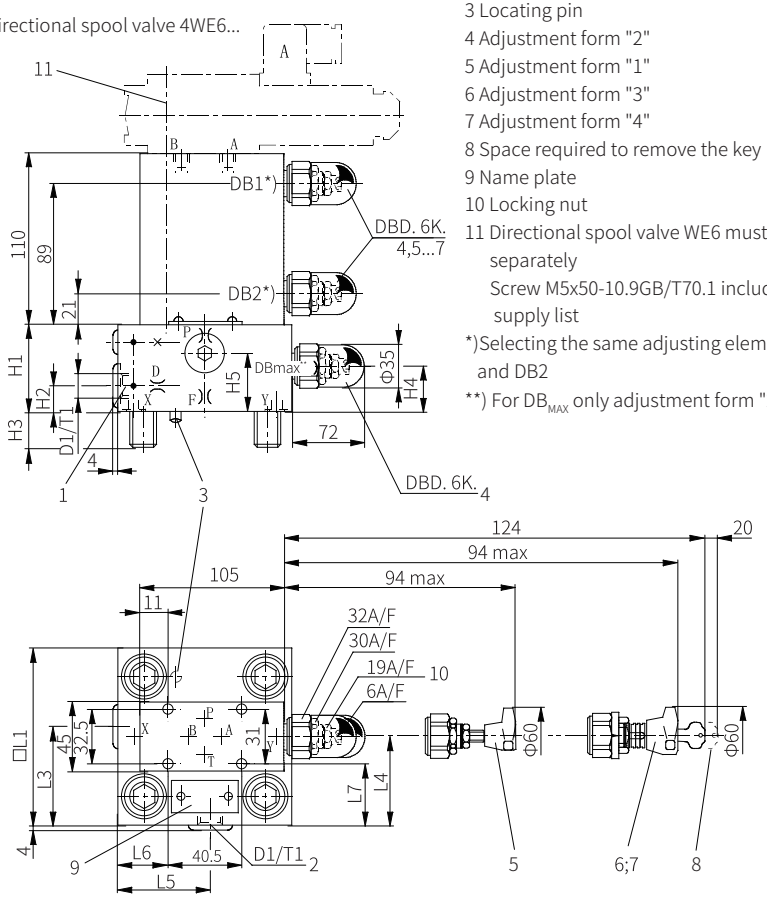
**) For DB_{MAX} only adjustment form "2" is possible

Size	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L6	L7	Weight kg
16	40	17	15	19	28	65	80	36.5	32.5	35	7	17	4.7
25	40	19	24	19	28	85	85	49	45.5	36	8	27	5.1
32	50	26	28	26	37	100	100	56.5	53	57	31	34.5	6.8

Control cover "DBU3D" with three manual pressure regulation by electric selection

.. DBU3D... type (size 40 to 50)

Directional spool valve 4WE6...



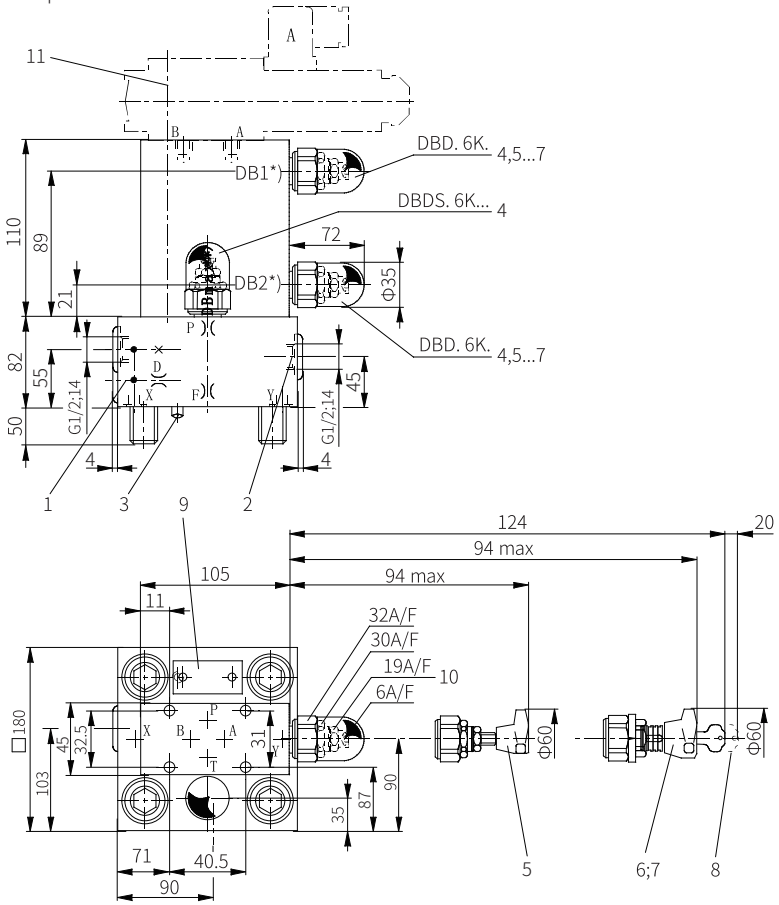
Size	D1	T1	H1	H2	H3	H4	H5	L1	L3	L4	L5	L6	L7	Weight kg
40	G1 /4	12	60	17	32	27	40	125	69	76	68	43.5	47	10.7
50	G1/2	14	68	19.5	34	35	50	140	80	84	74.5	51	54.5	13.4

1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 must be ordered separately
Screw M5x50-10.9GB/T70.1 included in the supply list
*)Selecting the same adjusting element for DB1 and DB2
**) For DB_{MAX} only adjustment form "2" is possible

Control cover "DBU3D" with three manual pressure regulation by electric selection

.. DBU3D... type (size 63)

Directional spool valve 4WE6...



1 Optional port X used as threaded hole
2 Optional port Y used as threaded hole
3 Locating pin
4 Adjustment form "2"
5 Adjustment form "1"
6 Adjustment form "3"
7 Adjustment form "4"
8 Space required to remove the key
9 Name plate
10 Locking nut
11 Directional spool valve WE6 must be ordered separately
Screw M5x50-10.9GB/T70.1 included in the supply list
*)Selecting the same adjusting element for DB1 and DB2
**) For DB_{MAX} only adjustment form "2" is possible

Logic cartridge valves models and specifications

LC | DR | E | 7X | J

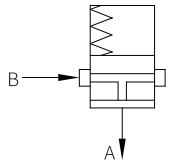
- logic cartridge valve
- size 16 =16
- size 25 =25
- size 32 =32
- size 40 =40
- size 50 =50
- size 63 =63
- reducing function
- the spool valve without precise control groove
- 7X= 70 to 79 series (70 to 79 series installation and connection size unchanged)
- J= Rekith
- sealing material
  - No code= NBR seals
  - V= FKM seals (consult for other seals)

00= cracking pressure about 0MPa(without spring)
20= cracking pressure about 0.2[1)]MPa
30= cracking pressure about 0.3[1)]MPa
40= cracking pressure about 0.4MPa
50= cracking pressure about 0.5MPa

[1)]Only for size 16, 25 and 32

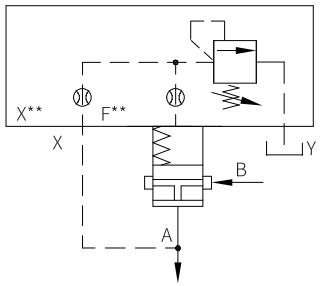
Logic cartridge valves functional symbols

Model: LC ..DR..



Attention!

It is composed of 2-way logic cartridge valve LC... DR... and control cover LFA... DB...



pressure reducing function

Normally open

Example:

Model: LFA..DB... / LC..DR40...

Technical parameters

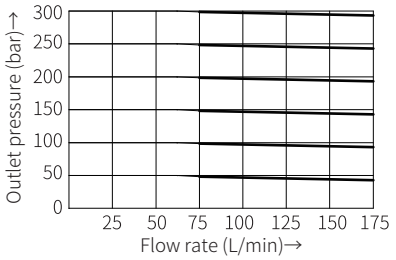
Maximum working pressure	Oil ports A and B bar	315					
Maximum flow (Reference)	Size	16	25	32	40	50	63
	LC..DR20.... L/min	100	200	300	750	1000	600
	LC..DR40... L/min	150	300	450	1000	1300	2000
Weight kg		0.25	0.5	1.1	1.9	3.9	7.2
Work medium		Mineral oil - for NBR seal or FKM seal					
		Phosphate ester - for FKM seal					
Working medium temperature range °C		-30 to +80 (NBR seal)					
		-20 to +80 (FKM seal)					
Viscosity range mm^2/s		2.8 to 380					
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9 and ISO4406 Class 20 / 18 / 15[1)]					

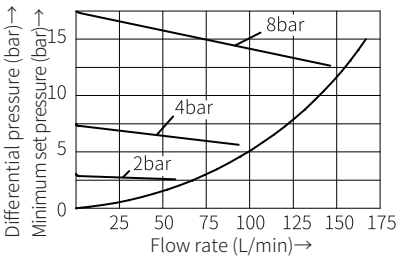
1) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

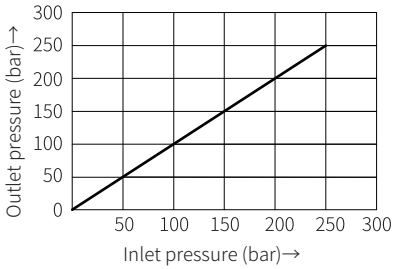
Characteristic curve

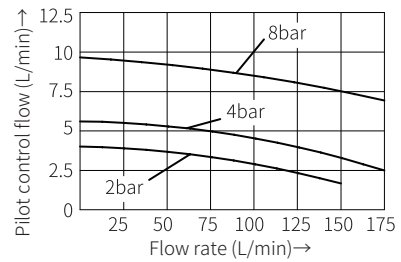
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

LC16DR...







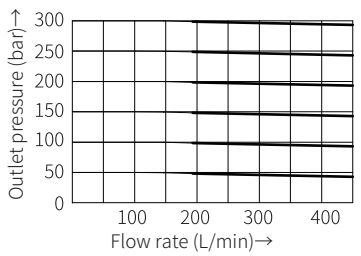


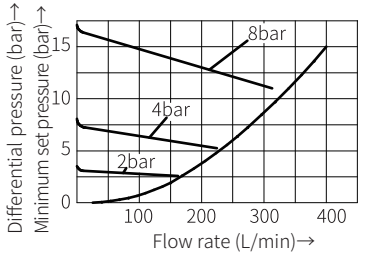
Measured at p_a=50bar

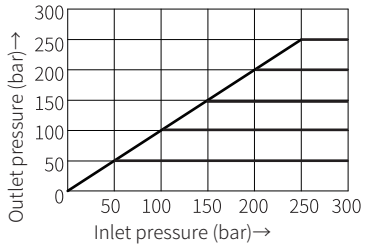
Characteristic curve

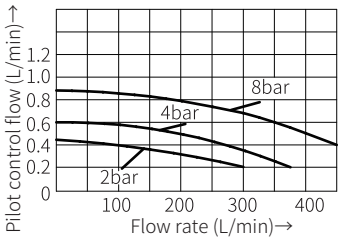
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

LC25DR...



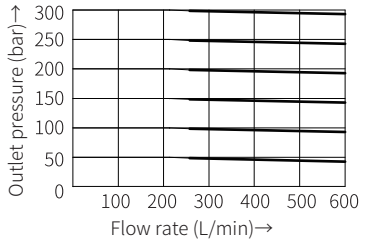


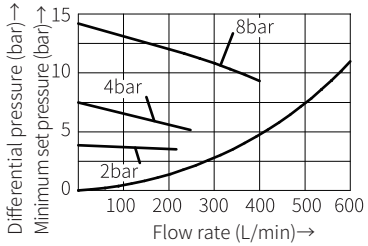


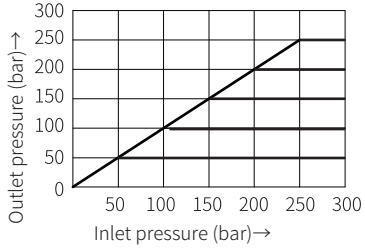


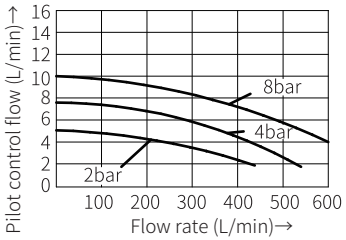
Measured at p_a=50bar

LC32DR...







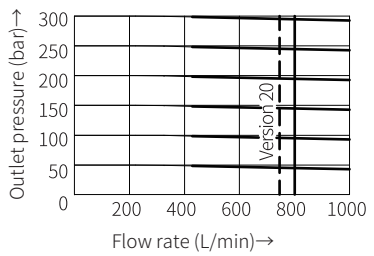


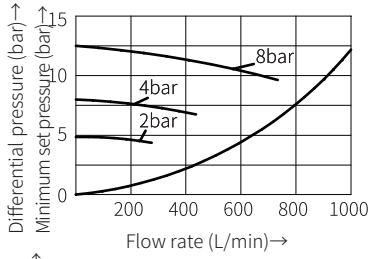
Measured at p_a=50bar

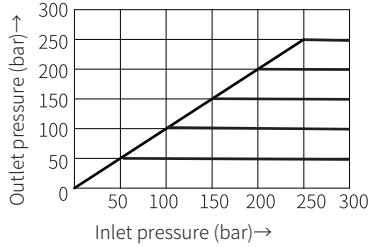
Characteristic curve

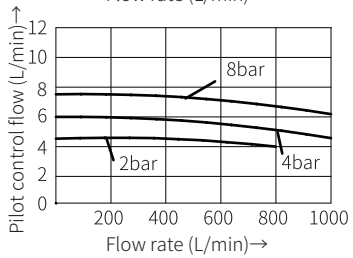
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

LC40DR...



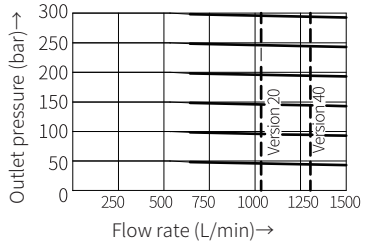


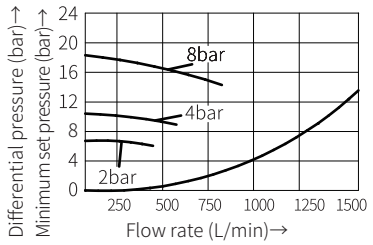


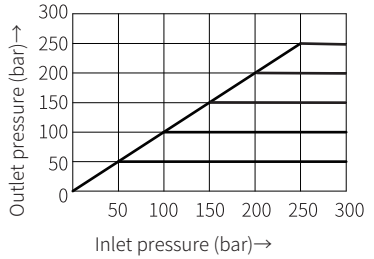


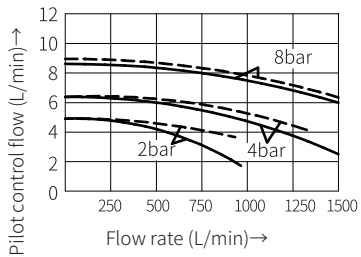
Measured at p_a=50bar

LC50DR...







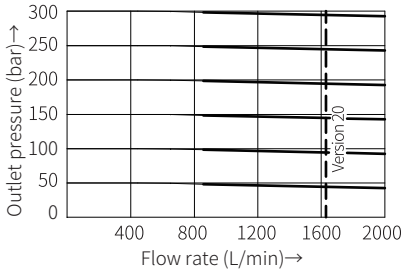


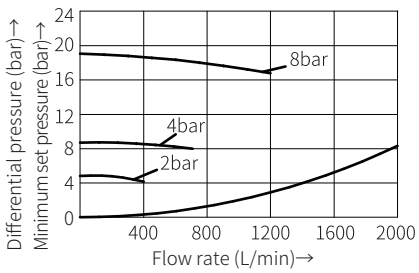
Measured at p_a=50bar

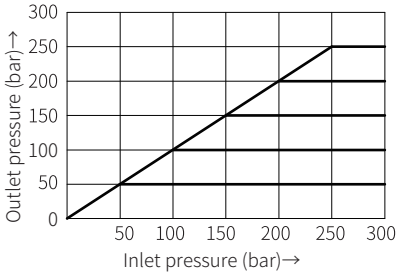
Characteristic curve

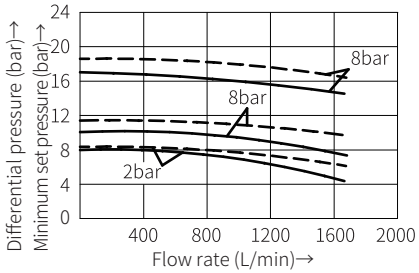
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

LC63DR...



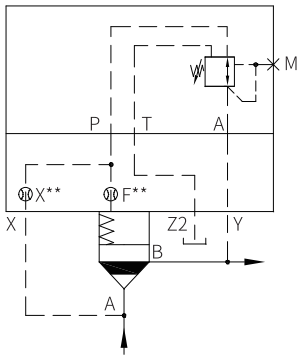






Measured at p_a=50bar

Application example



Attention!

It is composed of 2-way logic cartridge valve LC... DB... and control cover LFA... DR...

pressure reducing function

Normally closed

Example:

Model: LFA.. DR... / LC..DB 40 D...

Technical parameters

Working medium		Mineral oil - for NBR seal or FKM seal					
		Phosphate ester - for FKM seal					
Working medium temperature range	°C	-30 to +80 (NBR seal)					
		-20 to +80 (FKM seal)					
Viscosity range	mm^2/s	2.8 to 380					
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9 and ISO4406 Class 20 / 18 / 15					
Size		16	25	32	40	50	63
Weight	kg	3.1	3.6	5.2	8	11.4	20.8

The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

Control cover		
Maximum working pressure at the oil port...		Control cover type L-LFA..DR.—../.. L-LFA..DRW.—../...
... X(basic pressure)		315bar
... Y(secondary pressure = maximum set pressure)		315bar
...Z2	As control pressure	0bar (Maximum 2bar)
	Static	60bar

Valve fixing screw (included in the supply list)

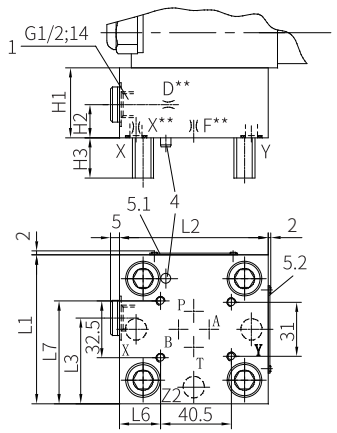
GB/T70.1 10.9 grade			
Size	Quantity	Dimension	Tightening torque (Nm)
16	4	M8×45	32
25		M12×50	110
32		M16×60	270

GB/T70.1 10.9 grade			
Size	Quantity	Dimension	Tightening torque (Nm)
40	4	M20×70	520
50		M20×80	520
63		M30×100	1800

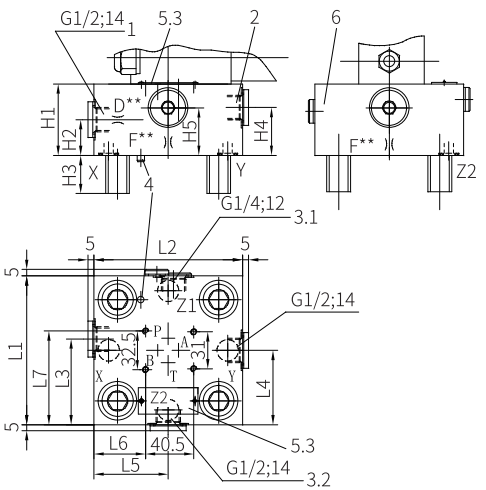
Control cover "DR" and "DRW" component size

Size unit: mm

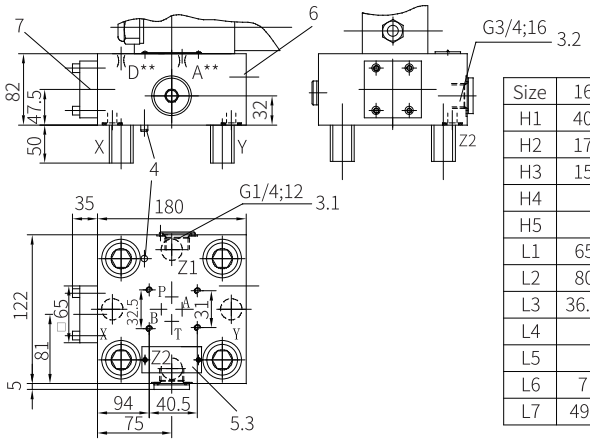
Size 16, 25, 32



Size 40, 50



Size 63



Size	16	25	32	40	50
H1	40	40	50	60	68
H2	17	19	26	30	32
H3	15	24	28	32	34
H4				40	32
H5				40	32
L1	65	85	100	125	140
L2	80	85	100	125	40
L3	36.5	49	56.5	72	80
L4				62.5	68
L5				62.5	70
L6	7	23.5	31	43.5	51
L7	49	59	66.5	79	86.5

1 Optional port X used as threaded hole (for size 16 to 50)
2 Optional port Y used as threaded hole (for size 40 to 50)
3.1 Optional port Z1 used as threaded hole (for size 25 to 63)
3.2 Optional port Z2 used as threaded hole (for size 40 to 63)
4 Locating pin
5.1 Name plate (size 16)
5.2 Name plate (size 25, 32)
5.3 Name plate (size 40, 50 and 63)
6 Check valve (for size 40, 50 and 63)
7 For control cover size 63
2 -way logic cartridge valve size 16

Control cover "DR" with pressure reducing function

.. DR... type (size 16 to 63)

LFA | DR | – 7X | J | /

control cover

size 16	=16
size 25	=25
size 32	=32
size 40	=40
size 50	=50
size 63	=63

control cover type

adjusting element

rotary knob	=1
hexagonal sleeve with protective cap	=2
lockable rotary knob with scale	=3
rotary knob with scale	=4

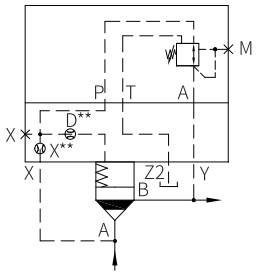
sealing material

No code=	NBR seals
V=	FKM seals (consult for other seals)

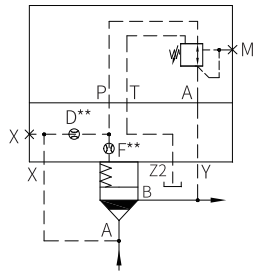
025=	Maximum secondary pressure is 2.5MPa
075=	Maximum secondary pressure is 7.5MPa
150=	Maximum secondary pressure is 15MPa
210=	Maximum secondary pressure is 21MPa
315=	Maximum secondary pressure is 31.5MPa

J= Rekith

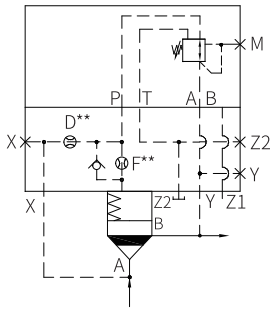
7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)



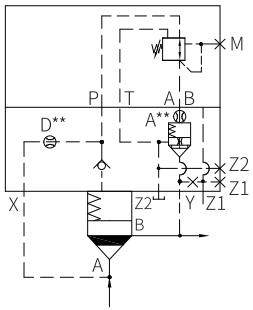
LFA...DR.7X/..
Size 16



LFA...DR.7X/..
Size 25 and 32



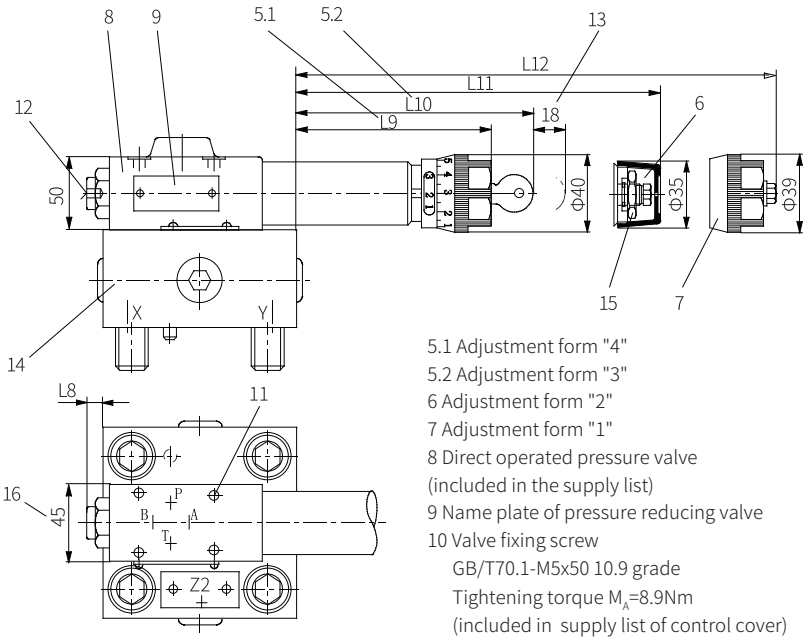
LFA...DR.7X/...
Size 40 and 50



LFA...DR.7X/...
Size 63

Control cover "DR" with pressure reducing function

.. DR... type (size 16 to 63)



5.1 Adjustment form "4"
5.2 Adjustment form "3"
6 Adjustment form "2"
7 Adjustment form "1"
8 Direct operated pressure valve (included in the supply list)
9 Name plate of pressure reducing valve
10 Valve fixing screw
GB/T70.1-M5x50 10.9 grade
Tightening torque M_A=8.9Nm
(included in supply list of control cover)
11 Pressure gauge connection G1/4, depth 12
Socket screw 6A/F
12 Space required to remove the key
13 Control cover
14 Locknut 24A/F
15 For model... /315→50mm

Size		16	25	32	40	50	63
L8		23	6				
	.../315	30.5	14	6			
L9		99.5	111	103.5	91	83.5	67.5
	.../315	96.5	108	100.5	88	80.5	64.5
L10		99.5	111	103.5	91	83.5	67.5
	.../315	96.5	108	100.5	88	80.5	64.5
Other size		See page 32/36					

Control cover "DRW" with pressure reducing and isolating function

.. DRW... type (size 16 to 63)

LFA | | DRW | – 7X | J | /

control cover
size 16 =16
size 25 =25
size 32 =32
size 40 =40
size 50 =50
size 63 =63

control cover type

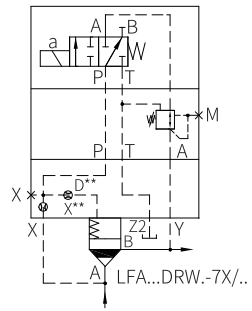
adjusting element
rotary knob =1
hexagonal sleeve with protective cap =2
lockable rotary knob with scale =3
rotary knob with scale =4

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

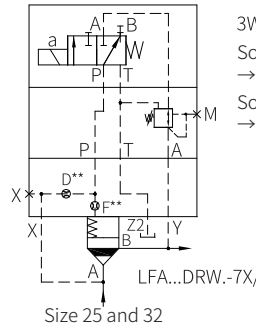
025= Maximum secondary pressure is 2.5MPa
075= Maximum secondary pressure is 7.5MPa
150= Maximum secondary pressure is 15MPa
210= Maximum secondary pressure is 21MPa
315= Maximum secondary pressure is 31.5MPa

J= Rekith

7X= 70 to 79 series
(70 to 79 series installation and connection size unchanged)

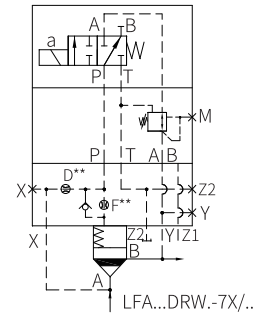


Size 16

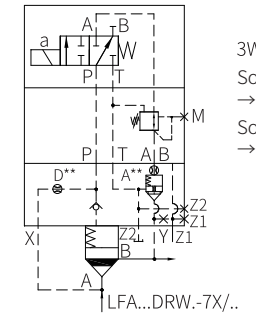


Size 25 and 32

3WE6B9-.../...
Solenoid de-energized
→ closed
Solenoid energized
→ pressure reducing function



Size 40 and 50

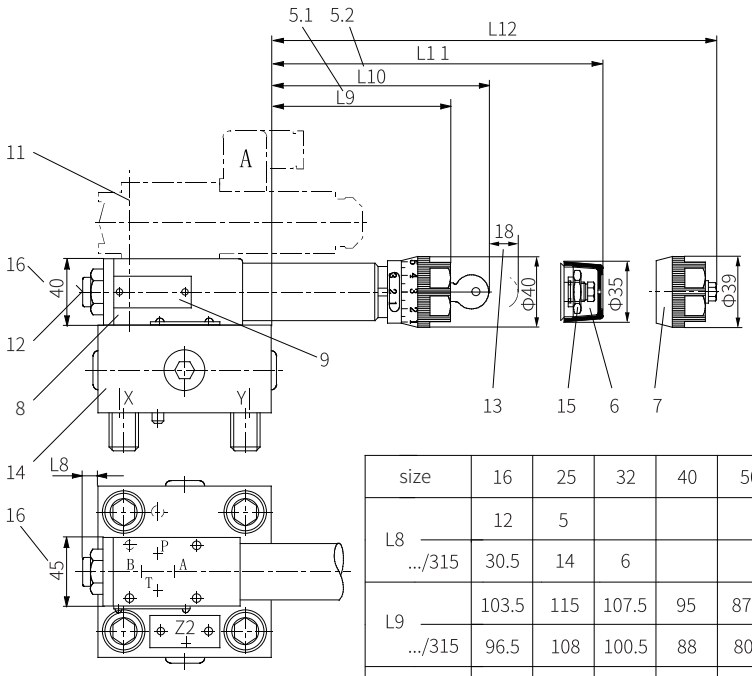


Size 63

3WE6B9-.../...
Solenoid de-energized
→ closed
Solenoid energized
→ pressure reducing function

Control cover "DRW" with pressure reducing and isolating function

...DRW...type (size 16 to 63)



size	16	25	32	40	50	63
L8	12	5				
.../315	30.5	14	6			
L9	103.5	115	107.5	95	87.5	71.5
.../315	96.5	108	100.5	88	80.5	64.5
L10	103.5	115	107.5	95	87.5	71.5
.../315	96.5	108	100.5	88	80.5	64.5
other size	see page 32/36					

5.1 Adjustment form "4"
5.2 Adjustment form "3"
6 Adjustment form "2"
7 Adjustment form "1"
8 Direct operated pressure reducing valve
(included in the supply list)
9 Name plate of pressure reducing valve
10 Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000 M_A=7.8Nm
(included in the supply list of control cover)
11 Pressure gauge connection G1/4, depth 12
Socket screw 6A/F
13 Space required to remove the key
12 Control cover
13 Locknut 24A/F
14 For model.../315 → 50mm

2-way Logic Cartridge Valves-with Spool Position Monitoring Function

Model: LFA...7XJ(control cover)

- Size 16 to 50
- Maximum working pressure 40 bar

Contents

—— Control cover "E" 02
—— Control cover "EH2" 03
—— Control cover "EWA" and "EWB" 04-07

Features

- Directly monitor the close and switching position of the valve
- Long life cycle
- The control cover and logic cartridge valves included in the model

Control cover "E" with spool position monitoring

Size 16 to 50

LFA | | E | – 7X | J | ⁄ | | D | QMG24 | F | | |

control cover
size 16 =16
size 25 =25
size 32 =32
size 40 =40
size 50 =50

70 to 79 series =7X
(70 to 79 series installation and connection size unchanged)

Rekith =J

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

throttle at port
Φ1/10mm
x** ⊿

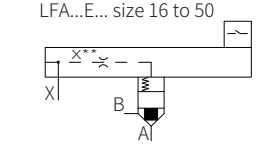
QM: Inductive position switch type
G24: 24V DC voltage

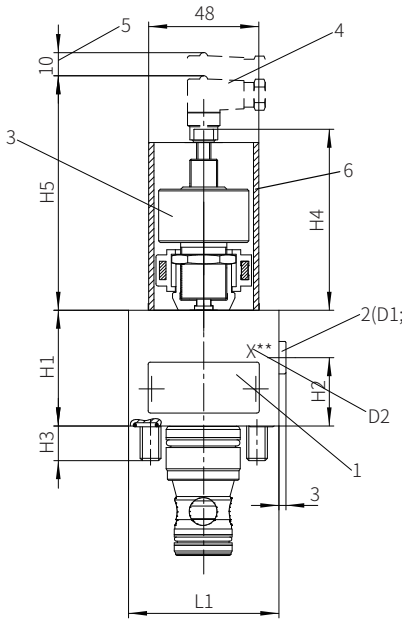
cracking pressure P_0
10= 1.0bar
20= 2.0bar
40= 4.0bar

area ratio A1:A2
CA= 2:1
CB= 14.3:1

⊿ If necessary, please provide specifications of the throttle

LFA...E... size 16 to 50





Size	16	25	32	40	50
D1	G1/8	G1/4	G1/4	G1/2	G1/2
D2	M6	M6	M6	M8*1	M8*1
H1	50	50	70	110	120
H2	12	16	16	83	93
H3	15	24	28	32	34
H4	78	78	78	98	78
H5	105	105	105	123	123
L1	65	85	100	125	140
T1	8	12	12	14	14

1、Name plate
2、Optional port X used as threaded port
3、Inductive position switch type QM
4、Cable plug
5、Space required to remove the plug
6、Protective cap

Control cover "EH2" with spool position monitoring

Size 16 to 32

LFA | | EH2 | – 7X | J | ⁄ | | F | QMG24 | F | | |

control cover
size 16 =16
size 25 =25
size 32 =32

70 to 79 series =7X
(70 to 79 series installation and connection size unchanged)

Rekith =J

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

throttle at port
Φ1/10mm
x** ⊿

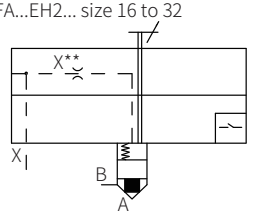
QM: Inductive position switch type
G24: 24V DC voltage

cracking pressure P_0
10= 1.0bar
20= 2.0bar
40= 4.0bar

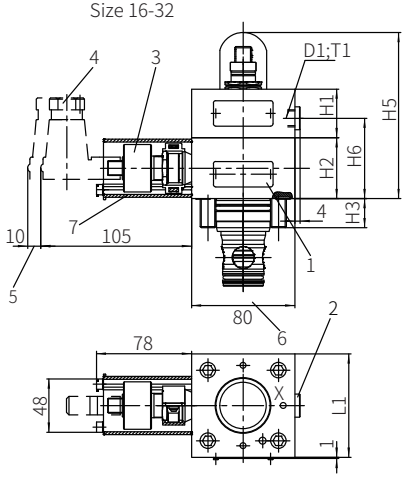
area ratio A1:A2
CA= 2:1
CB= 14.3:1

⊿ If necessary, please provide specifications of the throttle

LFA...EH2... size 16 to 32



Size 16-32



Size	16	25	32
D1	G1/8	G1/4	G1/2
H1	35	40	50
H2	50	50	50
H3	15	24	28
H5	126	130	150
H6	62	66	66
L1	65	85	100
T1	8	12	12

1、Name plate
2、Optional port X used as threaded port
3、Inductive position switch type QM
4、Cable plug
5、Space required to remove the plug
6、For size 16 (for the bottom cover only)
7、Protective cap

Control cover "EWA" and "EWB" for set-up of a directional spool valve with spool position monitoring

Size 16 to 32

LFA | | | | – 7X | J | | D | QMG24 | | |

control cover

size 16 =16
size 25 =25
size 32 =32

type =EWA
=EWB

70 to 79 series =7X
(70 to 79 series installation and connection size unchanged)

Rekith =J

area ratio A1:A2
2:1 =CA
14.3:1 =CB

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

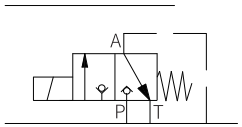
throttle at port Φ1/10mm			
A	B	P	T
A**		P**	T**
	B**	P**	T**

QM: Inductive position switch type
G24: 24V DC voltage

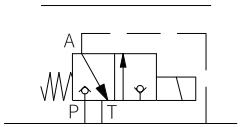
cracking pressure P_0
10= 1.0bar
20= 2.0bar
40= 4.0bar

⊿ If necessary, please provide specifications of the throttle

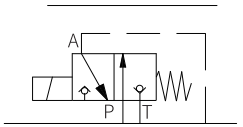
M-3SEW6C.../420



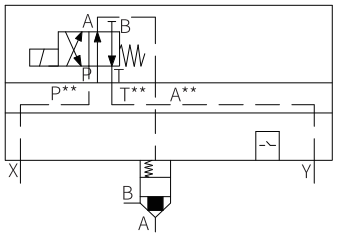
M-3SED6CK.../350



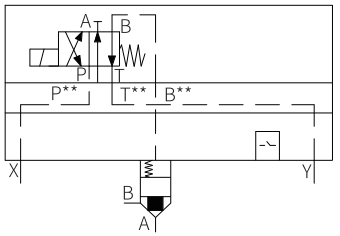
M-3SED6UK.../350
M-3SEW6U.../420



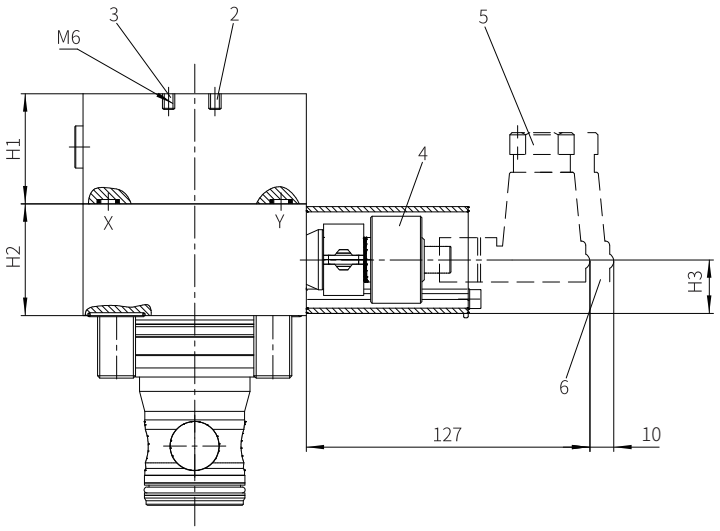
LFA...EWA
Size 16 to 32
With direction spool valve model 4WE6D...

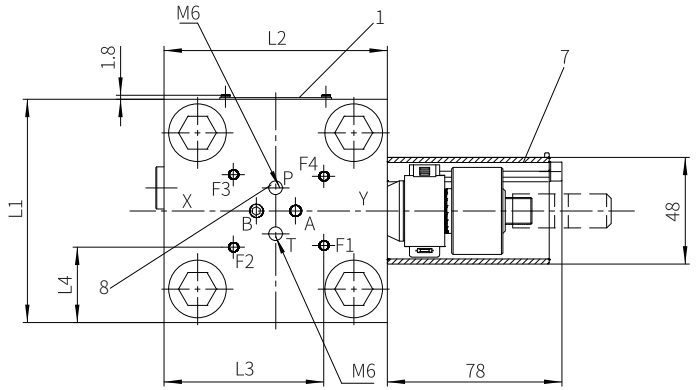


LFA...EWB
Size 16 to 32
With direction spool valve model 4WE6D...



Control cover "EWA" and "EWB" for set-up of a directional spool valve with spool position monitoring





1、Name plate
2、Plug for ...EWB...type
3、Plug for ...EWA...type
4、Inductive position switch type QM
5、Cable plug
6、Space required to remove the plug
7、Protective cap
7、Oil port position in accordance with ISO4401-03-0-94

Size	16	25	32
H1	40	40	50
H2	50	50	50
H3	25	25	25
L1	65	85	100
L2	80	85	100
L3	47.5	64	71.5
L4	17.25	27.25	34.75

Control cover "EWA" and "EWB" for set-up of a directional valve with spool position monitoring

Size 40 to 50

LFA | | – 7X | J | | D | QMG24 | | |

control cover

size 40 =40
size 50 =50

type
=EWA
=EWB

70 to 79 series =7X
(70 to 79 series installation and connection size unchanged)

Rekith =J

area ratio A1:A2
2:1 =CA
14.3:1 =CB

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

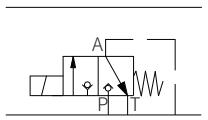
throttle at port Φ1/10mm			
A	B	P	T
A**		P**	T**
	B**	P**	T**

QM: Inductive position switch type
G24: 24V DC voltage

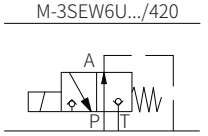
cracking pressure P_0
10= 1.0bar
20= 2.0bar
40= 4.0bar

◿ If necessary, please provide specifications of the throttle

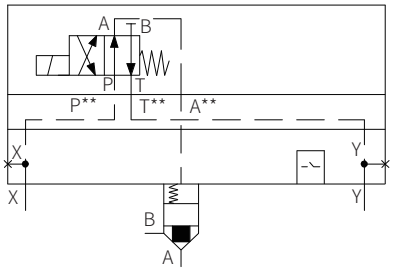
M-3SEW6C.../420



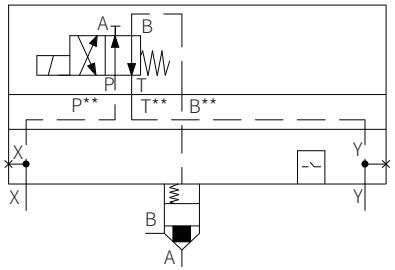
M-3SED6UK.../350
M-3SEW6U.../420



LFA...EWA
Size 40 and 50
With direction spool valve model 4WE6D...

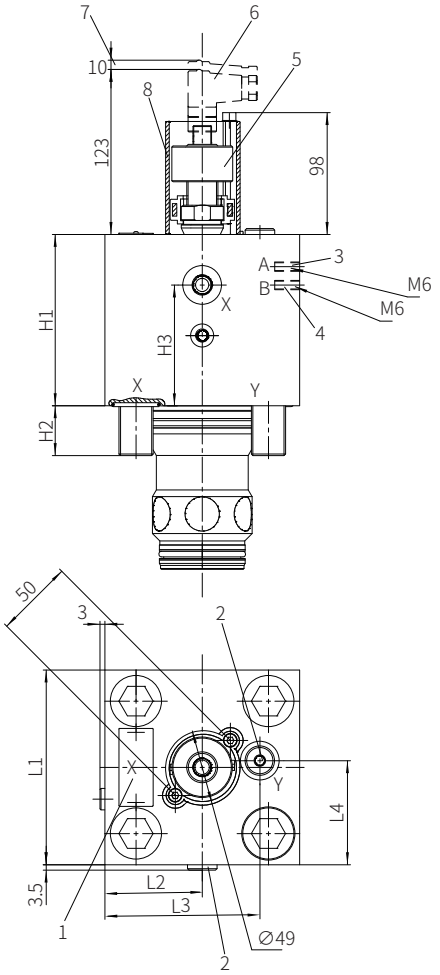


LFA...EWB
Size 40 and 50
With direction spool valve model 4WE6D...



Control cover "EWA" and "EWB" for set-up of a directional valve with spool position monitoring

Size 40 to 50



1、Name plate
2、Optional ports X and Y used as threaded port
3、Plug for ...EWB...type
4、Plug for ...EWA...type
5、Inductive position switch type QM
6、Cable plug
7、Space required to remove the plug
8、Protective cap

Size	40	50
H1	110	120
H2	32	34
H3	77.5	87
L1	125	140
L2	62.5	70
L3	98.5	113
L4	66.5	70

6 - Mobile valves

Contents

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- JYT-MH6WE6/Diverter 0919-0922
- JYT-MH8WE8/Diverter 0923-0928
- JYT-MH10WE10/Diverter 0929-0934

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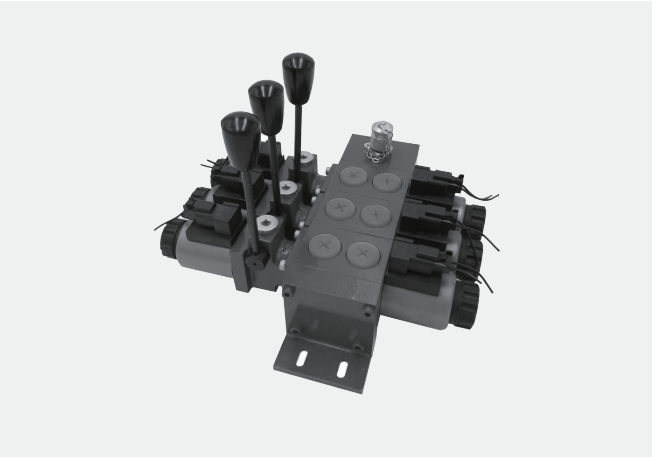
Solenoid Operated Directional Multi-way Valve

Model: DCF6...1XJ



- Size 6
- Maximum working pressure 15 bar
- Maximum working flow 40 L/min

Contents

Function description, sectional drawing	02
Models and specification	03
Technical parameters	03
Component size and functional principle	04-07

Features

- Working port threaded connection
- Manual operated handle, optional
- Operated by solenoid
- Multiple units, optional
- Integrated relief valve
- Integrated hydraulic lock, optional

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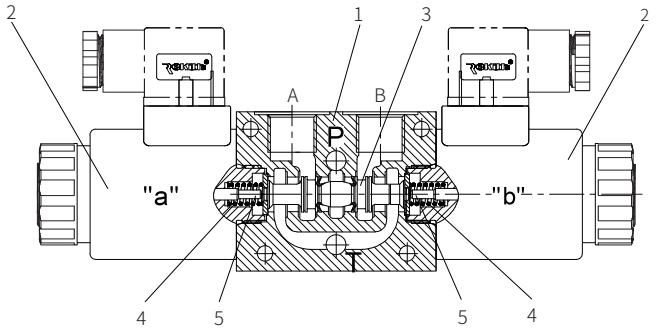
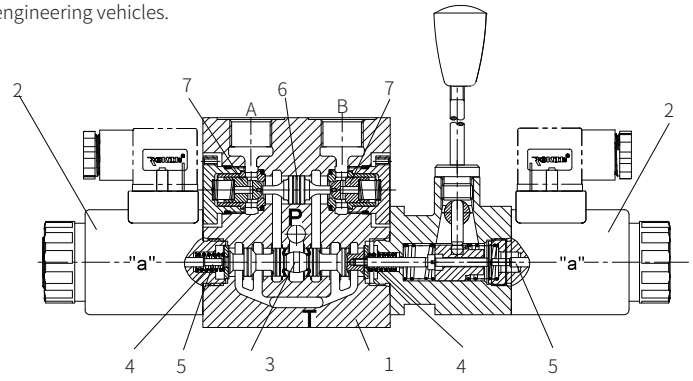
Function description, sectional drawing

The DCF6...-1XJ...B(C)...type solenoid multi-way valve is composed of multiple solenoids operated sectional direction spool valves. It controls the opening, closing and direction of the flow.
The valve mainly consists of the valve body (1), one or two solenoids (2), control spool (3) and two reset springs (4).
The control spool (3) is held in the initial position by means of the reset springs (4) in the de-energized condition. The control spool (3) is operated by wet-pin solenoids (2). The force of the solenoids (2) acts on the control spool (3) through the push rod (5) to push it from the stationary position to the terminal position. In this way, the hydraulic oil passes from P to A and B to T, or from P to B and A to T. After the solenoids (2) are de-energized, the reset spring (4) pushes the control spool (3) back to the middle position.



Model DCF6J-1XJ/CG...B...

The principle of model DCF6...-1XJ/...YS...sectional solenoid multi-way valve is same as model DCF6...-1XJ/...B(C)... but integrated hydraulic lock in the directional valve. When P connected to A of the directional valve, the piston (6) moves to the right to open the conical valve core (7) and allow the fluid to return from B to T to form a circuit. When the solenoid is de-energized, the fluid of the directional valve returns to the tank through channel A and B, at this time, the working chamber A or B forms a holding pressure chamber until the control load remains stationary.
The DCF6 type solenoid multi-way valve adopts modular design, it can be customized oil inlet section with optional manual operated handle, and can add with relief and unloading and other functions as requirement. It is application for hydraulic system of large intelligent agricultural machinery, sanitation machinery, engineering vehicles.



Model DCF6J-1XJ/CG...YS...

Models and specifications

		6		1X	J							*

- solenoid sectional multi-way valve=DCF
  sectional multi-way valve =AM-DCF
  (only for agricultural machinery)
- size 6 =6
- function symbol =G(series connection)
  =J(parallel connection, or with hydraulic check valve)
- 10 to 19 series =1X
  (10 to 19 series installation and connection size unchanged)
- Rekith =J
- voltage DC 12V =CG12
- voltage DC 24V =CG24
- voltage DC 28V =CG28
- oil circuit parallel connection= B
- oil circuit series connection= C
- integrated hydraulic check valve= YS
- No code= standard
- with manual operated handle= M
- 2= number of working unit
  (the modules number according to customers' demands)
- 25= setting pressure of relief valve 25MPa
  (according to customers' request)
- No code= without relief valve
- K4= no insert plug
- Z5L= large right angle lamp plug
- FS2= deutsch water-proof plug
- more information in text
- sealing material
- No code= BNR seals
- V= FKM seals
- (consult for other seals)

Technical parameters

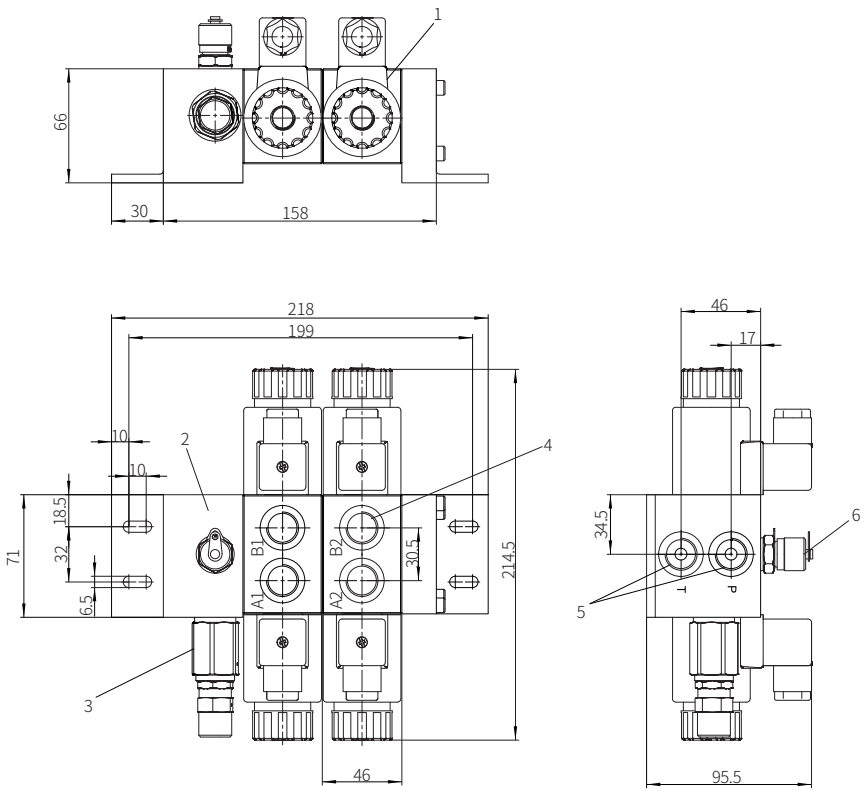
Hydraulic			
Maximum working pressure	Port P、A、B	bar	315
	Port T	bar	160
Maximum flow		L/min	40
Fluid			Mineral oil (HL,HLP) according to DIN 51524 other fluid please consult with us
Fluid temperature range		°C	-20...+80
Viscosity range		mm^2/S	15...380
Maximum allowable pollution level of oil			ISO 4406 Class 20/18/15[1)]
Electric			
Voltage available		v	DC12、DC24、DC28
Duty			Continue
Switching time		(Time/h)	15000
Valve protection			IP65 or IP67 (for water-proof plug)

[1)]The oil must meet the cleanliness degree requested by the components in the hydraulic system.Effective oil filtration can prevent failure and increase the service life of the components.

Component size and functional principle

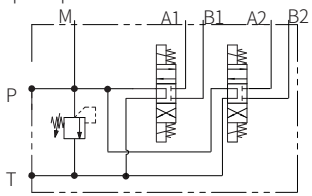
Size unit: mm

Model DCF6...-1XJ/...C...



1 Sectional solenoid directional valve
2 Oil inlet section
3 Optional relief valve
4 Working port G3/8"
5 Inlet and outlet port G3/8"
6 Pressure measuring port G1/4"

Functional principle:

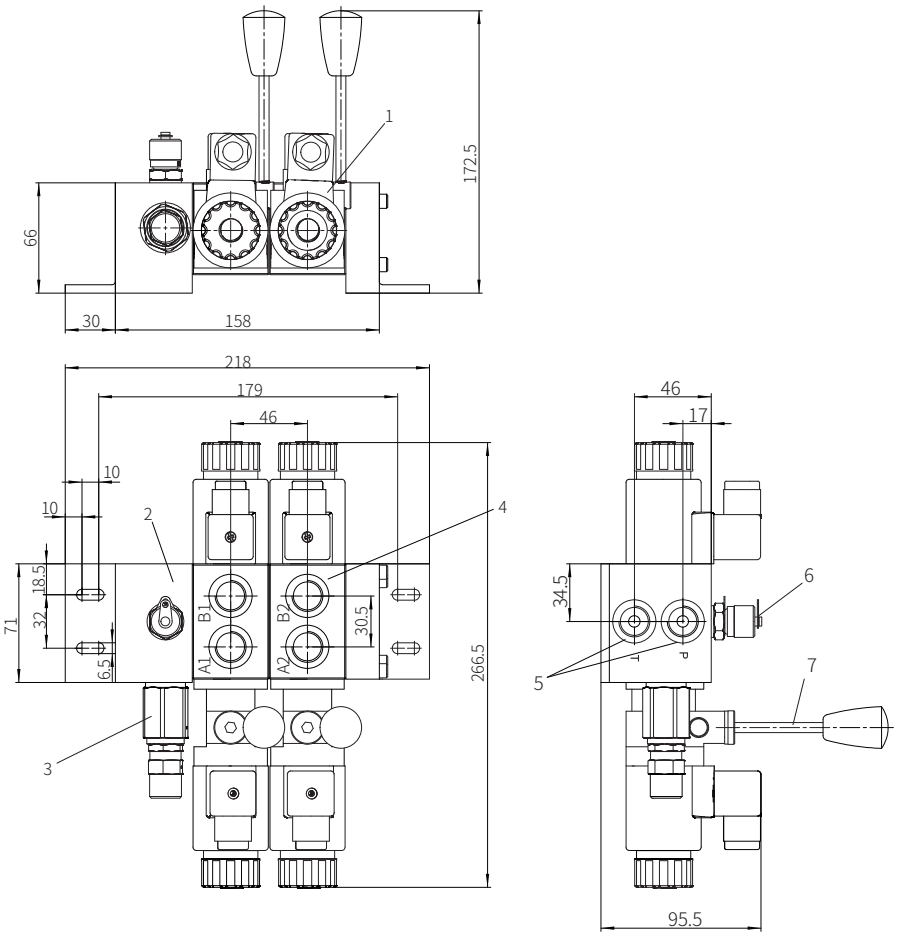


Note: The corresponding work units can be added according to the requirements from the customers.

Component size and functional principle

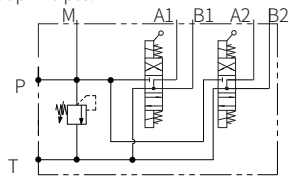
Size unit: mm

Model DCF6...-1XJ/...B...



1 Sectional directional valve
2 Oil inlet section
3 Optional relief valve
4 Working port G3/8"
5 Inlet and outlet port G3/8"
6 Pressure measuring port G1/4"
7 Manual operated handle

Functional principle:

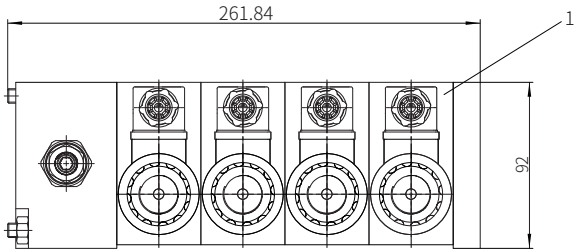


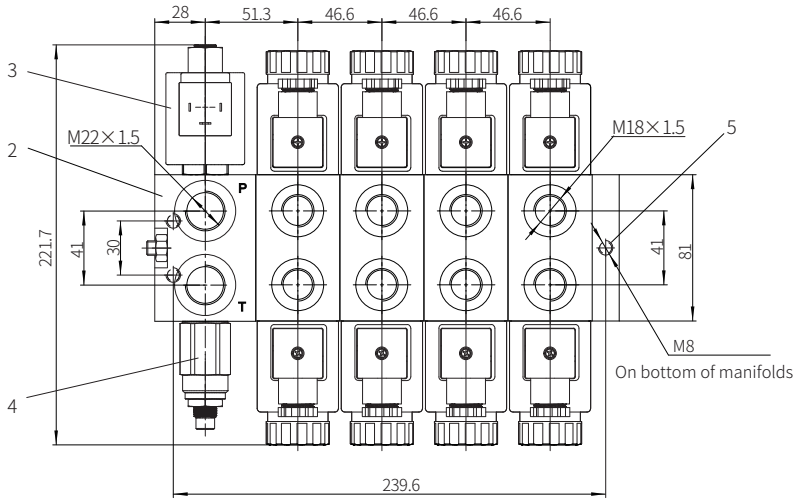
Note: The corresponding work units can be added according to the requirements from the customers.

Component size and Functional principle

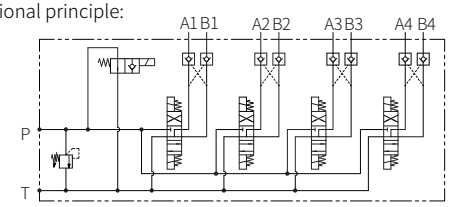
Size unit: mm

Model DCF6J-1XJ/...YS...





Functional principle:



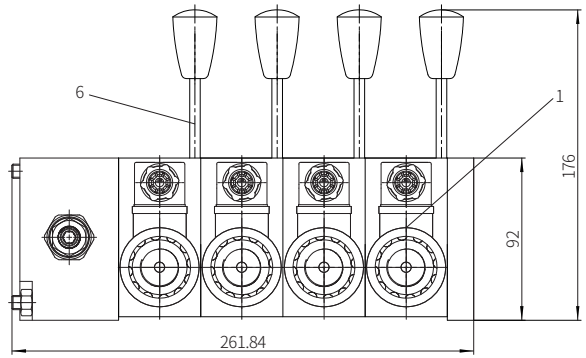
1 Sectional solenoid directional valve
2 Oil inlet section
3 Unloading solenoid valve
4 Relief valve
5 Screw connecting holes

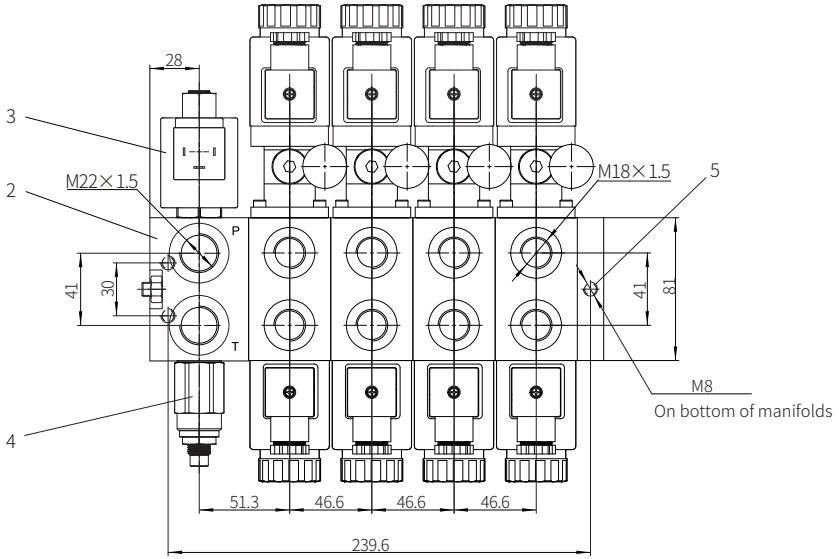
Note：The corresponding work units can be added according to the requirements from the customers.

Component size and Functional principle

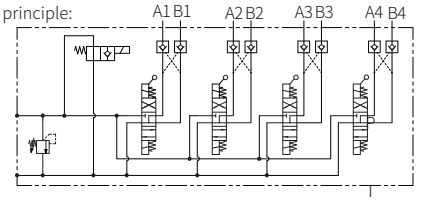
Size unit: mm

Model DCF6J-1XJ/...MYS...





Functional principle:



1 Sectional solenoid directional valve
2 Oil inlet section
3 Unloading solenoid valve
4 Relief valve
5 Screw connecting holes
6 Manual operated handle

Note: The corresponding work units can be added according to the requirements from the customers.

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Two-position Six-way Solenoid Valve

Model: JYT-MH6WE6...

- Size 6
- Maximum working pressure 250 bar
- Maximum working flow 50 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Characteristic curve	03
Component size	04

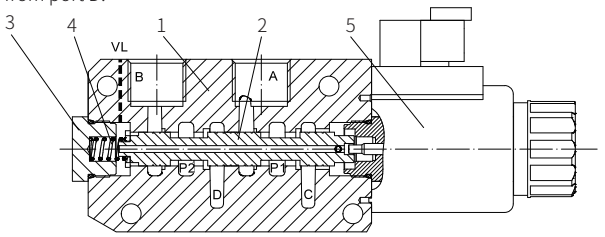
Features

- Solenoid valve with various voltage, optional
- Used in the hydraulic system when the actuator elements need to be sequentially added on the basis of the original multi-way valve
- Adding more units to achieve the same multi-way valve and control two different actuator components in sequence
- 5 solenoid valves in series according to modular directional valve principle to control the sixth actuator component
- Port L must be always connected to the return oil tank

Function description, sectional drawing

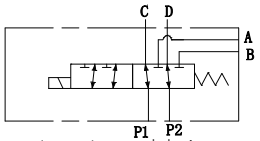
The JYT-MH6WE6 two-position six-way directional valve is a multi-loop selector valve with a tubular connection.

It is mainly composed of valve body (1), valve spool (2), plug (3), pressure spring (4) and solenoid (5). When the solenoid is energized, the valve spool is moved, the oil at port P1 flows out from port A and the oil at port P2 flows out from port B. When the solenoid is powered off, the oil at port P1 flows out from port C and the oil at port P2 flows out from port D.

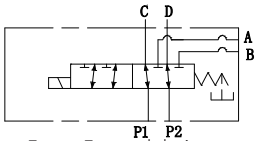


Model JYT-MH6WE6...

Symbols:



I type Internal drain



E type External drain

Transition function

Models and specifications

JYT – MH6WE | 6 | / | C | | | | | | | *

- Rekith
- 2-position six-way solenoid valve =MH6WE
- size 6 =6
- wet-pin solenoid with detachable coil =C
- DC 12V =G12
- DC 24V =G24
- DC 28V =G28
- I= internal drain
- E= external drain
- No code= no manual emergency operation
- N9= with hidden manual emergency operation
- Z5L= right angle plug
- FS2= water-proof plug
- No code= NBR seals
- V= FKM seals
- more information in text

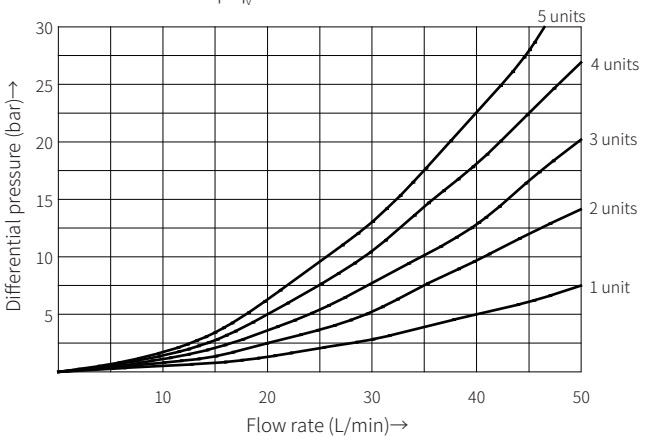
Technical parameters

Fluid temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 （FKM seal)
Max. working pressure	bar	250
Max. flow	L/min	50
Working medium		Mineral oil; phosphate
Viscosity range	mm^2/s	2.8 to 500
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9 and ISO4406 Class 20 / 18 / 15

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

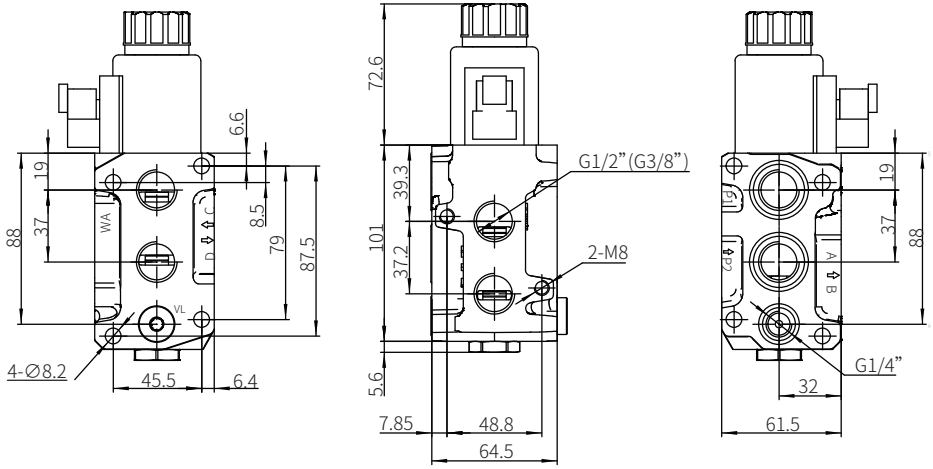
△p-q_v characteristic curve



Component size

unit: mm

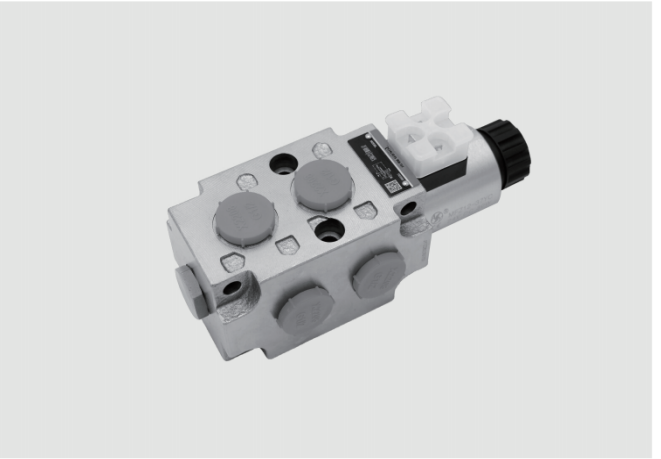
Model JYT-MH6WE6/...FS2



06

Two-position Six-way Solenoid Valve

Model: JYT-MH8WE8



- ◆ Size 08
- ◆ Maximum working pressure 310 bar
- ◆ Maximum working flow 80 L/min

Contents

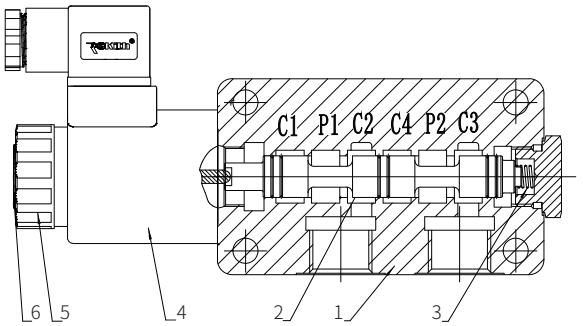
Function description, sectional drawing	02
Models and specifications	03
Technical parameters	03
Characteristic curve	04
Component size	05

Features

- ● Usable as stand-alone, or as multiple stackable units
- ● Control spool operated by solenoid with detachable coil fastened by a ring nut.
- ● Wet-pin tube for DC coil with push rod for mechanical override in case of voltage shortage
- ● Optional manual override (push-button)

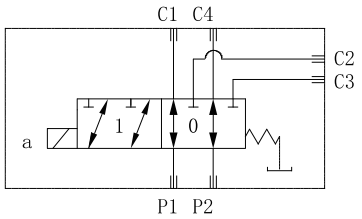
Function description, sectional drawing

The JYT-MH8WE8 is a two-position six-way directional valve controlled by direct operated solenoid.
The valve mainly consists of valve body (1), control spool (2), reset spring (3) and solenoid (5).
This valve is used to connect two oil inlet ports P1 and P2, and transfer it to the outlet ports (C1-C4) with spool in position "0" when the solenoid is powered off, or to the outlet ports (C2-C3) with spool in position "1" when the solenoid is powered on.
When the coil is powered off, the reset spring (3) pushes back the control spool (2) and keeps it in the position "0". The coil (4) is fixed to the magnetic tube by the ring nut (5). In the case of voltage shortage, the manual override (6) can also move the control spool (2) to connect to the external drain of the oil tank to ensure switching operations at higher working pressure.

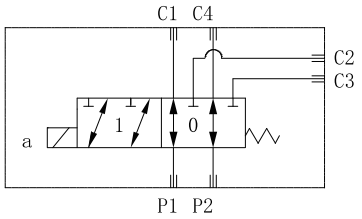


Symbols:

I type Internal drain



E type external drain



Transition function:

Models and specifications

JYT- MH8WE 8 / C

Rexroth

2-position six-way solenoid valve =MH8WE8

size 8 =8

wet-pin solenoid with detachable coil =C

12V DC =G12
24V DC =G24
28V DC =G28

internal drain =I
external drain =E

more information in text

sealing material
N= NBR seals
V= FKM seals
(consult for other seals)

Z5L= right angle plug
FS2= water-proof plug

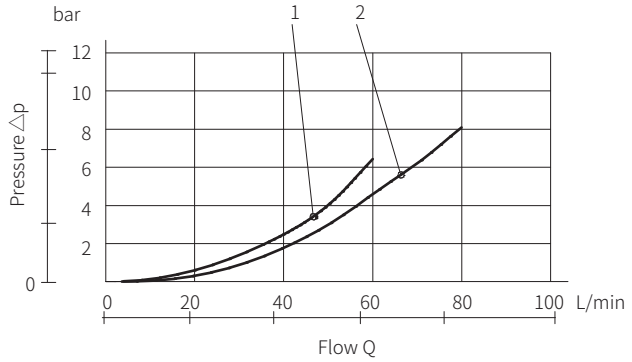
No code= no manual emergency operation
N9= with hidden manual emergency operation

Technical parameters

Fluid temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Max. pressure with external drain	bar	310
Max. pressure with internal drain	bar	250
Max. flow	L/min	80
Working medium		Mineral oil; phosphate
Viscosity range	mm^2/s	5 to 420
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9 and ISO4406 Class 20 / 18 / 15
Voltage (DC)	V	12 24 28 48
Power consumption (W)	W	36
Current (nominal at 20 °C (68 °F))	A	3.0 1.53 1.32 0.75
Resistance (nominal at 20 °C (68 °F))	Ω	3.97 15.67 20.42 63.60

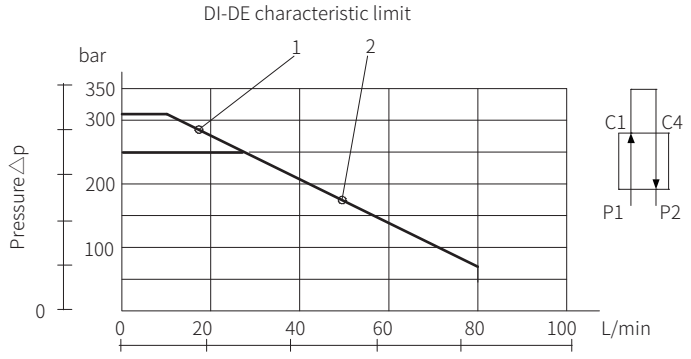
Characteristic curve

Measured with hydraulic oil temperature at 45 ± 5 °C, environment temperature at 20 °C



Model	Curve			
	P1>C1	P1>C2	P2>C4	P2>C3
JYT-MH8WE8-G3/8	1	1	1	1
JYT-MH8WE8-G1/2	2	2	2	2

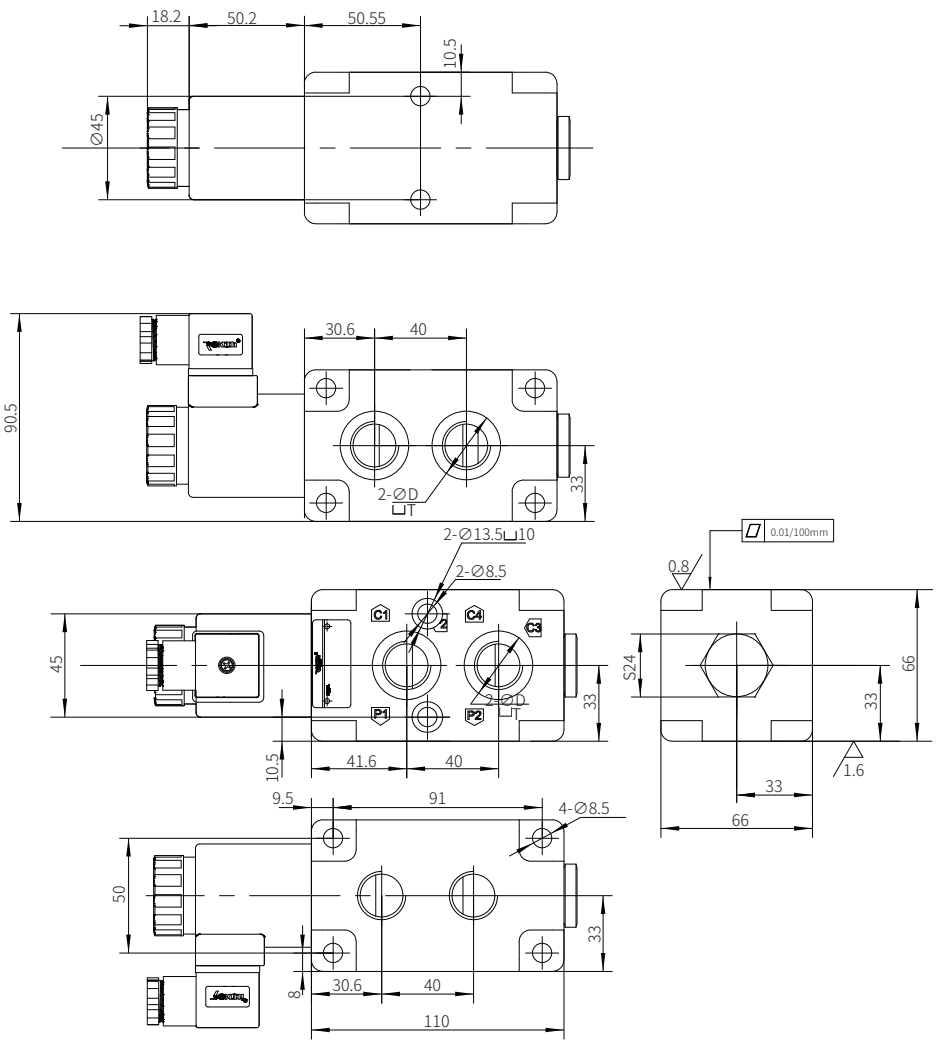
The performance curves are measured with flow going across and coming back, like P1>C1 and C4>P2.



Internal drain	External drain
2	1

Component size

unit:mm



	D	T	T1
JYT-MH8WE8-G3/8	Φ25	1.3	0.5
JYT-MH8WE8-G1/2	Φ30	1	0.5

Two-position Six-way Solenoid Valve

Model: JYT-MH10WE10

- ◆ Size 10
- ◆ Maximum working pressure 310 bar
- ◆ Maximum working flow 140 L/min

06

Contents

Function description, sectional drawing	02
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Characteristic curve	04
Component size	05

Features

- ● Control spool operated by solenoid with detachable coil fastened by a ring nut.
- ● Wet-pin tube for DC coil with push rod for mechanical override in case of voltage shortage
- ● Optional manual override (push-button)

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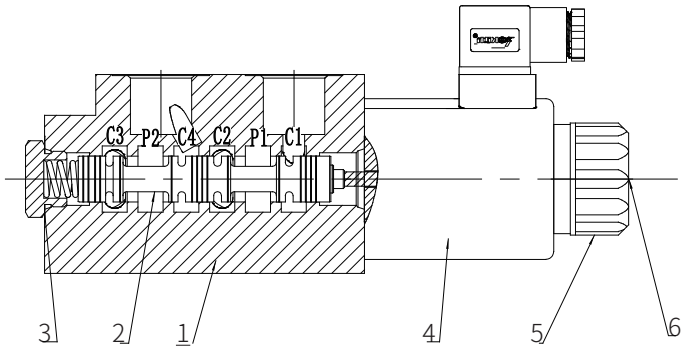
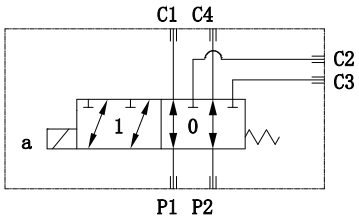
Function description, sectional drawing

The JYT-MH10WE10 is a two-position six-way directional valve controlled by direct operated solenoid. The valve mainly consists of valve body (1), control spool (2), reset spring (3) and solenoid (5).
This valve is used to connect two oil inlet ports P1 and P2, and transfer it to the outlet ports (C1-C4) with spool in position "0" when the solenoid is powered off, or to the outlet ports (C2-C3) with spool in position "1" when the solenoid is powered on.
When the coil is powered off, the reset spring (3) pushes back the control spool (2) and keeps it in the position "0". The coil (4) is fixed to the magnetic tube by the ring nut (5). In the case of voltage shortage, the manual override (6) can also move the control spool (2) to connect to the external drain of the oil tank to ensure switching operation at higher working pressure.

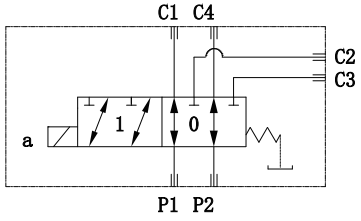


Symbols:

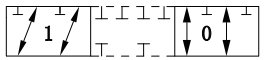
I type Internal arain



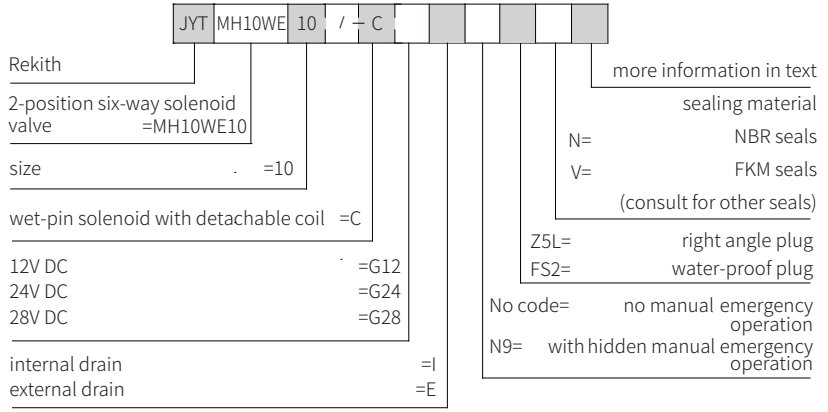
E type External drain



Transition function:



Models and specifications

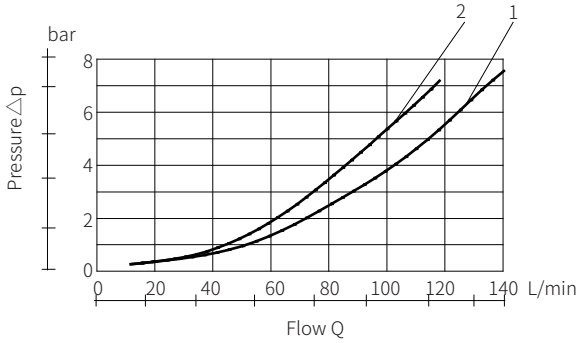


Technical parameters

Fluid temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Max. pressure with external drain	bar	310
Max. pressure with internal drain	bar	250
Max. flow	L/min	140
Working medium		Mineral oil; phosphate
Viscosity range	mm^2/s	5 to 420
Cleanliness of oil		The maximum allowable pollution level of oil is NAS1638 Class 9 and ISO4406 Class 20 / 18 / 15
Voltage (DC)	V	12 24 28 48
Power consumption (W)	W	44
Current (nominal at 20 °C (68 °F))	A	3.6 1.8 1.6 0.9
Resistance (nominal at 20 °C (68 °F))	Ω	3.2 12.8 16.9 50.5

Characteristic curve

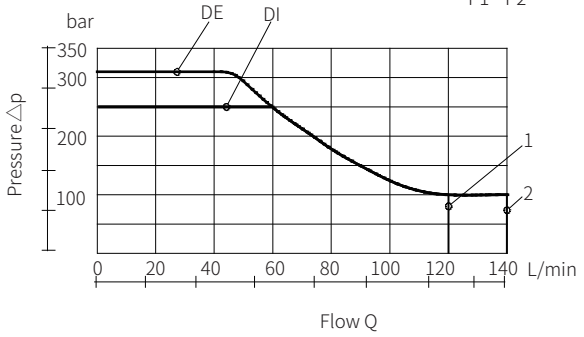
Measured with hydraulic oil temperature at 45 ± 5 °C, environment temperature at 20 °C



Model	Curve			
	P1>C1	P1>C2	P2>C4	P2>C3
JYT-MH10WE10-G1/2	2	2	2	2
JYT-MH10WE10-G3/4	1	1	1	1

The performance curves are measured with flow going across and coming back, likeP1>C1 andC4>P2.

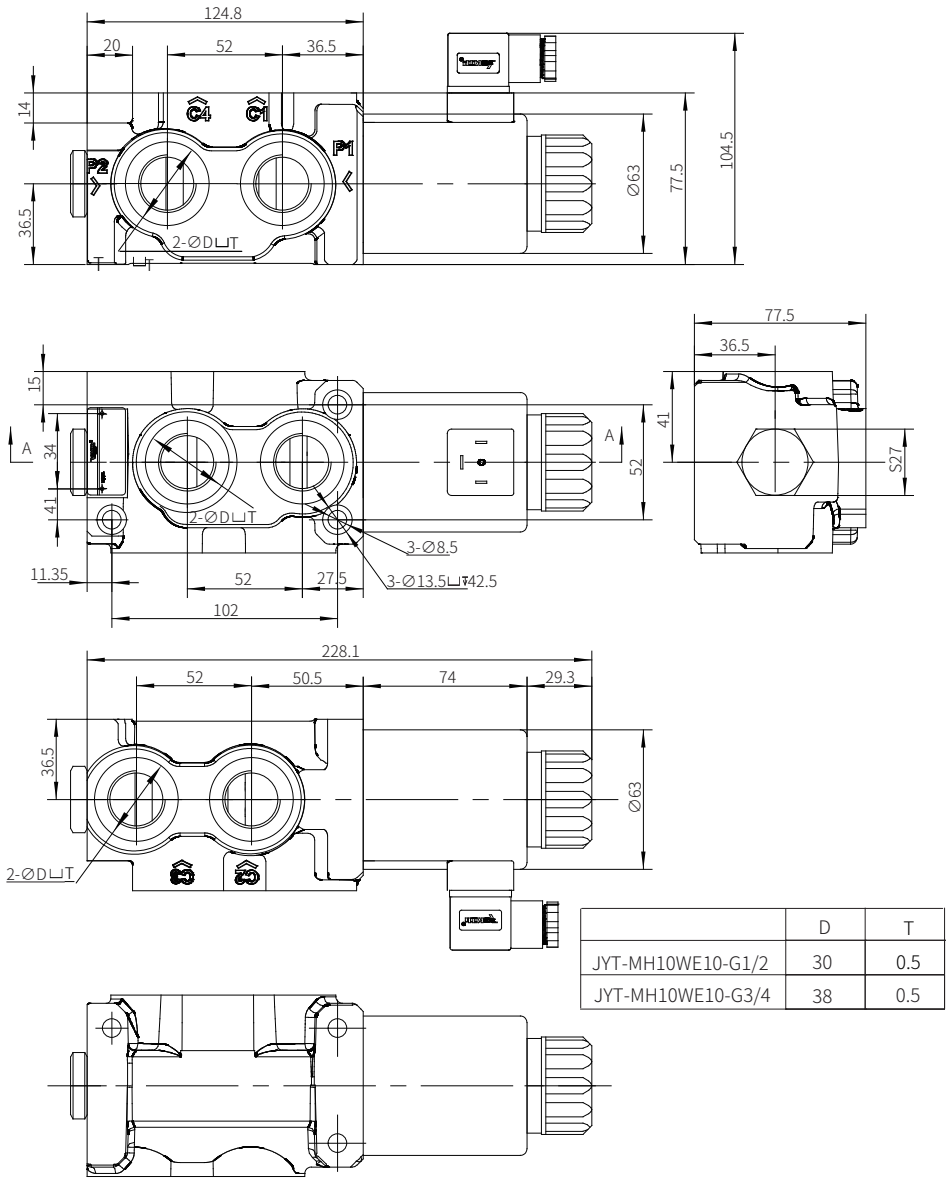
DI-DE characteristic limit



Internal drain(DI)	External drain(DE)
1	2

Component size

unit:mm



	D	T
JYT-MH10WE10-G1/2	30	0.5
JYT-MH10WE10-G3/4	38	0.5

7 - Pressure switch

Contents

Page

- HED4...1XJ/Piston type pressure switch 0937-0942
- HED8...1XJ/Piston type pressure switch 0943-0952

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Piston Type Pressure Switch

Model: HED4...1XJ

◆ Maximum working pressure 350 bar

Contents

Function description, sectional drawing	02
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Functional symbols and terminal connection	03
Technical parameters	03
Characteristic curve	04
Component size	05-06

Features

- Piston type, sensitive and reliable action
- Subplate mounting
- Pipe installation

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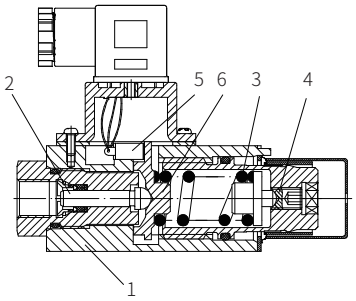
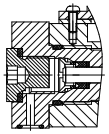
Function description, sectional drawing

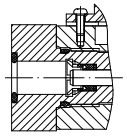
The HED4 type hydraulic-electric pressure switch is a piston pressure switch.
It consists of the valve body (1), cartridge with piston (2), spring (3), adjusting element (4) and micro switch (5). The detected pressure acts on the piston (2), then the piston (2) is supported by the spring seat (6) and acts against the continuously adjustable force of the spring (3). The spring seat (6) transfers the movement of the piston (2) to the micro switch (5) to make the circuit switched on or off according to the design requirements.



Model HED4OA-1XJ/



Model HED4OP-1XJ/



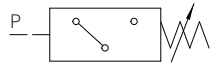
Model HED4OH-1XJ/

Models and specifications

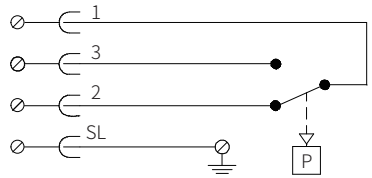
HED4 ÷ 1X J ÷ Z14 *

- piston type pressure switch
- subplate mounting =OP; piping installation =OA; vertical stacking systems =OH
- 10 to 19 series =1X (10 to 19 series installation and connection size unchanged)
- Rekith =J
- maximum adjusting pressure 50bar =50; maximum adjusting pressure 100bar =100; maximum adjusting pressure 350bar =350
- Z14= small plug
- L24= 24V lamp (25~35V); L110= 110V lamp (90~130V); L220= 220V lamp (180~240V)
- S= protective cap
- No code= NBR seals; V= FKM seals (consult for other seals)
- more information in text

Functional symbols and terminal connection



Functional symbol



terminal connection -Z14 small plug

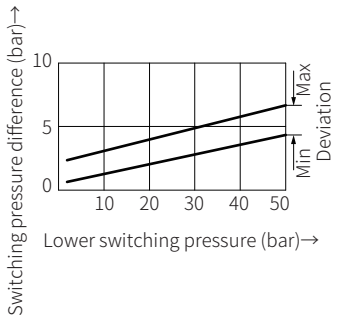
Technical parameters

Working medium		Mineral oil - suitable for NBR and FKM seal			
		Phosphate ester - suitable for FKM seal			
Working medium temperature range	°C	20 to +80 (FKM seal)			
	°C	30 to +80 (NBR seal)			
Viscosity range	mm^2/s	2.8 to 500			
Cleanliness of oil:		The maximum allowable pollution level of oil is NAS16389 and ISO4406 Class 20/18/15			
Switching accuracy (repeatability)	%	<± 1% of setting range			
Allowed switching frequency	times/per minute	120			
Electrical connection		Plug-in connector to DIN 43 650 form A, 3... Pin +PE			
Rated pressure (bar)	Maximum setting pressure (bar)	Recover pressure (bar)		Action pressure (bar)	
		min	max	min	max
50	50	2	46	4	50
100	100	3	89	8	100
350	350	6	322	20	350
Maximum connection cross-sectional area	mm^2/s	1.5			
Valve protection to DIN43650		IP 65			
If DC inductive loading, it need to use a spark suppressor to extend the life.					
Contact load	AC	250V/5A;			
	DC	50V/1A, 250V/0.2A			
Weight	Pressure switch	0.6			
	Stacking plate	0.8 (size 6)			
		1.9 (size 10)			

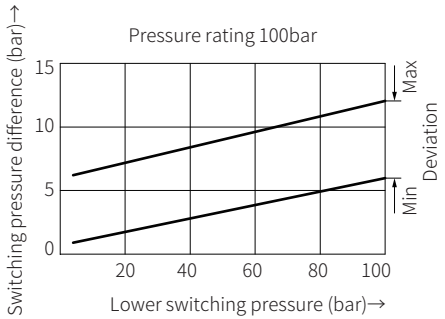
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

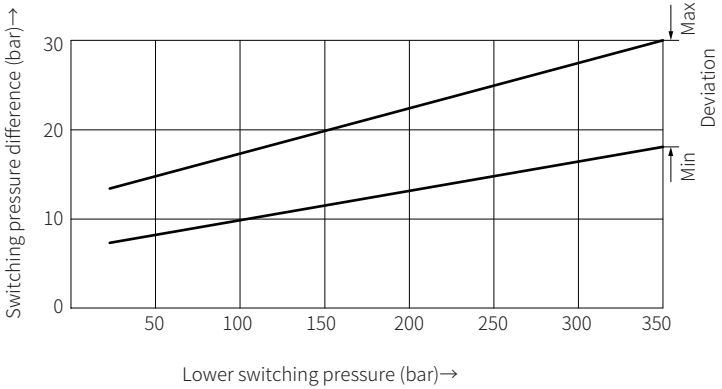
Pressure rating 50bar



Pressure rating 100bar



Pressure rating 350bar



Component size

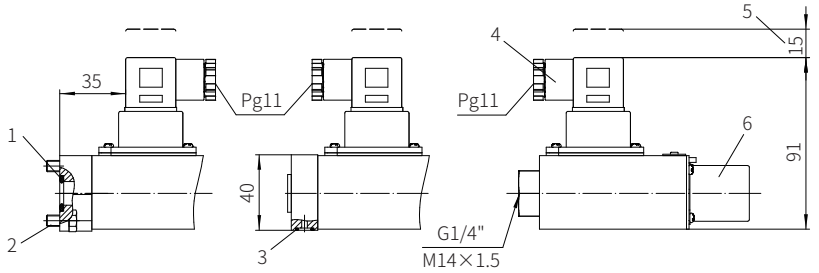
Size unit: mm

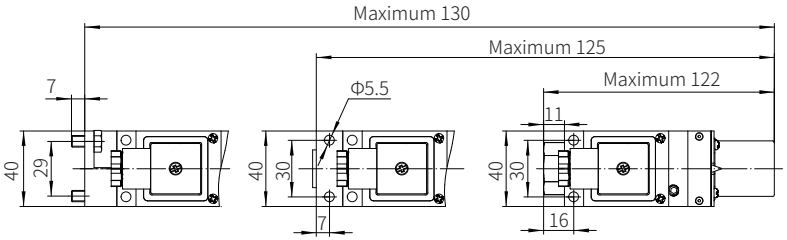
Pressure switch

Model HED4OH-1XJ
Vertical stacking systems

Model HED4OP-1XJ
Subplate mounting

Model HED4OA-1XJ
Pipe installation



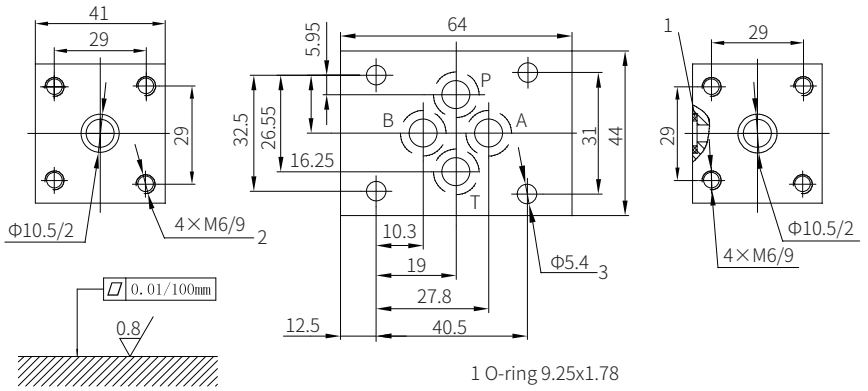


1 O-ring 13x2
2 Valve fixing screws 2 pieces M6x12
3 O-ring 7x1.5
4 Plug can be rotated 90°
5 Space required for removing the plug
6 Protective cap

Component size

Size unit: mm

Stacking plate size 6 (for pressure switch HED4...vertical stacking systems)



Required surface finishing of mating components

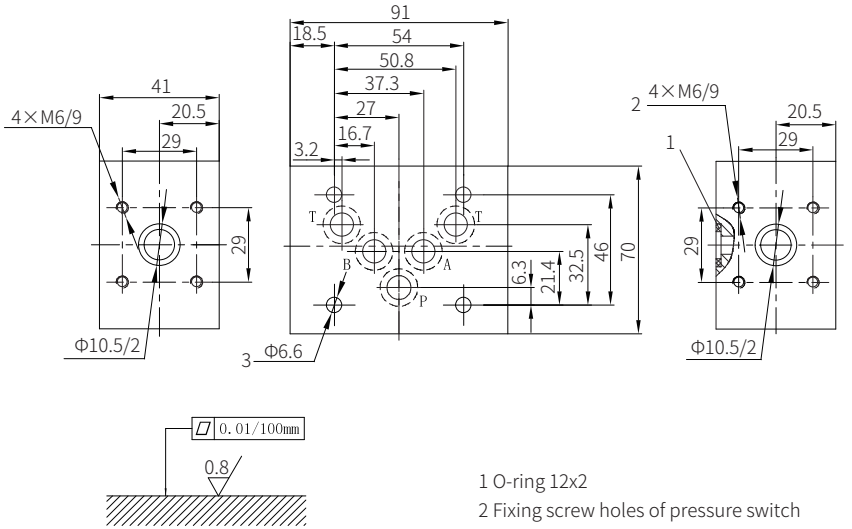
1 O-ring 9.25x1.78
2 Fixing screw holes of pressure switch
3 Fixing screw holes of stacking plate size 6

07

Component size

Size unit: mm

Stacking plate size 10 (for pressure switch HED4...vertical stacking systems)

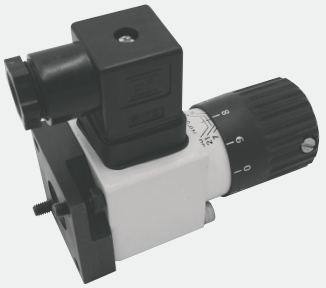


Required surface finishing of mating components

1 O-ring 12x2
2 Fixing screw holes of pressure switch
3 Fixing screw holes of stacking plate size 10

Piston Type Pressure Switch

Model: HED8...1XJ



◆ Maximum working pressure 350 bar

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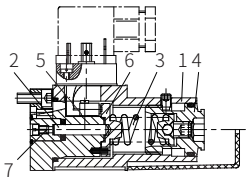
Features

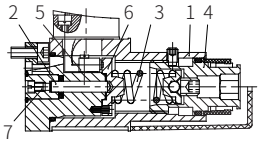
- Subplate mounting
- Pipe installation
- Vertical stacking systems
- Four pressure rating
- Plug with connection (lamp)

Function description, sectional drawing

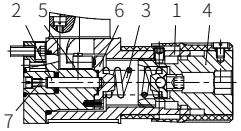
The HED8 type hydraulic-electric pressure switch is a piston pressure switch.
The pressure switch mainly includes the valve body (1), cartridge with spool (2), spring (3), adjusting element (4)and the micro switch (5).
If the monitored pressure is below the set value, the micro switch (5) will start working. The monitored hydraulic oil acts on the spool (2) through the damping hole (7). The spool (2) is supported by the spring seat (6) and acts against the continuously adjustable force of the spring (3). The spring seat (6) transfers the movement of the spool (2) to the micro switch (5) to release the micro switch (5) when the set pressure is reached. In this way, the circuit is switched on or off.
The mechanical structure of the spring seat (6) protects the micro switch (5) from damage when the pressure is reduced suddenly, and also prevents the spring (3) in case of overpressure.



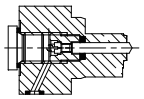
Model HED8OH-1XJ/...K14
Model HED8OH-1XJ/...K14S...



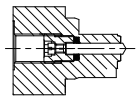
Model HED8OH-1XJ/...K14A...
Model HED8OH-1XJ/...K14AS...



Model HED8OH-1XJ/...K14KW...



Model HED8OP-1XJ/...



Model HED8OA-1XJ/...

Attention:
In order to extend the working life, the pressure switch should be mounted vibration-proof and protected from hydraulic pressure shocks.

Models and specifications

HED8 ___ 1X J ___ / ___ / ___ *

piston type pressure switch

vertical stack systems =OH
subplate mounting =OP
pipe installation =OA

10 to 19 series =1X
(10 to 19 series installation and connection size unchanged)

Rekith =J

maximum adjusting pressure 50bar =5
maximum adjusting pressure 100bar =10
maximum adjusting pressure 200bar =20
maximum adjusting pressure 350bar =35

electrical connection:
no plug-in connector, with protective cap =K14
small plug (lamp) =Z14
24V lamp (20～35V) =L24
110V lamp (90～130V) =L110
220V lamp (180~240V) =L220

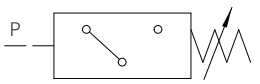
for pipe installation
No code= inch thread
2= metric thread

sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

No code= spindle without scale
S= spindle without scale, with protective cap
A= spindle with scale
AS= spindle with scale and protective cap
KS= lock rotary knob with scale
KW= rotary knob with scale

more information in text

Functional symbols



Functional symbol

Technical parameters

Weight	-pressure switch	kg	0.8
	-subplate for vertical stacking systems	kg	0.8 (size 6, plate height 40.5mm)
			3 (size 6, plate height 120mm)
			2 (size 10)
Hydraulic oil			Mineral oil - suitable for NBR and FKM seal Phosphater- suitable for FKM seal
Hydraulic oil temperature range		°C	-30 to +80 (NBR seals)
			-20 to +80 (FKM seals)
Viscosity range		mm^2/s	2.8 to 500
Cleanliness of oil:			The maximum allowable pollution level of oil is ISO4406 (C) Class 20/18/15
Switching accuracy (repeatability)			< ±1% of setting range
Allowed switching frequency		1/h	4800

Pressure setting range

Pressure grade (maximum set pressure) bar	Maximum working pressure (bar)	Pressure setting range (bar)
50	350	2~50
100	350	4~100
200	350	5~200
350	500	8~350

Electrical connection	Plug-in connector to DIN 43 650 form A 3... pin +PE
Maximum connection section area mm^2	1.5
Maximum contact load -AC	250V; 5V
-DC	50V/ 1A; 125V/0.03A; 250V/0.02A
Valve protection to DIN 40 050	IP65

If DC inductive loading , it need to use a spark suppressor to extend the life

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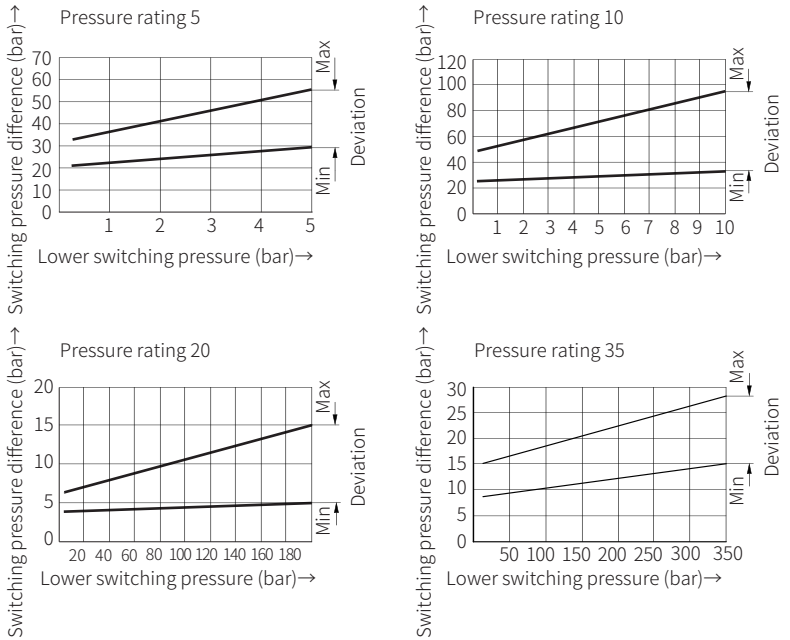
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)



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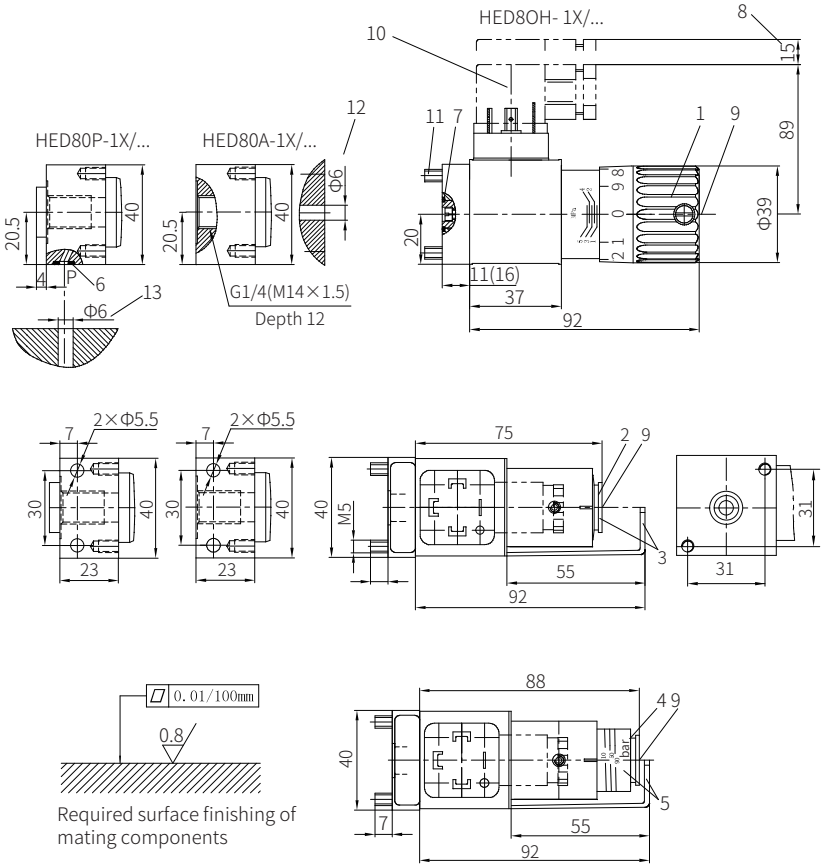
Component size

Size unit: mm

Pressure switch



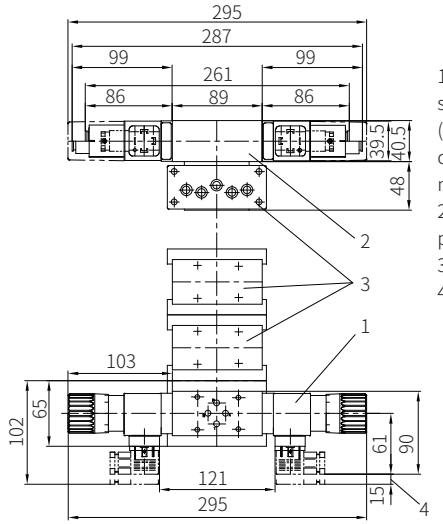
Required surface finishing of mating components

1 Regulating element "KW"
2 Regulating element "_"
3 Regulating element "S"
4 Regulating element "A"
5 Regulating element "AS"
6 O-ring 5.3x1.8
7 O-ring 10.82x1.78
8 Space required to remove plug
9 Internal hexagon nut AF 10
10 Plug without cable to DIN 43650
11 Valve fixing screws 2ps M5x12 GB/T70.1-10.9
Tightening torque M_A=8.9Nm
12 Maximum diameter of mounting surface of mating parts (Model HED8OH)
13 Maximum diameter of mounting surface of mating parts (Model HED8OP)
Valve fixing (ModelHED8OP):
2-M5x50 GB/T70.1-10.9
Tightening torque M_A=7.8Nm

Component size

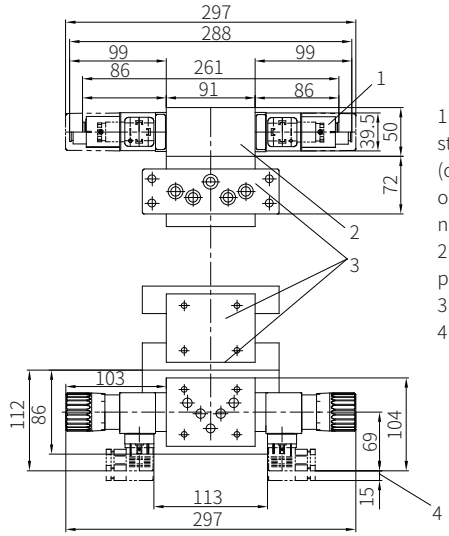
Size unit: mm

Model HED80H... in vertical stacking size 6



1 Pressure switch HED8OH is used in stacking assemblies
(can be installed by 4x90°). The mounting option of pressure switch depends on the nearest stacking plate.
2 Sandwich plate model HSZ06 is used for pressure switch as stacking element
3 Stacking elements
4 Space required to remove plug

Model HED80H... in vertical stacking size 10

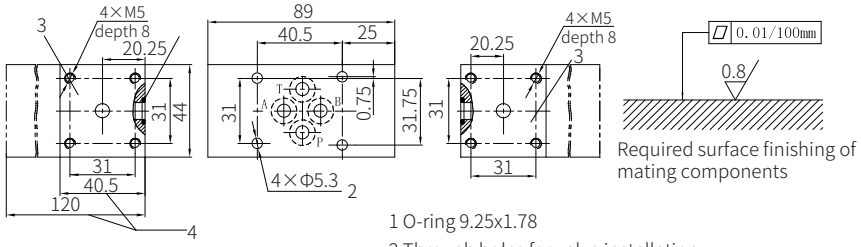


1 Pressure switch HED8OH is used in stacking assemblies
(can be installed by 4x90°). The mounting option of pressure switch depends on the nearest stacking plate.
2 Sandwich plate model HSZ10 is used for pressure switch as stacking element
3 Stacking elements
4 Space required to remove plug

Component size

Size unit: mm

Model HED8 in sandwich version (350 bar)

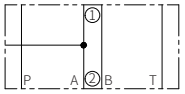
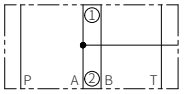
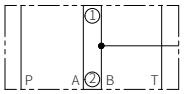


1 O-ring 9.25x1.78
2 Through holes for valve installation
3 Valve mounting surface
4 Plate height 40.5mm or 120mm, optional
Stacking plate must be ordered separately

Models and specifications

Sandwich plate size 6: symbols, type number (type number in ( ) for 120mm plate height)
(①= valve side; ②= subplate side)

Pressure switch effective in channel...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	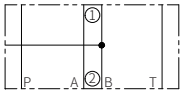	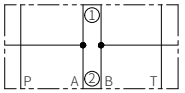	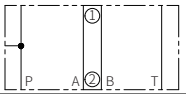
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	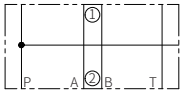	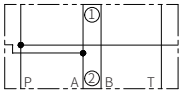	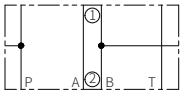
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	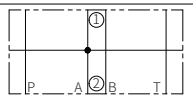	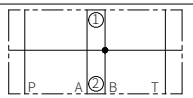	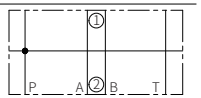
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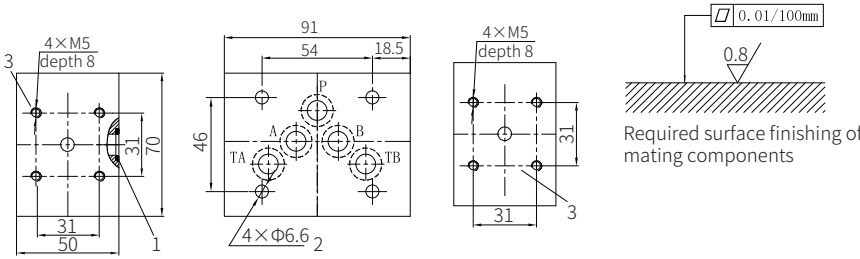
Component size

Size unit: mm

Model HED8 in sandwich version (350 bar)

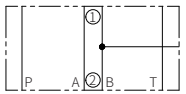
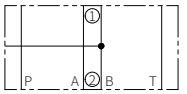
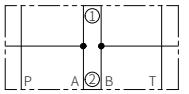


1 O-ring 12x2
2 Through holes for valve installation
3 Valve mounting surface
Stacking plate must be ordered separately

Models and specifications

Sandwich plate size 10: symbols, type number (①= valve side; ②= subplate side)

Pressure switch effective in channel...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	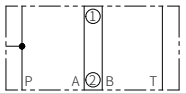	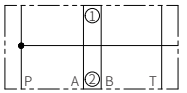	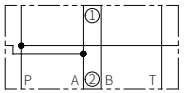
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	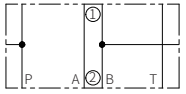	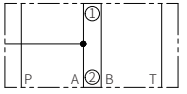	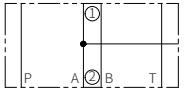
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	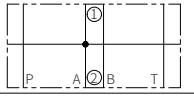	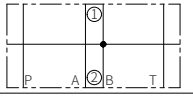	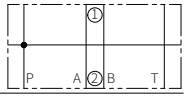
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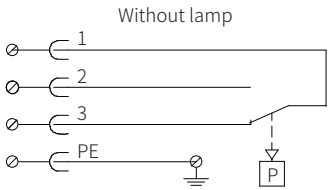
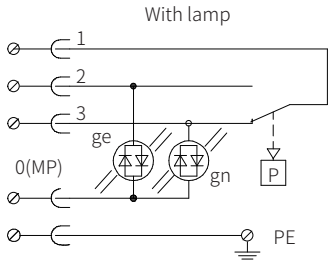
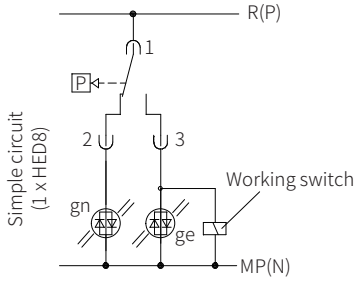
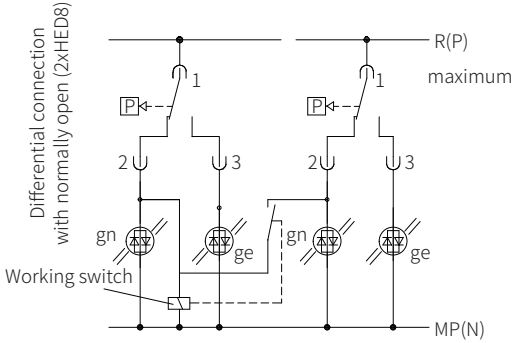
Terminal connection





Circuit example





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8 - Subplate

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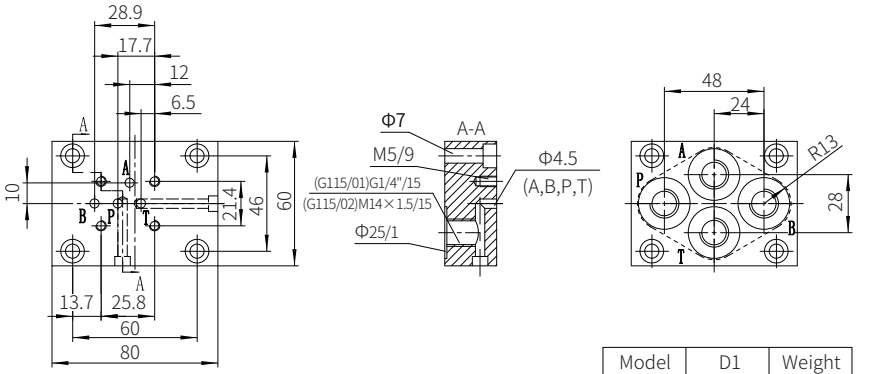
Subplate, Size 5 (ISO4401)

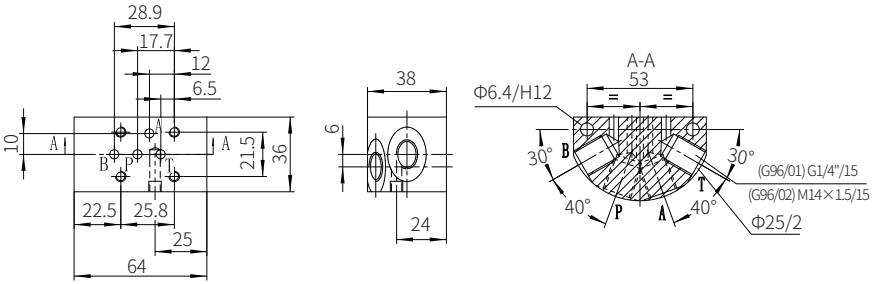
Size unit: mm

Model G115/01 (G1/4"), Model G115/02 (M14×1.5)



Model	D1	Weight
G115/01	G1/4"	0.7kg
G115/02	M14×1.5	

Model G96/01 (G1/4"), Model G96/02 (M14×1.5)



Model	D1	Weight
G96/01	G1/4"	0.7kg
G96/02	M14×1.5	

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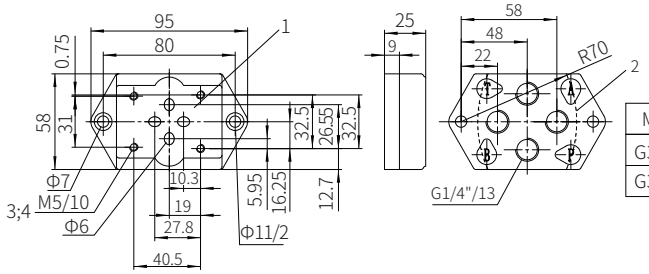
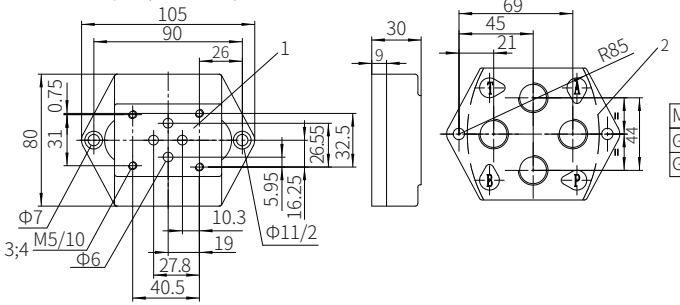
Subplate，Size 6 (ISO4401) Size unit: mm

Model G341/01 (G1/4")
Model G341/02 (M14×1.5)



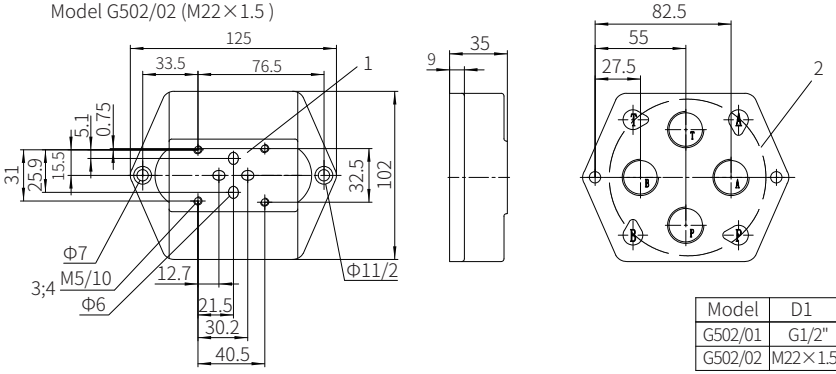
Model	D1	Weight
G341/01	G1/4"	0.6kg
G341/02	M14×1.5	

Model G342/01 (G3/8")
Model G342/02 (M18×1.5)



Model	D1	Weight
G342/01	G3/8"	1.1kg
G342/02	M18×1.5	

Model G502/01 (G1/2")
Model G502/02 (M22×1.5)

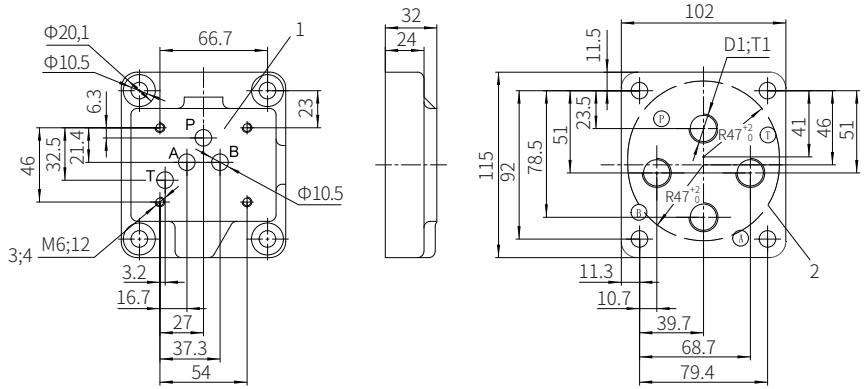


Model	D1	Weight
G502/01	G1/2"	1.1kg
G502/02	M22×1.5	

1 Valve mounting face grinding
2 Front panel opening
3 Valve fixing screw holes
4 Valve fixing screw: 4pcs hexagon screws M5, GB/T70.1-10.9 grade

Subplate，Size 10 (ISO4401) Size unit: mm

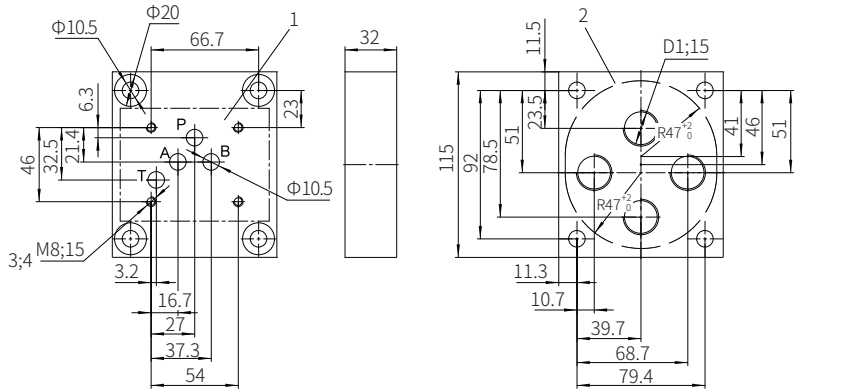
Model G66/01 (G3/8") , Model G67/01 (G1/2")
Model G66/02 (M18×1.5) , Model G67/02 (M22×1.5)
For spool and seat directional valve, pressure up to 315bar



Model	D1	T1	Weight
G66/01(02)	G3/8" (M18×1.5)	13	2.3kg
G67/01(02)	G1/2"(M22×1.5)	15	

1 Valve mounting face grinding
2 Front panel opening
3 Valve fixing screw holes
4 Valve fixing screw： 4pcs hexagon screws M6, GB/T70.1-10.9 grade
Model G292/01(02), Model G308/01(02), Model G377/01(02), Model G378/01(02)

For seat directional valve, pressure up to 630bar (not suitable for proportional valves and servo valves)

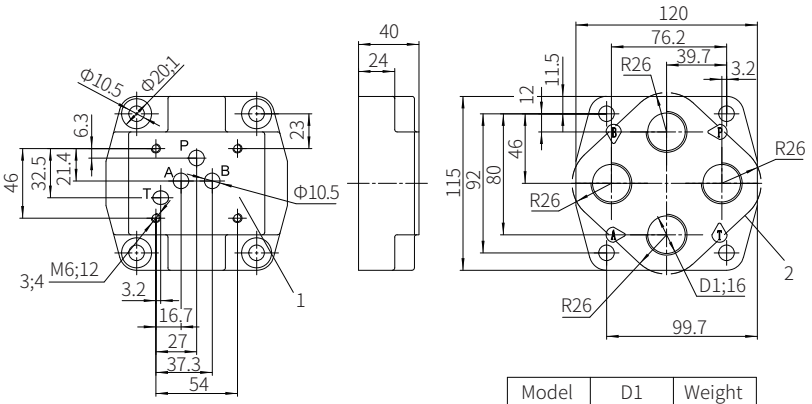


Model	D1	Weight
G292/01(02)	G1/2" (M22×1.5)	2.6kg
G308/01(02)	G3/8"(M18×1.5)	
G377/01(02)	G3/8" (M18×1.5)	
G378/01(02)	G1/2" (M22×1.5)	

1 Valve mounting face grinding
2 Front panel opening
3 Valve fixing screw holes
4 No port B for subplate G292/01(02) and G308/01(02)
5 Valve fixing screw: 4pcs hexagon screws M8，GB/T70.1-10.9 grade

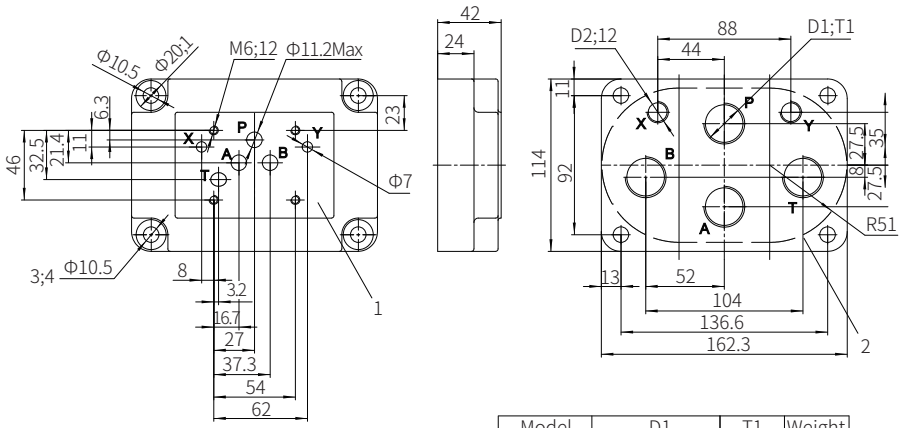
Subplate, Size 10 (ISO4401) Size unit: mm

Model G534/01 (G3/4") , Model G534/02 (M27×2)
For spool directional valve



Model	D1	Weight
G534/01	G3/4"	2.5kg
G534/02	M27×1.5	

Model G535/01 (G3/4"), Model G535/02 (M27×2), Model G536/01 (G1"), Model G536/02 (M33×2)
For spool directional valve

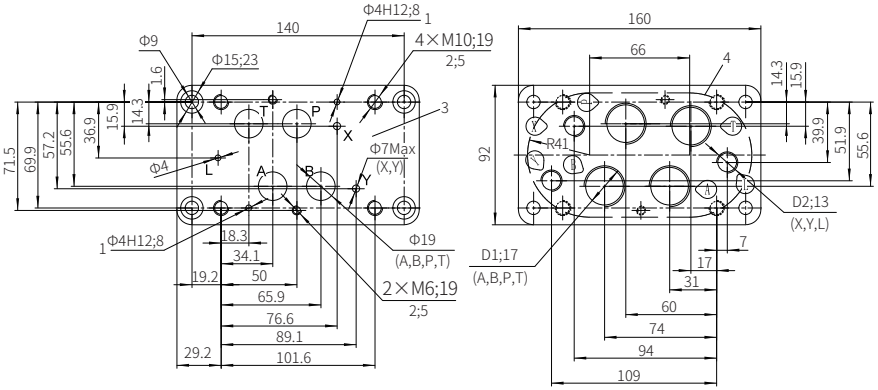


Model	D1	T1	Weight
G535/01(02)	G3/4" (M27×2)	16	3.6kg
G536/01(02)	G1"(M33×2)	18	

1 Valve mounting face grinding
2 Front panel opening
3 Valve fixing screw holes
4 Valve fixing screw: 4pcs hexagon screws M6，GB/T70.1-10.9 grade

Subplate, Size 16 (ISO4401) Size unit: mm

Model G172/01 (G3/4") , Model G172/02 (M27×2)



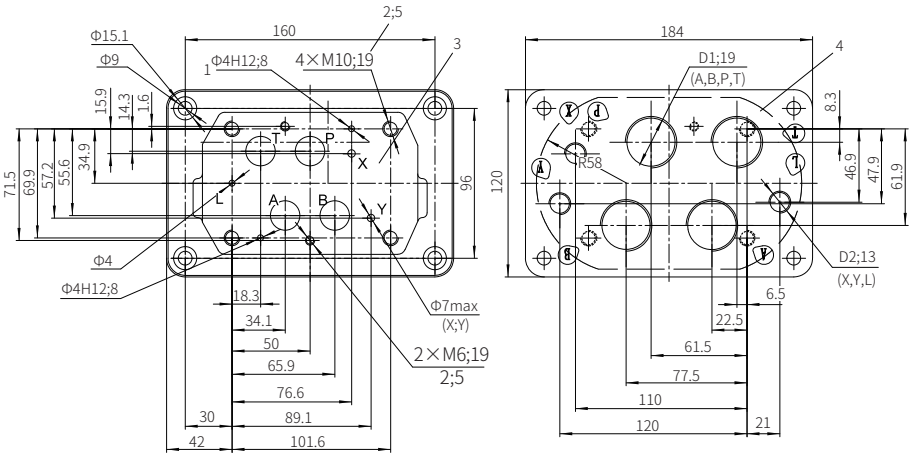
Model	D1	D2	Weight
G172/01	G3/4"	G1/4"	2.8kg
G172/02	M27×1.5	M14×1.5	

1 Locating pin hole
2 Valve fixing screw holes
3 Valve mounting face grinding
4 Front panel opening
5 Valve fixing screw:
4pcs M10, GB/T70.1-10.9 grade
4pcs M6, GB/T70.1-10.9 grade

Subplate, Size 16 (ISO4401)

Size unit: mm

Model G174/01 (G1") , Model G174/02 (M33×2)



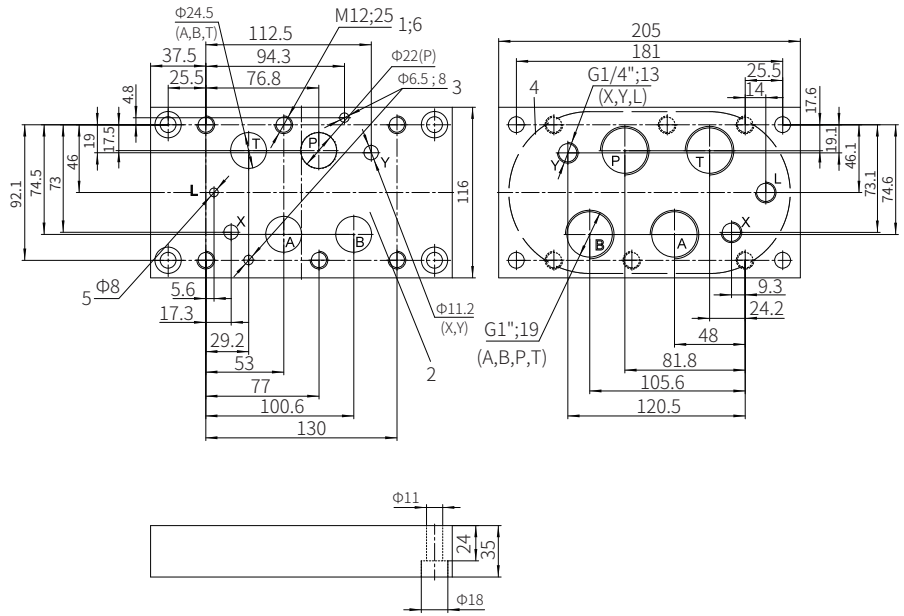
Model	D1	D2	Weight
G174/01	G1"	G1/4"	5.5kg
G174/02	M33×2	M14×1.5	

1 Locating pin hole
2 Valve fixing screw holes
3 Valve mounting face grinding
4 Front panel opening
5 Valve fixing screw:
4pcs M10, GB/T70.1-10.9 grade
4pcs M6, GB/T70.1-10.9 grade

Subplate, Size 25 (ISO4401)

Size unit: mm

Model G151/01 (G1") , Model G151/02 (M33×2); Model G153/01 (G1"), Model G153/02(M33×2)

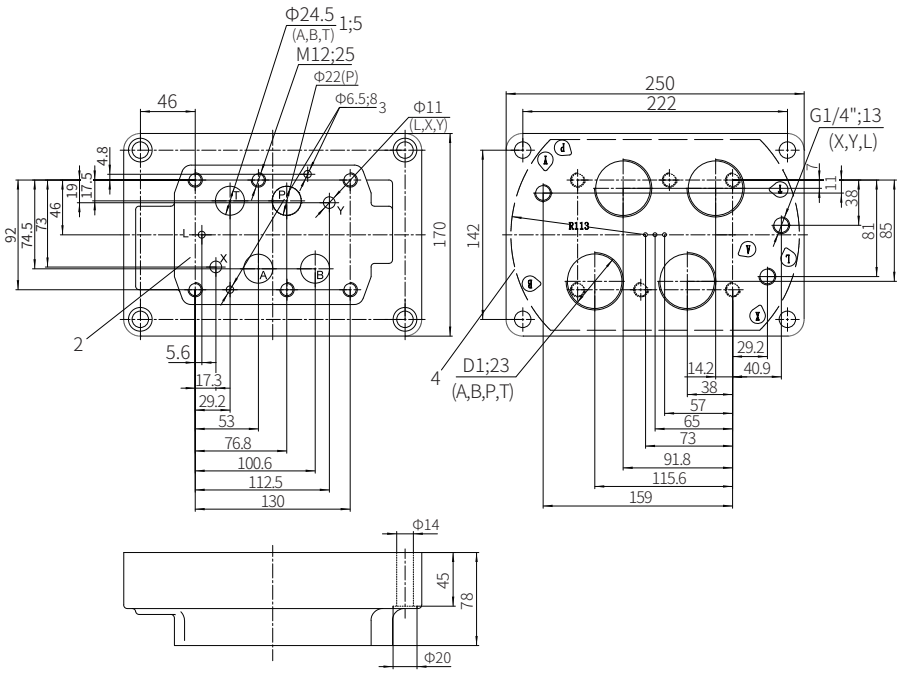


Model	D1	D2	Weight
G151/01	G1"	G1/4"	5.4kg
G151/02	M33×2	M14×1.5	
G153/01	G1"	G1/4"	
G153/02	M33×2	M14×1.5	

1 Locating pin hole
2 Valve fixing screw holes
3 Valve mounting face grinding
4 Front panel opening
5 Φ8mm connection hole to oil port L only drilled in subplate G153
(for hydraulic centered valves)
6 Valve fixing screw:
6pcs M12, GB/T70.1-10.9 grade

Subplate, Size 25 (ISO4401) Size unit: mm

Model G154/01, Model G154/02; Model G156/01, Model G156/02

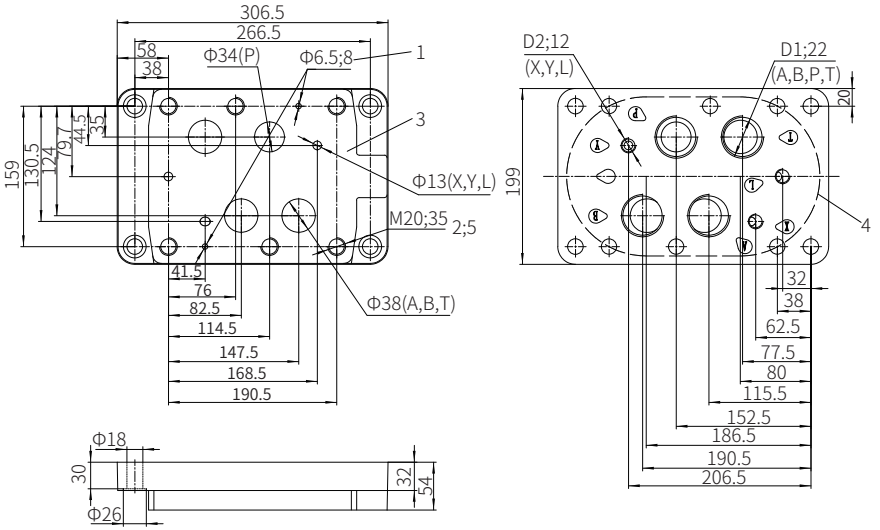


Model	D1	D2	Weight
G154/01	G1 1/4"	1/4"	18.5kg
G154/02	M42×2	M14×1.5	
G156/01	G1 1/2"	G1/4"	
G156/02	M48×2	M14×1.5	

1 Valve fixing screw holes
2 Valve mounting face grinding
3 Locating pin hole
4 Front panel opening
5 Valve fixing screw:
6pcs M20, GB/T70.1-10.9 grade

Subplate, Size 32 (ISO4401) Size unit: mm

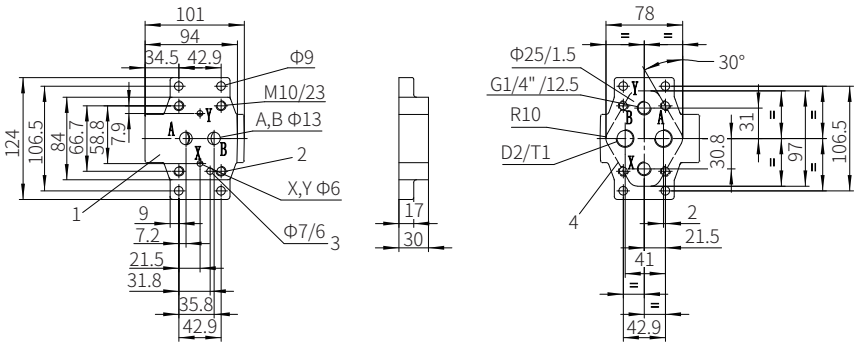
Model G157/01 (G1 1/2") , Model G157/02 (M48×2)



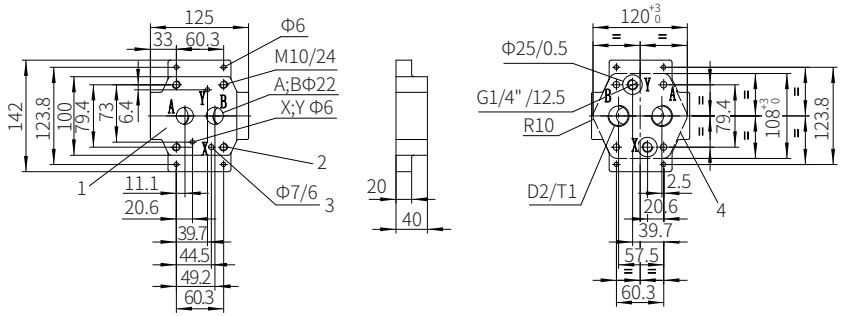
Model	D1	D2	Weight
G157/01	G1 1/2"	G3/8"	18.8kg
G157/02	M48×2	M18×1.5	

1 Locating pin hole
2 Valve fixing screw holes
3 Valve mounting face grinding
4 Front panel opening
5 Valve fixing screw:
6pcs M20, GB/T70.1-10.9 grade

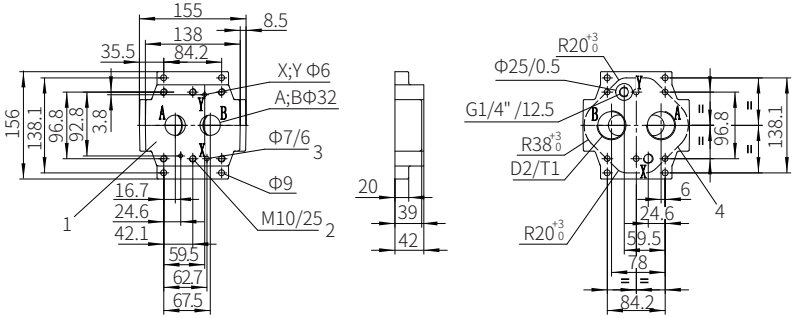
Subplate (ISO5781) Size unit: mm



Size	Model	D2	T1	Valve fixing screw	Torque	Weight
10	G460/01	G3/8"	13	4pcs M10×40-10.9 (GB/T70.1-2000)	69Nm	1.7kg
	G460/02	M18×1.5				
	G461/01	G1/2"	16			
	G461/02	M22×1.5				



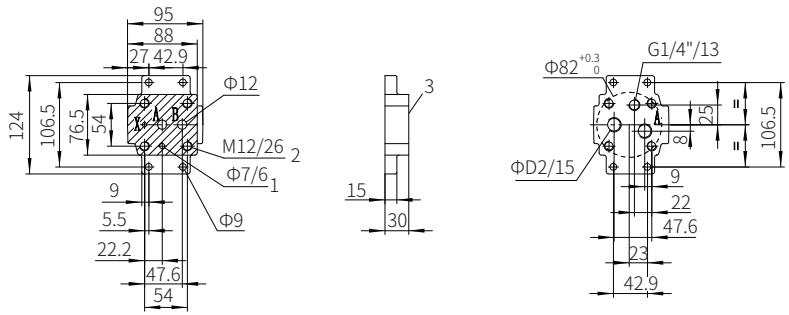
Size	Model	D2	T1	Valve fixing screw	Torque	Weight
25	G412/01	G3/4"	17	4pcs M10×50-10.9 (GB/T70.1-2000)	69Nm	3.3kg
	G412/02	M27×2				
	G413/01	G1"	20			
	G413/02	M33×2				



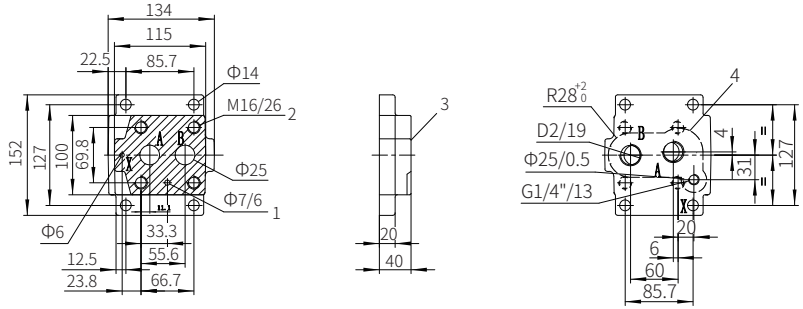
Size	Model	D2	T1	Valve fixing screw	Torque	Weight
32	G414/01	G11/4"	20.5	4pcs M10×60-10.9 (GB/T70.1-2000)	69Nm	5.0kg
	G414/02	M42×2				
	G415/01	G11/2"	22.5			
	G415/02	M48×2				

1 Valve mounting face grinding
2 Valve fixing screw holes
3 Locating pin hole
4 Incision outline of subplate

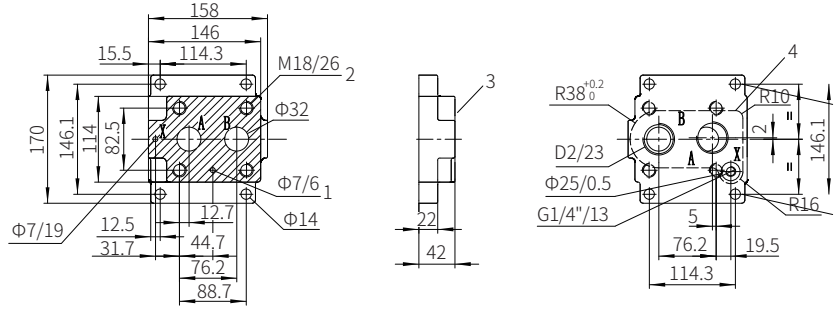
Subplate (ISO6264) Size unit: mm



Size	Model	D2	T1	Valve fixing screw	Torque	Weight
10	G545/01	G3/8"	13	4pcs M12×50-10.9 (GB/T70.1-2000)	120Nm	1.5kg
	G545/02	M18×1.5				
	G546/01	G1/2"	16			
	G546/02	M22×1.5				



Size	Model	D2	T1	Valve fixing screw	Torque	Weight
25	G408/01	G3/4"	17	4pcs M16×50-10.9 (GB/T70.1-2000)	295Nm	3.0kg
	G408/02	M27×2				
	G409/01	G1"	20			
	G409/02	M33×2				

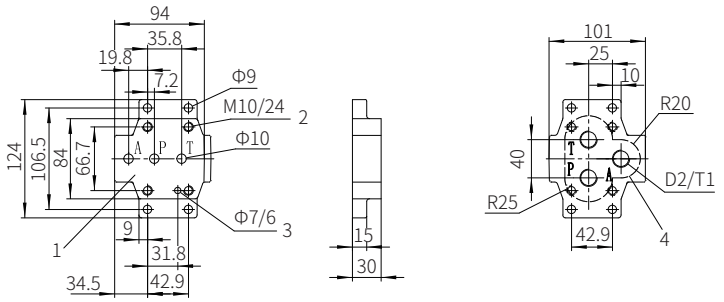


Size	Model	D2	T1	Valve fixing screw	Torque	Weight
32	G410/01	G11/4"	20.5	4pcs M18×50-10.9 (GB/T70.1-2000)	405Nm	5.0kg
	G410/02	M42×2				
	G411/01	G11/2"	22.5			
	G411/02	M48×2				

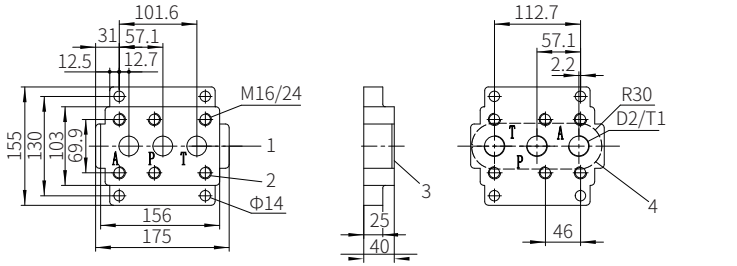
1 Valve mounting face grinding
2 Valve fixing screw holes
3 Locating pin hole
4 Incision outline of subplate

Subplate (ISO6264)

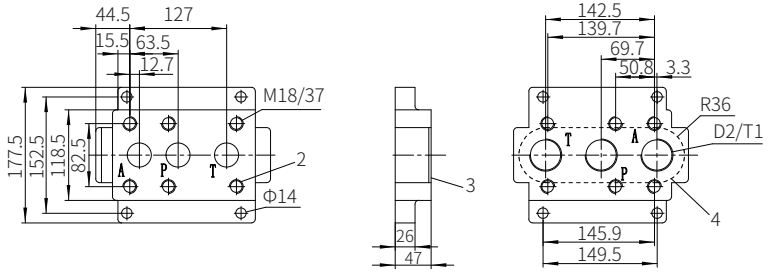
Size unit: mm



Size	Model	D2	T1	Valve fixing screw	Torque	Weight
10	G467/01	G3/8"	12	4pcs M10×80-10.9 (GB/T70.1-2000)	69Nm	1.7kg
	G467/02	M18×1.5				
	G468/01	G1/2"	14			
	G468/02	M22×1.5				



Size	Model	D2	T1	Valve fixing screw	Torque	Weight
25	G469/01	G3/4"	16	4pcs M16×100-10.9 (GB/T70.1-2000)	295Nm	5.2kg
	G469/02	M27×2				
	G470/01	G1"	18	4pcs M16×60-10.9 (GB/T70.1-2000)		
	G470/02	M33×2				



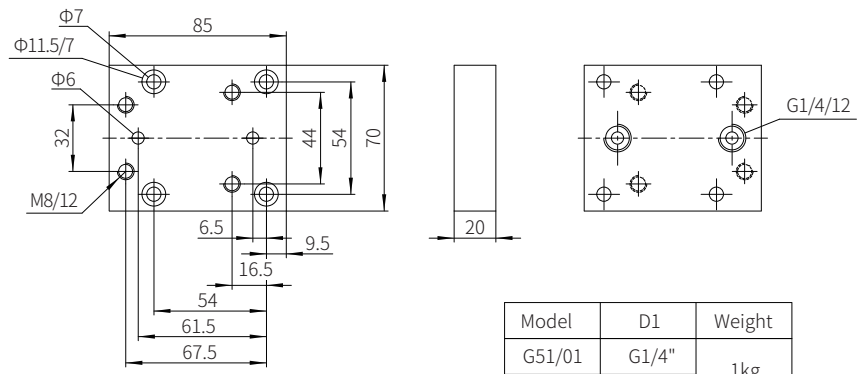
Size	Model	D2	T1	Valve fixing screw	Torque	Weight
32	G471/01	G11/4"	20	4pcs M18×120-10.9 (GB/T70.1-2000)	405Nm	8.2kg
	G471/02	M42×2				
	G472/01	G11/2"	22	4pcs M18×80-10.9 (GB/T70.1-2000)		
	G472/02	M48×2				

1 Valve mounting face grinding
2 Valve fixing screw holes
3 Locating pin hole
4 Incision outline of subplate

Subplate (G51、G565)

Size unit: mm

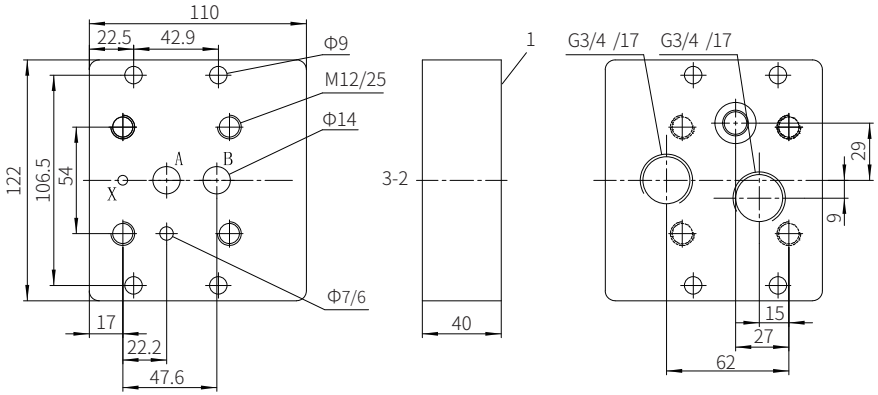
Model G51/01 (G1/4") , Model G51/02 (M14×1.5)



Model	D1	Weight
G51/01	G1/4"	1kg
G51/02	M14×1.5	

Valve fixing screw 4pcs M8, GB/T70.1-10.9 grade

Model G565/01 (G3/4") , Model G565/02 (M27×2)

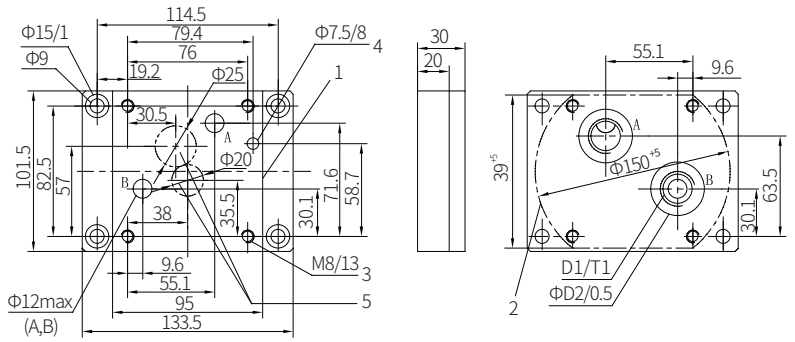


Valve fixing screw 4pcs M12, GB/T70.1-10.9 grade
1 Valve mounting face grinding
2 Valve fixing screw holes

Model	D1	Weight
G565/01	G3/4"	1kg
G565/02	M27×2	

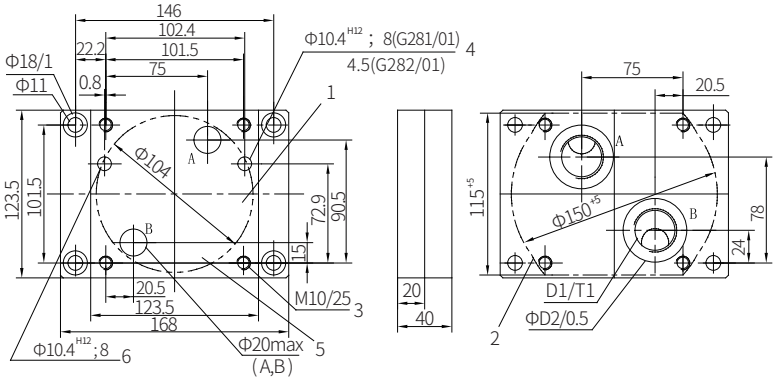
Subplate (ISO6263) Size unit: mm

Model G279/01(G1/2)，Model G279/02 (M22×1.5) ; Model G280/01(G3/4)，Model G280/02 (M27×2)



Size	Model	Weight	D1	D2	T1	Valve fixing screw
10	G279/01(02)	2.8kg	G1/2(M22×1.5)	34	15	4 pcs hexagon screws M10
	G280/01(02)		G3/4(M27×2)	42	17	GB/T70.1 10.9 grade

Model G281/01 (G1), Model G281/02(M33×2); Model G282/01(G11/4)，Model G282/02 (M42×2)



Size	Model	Weight	D1	D2	T1	Valve fixing screw
16	G281/01(02)	5kg	G1(M33×2)	47	19	4 pcs hexagon screws M10
	G282/01(02)		G11/4(M42×2)	56	21	GB/T70.1 10.9 grade

1 Valve mounting face grinding
2 Front panel opening
3 Valve fixing screw holes
4 Locating pin hole
5 Valve fixing screw:
GB/T 70.1-M 12-10.9 (size 10)
GB/T 70.1-M 16-10.9 (size 25)
GB/T 70.1-M 18-10.9 (size 32)

9 - Screws and Studs for Modular Valves

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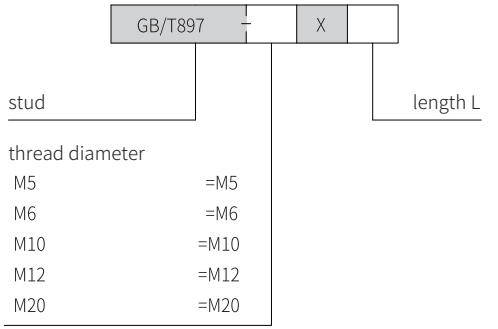
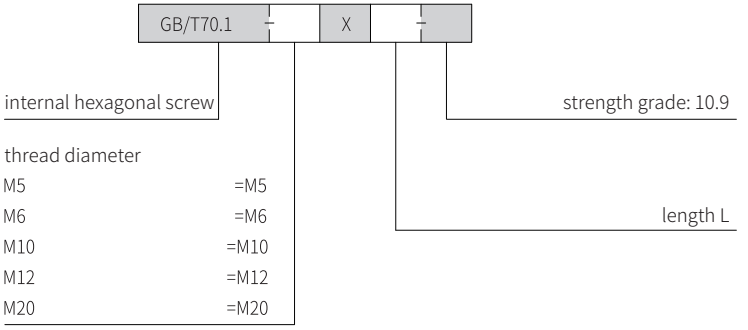
- Model GB/T70.1-M10×***-10.9，GB/T897-M10×*** 0974
- Model GB/T70.1-M12×***-10.9，GB/897-M12×*** 0975
- Model GB/T70.1-M20×***-10.9，GB/T897-M20×*** 0976

Screws and Studs for Modular Valves

Models and specifications





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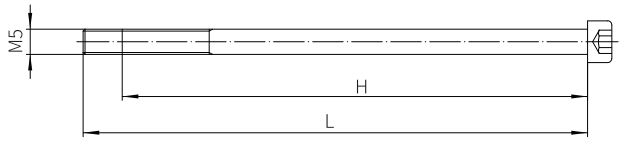
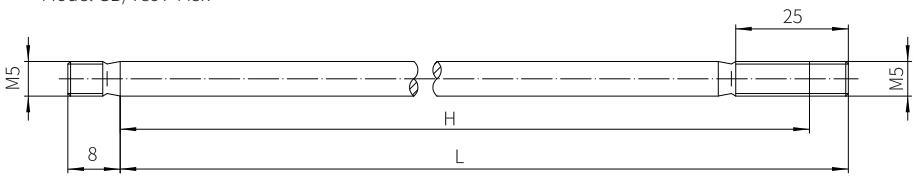
Component size

Size unit: mm

Screws and studs
Model GB/T70.1-M5x***-10.9



Model GB/T897-M5x***

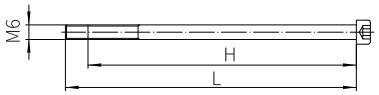


Screw model	Stud model	Specifications Thread diameter x Length L	Applicable stack height H
GB/T70.1-M5×90-10.9		M5×90	82
GB/T70.1-M5×105-10.9		M5×105	94
	GB/T897-M5×135	M5×135	122
	GB/T897-M5×145	M5×145	132
	GB/T897-M5×175	M5×175	162
	GB/T897-M5×185	M5×185	172
	GB/T897-M5×215	M5×215	202
	GB/T897-M5×225	M5×225	212
	GB/T897-M5×255	M5×225	242
	GB/T897-M5×265	M5×265	252

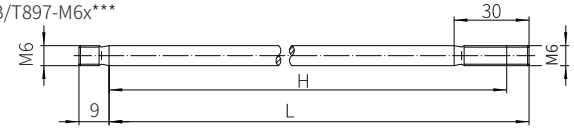
Component size

Size unit: mm

Screws and studs
Model GB/T70.1-M6x***-10.9



Model GB/T897-M6x***

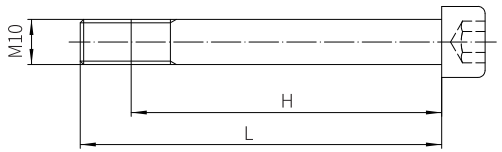


Screw model	Stud model	Specifications Thread diameter x Length L	Applicable stack height H
GB/T70.1-M6×90-10.9		M6×90	80
GB/T70.1-M6×95-10.9		M6×95	84
GB/T70.1-M6×100-10.9		M6×100	89
GB/T70.1-M6×105-10.9		M6×105	94
GB/T70.1-M6×115-10.9		M6×115	103
GB/T70.1-M6×135-10.9		M6×135	123
	GB/T897-M6×145	M6×145	130-134
	GB/T897-M6×150	M6×150	135-139
	GB/T897-M6×155	M6×155	145
	GB/T897-M6×165	M6×165	150-154
	GB/T897-M6×170	M6×170	155-159
	GB/T897-M6×185	M6×185	174
	GB/T897-M6×195	M6×195	180-184
	GB/T897-M6×200	M6×200	185-189
	GB/T897-M6×210	M6×210	196
	GB/T897-M6×215	M6×215	200-204
	GB/T897-M6×220	M6×220	205-209
	GB/T897-M6×235	M6×235	225
	GB/T897-M6×245	M6×245	230-234
	GB/T897-M6×250	M6×250	235-239
	GB/T897-M6×260	M6×260	247
	GB/T897-M6×265	M6×265	250-254
	GB/T897-M6×270	M6×270	255-259
	GB/T897-M6×275	M6×275	263
	GB/T897-M6×290	M6×290	276
	GB/T897-M6×295	M6×295	280-284
	GB/T897-M6×300	M6×300	285-289
	GB/T897-M6×315	M6×315	300-304
	GB/T897-M6×320	M6×320	305-309
	GB/T897-M6×340	M6×340	327
	GB/T897-M6×350	M6×350	334
	GB/T897-M6×355	M6×355	343
	GB/T897-M6×370	M6×370	356
	GB/T897-M6×380	M6×380	365

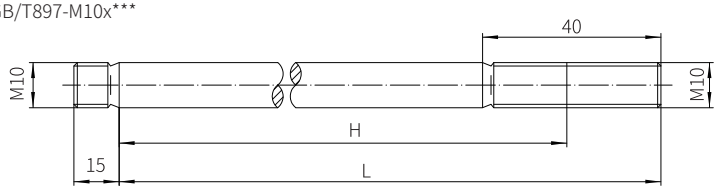
Component size

Size unit: mm

Screws and studs
Model GB/T70.1-M10x***-10.9



Model GB/T897-M10x***

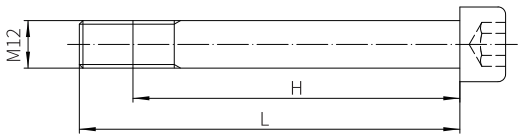


Screw model	Stud model	Specifications	Applicable stack height H
		Thread diameter x Length L	
GB/T70.1-M10×110-10.9		M10×110	94
GB/T70.1-M10×120-10.9		M10×120	103
GB/T70.1-M10×140-10.9		M10×140	123
	GB/T897-M10×165	M10×165	145
	GB/T897-M10×195	M10×195	174
	GB/T897-M10×205	M10×205	183
	GB/T897-M10×215	M10×215	196
	GB/T897-M10×225	M10×225	203-205
	GB/T897-M10×245	M10×245	225
	GB/T897-M10×265	M10×265	247
	GB/T897-M10×275	M10×275	254
	GB/T897-M10×285	M10×285	263
	GB/T897-M10×295	M10×295	276
	GB/T897-M10×305	M10×305	283-285
	GB/T897-M10×325	M10×325	305
	GB/T897-M10×345	M10×345	327
	GB/T897-M10×355	M10×355	334
	GB/T897-M10×365	M10×365	343
	GB/T897-M10×375	M10×375	356
	GB/T897-M10×385	M10×385	365

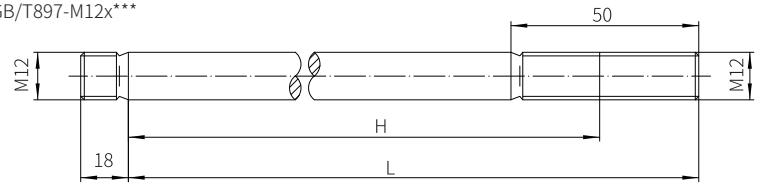
Component size

Size unit: mm

Screws and studs
Model GB/T70.1-M12x***-10.9



Model GB/T897-M12x***

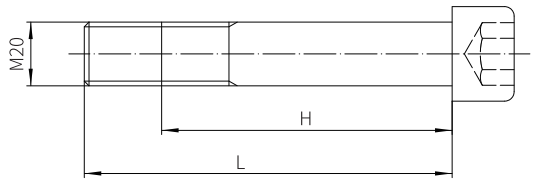


Screw model	Stud model	Specifications	Applicable stack height H
		Thread diameter x Length L	
GB/T70.1-M12×115-10.9		M12×115	96
GB/T70.1-M12×120-10.9		M12×120	101
GB/T70.1-M12×145-10.9		M12×145	124
GB/T70.1-M12×160-10.9		M12×160	141
GB/T70.1-M12×170-10.9		M12×170	151
GB/T70.1-M12×175-10.9		M12×175	156
GB/T70.1-M12×185-10.9		M12×185	163
GB/T70.1-M12×205-10.9		M12×205	184
GB/T70.1-M12×215-10.9		M12×215	196
GB/T70.1-M12×220-10.9		M12×220	201
GB/T70.1-M12×230-10.9		M12×230	211
GB/T70.1-M12×240-10.9		M12×240	218
GB/T70.1-M12×245-10.9		M12×245	224
	GB/T897-M12×265	M12×265	241
	GB/T897-M12×270	M12×270	246
	GB/T897-M12×275	M12×275	251
	GB/T897-M12×280	M12×280	256
	GB/T897-M12×290	M12×290	263
	GB/T897-M12×300	M12×300	273
	GB/T897-M12×310	M12×310	284
	GB/T897-M12×320	M12×320	296
	GB/T897-M12×325	M12×325	301
	GB/T897-M12×335	M12×335	311
	GB/T897-M12×345	M12×345	318
	GB/T897-M12×370	M12×370	346
	GB/T897-M12×375	M12×375	351
	GB/T897-M12×380	M12×380	356
	GB/T897-M12×390	M12×390	363
	GB/T897-M12×400	M12×400	373
	GB/T897-M12×410	M12×410	384
	GB/T897-M12×445	M12×445	418
	GB/T897-M12×470	M12×470	446

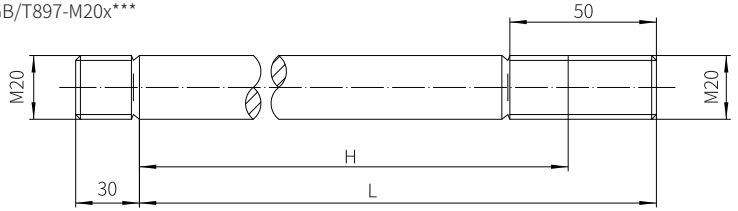
Component size

Size unit: mm

Screws and studs
Model GB/T70.1-M20x***-10.9



Model GB/T897-M20x***



Screw model	Stud model	Specifications Thread diameter x Length L	Applicable stack height H
GB/T70.1-M20×200-10.9		M20×200	169
GB/T70.1-M20×210-10.9		M20×210	176
GB/T70.1-M20×245-10.9		M20×245	214
GB/T70.1-M20×320-10.9		M20×320	289
GB/T70.1-M20×330-10.9		M20×330	296
GB/T70.1-M20×365-10.9		M20×365	334
GB/T70.1-M20×370-10.9		M20×370	341
	GB/T897-M20×440	M20×440	409
	GB/T897-M20×450	M20×450	416
	GB/T897-M20×490	M20×490	461
	GB/T897-M20×560	M20×560	529
	GB/T897-M20×570	M20×570	536
	GB/T897-M20×610	M20×610	581

Attached List

Installation height of directional valves and modular valves (Size unit: mm)

Size 4

Valve	Directional valve	Z2S4 Hydraulic -operated check valve
Height	27	30

Note: According to the stack length, 4 pcs M5 GB/T 70.1 screws with suitable length or 4 pcs M5 studs with suitable length are used for size 4 valves.

Size 6

Valve	Directional valve	ZDR6 Pressure reducing valve	ZDB6 Pressure relief valve	Z2S6 Hydraulic -operated check valve	Z1S6 Check valve	Z2FS6...4X Modular restrictive valve	Sandwich plate of pressure switch
Height	42	40	40	40	40	40	40

Note: According to the stack length, 4 pcs M5 GB/T 70.1 screws with suitable length or 4 pcs M5 studs with suitable length added M5 nuts are used for size 6 valves.

Size 10

Valve	WE10 Solenoid operated directional valve	WEH10 Electro -hydraulic directional valve	ZDR10 Pressure reducing valve	ZDB10 Pressure relief valve	Z2S10 Hydraulic -operated check valve	Z1S10 Check valve	Z2FS10...4X Modular restrictive check valve	Sandwich plate of pressure switch
Height	30	35	50	50	50	50	50	50

Note: According to the stack length, 4 pcs M6 GB/T 70.1 screws with suitable length or 4 pcs M6 studs with suitable length added M6 nuts are used for size 10 valves.

Size 16

Valve	Directional valve	ZDB16 Pressure relief valve	Z2S16 Hydraulic -operated check valve	Z2FS16 Modular restrictive check valve
Height	43	80	80	51

Note: According to the stack length 4 pcs M10 GB/T 70.1 screws and 2 pcs M6 GB/T70.1 screws with suitable length, or 4 pcs M10 studs with suitable length added M10 nuts and 2 pcs M6 studs with suitable length added M6 nuts are used for size 16 valves

Size 22

Valve	Directional valve	ZDB22 Pressure relief valve	Z2S22 Hydraulic -operated check valve	Z2FS22 Modular restrictive check valve
Height	41	60	100	54

Note: According to the stack length, 6 pcs M12 GB/T 70.1 screws with suitable length or 6 pcs M12 studs with suitable length added M12 nuts are used for size 12 valves.

10 - Plugs for Valves and Sensors

Features

- Used as an accessory
- Plastic and metal varieties
- Various models and standards
- For solenoids, position sensors, and pressure sensors, valves with/without built-in amplifiers

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Description

2P+PE	Plug with lamp for solenoid of on/off valve DIN 43 650 ISO 4400	Features - Frosted transparent shell - DC/AC, optional - With or without cable, optional - Protection grade IP65
2P+PE	Plug without lamp for solenoid of on/off valve DIN 43 650 ISO 4400	Features - Gray shell (A-end)/black shell (B-end) - DC/AC, optional - Without cable - Protection grade IP65
3P+PE	Plug for pressure switch and sensor DIN 43 650 ISO 4400	Features - Black shell - With or without cable,optional - Protection grade IP65
2P+PE	Plug with lamp for solenoid of on/off valve DIN 43 650 ISO 4400	Features - Transparent shell - With rectifier - Half wave rectification/full wave rectification, optional - Protection grade IP65
2P	Deutsch water-proof plug (without lamp) for water-proof solenoid	Features - Deutsch horizontal insertion - DC - Customizable cable length - Protection grade IP67

Description

2P	Deutsch water-proof plug (with lamp) for water-proof solenoid	Features - Deutsch horizontal insertion - DC - Customizable cable length - With LED indicate lamp - Protection grade IP67
2P+PE	DIN plug connect to Deutsch water-proof plug DIN 43 650 ISO 4400	Features - Epoxy resin filling (shockproof, water-proof) - With LED indicate lamp - DC/AC, optional - Connect to Deutsch plug - Protection grade IP67
2P+PE	DIN water-proof plug with cable DIN 43 650 ISO 4400	Features - Epoxy resin filling (shockproof, water-proof) - With LED indicate lamp - DC/AC, optional - Connect to Deutsch plug - Protection grade IP67
4P	Plug with lamp and cable for valve with position monitoring sensor	Features - Frosted transparent shell - M12x1 threaded connection - Customizable cable length
2P+PE	Plug for solenoid of proportional valve DINEN 175301-803 ISO 4400	Features - Gray shell (A-end)/black shell (B-end) - For proportional valve with external amplifier - Protection grade IP65
5P	5-pin aviation plug for plug-in type proportional amplifier	Features - M12x1 threaded connection - Please refer to the connection in electrical connections of each proportional valve - Protection grade IP65
6P+PE	7-pin aviation plug for valve with built-in amplifier DINEN 175201-804	Features - M22x1.5 threaded connection - Please refer to the connection in electrical connections of each proportional valve - Protection grade IP65

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