02

Pilot Operated Pressure Reducing Valve

Model: DR...5XJ

- Size 10 to 32
- Maximum working pressure 315 bar
- Maximum working flow 400 L/min

Contents

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)

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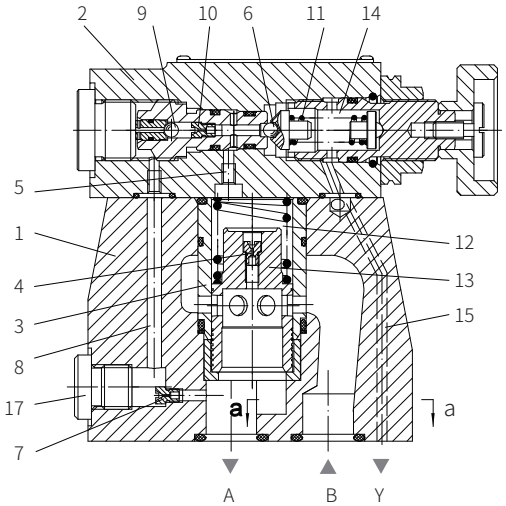
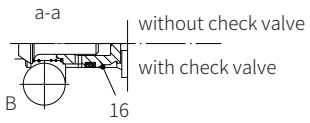
Function description, sectional drawing

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 [ ] [ ] [ ] *

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

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

J= Rexroth

Y= pilot oil return external
pilot oil supply internal
pilot oil supply

No code[3]= with chech valve
M= without check valve

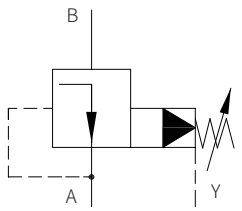
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

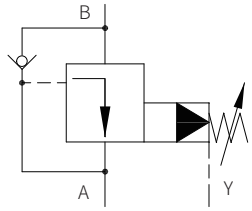
50= set pressure up to 50 bar
100= set pressure up to 100 bar
200= set pressure up to 200 bar
315= set pressure up to 315 bar

3) only for pilot valve with subplate mounting

Functional symbols



Model DR…-5XJ/YM…



Model DR...-5XJ/Y...
(only for subplate mounting)

Technical parameters

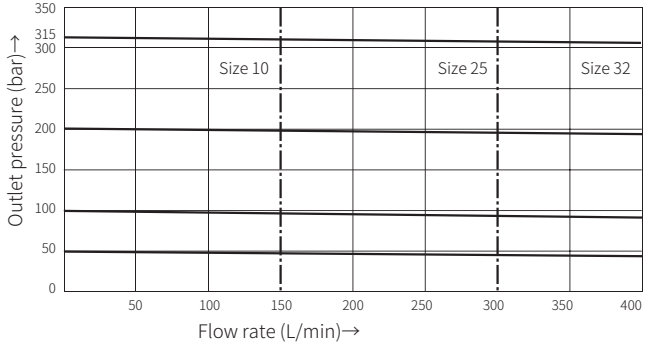
Overview							
Installation position			optional				
Environment temperature range		°C	-30 to +50 (NBR seal)				
		°C	-20 to +50 (FKM seal)				
Weight			DR10	DR15	DR20	DR25	DR30
Subplate mounting	DR…	kg	3.4	-	5.3	-	8.0
	DRC…	kg	1.2				
	DRC30…	kg	1.2				
Threaded connection	DR…G…	kg	5.3	5.2	5.1	5.0	4.8
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.

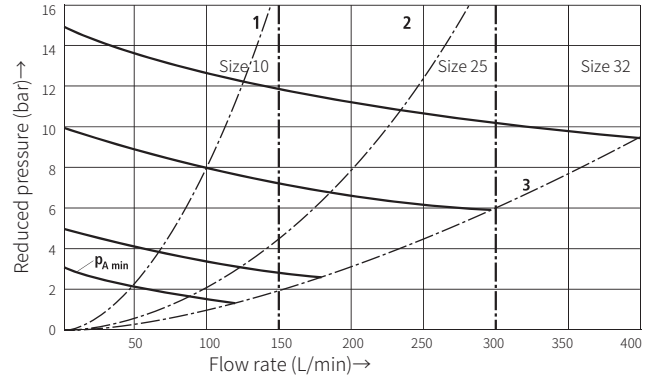
Characteristic curve

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

inlet pressure p_A-flow q_V(B→A)

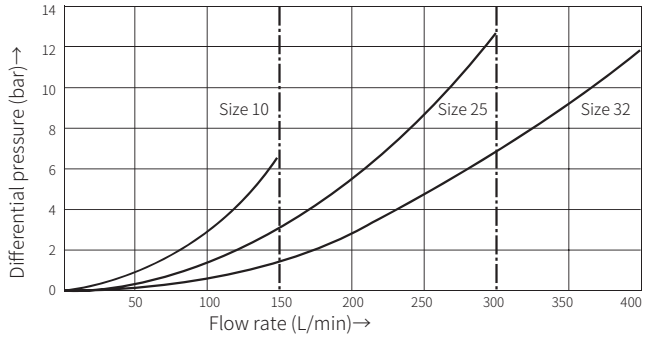


Minimum setting pressure p_{Amin}-flow q_V(B→A)



Performance limit (system-dependent)
1=Size 10
2=Size 25
3=Size 30

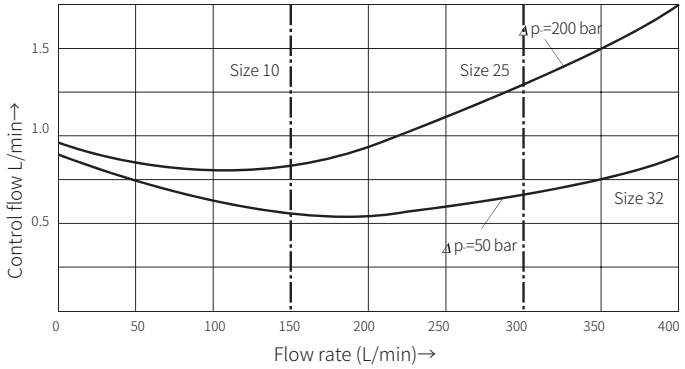
Δp-q_v-characteristic curves (B→A)(lowest setting pressure differential)



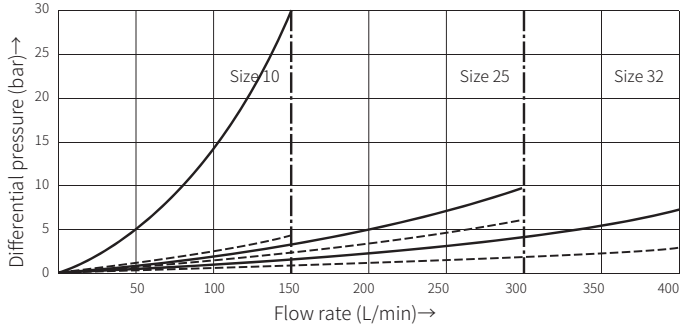
Characteristic curve

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

Pilot flow depending on flow (B→A)and pressure differential



$\Delta p \cdot q_V$-characteristic curves across the check valve (A→B)



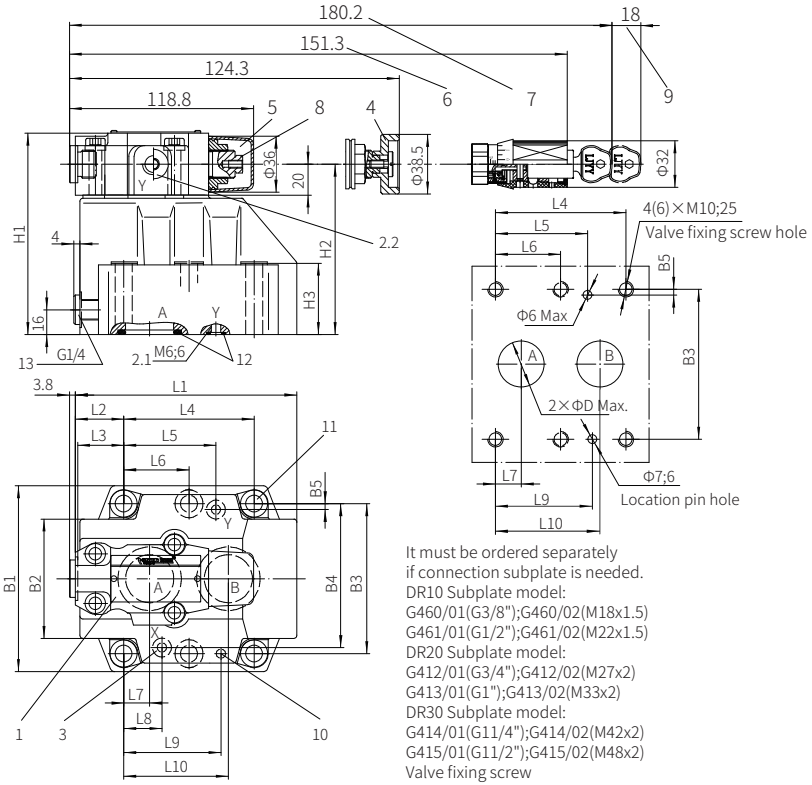
——— Flow resistance across check valve, main valve closed

– – – Flow resistance across check valve with completely opened main valve

Component size

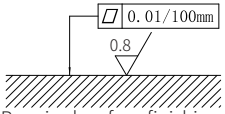
Size unit: mm

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

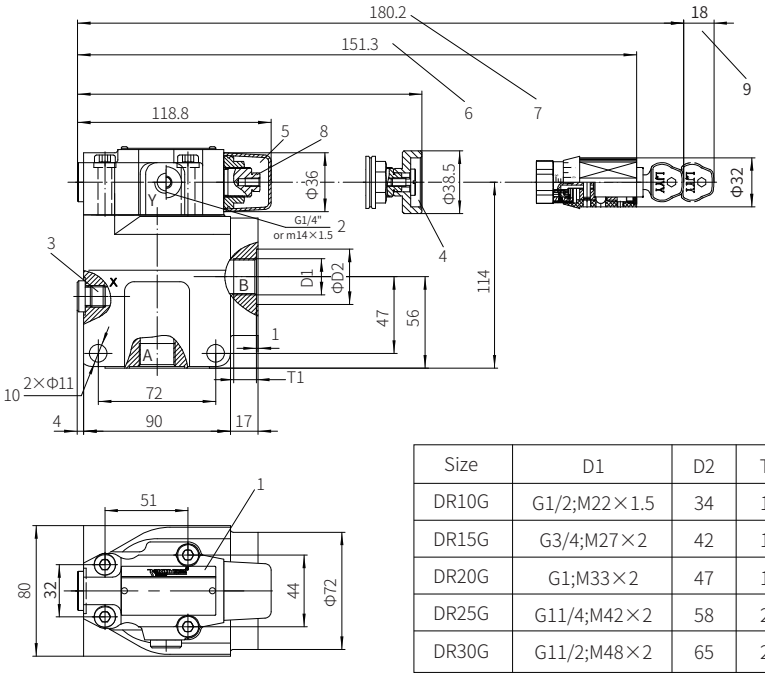
Size	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	B1	B2
10	98.8	34.6	33.1	42.9	21.5	-	7.2	21.5	31.8	35.8	85	50
20	117.8	36.9	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	102	60
30	143	31.3	29.8	84.2	59.5	42.1	16.7	24.6	62.7	67.5	120	77

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/



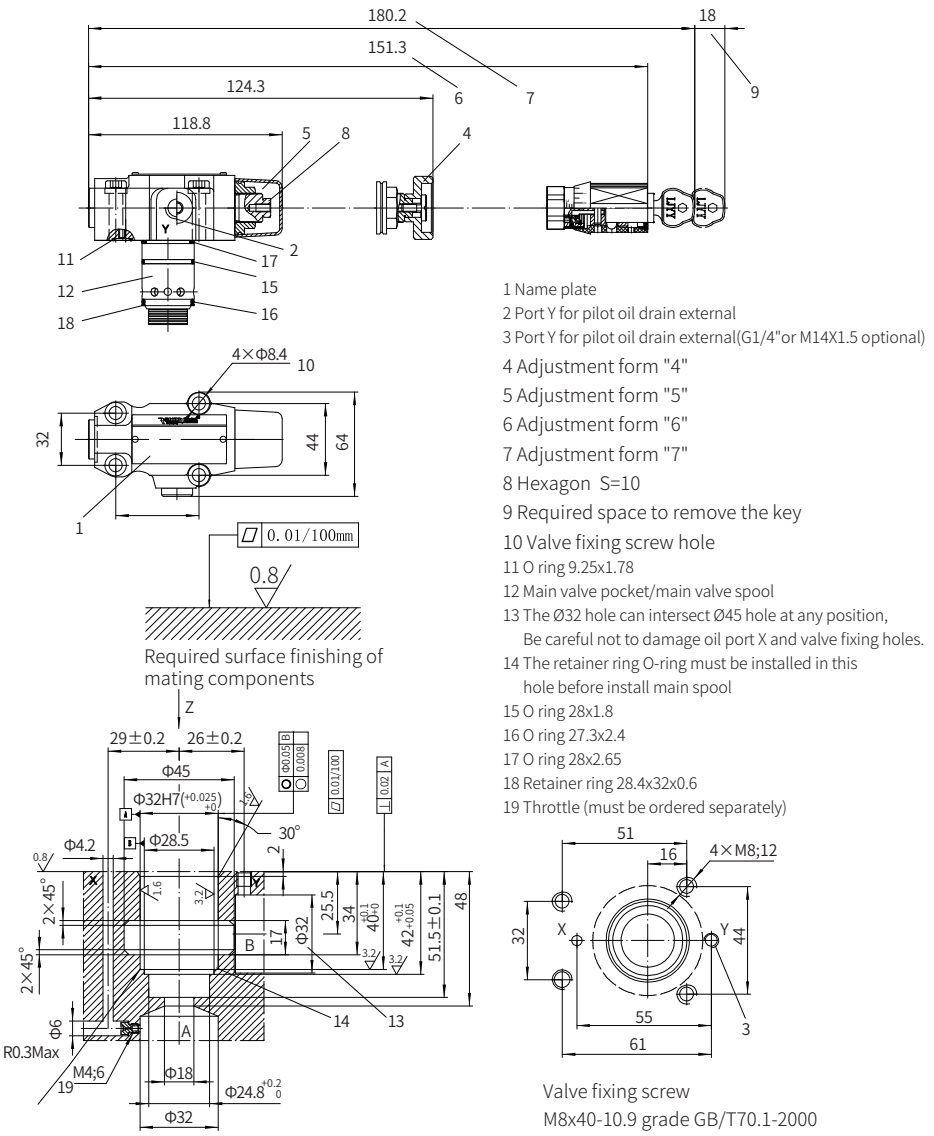
Size	D1	D2	T1
DR10G	G1/2;M22×1.5	34	14
DR15G	G3/4;M27×2	42	16
DR20G	G1;M33×2	47	18
DR25G	G11/4;M42×2	58	20
DR30G	G11/2;M48×2	65	22

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