04

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)

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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.

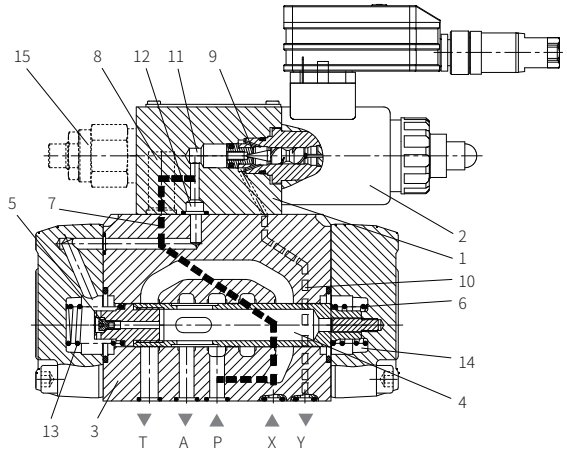
Structure:
The valve mainly consists of:
- Pilot valve (1) with proportional solenoid (2), and optional maximum pressure limitation (15)
- Main valve (3) with main spool (4)

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 =7X
(70 to 79 series installation and connection size unchanged)

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

more information in text

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

for 3DRE(M)E
A1= command value 0 to 10V
F1= command value 4 to 20mA

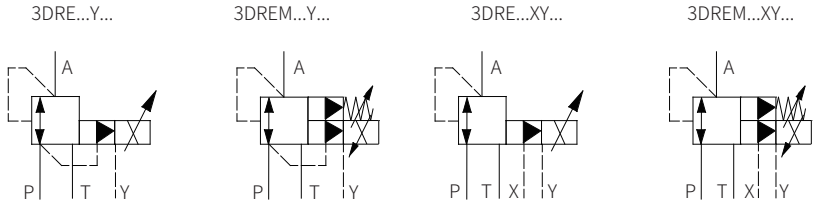
electrical connection:
for model 3DRE(M)
K4= without plug in connector
for model 3DRE(M)E
K31S= with 1.5 meter cable and tin on the end
K31C= with M12×1 aviation plug, 5-pin

no code= 1600mA
-8= 800mA

G24= voltage 24V DC

Y= pilot oil internal supply and external drain
XY= pilot oil external supply and drain

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.

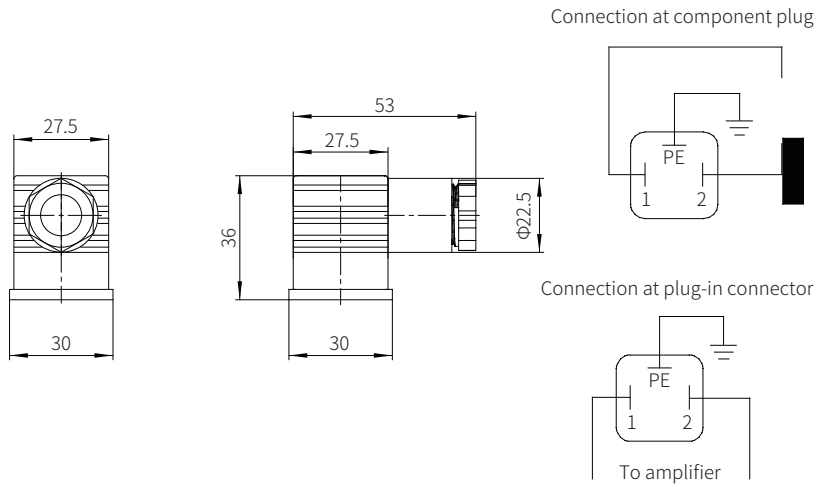
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

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	

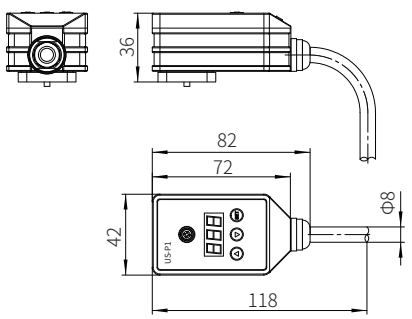
Electrical connections

For model 3DRE/3DREM (with external amplifier)
The plug-in connector to DIN EN 175301-803

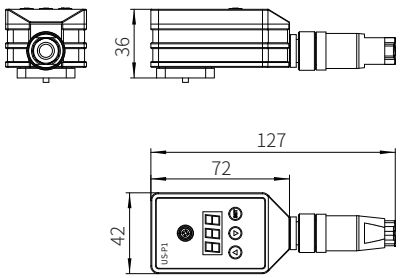


Electrical connections

Model 3DRE(M)E...7XJ/...K31S



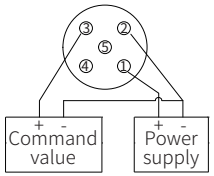
Model 3DRE(M)E...7XJ/...K31C



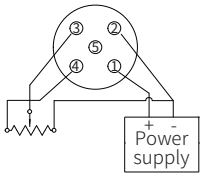
Terminal identification

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



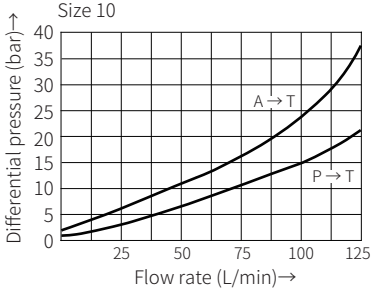
Connection example: Potentiometer input command



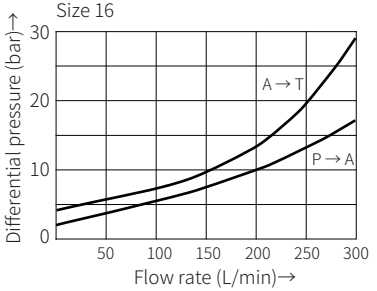
Characteristic curve

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

Size 10

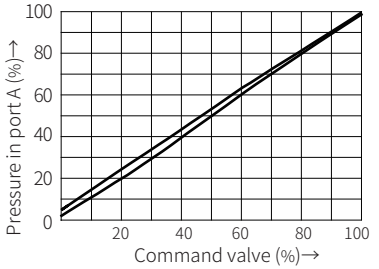


Size 16



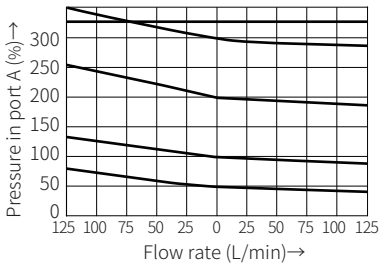
Pressure in port A-command valve (measured at flow 0L/min)

Size 10 -16

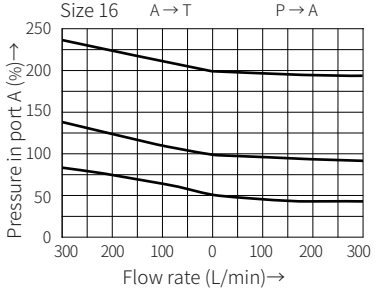


Pressure in port A - flow

Size 10 A → T P → A

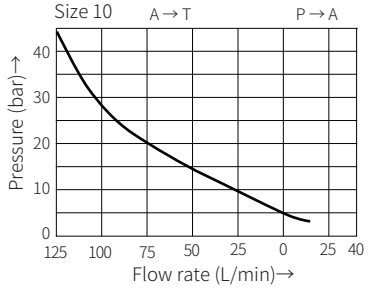


Size 16 A → T P → A

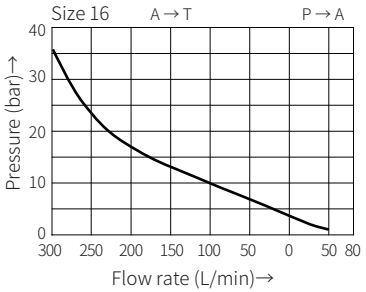


Min. set pressure - flow

Size 10 A → T P → A

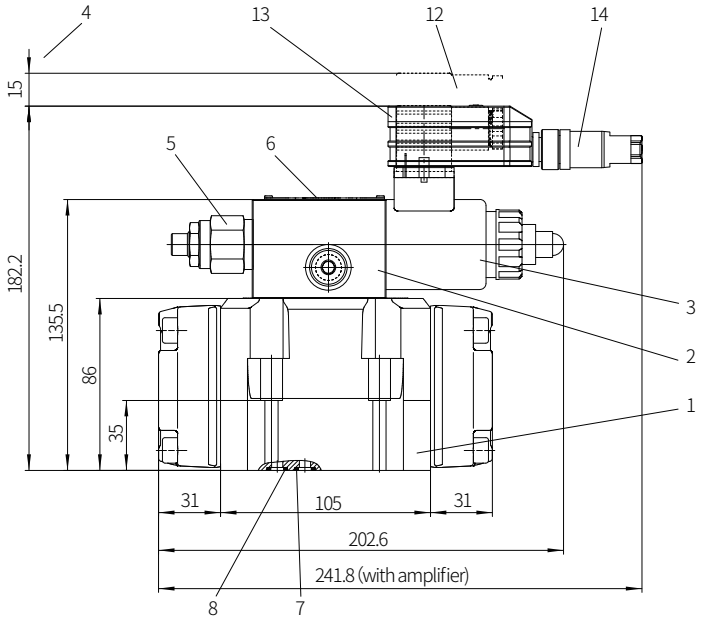


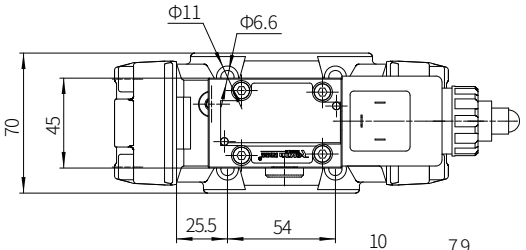
Size 16 A → T P → A

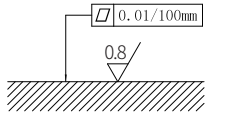


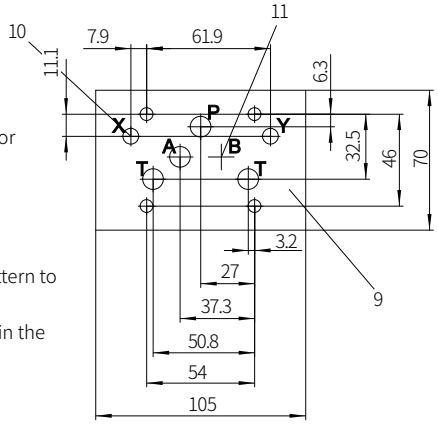
Component size

Size unit: mm





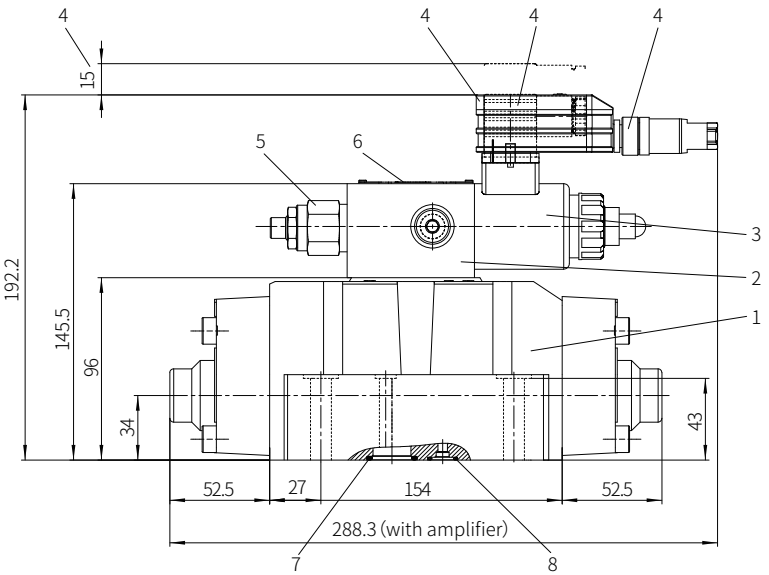


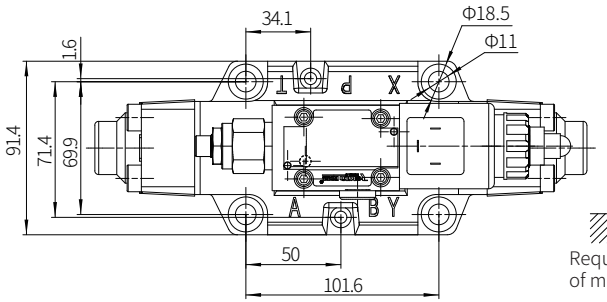


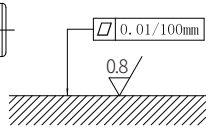
1 Main valve
2 Pilot valve
3 Proportional solenoid
4 Space required to remove the plug-in connector
5 Max. pressure limitation (model 3DREM...)
6 Name plate
7 O-ring 12x2 (for oil port P, A, B, T)
8 O-ring 12x2 (for oil port X, Y)
9 Machined valve mounting surface, porting pattern to DIN24340A, ISO 4401
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)

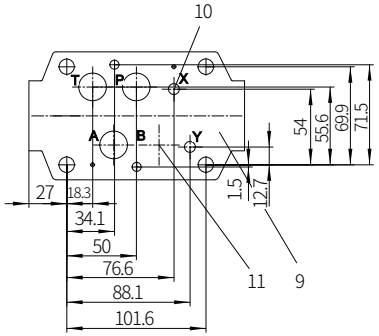
Component size

Size unit: mm









1 Main valve
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)

Control oil supply

Model 3DRE...-.../...XY Pilot oil external supply
Pilot oil external drain

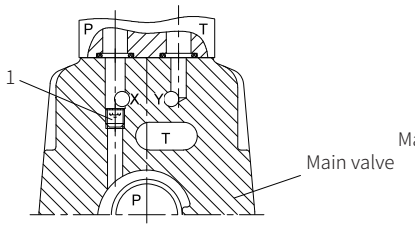
In this version, the pilot oil is supplied from a separate control circuit (external).
The pilot oil drain is not directed to the port T of the main valve, but return to the tank via port Y (external).

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.

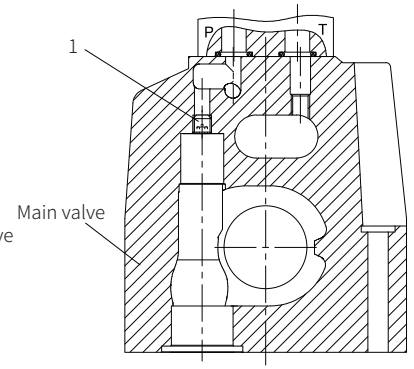
04

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

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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