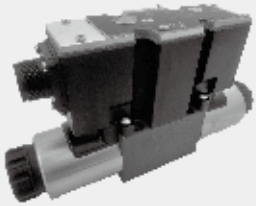
6.6

3-way Proportional pressure reducing valve

Type 3DREP and 3DREPE

NG 6
Max pressure 100 bar
Max flow 15 L/min



Contents

Features

-Directly controlled proportional valves for the control of the pressure and direction of a flow
-3-Way design and standard ISO 4401-03 mounting
-Operated via proportional solenoids with central thread and removable coil
-Spring centred control spool
-Hand override, optional
-3DREP: available module amplifier
-3DREPE: integrated electronics (OBE) with voltage input or current input (A1 resp. F1)

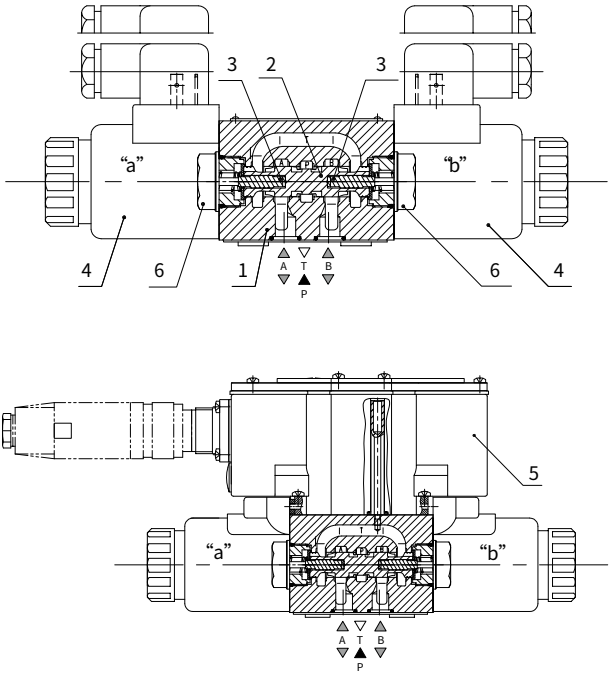
Function and configuration

General:
The 3-way pressure reducing valve type 3DREP 6... is directly actuated by proportional solenoids. They convert an electrical input signal into a proportional pressure output signal.

Design:
The valve mainly comprises of: Housing (1) with mounting surface, Control spool (2) with pressure measuring spools (3), Solenoids (4) with control thread and Optional integrated valve electronics (5).

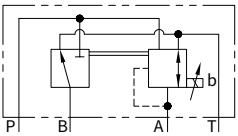
Function:
With the solenoids (4) de-energized the control spool (2) is held in its centeres position by compression springs. The control spool (2) is directly actuated when one of the solenoids is energised E.g. by energizing solenoid "a". The pressure measuring spool (3) and control spool (2) move to the right in proportion to the electrical input signal. The connection from P to B and A to T is via orifice form cross-sections with progressive flow Characteristics – De-energization of the solenoid (4). The control spool (2) is returned to its centre position by the compression springs.
In the middle postion the connections A and B to T are open, therefore, the pressure fluid can freely flow to tank.

Type 3DREP6...-L2X/...

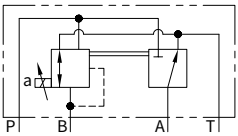


Symbols

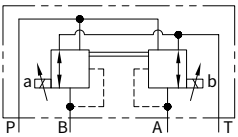
Type 3DREP6... A -L2X/...



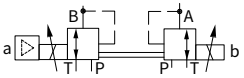
Type 3DREP6... B -L2X/...



Type 3DREP6... C -L2X/...



Type 3DREPE6...C L2X/... (simplified)
Example of a valve with integrated control electronics



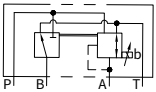
Ordering code

3DREP		6	– L2X /	E	G24		/		*

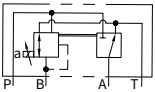
Without integrated =No code
With integrate = E

Nominal size 6 =6

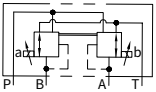
Spool symbols



=A



=B



=C

Series L20~L29 =L2X
(L20 to L29, unchanged installation and connection dimensions)

16= Pressure stage 16 bar
25= Pressure stage 25 bar
45= Pressure stage 45 bar

E = Proportional solenoid with removable coil

Supply voltage for the control electronics
G24= Power supply voltage 24VDC

No code = Without hand override
N9 = With protected hand override

3DREP: Z4= With plug-in connector
K4= Without plug-in connector
3DREPE: K31= Without plug-in connector
Z31= With plug-in connector

3DREP: No code
Interface A1 or F1 for 3DREPE:
A1= Command value input ±10V
F1= Command value input 4 to 20mA

No code = NBR seals
V = FKM seals

Further information in plain text

Technical data

Hydraulic				
Valve type			3DREP6...L2X	3DREPE6...L2X
Installation			optional, preferably horizontal	
Weight		KG	2.0	2.2
Ambient temperature range		°C	-20 to +70	-20 to +50
Max. flow		L/min	15 (Δp = 50 bar)	
Hysteresis		%	⩽ 5	
Repeatability accuracy		%	⩽ 1	
Response sensitivity		%	⩽ 0.5	
Operating pressure range	Port P	bar	20 to 100 for pressure stage 16	
			30 to 100 for pressure stage 25	
			50 to 100 for pressure stage 45	
	Port T		0 to 3	
Pressure fluid			Mineral oil (HL, HLP) to DIN 51524	
			other pressure fluids on request	
Pressure fluid temperature range		°C	-20 to +80	
Viscosity range		mm^2/s	20 to 380 (preferably 30 to 46)	
Degree of contamination			Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9 or 20/18/15, ISO4406	

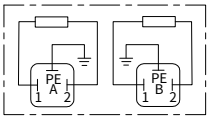
Electrical				
solenoid				
Valve type			3DREP6...L2X	3DREPE6...L2X
Voltage type			DC	
Command value signal Voltage input "A1"			-	±10V
Max. current per solenoid		A	1.5	2.5
Solenoid coil resistance	Cold value at 20 °C	Ω	4.8	2
	Max. warm value		7.2	3
Duty		%	ED100%	
Coil temperature		°C	up to 150	
Valve protection to EN 60529			IP 65 with mounted and fixed plug-in connector	
Amplifier			VT-VSPA2-...-L2X	integrated
Supply voltage	Nominal voltage	VDC	24	
	Lower limiting value	V	19	
	Upper limiting value	V	35	
Amplifier current consumption	I_{max}	A	1.8	
	Impulse current	A	4	

Electrical connections, plug-in connectors

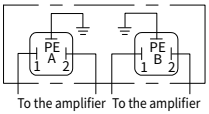
·For type 3DREP6...L2X (without integrated electronics)

Connections on the component plug

Plug-in connector to DIN EN 175301-803 or ISO 4400



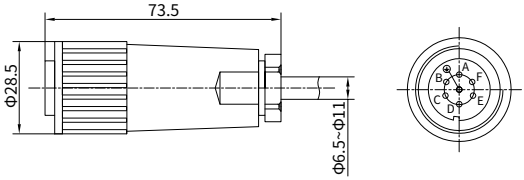
Connections on the plug-in connector



·For type 3DREPE6...L2X (with integrated electronics (OBE))

For pin allocation also see block circuit diagram.

Plug-in connector to DIN EN 175201-804



·Integrated control electronics for type 3DREPE6

Component plug allocation

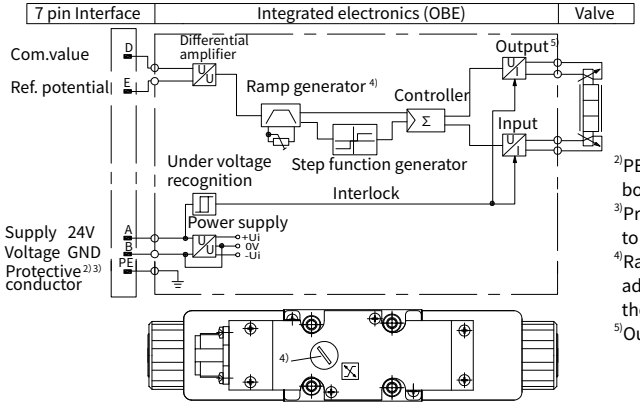
	Contact	Interface A1 signal	Interface F1 signal
Supply voltage	A	24 VDC(U(t)=19V to 35V)	
	B	GND	
	C	n.c. [1]	
Differential amplifier input	D	±10V, Re>50KΩ	4 to 20mA, Re>100Ω
	E	reference potentional command value	
	F	n.c. [1]	

[1]Contacts C and F must not be connected!

Connection cable:
Recommended:
– up to 25m cable length type LiYCY 7×0.75 mm²;
– up to 50 m cable length type LiYCY 7×1.0 mm².
For outside diameter see plug-in connector sketch.
Only connect screen to PE on the supply line.

Command value:
Reference potential at E and positive command value (0 to +10V or 12 to 20mA) at D result in pressure in A.
Reference potential at E and positive command value (0 to -10V or 12 to 4mA) at D result in pressure in B.
With valves with 1 solenoid on side b (design A): Reference potential at E and positive command value at D result in pressure in A.
With valves with 1 solenoid on side b (design B): Reference potential at E and positive command value at D result in pressure in B.

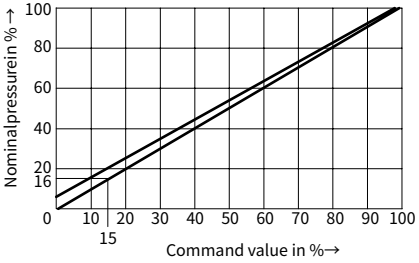
·Integrated electronics (OBE) for type 3DREPE6



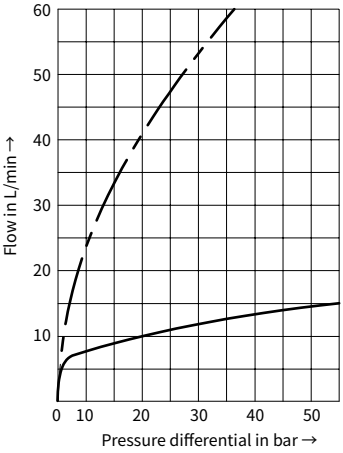
[2]PE is connected to the cooling body and the valve housing!
[3]Protective conductor screwed to the valve housing and cover.
[4]Ramp can be externally adjusted from 0 to 5s, the same applies for T_{up} and T_{down}.
[5]Output stages current regulated.

Characteristic curves (measured with HLP46, ϑ_{oil}=40°C ±5°C)

Pressure stages 16, 25 and 45 bar

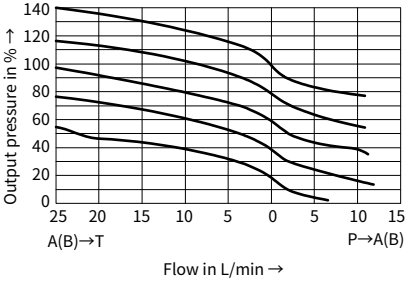


Pressure stages 16, 25 and 45 bar



06

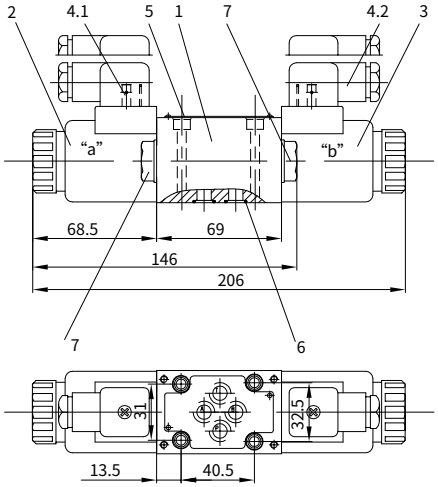
Pressure-flow relationship

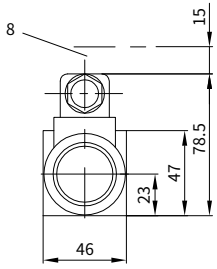


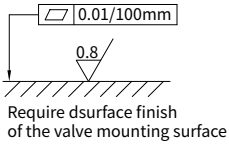
Unit dimensions

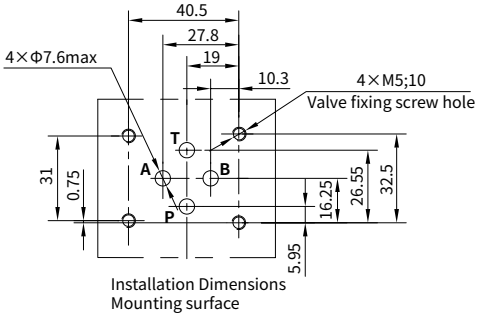
(nominal dimensions in mm)

Type 3DREP6...L2X









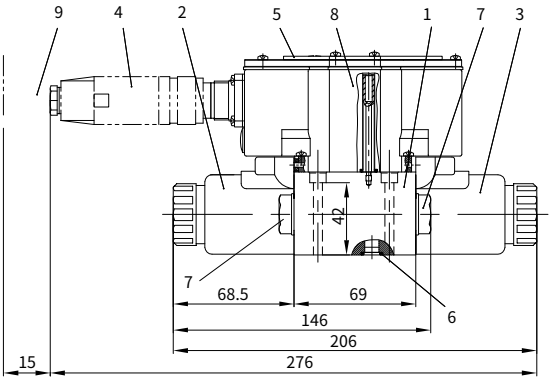
Valve fixing screws:
The following valve fixing screws are recommended:
- 4 S.H.C.S. ISO 4762 - M5×50 - 10.9
- 4 GB / T 70.1 - M5×50 - 10.9
- Tightening torque M_A = 8.9 Nm ± 10%

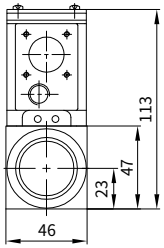
1 Valve housing
2 Proportional solenoid "a"
3 Proportional solenoid "b"
4.1 Plug-in connector "A"
4.2 Plug-in connector "B"
5 Name plate
6 Identical seal rings for ports A, B, P and T (R-ring 9.81×1.5×1.78 or O-ring 9.25×1.78)
7 Plug for valves with one solenoid (2 switching positions, versions A or B)
8 Space required to remove the plug-in connector

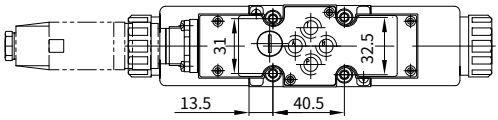
Unit dimensions

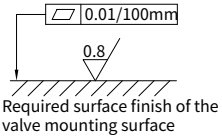
(Nominal dimensions in mm)

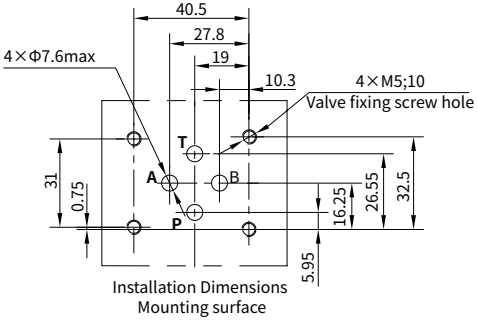
Type 3DREPE6...L2X











Valve fixing screws:
The following valve fixing screws are recommended:
- 4 S.H.C.S. ISO 4762 - M5×50 - 10.9
- 4 GB / T 70.1 - M5×50 - 10.9
- Tightening torque M_A = 8.9 Nm ± 10%

1 Valve housing
2 Proportional solenoid "a"
3 Proportional solenoid "b"
4 Plug-in connector
5 Name plate
6 Identical seal rings for ports A, B, P and T (R-ring 9.81×1.5×1.78 or O-ring 9.25×1.78)
7 Plug for valves with one solenoid (2 switching positions, versions A or B)
8 Integrated electronics (OBE)
9 Space required to remove the plug-in connector