

Solenoid Operated Directional Valve

Model: WE4...2XJ



01

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

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Features

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

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.

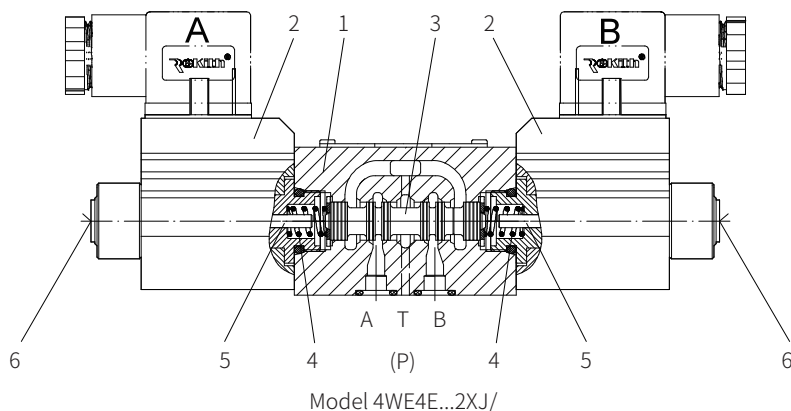
Therefore, the relevant switching position is fixed and there is no require of continuous power supply.

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.



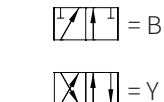
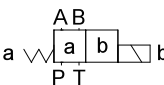
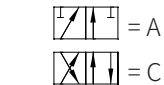
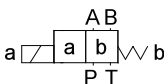
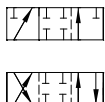
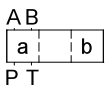
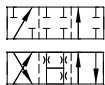
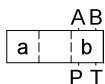
Models and specifications

		WE	4		-2X	J	/	C						*
3 ways	=3													more information in text
4 ways	=4													sealing material
size 4	=4													No code= NBR seals
Symbols e.g. D, E, EA, EB, etc.														V= FKM seals
20 to 29 series					=2X									(consult for other seals)
(20 to 29 series installation and connection size unchanged)														No code= without plug-in throttle
Rekith						=J								B08= throttle Ø0.8mm
with reset spring							=No code							B10= throttle Ø1.0mm
no reset spring							=0							B12= throttle Ø1.2mm
wet pin standard solenoid								=C						Z4= standard plug
12V DC									=G12					Z5L= large right angle plug with light
220V AC, 50H										=W220-50				FS2= deutsch waterproof plug
24V DC											=G24			No code= without manual emergency operation
110 or 220V AC with rectifier												=W110R/220R		N9= with hidden manual emergency operation

Functional symbols

Transition function

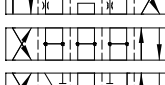
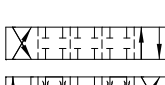
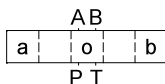
spool valve function



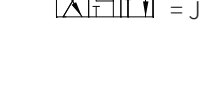
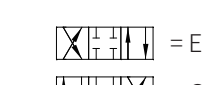
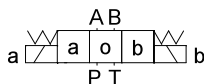
(The port serves as drain port)

(The port serves as drain port)

Transition function



spool valve function



= E

= G

= H

= J

Technical parameters

Universal			
Installation position			Optional
Environment temperature range °C			-30 to +50 (NBR seal) -20 to +50 (FKM seal)
Weight	Valve with 1 solenoid kg		0.8
	Valve with 2 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		mm²/s	2.8 to 500
Oil cleanliness ³⁾			The maximum allowable pollution level of oil is ISO4406 Class 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	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

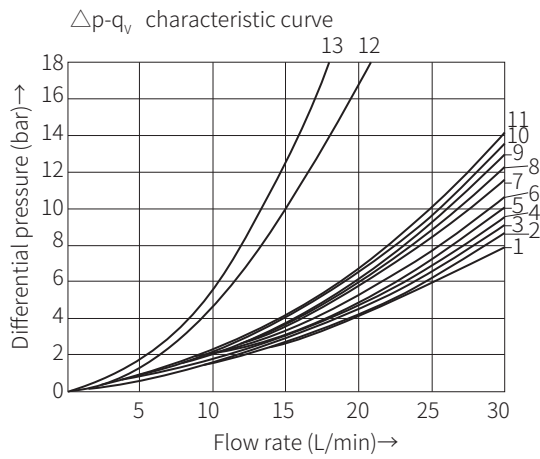
1) For NBR seal and FKM seal.

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, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)



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	-	-

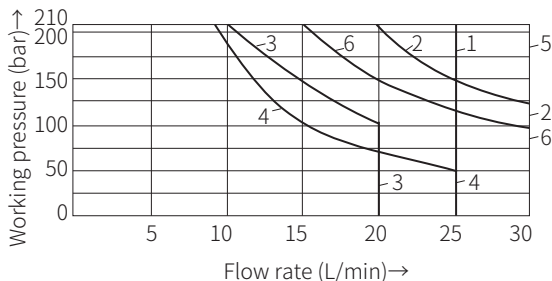
Characteristic limit

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.

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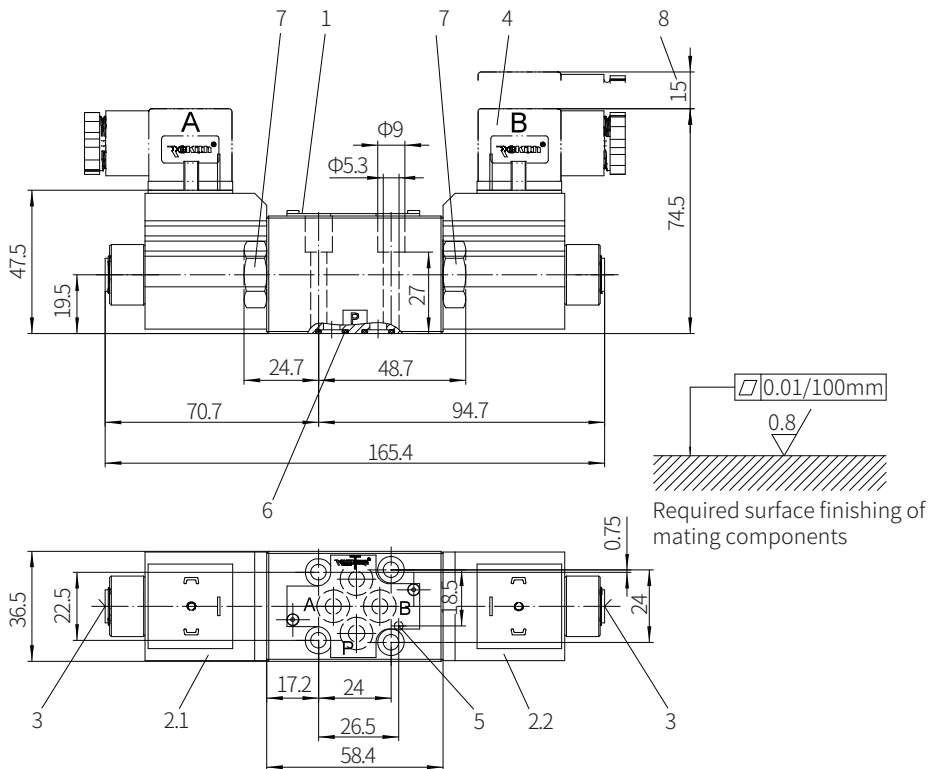
Characteristic curve	Symbol
1	C, C/O, C/OF, D, D/O, D/OF, Y
2	E, J, L, Q, U, W
3	G
4	A, B
5	H, M
6 ¹⁾	R

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 $M_A=6\text{Nm}$

