ГИДРООТВЕТ
доступная гидравлика

Solenoid Operated Directional Valve

Model: WE4...2X

- 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

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...

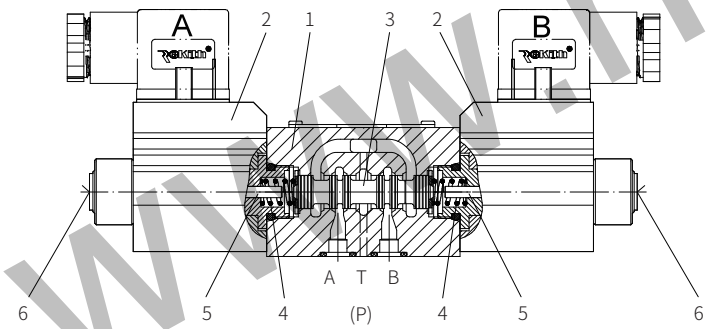
This model is a directional valve with two switching positions, two solenoids and a detent. Therefore, the relevant switching position is fixed and there is no require of continuous power supply.

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 / 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)

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

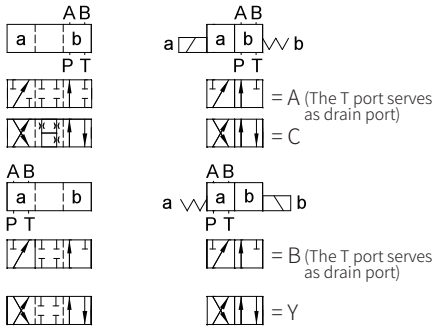
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

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

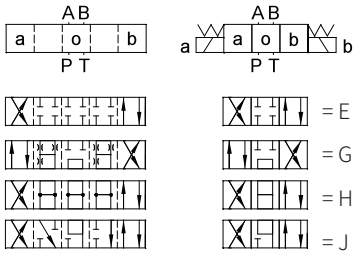
Z4= standard plug
Z5L= large right angle plug with light
FS2= deutsch waterproof plug

Functional symbols

Transition function spool valve function



Transition function spool valve function



Technical parameters

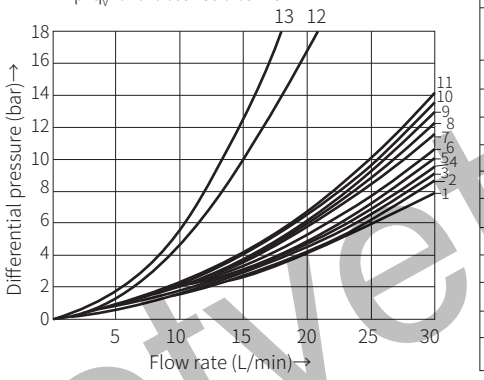
Universal			
Installation position			Optional
Environment temperature range		°C	-30 to +50 (NBR seal)
			-20 to +50 (FKM seal)
Weight	Valve with one solenoid	kg	0.8
	Valve with two solenoids	kg	1.1
Hydraulic			
Maximum working pressure	Oil port A, B, P	bar	210
	Oil port T	bar	100 When the working pressure 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



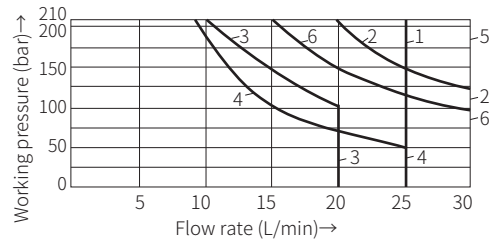
Symbol	Flow direction					
	P-A	P-B	A-T	B-T	P-T	B-A
A、B	7	6	-	-	-	-
C	11	11	8	7	-	-
D、Y	11	11	8	7	-	-
E	8	8	6	6	-	-
G	6	8	8	6	12	-
H	2	4	6	7	7	-
Q	9	8	4	5	-	-
L	9	7	1	5	-	-
M	3	3	7	7	-	-
R	11	9	5	-	-	13
J	10	10	3	4	-	-
W	11	11	8	7	-	-

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.



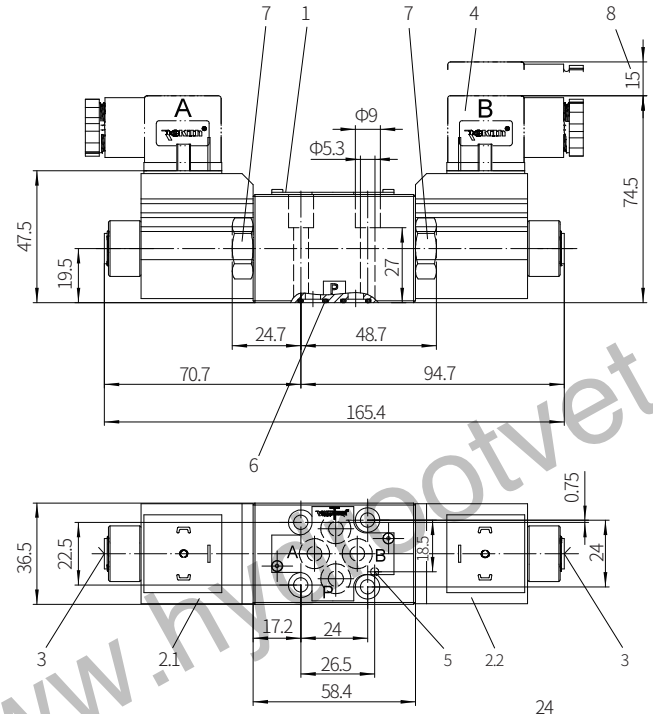
Characteristic curve	Symbol
1	C, C/O, C/OF, D, D/O, D/OF, Y
2	E, J, L, Q, U, W
3	G
4	A, B
5	H, M
6[1]	R

Return oil flow
(Independent from area ratio)
Other switching performance limits available on request!

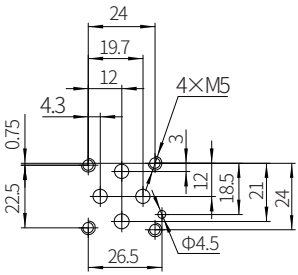
Component size

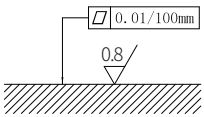
Size unit: mm

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