

## Solenoid Operated Directional Valve

Model: WE6...6X



- ◆ Size 6
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 80 L/min-DC  
60 L/min-AC

### Contents

Function description, sectional drawing	02
Models and specifications	03
Functional symbols	04
Technical parameters	05-06
Characteristic curve	06
Characteristic limit	07
Component size	08-09

### Features

- With the direct type solenoid operated directional spool valve as the standard type
- Wet-pin DC or AC solenoids with detachable coil
- The solenoid coil can be rotated by 90°
- Replace the coil without releasing the oil
- Individual or central electrical connection, optional
- Optional manual emergency operation

The WE6 directional valve is a directional spool valve operated by the solenoid. 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 solenoids (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 spring (4) (except for impulse spools) in the de-energized condition.

The control spool (3) is operated by wet pin solenoids (2). The force of the solenoid (2) acts on the control spool (3) through the push rod (5) to push it from the stationary position to the terminal position. In this way, the hydraulic oil passes from P to A and from B to T, or from P to B and from A to T. After the solenoid (2) is de-energized, the reset spring (4) pushes the control spool (3) back to the middle position. As an optional emergency operation (6), it can change the position of the control spool (3) without solenoid.

Model WE6..6XJ/O (only for symbols A, C and D)

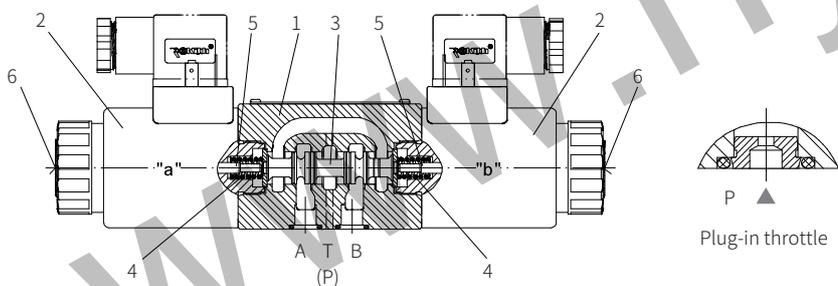
This model is a directional valve with two solenoids, two-position switch, without detent and no definite switching position in the power loss state. During power failure, there is no predetermined spool position.

Model WE6..6XJ/OF (impulse spool valve, only for symbols A, C and D)

This type refers to a two-position valve composed of two solenoids and a detent. The detent maintains the spool valve in its closest position and it is no require of continuous power supply.

Attention!

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.



Model 4WE6...6XJ/

3 working oil ports =3 4 working oil ports =4		WE	6	6X	C	*
--	--	----	---	----	---	---

more information in text

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

60 to 69 series =6X  
(60 to 69 series installation and connection size unchanged)

with reset spring = No code  
no reset spring =O  
no reset spring, with detent =OF

wet pin solenoid with detachable coil =C

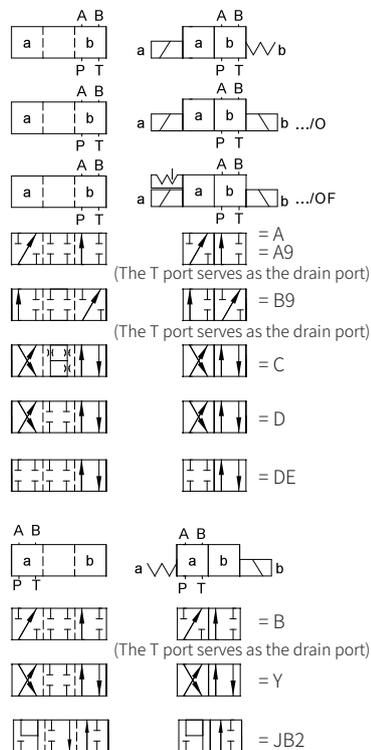
Oil port	Throttle portΦ(mm)		
	0.8	1.0	1.2
P	=B08	=B10	=B12
A	=H08	=H10	=H12
B	=R08	=R10	=R12
A and B	=N08	=N10	=N12
T	=X08	=X10	=X12

single connection  
K4= no insert plug  
Z4= standard plug  
Z5L= large right angle lamp plug  
FS2= deutsch waterproof plug  
centralized connection  
DL= connection box with lamp

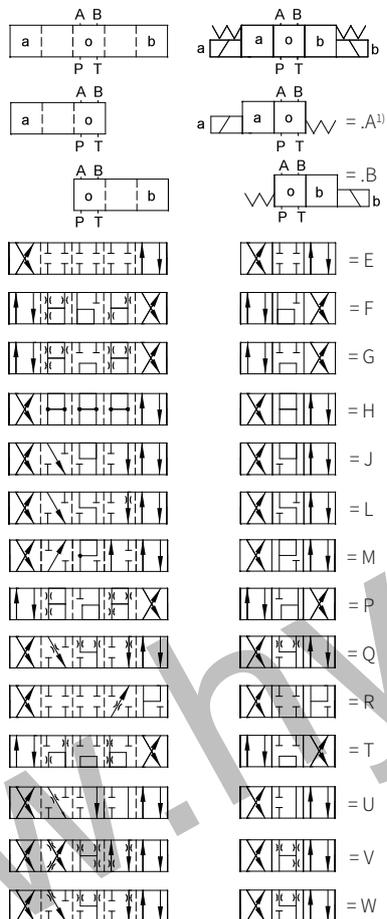
12V DC =G12  
24V DC =G24  
28V DC =G28  
220V AC 50/60Hz =W220  
120V or 110V AC 50 or 60Hz =W110  
=W+Voltage  
110V or 220V AC with rectifier =W110R or  
=W+Voltage+R W220R

with hidden manual emergency operation (standard) =N9  
no manual emergency operation =No code

Transition function spool valve function



Transition function spool valve function



For example:  
the function symbol EA means the solenoid on side A.  
Note: function A9 and B9 are only used as pilot valves.

Overview			
Weight	Valve with one solenoid	kg	1.45
	Valve with two solenoids	kg	1.95
Installation position	Optional		
Environment temperature range	(°C)	-30 to + 50 (NBR seal) -20 to + 50 (FKM seal)	
Hydraulic			
Maximum working pressure	Oil port A, B, P	bar	350
	Oil port T	bar	210 (DC); 160 (AC)
			When the working pressure exceeds the allowable pressure, port T must be used as drain port for symbols A and B.
Maximum flow	L/min	80 (DC); 60 (AC)	
Effective over-flow section (spool position)	symbol Q	mm <sup>2</sup>	About 6% cross-sections
	symbol W	mm <sup>2</sup>	About 3% cross sections
Oil fluid	Mineral oil (HL, HLP) <sup>1)</sup> in accordance with DIN 51524; Fast living organisms Degraded oil according to VDMA 24568; HETG (Rapeseed oil) <sup>1)</sup> HEPG (Polyethylene glycol) <sup>2)</sup> HEES (synthetic ester) <sup>2)</sup>		
Oil temperature range	(°C)	-30 to +80 (NBR seal) -20 to +80 (FKM seal)	
Viscosity range	mm <sup>2</sup> /s	2.8 to 500	
Cleanliness of oil	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.

Technical parameters

Electric			
Voltage type		DC	AC 50/60 Hz
Voltage available <sup>4)</sup>	V	12, 24, 42, 60, 96 110, 180, 205, 220	42, 110, 120, 230
Allowable voltage tolerance (voltage unit)	%	±10	±10
Power consumption	W	30	-
Holding power	VA	-	50
Impact power	VA	-	220
Power rate		100 %	100 %
Switching time to ISO6403	On	ms	25 to 45
	Off	ms	10 to 25
Maximum switching frequency	Times/h	15000	7200
Insulation requirements		IP65	IP65

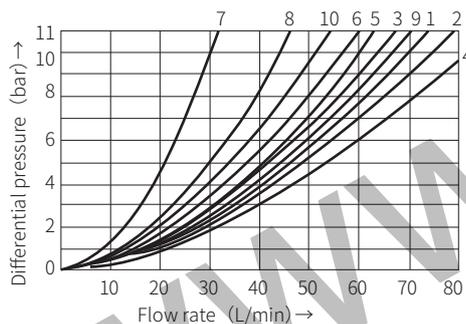
<sup>4)</sup>Other voltages are determined as required

**Note:**

There are 2-3 kinds of power supply options for AC voltage solenoids, such as W110; 110V-50Hz; 110V-60Hz; 120V-60Hz.

Characteristic curve

(Measured when using HLP 46,  $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ )



Functional symbol	Flow direction			
	P-A	P-B	A-T	B-T
A; B	3	3	-	-
C	1	1	3	1
D; Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J; Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	-
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

7 Symbol R in control position B→A  
 8 Symbols G and T in center position  
 9 Symbols H and T in center position P→T

Characteristic limit

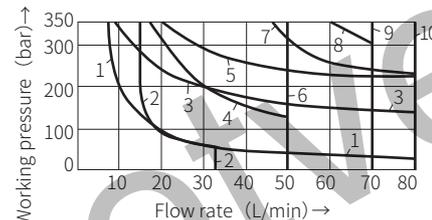
(Measured when using HLP 46,  $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ )

**Attention!**

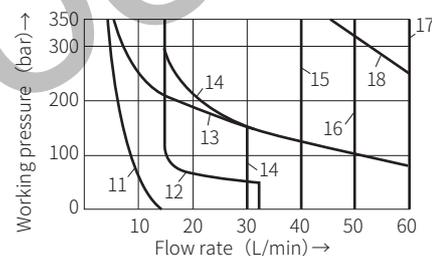
The given working limit is suitable for the use of flow in both directions (e. g. from P to A and return from B to T at the same time).

Due to the power of the fluid in the valve, the power limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

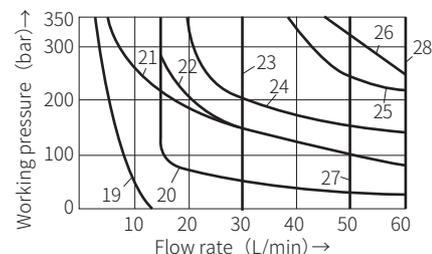
The power limit is measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.



DC solenoid			
Characteristic curve	Function symbol	Characteristic curve	Function symbol
1	A; B <sup>1)</sup>	6	G; H; T
2	V	7	A/O; A/OF; L; U
3	A; B	8	C; D; Y
4	F; P	9	M
5	J	10	E; E1 <sup>2)</sup> ; R <sup>3)</sup> ; C/O; C/OF; D/O; D/OF; Q; W



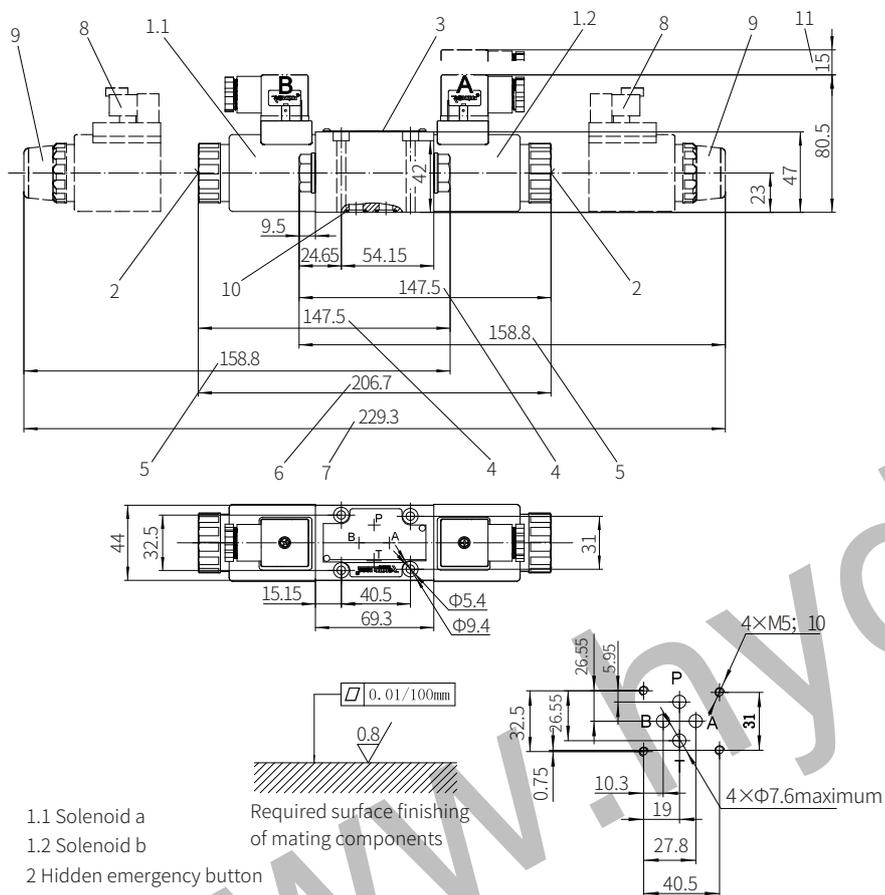
AC solenoid—50Hz	
Characteristic curve	Function symbol
11	A; B <sup>1)</sup>
12	V
13	A; B
14	F; P
15	G; T
16	H
17	A/O; A/OF; C/O; C/OF; D/O; D/OF; E; E1 <sup>2)</sup> ; J; L; M; Q; R <sup>3)</sup> ; U; W
18	C; D; Y



AC solenoid—60Hz	
Characteristic curve	Function symbol
19	A; B <sup>1)</sup>
20	V
21	A; B
22	F; P
23	G; T
24	J; L; U
25	A/O; A/OF; Q; W
26	C; D; Y
27	H
28	C/O; C/OF; D/O; D/OF; E; E1 <sup>2)</sup> ; M; R <sup>3)</sup>

<sup>1)</sup> With manual emergency device <sup>2)</sup> P- A/B pre-opening <sup>3)</sup> Back from the actuator to the oil tank.

Valve with DC or AC rectified solenoid

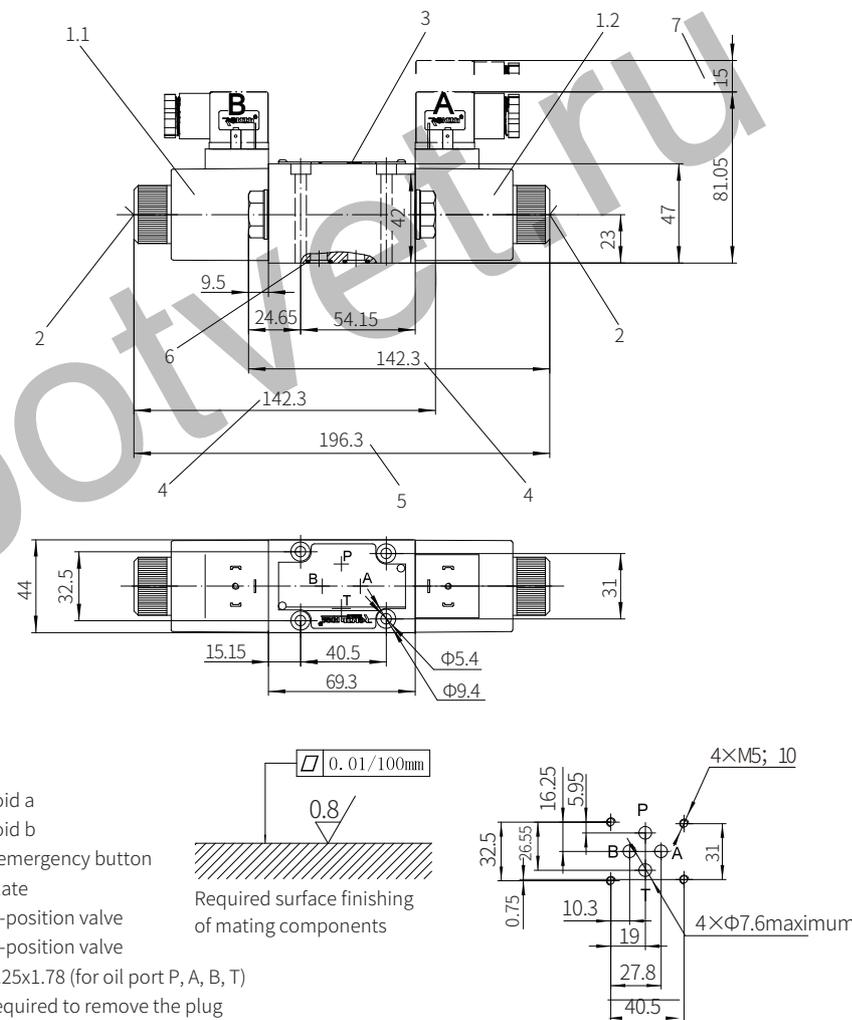


- 1.1 Solenoid a
- 1.2 Solenoid b
- 2 Hidden emergency button
- 3 Name plate
- 4 Size of 2-position valve (non-waterproof)
- 5 Size of 2-position valve (waterproof with waterproof cap)
- 6 Size of 3-position valve (non-waterproof)
- 7 Size of 3-position valve (waterproof with waterproof cap)
- 8 Waterproof deutsch plug
- 9 Waterproof rubber cap (optional)
- 10 O-ring 9.25x1.78 (for oil port P, A, B, T)
- 11 Space required to remove the plug

Required surface finishing of mating components

Valve fixing screw  
 M5x50-10.9 grade GB/T70.1-2000  
 Tightening torque  $M_A=7.8\text{Nm}$   
 It must be ordered separately if connection subplate is needed.  
 Subplate model:  
 G341/01 (G1/4"); G341/02(M14x1.5)  
 G342/01 (G3/8"); G342/02(M18x1.5)  
 G502/01 (G1/2"); G502/02(M22x1.5)

Valve with AC solenoid



- 1.1 Solenoid a
- 1.2 Solenoid b
- 2 Hidden emergency button
- 3 Name plate
- 4 Size of 2-position valve
- 5 Size of 3-position valve
- 6 O-ring 9.25x1.78 (for oil port P, A, B, T)
- 7 Space required to remove the plug

Required surface finishing of mating components

It must be ordered separately if connection subplate is needed.  
 Subplate model:  
 G341/01 (G1/4"); G341/02(M14x1.5)  
 G342/01 (G3/8"); G342/02(M18x1.5)  
 G502/01 (G1/2"); G502/02(M22x1.5)

Valve fixing screw  
 M5x50-10.9 grade GB/T70.1-2000  
 Tightening torque  $M_A=7.8\text{Nm}$