

Explosion-proof Solenoid Directional Valve

Model: GD-WE6...6X

БЕЛІМПОРТНАБ



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

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Features

- With the direct type solenoid operated directional spool valve as the standard type
- Wet-pin explosion-proof solenoid with detachable coil

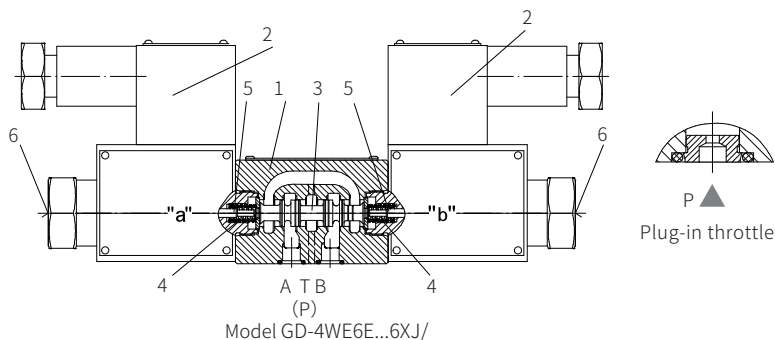
Function description, sectional drawing

The GD-WE6 directional control valve is a directional spool valve operated by a explosion-proof solenoid, it is used to control the opening, closing and flow direction of the liquid flow.

This directional control valve mainly includes valve body (1), one or two explosion-proof solenoids (2), control spool (3) and one or two reset springs (4).

In the non-energized condition, the control spool (3) is held in the middle or initial position by the reset spring (4). The control spool (3) is operated by the wet-pin explosion-proof solenoid (2). To ensure the proper functioning, the pressure chamber of the solenoid must be filled with oil.

The force of the explosion-proof solenoid (2) acts on the control spool (3) through the push rod (5) to push from the stationary position to the required position. In this way, the oil flows freely from P to A and B to T, or P To B and A to T. When the explosion-proof solenoid (2) is powered off, the control spool (3) is pushed back to the initial position by the reset spring (4).



Models and specifications

explosion proof class I =G1 explosion proof class II =G2				GD		WE		6		6X		/		/		*	
explosion proof valve																more information in text	
working oil port																sealing material	
3 working oil ports								=3								No code= NBR seals	
4 working oil ports								=4								V= FKM seals (consult for other seals)	
function symbol																	
60 to 69 series (60 to 69 series installation and connection size unchanged)										=6X							
with reset spring																No code= no plug-in throttle port plug-in throttle port (see table)	
no reset spring																	
no reset spring, with detent																	
voltage																	
G24																=24V DC	
B36																=36V AC with rectifier	
B127																=127V AC with rectifier	
B220																=220V AC with rectifier	

Oil port	throttle port Ø(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

Note:

G1 explosion-proof grade EXD I

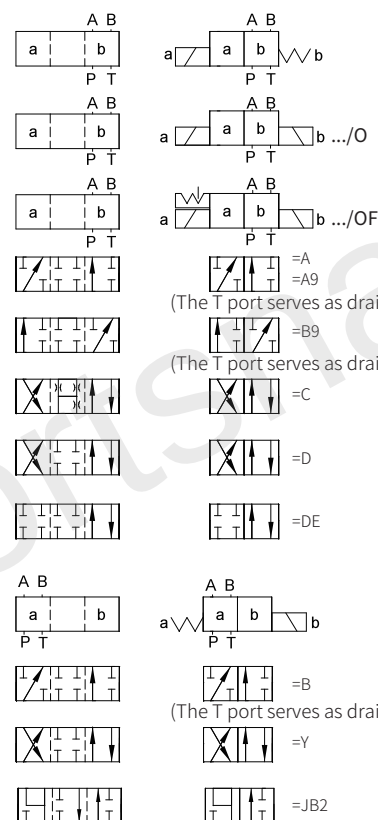
G2 explosion-proof grade EXD II C

Note:

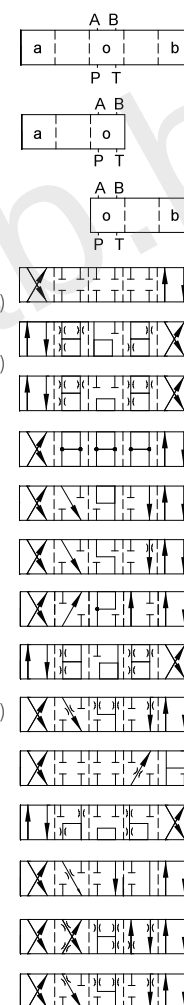
G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Functional symbols

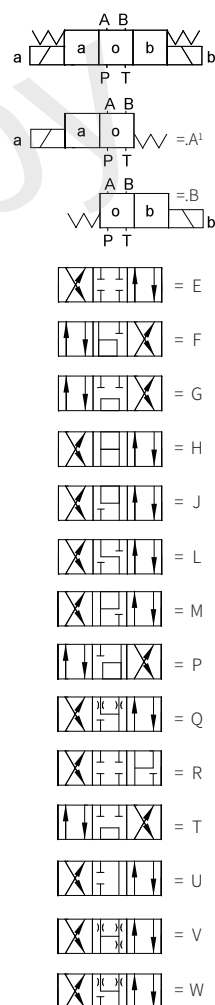
Transition function Spool valve function



Transition function



Spool valve function



1) For example: .

The function symbol EA means the coil on side A

Note: Functions A9 and B9 are only used as pilot valves

Technical parameters

Hydraulic				
Maximum working pressure	Oil ports A, B, P	bar	350	
	Oil port T	bar	210	
			When the working pressure exceeds the allowable pressure, the valves with symbols A and B must use T port as the drain port.	
Maximum flow		L/min	80	
Effective over-flow section (spool position)	symbol Q	mm ²	About 6% cross-sections	
	symbol W	mm ²	About 3% cross-sections	
Oil 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) -15 to +80 (FKM seal)	
Viscosity range	mm ² /s		2.8 to 500	
Cleanliness of oil			The maximum allowable pollution level of oil is ISO4406 level 20/18/15	

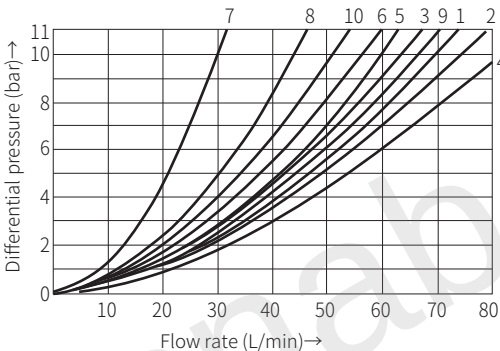
- 1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effective oil filtration can prevent failure and increase the service life of the components.

Electric				
Voltage type	DC		AC Rectifier	
Voltage available ⁴⁾	v	24	36	127 220
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	10 to 20
	Off	ms	10 to 25	15 to 40
Maximum switching frequency	1/h	15000	7200	

4) Other voltages are determined as required

Characteristic curve

(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)



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

Explosion-proof Solenoid Directional Valve

Model: GD-WE10...3X



- ◆ Size 10
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow rate 120 L/min

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Component size	07

Features

- Solenoid operated directional spool valve
- Wet-pin explosion-proof solenoid

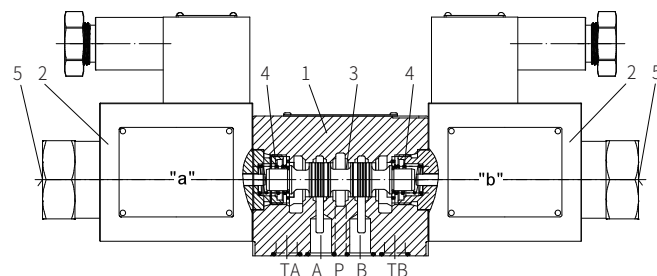
Function description, sectional drawing

The GD-WE10 directional control valve is a directional spool valve operated by explosion-proof solenoid, it is used to control the opening, closing and flow direction of the liquid flow.

The directional control valve mainly includes valve body (1), one or two explosion-proof solenoids (2), control spool (3), and one or two reset springs (4). In the non-energized condition, the control spool (3) is held in the middle or initial position by the reset spring (4). The control spool (3) is operated by the wet-pin explosion-proof solenoid (2).

To ensure proper function, the pressure chamber of the solenoid must be filled with oil. The force of the explosion-proof solenoid (2) acts on the control spool (3) through the push rod (5) to push it from the stationary position to the required position. In this way, the oil flow freely from P to A and B to T, or from P to B and A to T.

When the explosion-proof solenoid (2) is powered off, the control spool (3) is pushed to the initial position by the return spring (4).



Model GD-WE10...3XJ/

Models and specifications

GD WE 10 3X J									
explosion-proof class I =G1 explosion-proof class II =G2		explosion proof valve		working oil port 3 working oil ports =3 4 working oil ports =4		function symbol		30 to 39 series (30 to 39 series installation and connection size unchanged)	
with reset spring no reset spring no reset spring, with detent		voltage G24 B36 B127 B220		=No code =O =OF		=24V DC =36V AC with rectifier =127V AC with rectifier =220V AC with rectifier		more information in text sealing material No code= NBR seals V= FKM seals (consult for other seals)	
No code=no plug-in throttle port plug-in throttle port (see table)		No code=no code V= V		No code=no code V= V		No code=no code V= V		No code=no code V= V	
Oil port		Throttle port Ø (mm)		No code=no code V= V		No code=no code V= V		No code=no code V= V	
P		=B08 =B10 =B12		No code=no code V= V		No code=no code V= V		No code=no code V= V	
A		=H08 =H10 =H12		No code=no code V= V		No code=no code V= V		No code=no code V= V	
B		=R08 =R10 =R12		No code=no code V= V		No code=no code V= V		No code=no code V= V	
A and B		=N08 =N10 =N12		No code=no code V= V		No code=no code V= V		No code=no code V= V	
T		=X08 =X10 =X12		No code=no code V= V		No code=no code V= V		No code=no code V= V	
N9=		with hidden emergency button operation		No code=no code V= V		No code=no code V= V		No code=no code V= V	

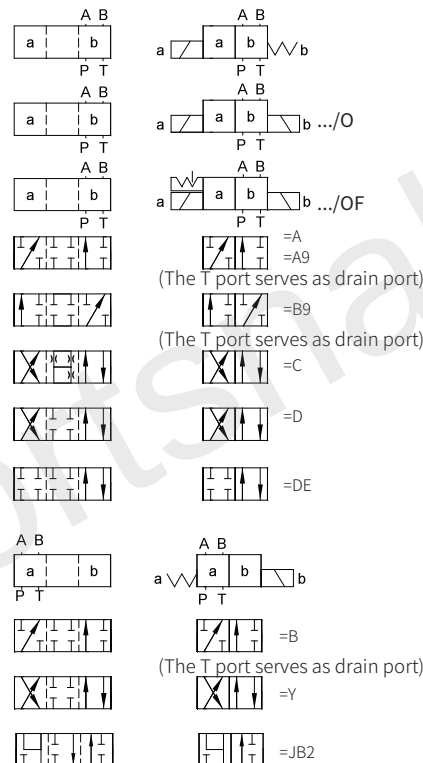
Note:

G1 explosion-proof grade EXD I

G2 explosion-proof grade EXD II CT4

Functional symbols

Transition function Spool valve function

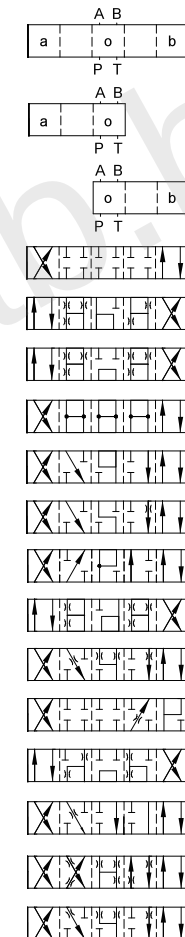


1) For example: .

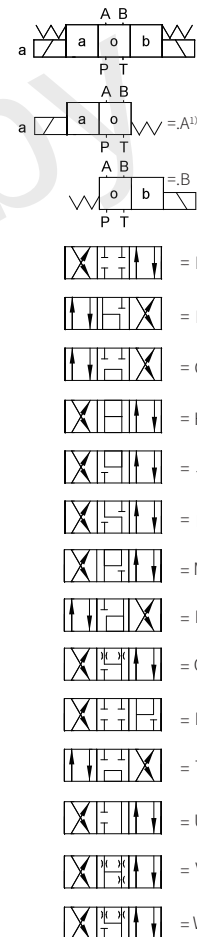
The function symbol EA means the coil on side A

Note: Functions A9 and B9 are only used as pilot valves

Transition function



Spool valve function



Technical parameters

Hydraulic			
Maximum working pressure	Oil ports A, B, P	bar	350
	Oil port T	bar	210
			When the working pressure exceeds the allowable pressure, port T must be used as the drain port for symbols A and B.
Maximum flow		L/min	120
Effective over-flow section (spool position)	<u>symbol</u> Q	mm ²	About 6% cross-sections
	<u>symbol</u> W	mm ²	About 3% cross-sections
Oil 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) -15 to +80 (FKM seal)
Viscosity range		mm ² /s	2.8 to 500
Cleanliness of oil	The maximum allowable pollution level of oil is ISO4406 level 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.

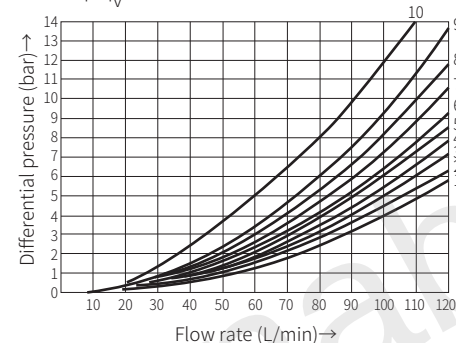
Electric			
Voltage type		DC	AC Rectifier
Available voltage ⁴⁾	v	24	36 127 220
Allowable voltage tolerance (voltage unit)	%	±10	±10
Power consumption	W	30	—
Holding power	VA	—	50
Impact power	VA	—	220
Power rate		100 %	100 %
Switching time to ISO6403	On	ms	25 to 45
	Off	ms	10 to 20
Maximum switching frequency	1/h	15000	7200

4) Other voltages are determined as required

Characteristic curve

(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

$\Delta p-q_v$ -characteristic curve



Flow direction				
Function symbol	P - A	P - B	A - T	B - T
A, B	3	3	-	-
C	3	3	4	5
D, Y	5	5	6	6
E	1	1	4	4
F	2	3	7	4
G	3	3	6	7
H	1	1	6	7
J	1	1	3	3
L	2	2	3	5
M	1	1	4	5
P	4	2	5	7
Q	1	2	1	3
R	3	6	4	-
T	3	3	6	7
U, V	2	2	3	3
W	2	2	4	5
Switch position	P - A	B - A	A - T	P - T
R	-	9	-	-

	P - A	P - B	B - T	A - T	P - T
F	4	-	-	9	9
P	-	5	8	-	10
G, T	-	-	-	-	9
H	-	-	-	-	3

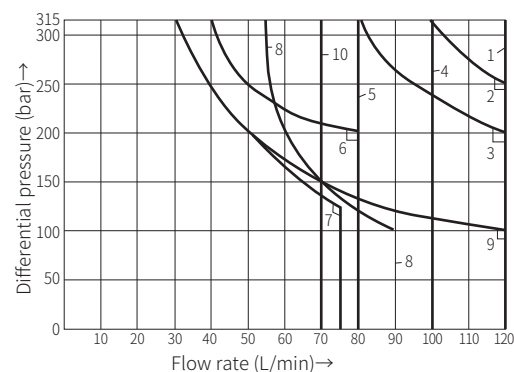
Characteristic limit

DC voltage (Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

The indicated switching power limit applies to two flow directions (e.g. from P to A and simultaneous return oil flow from B to T).

Due to the effect of hydraulic power inside the valve, the allowable power will be significantly reduced when there is only one flow direction (e.g. from P to A, and the B oil port is closed).

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



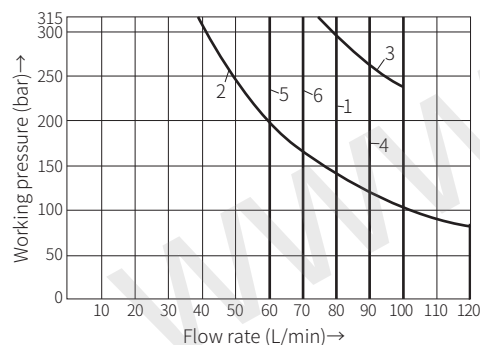
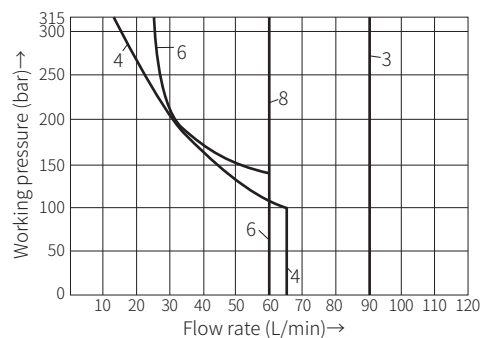
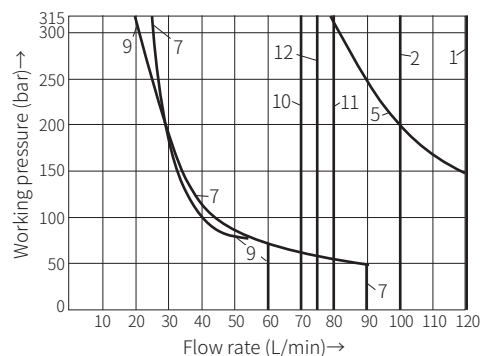
Characteristic curve	Functional symbols
1	C, C/O, C/OF, D, D/O, D/OF, Y, M
2	E
3	A/O, A/OF, L, U, Q, W
4	H
5 ¹⁾	R, L ²⁾ , U ²⁾
6	G
7	T
8	F, P
9	A, B
10	V

1) Return oil flow (Independent from area ratio)

2) Applicable only in the middle position

Characteristic limit

AC voltage (Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)



Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	E, L, U Q, W
3	M
4	A, B
5	A/O, A/OF, J
6	G
7	F, P
8	V
9	T
10	H
11	R
12 ¹⁾	L, U

1) Applicable only in the middle position

42V, 50Hz; 110V, 50Hz; 120V, 60Hz;
127V, 50Hz; 220V, 50Hz; 240V, 60Hz

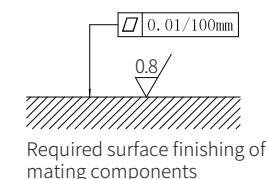
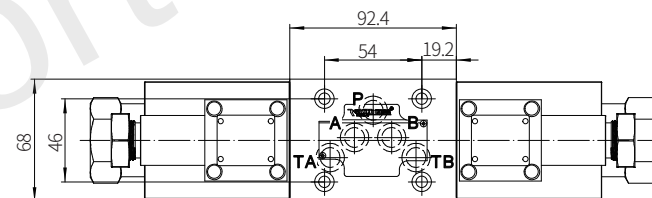
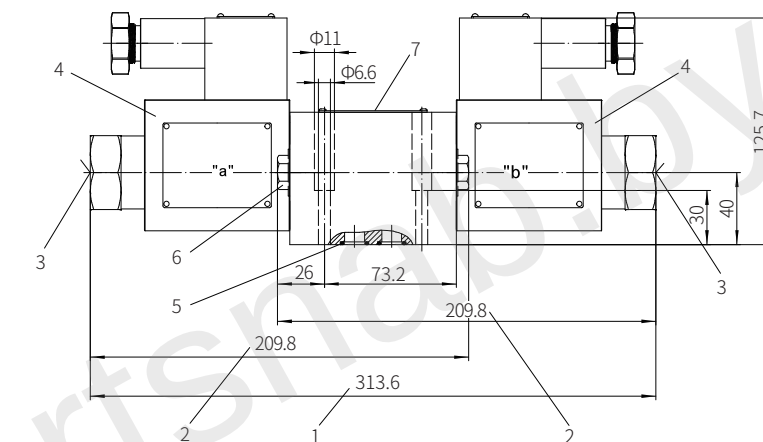
Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	A/O, A/OF
3	E
4	M
5	V
6	H

42V, 60Hz; 110V, 60Hz;
127V, 60Hz; 220V, 60Hz
Please consult us the power
limit of the special valve spools!

Component size

Size unit: mm

Model GD-4WE10...-3XJ/...



- 1 Size of 3-position valve
- 2 Size of 2-position valve
- 3 Hidden emergency button
- 4 Solenoids
- 5 O-ring 12x2 (for oil ports P, A, B, T)
- 6 Plug for valve with one solenoid
- 7 Name plate

Valve fixing screw
M6x60-10.9 grade GB/T70.1-2000
Tightening torque $M_A=13.7\text{Nm}$

It must be ordered separately
if connection subplate is needed.

Subplate model:
G66/01 (G3/8"); G66/02 (M18x1.5)
G67/01 (G1/2"); G67/02 (M22x1.5)
G534/01 (G3/4"); G534/02 (M27x2)

Explosion-proof Electro-hydraulic Directional Valve

Model: G-WEH...4X/6X/7X



- ◆ Size 10~32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum working flow 1100 L/min

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Switching time adjustment, pressure reducing valve and pre-load valve	15
Component size	16-24

Features

- Mainly used to control the opening closing and flow direction of liquid flow
- Subplate mounting
The mounting surface according to DIN24340 form A and ISO4401
- Spring or hydraulic centered
Spring or hydraulic return to initial position
- Explosion-proof solenoid
- Optional switching time adjustment
- Optional pre-load valve in port P of the main valve

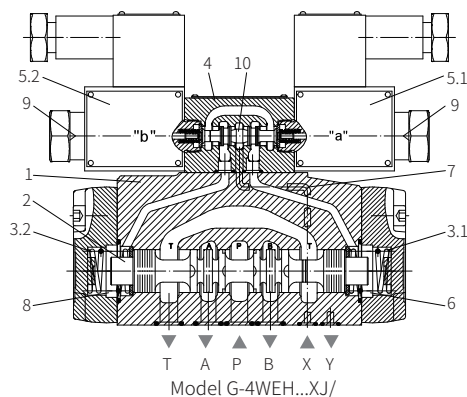
Function description, sectional drawing

The G-WEH directional valve is a directional spool valve with explosion-proof electro-hydraulic operation. It is used to control the opening, closing and direction of the liquid flow.

The valve mainly consists of valve body (1), control spool (2), main valve with one or two reset springs (3.1) and (3.2), pilot valve (4) with one or two explosion-proof solenoids "a" (5.1) and "b" (5.2).

The main control spool is held in the neutral or initial position by springs or pressure. For the valve with spring-centered, the two spring chambers (6) and (8) are connected to the oil tank through the pilot valve in the initial position. The pilot valve (4) is supplied with oil through the control line (7). The control oil can be supplied internally or externally (externally via port X).

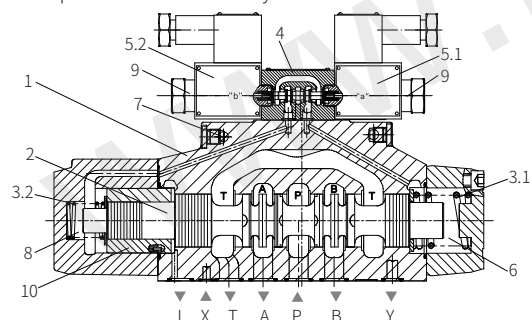
The main control spool (2) is hydraulically operated by the pilot valve (4). Due to the operating of the pilot valve on one end of the main control spool, the spool moves to the operation position, then the valve opens in the operation direction and the fluid flows from P to A and B to T or P to B and A to T. The control oil can be drained internally or externally.



4/3-way directional valve with hydraulic centered of main valve, model WEH..H/

In this structure, pressure oil acts on both end surfaces of the main control spool (2). The centering sleeve (10) locates the main control spool (2) and keeps it in the middle position.

If one end of the main spool (2) is unloaded, the main spool (2) moves to the working position under the pressure from the other end, thereby changing the direction of the oil flow. The unloaded control spool face displaces the returning pilot oil into port Y externally through the pilot valve (4). The oil is drained internal from port L to the tank directly.



- 1 Main valve
- 2 Main control spool
- 3.1 Spring
- 3.2 Spring
- 4 Pilot solenoid valve
- 5.1 Solenoid A
- 5.2 Solenoid B
- 6 Spring chamber
- 7 Control oil inlet channel
- 8 Spring chamber
- 9 Manual operation
- 10 Centering sleeve

Structural diagram of electro-hydraulic directional valve with hydraulic centered
Model G-4WEH...H/

Function description, sectional drawing

Pilot oil supply

1. Model G-WEH10

(1) Conversion between internal supply and external supply:

The channel P on the top of the main valve body with M6 screw (3) is external supply, and is internal supply when M6 screw (3) is dismantled.

(2) Conversion between internal drain and external drain:

Removing the plug (1) and installing M6 screw (2) is external drain, dismantling the M6 screw (2) is internal drain.

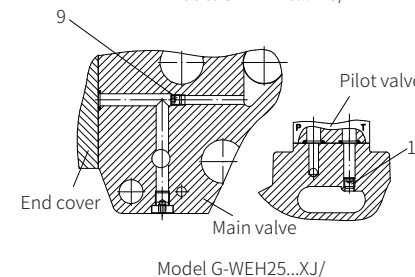
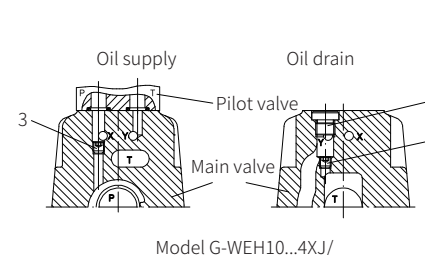
2. Model G-WEH16

(1) Conversion between internal supply and external supply:

The channel P on the bottom of the main valve with M6 screw (8) is external supply, and is internal supply when M6 screw (8) is dismantled.

(2) Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (7) is external drain, and is internal drain when M6 screw (7) is dismantled.



3. Model G-WEH25

(1) Conversion between internal supply and external supply:

The channel P on the top of the main valve with M6 screw (9) is external supply, and is internal supply when M6 screw (9) is dismantled.

(2) Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (10) is external drain, and is internal drain when M6 screw (10) is dismantled.

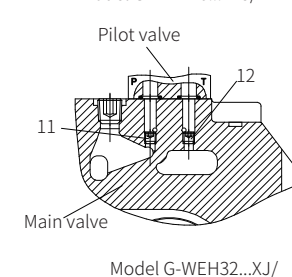
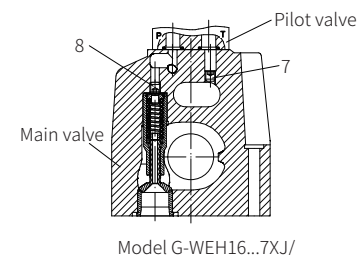
4. Model G-WEH32

(1) Conversion between internal supply and external supply:

The channel P on the top of the main valve with M6 screw (11) is external supply, and is internal supply when M6 screw (11) is dismantled.

(2) Conversion between internal drain and external drain:

The channel T on the top of the main valve with M6 screw (12) is external drain and is internal drain when M6 screw (12) is dismantled.



Spring centered

Diagram illustrating four types of 4-way electrohydraulic valves (4WEH) with spring-centered solenoid configurations:

- Type 4WEH..**: Solenoid at end A. Spring-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.
- Type 4WEH../E.**: Solenoid at end A. Spring-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.
- Type 4WEH../ET**: Solenoid at end A. Spring-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.
- Type 4WEH../T**: Solenoid at end A. Spring-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.

Legend: X=External, Y=Internal.

Diagram illustrating four types of 4-way electrohydraulic valves (4WEH) with hydraulic-centered solenoid configurations:

- Type 4WEH..**: Solenoid at end A. Hydraulic-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.
- Type 4WEH../E.**: Solenoid at end A. Hydraulic-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.
- Type 4WEH../H.../E**: Solenoid at end A. Hydraulic-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.
- Type 4WEH../H.../E**: Solenoid at end A. Hydraulic-centered. Ports: P, X, Y, T. Solenoid ports: aX, bY.

Legend: X=External, Y=Internal.

Spring return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)

Diagram illustrating eight types of 4-way electrohydraulic valves (4WEH) with spring return valves:

- Type 4WEH...A...**: Solenoid at end A. Spring return valve. Ports: X, Y, P, T.
- Type 4WEH...A.../E**: Solenoid at end A. Spring return valve. Ports: Y, P, T.
- Type 4WEH...B...**: Solenoid at end B. Spring return valve. Ports: P, T, Y, X.
- Type 4WEH...B.../E**: Solenoid at end B. Spring return valve. Ports: P, T, Y.
- Type 4WEH...A.../ET**: Solenoid at end A. Spring return valve. Ports: P, T.
- Type 4WEH...A.../T**: Solenoid at end A. Spring return valve. Ports: X, P, T.
- Type 4WEH...B.../ET**: Solenoid at end B. Spring return valve. Ports: P, T.
- Type 4WEH...B.../T**: Solenoid at end B. Spring return valve. Ports: P, T, X.

Hydraulic return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)

Diagram illustrating four types of 4-way electrohydraulic valves (4WEH) with hydraulic return valves:

- Type 4WEH...H.../...**: Solenoid at end A. Hydraulic return valve. Ports: X, Y, P, T.
- Type 4WEH...H.../...**: Solenoid at end A. Hydraulic return valve. Ports: Y, P, T.
- Type 4WEH...H.../...**: Solenoid at end B. Hydraulic return valve. Ports: P, T, X, Y.
- Type 4WEH...H.../...**: Solenoid at end B. Hydraulic return valve. Ports: P, T, Y, X.

Functional symbols of 3-position valves

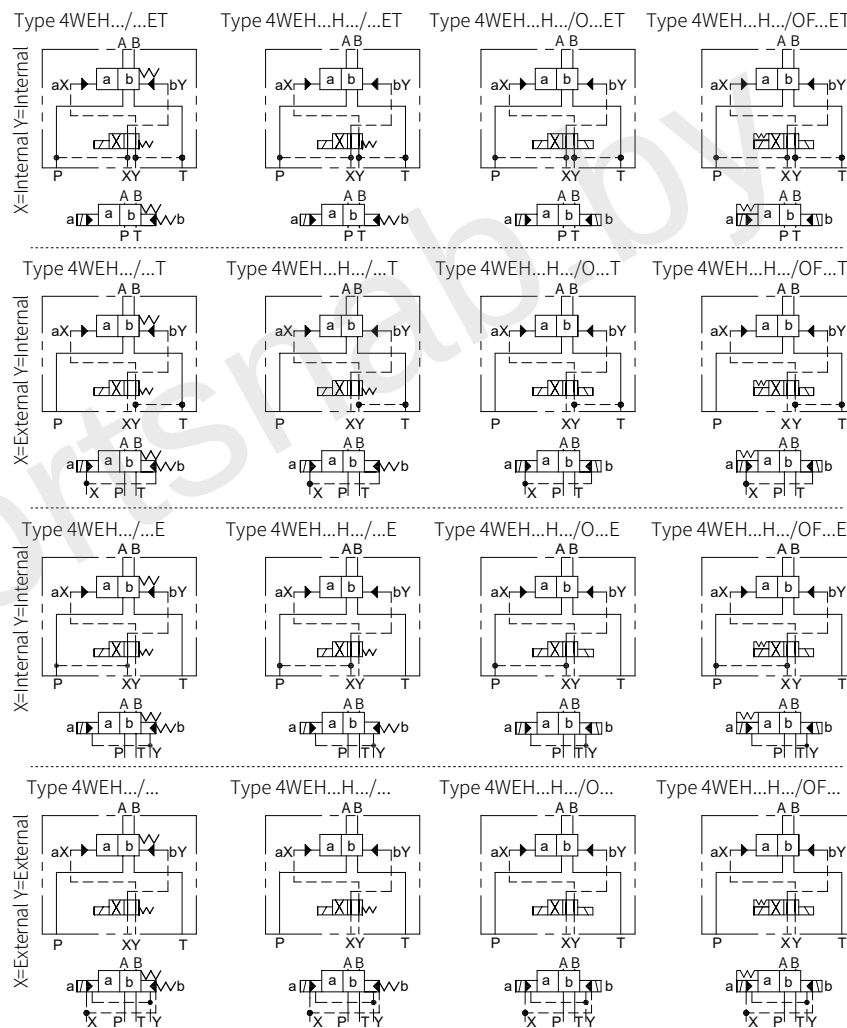
3-position valve

3-position valve model	Functional symbol	Transition function
4WEH...E.../... E		
4WEH...F.../... F		
4WEH...G.../... G		
4WEH...H.../... H		
4WEH...J.../... J		
4WEH...L.../... L		
4WEH...M.../... M		
4WEH...P.../... P		
4WEH...Q.../... Q		
4WEH...R.../... R		
4WEH...S.../... S		
4WEH...T.../... T		
4WEH...U.../... U		
4WEH...V.../... V		
4WEH...W.../... W		

2-position valve derived from 3-position valve

2-position valve model	Functional symbol (Solenoid at end A)	2-position valve model	Functional symbol (Solenoid at end B)
4WEH...EA.../... E		4WEH...EB.../... E	
4WEH...FA.../... F		4WEH...FB.../... F	
4WEH...GA.../... G		4WEH...GB.../... G	
4WEH...HA.../... H		4WEH...HB.../... H	
4WEH...JA.../... J		4WEH...JB.../... J	
4WEH...LA.../... L		4WEH...LB.../... L	
4WEH...MA.../... M		4WEH...MB.../... M	
4WEH...PA.../... P		4WEH...PB.../... P	
4WEH...QA.../... Q		4WEH...QB.../... Q	
4WEH...RA.../... R		4WEH...RB.../... R	
4WEH...SA.../... S		4WEH...SB.../... S	
4WEH...TA.../... T		4WEH...TB.../... T	
4WEH...UA.../... U		4WEH...UB.../... U	
4WEH...VA.../... V		4WEH...VB.../... V	
4WEH...WA.../... W		4WEH...WB.../... W	

Detailed and simplified symbols for 2-position directional valves



Function symbols of 2 position valves

Spool valve function:	C	D	K	Z	Y
Spool valve function symbol:					
Transition function:					

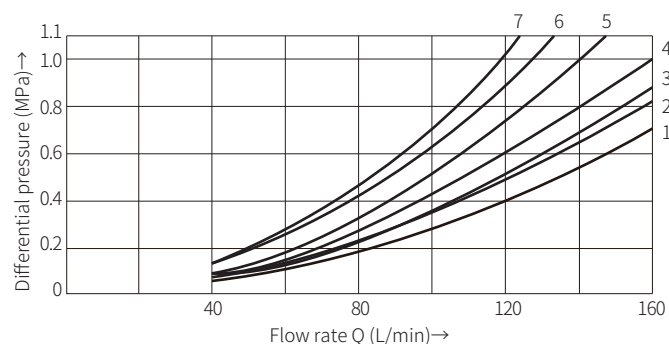
Technical Parameters

Size	10	16	22	25	32
Maximum working pressure					
Oil ports P, A, B (MPa)	35	35	35	35	35
Oil port T					
External Y port pilot oil drain (MPa)	31.5 ⁵⁾	25	25	25	25
Internal Y port pilot oil drain (MPa)			21 DC 16 AC		
Oil port Y			21 DC		
External pilot oil drain			16 AC		
For 4WH type (MPa)	25 (size 10, 16, 25, 32)		21 (size 22)		
Maximum pilot pressure (MPa)	25 (size 10, 16, 25, 32)		21 (size 22)		
(For high pilot pressure, a pressure reducing valve is required)					
Minimum pilot pressure			H-4W...		
-Pilot oil supply X external					
-Pilot oil supply X internal (Not for spool C, F, G, H, P, T, V, Z, S ²⁾)					
Spring centered 3-position valve (MPa)	1.0	1.4	1.25	1.3	0.85
Pressure centered 3-position valve (MPa)	-	1.4	1.05	1.8	0.85
Spring centered 2-position valve (MPa)	1.0	1.4	-	1.3	1.0
Pressure centered 2-position valve (MPa)	0.7	1.4	1.4	0.8	0.5
Pilot oil supply X internal (for spool C, F, G, H, P, T, V, Z, S ²⁾)	0.45 ³⁾	0.45 ⁴⁾	0.45 ⁴⁾	0.45 ⁴⁾	0.45 ⁴⁾
1) In a 3-position valve, pressure centered only possible if: Pilot $\geq 2 \times P_{tank} + P_{pilot min}$. 2) Spool S only for size 16. 3) For the spools C, F, G, H, P, T, V, Z, the internal pilot oil supply is only possible if the flow from P to T in the central position (for 3-position valve) or when the valve moves through the central position (for 2-position valve) is large enough to ensure the pressure differential as 0.65MPa from P to T. 4) For the spools C, F, G, H, P, T, V, Z, S-via the pre-load valve or correspondingly large flow. 5) 28MPa for model 4WEH10..., 31.5MPa for model H-4WEH10... type is 31.5MPa					
Hydraulic oil	Mineral hydraulic oil or phosphate ester hydraulic oil				
Temperature range (°C)	-30 to +80 (NBR seal) -20~+80 (FKM seal)				
Viscosity range (mm ² /s)	2.8 to 500				
Cleanliness of oil	The maximum allowable pollution level of oil is NAS1638 Class 9, so we recommend a filter with the minimum filtration accuracy $\beta_{10} \geq 75$				
Pilot oil volume during switching process					
3-position valve spring centered (cm ³)	2.04	5.72	7.64	14.2	29.4
2-position valve (cm ³)	4.08	11.45	15.28	28.4	58.8
3-position valve hydraulic centered (cm ³)	-	WH WEH	-	WH WEH	WH WEH
from neutral position to position "a" (cm ³)	-	2.83	2.83	-	7.15 7.15 14.4 14.4
From position "a" to neutral position (cm ³)	-	5.72	5.72	-	14.18 7.0 29.4 15.1
From neutral position to position "b" (cm ³)	-	5.72	5.72	-	14.18 14.15 29.4 29.4
from position "b" to neutral position (cm ³)	-	8.55	8.55	-	19.88 5.73 43.8 14.4
Pilot oil flow for shortest switching time (L/min)	about 35	about 35	about 35	about 35	about 45
Weight	Valve with one solenoid (kg)	about 7.8	about 10	about 12.8	about 18.8
	Valve with two solenoid, spring centered (kg)	about 9.1	about 11.8	about 14.2	about 21.3
	Valve with two solenoid, hydraulic centered (kg)	about 9.1	about 11.8	about 14.2	about 21.3
	Switching time adjustment (kg)			about 0.8	
	Pressure reducing valve (kg)			about 0.4	
Installation position	Optional, except for the hydraulic return valve C, D, K, Z, Y installed horizontal				

Technical Parameters

Switching time (refers to the time from the solenoid closing to the main valve fully opening.)														
Size 10	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)													
	at pilot pressure	(MPa)	~7=		~14=		~21=		~25=					
	3-position valve	(ms)	30	65	25	60	20	55	15	50				
	2-position valve	(ms)	35	80	30	75	25	70	20	65				
	Switching time for valve from operating position to neutral position (ms)													
	3-position valve	(ms)	30											
Size 16	2-position valve	(ms)	35	40	30	75	25	30	20	25				
	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)													
	at pilot pressure	(MPa)	~7=		~15=		~25=							
	3-position valve-spring centered	(ms)	25...30	40	25...30	40	25...30	40	25...30	40				
	2-position valve	(ms)	30...35	55	30...35	55	30...35	55	30...35	55				
	3-position valve	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b
	- hydraulic centered	(ms)	30	30	40	40	30	30	40	40	30	30	35	40
	Switching time for valve from operating position to static position													
	3-position valve	(ms)	20 to 35 for ~; 30 for =											
	2-position valve	(ms)	30...50	45	30...50	45	30...50	45	30...50	45				
3-position valve	From-	a	b	a	b	a	b	a	b	a	b	a	b	
- hydraulic centered	(ms)	20...35	20	20...55	20	20...35	20	20...35	20					
Size 25	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)													
	at pilot pressure	(MPa)	~7=		~14=		~21=		~25=					
	3-position valve-spring centered	(ms)	50	85	40	75	35	70	30	65				
	2-position valve	(ms)	120	160	100	130	85	120	70	105				
	3-position valve	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b
	- hydraulic centered	(ms)	20	35	55	65	30	35	55	65	25	30	50	60
	Switching time for valve from operating position to static position													
	3-position valve	(ms)	40 to 55 for ~; 40 for =											
	2-position valve	(ms)	120	125	85	100	85	90	75	80				
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b
	(ms)	30...50	30	35	30...50	30	35	30...50	30	35	30...50	30	35	
Size 32	Switching time for valve from neutral position to operating position (for DC (=) and AC (~) operation)													
	at pilot pressure	(MPa)	~5=		~15=		~25=							
	3-position valve-spring centered	(ms)	65	80	50	90	35	105	35	105				
	2-position valve	(ms)	100	130	75	100	60	115	60	115				
	3-position valve	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b
	- hydraulic centered	(ms)	55	35	100	105	40	45	85	95	35	40	85	95
	Switching time for valve from operating position to static position													
	3-position valve	(ms)	60 to 75 for ~; 50 for =											
	2-position valve	(ms)	115...130	90	85...100	70	65...80	65	65...80	65				
	3-position valve	From-	a	b	a	b	a	b	a	b	a	b	a	b
- hydraulic centered	(ms)	30...65	30	40	60...90	30	40	105...155	50	50	50	50	50	

Characteristic curve

Model G-4WEH10...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

Spool	Working position				Spool	Working position		
	P-A	P-B	A-T	B-T		A-T	B-T	P-T
E, D, Y	2	2	4	5	F	3	-	6
F	1	4	1	4				
G, T	4	2	2	6	G, T	-	-	7
H, C	4	4	1	4				
J, K	1	2	1	3	H	1	3	5
L	2	3	1	4	L	3	-	-
M	4	4	3	4	P	-	7	5
Q, V, W, Z	2	2	3	5				
R	2	2	3	-	U	-	4	-
U	3	3	3	4				
P	4	1	3	4				

Characteristic limit

Model G-4WEH10...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

Allowable flow of 2-position and 3-position valves (L/min)			
Spool	Working pressure(MPa)		
	20	25	31.5
E, J, L, M, Q, R, U, V, W C, D, K, Z, Y	160		
H	160	150	120
G, T	160	160	140
F, P	160	140	120

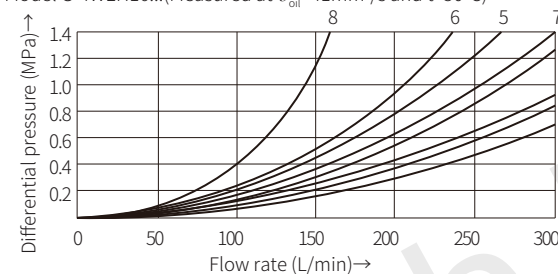
Notice:

The given characteristic limits are 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 characteristic limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

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

Characteristic curve

Model G-4WEH16...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

Spool	Working position				
	P-A	P-B	A-T	B-T	P-T
E, D, Y	1	1	1	3	-
F, P	2	2	3	3	-
G, T	5	1	3	7	6
H, C, Q, V, Z	2	2	3	3	-
J, K, L	1	1	3	3	-
M, W	2	2	4	3	-
R	2	2	4	-	-
U	1	1	4	7	-
S	4	4	4	-	8

Characteristic limit

Model G-4WEH16...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

Allowable flow of 2-position valve (L/min)					
Spool	Working pressure(MPa)				
	7	14	21	28	35
Main valve spring return ¹⁾					
C, D, K, Z, Y	300	300	300	300	300
Main valve spring return ²⁾					
C	300	300	300	300	300
D, Y	300	270	260	250	230
K	300	250	240	230	210
Z	300	260	190	180	160
Main valve hydraulic return					
HC, HD, HK	300	300	300	300	300
HZ, HY	300	300	300	300	300

- 1) The given flow value can be achieved when the minimum pilot pressure of 1.2MPa exists.
- 2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Allowable flow of 3-position valve (L/min)					
Spool	Working pressure(MPa)				
	7	14	21	28	35
Main valve spring return ¹⁾					
E, H, J, L, MQ, U, W, R	300	300	300	300	300
F, P	300	250	180	170	150
G, T	300	300	240	210	190
S	300	300	300	250	220
V	300	250	210	200	180
Pressure centered (minimum pilot pressure 1.6MPa)					Spool approx. to 160L/min
All spools	300	300	300	300	

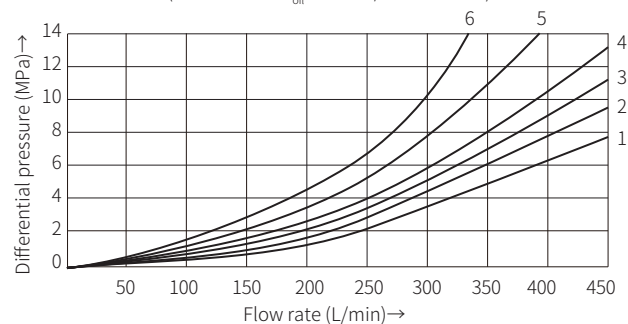
Notice:

When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.6MPa is required.

The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

Characteristic curve

Model G-4WEH22...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Spool	Switching position			
	P-A	P-B	A-T	B-T
E, M, P, Q, U, V	2	2	1	4
F	1	2	1	2
G, T	2	2	2	4
H, J, W	2	2	1	3
L	2	2	1	2
R	1	2	1	-

Spool	Median position		
	A-T	B-T	P-T
F	-	-	4
G, P	-	-	6
H	-	-	2
L	4	-	-
T	-	-	5
U	-	6	-

Characteristic limit

Model G-4WEH22...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

Allowable flow of 2-position valve L/min					
Spool	working pressure(MPa)				
	7	14	21	28	35
X external supply main valve spring return (with $P_{pilot\ min}=11\text{bar}/14\text{bar}$)					
C, D, K, Y, Z	450	450	450	450	450
X external supply main valve spring return ¹⁾					
C	450	450	320	250	200
D, Y	450	450	450	400	320
K	450	215	150	120	100
Z	350	300	290	260	160
X external supply hydraulic centered					
HC, HD, HK, HY, HZ	450	450	450	450	450
HC../O..	450	450	450	450	450
HD../O..	450	450	450	450	450
HK../O..	450	450	450	450	450
HZ../O..	450	450	450	450	450
HC../OF..	450	450	450	450	450
HD../OF..	450	450	450	450	450
HK../OF..	450	450	450	450	450
HZ../OF..	450	450	450	450	450

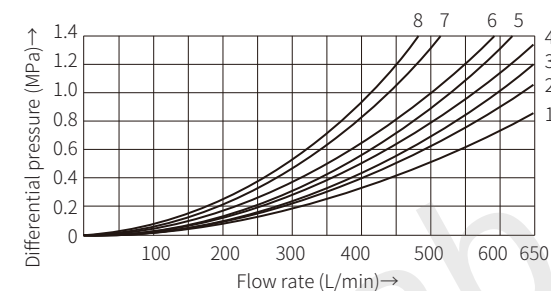
Allowable flow of 3-position valve L/min					
Spool	working pressure(MPa)				
	7	14	21	28	35
X external supply spring centered					
E, J, L, M, Q, U, W, R	450	450	450	450	450
H	450	450	300	260	230
G	400	350	250	200	180
F	450	270	175	130	110
V	450	300	240	220	160
T	400	300	240	200	160
P	450	270	180	170	110

When internal supply, a back pressure valve is required because of negative cover of spools Z, HZ, V and the flow less than 180L/min. It is also required due to negative cover of spools F, G, M, P and T.

1) The specified flow value is the limited value at which the reset spring can return the spool back to the end position when the pilot pressure disappears.

Characteristic curve

Model G-4WEH25...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)



Spool	Working position				Spool	Working position			
	P-A	P-B	A-T	B-T		P-A	P-B	A-T	B-T
E	1	1	1	3	P	4	1	1	5
F	1	4	3	3	Q	2	2	3	5
G	3	1	2	4	Z	1	1	1	-
H	4	4	3	4	U	2	1	1	6
J	2	2	3	5	V	4	4	3	6
L	2	2	3	3	W	1	1	1	3
M	4	4	1	4	T	3	1	2	4

Characteristic limit

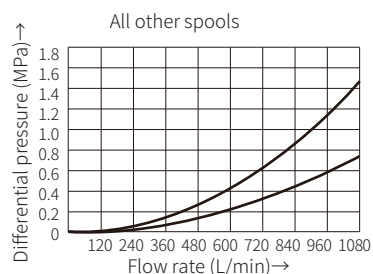
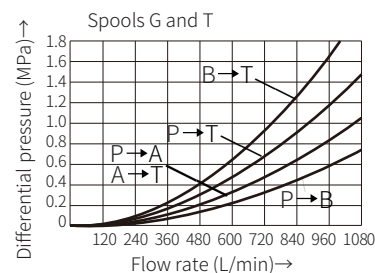
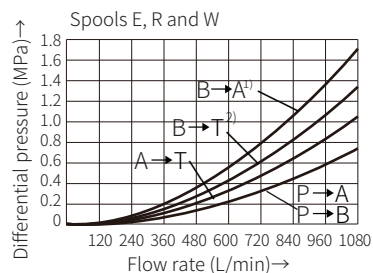
Model G-4WEH25...(Measured at $\vartheta_{oil}=41\text{mm}^2/\text{s}$ and $t=50^\circ\text{C}$)

Allowable flow of 2-position valve (L/min)						with pre-load valve and X port internal supply	Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply		
Spool	Working pressure(MPa)						Spools C and Z approx. to 180 L/min	Spool	Working pressure(MPa)					Spools F, G, HP and T approximately to 180L/min	
	7	14	21	28	35				7	14	21	28			35
Main valve spring return ¹⁾								spring centered							
C, D, K, Z, Y	700	700	700	700	700		E, L, M Q, U, W	700	700	700	700	650			
Main valve spring return ²⁾							G/T	400	400	400	400	400			
C	700	700	700	700	700		F	650	550	430	330	300			
D, Y	700	650	400	350	300		H	700	650	550	400	360			
K	700	650	420	370	320		J	700	700	650	600	520			
Z	700	700	650	480	400		P	650	550	430	330	300			
Main valve hydraulic return							V	650	550	400	350	310			
HC, HD, HK	700	700	700	700	700	Spools HC and HZ approximately to 180L/min	R	700	700	700	650	680			
HZ, HY	700	700	700	700	700		Pressure centered (minimum pilot pressure 1.8MPa)								
HC../O	700	700	700	700	700		E/F/H/J	700	700	700	700	650			
HD../O	700	700	700	700	700		L/M/P/Q	700	700	700	700	650			
HK../O	700	700	700	700	700		R/U/V/W	700	700	700	700	650			
HZ../O	700	700	700	700	700		G/T	400	400	400	400	400			
HC../OF	700	700	700	700	700		When the pilot pressure higher than 3MPa								
HD../OF	700	700	700	700	700		G/T	700	700	700	700	700			
HK../OF	700	700	700	700	700										
HZ../OF	700	700	700	700	700										

- 1) The given flow value can be achieved when the minimum pilot pressure of 1.3MPa exists.
- 2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Characteristic curve

Model G-4WEH32... (Measured at $\dot{v}_{oil}=41\text{mm}^3/\text{s}$ and $t=50^\circ\text{C}$)



- 1) Only for spool R
2) Not for spool R

Characteristic limit

Model G-4WEH32... (Measured at $\dot{v}_{oil}=41\text{mm}^3/\text{s}$ and $t=50^\circ\text{C}$)

Allowable flow of 2-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure (MPa)					
	7	14	21	28	25	
Main valve spring return ¹⁾						
C, D, K, Z, Y	1100	1040	860	750	680	
Main valve spring return ²⁾						
C	1100	1040	860	800	700	Spool Z approx to 180L/min
D、Y	1100	1040	540	480	420	
K	1100	1040	860	500	450	
Z	1100	1040	860	750	650	
Main valve hydraulic return						Spool Z approx to 180L/min
HC、HD、HK	1100	1040	860	750	680	
HZ、HY	1100	1040	860	750	680	

Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure (MPa)					
	7	14	21	28	25	
Main valve spring return ¹⁾						
E, H, J, L, M Q, U, W, R	1100	1040	860	750	680	
G, T, H, F, P	900	900	800	650	450	Spools F, G, H, P and T approximately to 180L/min
V	1100	1000	680	500	450	
Pressure centered (minimum pilot pressure 0.85MPa)						
All spools	1100	1040	860	750	680	

Notice:
When using a 4/3-way valve with pressure centered in

- 1) The given flow value can be achieved when the minimum pilot pressure of 1.0MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

Notice:

When using a 4/3-way valve with pressure centered in the main spool which exceeds the given performance limits, a higher pilot pressure is required. Therefore, if the pressure is 35MPa and the flow is 300L/min in the circuit, the pilot pressure of 1.5MPa is required. The maximum flow of the valve only depends on the acceptable pressure drop through the valve.

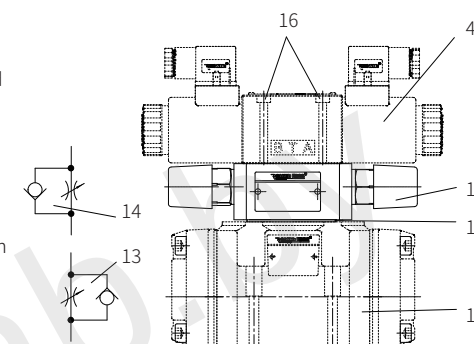
Operating time, pressure valves and pilot valves

Switching time adjustment

To control the switching time of the main valve (1), a double throttle check valve (12) is installed between the pilot valve and the main valve.

Conversion from meter-in control (13) to meter-out control (14):

Remove the pilot valve (4) but retain the O-ring support plate (15), turn the throttle check valve around its longitudinal axis and reassemble it on the mounting surface, install the pilot valve (4). Tightening torque $M_A=9\text{Nm}$ for fixing screw (16).

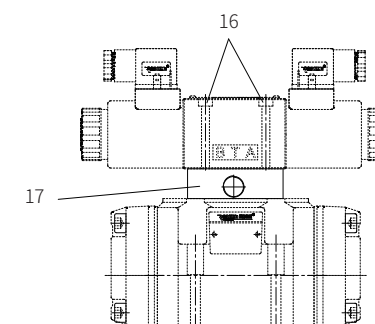


Model G-4WEH.../.../S or S2

Pressure reducing valve "D3"

The pressure reducing valve (17) must be used if the pilot pressure exceeds 25MPa. The secondary pressure should be maintained at 4.5MPa. When using the pressure reducing valve D3, it must install a plug-in throttle B10 in port P of the pilot valve.

Tightening torque $M_A=9\text{Nm}$ for fixing screw (16).

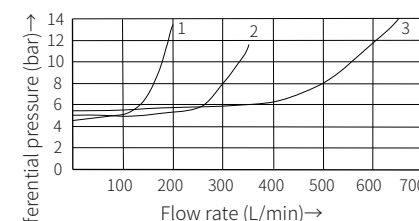


Model G-4WEH.../.../D3

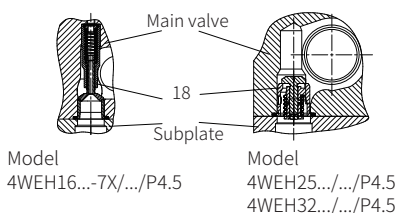
Pre-load valve (not for size 10)

In the valve with pressureless bypass and internal pilot oil supply, a pre-load valve (18) is installed in port P of the main valve to build up the minimum pilot pressure.

The differential pressure of the pre-load valve must be added to the differential pressure of the main valve to determine the actual value (see characteristic curve). The cracking pressure of the valve is 0.45MPa.



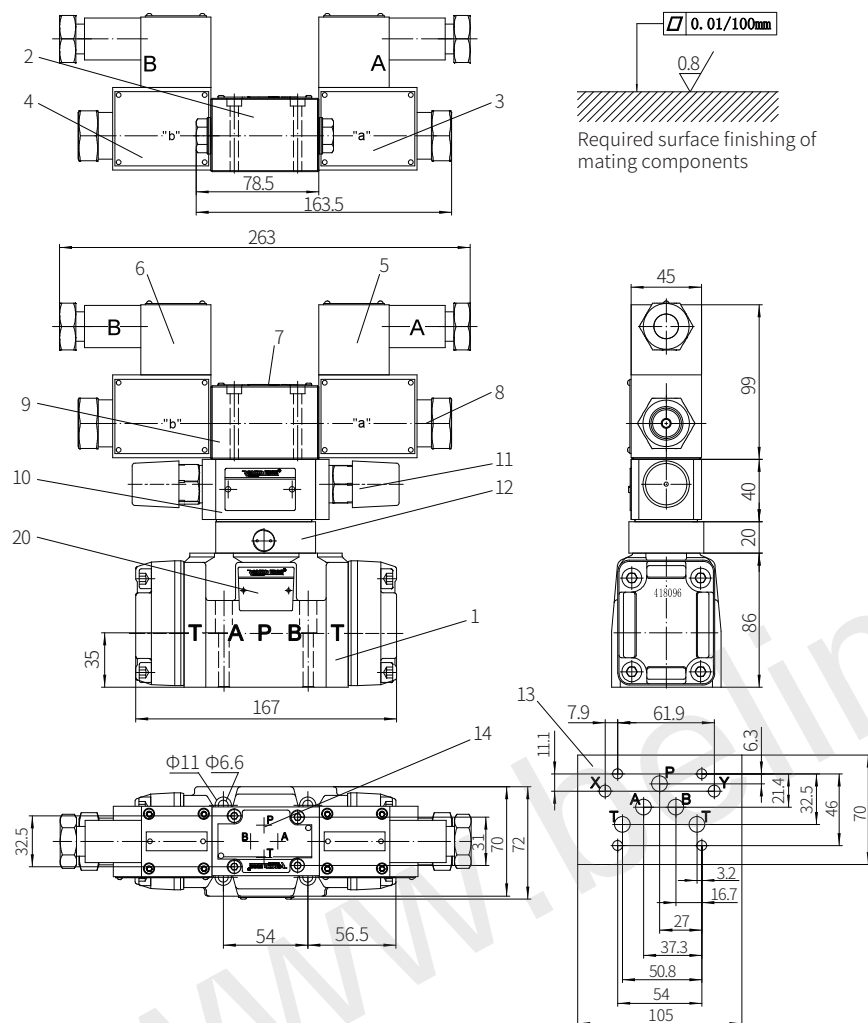
- 1 Size 16
2 Size 25
3 Size 32



Model 4WEH16...-7X/.../P4.5

Model 4WEH25.../.../P4.5
4WEH32.../.../P4.5

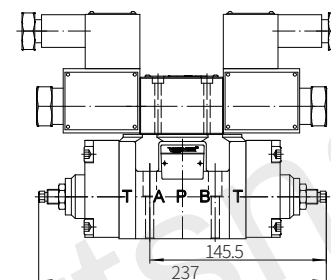
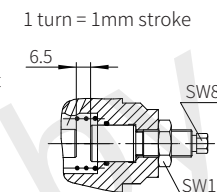
Model G-WEH10...-4XJ/...



- | | | |
|--|---|---|
| 1 Main valve | 7 Name plate of pilot valve | 13 Port layout of main valve (valve mounting surface) |
| 2 2-position valve with one solenoid and plug Z4 | 8 Manual emergency operation | 14 Port position of pilot oil |
| 3 Solenoid a | 9 2-position or 3-position valve with two solenoids and plug Z4 | 15 Name plate of complete valve |
| 4 Solenoid b | 10 Switching time adjustment | |
| 5 Gray plug (or transparent plug) | 11 Adjustment bolt | |
| 6 Black plug (or transparent plug) | | |

Dimension of additional devices for model G-WEH10

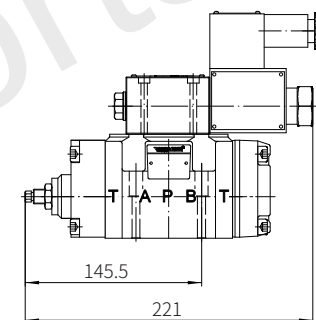
The installation range of the stroke adjustment is 6.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)



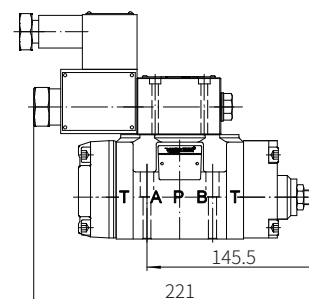
Stroke adjustment installed on the ends A and B of the main valve.../10

Stroke adjustment installed on the end A of the main valve.../11

Stroke adjustment installed on the end B of the main valve.../12

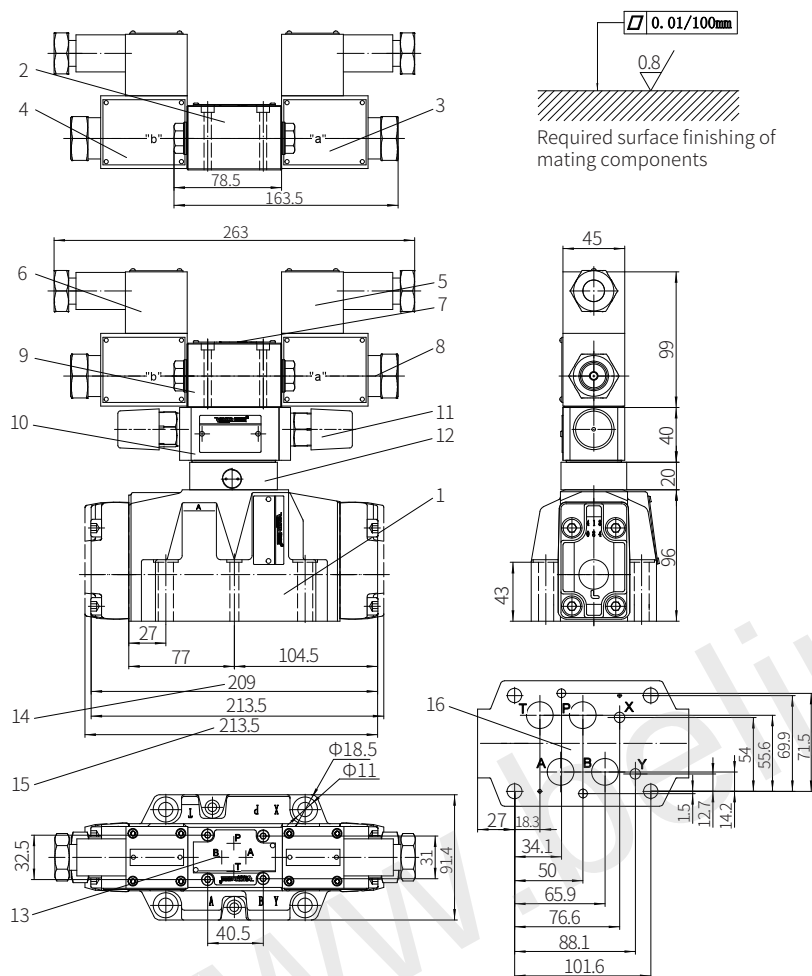


Stroke adjustment installed on the end A of the
main valve.../11
(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the
main valve.../12
(2-position valve, symbol Y)

Model G-WEH16...-7XJ/...

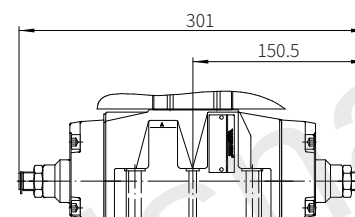
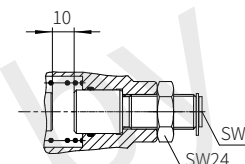


- | | | |
|--|---|---|
| 1 Main valve | 7 Name plate of pilot valve | 13 Port layout of main valve (valve mounting surface) |
| 2 2-position valve with one solenoid and plug Z4 | 8 Manual emergency operation | 14 Size of 3-position valve with spring centered |
| 3 Solenoid a | 9 2-position or 3-position valve with two solenoids and plug Z4 | 15 Size of 2-position valve with spring centered |
| 4 Solenoid b | 10 Switching time adjustment | 16 Main valve connection diagram |
| 5 Gray plug (or transparent plug) | 11 Adjustment bolt | |

Dimension of additional devices for model G-WEH16

The installation range of the stroke adjustment is 10mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

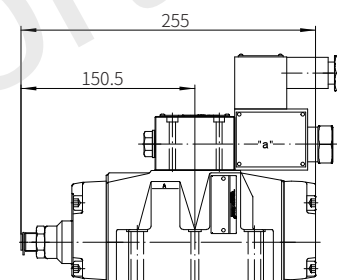
1 turn = 1.5mm stroke



Stroke adjustment installed on the ends A and B of the main valve.../10

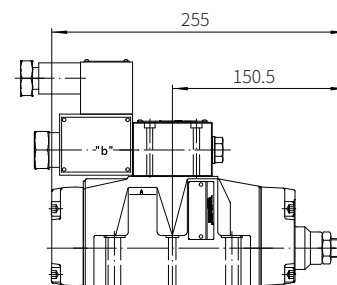
Stroke adjustment installed on the end A of the main valve.../11

Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11

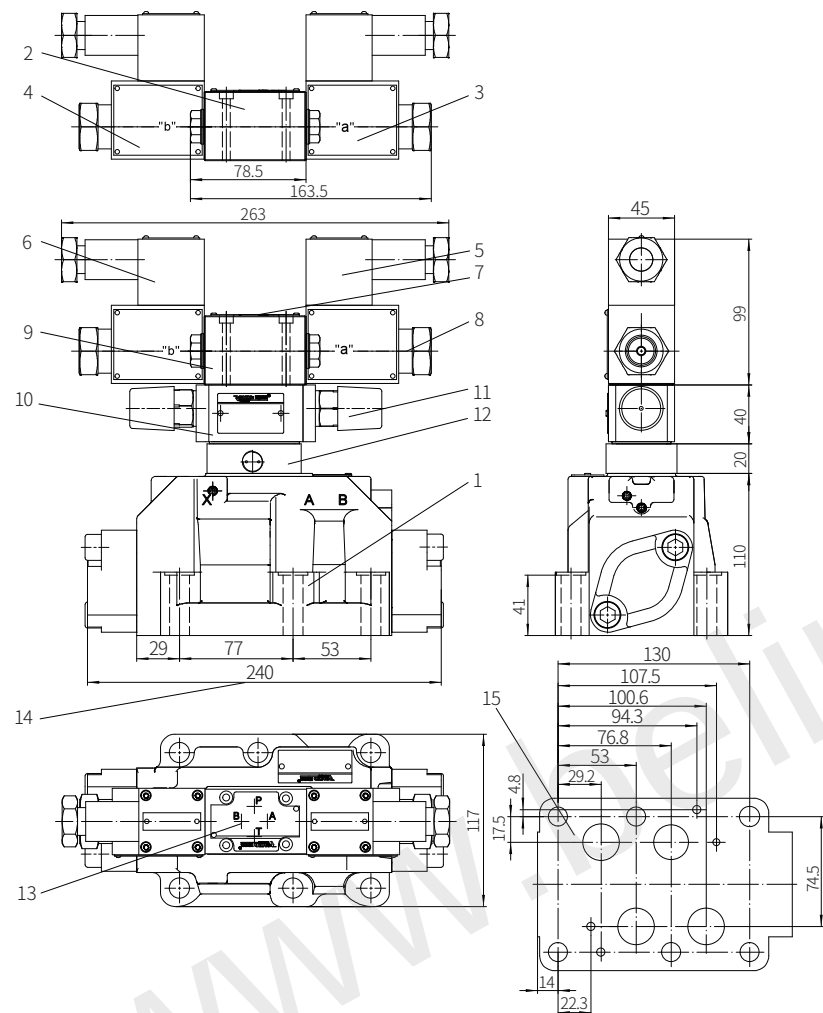
(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the main valve.../12

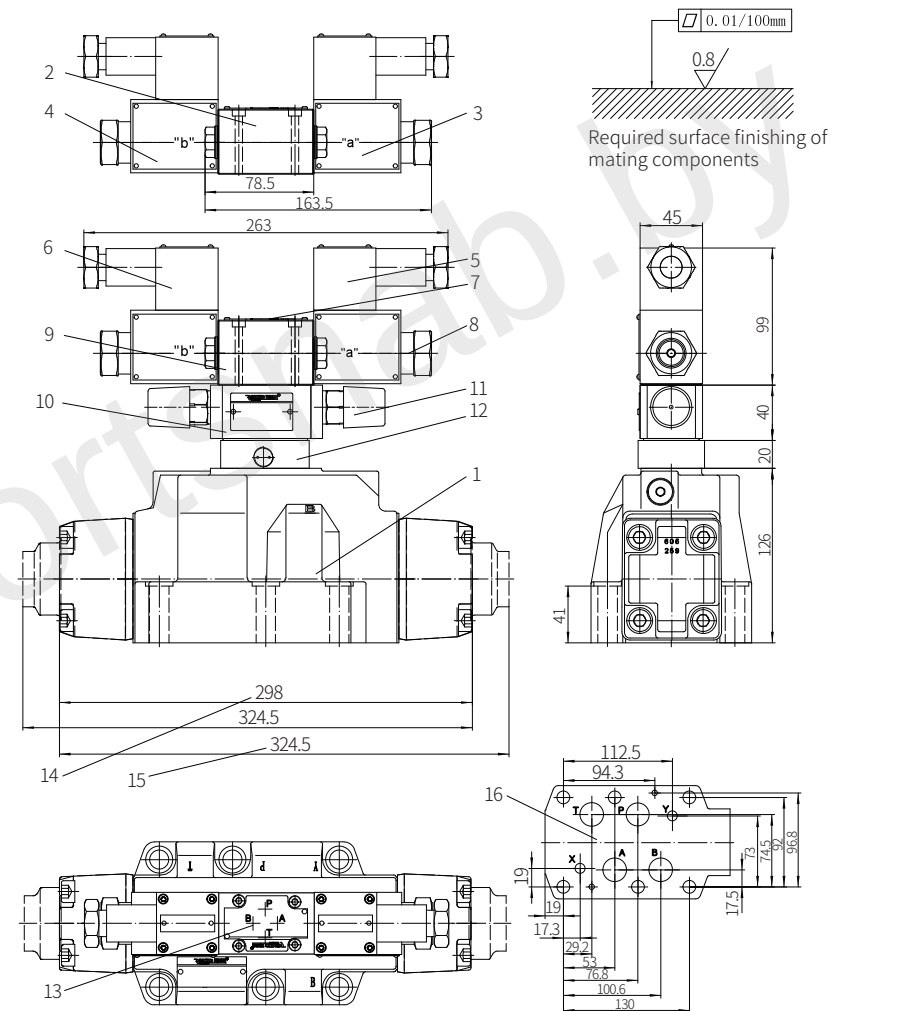
(2-position valve, symbol Y)

Model G-WEH22...-7XJ/...



- | | | |
|--|---|---|
| 1 Main valve | 7 Name plate of pilot valve | 13 Port layout of main valve (valve mounting surface) |
| 2 2-position valve with one solenoid and plug Z4 | 8 Manual emergency operation | 14 Size of 3-position valve with spring centered |
| 3 Solenoid a | 9 2-position or 3-position valve with two solenoids and plug Z4 | 15 Main valve connection diagram |
| 4 Solenoid b | 10 Switching time adjustment | |
| 5 Gray plug (or transparent plug) | 11 Adjustment bolt | |
| 6 Black plug (or transparent plug) | 12 Pressure reducing valve | |

Model G-WEH25...-6XJ/...

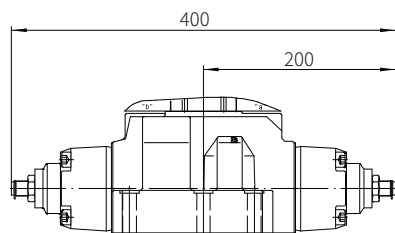
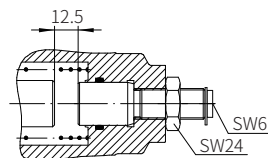


- | | | |
|--|---|---|
| 1 Main valve | 7 Name plate of pilot valve | 13 Port layout of main valve (valve mounting surface) |
| 2 2-position valve with one solenoid and plug Z4 | 8 Manual emergency operation | 14 Size of 3-position valve with spring centered |
| 3 Solenoid a | 9 2-position or 3-position valve with two solenoids and plug Z4 | 15 Size of 2-position valve with spring centered |
| 4 Solenoid b | 10 Switching time adjustment | 16 Main valve connection diagram |
| 5 Gray plug (or transparent plug) | 11 Adjustment bolt | |
| 6 Black plug (or transparent plug) | 12 Pressure reducing valve | |

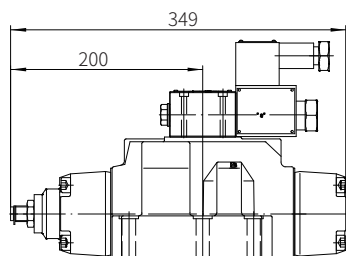
Dimension of additional devices for model G-WEH25

The installation range of the stroke adjustment is 12.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

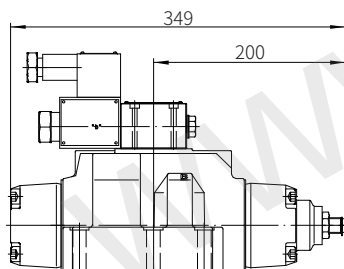
1 turn = 1.5mm stroke



Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12

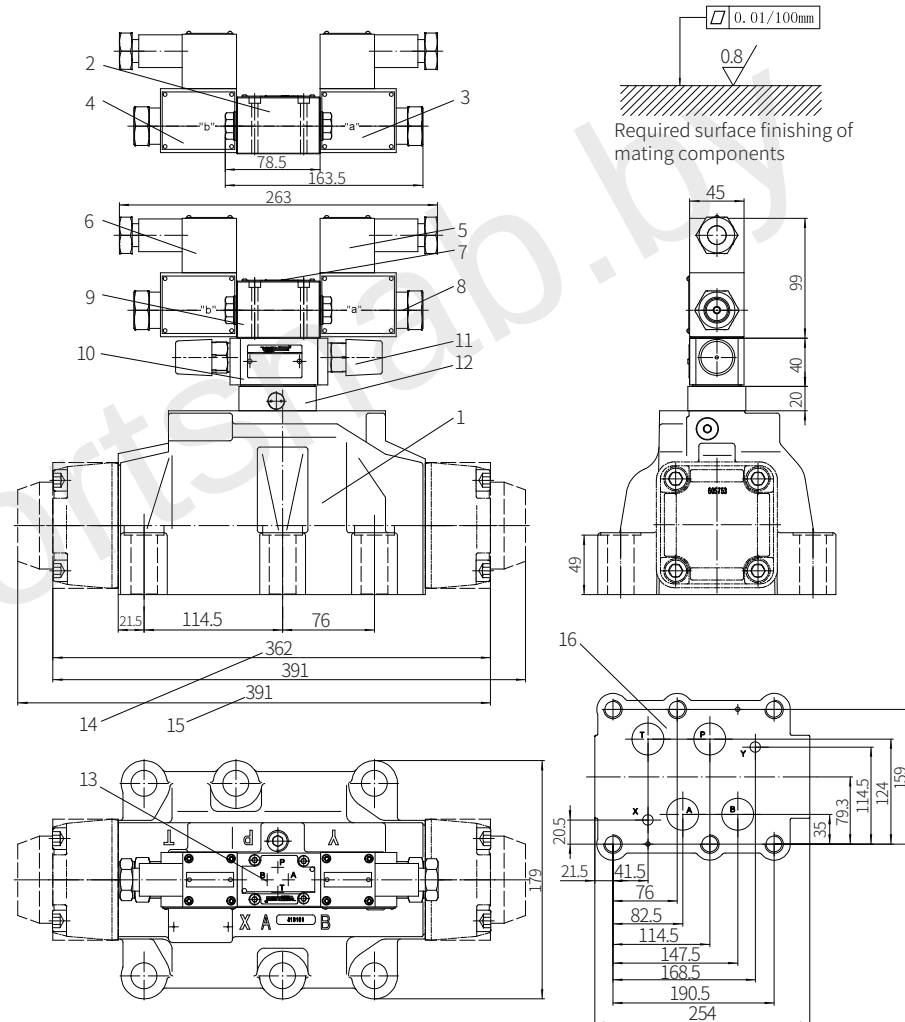


Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

Model G-WEH32...-6XJ/...

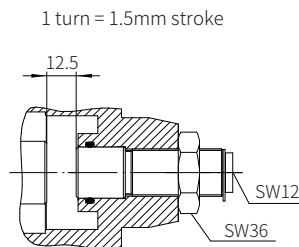
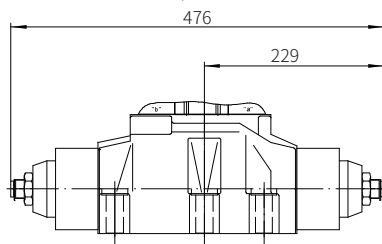


- 1 Main valve
- 2 2-position valve with one solenoid and plug Z4
- 3 Solenoid a
- 4 Solenoid b
- 5 Gray plug (or transparent plug)
- 6 Black plug (or transparent plug)
- 7 Name plate of pilot valve
- 8 Manual emergency operation
- 9 2-position or 3-position valve with two solenoids and plug Z4
- 10 Switching time adjustment
- 11 Adjustment bolt
- 12 Pressure reducing valve

- 13 Port layout of main valve (valve mounting surface)
- 14 Size of 3-position valve with spring centered
- 15 Size of 2-position valve with spring centered
- 16 Main valve connection diagram

Dimension of additional devices for model G-WEH32

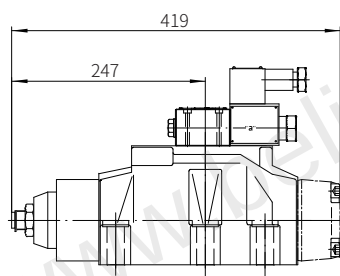
The installation range of the stroke adjustment is 15mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)



Stroke adjustment installed on the ends A and B of the main valve.../10

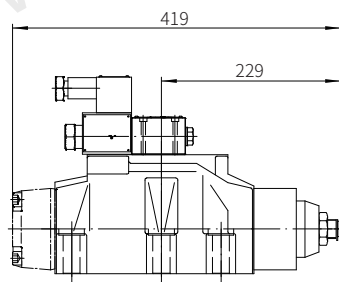
Stroke adjustment installed on the end A of the main valve.../11

Stroke adjustment installed on the end B of the main valve.../12



Stroke adjustment installed on the end A of the main valve.../11

(2-position valve, symbols C, D, K, Z)



Stroke adjustment installed on the end B of the main valve.../12

(2-position valve, symbol Y)

Explosion-proof Solenoid Operated Directional Valve with Emergency Handle

Model: GD-4WEMM6(10).../...



- ◆ Size 6 to 10
- ◆ Maximum working pressure 350 bar
- ◆ Maximum flow rate 120 L/min

Contents

Function description, sectional drawing	02
Models and specifications	02
Technical parameters	03
Functional symbols	03
Component size	04-05

Features

- The opening closing and direction of the flow controlled by the solenoid and manual
- Wet-pin solenoid with detachable coil
- The solenoid coil can rotate 90°
- Subplate mounting

Function description, sectional drawing

The GD-4WEMM directional valve is a directional spool valve operated by explosion-proof solenoid and control handle. It controls the opening, closing and flow direction of liquid flow.

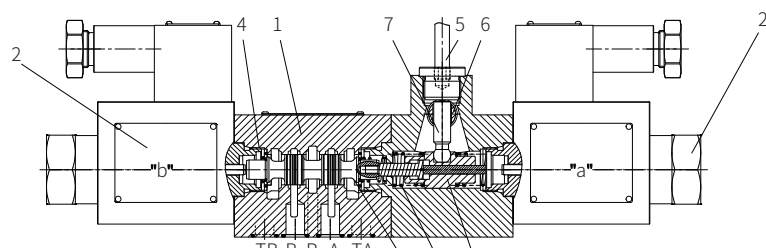
It is mainly composed of valve body (1), one or two solenoids (2), valve spool (3), reset spring (4) and manual control device.

Solenoid operation:

When the solenoid is de-energized, the valve spool (3) is held in the neutral or original position by means of the reset spring. The force of the solenoid (2) acts on the valve spool (3) to push it from the stationary position to the terminal position. In this way, the pressure oil flows from P to A and B to T, or from P to B and A to T. After the solenoid (2) is de-energized, the reset spring (4) pushes the valve spool (3) back to its original position.

Auxiliary handle operation:

When the solenoid is not energized, the valve spool (3) can be moved by operating the auxiliary handle. Turn the auxiliary handle (5) to the right so that the operating force acts on the valve spool (3) through the spindle (6), the ball valve core (7) and the guide sleeve (8) to move it to the left. When the auxiliary handle (5) returns to the zero position, the valve spool (3) returns to the original position under the action of the reset spring (9).



Model GD-4WEMM10E...3XJ/

Models and specifications

explosion-proof class I =G1 explosion-proof class II =G2		sealing material No code= NBR seals V= FKM seals (consult for other seals)
explosion-proof valve		No code= without plug-in throttle
3 way =3 4 way =4		B08= throttle $\phi 0.8\text{mm}$ B10= throttle $\phi 1.0\text{mm}$ B12= throttle $\phi 1.2\text{mm}$
solenoid spool valve with emergency handle =WEMM		No code= no manual emergency operation N9= with hidden manual emergency operation
size 6 =6 size 10 =10		
functional symbols		
size 6 =6X design serial number		
size 10 =3X design serial number		
12V DC =G12 24V DC =G24 28V DC =G28		

Note:

G1 explosion-proof grade EXD I

G2 explosion-proof grade EXD II

Technical parameters

Working pressure	Mpa	port A,B,P to 35
Pressure in port T	Mpa	to 16(AC), to 21(DC)
Medium		Mineral hydraulic oil or phosphate ester wave pressure oil
Viscosity range	mm^2/s	2.5 to 500
Temperature range	$^{\circ}\text{C}$	-30 to +80

Note: For symbols A and B, port T must be used as drain port if the working pressure exceeds the allowable pressure.

For the characteristic curve and operating limit, please refer to the WE solenoid directional valve.

Functional symbols

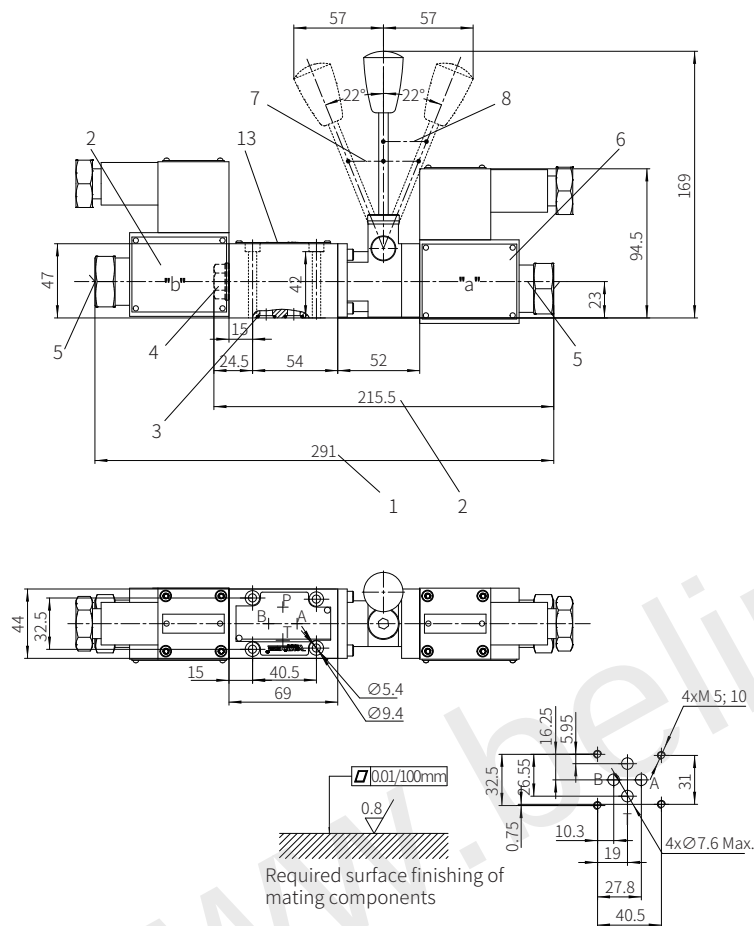
Transition function	Spool valve function	Transition function	Spool valve function

1) For example: .

The function symbol EA means the coil on side A

Note: Functions A9 and B9 are only used as pilot valves

Valve with DC solenoid
(Size 6)



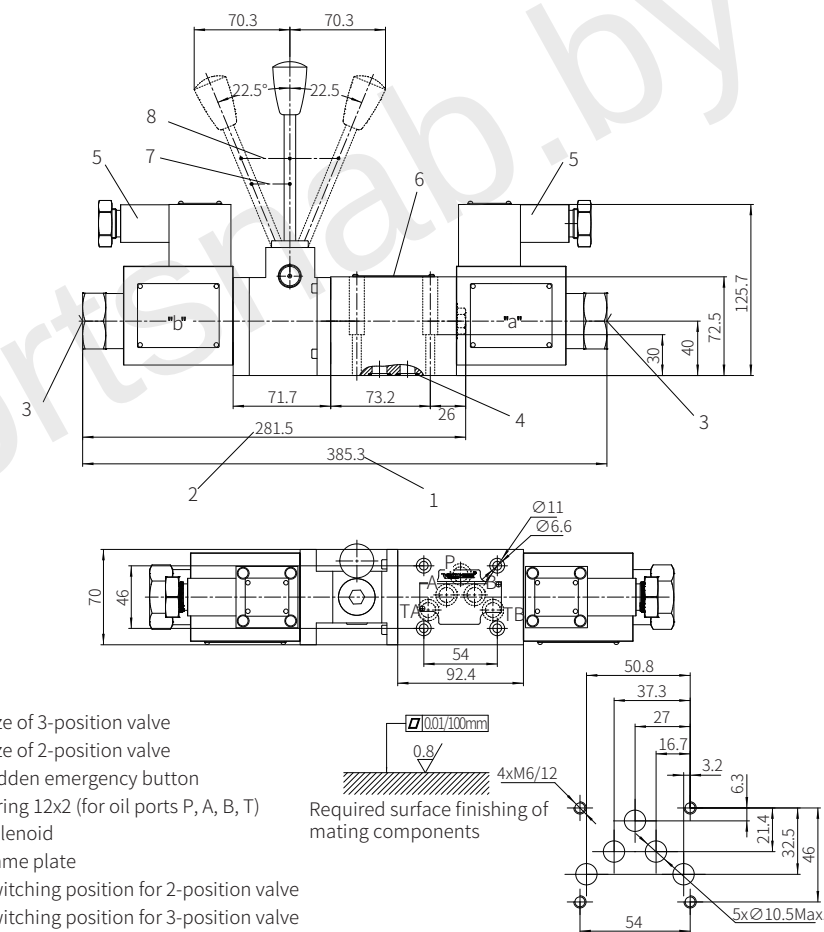
- 1 Size of 3-position valve
- 2 Size of 2-position valve
- 3 O ring 9.25x1.78 (for oil ports P, A, B, T)
- 4 Plug for 2-position valve
- 5 Hidden emergency button
- 6 Solenoid
- 7 Switching position for 3-position valve
- 8 Switching position for 2-position valve

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque $M_A=8.9\text{Nm}$

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 (M14x1.5)
G502/01 (G1/2"); G502/02 (M22x1.5)

0288

Valve with DC solenoid
(Size 10)



- 1 Size of 3-position valve
- 2 Size of 2-position valve
- 3 Hidden emergency button
- 4 O ring 12x2 (for oil ports P, A, B, T)
- 5 Solenoid
- 6 Name plate
- 7 Switching position for 2-position valve
- 8 Switching position for 3-position valve

It must be ordered separately
if connection subplate is needed.
Subplate model:
G66/01 (G3/8"); G66/02 (M18x1.5)
G67/01 (G1/2"); G67/02 (M22x1.5)
G534/01 (G3/4"); G534/02 (M27x1.5)

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque $M_A=15.5\text{Nm}$

0289

Explosion-proof Pilot Operated Unloading Pressure Relief Valve

Model: G-DAW...5X



- ◆ Size 10 to 32
- ◆ Maximum working pressure 315 bar
- ◆ Maximum flow rate 240 L/min

Contents

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

Features

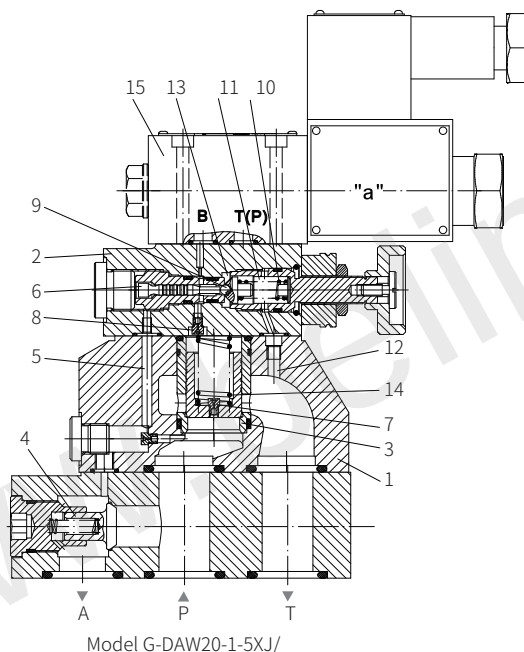
- For subplate mounting
- For manifolds mounting
- 4 adjusting elements
- 4 pressure ranges
- Unload by the installed explosion-proof directional valve

The valve is composed of main valve (1) with main spool assembly (3), pilot valve (2) with pressure adjusting element and check valve (4). For size 10 valve, the check valve (4) is installed in main valve (1). For size 25 and 32, the check valve (4) is built into a separate subplate installed under the main valve (1).

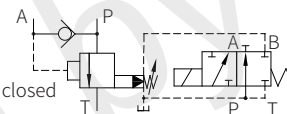
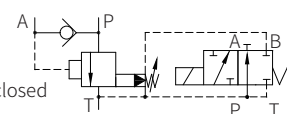
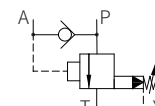
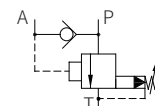
02

Due to orifices (7) and (8), there is pressure drop in the main spool (3). The main spool (3) lifts off its seat and opens the connection from P to T. and the check valve (4) closes the connection from A to P. Now the poppet valve (9) is kept opening by the system pressure via pilot valve spool (6).

The area of the pilot spool (6) is 10% or 17% greater than the effective area of the conical spool (9) , thus the effective force on the pilot valve spool (6) is 10% or 17% greater than the effective force on the conical spool (9). When the actuator pressure drop to equal the cut-off pressure of the valve that corresponds to the switching pressure differential, the spring (10) pushes the poppet valve(9) on to its seat. The pressure is built up on the spring loaded side of the main spool (3). In conjunction with spring (14), the main spool (3) is closed and the connection from port P to T is isolated. The pump flow passes again via the check valve (4) into the hydraulic system (P to A). The solenoid direction valve (15) can switch the setting shut-off pressure of the pilot valve (2) either from P to A or P to T.



02



explosion-proof class I	=G1
explosion-proof class II	=G2
with directional valve	=W
pilot valve	=No code
pilot valve without main spool insert (no mark for size)	=C
pilot valve with main spool insert (mark with size 30)	=C
size 10	=
size 25	=
size 32	=



adjusting element	
rotary knob	=1
hexagon screw with sleeve and protective cap	=2
lockable rotary knob with scale	=3
rotary knob with scale	=7
50 to 59 series	=5X
(50 to 59 series installation and connection size unchanged)	

more
information in text

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

N9= with hidden manual emergency operation

G24=	DC 24V
B36=	AC rectified 36V
B127=	AC rectified 127V
B220=	AC rectified 220V

C= with directional valve

No code=	pilot control oil drain internal
Y=	pilot control oil drain external

switching pressure differential (P-A)
on average 10 %
on average 17 %

pressure range

50= pressure setting up to 50 bar
100= pressure setting up to 100 bar
200= pressure setting up to 200 bar
315= pressure setting up to 315 bar

Note:

G1 explosion-proof grade EXD I

G2 explosion-proof grade EXD II CT4

Hydraulic					
Maximum working pressure	port P	bar	315		
	port A	bar	315(after switching from P to T)		
Hydraulic oil			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)		
		°C	-20 to +80 (FKM seal)		
Viscosity range		mm²/s	10 to 800		
Maximum flow	Type 10%	L/min	40	80	120
	Type 17%	L/min	60	120	240
Cleanliness of oil ³⁾			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15		
Maximum setting pressure			50; 100; 200; 315		

1) For NBR seal and FKM seal.

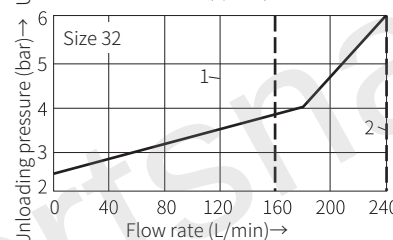
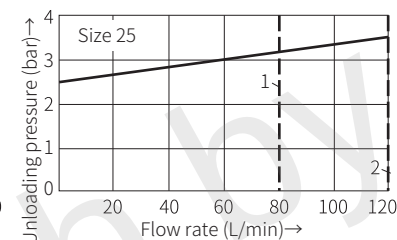
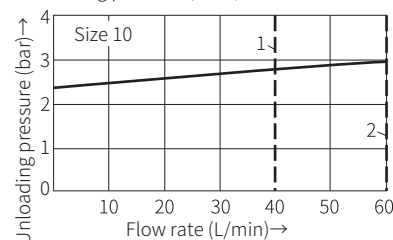
2) Only for FKM seal.

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.

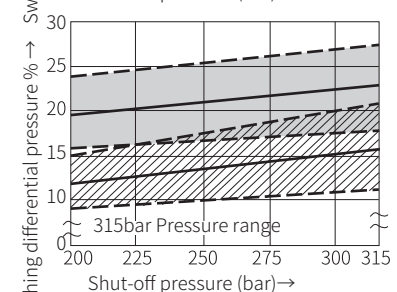
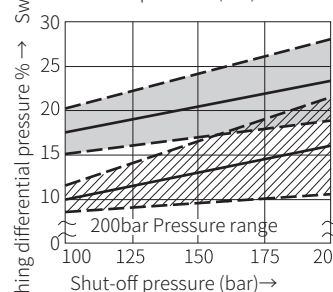
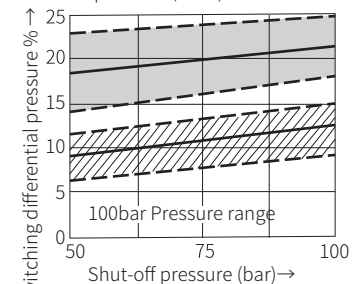
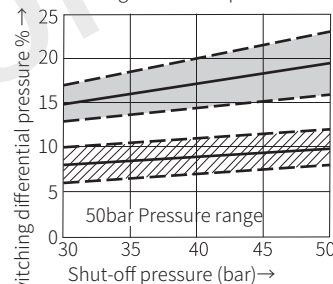
(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

Unloading pressure (P→T)



1 $q_{v\ pmax}$ for version 10%
2 $q_{v\ pmax}$ for version 17%
These curves are valid for outlet pressure (T)=0 over the entire flow range

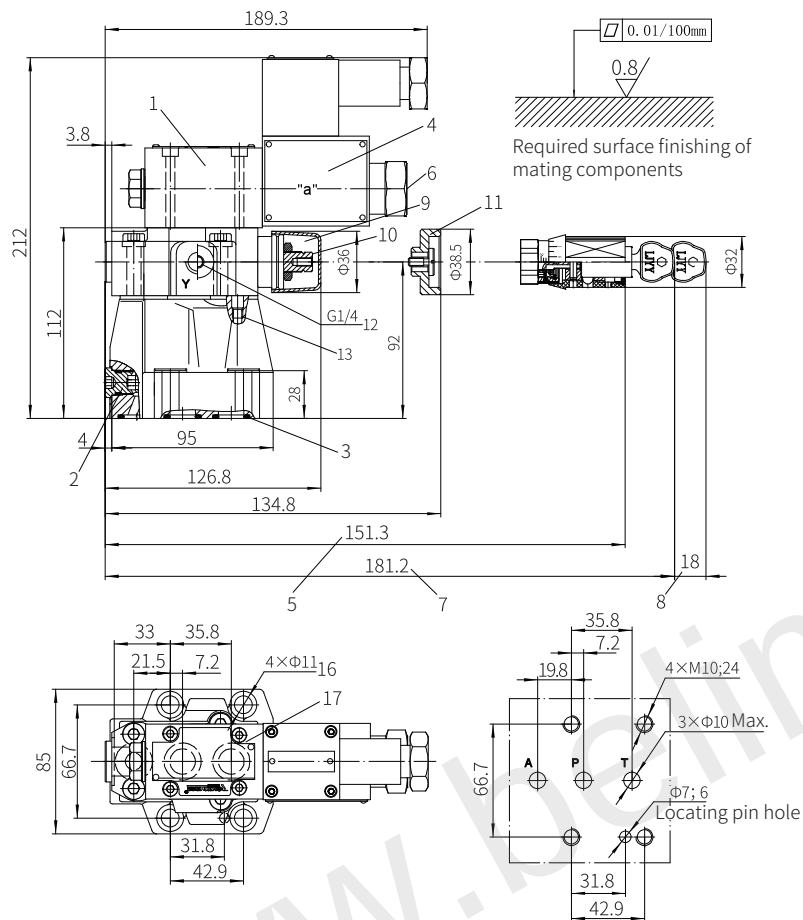
Switching differential pressure in relation to shut-off pressure (P→A)



= Scatter range for version "10"

= Scatter range for version "17"

Model G-DAW10...-5XJ/...

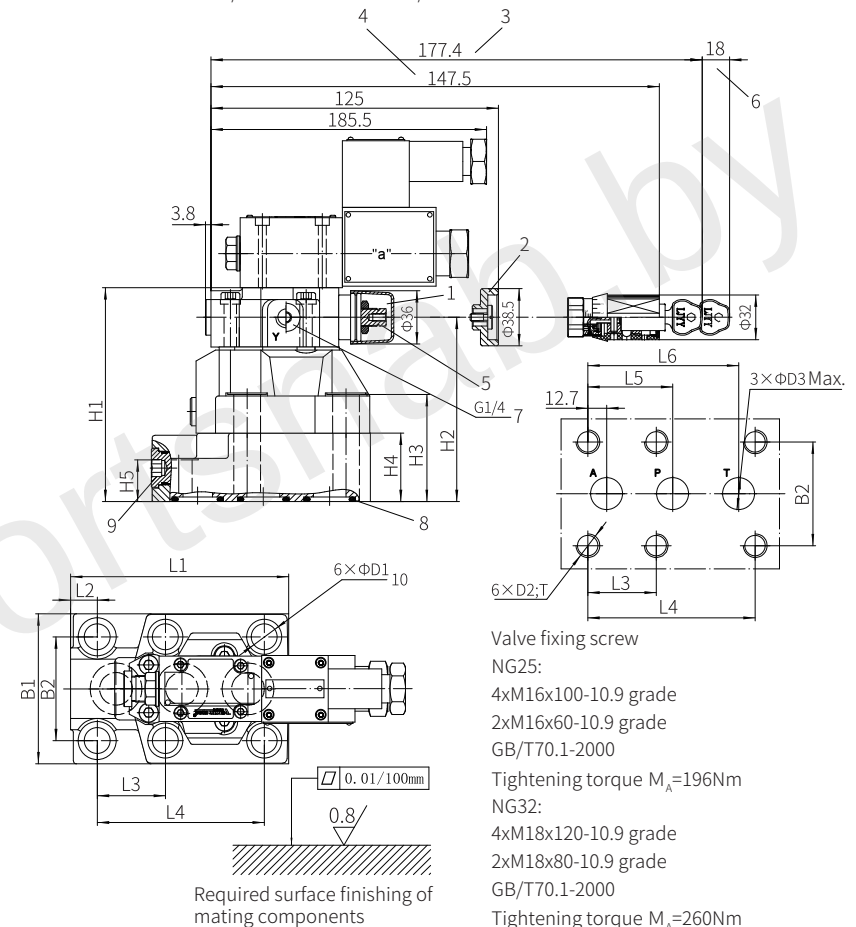


Valve fixing screw
M10x50-10.9 grade GB/T70.1-2000
Tightening torque $M_A=75\text{Nm}$
It must be ordered separately
if connection subplate is needed.
G467/01; G467/02
G468/01; G468/02

1 Solenoid pilot valve
2 Built-in check valve
3 O ring 17.12x2.62
4 Solenoid
5 Adjustment form "7"
6 Hidden emergency
operation
7 Adjustment form "5"
8 Space required to remove the key
9 Adjustment form "2"

10 Hexagon S=10
11 Adjustment form "1"
12 Port Y for control oil drain
external
13 Omitted with internal
pilot oil drain

Model G-DAW20...-5XJ/...and G-DAW30...-5XJ/...



Valve fixing screw
NG25:
4xM16x100-10.9 grade
2xM16x60-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=196\text{Nm}$
NG32:
4xM18x120-10.9 grade
2xM18x80-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=260\text{Nm}$

Size	L1	L2	L3	L4	L5	L6	H1	H2	H3
25	147	18	46	112.7	57.1	101.6	144	124	72
32	189.2	32	50.8	139.7	63.5	127	165	145	93
Size	H4	H5	B1	B2	D1	D2	D3	T	
25	46	28	101	69.9	18	M16	22	34	
32	67	45	116	82.5	20	M18	30	37	

It must be ordered separately if connection subplate is needed.
Subplate model:
NG25: G469/01; G469/02; G470/01; G470/02
NG32: G471/01; G471/02; G472/01; G472/02

1 Adjustment form "1"
2 Adjustment form "2"
3 Adjustment form "5"
4 Adjustment form "7"
5 Hexagon S=10
6 Space required to remove the
key
7 Port Y for control oil drain
external
8 O ring
9 Built-in check valve
10 Valve fixing screw hole

02



- 02



02

02

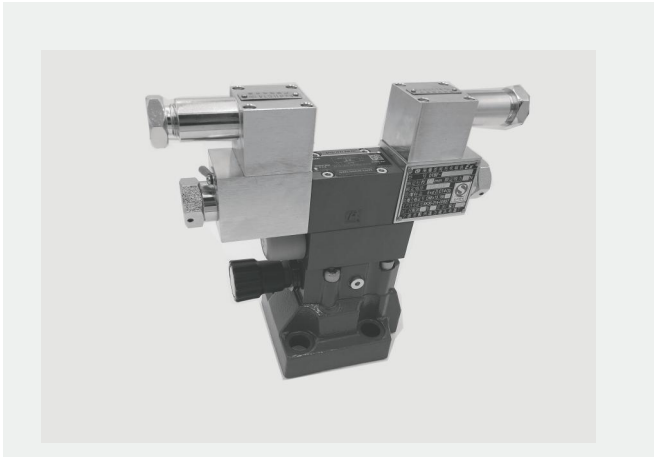
- 02

02



Explosion-proof Multistage Electro-hydraulic Pilot Relief Valve

Model: G-DB2U....-5X



- ◆ Size 10 to 32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum flow rate 600 L/min

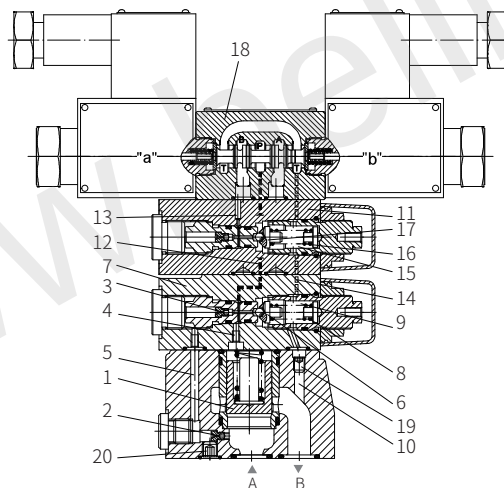
Contents

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

Features

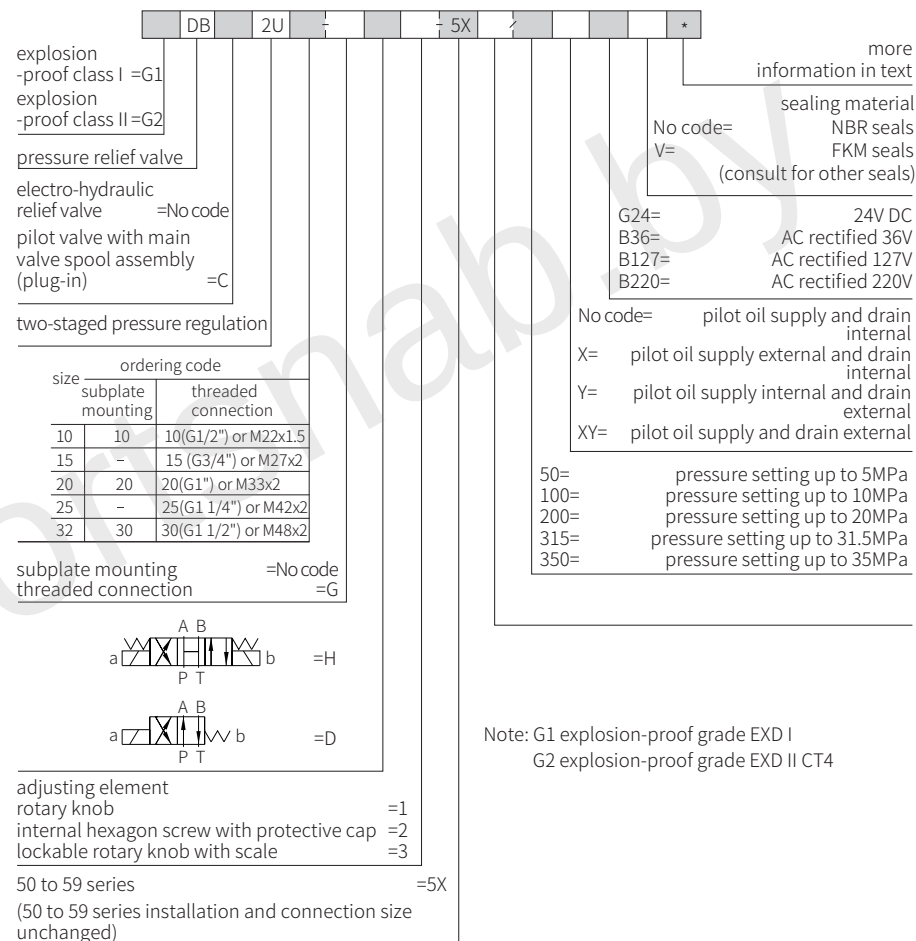
- Subplate mounting
- Threaded connection
- Cartridge connection
- Two-stage pressure setting
- Controlled by solenoid directional valve
- Pressure adjusting forms:
 - Rotary knob
 - Internal hexagon screw with protective cap
 - Lockable rotary knob with scale.

It is the primary pressure regulation when solenoid is de-energized, but the secondary pressure regulation when solenoid is energized. This valve doesn't have solenoid unloading function. The switch of different supply and drain modes can be achieved by assembling the conical plugs (19 and 20).

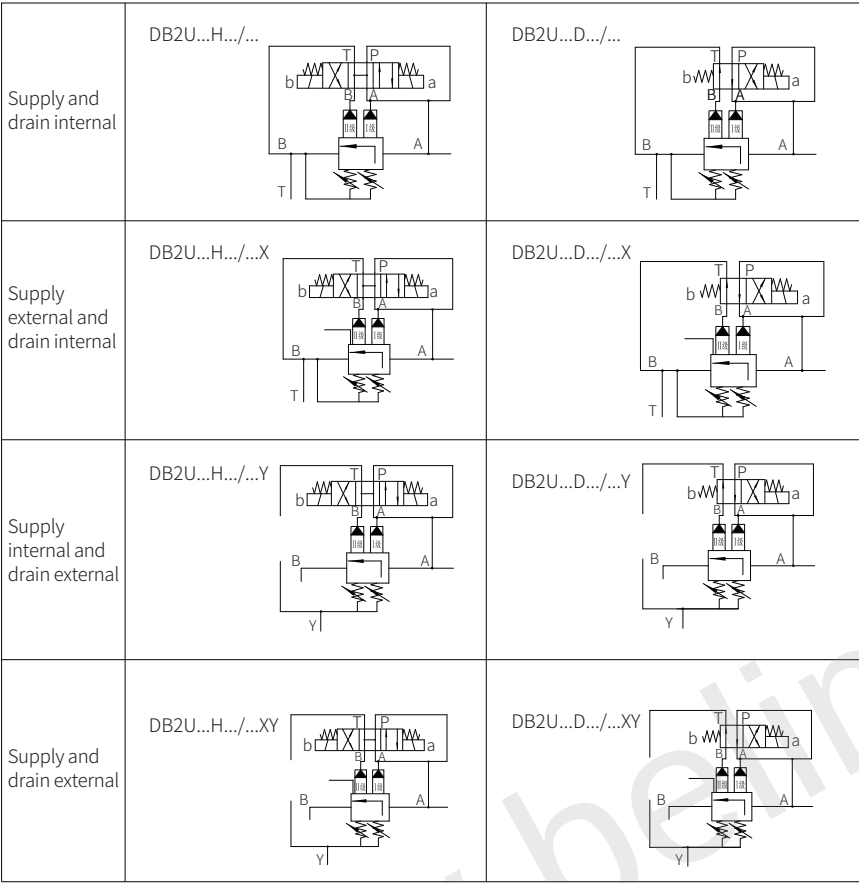


Model G-D-DB2U10-H-2-5XJ/

Models and specifications



Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

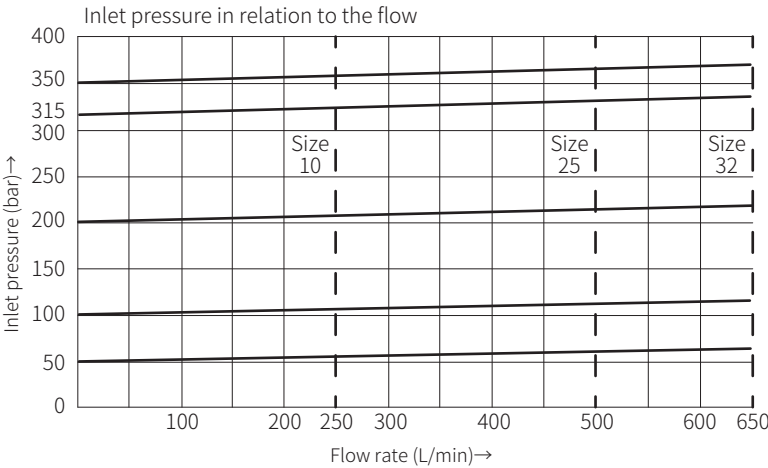


Size		10	15	20	25	30
Flow (L/min)	threaded connection valve	200		400		600
	subplate mounting valve	200	—	400	—	600
Working pressure		MPa Port A, B, X to 35				
Port Y back pressure		MPa to 31.5				
Minimum setting pressure		MPa Related to flow, see characteristic curve				
Maximum setting pressure		MPa 35				
Medium		Mineral hydraulic oil or phosphate hydraulic oil				
Viscosity range		mm²/s 10 to 800				
Working medium temperature range °C		-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Solenoid valve characteristic		See G-4WE6 solenoid valve				

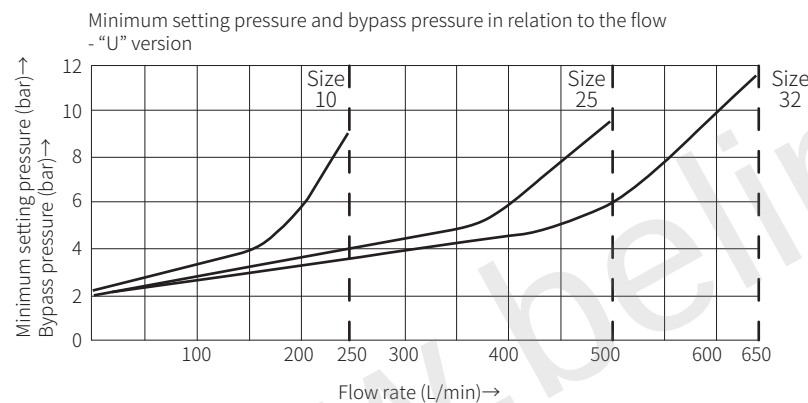
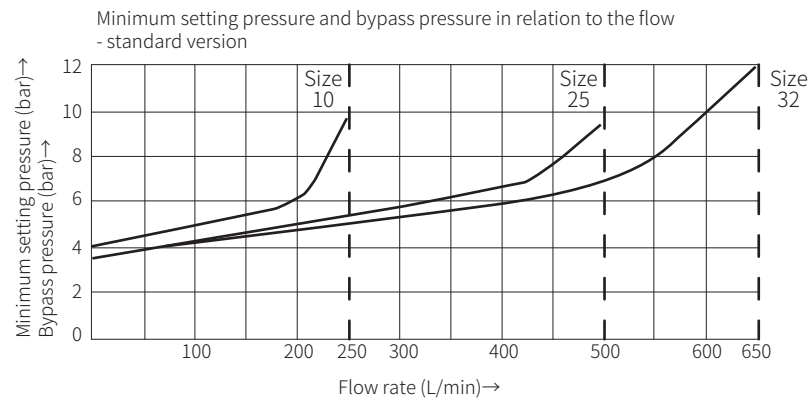
Characteristic curve

(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

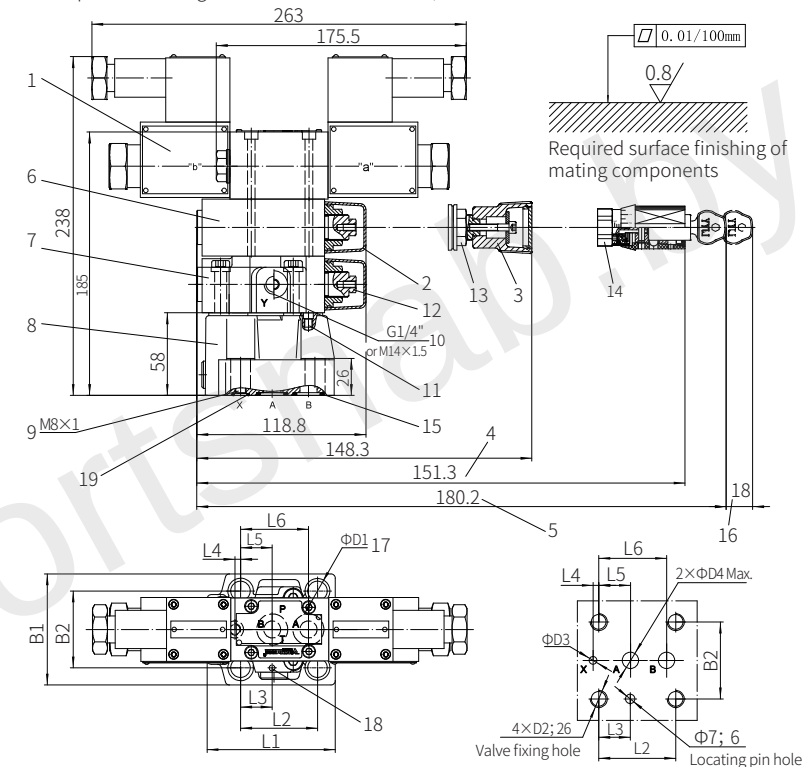
The curve was measured at zero pressure for externally controlled oil leakage.
For internal control oil return, the pressure at port B is added to the command value.



(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)



Subplate mounting valve model G-DB2U...-5XJ/...



Size	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

- 1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and M14x1.5, optional)
11 Omitted with internal pilot oil drain
12 External hexagon screw S=10
13 Hexagon nut S=24
14 External hexagon screw S=24
15 O ring 17.12x2.62(for port A, B)
16 Space required to remove the key
17 Valve fixing screw holes
18 Locating pin hole
19 O ring 9.25x1.78(for port X)

- Valve fixing screw
NG10:
M12x50-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=95\text{Nm}$
NG25:
M16x50-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=196\text{Nm}$
NG32:
M18x50-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=260\text{Nm}$

It must be ordered separately if connection subplate is needed.

NG10 Subplate model:

G545/01 (G3/8"); G545/02 (M18x1.5)

G546/01 (G1/2"); G546/02 (M22x1.5)

NG25 Subplate model:

G408/01 (G3/4"); G408/02 (M27x2)

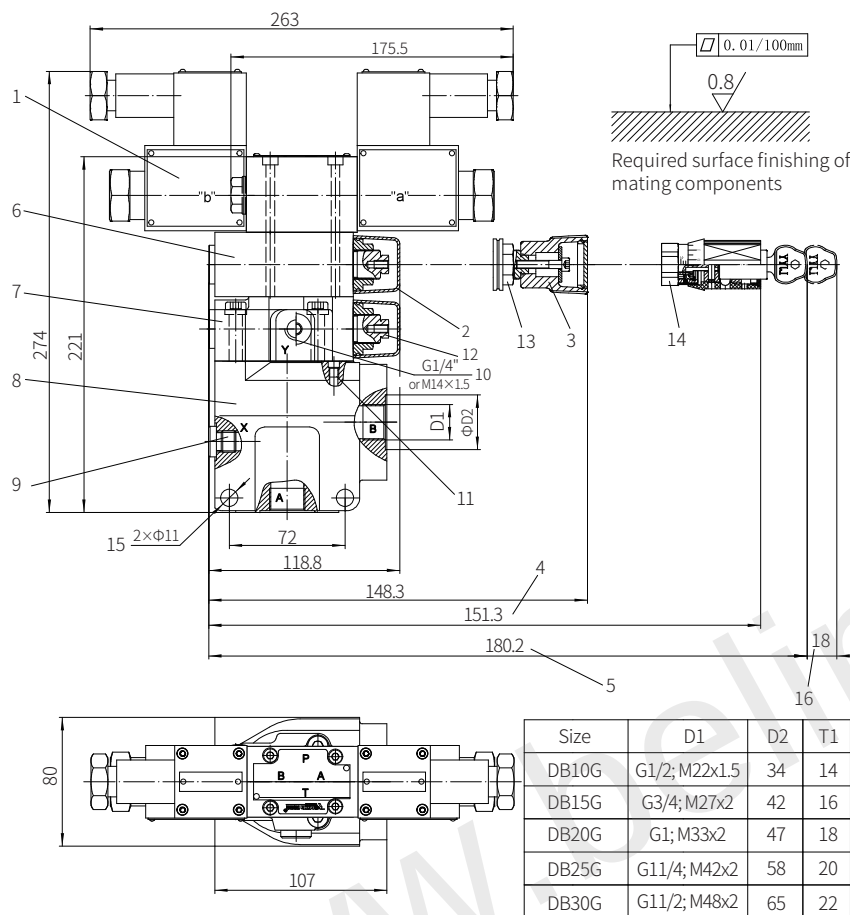
G409/01 (G1"); G409/02 (M33x2)

NG32 Subplate model:

G410/01 (G1 1/4"); G410/02 (M42x2)

G411/01 (G1 1/2"); G411/02 (M48x2)

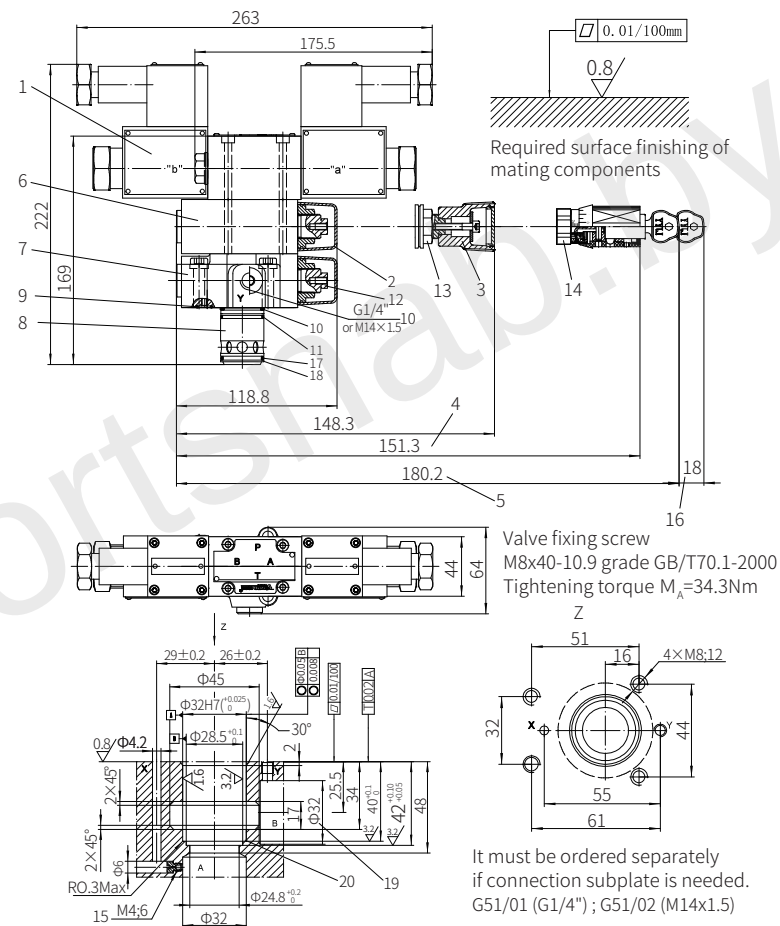
Threaded connection valve model G-DB2U...G...-5XJ/...



- 1 Solenoid directional valve (type H, type D, optional)
- 2 Adjustment form "2"
- 3 Adjustment form "1"
- 4 Adjustment form "3"
- 5 Adjustment form "7"
- 6 Secondary pilot valve
- 7 Primary pilot valve
- 8 Main valve
- 9 Port X for external pilot oil supply
- 10 Port Y for external pilot oil drain (G1/4" and M14x1.5, optional)

- 11 Omitted with internal pilot oil drain
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 Valve screw fixing holes
- 16 Space required to remove the key

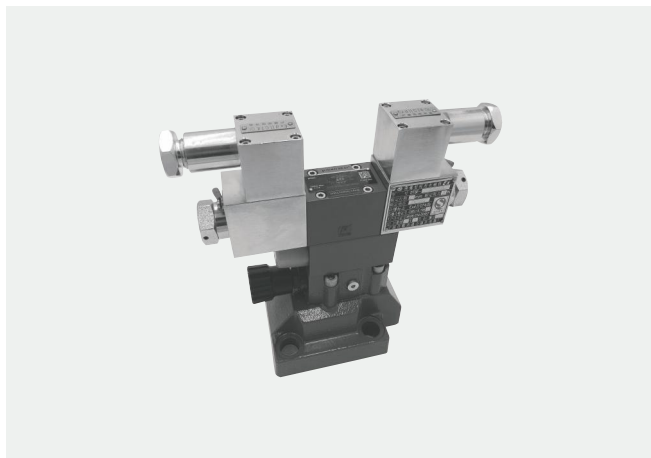
With (G-DB2UC10 or 30) or without (G-DB2UC)



- 1 Solenoid directional valve (type H, type D, optional)
- 2 Adjustment form "2"
- 3 Adjustment form "1"
- 4 Adjustment form "3"
- 5 Adjustment form "7"
- 6 Secondary pilot valve
- 7 Primary pilot valve
- 8 Main spool
- 9 O ring 9.25x1.78
- 10 O ring 28x2.65
- 11 O ring 28x1.8
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 Throttle must be order separately
- 16 Space required to remove the key
- 17 O ring 27.3x2.4
- 18 Retainer ring 32x28.4x0.8
- 19 The $\Phi 32$ hole can intersect $\Phi 45$ hole at any position
Be careful not to damage oil port X and fixing holes
- 20 The retainer ring and O-ring should be installed in this hole before install main spool position

Explosion-proof Multistage Electro-hydraulic Pilot Relief Valve

Model: G-DB3U...-5X



- ◆ Size 10 to 30
- ◆ Maximum working pressure 350 bar
- ◆ Maximum flow rate 600 L/min

Contents

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

Features

- Subplate mounting
- Threaded connection
- Cartridge connection
- Two-stage or three-stage pressure setting
- Controlled by solenoid directional valve
- Pressure adjusting forms:
 - Rotary knob
 - Internal hexagon screw with protective cap
 - Lockable rotary knob with scale

Function description, sectional drawing

The G-DB3U valve is a pilot controlled two-stage concentric type multistage relief valve (two or three stages). The main valve and pilot valve are both poppet valve structures. The valve is used to control the system pressure, and it may switch the system pressure to the tertiary or multistage pressure by the solenoid directional valve.

G-DB3U valve mainly consists of main valve, 4/3-way or 4/2-way directional valve (size 6) and three pilot valves. The pilot valve I and II are direct operated relief valve.

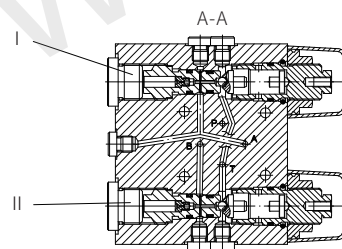
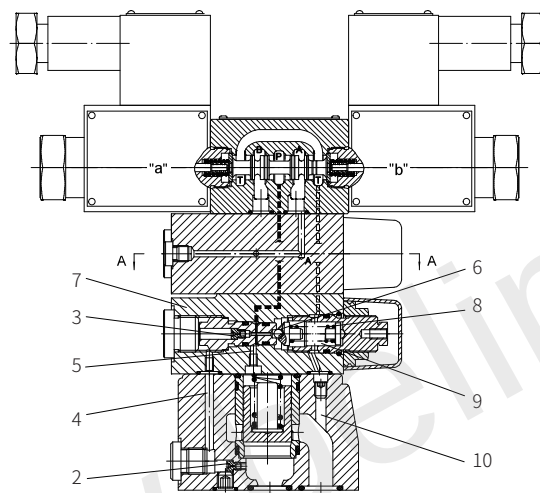
When solenoid is de-energized, the pressure oil at port A is controlled by the pilot valve (7), it acts on bottom of main spool (1), and acts on the upper end of main spool and poppet valve (6) of pilot valve (7) via orifices (2 and 3) and channels (4 and 5). When the system pressure exceeds the setting pressure of the spring (8), the poppet valve (6) is opened, at the same time, the pressure oil at the upper end of the main spool flows back to the oil tank through the orifice (3), channel (5), spring chamber (9), and channel (10) (control oil drain internal type) or back to the oil tank through the external drain port (control oil drain external).

In this way, a differential pressure is formed on the main spool when the pressure oil flows through orifices (2 and 3) and it opens the main spool. The pressure oil flows from A to B at a set pressure.

When solenoid "a" is energized, the pressure at port A is controlled by pilot valve II.

When solenoid "b" is energized, the pressure at port A is controlled by pilot valve I.

The setting pressure of pilot valve 7 must be higher than the setting pressure of pilot valves I and II. There are four different models of control oil: supply and drain internal, supply internal and drain external, supply external and drain internal, supply and drain external. (See the symbols of control oil in details).

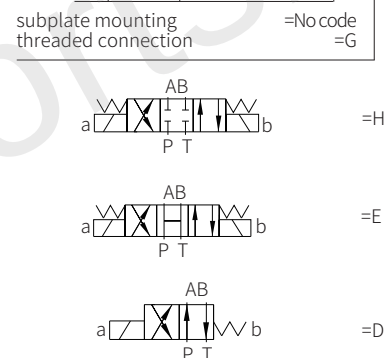


Model G-DB3U10-H-2-5XJ/

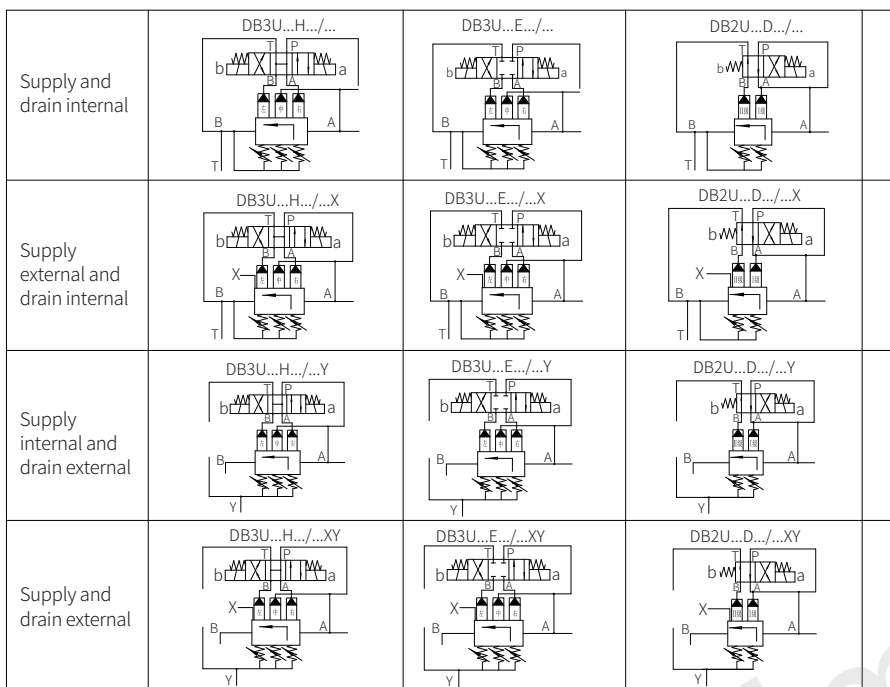
Models and specifications

DB										5X										*									
explosion																				more									
-proof class I =G1																				information in text									
explosion																				sealing material									
-proof class II =G2																				No code= NBR seals									
electro-hydraulic																				V= FKM seals									
relief valve																				(consult for other seals)									
pilot valve with main																				G24= 24V DC									
valve spool assembly																				B36= AC rectified 36V									
(plug-in)																				B220= AC rectified 220V									
																				B127= AC rectified 127V									
three-staged pressure regulation																				No code= pilot oil supply and									
																				drain internal									
																				X= pilot oil supply external and									
																				drain internal									
																				Y= pilot oil supply internal and									
																				drain external									
																				XY= pilot oil supply and									
																				drain external									
																				50= pressure setting up to 5MPa									
																				100= pressure setting up to 10MPa									
																				200= pressure setting up to 20MPa									
																				315= pressure setting up to 31.5MPa									
																				350= pressure setting up to 35MPa									
																				5X= 50 to 59 series									
																				(50 to 59 series installation and connection size									
																				unchanged)									
																				Note: G1 explosion-proof grade EXD I									
																				G2 explosion-proof grade EXD II CT4									
adjusting element																													
rotary knob																				=1									
internal hexagon screw with protective cap																				=2									
lockable rotary knob with scale																				=3									

size		ordering code	
subplate mounting	threaded connection		
10	10	10(G1/2") or M22x1.5	
15	-	15 (G3/4") or M27x2	
20	20	20(G1") or M33x2	
25	-	25(G1 1/4") or M42x2	
32	30	30(G1 1/2") or M48x2	



adjusting element
rotary knob
internal hexagon screw with protective cap
lockable rotary knob with scale



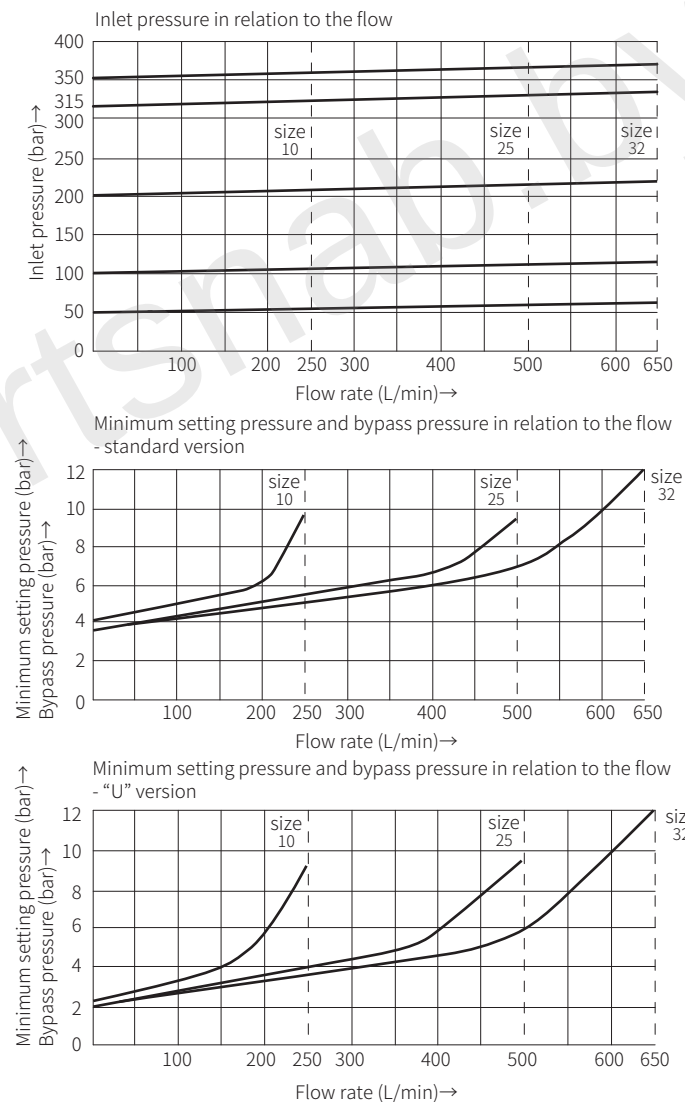
Technical parameters

Size		10	15	20	25	30
Flow (L/min)	threaded connection valve	200		400		600
	subplate mounting valve	200	—	400	—	600
Working pressure	MPa	Port A, B, X to 35				
Port Y back pressure	MPa	to 31.5				
Minimum setting pressure	MPa	Related to flow, see characteristic curve				
Maximum setting pressure	MPa	35				
Medium	Mineral hydraulic oil or phosphate hydraulic oil					
Viscosity range	mm ² /s	10 to 800				
Working medium temperature range	°C	-30 to +80 (NBR seal) -20 to +80 (FKM seal)				
Solenoid valve characteristic	See G-4WE6 solenoid valve					

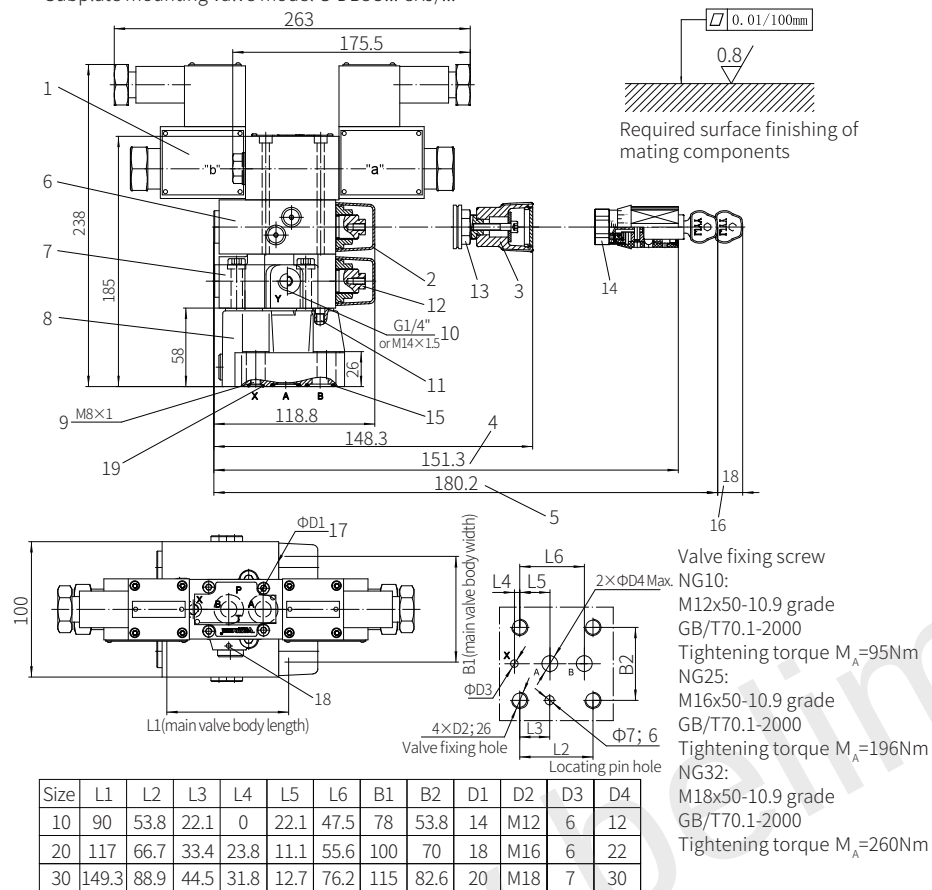
Characteristic curve

(Measured when using HLP46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

The curve was measured at zero pressure for externally controlled oil leakage.
For internal control oil return, the pressure at port B is added to the command value.



Subplate mounting valve model G-DB3U...-5XJ/...



- 1 Solenoid directional valve (type H, type D, optional)
- 2 Adjustment form "2"
- 3 Adjustment form "1"
- 4 Adjustment form "3"
- 5 Adjustment form "7"
- 6 Secondary or tertiary pilot valve
- 7 Primary pilot valve
- 8 Main valve
- 9 Port X for external pilot oil supply
- 10 Port Y for external pilot oil drain (G1/4" and M14x1.5, optional)
- 11 Omitted with internal pilot oil drain
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 O ring 17.12x2.62(for port A, B)
- 16 Space required to remove the key
- 17 Valve screw fixing holes
- 18 Locating pin hole
- 19 O ring 9.25x1.78(for port X)

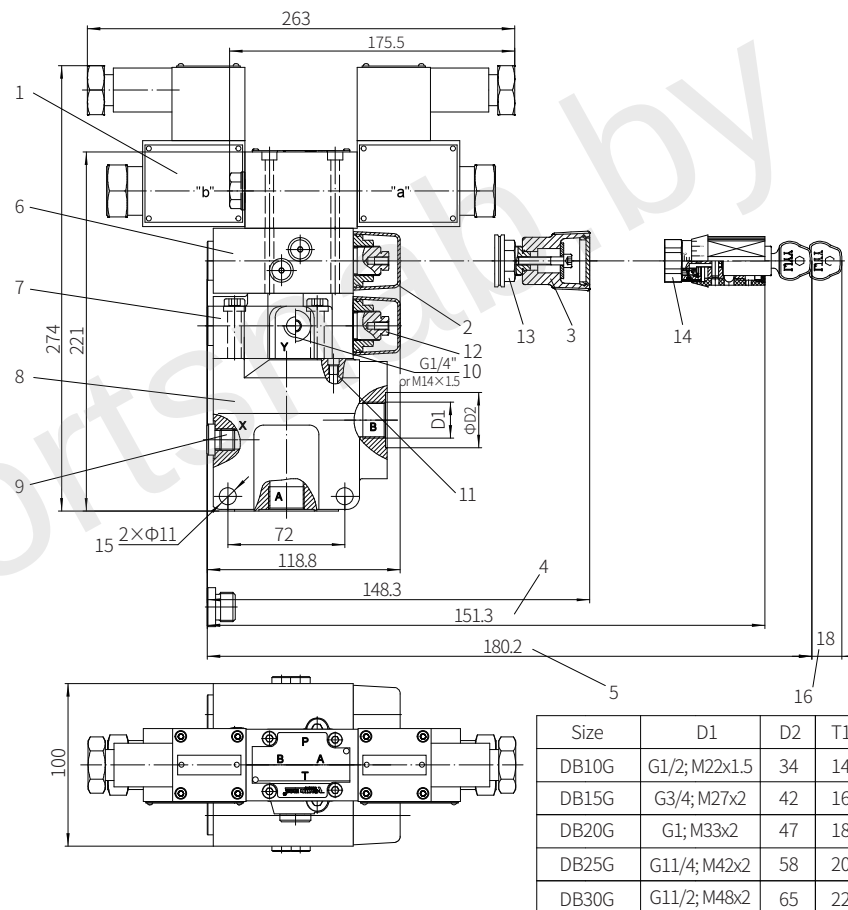
It must be ordered separately if connection subplate is needed.

NG10 Subplate model:
 G545/01 (G3/8"); G545/02 (M18x1.5)
 G546/01 (G1/2"); G546/02 (M22x1.5)

NG25 Subplate model:
 G408/01 (G3/4"); G408/02 (M27x2)
 G409/01 (G1"); G409/02 (M33x2)

NG32 Subplate model:
 G410/01 (G1 1/4"); G410/02 (M42x2)
 G411/01 (G1 1/2"); G411/02 (M48x2)

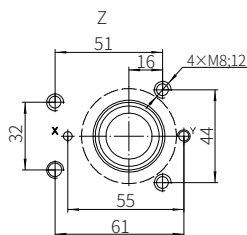
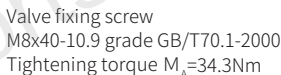
Threaded connection valve model G-DB3U...G...-5XJ/...



- 1 Solenoid directional valve (type H, type D, optional)
- 2 Adjustment form "2"
- 3 Adjustment form "1"
- 4 Adjustment form "3"
- 5 Adjustment form "7"
- 6 Secondary or tertiary pilot valve
- 7 Primary pilot valve
- 8 Main valve
- 9 Port X for external pilot oil supply
- 10 Port Y for external pilot oil drain (G1/4" and M14x1.5, optional)

- 11 Omitted with internal pilot oil drain
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 Valve screw fixing holes
- 16 Space required to remove the key

02



It must be ordered separately
if connection subplate is needed.
G51/01 (G1/4") ; G51/02 (M14x1.5)

- 11 O ring 28x1.8
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 Throttle must be order separately
- 16 Space required to remove the key
- 17 O ring 27.3x2.4
- 18 Retainer ring 32x28.4x0.8
- 19 The $\Phi 32$ hole can intersect $\Phi 45$ hole at any position
Be careful not to damage oil port X and fixing holes
- 20 The retainer ring and O-ring should be installed in
this hole before install main spool position

Explosion-proof Solenoid Pilot Relief Valve

Model: G-DBW...5X



- ◆ Size 10 to 32
- ◆ Maximum working pressure 350 bar
- ◆ Maximum flow rate 650 L/min

Contents

Function description, sectional drawing	02-03
Models and specifications	04-05
Functional symbols	06
Technical parameters	06
Characteristic curve	07
Component size	08-10

Features

- Subplate mounting, threaded connection, manifolds installation
- 5 setting pressure ranges
- Pressure adjusting elements:
Rotary knob
Inner hexagon screw with protective cap

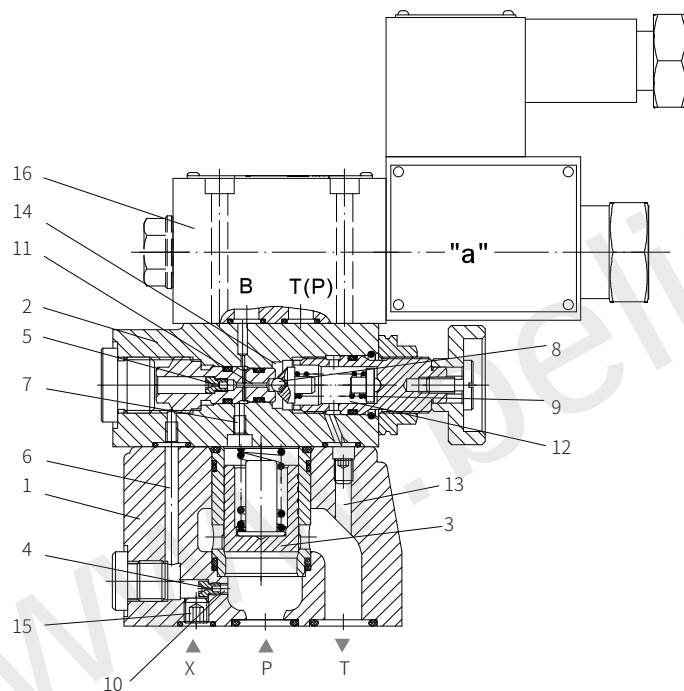
Function description, sectional drawing

The G-DBW pressure control valve is pilot operated relief valve, it is used to limit and unload working pressure by solenoids.

The valve is basically composed of main valve (1) with main spool inserted (3) and pilot valve (2) with pressure adjustment element.

The pressure of port P acts on the main spool (3), meanwhile, the pressure is applied via control lines (6) and (7) with orifices (4) and (5) to the spring loaded side of the main spool (3) and on the ball (8) in the pilot valve (2). When the pressure in port P rises excess the spring setting pressure, the ball (8) overcomes the spring pressure (9) to open the pilot valve.

The signal is obtained internally via the control channels (10) and (6) from port P. The oil fluid on the spring loaded side of the main spool (3) flows into spring chamber (12) via control line (7), throttle (11) and ball (8). Thus, hydraulic oil external drain via control line (14) into the tank for model DBW...Y. Because of throttles (4) and (5), the pressure drop occurs at the main spool (3) and the connection from port P to port T is opened. The fluid flows from port P to port T while the setting working pressure is no changing. The pressure relief valve can unload or shift the different pressure (second pressure stage) by "X" port.



Model G-DBW10-1-5XJ/

0544

Function description, sectional drawing

Solenoid pilot relief valve with switching shock damping(sandwich), model G-DBW.../...S...R12

The connection from B2 to B1 opens with delay when switching shock damping valve (17) used, it can prevent pressure peaks and unloading shocks in the return line. The valve is installed between pilot valve and directional control valve (16). The degree of damping (unloading shock) depends on the size of throttle (18). Throttle Ø1.2mm is used as standard size (ordering code...R12...).

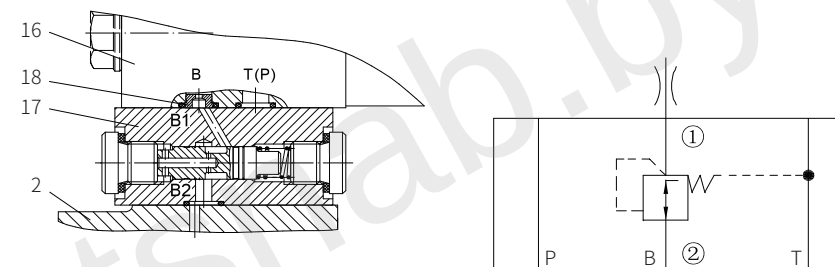


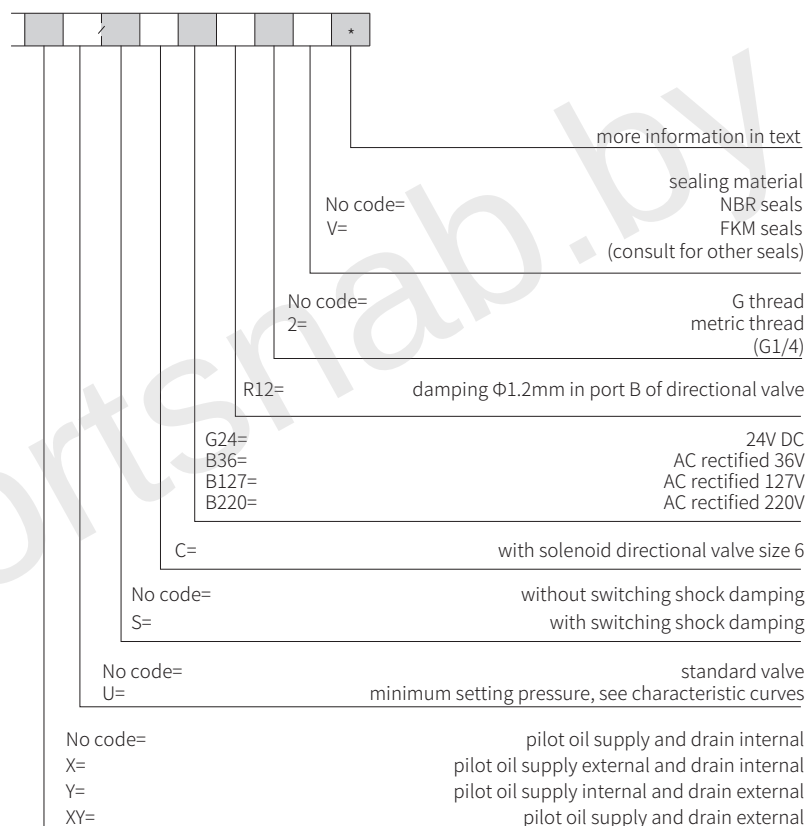
Illustration: directional valve opened

- The unloading function (directional valve function of DBW) cannot be used as safety function!
- When power off or cable breakage, Model DBW... B.. 5XJ/... should use the minimum setting pressure (circulation pressure).
- When power off or cable breakage, the pressure relief function of model DBW...A...5XJ/...is launched.
- The back pressure of pilot oil internal drain in port T or external drain in port Y is 1:1 added in pilot control pressure.

0545

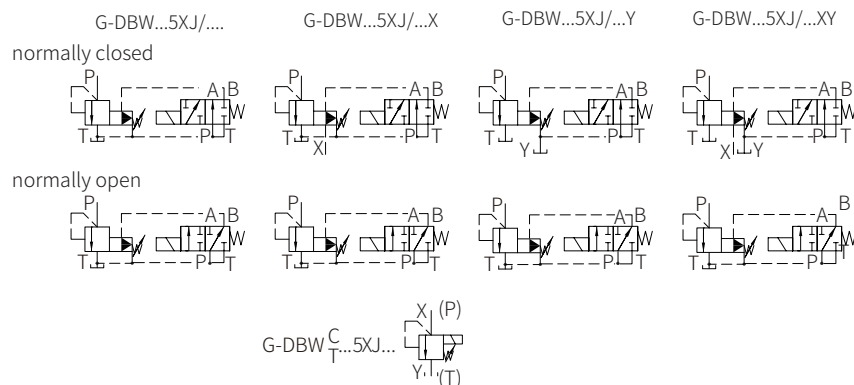
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Models and specifications



Note:
G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Functional symbols



Technical parameters

Installation position			Optional				
			G-DBW...10	G-DBW...15	G-DBW...20	G-DBW...25	G-DBW...30
Weight	Subplate mounting G-DBW	kg	About 5.6	-	About 6.5	-	About 7.9
	Threaded connection G-DBW...G..	kg	About 7.9	About 7.8	About 7.7	About 8.5	About 8.4
	Switching shock damping	kg	About 0.6				
Technical parameters of directional valve			Directional valve is explosion- proof solenoid directional valve. G-3WE6A for normally closed type; G-3WE6B for normally open type				
Hydraulic							
Maximum working pressure	port P, X	MPa	35.0				
	port T	MPa	21				
Maximum setting pressure		MPa	5.0; 10.0; 20.0; 31.5; 35.0				
Minimum setting pressure		MPa	Interrelated with flow (see the curve)				
Maximum flow	Subplate mounting	L/min	250	-	500	-	650
	Threaded connection	L/min	250	500	500	500	650
Oil 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 (FRM seal)				
Viscosity range		mm²/s	10 to 800				
Cleanliness of oil ³⁾			The maximum allowable pollution level of oil is ISO4406 Class 20/18/15				

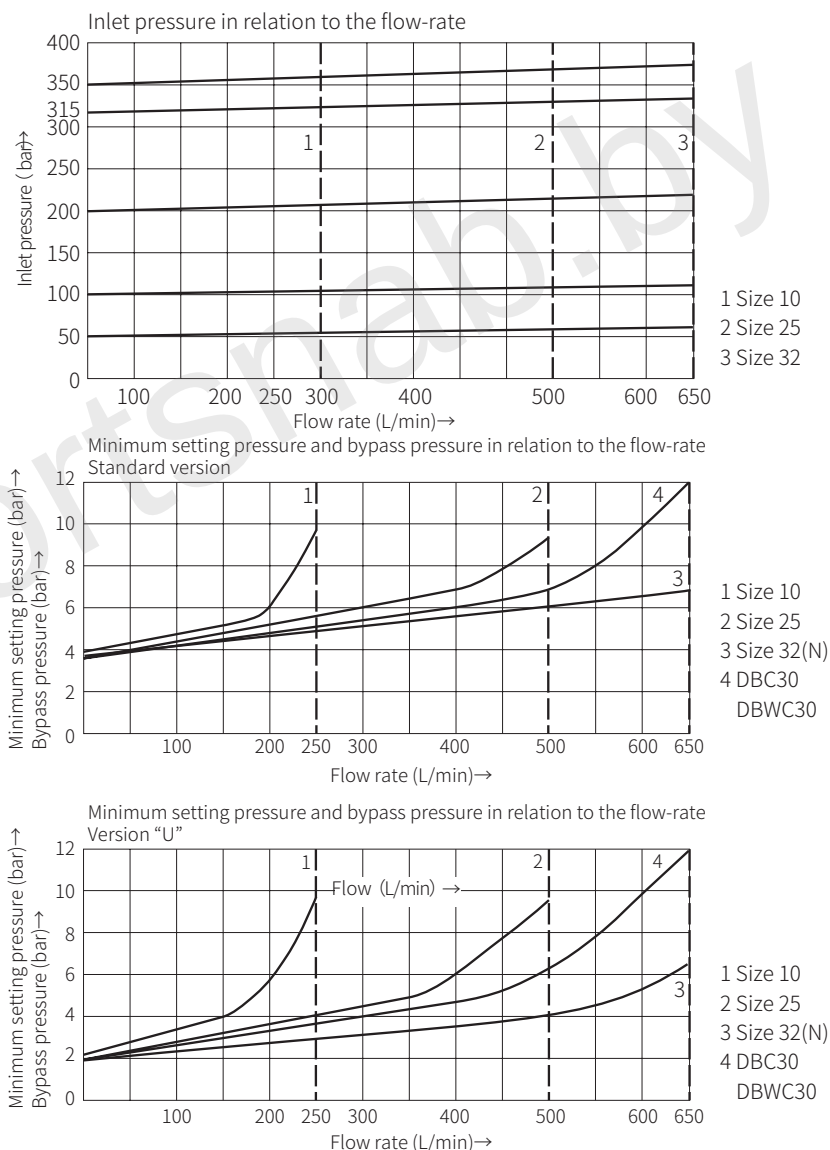
1) For NBR seal and FKM seal.

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.

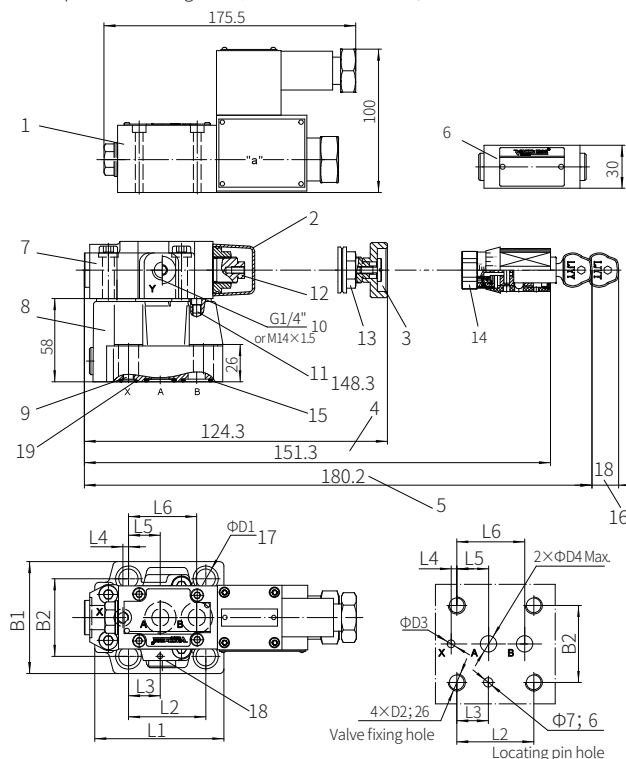
Characteristic curve

(Measured when using HLP46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

Component size

Size unit: mm

Subplate mounting valve, model G-DBW...-5XJ/...



Valve fixing screw
NG10:
M12x50-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=95\text{Nm}$
NG25:
M16x50-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=196\text{Nm}$
NG32:
M18x50-10.9 grade
GB/T70.1-2000
Tightening torque $M_A=260\text{Nm}$

Size	L1	L2	L3	L4	L5	L6	B1	B2	D1	D2	D3	D4
10	90	53.8	22.1	0	22.1	47.5	78	53.8	14	M12	6	12
20	117	66.7	33.4	23.8	11.1	55.6	100	70	18	M16	6	22
30	149.3	88.9	44.5	31.8	12.7	76.2	115	82.6	20	M18	7	30

- 1 Solenoid valve
- 2 Adjustment form "2"
- 3 Adjustment form "1"
- 4 Adjustment form "3"
- 5 Adjustment form "7"
- 6 With switching shock damping valve, optional
- 7 Pilot valve
- 8 Main valve
- 9 Port X for external pilot oil supply
- 10 Port Y for external pilot oil drain (G1/4" and M14x1.5 optional)
- 11 Omitted with internal pilot oil drain
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 O-ring 17.12x2.62 (for port A, B)
- 16 Space required to remove the key
- 17 Valve screw fixing holes
- 18 Locating pin hole
- 19 O-ring 9.25x1.78 (for port X)

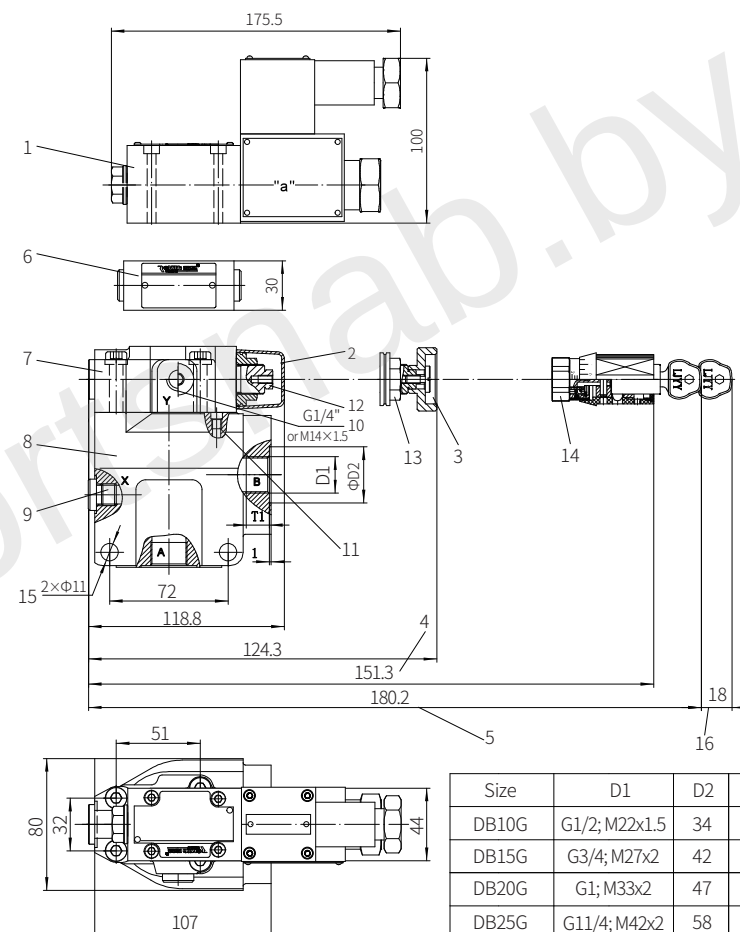
It must be ordered separately if connection subplate is needed.
NG10 subplate model:
G545/01 (G3/8"); G545/02 (M18x1.5)
G546/01 (G1/2"); G546/02 (M22x1.5)
NG25 subplate model:
G408/01 (G3/4"); G408/02 (M27x2)
G409/01 (G1"); G409/02 (M33x2)
NG32 subplate model:
G410/01 (G1 1/4"); G410/02 (M42x2)
G411/01 (G1 1/2"); G411/02 (M48x2)

0550

Component size

Size unit: mm

Threaded connection valve, model G-DBW...-5XJ/...



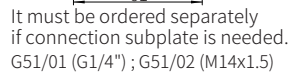
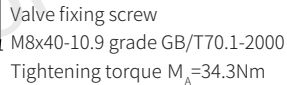
- 1 Solenoid valve
- 2 Adjustment form "2"
- 3 Adjustment form "1"
- 4 Adjustment form "3"
- 5 Adjustment form "7"
- 6 With switching shock damping valve, optional
- 7 Pilot valve
- 8 Main valve
- 9 Port X for external pilot oil supply
- 10 Port Y for external pilot oil drain (G1/4" and M14x1.5 optional)
- 11 Omitted with internal pilot oil drain
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 Valve screw fixing holes
- 16 Space required to remove the key

Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G1 1/4; M42x2	58	20
DB30G	G1 1/2; M48x2	65	22

- 11 Omitted with internal pilot oil drain
- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 Valve screw fixing holes
- 16 Space required to remove the key

0551

02



- 12 External hexagon screw S=10
- 13 Hexagon nut S=24
- 14 External hexagon screw S=24
- 15 Throttle must be ordered separately
- 16 Space required to remove the key
- 17 O ring 27.3x2.4
- 18 Retainer ring 32x28.4x0.8
- 19 The Ø32 hole can intersect Ø45 hole at any position.
Be careful not to damage oil port X and fixing holes.
- 20 The retainer ring and O-ring should be installed in
this hole before install main spool.

Explosion-proof Solenoid Operated Poppet Valve

Model: G-M-SEW6...3X



- ◆ Size 6
- ◆ Maximum working pressure 420/630 bar
- ◆ Maximum working flow 25 L/min

Contents

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Characteristic limit	07
Component size	08-09
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Features

- Steel ball directional valve operated by explosion-proof solenoid
- Switching smoothly even in high-pressure state long periods
- Closed port without leakage

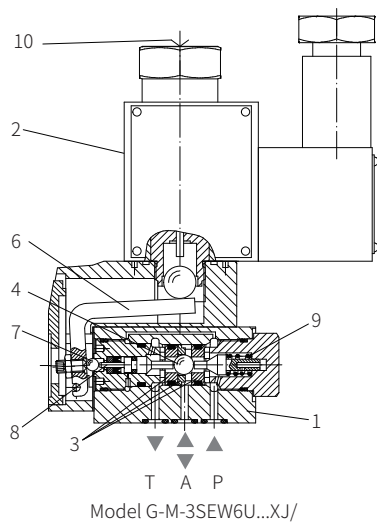
Function description, sectional drawing

2/2-way, 3/-way poppet directional valve
The G-M-SEW directional valve is explosion-proof solenoid operated poppet valve. It is used to control the opening, closing and direction of oil.

The valve is mainly composed of valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element. Basic function:

In the initial position, the spool (4) is pushed against the valve seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing elements is connected to the port P. Therefore, the valve system (3) is pressure compensated based on the actuating force (solenoid or spring). In this way, the valve can be used up to 630bar.

Note:
The 3/2-way poppet directional valve has negative cover function. Therefore, port T must be always connected. That means the ports P-A-T are connected with each other during the switching process (from the starting of the opening of one valve seat to the closing of the other valve seat). But this process is completed in a very short time, so it is irrelevant in almost all applications. It must ensure that the maximum flow does not exceed the performance limit of the valve. If necessary, the cartridge throttle can be installed to limit the flow.



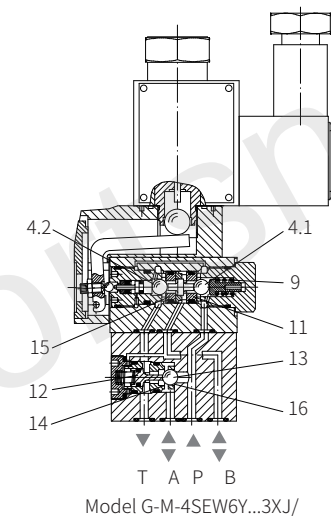
2/2-way directional seat valve		3/2-way directional seat valve	
Symbol "P"		Symbol "U"	
Initial position	P and T connected	Initial position	P and A connected, T blocked
Switching position	P blocked	Switching position	P blocked, A and T connected
Symbol "N"		Symbol "C"	
Initial position	P blocked	Initial position	P blocked, A and T connected
Switching position	P and T connected	Switching position	P and A connected, T blocked

Function description, sectional drawing

4/2-way solenoid directional seat valve G-M-4SEW6

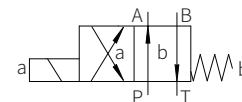
Initial position: When the solenoid is not energized, the force of the spring (6) holds the ball spool (12) on the left valve seat (8). The port P is connected to A. The pump pressure oil acts on the large area of the control piston (15) through the control line from port A. The steel ball (13) is pushed to the other side of the valve seat (14), so P is connected to A and B to T.

Switching position: After the solenoid is powered on, the oil port A and T are connected. In addition, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat (14). At this time, the oil port P is connected to B.

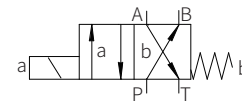


The seat valve with plus-1 plate as below:

Symbol "D"



Symbol "Y"



Cartridge throttle	Cartridge check valve
Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required. Example: -Accumulator operation -Used as a pilot valve with internal pilot oil supply	The cartridge check valve allows free flow from P to A and leak-free closure from A to P.
3/2-way poppet valve The throttle is inserted into the port P of the directional valve.	3/2-way poppet valve The cartridge check valve is inserted into the oil port P of the directional valve.
4/2-way poppet valve The throttle is inserted into the oil port P of the plus-1 plate.	4/2-way poppet valve The cartridge check valve is inserted into port P of the plus-1 plate.

	M	SEW	6	3X	M	*
explosion -proof class I =G1 explosion -proof class II=G2						more information in text
working oil port 2 working oil port 3 working oil port 4	=2 =3 =4					sealing material No code= NBR seals V= FKM seals (consult for other seals)
poppet valve						No code= without cartridge check valve and cartridge throttle P= with cartridge check valve B12= throttle Ø1.2mm B15= throttle Ø1.5mm B18= throttle Ø1.8mm B20= throttle Ø2.0mm B22= throttle Ø2.2mm
size 6	=6					N9= with hidden emergency operation
working port	2 3 4					G24= 24 V DC
	● - -	=P				
	● - -	=N				
	- ● -	=U				
	- ● -	=C				
	- - ●	=D				
	- - ●	=Y				
	●=available					
30 to 39 series (30 to 39 series installation and connection size unchanged)	=3X					
working pressure to 420 bar (fixing screw M5) Working pressure to 630 bar (fixing screw M6)	=420 =630					
solenoid with detachable coil (air-gap)	=M					

Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Overview			
Environment temperature range		°C	-30 to +50 (NBR seal) -20 to +50 (FKM seal)
Weight	2/2-way valve	kg	2.7
	3/2-way valve	kg	2.7
	4/2-way valve	kg	3.5
Hydraulic			
Maximum working pressure		bar	See characteristic limit
Maximum flow		L/min	25
Hydraulic oil		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
Cleanliness of oil		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15	
Electrical			
Voltage type		DC	
Available voltage		V	24
Allowable voltage tolerance (nominal voltage) %		± 10	
Power consumption		W	3
Continuous power on time		%	100
Switching time according to ISO 6403		See table below	
Switching frequency		times/hour	15000
Maximum coil temperature		°C	150

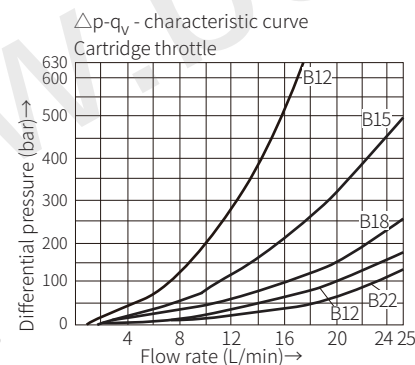
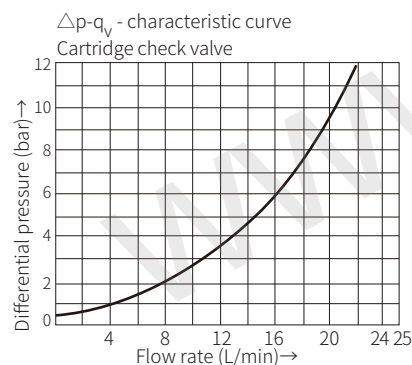
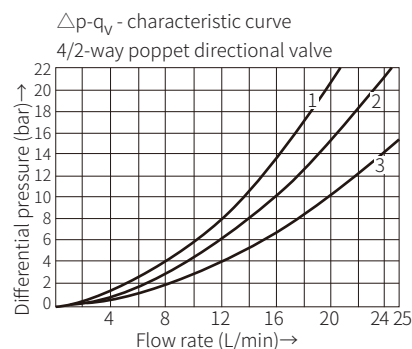
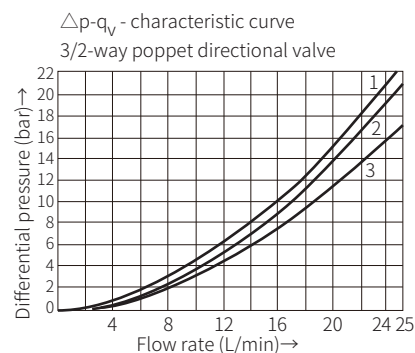
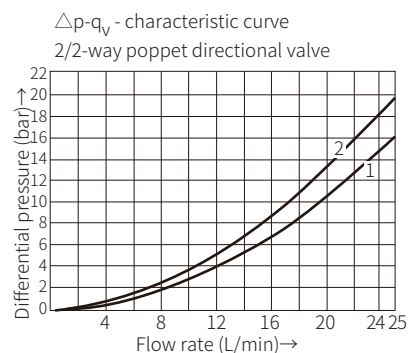
The oil must meet the cleanliness degree requested by the components in the hydraulic system.
Effective oil filtration can prevent failure and increase the service life of the components.

Switching time tms (installation position:
solenoid installed horizontally)

Pressure P bar	Flow q _v L/min	DC Solenoid					
		Functional symbols U, C, D, Y					
		t _{on} No tank pressure			t _{off}		
		U	C	D	Y	U/C	D/Y
140	25	25	30	25	30	10	10
280	25	25	30	25	30	10	10
320	25	25	35	25	35	10	10
420	25	25	35	25	35	10	10
500	25	25	40	25	40	10	10
600	25	25	40	25	40	10	10

Electrical protective conductor (PE ⚡)
must be connected properly as rules

(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

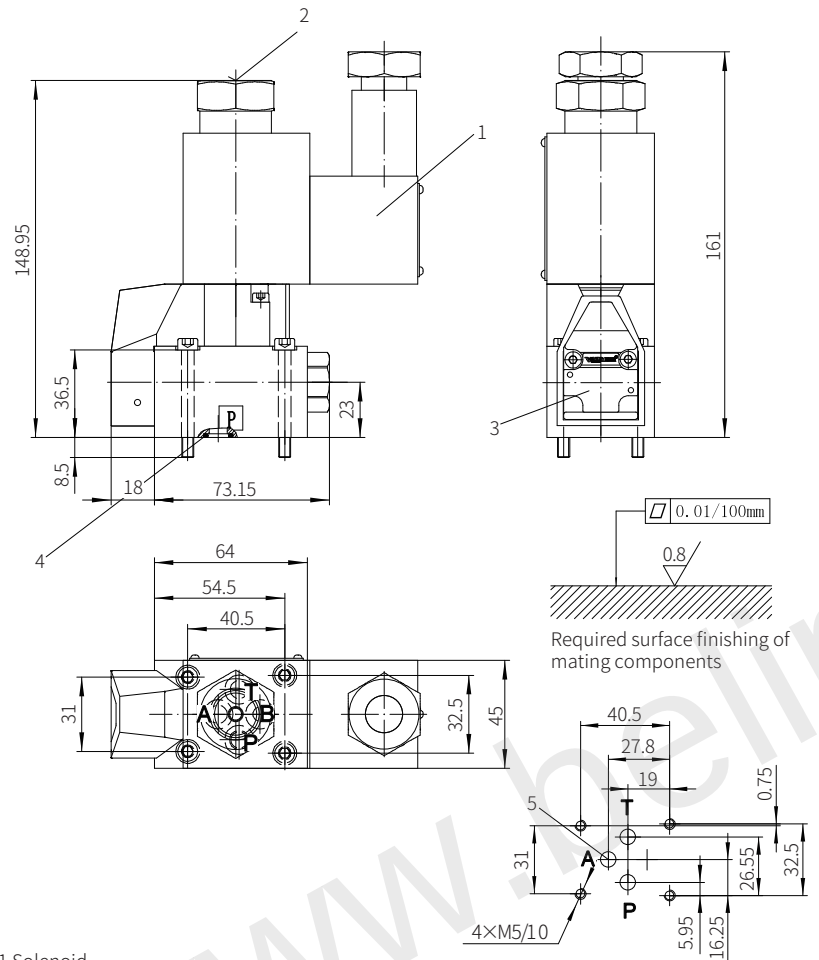


	Functional symbol	comment	Working pressure bar				Flow L/min
			P	A	B	T	
Two-way circuit	"P" 	Oil port pressure $P \geq T$	420/630			100	25
	"N" 		420/630			100	25
Three-way circuit	"U" 	Oil port pressure $P \geq A \geq T$	420/630	420/630		100	25
	"C" 		420/630	420/630		100	25
Two way circuit (Only for unloading function)	"U" 	Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure $A \geq T$		420/630		100	25
	"C" 	Oil port pressure $A \geq T$		420/630		100	25
Four-way circuit (flow only in the direction of arrow)	"D" 	Single poppet valve (symbol "U") with plus-1 plate $P \geq A \geq B \geq T$	420/630	420/630	420/630	100	25
	"Y" 	Double poppet valve (symbol "C") with plus-1 plate $P \geq A \geq B \geq T$	420/630	420/630	420/630	100	25

Note:

- In order to operate the valve safely or keep it in the switching position, the oil port pressure $P \geq A \geq T$ (based on the structure).
 - The ports P, A and T (3/2-way valve), and ports P, A, B and T (4/2-way valve) are configured according to their functions and must not be blocked or used in other ways. Liquid flow is only allowed in the direction of the arrow.
 - When using the plus-1 plate (4/2-way valve), the following data must be met: $P_{min}=8\text{bar}$; $Q>3\text{ L/min}$
 - The specified maximum flow should not be exceeded.
- The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

2/2 and 3/2-way poppet directional valve

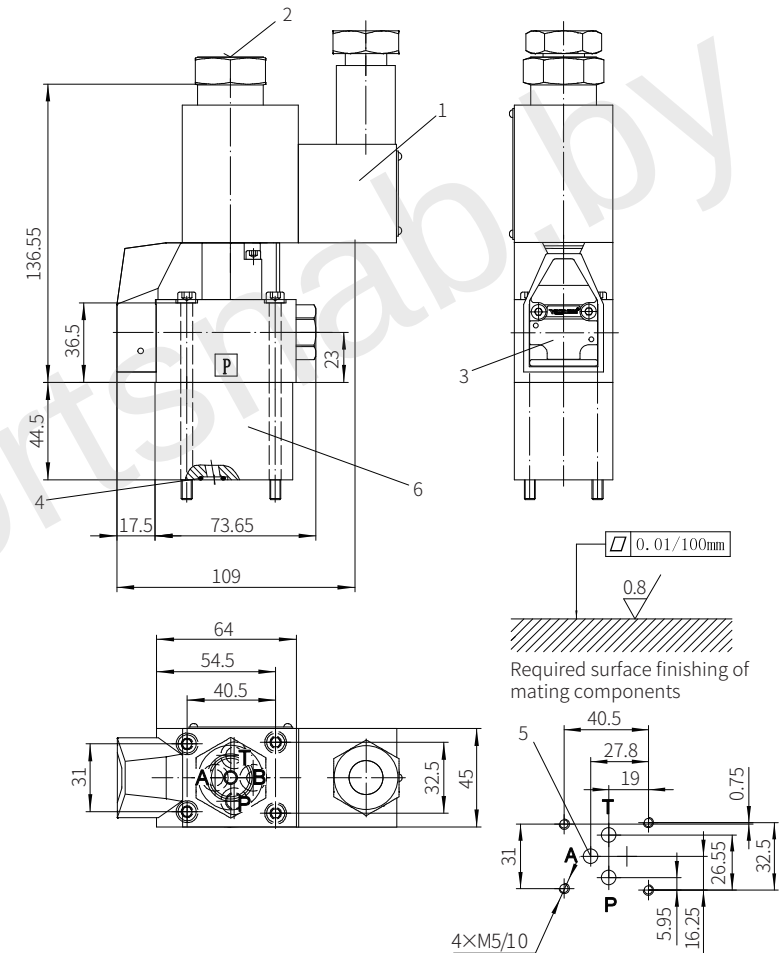


- 1 Solenoid
2 Hidden emergency button
3 Name plate
4 O-ring 10x2(for oil port P)
O-ring 9.25x1.78(for oil ports B, A, T) 420bar type
O-ring 9.25x1.78(for oil ports P, B, A, T) 630bar type
5 Port A and B are blind holes for 2/2-way valve
Port B is a blind hole for 3/2-way valve

Valve fixing screw
Version 420 bar
M5x45-10.9 grade GB/T70.1-2000
Tightening torque $M_A=7.8\text{Nm}$
Version 630 bar
M6x45-10.9 grade GB/T70.1-2000
Tightening torque $M_A=13.7\text{Nm}$

0298

4/2-way poppet directional valve



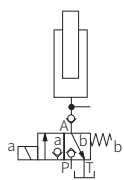
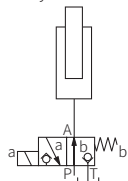
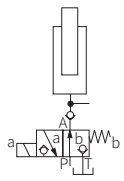
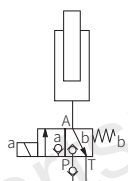
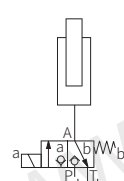
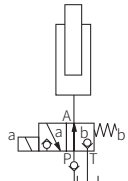
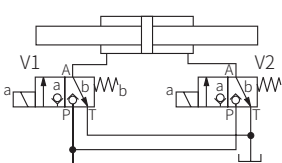
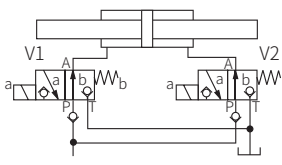
- 1 Solenoid
2 Hidden emergency button
3 Name plate
4 O-ring 10x2(for oil port P)
O-ring 9.25x1.78(for oil ports B, A, T)
5 Port A and B are blind holes for 2/2-way valve
Port B is a blind hole for 3/2-way valve
6 Plus-1 plate

Valve fixing screw
Version 420 bar
M5x90-10.9 grade GB/T70.1-2000
Tightening torque $M_A=7.8\text{Nm}$
Version 630 bar
M6x90-10.9 grade GB/T70.1-2000
Tightening torque $M_A=13.7\text{Nm}$

0299

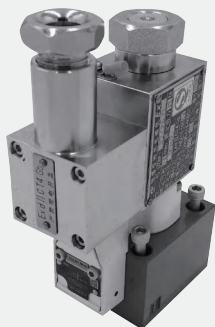
Application examples

These examples only indicate some applications of the poppet valve but not include all functions.

Symbol C 	2/2-way circuit with two poppet valves and check valve at port A The check valve must be installed on the pipeline. Initial position: the flow is blocked and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The fluid flows freely and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol U 	3/2-way circuit with a single poppet valve Initial position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P. Switching position: Descending
Symbol U 	2/2-way circuit with a single poppet valve and check valve at port A The check valve must be installed on the pipeline. Initial position: The fluid flows freely and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The flow blocked and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol C 	3/2-way circuit with two poppet valves and cartridge check valve at port A The check valve is installed at port P of the 3/2-way directional poppet valve. Initial position: Descending Switch position: Lifting The load can be held in any position when the pump is turned off and the solenoid is energized.
Symbol C 	3/2-way circuit with two poppet valves Initial position: Descending Switch position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P.	Symbol U 	3/2-way circuit with a single poppet valve and cartridge check valve at port P The check valve is installed at port P of the 3/2-way popper valve. Initial position: Lifting The load can be held in any position when the pump is turned off. Switching position: Descending
Symbol C 	4/3-way (4/4-way) circuit with two poppet valves V1 and V2 in the initial position: both ends of the cylinder are connected to the oil tank port. V2 in the switching position: the piston moves to the left. V1 in the switching position: the piston moves to the right. V1 and V2 in the switching position: both ends of the cylinder are connected to the pump port. The fast movement is possible when a single rod cylinder with an area ratio of 2:1 is used. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!		
Symbol U 	4/3-way (4/4-way) circuit with two poppet valves and cartridge check valve at port P of the 3/2-way poppet valve V1 and V2 in the initial position: the piston is locked externally to prevent oil flow. V2 in the switching position: the piston moves to the right. V1 in the switching position: the piston moves to the left. V1 and V2 in the switching position: both ends of the cylinder are connected to the tank port. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum allowable working pressure (overpressure) must be taken into account!		

Explosion-proof Solenoid Operated Poppet Valve

Model: G-M-SEW10...1X



- ◆ Size 10
- ◆ Maximum working pressure 420/630 bar
- ◆ Maximum working flow 40 L/min

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Features

- Closed port without leakage
- Switching flexibility even in high-pressure state long periods
- Air-gap DC solenoid with detachable coil
- Solenoid coil can be rotated 90°

Function description, sectional drawing

3/2-way directional seat valve

General:

The G-M-SEW directional valve is explosion-proof solenoid operated poppet valve. It is used to control the opening, closing and direction of liquid flow.

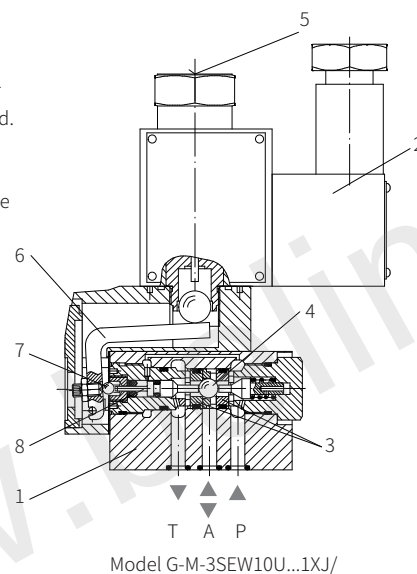
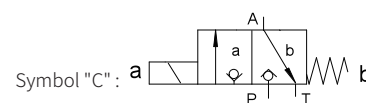
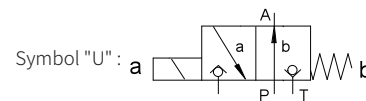
The valve mainly includes valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element.

Basic function:

In the initial position, the spool (4) is pushed to the seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod (8) which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing elements is connected to the port P. Therefore, the valve system (3) is pressure compensated based on the actuating force (solenoid or spring). In this way, the valve can be used up to 630bar.

Note:

The 3/2-way poppet directional valve has negative cover function. Therefore, the port T must be always connected. That means the ports P-A-T are connected with each other during the switching process (from the starting of the opening of one valve seat to the closing of other valve seat). But this process is completed in a very short time, so it is irrelevant in almost all applications. It must ensure that the maximum flow does not exceed the performance limit of the valve. If necessary, the cartridge throttle can be installed to limit flow.

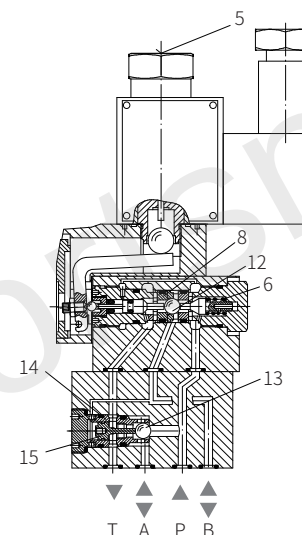


Function description, sectional drawing

4/2-way poppet directional valve

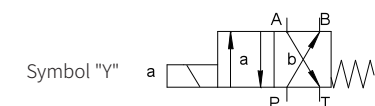
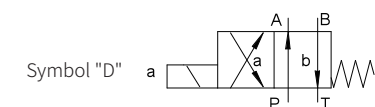
Initial position: When the solenoid is not energized, the force of the spring (6) holds the ball spool (12) on the left valve seat (8). The port P is connected with A. The pump pressure oil acts on the large area of the control piston (15) through the control line from port A. The steel ball (13) is pushed to the other side of the valve seat (14), so the oil port P is connected to A and B to T.

Switching position: After the solenoid is powered on, the oil port A and T are connected. In addition, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat (14). At this time, the oil port P is connected to B.



Model G-M-4SEW10D...1XJ/

The seat valve with plus-1 plate as below:



Cartridge throttle

Due to the working conditions limitations, it may occur that the flow exceeds the performance limit of the valve during the switching process, then the use of a throttle is required.

Example:

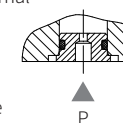
- Accumulator operation
- Used as a pilot valve with internal pilot oil supply

3/2-way poppet valve

The throttle is inserted into the port P of the directional valve.

4/2-way poppet valve

The throttle is inserted into the oil port P of the plus-1 plate.



Cartridge check valve

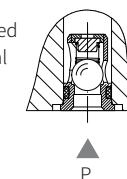
The cartridge check valve allows free flow from P to A and leak-free closure from A to P.

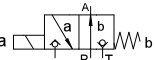
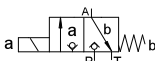
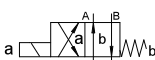
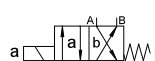
3/2-way poppet valve

The cartridge check valve is inserted into the oil port P of the directional valve.

4/2-way poppet valve

The cartridge check valve is inserted into port P of the plus-1 plate.



	M	SEW	10	-1X	/	M	/	/	/	*
explosion -proof class I =G1 explosion -proof class II=G2										more information in text
working oil port 3 working oil port 4	=3 =4									sealing material No code= NBR seals V= FKM seals (consult for other seals)
poppet valve										No code= without cartridge check valve and cartridge throttle
size 10	=10									P= with cartridge check valve B12= throttle Ø1.2mm B15= throttle Ø1.5mm B18= throttle Ø1.8mm B20= throttle Ø2.0mm B22= throttle Ø2.2mm
working port Functional symbols	3 4									N9= with hidden emergency operation G24= 24 V DC
	• -	= U								
	• -	= C								
	- •	= D								
	- •	= Y								
	•= available									
10 to 19 series (10 to 19 series installation and connection size unchanged)	=1X									
working pressure to 420 bar (fixing screw M5) Working pressure to 630 bar (fixing screw M6)	=420 =630									
solenoid with detachable coil (air-gap)	=M									

Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

Overview		
Installation position		Optional
Environment temperature range		°C -30 to +50 (NBR seal)
		-20 to +50 (FKM seal)
Hydraulic		
Maximum working pressure		bar See characteristic curve
Maximum flow		L/min 40
Hydraulic oil		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		-30 to +80 (NBR seal) -20 to +80 (FKM seal)
Viscosity range		mm ² /s 2.8 to 500
Cleanliness of oil ⁴⁾		The maximum allowable pollution level of oil is ISO4406 Class 20/18/15
Electrical		
Voltage type		DC
Available voltage ³⁾		V 24
Allowable voltage tolerance (nominal voltage)		% ±10
Power consumption		W 30
Continuous power on time		% 100
Switching time according to ISO 6403		See table below
Switching frequency		times/hour 15000
Protection type to DIN 40 050		IP 65 with plug installed and fixed
Maximum coil temperature		°C 150

- 1) For NBR seal and FKM seal
- 2) Only for FKM seal
- 3) Please inquire for special voltages
- 4) 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.

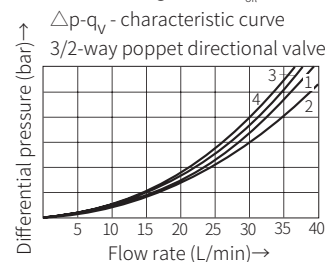
Electrical protective conductor (PE ⚡)
must be connected properly as rules

Switching time t_{ms}

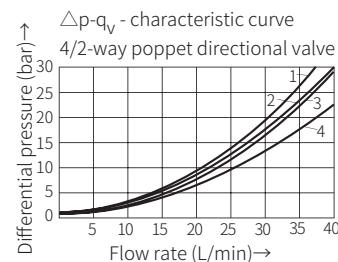
Pressure P bar	Flow q _v L/min	DC Solenoid Functional symbols U, C, D, Y					
		t _{on} No tank pressure				t _{off}	
		U	C	D	Y	U/C	D/Y
140	40	20	40	20	40	12	17
280	40	25	45	20	45	12	17
320	40	25	45	20	45	12	17
420	40	30	45	20	50	12	17
500	40	30	45	20	50	12	17
600	40	30	50	20	50	12	17

Characteristic curve

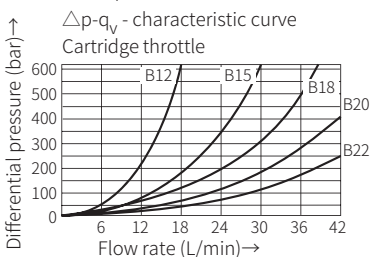
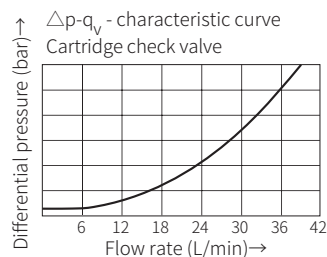
(Measured when using HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)



1 G-M-3SEW10 C..., P to A 3 G-M-3SEW10 U..., P to A
2 G-M-3SEW10 C..., A to T 4 G-M-3SEW10 U..., A to T



1 G-M-4SEW10 $\overset{D}{Y}$..., A to T 3 G-M-4SEW10 $\overset{D}{Y}$..., P to B
2 G-M-4SEW10 $\overset{D}{Y}$..., P to A 4 G-M-4SEW10 $\overset{D}{Y}$..., B to T



Characteristic limit

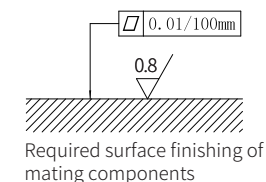
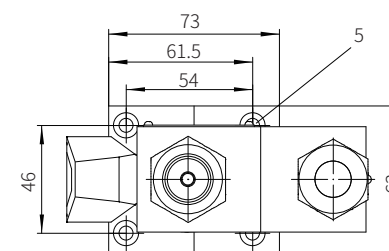
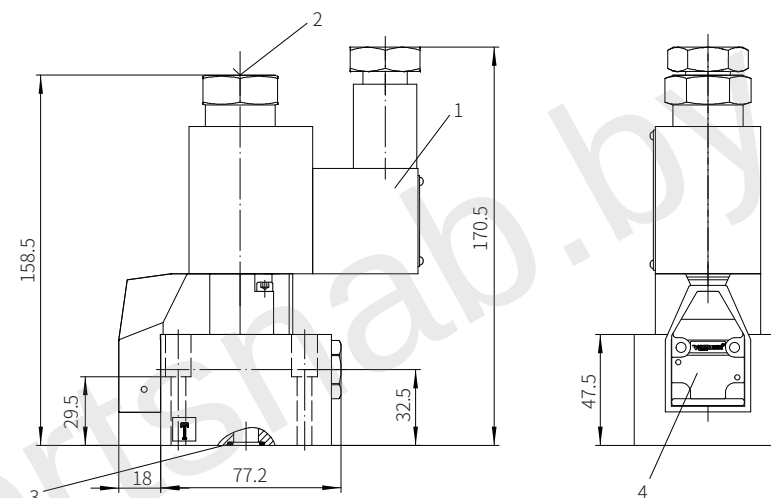
	Functional symbol	comment	Working pressure bar				Flow L/min
			P	A	B	T	
Three-way circuit		Oil port pressure $P \geq A \geq T$	420/630	420/630		100	40
			420/630	420/630		100	40
Two way circuit (Only for unloading function)		Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure $A \geq T$		420/630		100	40
		Oil port pressure $A \geq T$		420/630		100	40
Four-way circuit (flow only in the direction of arrows)		Single poppet valve (symbol "U") with the plus-1 plate $P \geq A \geq B \geq T$	420/630	420/630	420/630	100	40
		Double poppet valve (symbol "C") with the plus-1 plate $P \geq A \geq B \geq T$	420/630	420/630	420/630	100	40

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

Component size

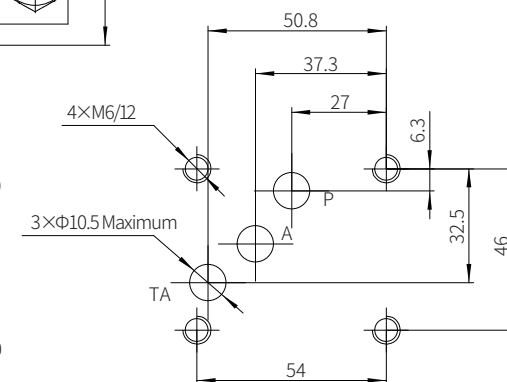
Size unit: mm

3/2-way poppet directional valve, 420bar

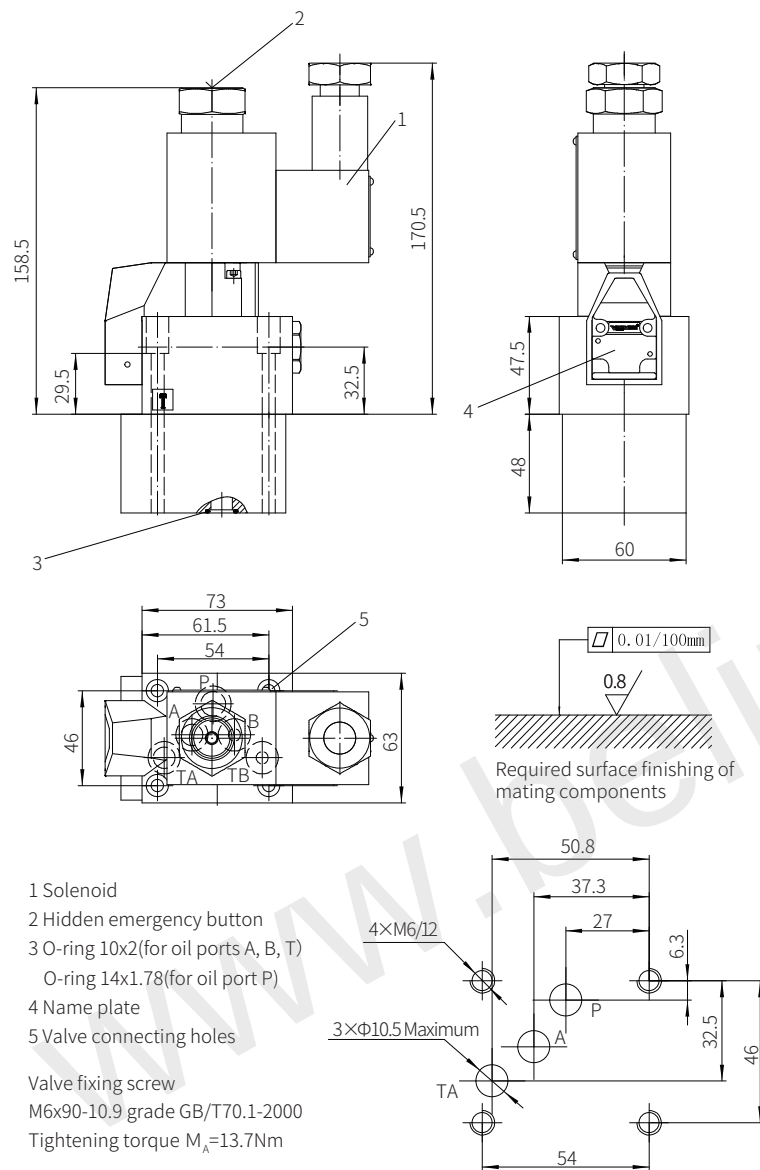


- 1 Solenoid
- 2 Hidden emergency button
- 3 O-ring 10x2 (for oil ports A, B, T)
O-ring 14x1.78 (for oil port P)
- 4 Name plate
- 5 Valve connecting holes

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque $M_A=13.7\text{Nm}$

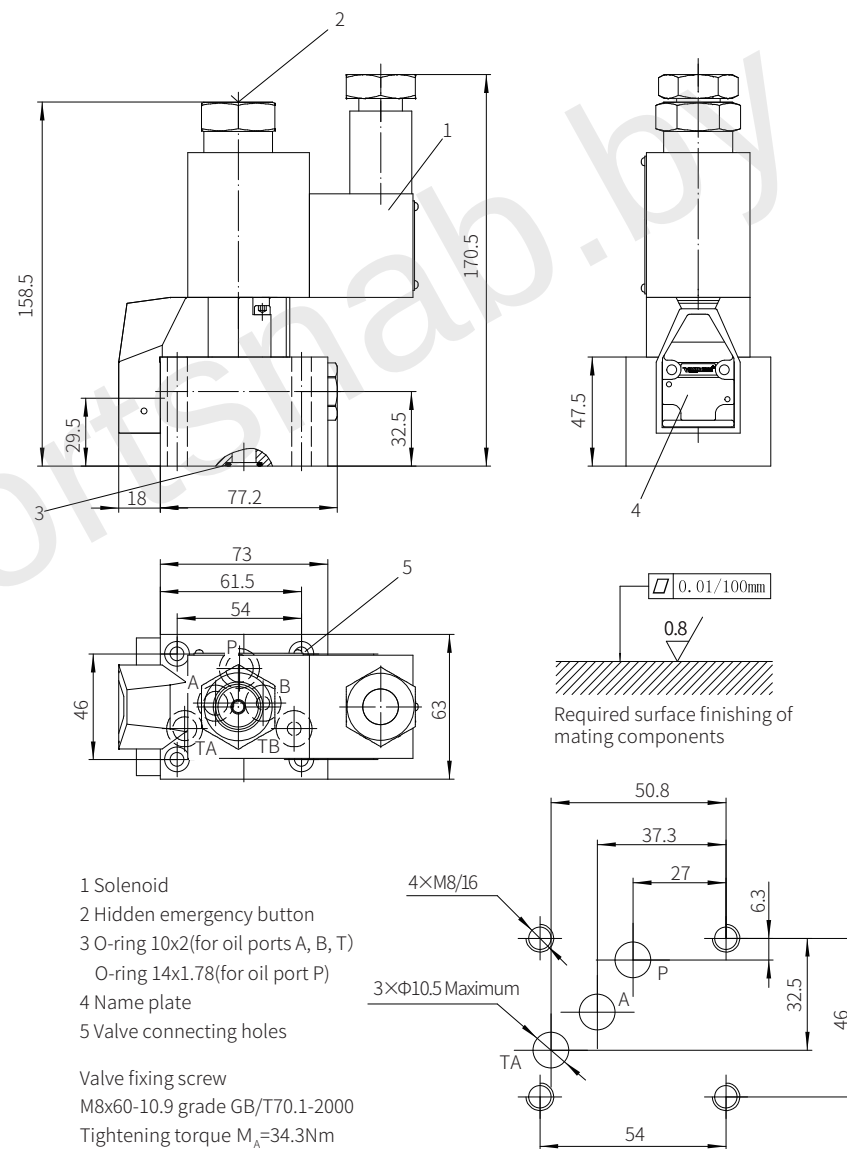


4/2-way poppet directional valve, 420bar



0308

3/2-way poppet directional valve, 630bar



0309

These examples only indicate some applications of the poppet valve but not include all functions.

Symbol C	2/2-way circuit with two poppet valves and check valve at port A The check valve must be installed on the pipeline. Initial position: the flow is blocked and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The fluid flows freely and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol U	3/2-way circuit with a single poppet valve Initial position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P. Switching position: Descending
Symbol U	2/2-way circuit with a single poppet valve and check valve at port A The check valve must be installed on the pipeline. Initial position: The fluid flows freely and the maximum pressure is allowed. Due to the check valve at port A, the pressure is held in the actuator even when the pump is turned off. Switching position: The flow blocked and the maximum pressure is allowed. The oil is drained via port T. The only oil leakage occurring is that the oil flows to port T during the switching process.	Symbol C	3/2-way circuit with two poppet valves and cartridge check valve at port A The check valve is installed at port P of the 3/2-way directional poppet valve. Initial position: Descending Switch position: Lifting The load can be held in any position when the pump is turned off and the solenoid is energized.
Symbol C	3/2-way circuit with two poppet valves Initial position: Descending Switch position: Lifting The maintenance of position only depends on the stroke limit and the pressure at port P.	Symbol U	3/2-way circuit with a single poppet valve and cartridge check valve at port P The check valve is installed at port P of the 3/2-way popper valve. Initial position: Lifting The load can be held in any position when the pump is turned off. Switching position: Descending
Symbol C	4/3-way (4/4-way) circuit with two poppet valves V1 and V2 in the initial position: both ends of the cylinder are connected to the oil tank port. V2 in the switching position: the piston moves to the left. V1 in the switching position: the piston moves to the right. V1 and V2 in the switching position: both ends of the cylinder are connected to the pump port. The fast movement is possible when a single rod cylinder with an area ratio of 2:1 is used. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum permissible working pressure (overpressure) must be taken into account!		
Symbol U	4/3-way (4/4-way) circuit with two poppet valves and cartridge check valve at port P of the 3/2-way poppet valve V1 and V2 in the initial position: the piston is locked externally to prevent oil flow. V2 in the switching position: the piston moves to the right. V1 in the switching position: the piston moves to the left. V1 and V2 in the switching position: both ends of the cylinder are connected to the tank port. Attention! When using single rod cylinders, the performance limit (double flow) of the valve and the maximum allowable working pressure (overpressure) must be taken into account!		