Explosion-proof Solenoid Directional Valve

Model: GD-WE6...6X

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

Contents

Features

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

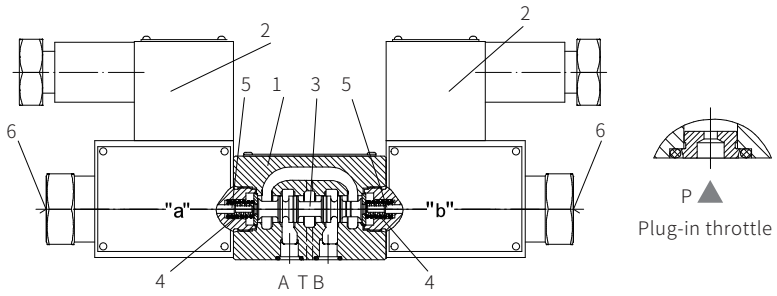
Function description, sectional drawing

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).



Model GD-4WE6E...6XJ/

Plug-in throttle

Models and specifications

GD | WE | 6 | 6X | / | | / | *

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

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

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

voltage
G24 =24V DC
B36 =36V AC with rectifier
B127 =127V AC with rectifier
B220 =220V AC with rectifier

more information in text

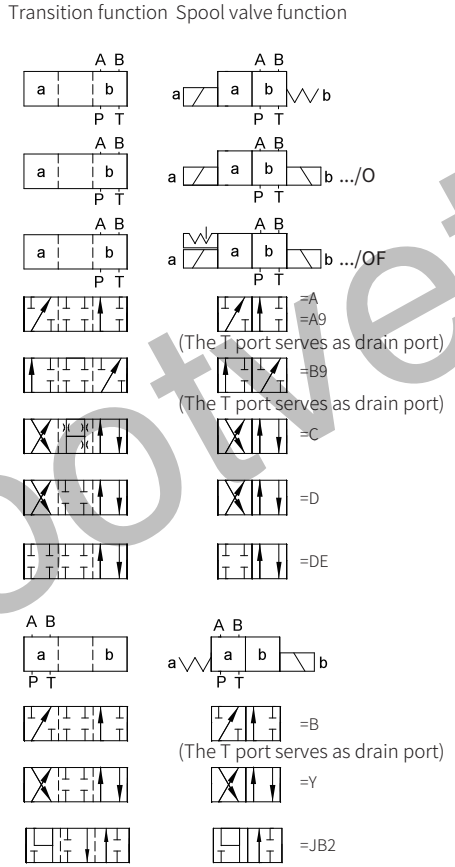
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

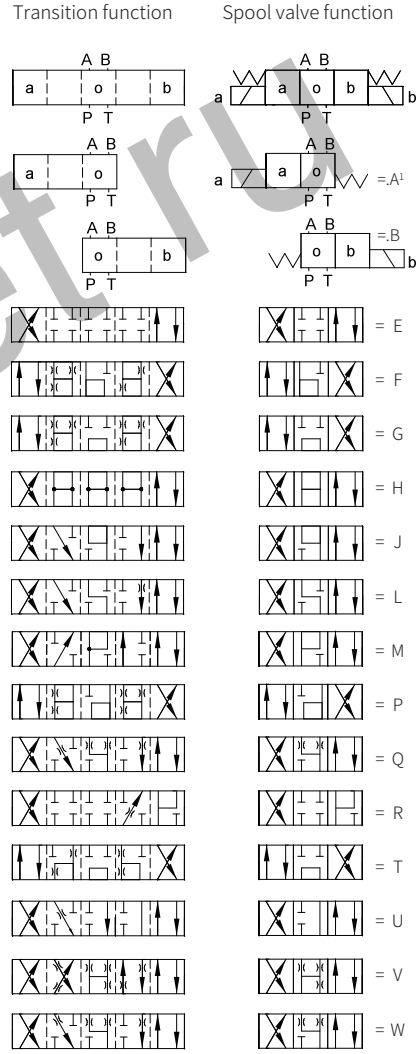
No code= no plug-in throttle port
plug-in throttle port (see table)

Oil port	throttle port ∅(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 CT4

Functional symbols





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 IS04406 level 20/18/15

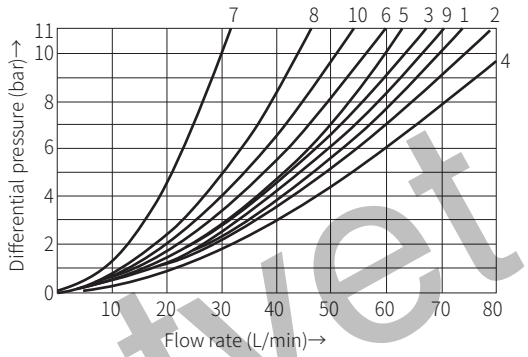
1) For NBR seal and FKM seal.
2) Only for FKM seal.
3) The oil must meet the cleanliness degree requested by the components in the hydraulic system. Effective oil filtration can prevent failure and increase the service life of the components.

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, ϑ_{oil}=40°C ± 5°C)



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

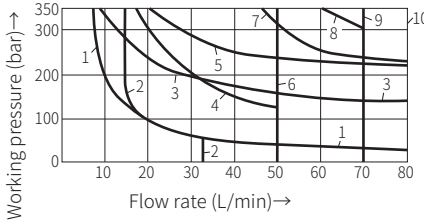
7 Symbol R in control position B-→A
8 Symbols G and T in center position
9 Symbols H and T in center position P→T

Characteristic limit

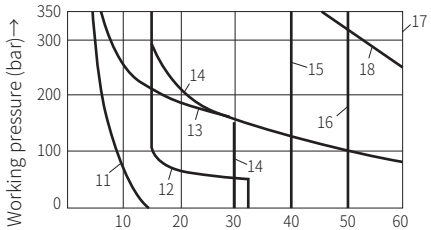
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Attention!
The given working limit is suitable for the use of flow in both directions (e. g. from P to A and return from B to T at the same time).
Due to the power of the fluid in the valve, the power limit allowed for only one flow direction might be significantly reduced (e.g. from P to A, while B is closed)!

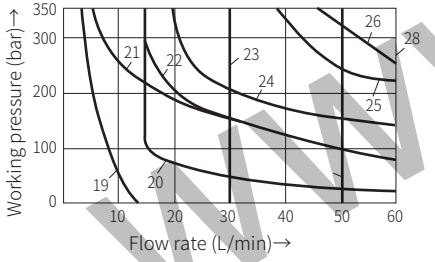
The power limit is measured when the solenoid is at the operating temperature, at 10% below the standard voltage and without tank preloading.



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



AC Solenoid-50 Hz	
Characteristic curve	Function symbol
11	A; B
12	V
13	A; B
14	F; P
15	G; T
16	H
17	A/O; A/OF; C/O; C/OF; D/O; D/OF; E; E1; J; L; M; Q; R; U; W
18	C; D; Y



AC Solenoid-60 Hz	
Characteristic curve	Function symbol
19	A; B
20	V
21	A; B
22	F; P
23	G; T
24	J; L; U
25	A/O; A/OF; Q; W
26	C; D; Y
27	H
28	C/O; C/OF; D/O; D/OF; E; E1; M; R

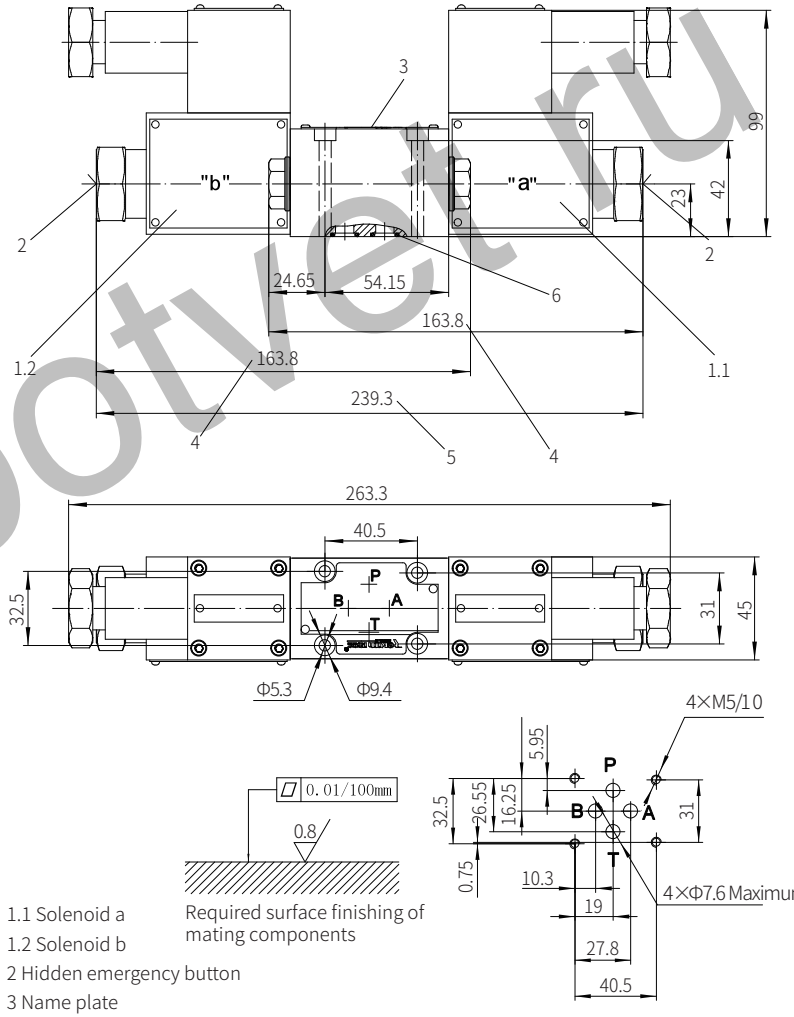
1) P-A/B Pre-opening

2) Back from the actuator to the oil tank

Component size

Size unit: mm

Model GD-4WE6...-6XJ/...



1.1 Solenoid a
1.2 Solenoid b
2 Hidden emergency button
3 Name plate
4 Size of 2-position valve
5 Size of 3-position valve
6 O-ring 9.25x178 (for oil port P, A, B, T)

Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=7.8Nm

Required surface finishing of mating components

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

Explosion-proof Solenoid Directional Valve

Model: GD-WE10...3X

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

Contents

Features

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

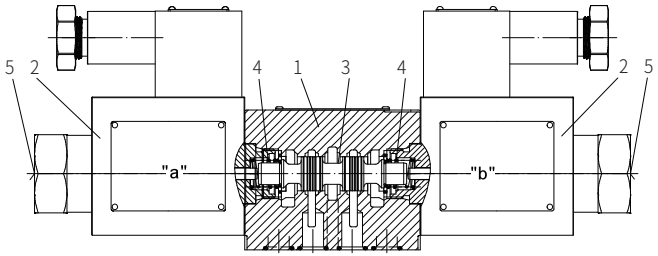
Function description, sectional drawing

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 | / | | / | | *

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 =3X
(30 to 39 series installation and connection size unchanged)

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

voltage
G24 =24V DC
B36 =36V AC with rectifier
B127 =127V AC with rectifier
B220 =220V AC with rectifier

more information in text

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

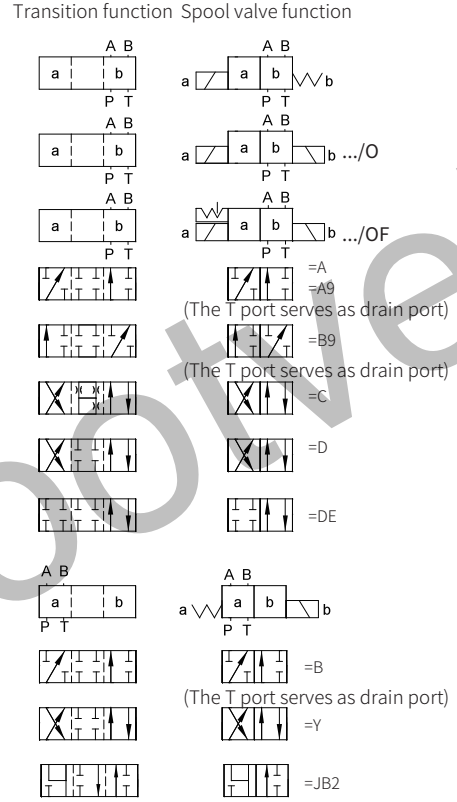
No code=no plug-in throttle port
plug-in throttle port (see table)

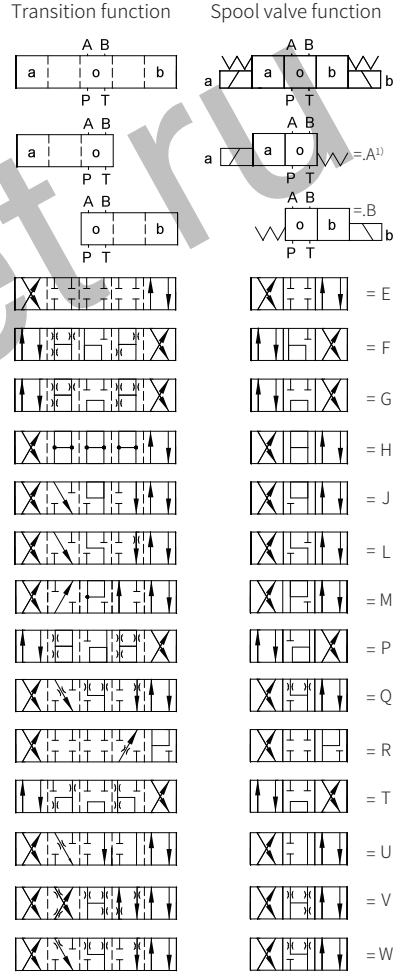
Oil port	Throttle port ∅ (mm)		
	0.8	1.0	1.2
P	=B08	=B10	=B12
A	=H08	=H10	=H12
B	=R08	=R10	=R12
A and B	=N08	=N10	=N12
T	=X08	=X10	=X12

N9= with hidden emergency button operation

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

Functional symbols





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, 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)	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		℃	-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 IS04406 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.

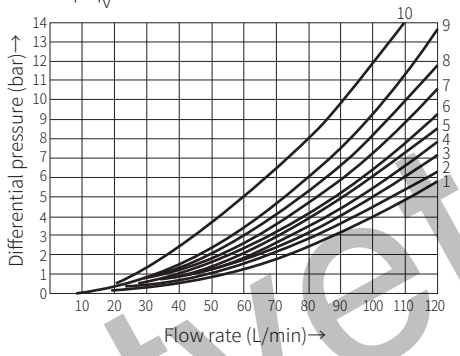
Electric				
Voltage type			DC	AC Rectifier
Available voltage[4]		v	24	36 127 220
Allowable voltage tolerance (voltage unit)		%	±10	±10
Power consumption		W	30	—
Holding power		VA	—	50
Impact power		VA	—	220
Power rate			100 %	100 %
Switching time to ISO6403	On	ms	25 to 45	10 to 20
	Off	ms	10 to 25	15 to 40
Maximum switching frequency		1/h	15000	7200

4) Other voltages are determined as required

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△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

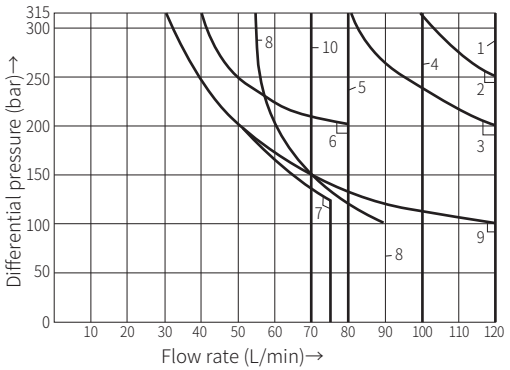
Characteristic limit

DC voltage (Measured when using HLP46, ϑ_{oil}=40°C ± 5°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.



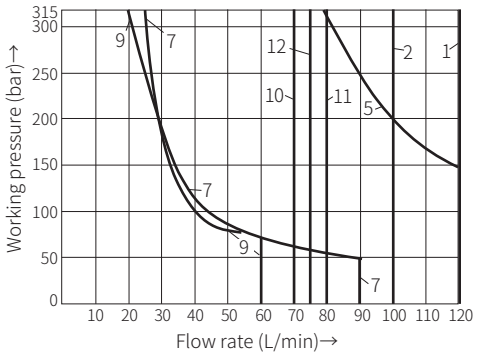
Characteristic curve	Functional symbols
1	C,C/O,C/OF D,D/O,D/OF Y,M
2	E
3	A/O,A/OF L,U,Q,W
4	H
5[1]	R,L[2] ,U[2]
6	G
7	T
8	F,P
9	A,B
10	V

1) Return oil flow (Independent from area ratio)

2) Applicable only in the middle position

Characteristic limit

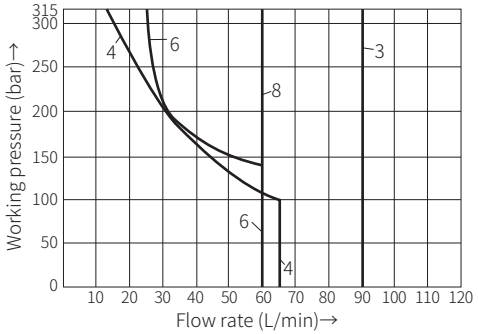
AC voltage (Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

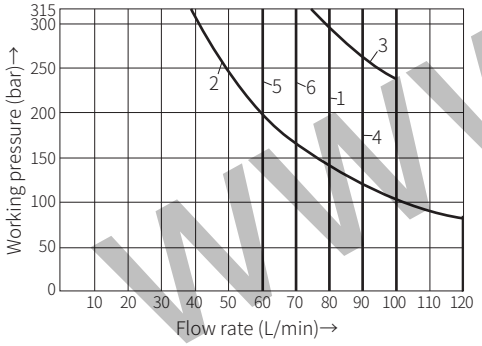


Characteristic curve	Function symbol
1	C, C/O, C/OF D, D/O, D/OF Y
2	E, L, U Q, W
3	M
4	A, B
5	A/O, A/OF, J
6	G
7	F, P
8	V
9	T
10	H
11	R
12[1)]	L, U

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!

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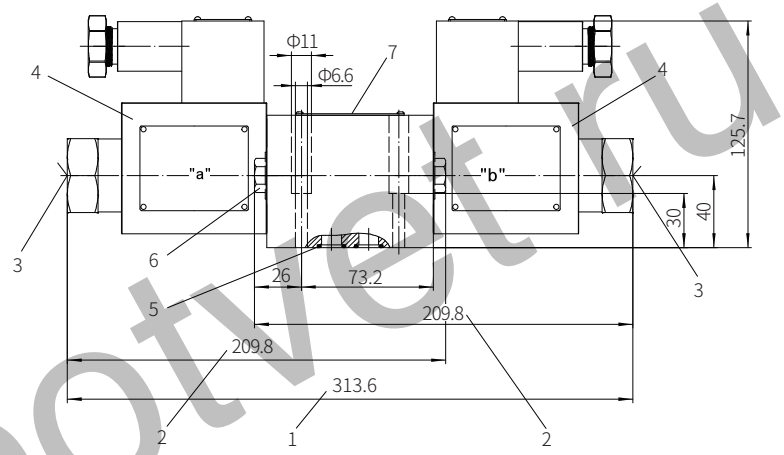
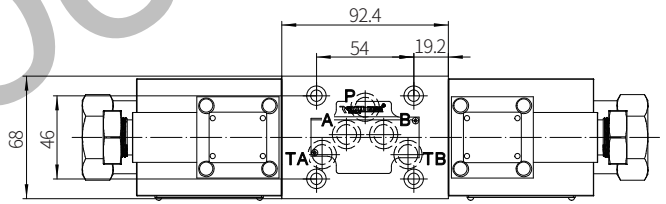
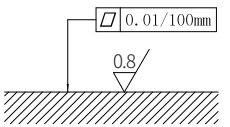
Component size

Size unit: mm

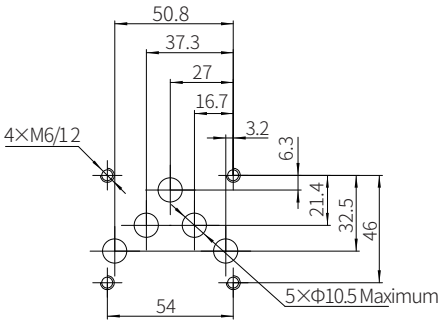
Model GD-4WE10...-3XJ/...







Required surface finishing of
mating components



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=13.7Nm

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)

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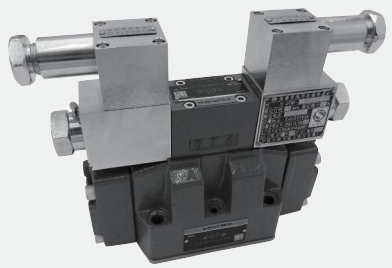
Explosion-proof Electro-hydraulic Directional Valve

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



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

Contents

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

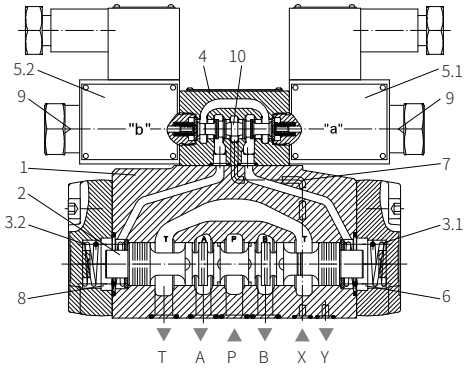
Function description, sectional drawing

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.

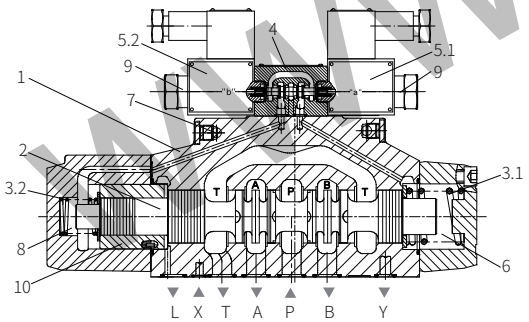


Model G-4WEH...XJ/

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.



Structural diagram of electro-hydraulic directional valve with hydraulic centered

Model G-4WEH...H/

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

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) dismounted.

(2) Conversion between internal drain and external drain:

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

(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) dismounted.

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) dismounted.

(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) dismounted.

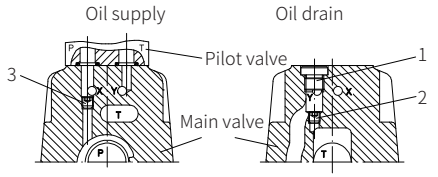
4、Model G-WEH32

(1) Conversion between internal supply and external supply:

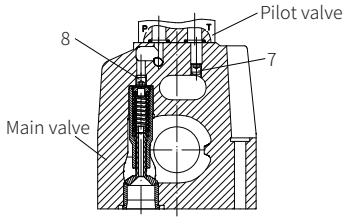
The channel P on the top pf the main valve with M6 screw (11) is external supply, and is internal supply when M6 screw (11) dismounted.

(2) Conversion between internal drain and external drain:

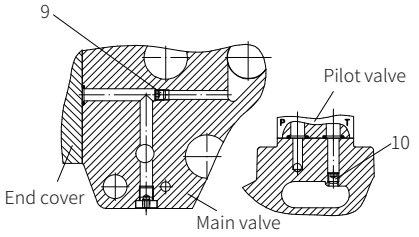
The channel T on the top of the main valve with M6 screw (12) is external drain and is internal drain when M6 screw (12) dismounted.



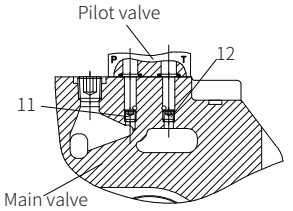
Model G-WEH10...4XJ/



Model G-WEH16...7XJ/



Model G-WEH25...XJ/



Model G-WEH32...XJ/

Models and specifications

4 / / *

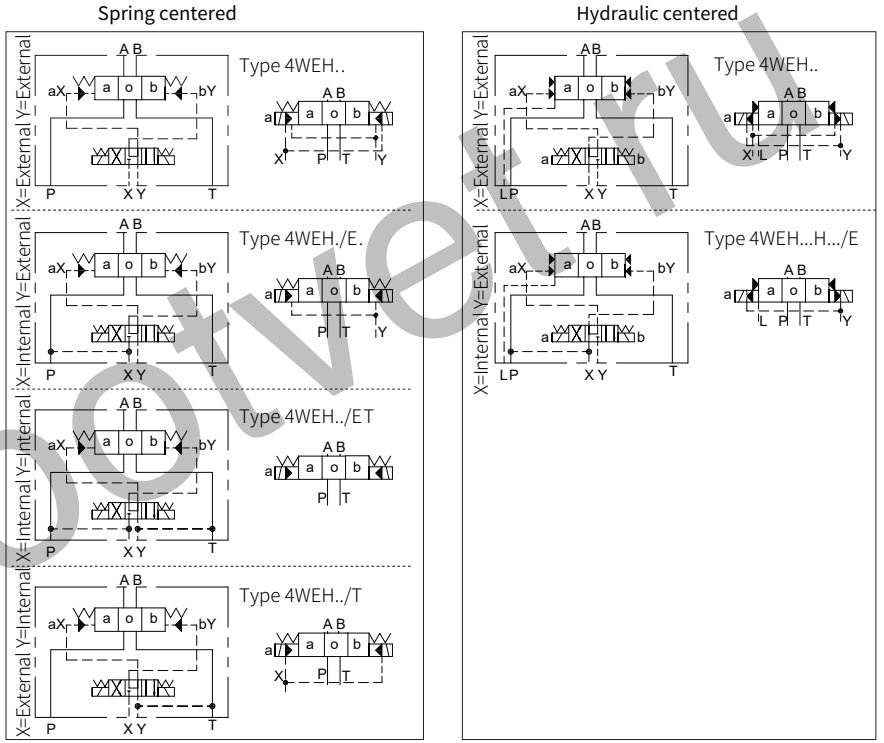
working pressure to 35MPa =no code
explosion-proof class I =G1
explosion-proof class II =G2
four-way version =4
electro-hydraulic =WEH
size
size 10 =10
size 16 =16
size 22 =22
size 25 =25
size 32 =32
main valve hydraulic return or centered =H
main valve spring return or centered =No code
functional symbols (see functional symbol diagram)
40 to 49 series (size 10) =4X
60 to 69 series (size 25, 32) =6X
70 to 79 series (size 16, 22) =7X
when the pilot valve is a 2-position valve with two solenoids and hydraulic return in the main valve
without reset spring =O
without reset spring with detent =OF
solenoid with threaded connection =6E
DC voltage 24V =G24
AC rectified voltage 36V, 220V =B36、B220
for other voltages and frequencies, see directional valve WE6
with hidden manual emergency operation =N9

1) For internal oil supply
*Minimum control pressure: see page 292
*To avoid impermissible maximum force peaks, a throttle (B10) must be installed in port P of the pilot valve
2) Only in conjunction with throttle "B10"
3) G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

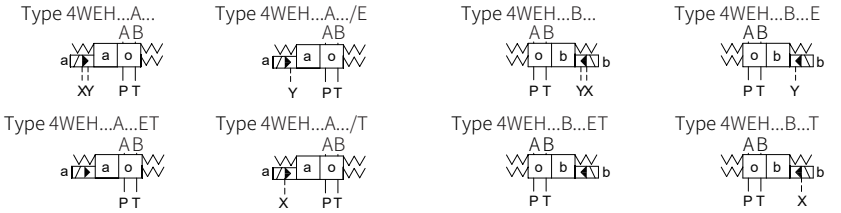
more information in text
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)
No code= without pressure reducing valve
D3[2]= with pressure reducing valve
pre-load valve(not for size 10)
No code=without pre-load valve
P4.5= with pre-load valve, cracking pressure 0.45MPa
P6.0= with pre-load valve, cracking pressure 0.6MPa
No code= no plug-in throttle
B08= throttle ∅0.8mm
B10= throttle ∅1.0mm
B12= throttle ∅1.2mm
B15= throttle ∅1.5mm
additional device number (see additional device drawing)
electrical connection
K4= no insert plug
Z5L= large right angle lamp plug
FS2= deutsch water-proof plug
DL= connection box with lamp, centralized connection
No code= without switching time adjustment
S= switching time adjustment as meter-in control
S2= switching time adjustment as meter-out control
pilot oil supply
No code= pilot oil supply and drain external
E= pilot oil supply internal and drain external
ET[1)]= pilot oil supply and drain internal
T= pilot oil supply external and drain internal
(for model 4WH...only available as "no code")
(the 3-position valve with hydraulic centered in ET and T types must meet: P pilot ⩾ 2xP tank + P pilot min)
No code = without manual emergency operation
N9= with hidden manual emergency operation

Functional symbols

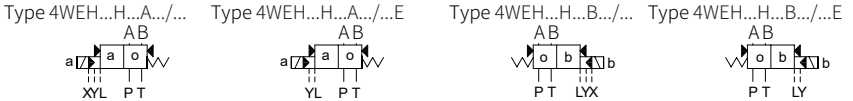
Detailed and simplified symbols for 3-position directional valves



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

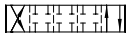
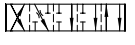
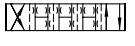


Hydraulic return valves
(the solenoid at end A or B of the 2-position valve derived from the 3-position valve)



Functional symbols of 3-position valves

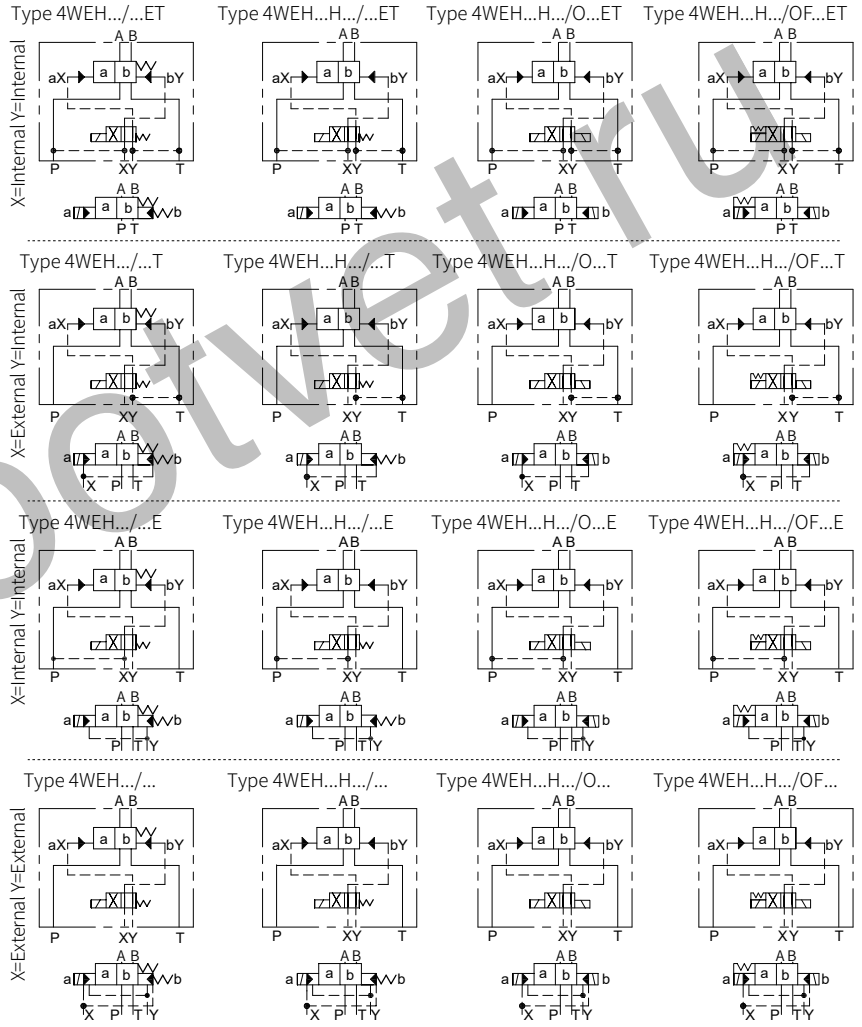
3-position valve

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		

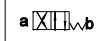
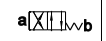
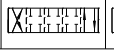
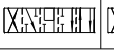
2-position valve derived from 3-position valve

2-position valve model	Functional symbol (Solenoid at end A)	2-position valve model	Functional symbol (Solenoid at end B)
4WEH...EA.../...		4WEH...EB.../...	
4WEH...FA.../...		4WEH...FB.../...	
4WEH...GA.../...		4WEH...GB.../...	
4WEH...HA.../...		4WEH...HB.../...	
4WEH...JA.../...		4WEH...JB.../...	
4WEH...LA.../...		4WEH...LB.../...	
4WEH...MA.../...		4WEH...MB.../...	
4WEH...PA.../...		4WEH...PB.../...	
4WEH...QA.../...		4WEH...QB.../...	
4WEH...RA.../...		4WEH...RB.../...	
4WEH...SA.../...		4WEH...SB.../...	
4WEH...TA.../...		4WEH...TB.../...	
4WEH...UA.../...		4WEH...UB.../...	
4WEH...VA.../...		4WEH...VB.../...	
4WEH...WA.../...		4WEH...WB.../...	

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:					

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				
		(MPa)	16 AC				
Oil port Y External pilot oil drain	-DC solenoid	(MPa)	21 DC				
	-AC solenoid	(MPa)	16 AC				
	For 4WH type	(MPa)	25（size 10、16、25、32） 21（size 22）				
Maximum pilot pressure (For high pilot pressure, a pressure reducing valve is required)		(MPa)	25（size 10、16、25、32） 21（size 22）				
Minimum pilot pressure -Pilot oil supply X external -Pilot oil supply X internal (Not for spool C, F, G, H, P, T, V, Z, S[2])			H-4W...				
	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:
Ppilot ⩾ 2xPtank + Ppilot 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...

H-4WEH10... type is 31.5MPa

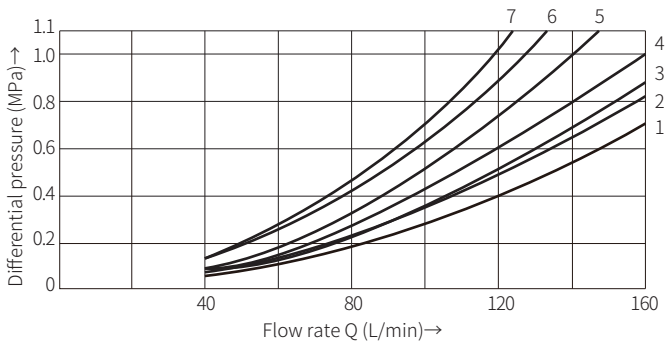
Hydraulic oil		Mineral hydraulic oil or phosphate ester hydraulic oil								
Temperature range	(℃)	-30 to +80 (NBR seal) -20~+80 (FKM seal)								
Viscosity range	(mm^2/s)	2.8 to 500								
Cleanliness of oil	The maximum allowable pollution level of oil is NAS1638 Class 9, so we recommend a fitter with the minimum filtration accuracy β10⩾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		about 41.7	
Weight: Valve with two solenoid, spring centered	(kg)	about 9.1	about 11.8		about 14.2		about 21.3		about 43.3	
Weight: Valve with two solenoid, hydraulic centered	(kg)	about 9.1	about 11.8		about 14.2		about 21.3		about 43.3	
Weight: Switching time adjustment	(kg)	about 0.8								
Weight: Pressure reducing valve	(kg)	about 0.4								
Installation position		Optional, except for the hydraulic return valve C, D, K, Z, Y installed horizontal								

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													
	2-position valve	(ms)	35	40			30	75			25	30			20	25
Size 16	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			
	2-position valve	(ms)	30...35		55		30...35		55		30...35		55			
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(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			
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b		
		(ms)	20...35		20		20...55		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 - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b	a	b
		(ms)	20	35	55	65	30	35	55	65	25	30	50	60	25	30
	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	
	3-position valve - hydraulic centered	From-	a	b	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	
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			
	2-position valve	(ms)	100		130		75		100		60		115			
	3-position valve - hydraulic centered	Solenoid operated	a	b	a	b	a	b	a	b	a	b	a	b		
		(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			
	3-position valve - hydraulic centered	From-	a	b	a	b	a	b	a	b	a	b	a	b		
		(ms)	30...65		30 40		60...90		30 40		105...155		50 50			

Characteristic curve

Model G-4WEH10...(Measured at ϑ_{oil}=41mm²/s and t=50°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 ϑ_{oil}=41mm²/s and t=50°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.

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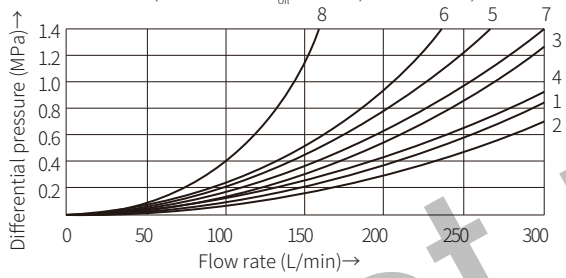
Characteristic curve

Model G-4WEH16...(Measured at ϑ_{oil}=41mm²/s and t=50°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 ϑ_{oil}=41mm²/s and t=50°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)					with pre-load valve and X port internal supply
	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	Spools F, G, H P and S in general
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	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.

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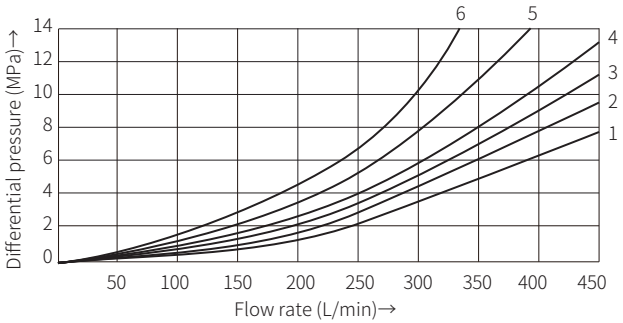
Characteristic curve

Model G-4WEH22...(Measured at ϑ_{oil}=41mm²/s and t=50°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 ϑ_{oil}=41mm²/s and t=50°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 $P_{pilot\ min}$=11bar/14bar)					
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

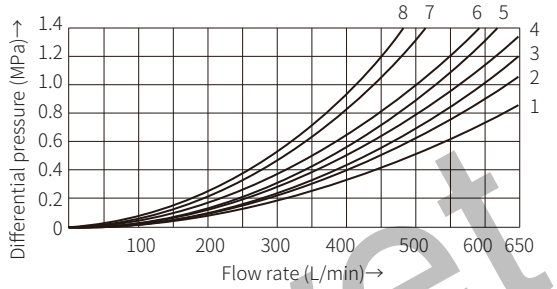
Allowable flow of 3-position valve L/min					
Spool	working pressure(MPa)				
	7	14	21	28	35
X external supply spring centered					
E, J, L, M, Q, U, W, R	450	450	450	450	450
H	450	450	300	260	230
G	400	350	250	200	180
F	450	270	175	130	110
V	450	300	240	220	160
T	400	300	240	200	160
P	450	270	180	170	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 ϑ_{oil}=41mm²/s and t=50°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 ϑ_{oil}=41mm²/s and t=50°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	35	
Main valve spring return[1)]						
C, D, K, Z, Y	700	700	700	700	700	
Main valve spring return[2)]						
C	700	700	700	700	700	Spools C and Z approx. to 180 L/min
D, Y	700	650	400	350	300	
K	700	650	420	370	320	
Z	700	700	650	480	400	
Main valve hydraulic return						
HC、HD、HK	700	700	700	700	700	Spools HC and HZ approximately to 180L/min
HZ、HY	700	700	700	700	700	
HC.../O	700	700	700	700	700	
HD.../O	700	700	700	700	700	
HK.../O	700	700	700	700	700	
HZ.../O	700	700	700	700	700	
HC.../OF	700	700	700	700	700	
HD.../OF	700	700	700	700	700	
HK.../OF	700	700	700	700	700	
HZ.../OF	700	700	700	700	700	

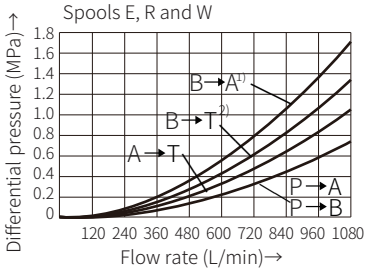
Allowable flow of 3-position valve (L/min)						with pre-load valve and X port internal supply
Spool	Working pressure(MPa)					
	7	14	21	28	35	
spring centered						
E、L、M Q、U、W	700	700	700	700	650	
G/T	400	400	400	400	400	Spools F, G, HP and T approximately to 180L/min
F	650	550	430	330	300	
H	700	650	550	400	360	
J	700	700	650	600	520	
P	650	550	430	330	300	
V	650	550	400	350	310	
R	700	700	700	650	680	
Pressure centered (minimum pilot pressure 1.8MPa)						
E/F/H/J	700	700	700	700	650	
L/M/P/Q	700	700	700	700	650	
R/U/V/W	700	700	700	700	650	
G/T	400	400	400	400	400	
When the pilot pressure higher than 3MPa						
G/T	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.

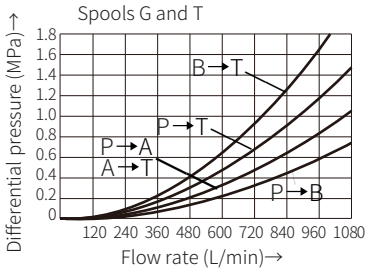
Characteristic curve

Model G-4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

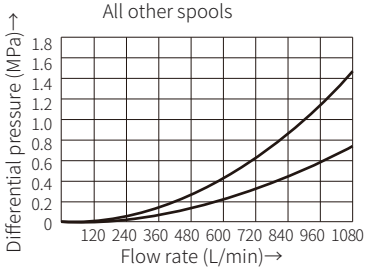
Spools E, R and W



Spools G and T



All other spools



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

Characteristic limit

Model G-4WEH32...(Measured at ϑ_{oil}=41mm²/s and t=50°C)

Allowable flow of 2-position valve (L/min)						
Spool	Working pressure(MPa)					with pre-load valve and X port internal supply
	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						
HC、HD、HK	1100	1040	860	750	680	Spool Z approx to 180L/min
HZ、HY	1100	1040	860	750	680	

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

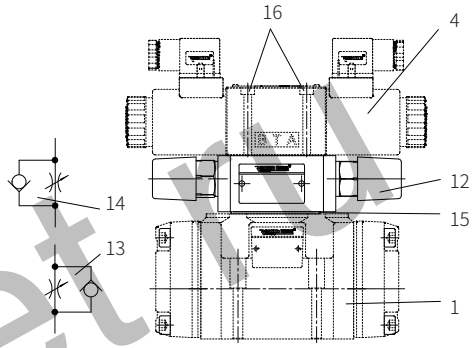
1)The given flow value can be achieved when the minimum pilot pressure of 1.0MPa exists.
2) The given flow value is limiting the value at which the reset spring can return the valve when the pilot pressure decreases.

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

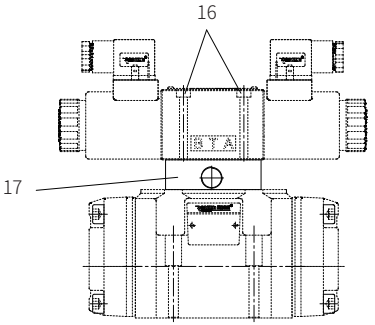
To control the switching time of the main valve (1), a double throttle check valve (12) is installed between the pilot valve and the main valve.
Conversion from meter-in control (13) to meter-out control (14):
Remove the pilot valve (4) but retain the O-ring support plate (15), turn the throttle check valve around its longitudinal axis and reassemble it on the mounting surface, install the pilot valve (4).
Tightening torque M_A=9Nm 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=9Nm for fixing screw (16).

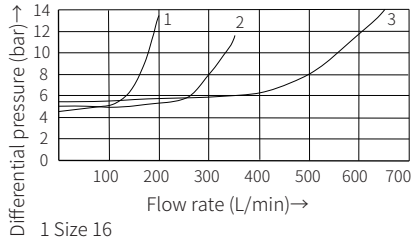


Model G-4WEH.../.../D3

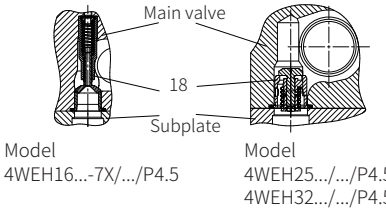
Pre-load valve (not for size 10)

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.



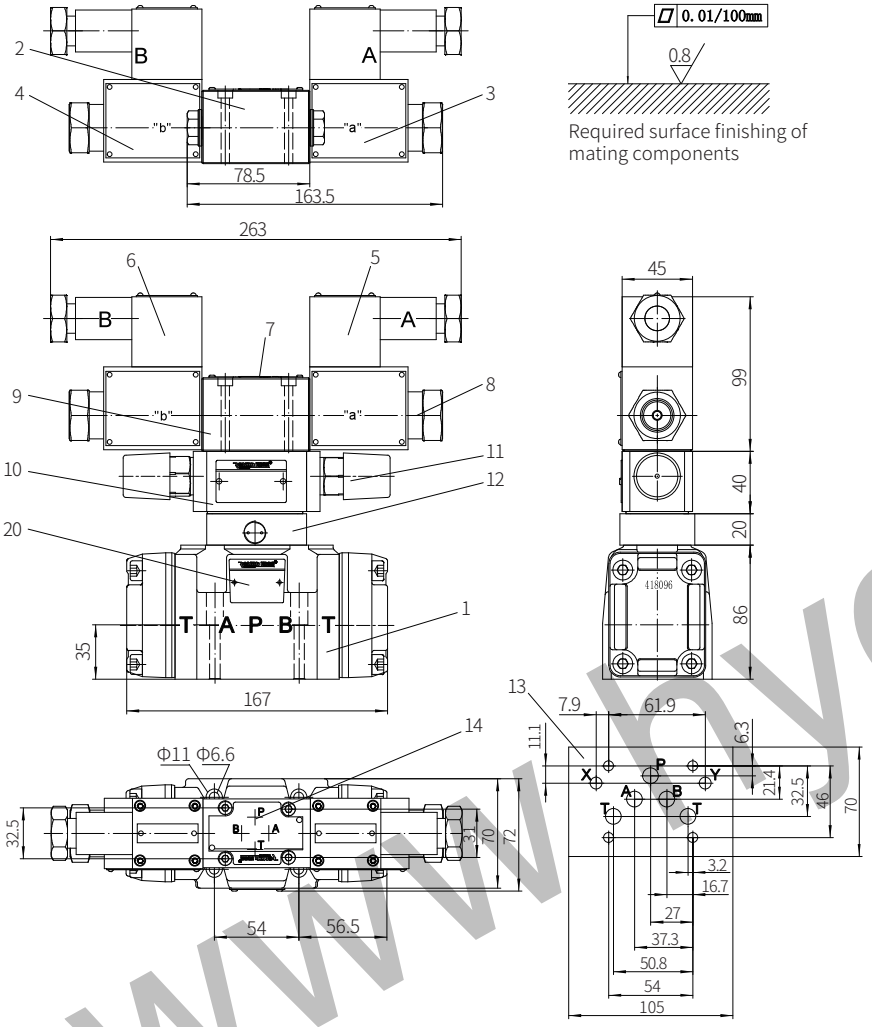
1 Size 16
2 Size 25
3 Size 32

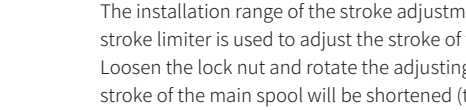


Model 4WEH16...-7X/.../P4.5

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

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





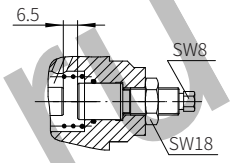
Required surface finishing of mating components

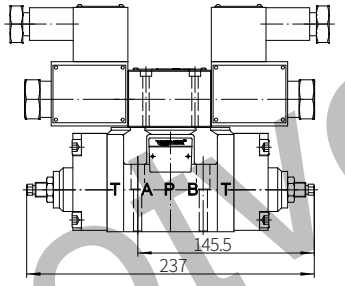
1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment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

Dimension of additional devices for model G-WEH10

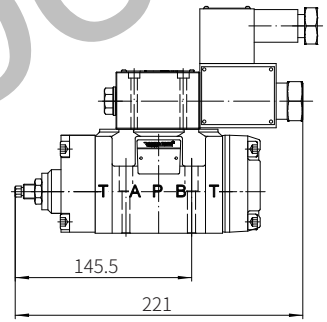
The installation range of the stroke adjustment is 6.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1mm stroke

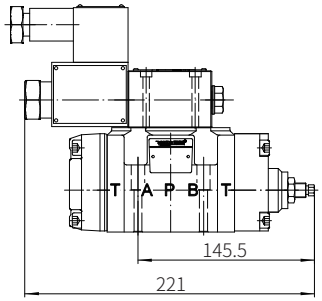




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12

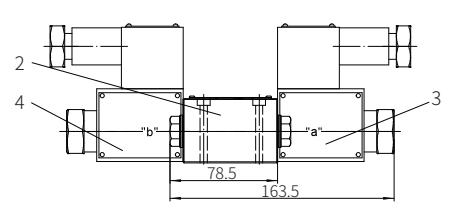


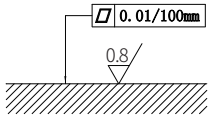
Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



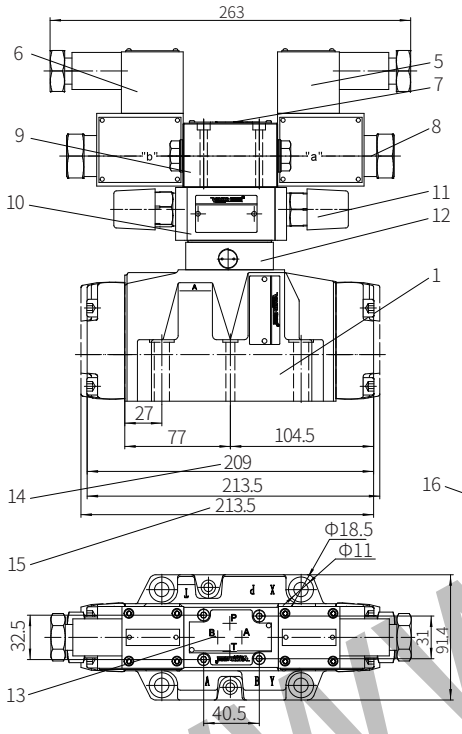
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

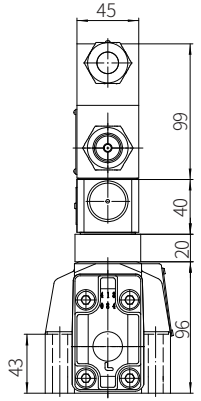
Model G-WEH16...-7XJ/...

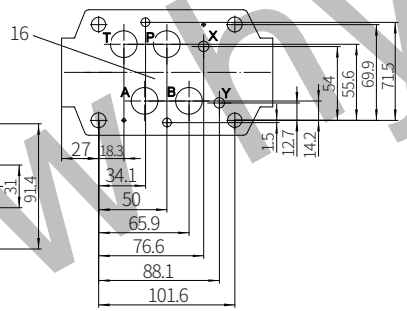




Required surface finishing of mating components







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)
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
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

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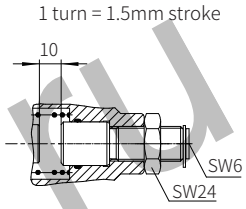
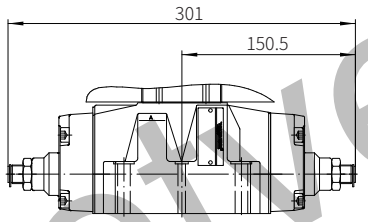
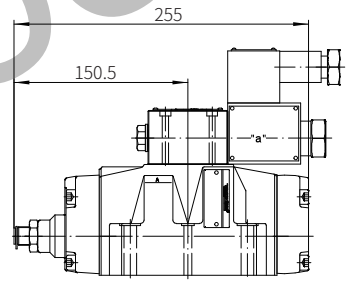
Dimension of additional devices for model G-WEH16

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)

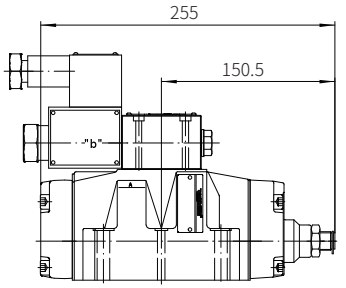




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



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)

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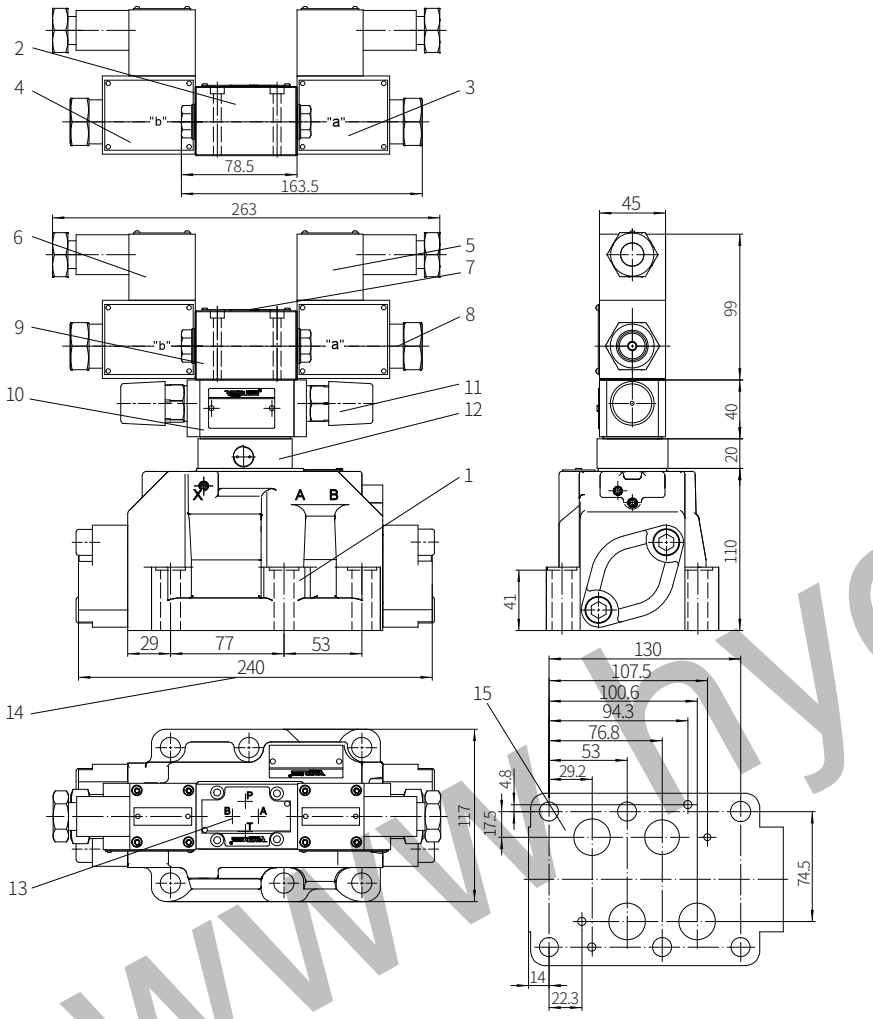
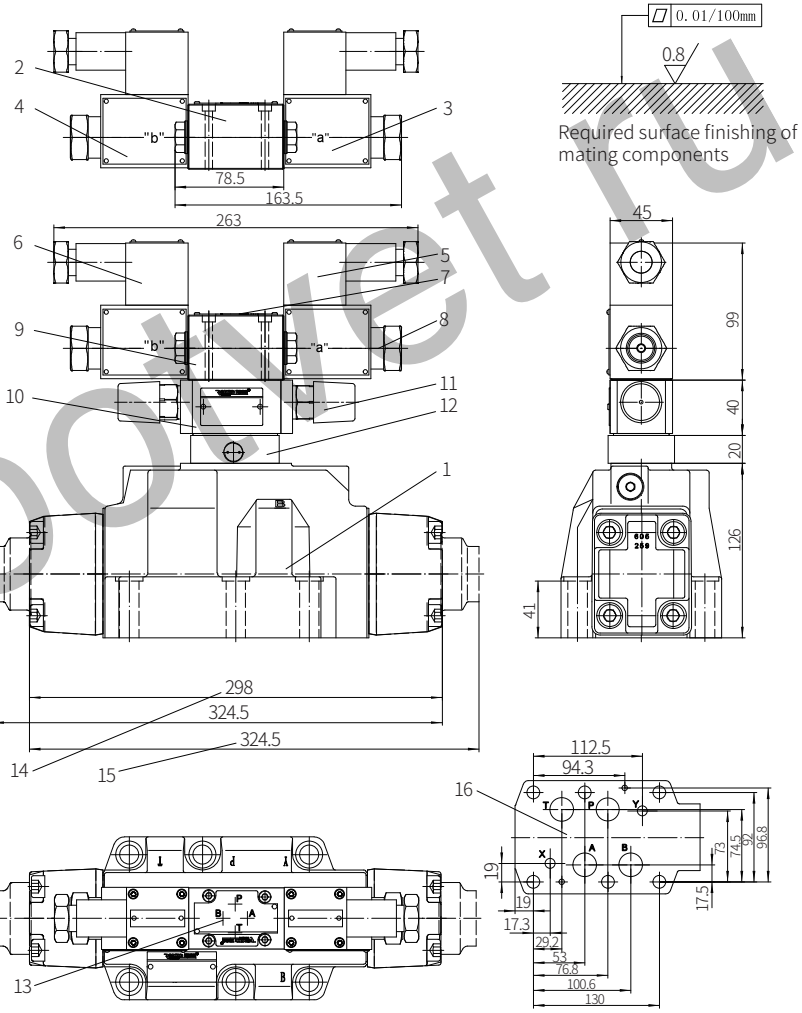
Model G-WEH22...-7XJ/...



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 Main valve connection diagram

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

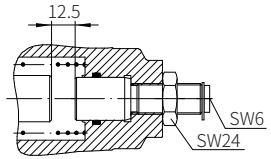


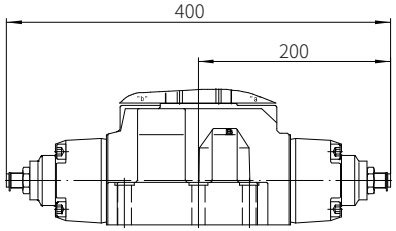
1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment
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-WEH25

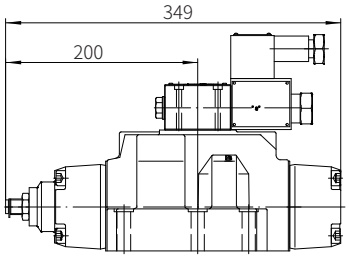
The installation range of the stroke adjustment is 12.5mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control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

1 turn = 1.5mm stroke

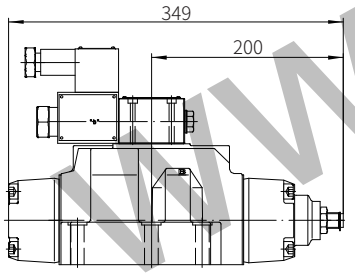




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12

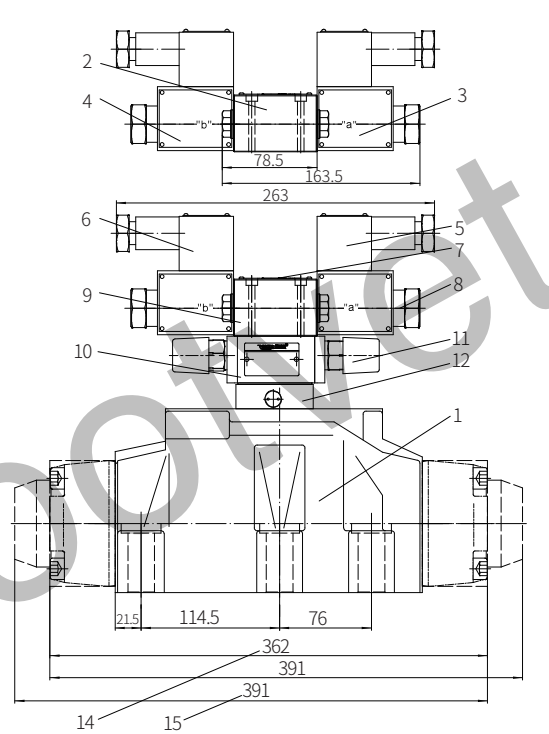


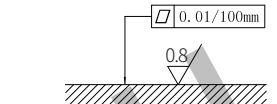
Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



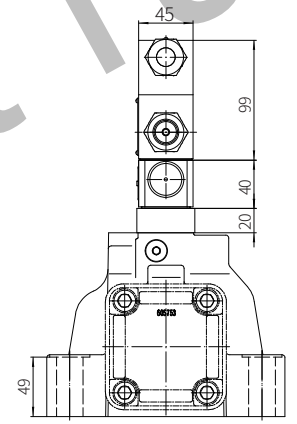
Stroke adjustment installed on the end B of the main valve.../12
(2-position valve, symbol Y)

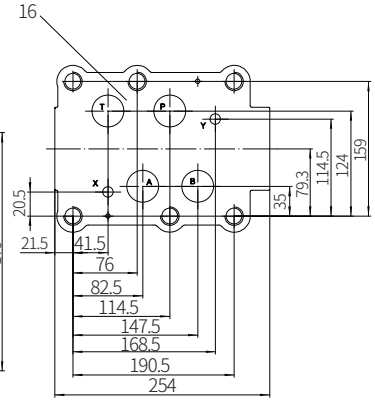
Model G-WEH32...-6XJ/...





Required surface finishing of mating components



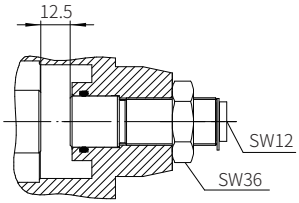


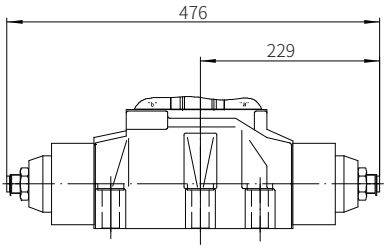
1 Main valve
2 2-position valve with one solenoid and plug Z4
3 Solenoid a
4 Solenoid b
5 Gray plug (or transparent plug)
6 Black plug (or transparent plug)
7 Name plate of pilot valve
8 Manual emergency operation
9 2-position or 3-position valve with two solenoids and plug Z4
10 Switching time adjustment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

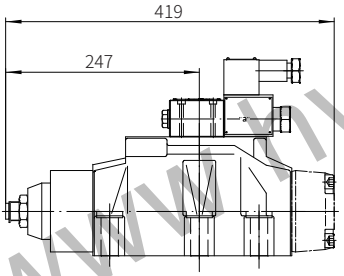
The installation range of the stroke adjustment is 15mm. The stroke limiter is used to adjust the stroke of the main spool. Loosen the lock nut and rotate the adjusting rod clockwise, the stroke of the main spool will be shortened (the adjustment must be carried out without pressure in the control chamber)

1 turn = 1.5mm stroke

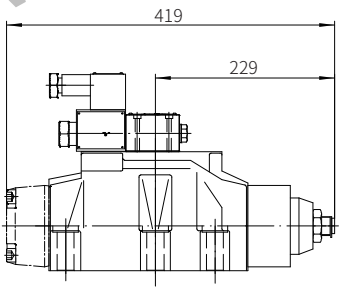




Stroke adjustment installed on the ends A and B of the main valve.../10
Stroke adjustment installed on the end A of the main valve.../11
Stroke adjustment installed on the end B of the main valve.../12



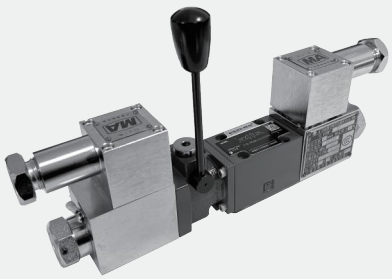
Stroke adjustment installed on the end A of the main valve.../11
(2-position valve, symbols C, D, K, Z)



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

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

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.

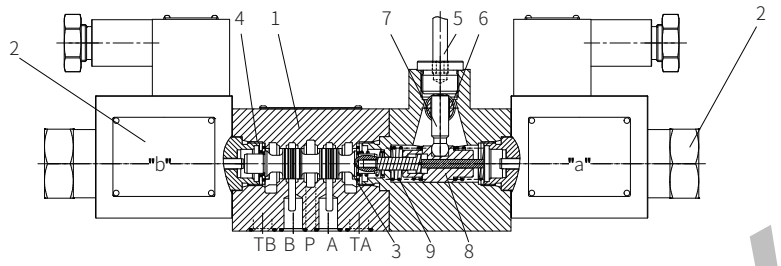
It is mainly composed of valve body (1), one or two solenoids (2), valve spool (3), reset spring (4) and manual control device.

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.

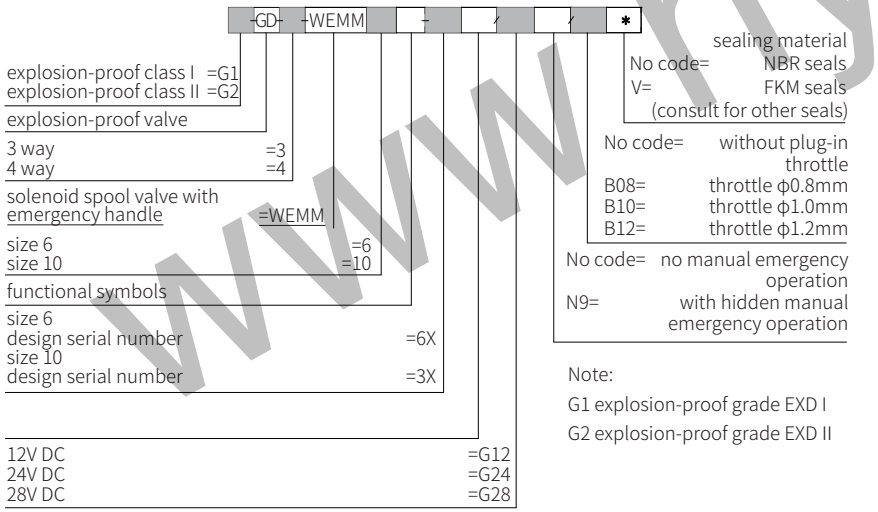
Auxiliary handle operation:

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



Note:

G1 explosion-proof grade EXD I

G2 explosion-proof grade EXD II

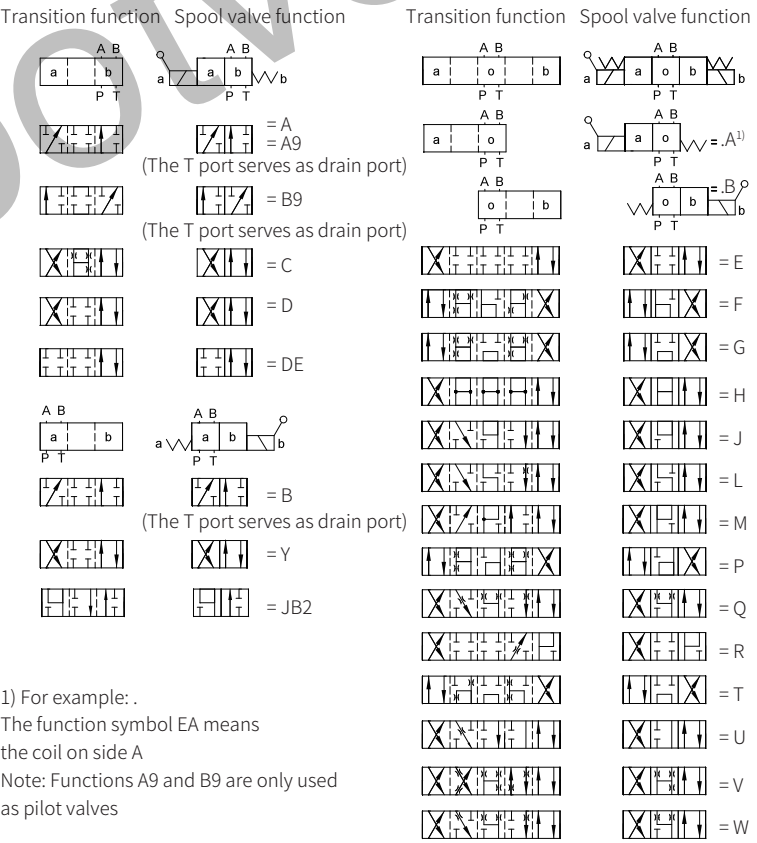
Technical parameters

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	°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

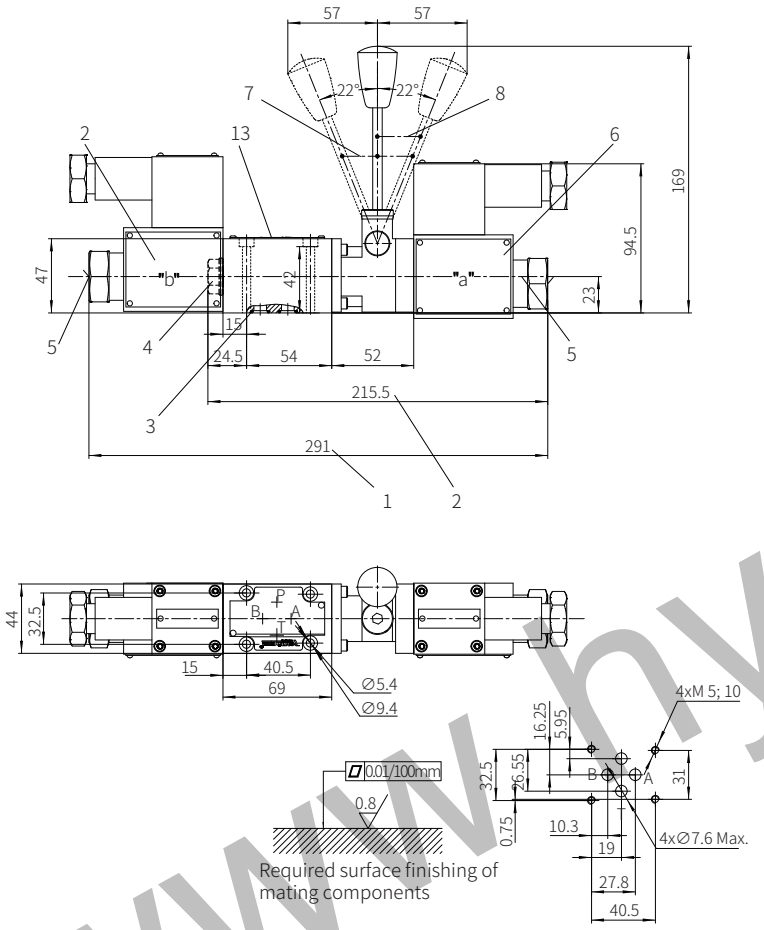


1) For example: .

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)



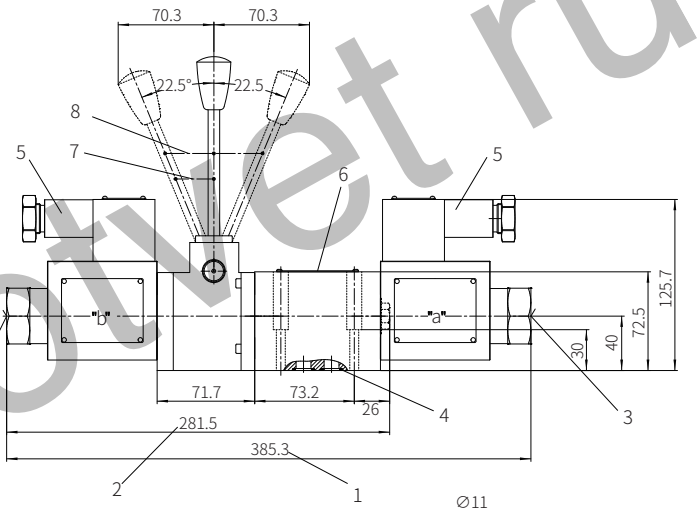
1 Size of 3-position valve
2 Size of 2-position valve
3 O ring 9.25x1.78 (for oil ports P, A, B, T)
4 Plug for 2-position valve
5 Hidden emergency button
6 Solenoid
7 Switching position for 3-position valve
8 Switching position for 2-position valve

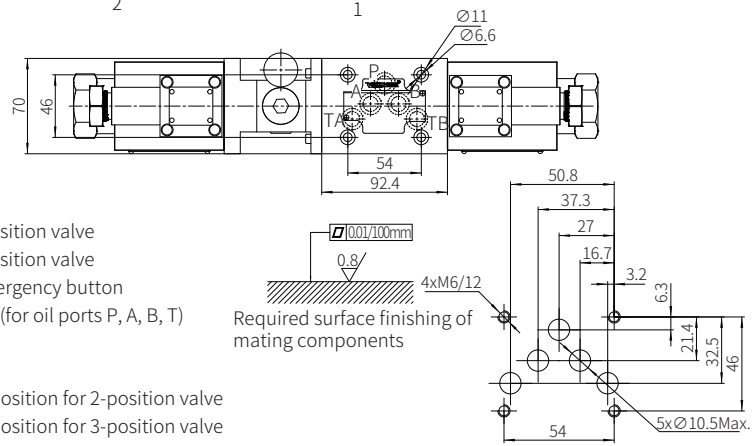
Valve fixing screw
M5x50-10.9 grade GB/T70.1-2000
Tightening torque M_A=8.9Nm

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)

Component size Size unit: mm

Valve with DC solenoid
(Size 10)





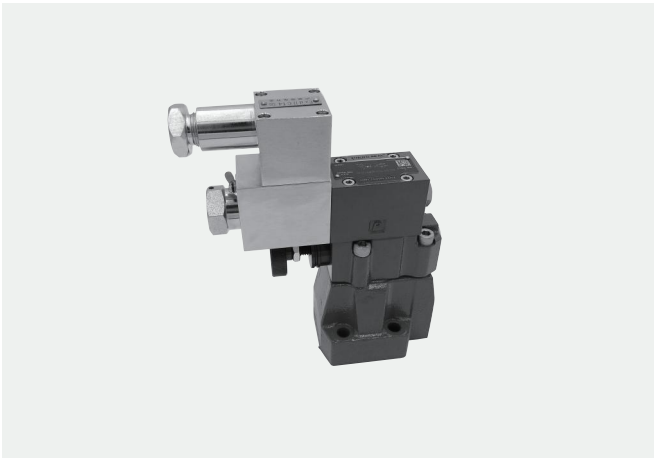
1 Size of 3-position valve
2 Size of 2-position valve
3 Hidden emergency button
4 O ring 12x2 (for oil ports P, A, B, T)
5 Solenoid
6 Name plate
7 Switching position for 2-position valve
8 Switching position for 3-position valve

Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=15.5Nm

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)

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

Features

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

Function description, sectional drawing

The G-DAW pressure control valve is pilot operated pressure shut-off valve. It is used to switch the pump flow to pressureless bypass when the accumulator loading pressure is reached. The other application of the valve is in high/low pressure pump system. In this application, the low pressure is switched to pressureless bypass when pressure reaches the high pressure setting value.

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).

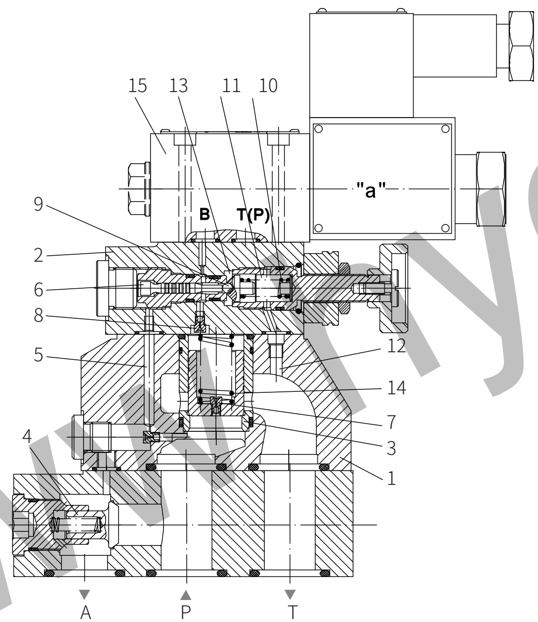
Diverting the pump flow from P to A - P to T

The pump supply oil for hydraulic system (P to A) via check valve (4). The pressure in port A acts on pilot valve spool (6) via control line (5). At same time, pressure in port P passes to the spring chamber of main spool (3) and conical spool (9) of pilot valve (2) via orifices (7) and (8). The conical spool lifts its valve seat against the spring force(10) when the setting cut-off pressure of the hydraulic system is reached. The fluid flows into spring chamber (11) via orifices (7) and (8), or the oil returns to tank external via control line (12) in model G- DAW...5XJ...Y.

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).

Diverting the pump fluid from P to T - P to A.

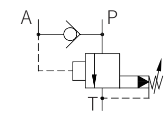
The area of the pilot spool (6) is 10% or 17% greater than the effective area of the conical spool (9) , thus the effective force on the pilot valve spool (6) is 10% or 17% greater than the effective force on the conical spool (9). When the actuator pressure drop to equal the cut-off pressure of the 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.



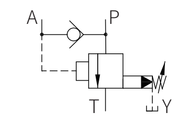
Model G-DAW20-1-5XJ/

Functional symbols

Model DA...-5XJ/...

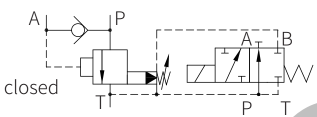


Model DA...-5XJ/...Y...



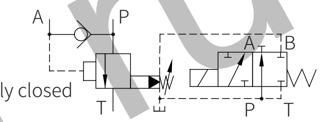
Model DAW...A....-5XJ/...

Normally closed



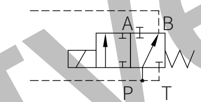
Model DAW...A...-5XJ/...Y...

Normally closed



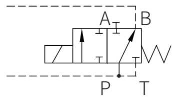
Model DAW...B....-5XJ/...

Normally open



Model DAW...B....-5XJ/...Y

Normally open



Models and specifications

| * DA | | | | | * | 5X | / | / | | | | | | * |

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 =10
size 25 =20
size 32 =30

normally closed =A
normally open =B

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)
10= on average 10 %
17= 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

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Technical parameters

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		mm^2/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.

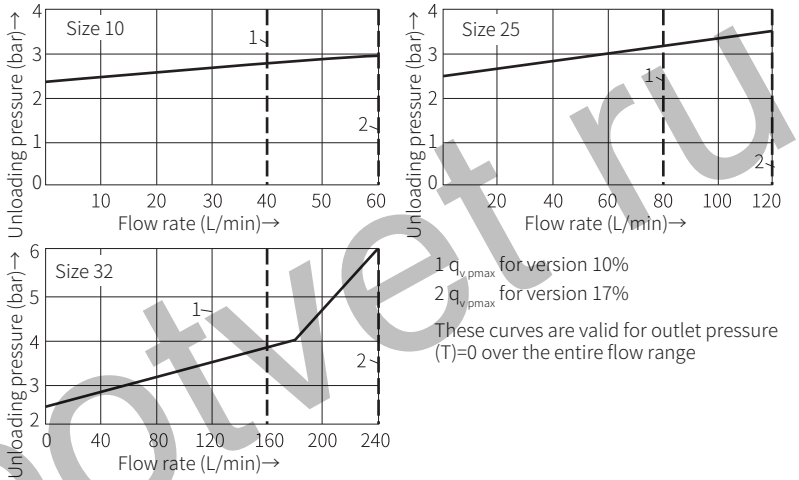
2) Only for FKM seal.

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.

Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

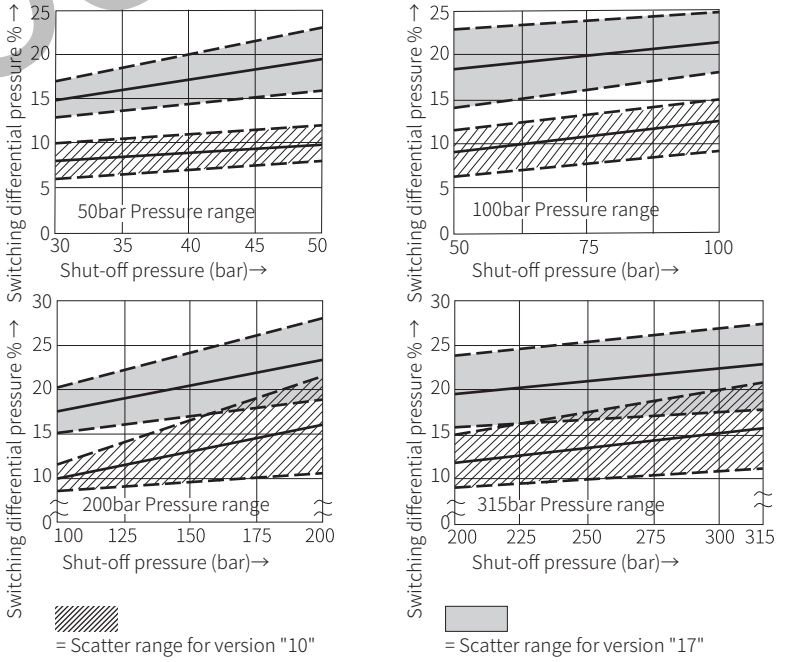
Unloading pressure (P→T)



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

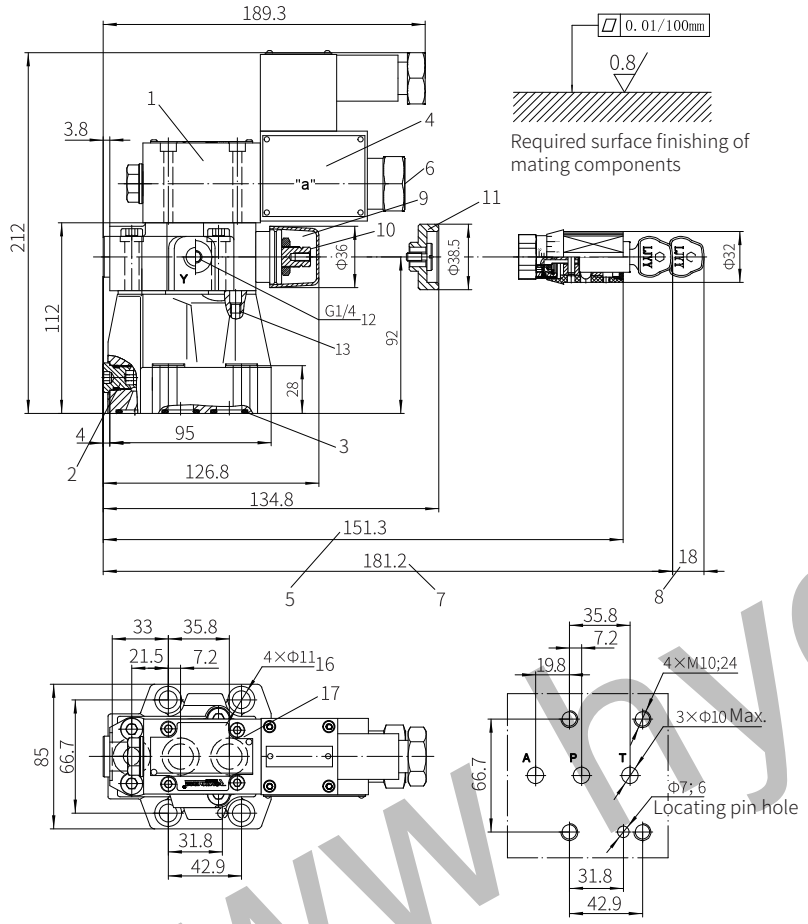
Switching differential pressure in relation to shut-off pressure (P→A)



= 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=75Nm
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

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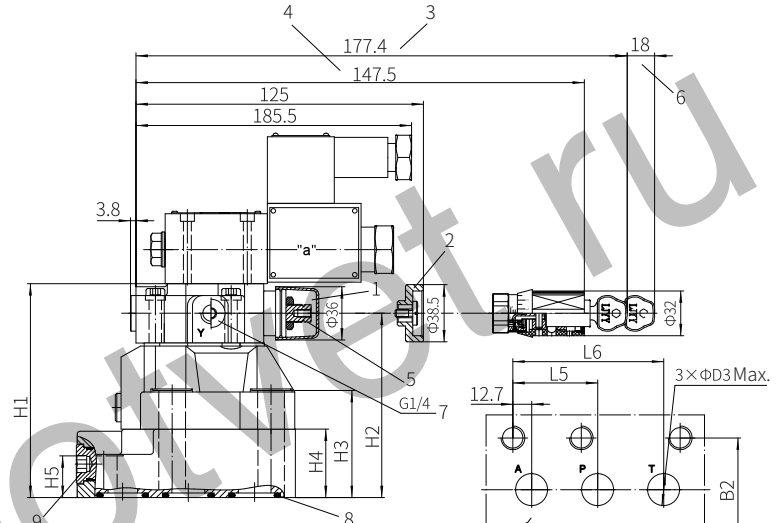
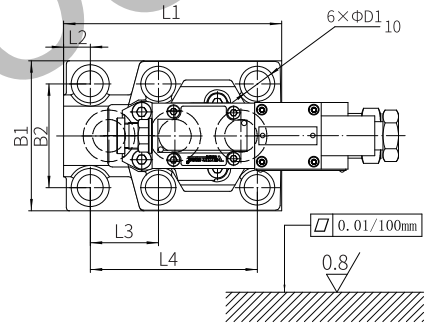
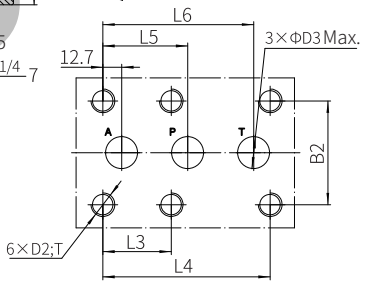
Model G-DAW20...-5XJ/...and G-DAW30...-5XJ/...







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

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

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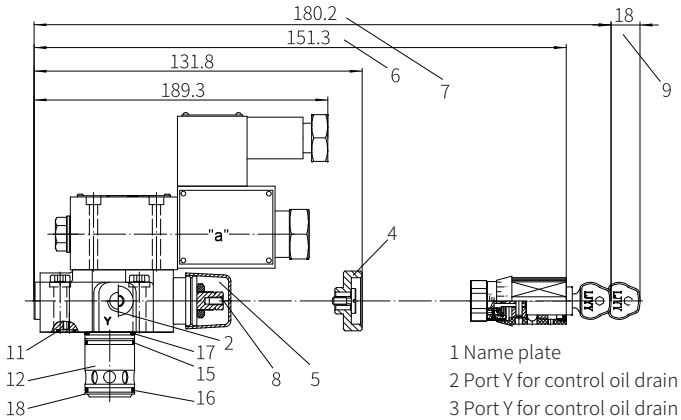
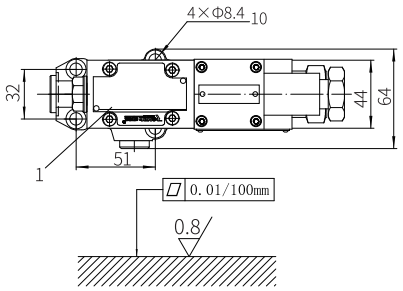
Component size

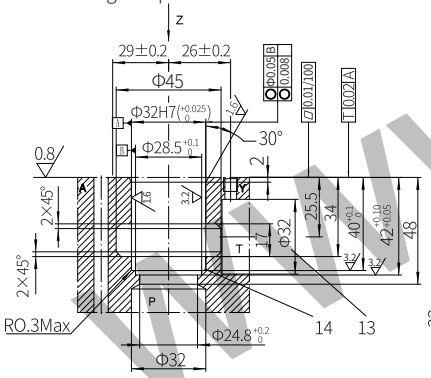
Size unit: mm

With (G-DAWC10 or 30) or without (G-DAWC)

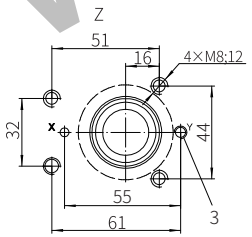




Required surface finishing of mating components



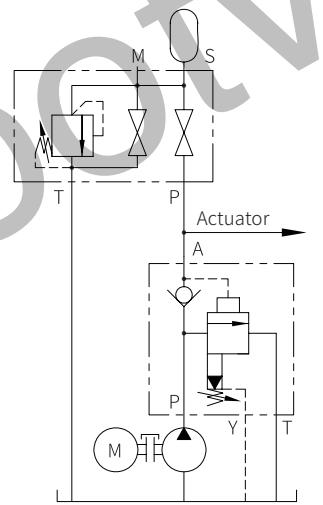
1 Name plate
2 Port Y for control oil drain external
3 Port Y for control oil drain external (G1/4 or M14x1.5 optional)
4 Adjustment form “1”
5 Adjustment form “2”
6 Adjustment form “5”
7 Adjustment form “7”
8 Hexagon S=10
9 Space required to remove the key
10 Valve fixing screw hole
11 O ring 9.25x1.78
12 Main valve insert
13 The ∅32 hole can intersect ∅45 hole at any position
Be careful not to damage oil port X and fixing holes
14 The retainer ring and O-ring should be installed in this hole before installing main spool.
15 O ring 28x1.8
16 O ring 28x2.65
17 O ring 27.3x2.4
18 Retainer ring 32x28.4x0.8



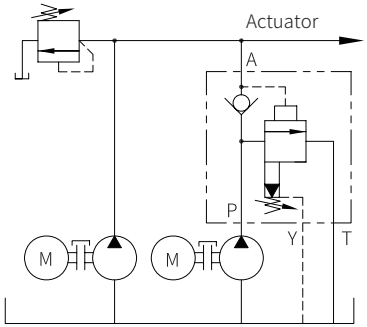
Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

Application example

Hydraulic system with accumulator:
installation notes:
- The connection resistance between DA valve and accumulator must be as low as possible
The pilot valve of DA is separately connected to the accumulator when the resistance is high.



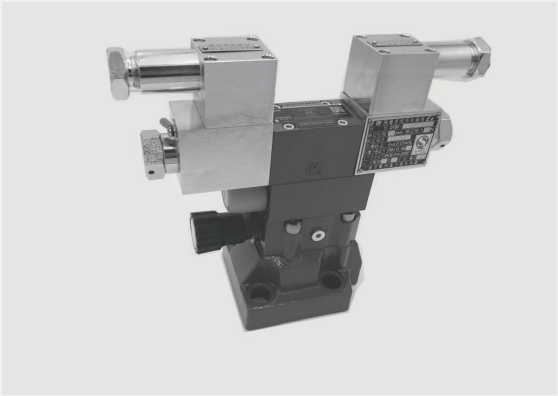
Hydraulic system with high and low pressure pump:
With high pump flow and small switching pressure differential values (10 %), "Y" version valves should preferably be used.



High pressure pump Low pressure pump

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

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.

Function description, sectional drawing

The G-DB2U...-5X/ valve is pilot controlled two-stage concentric type multistage relief valve (two-stage). The main valve and pilot valve are both seat valve. The valve is used to control the system pressure, and it may switch the system pressure to the secondary pressure by the solenoid directional valve.

G-DB2U valve mainly consists of main valve, 4/3-way(H type) or 4/2-way(D type) solenoid directional valve (size 6), and two pilot valves, the pilot valve (11) is a direct operated relief valve.

Model G-DB2U...H...-5XJ:

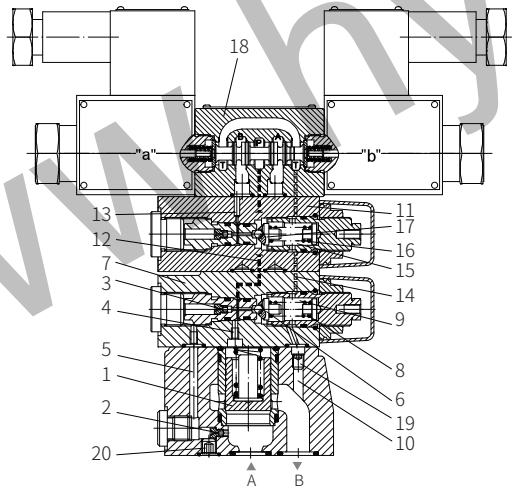
When the solenoid is de-energized, the fluid at port A of main valve acts on bottom of main spool (1), and via orifice (2), channel (5), orifice (3), channel (12), port P and T of pilot solenoid valve (18), spring chamber(15) of pilot valve (11), channel (14), spring chamber (9) of pilot valve (7), channel (10) back to tank (pilot oil drain internal), or via external outlet back to tank (pilot oil drain external). Thus, a differential pressure is formed on the main spool when the pressure oil flow through the orifices (2 and 3) and it opens the main spool to make the relief valve unloading.

When solenoid “b” is energized, the fluid of pilot solenoid valve (18) flows from P to A and B to T, at this time the pressure oil of the secondary pilot valve (11) via channel (13), port B and T of pilot solenoid valve, spring chamber (15), channel (14), spring chamber (9) and channel (10) back to tank, then the secondary pilot valve is unloading. The pressure oil of the pilot valve (7) acts on the valve spool (6) through orifice (3). When the system pressure exceeds the setting pressure of the spring (8), the valve spool (6) is opened, and the pressure oil at the upper end of the main spool flows back to the oil tank through channels (4 and 10) and spring chamber (9). In this way, a differential pressure is formed on the main spool and opens the main spool(1). The pressure oil flows from A to B at a set pressure as the primary pressure regulation.

When solenoid "a" is energized, it's a secondary pressure regulation under the same principle (note: the setting pressure of the secondary pilot valve should be less than the setting pressure of the primary pilot valve).

Model G-DB2U...D...-5XJ:

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

DB 2U - - 5X / *

explosion -proof class I =G1
explosion -proof class II =G2

pressure relief valve

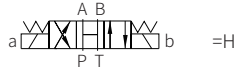
electro-hydraulic relief valve =No code

pilot valve with main valve spool assembly (plug-in) =C

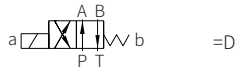
two-staged pressure regulation

size	ordering code: subplate mounting	ordering code: 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

subplate mounting =No code
threaded connection =G



=H



=D

adjusting element
rotary knob =1
internal hexagon screw with protective cap =2
lockable rotary knob with scale =3

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)

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

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

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

02

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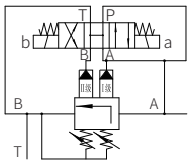
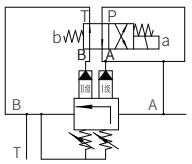
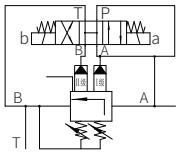
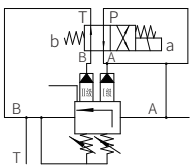
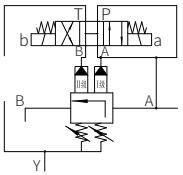
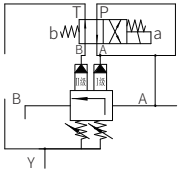
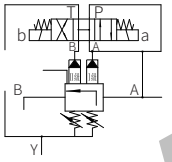
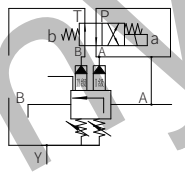
Functional symbols

Supply and drain internal	DB2U...H.../... 	DB2U...D.../... 
Supply external and drain internal	DB2U...H.../...X 	DB2U...D.../...X 
Supply internal and drain external	DB2U...H.../...Y 	DB2U...D.../...Y 
Supply and drain external	DB2U...H.../...XY 	DB2U...D.../...XY 

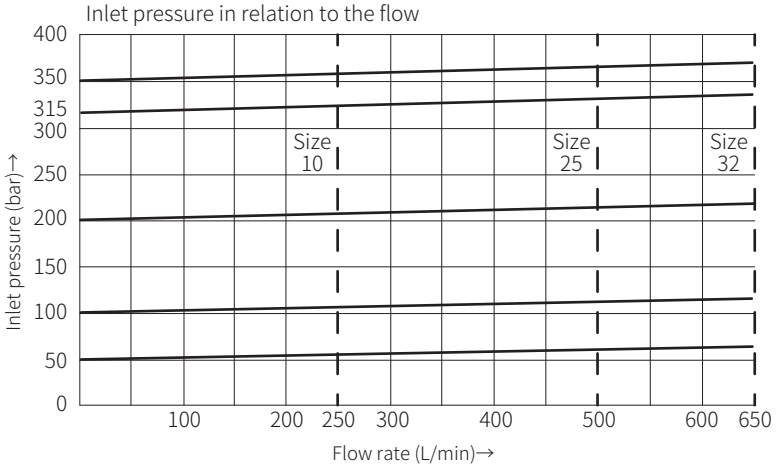
Technical parameters

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 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, ϑ_{oil}=40°C ± 5°C)

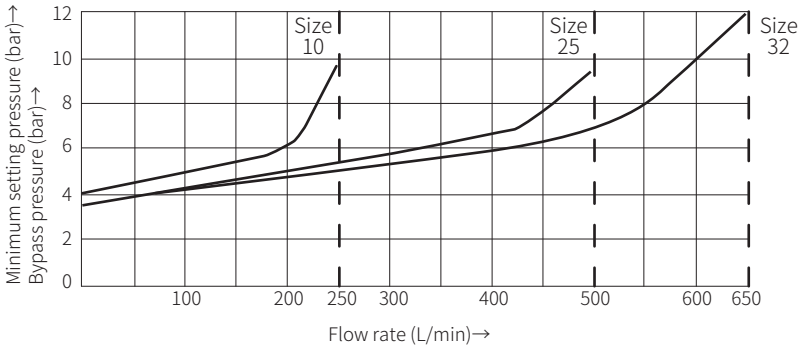
The curve was measured at zero pressure for externally controlled oil leakage.
For internal control oil return, the pressure at port B is added to the command value.



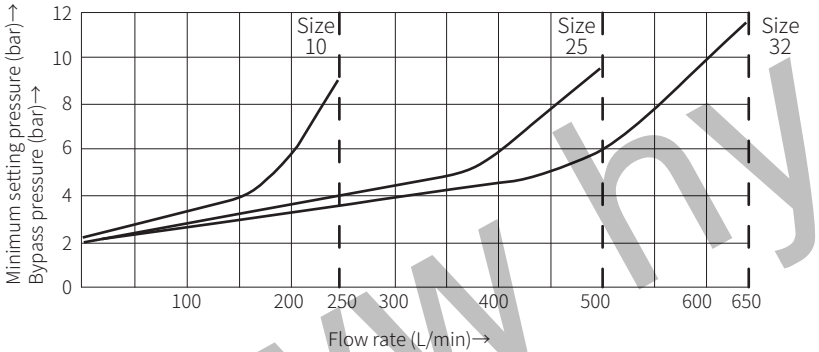
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

Minimum setting pressure and bypass pressure in relation to the flow
- standard version



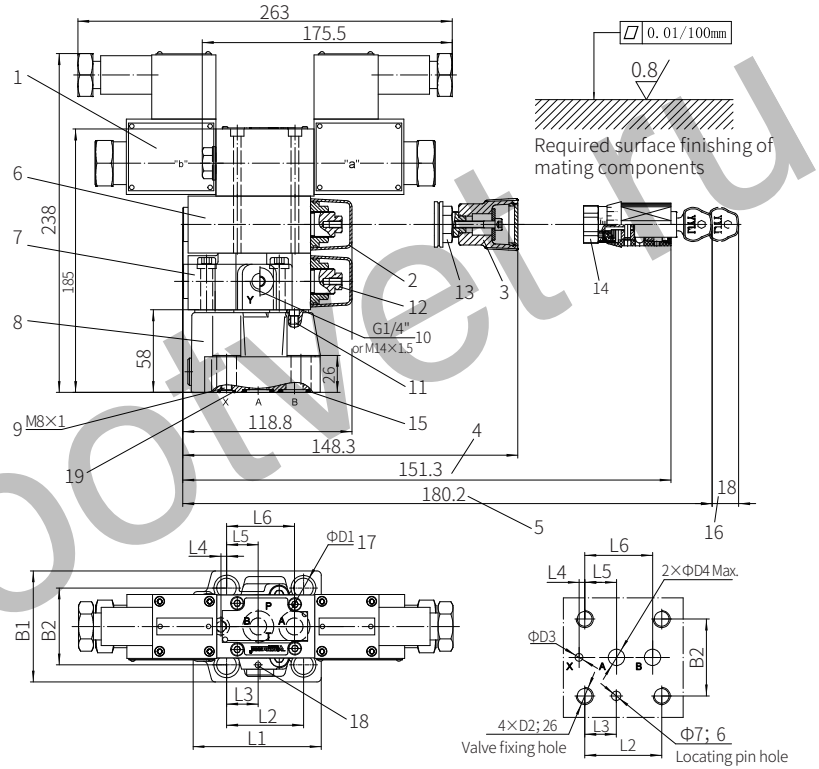
Minimum setting pressure and bypass pressure in relation to the flow
- "U" version



Component size

Size unit: mm

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=95Nm
NG25:
M16x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
M18x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

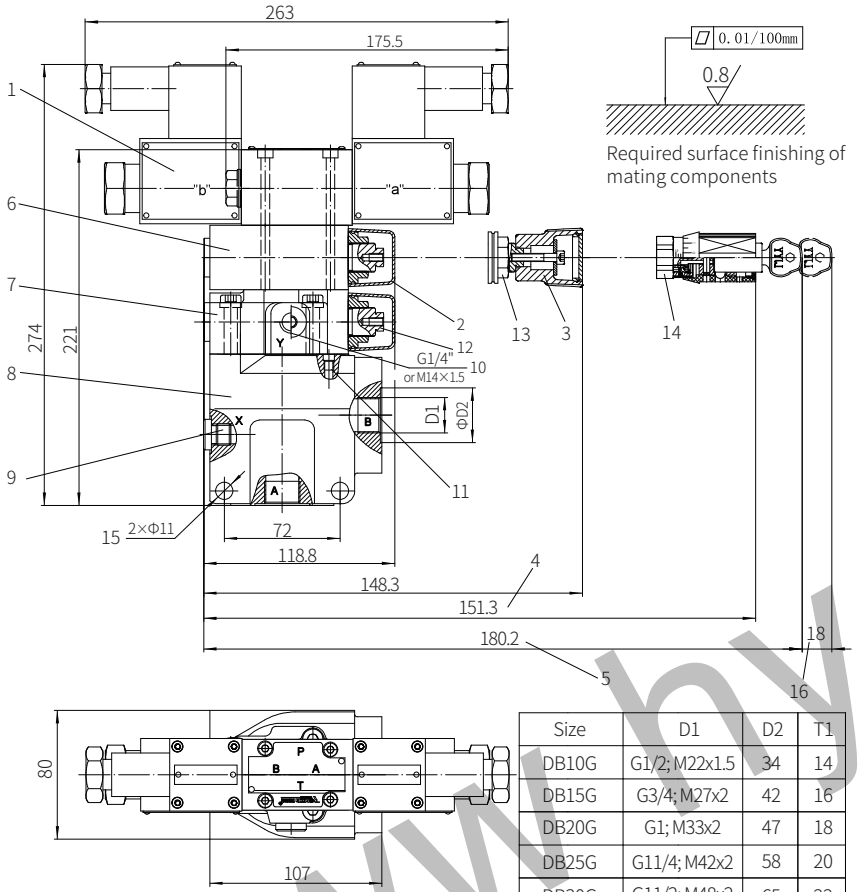
It must be ordered separately if connection subplate is needed.

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 (G11/4") ; G410/02 (M42x2)
G411/01 (G11/2") ; G411/02 (M48x2)

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



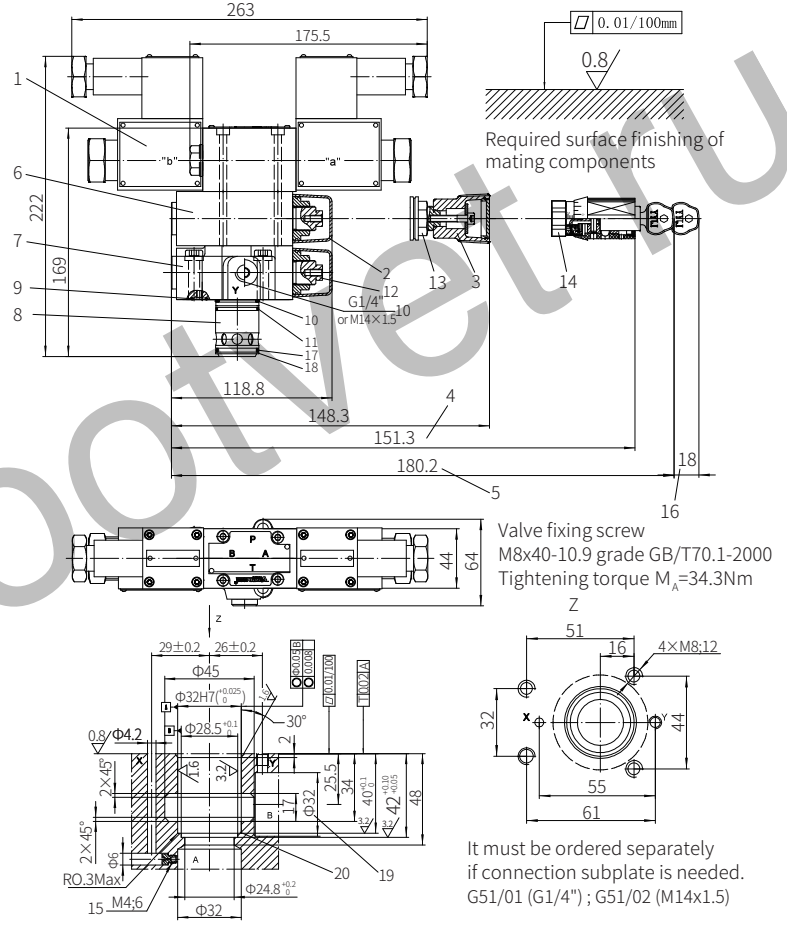
Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G11/4; M42x2	58	20
DB30G	G11/2; M48x2	65	22

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

Component size Size unit: mm

02

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 Φ32 hole can intersect Φ45 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

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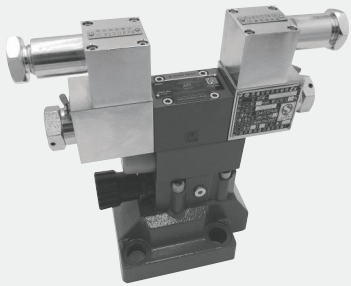
Explosion-proof Multistage Electro-hydraulic Pilot Relief Valve

Model: G-DB3U...-5X



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

Contents

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, 43/-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).

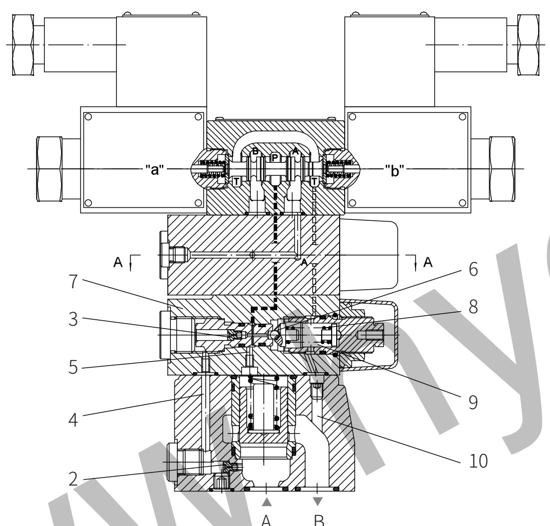
In this way, a differential pressure is formed on the main spool when the pressure oil flows through orifices(2 and 3) and it opens the main spool. The pressure oil flows from A to B at a set pressure.

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

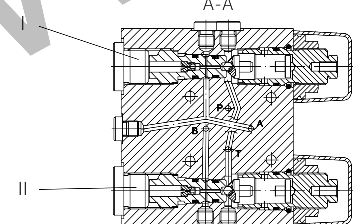
When solenoid "b" is energized, the pressure at port A is controlled by pilot valve I.

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).



A-A



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

Models and specifications

DB – – 5X / *

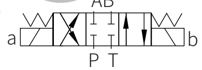
explosion-proof class I =G1
explosion-proof class II =G2

electro-hydraulic relief valve =No code
pilot valve with main valve spool assembly (plug-in) =C

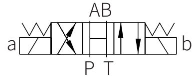
three-staged pressure regulation

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

subplate mounting =No code
threaded connection =G



=H



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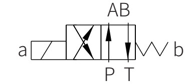


=D

adjusting element
rotary knob =1
internal hexagon screw with protective cap =2
lockable rotary knob with scale =3

more information in text

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

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

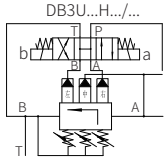
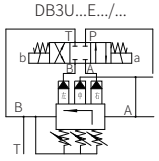
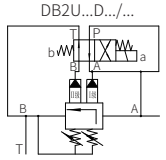
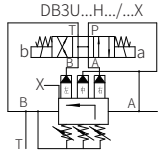
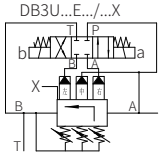
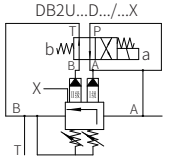
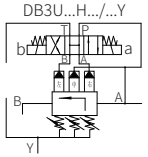
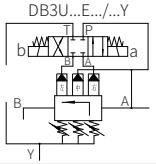
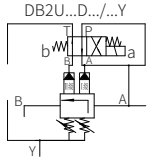
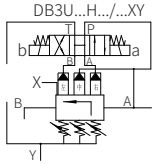
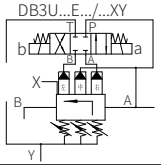
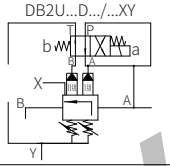
No code= pilot oil supply and drain internal
X= pilot oil supply external and drain internal
Y= pilot oil supply internal and drain external
XY= pilot oil supply and drain external

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

Functional symbols

Supply and drain internal	DB3U...H.../... 	DB3U...E.../... 	DB2U...D.../... 
Supply external and drain internal	DB3U...H.../...X 	DB3U...E.../...X 	DB2U...D.../...X 
Supply internal and drain external	DB3U...H.../...Y 	DB3U...E.../...Y 	DB2U...D.../...Y 
Supply and drain external	DB3U...H.../...XY 	DB3U...E.../...XY 	DB2U...D.../...XY 

Technical parameters

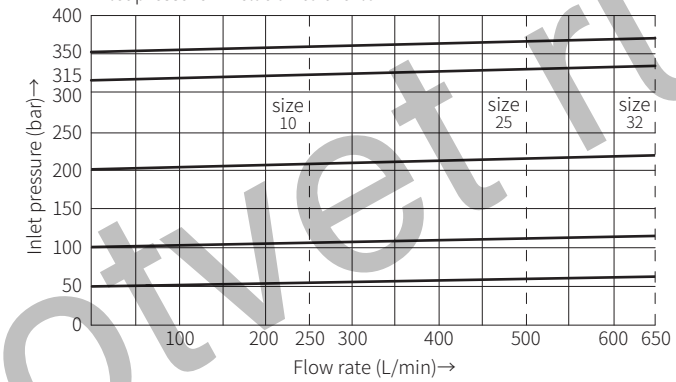
Size		10	15	20	25	30
Flow (L/min)	threaded connection valve	200		400		600
	subplate mounting valve	200	–	400	–	600
Working pressure	MPa	Port A, B, X to 35				
Port Y back pressure	MPa	to 31.5				
Minimum setting pressure	MPa	Related to flow, see characteristic curve				
Maximum setting pressure	MPa	35				
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

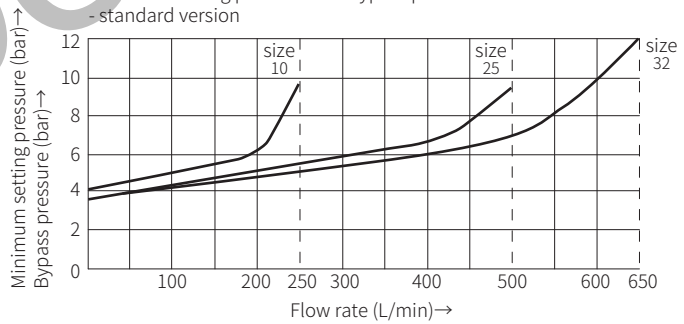
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

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.

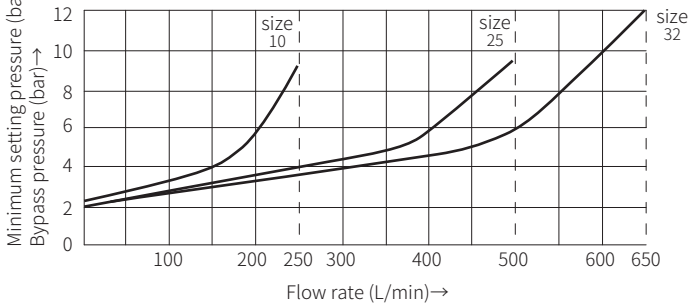
Inlet pressure in relation to the flow



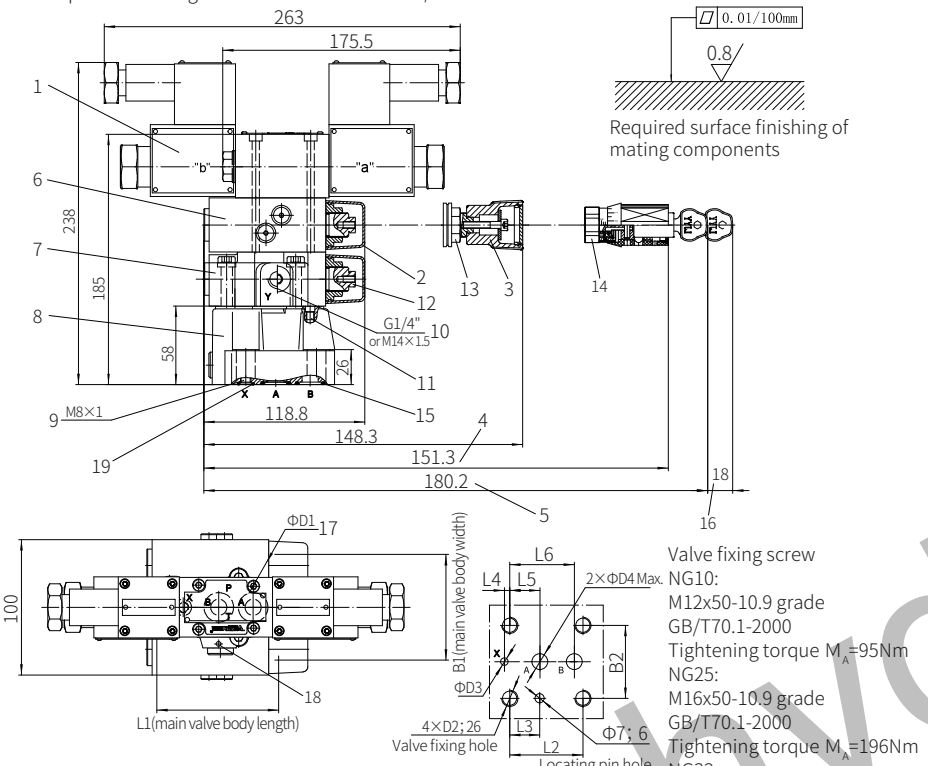
Minimum setting pressure and bypass pressure in relation to the flow - standard version



Minimum setting pressure and bypass pressure in relation to the flow - "U" version



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



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

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 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)

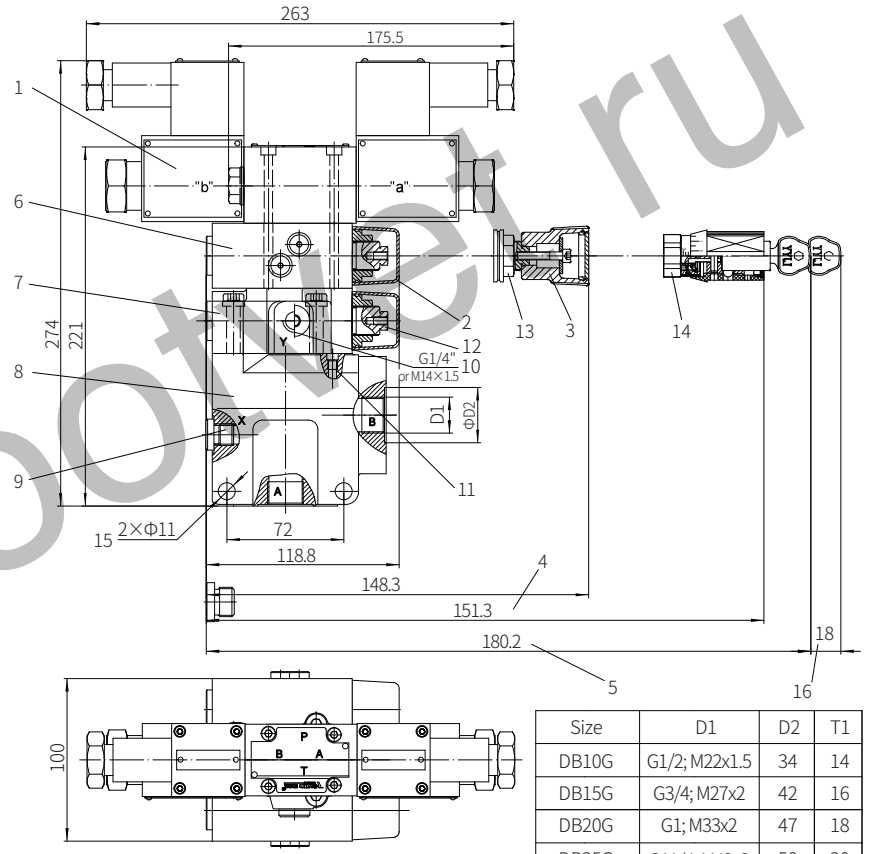
It must be ordered separately if connection subplate is needed.

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 (G11/4") ; G410/02 (M42x2)
G411/01 (G11/2") ; G411/02 (M48x2)

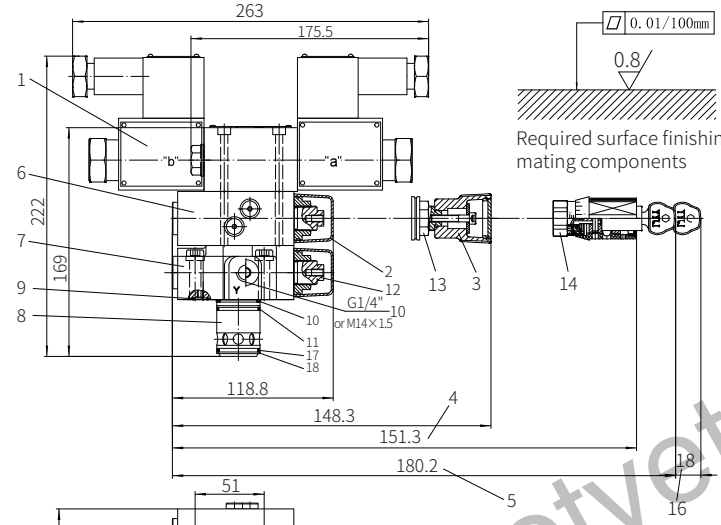
Threaded connection valve model G-DB3U...G...-5XJ/...

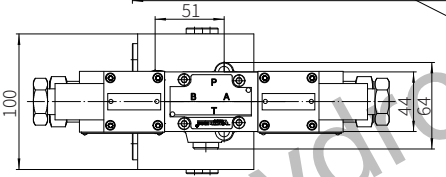


Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G11/4; M42x2	58	20
DB30G	G11/2; M48x2	65	22

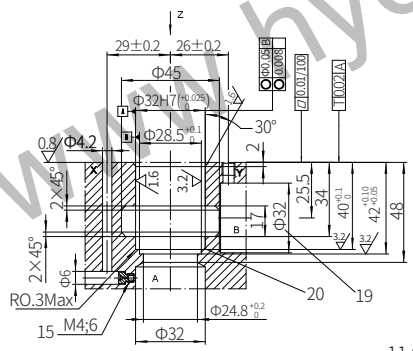
1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and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

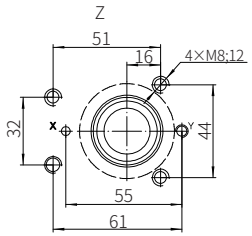
With (G-DBC3U10 or 30) or without (G-DBC3U)





Valve fixing screw
M8x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm



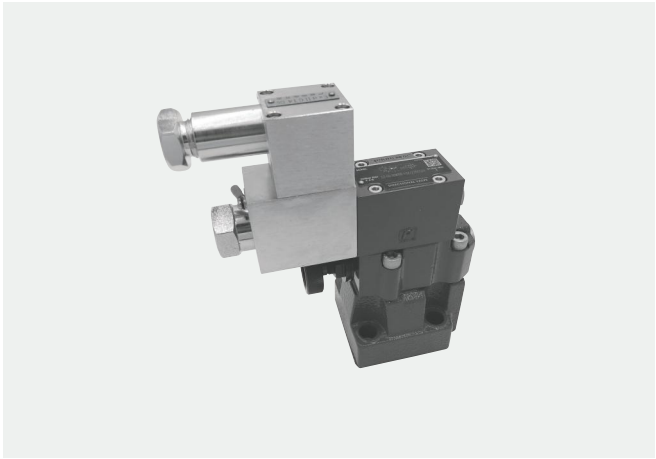


It must be ordered separately
if connection subplate is needed.
G51/01 (G1/4") ; G51/02 (M14x1.5)

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 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 Φ32 hole can intersect Φ45 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

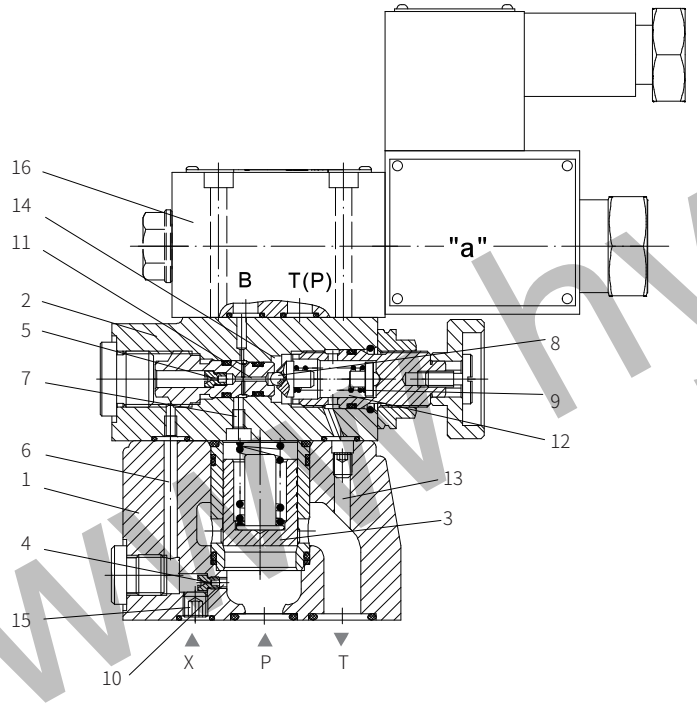
Contents

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/

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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...).

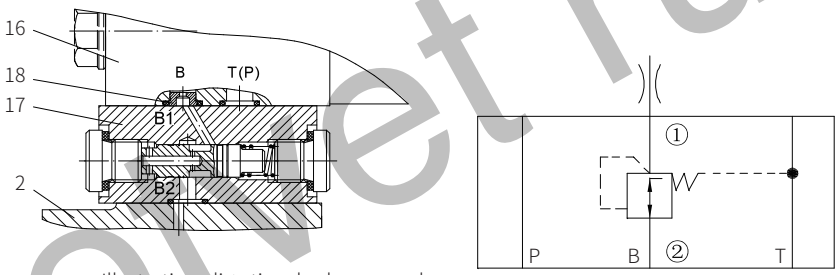

Illustration: directional valve opened

- 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.

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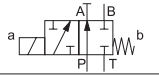
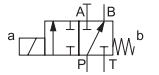
DB ___ ___ ___ ___ ___ ___ - 5X / ___

explosion-proof class I =G1
explosion-proof class II =G2

with directional valve =W

pilot operated valve (complete) =No code
pilot valve without main spool insert (do not enter size) =C
pilot valve with main spool insert (remark valve size 10 or 30) =C

size	Connection mode	
	subplate mounting "no code"	threaded connection "G"
10	=10	=10(G1/2)/M22x1.5
16		=15(G3/4)/M27x2
25	= 20	= 20(G1)/M33x2
25		= 25(G1 1/4)/M42x2
32	=30	=30(G1 1/2)/M48x2

	normally closed	=A
	normally open	=B

for subplate and multi-way mounting =No code
for threaded connection =G

adjustment element for pressure adjustment
rotary knob =1
inner hexagon screw with protective cap =2
lockable rotary knob with scale =3

50 to 59 series =5X
(50 to 59 series: installation and connection size unchanged)

pressure setting up to 50 bar =50
pressure setting up to 100 bar =100
pressure setting up to 200 bar =200
pressure setting up to 315 bar =315
pressure setting up to 350 bar =350

___ ___ / ___ ___ ___ ___ ___ *

more information in text

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

No code= G thread
2= metric thread
(G1/4)

R12= damping Φ1.2mm in port B of directional valve

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

C= with solenoid directional valve size 6

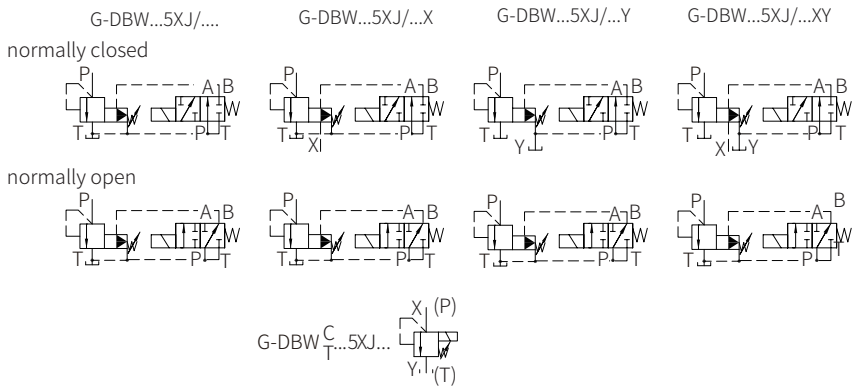
No code= without switching shock damping
S= with switching shock damping

No code= standard valve
U= minimum setting pressure, see characteristic curves

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

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		℃	-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.

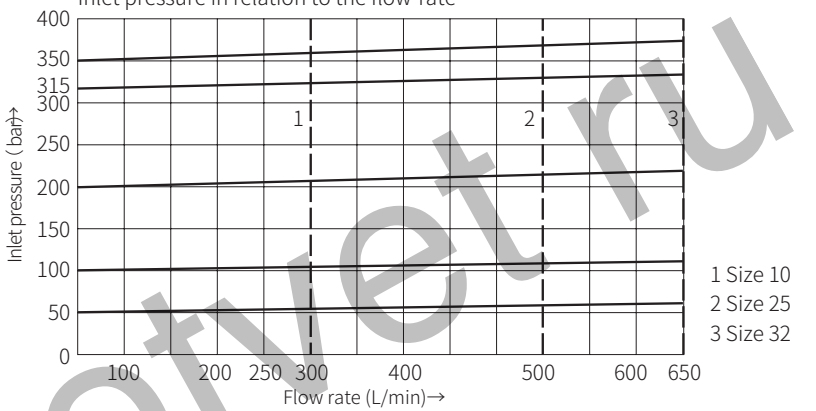
2) Only for FKM seal.

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.

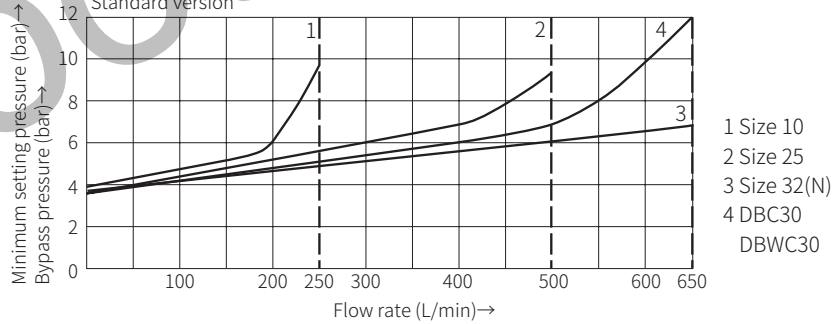
Characteristic curve

(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

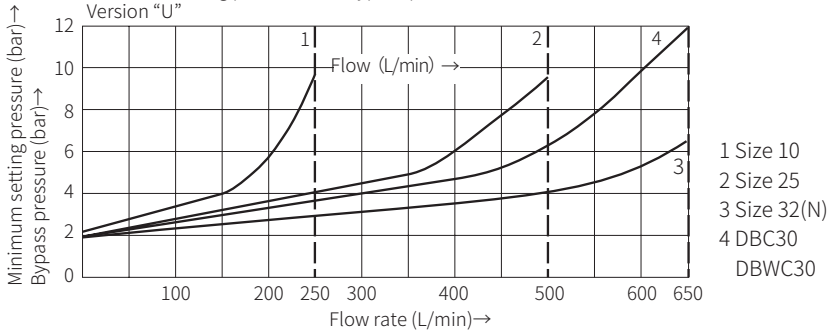
Inlet pressure in relation to the flow-rate



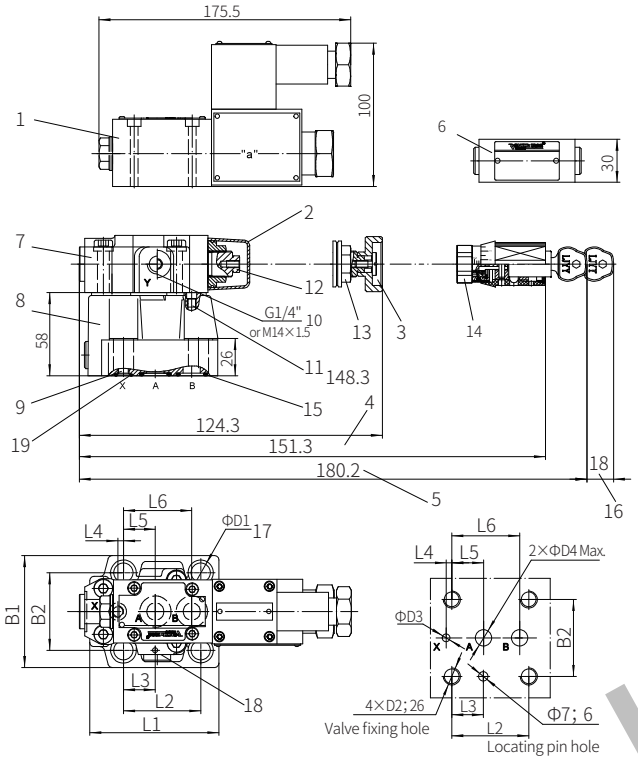
Minimum setting pressure and bypass pressure in relation to the flow-rate
Standard version



Minimum setting pressure and bypass pressure in relation to the flow-rate
Version “U”



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



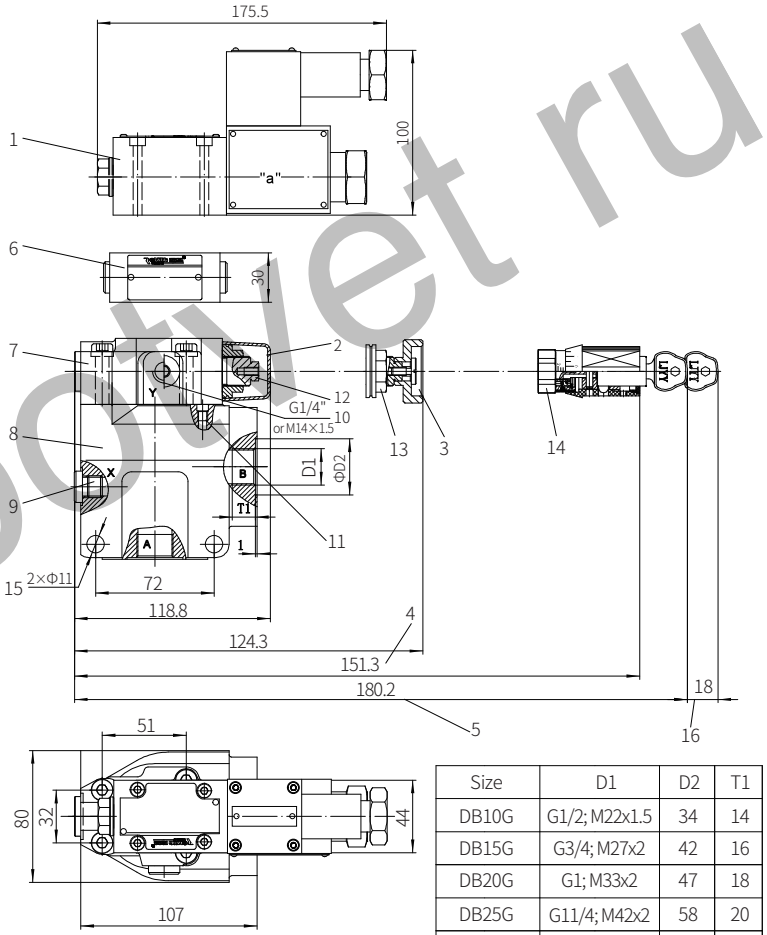
Valve fixing screw
NG10:
M12x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=95Nm
NG25:
M16x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=196Nm
NG32:
M18x50-10.9 grade
GB/T70.1-2000
Tightening torque M_A=260Nm

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 (G11/4") ; G410/02 (M42x2)
G411/01 (G11/2") ; G411/02 (M48x2)

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



Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G11/4; M42x2	58	20
DB30G	G11/2; M48x2	65	22

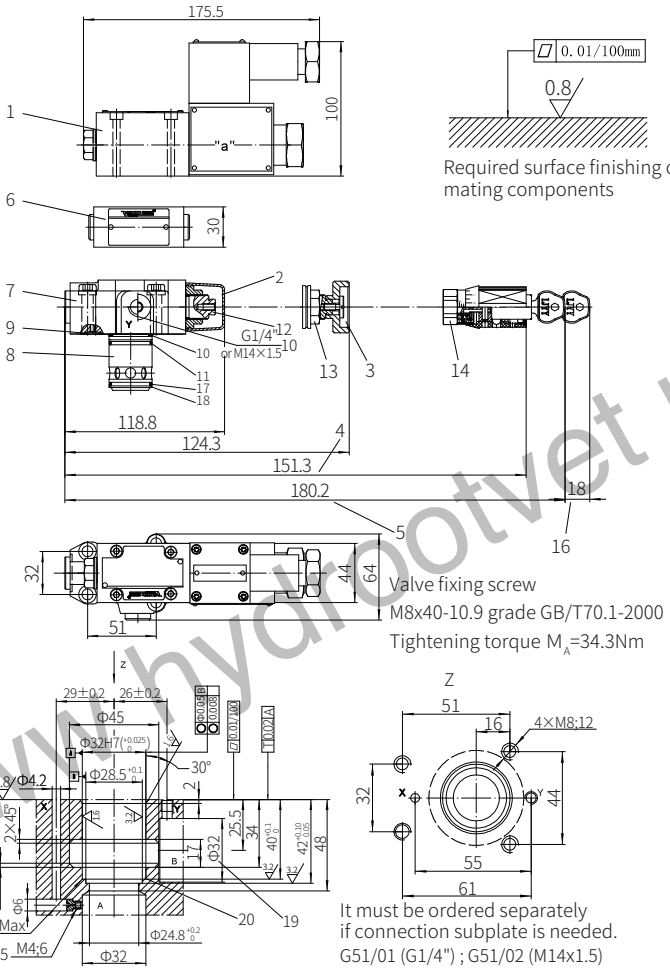
1 Solenoid valve
2 Adjustment form“2”
3 Adjustment form“1”
4 Adjustment form“3”
5 Adjustment form“7”
6 With switching shock damping valve, optional
7 Pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4"and M14x1.5 optional)
11 Omitted with internal 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

Component size

Size unit: mm

02

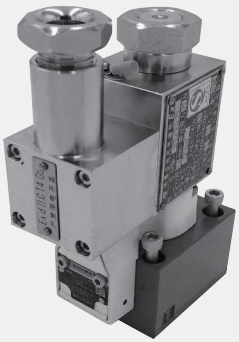
With(G-DBWC10 or 30) or without (G-DBWC)



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
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 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

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.

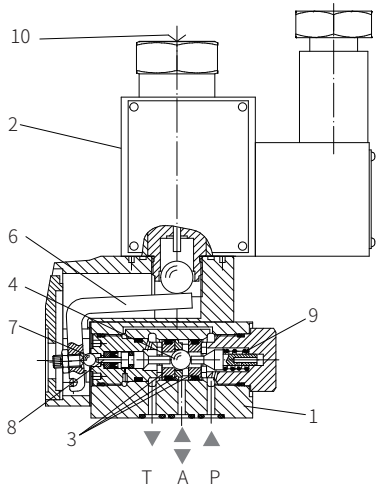
The valve is mainly composed of valve body (1), solenoid (2), hardened valve system (3) and ball (4) as the closing element.

Basic function:

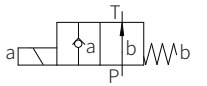
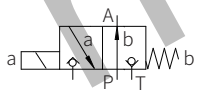
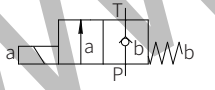
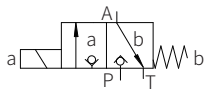
In the initial position, the spool (4) is pushed against the valve seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod which is sealed on both sides through the lever (6) and the ball (7). The chamber between the 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.



Model G-M-3SEW6U...XJ/

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

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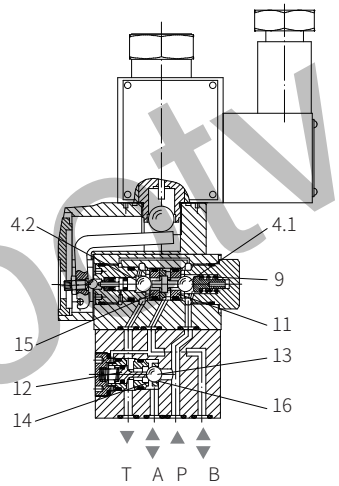
Function description, sectional drawing

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.

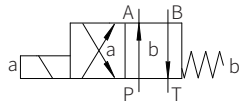
Switching position: After the solenoid is powered on, the oil port A and T are connected. In addition, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat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



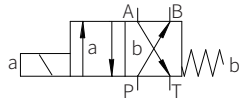
Model G-M-4SEW6Y...3XJ/

The seat valve with plus-1 plate as below:

Symbol "D"



Symbol "Y"



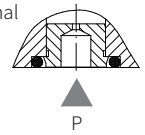
Cartridge throttle

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

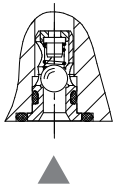
The throttle is inserted into the oil port P of the plus-1 plate.

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.

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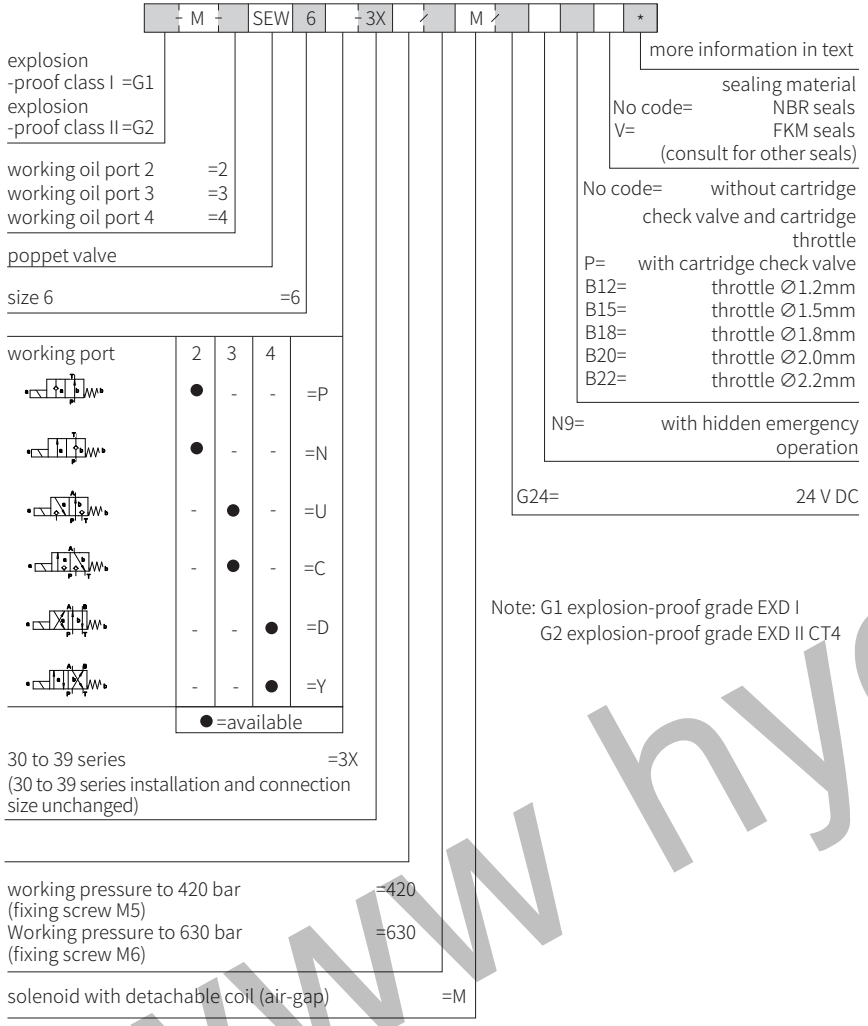


Note: G1 explosion-proof grade EXD I
G2 explosion-proof grade EXD II CT4

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)

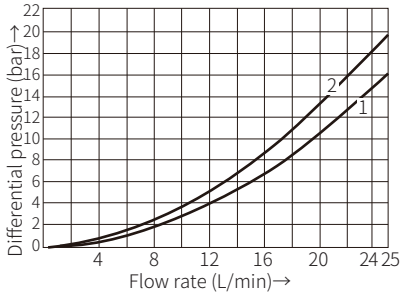
Pressure P bar	Flow q_v L/min	DC Solenoid					
		Functional symbols U, C, D, Y					
		t_{on} No tank pressure				t_{off}	
		U	C	D	Y	U/C	D/Y
140	25	25	30	25	30	10	10
280	25	25	30	25	30	10	10
320	25	25	35	25	35	10	10
420	25	25	35	25	35	10	10
500	25	25	40	25	40	10	10
600	25	25	40	25	40	10	10

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

Characteristic curve

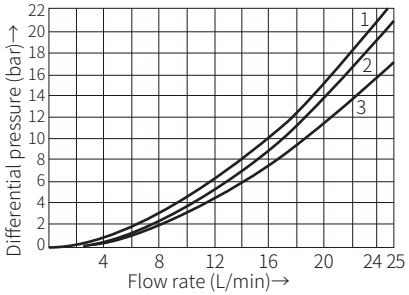
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V - characteristic curve
2/2-way poppet directional valve



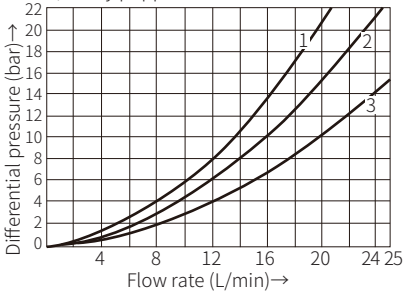
1 G-M-2SEW6N ..., P to T
2 G-M-2SEW6P ..., P to T

△p-q_V - characteristic curve
3/2-way poppet directional valve



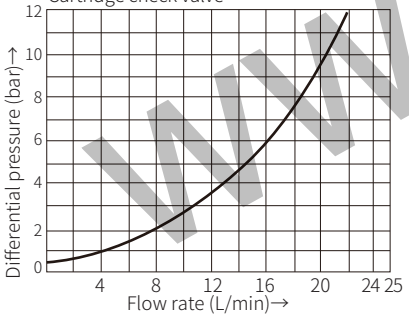
1 G-M-3SEW6 U/C ..., A to T
2 G-M-3SEW6 U ..., P to A
3 G-M-3SEW6 C ..., P to A

△p-q_V - characteristic curve
4/2-way poppet directional valve

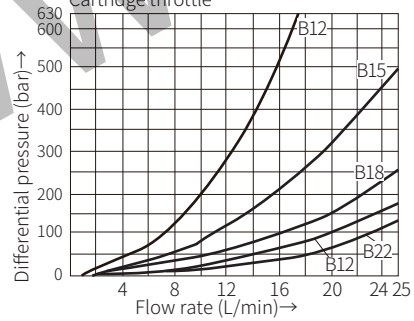


1 G-M-4SEW6 D/Y..., A to T
2 G-M-4SEW6 D/Y..., P to A
3 G-M-4SEW6 D/Y..., P to B, B to T

△p-q_V - characteristic curve
Cartridge check valve



△p-q_V - characteristic curve
Cartridge throttle



Characteristic limit

	Functional symbol	comment	Working pressure bar P	A	B	T	Flow L/min
Two-way circuit	"P"	Oil port pressure P≥T	420/630			100	25
	"N"		420/630			100	25
Three-way circuit	"U"	Oil port pressure P≥A≥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≥T		420/630		100	25
	"C"	Oil port pressure A≥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≥A≥B≥T	420/630	420/630	420/630	100	25
	"Y"	Double poppet valve (symbol "C") with plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	25

Note:

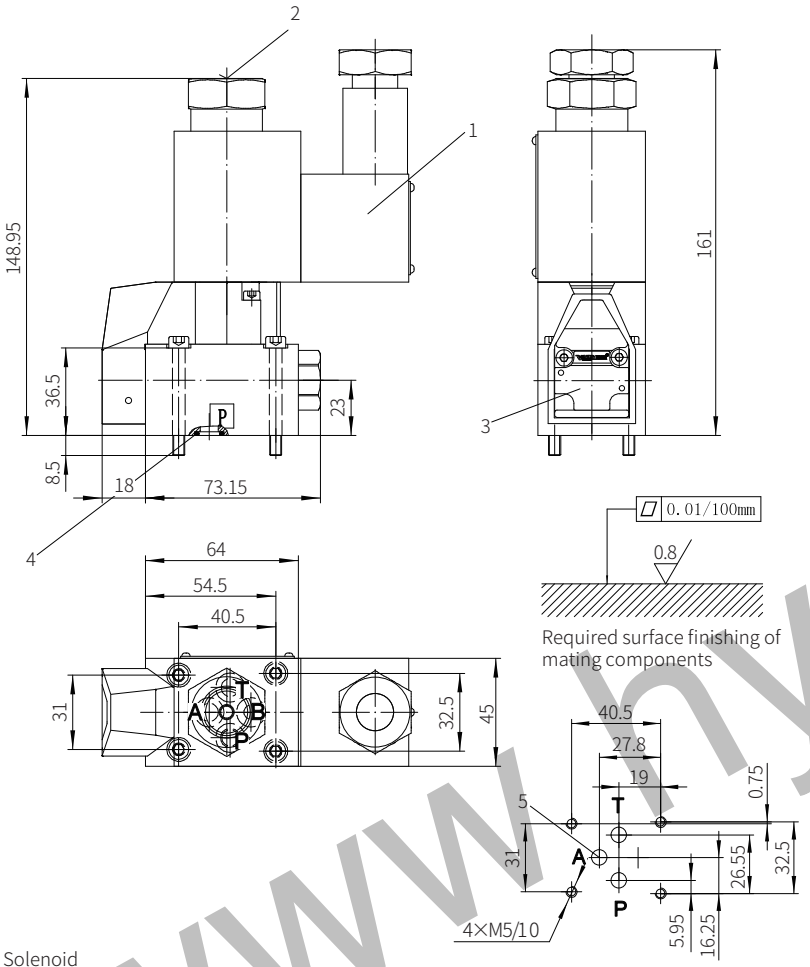
-In order to operate the valve safely or keep it in the switching position, the oil port pressure P≥A≥T (based on the structure).

-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: Pmin=8bar; Q>3 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.

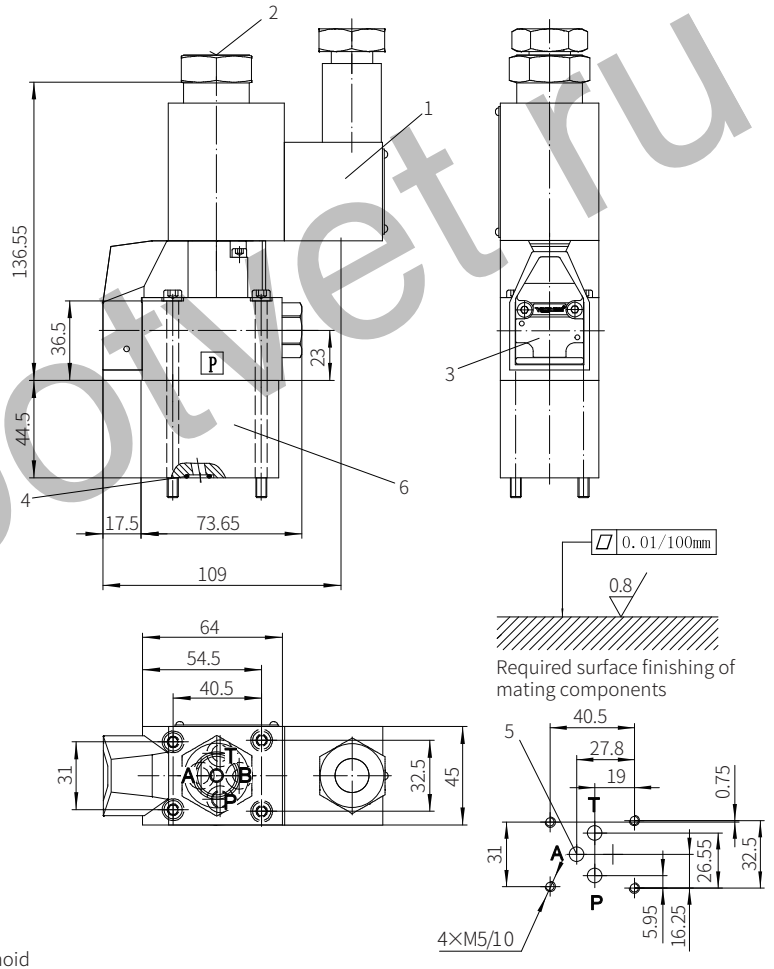
2/2 and 3/2-way poppet directional valve



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=7.8Nm
Version 630 bar
M6x45-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

4/2-way poppet directional valve

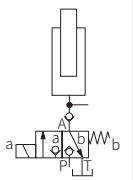
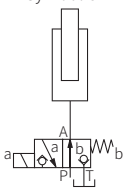
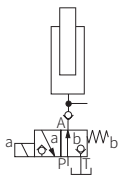
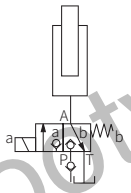
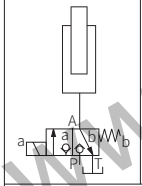
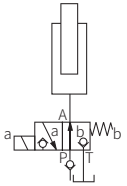
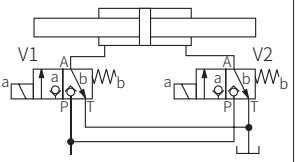
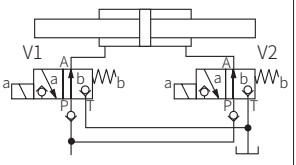


1 Solenoid
2 Hidden emergency button
3 Name plate
4 O-ring 10x2(for oil port P)
O-ring 9.25x1.78(for oil ports B, A, T)
5 Port A and B are blind holes for 2/2-way valve
Port B is a blind hole for 3/2-way valve
6 Plus-1 plate

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

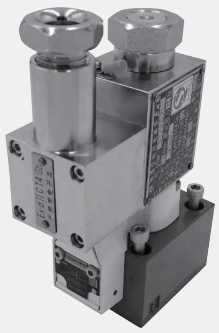
Application examples

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

Contents

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°

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:

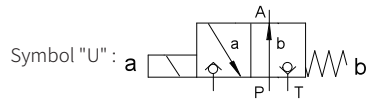
In the initial position, the spool (4) is pushed to the seat by the spring (9) and by the solenoid (2) when in the switching position. The force of the solenoid (2) acts on the actuating push rod (8) which is sealed on both sides through the lever (6) and the ball (7). The chamber between the two sealing 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:

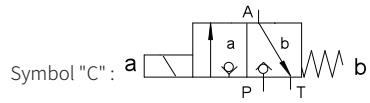
The 3/2-way poppet directional valve has negative cover function. Therefore, the port T must be always connected. That means the ports P-A-T are connected with each other during the switching process (from the starting of the opening of one valve seat to the closing of other valve seat). But this process is completed in a very short time, so it is irrelevant in almost all applications.

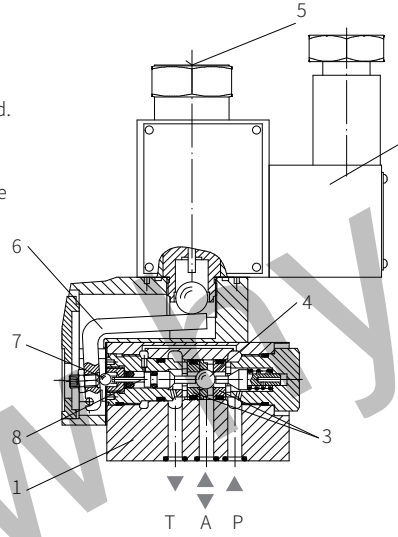
It must ensure that the maximum flow does not exceed the performance limit of the valve. If necessary, the cartridge throttle can be installed to limit flow.

Symbol "U" :



Symbol "C" :



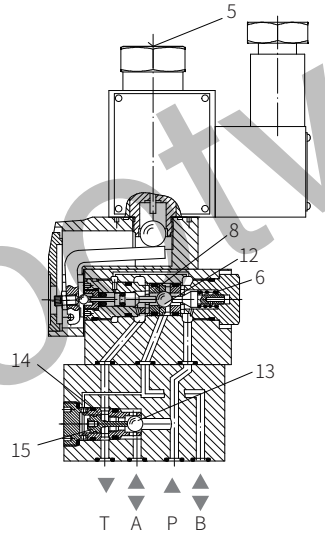


Model G-M-3SEW10U...1XJ/

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.

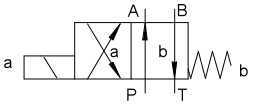
Switching position: After the solenoid is powered on, the oil port A and T are connected. In addition, the control line from the oil port A acts on the large area of the control piston (15) to unload to the tank. The pressure oil provided from the oil port P pushes the steel ball (13) to the valve seat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



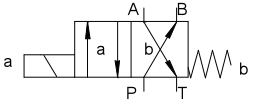
Model G-M-4SEW10D...1XJ/

The seat valve with plus-1 plate as below:

Symbol "D"



Symbol "Y"



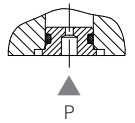
Cartridge throttle

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

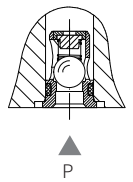
The throttle is inserted into the oil port P of the plus-1 plate.

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

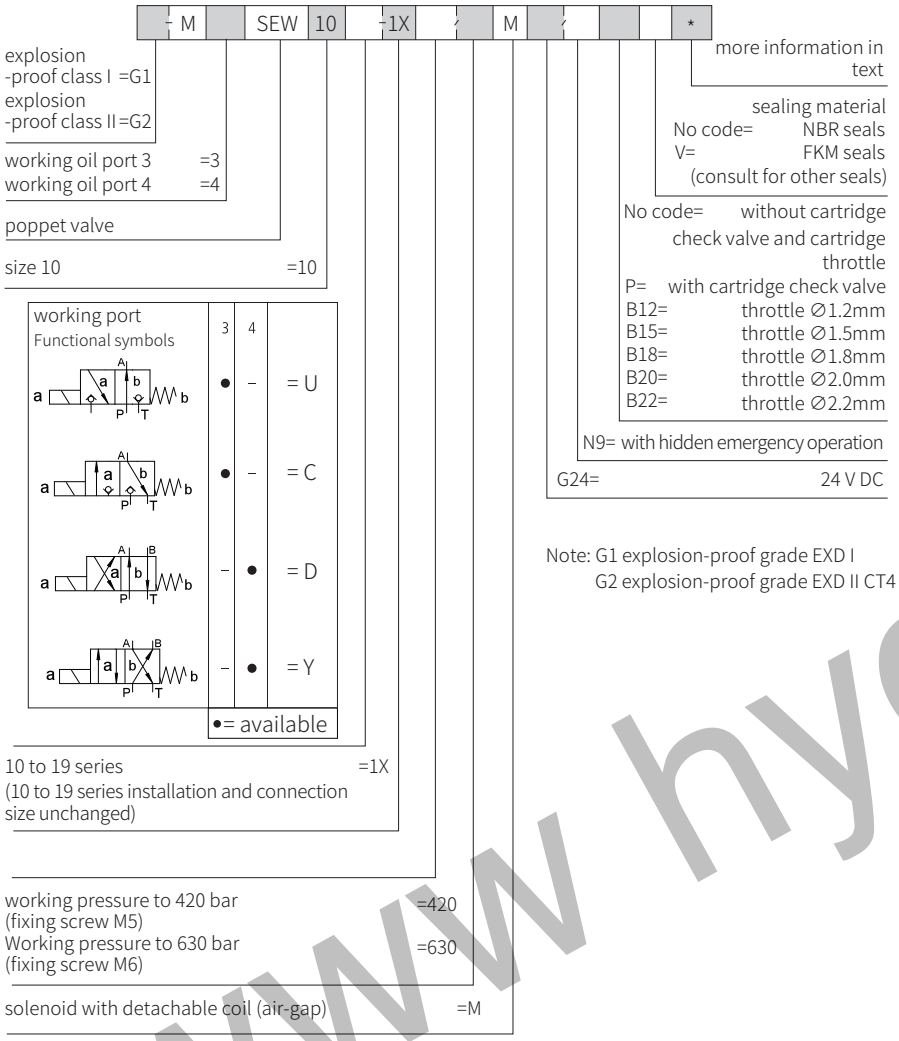
The cartridge check valve is inserted into the oil port P of the directional valve.



4/2-way poppet valve

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

Models and specifications



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

Technical parameters

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

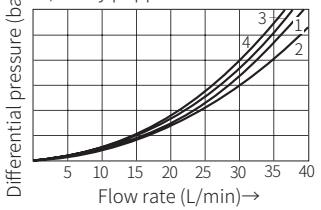
Switching time tms

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

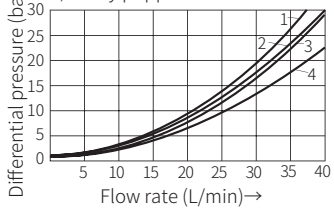
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

△p-q_V - characteristic curve
3/2-way poppet directional valve



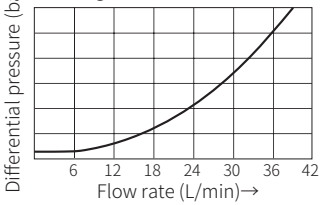
1 G-M-3SEW10 C..., P to A
2 G-M-3SEW10 C..., A to T
3 G-M-3SEW10 U..., P to A
4 G-M-3SEW10 U..., A to T

△p-q_V - characteristic curve
4/2-way poppet directional valve

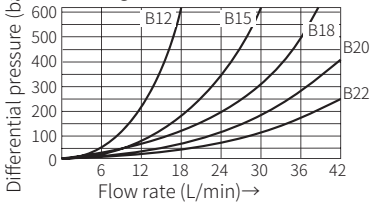


1 G-M-4SEW10 $^{D}_{Y}$ ..., A to T
2 G-M-4SEW10 $^{D}_{Y}$ ..., P to A
3 G-M-4SEW10 $^{D}_{Y}$ ..., P to B
4 G-M-4SEW10 $^{D}_{Y}$ ..., B to T

△p-q_V - characteristic curve
Cartridge check valve



△p-q_V - characteristic curve
Cartridge throttle



Characteristic limit

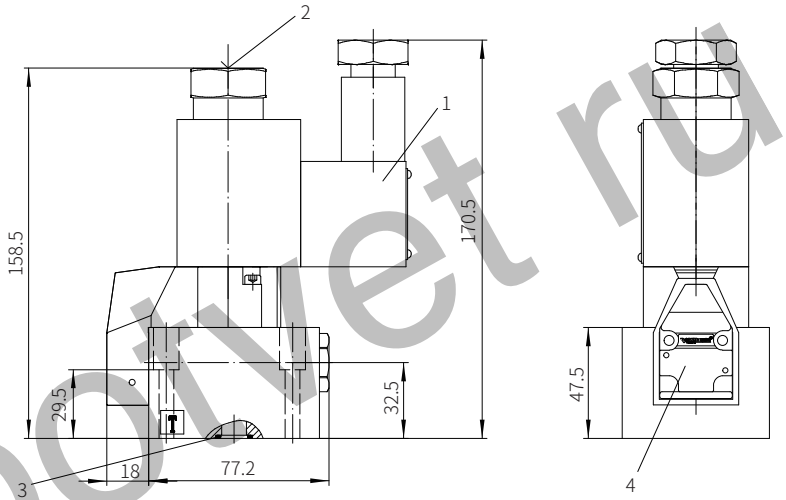
	Functional symbol	comment	Working pressure bar P	A	B	T	Flow L/min
Three-way circuit	"U"	Oil port pressure P≥A≥T	420/630	420/630		100	40
	"C"		420/630	420/630		100	40
Two way circuit (Only for unloading function)	"U"	Pressure must be maintained in port A before switching from the original position to the switching position. Oil port pressure A≥T		420/630		100	40
	"C"	Oil port pressure A≥T		420/630		100	40
Four-way circuit (flow only in the direction of arrow's)	"D"	Single poppet valve (symbol "U") with the plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	40
	"Y"	Double poppet valve (symbol "C") with the plus-1 plate P≥A≥B≥T	420/630	420/630	420/630	100	40

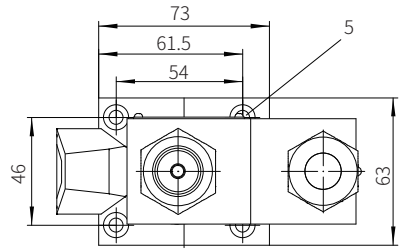
The characteristic limit is measured when the solenoid is at operating temperature, at 10% below the standard voltage and without tank preloading.

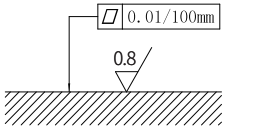
Component size

Size unit: mm

3/2-way poppet directional valve, 420bar



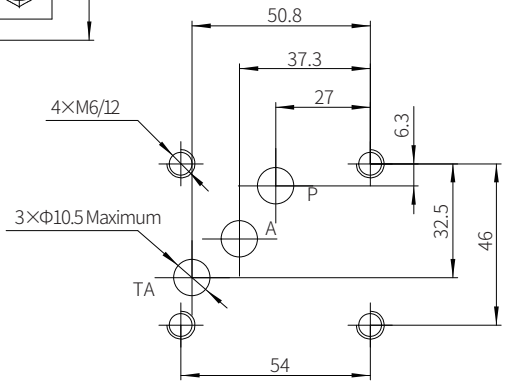




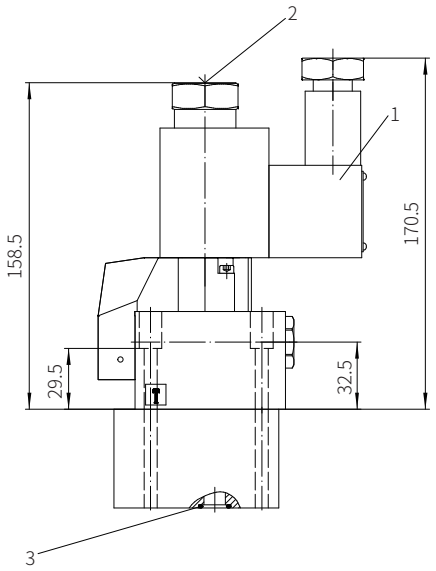
Required surface finishing of mating components

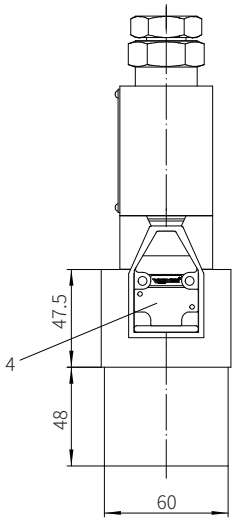
1 Solenoid
2 Hidden emergency button
3 O-ring 10x2(for oil ports A, B, T)
O-ring 14x1.78(for oil port P)
4 Name plate
5 Valve connecting holes

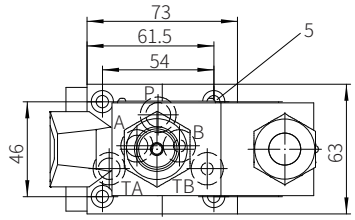
Valve fixing screw
M6x40-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

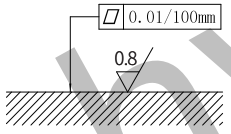


4/2-way poppet directional valve, 420bar

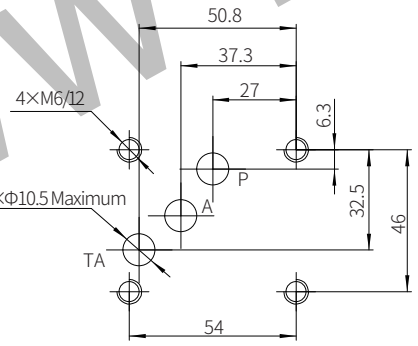








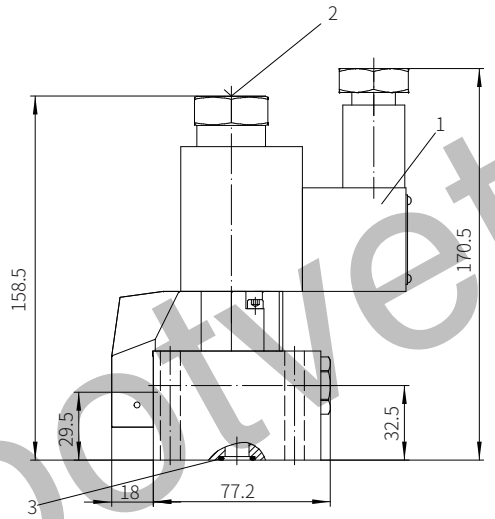
Required surface finishing of mating components

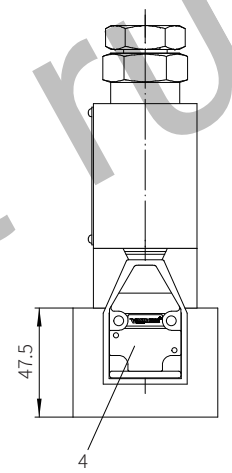


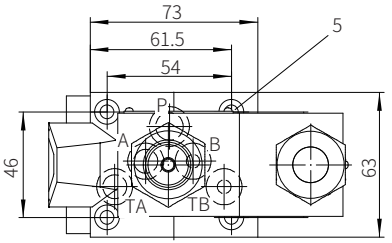
1 Solenoid
2 Hidden emergency button
3 O-ring 10x2(for oil ports A, B, T)
O-ring 14x1.78(for oil port P)
4 Name plate
5 Valve connecting holes

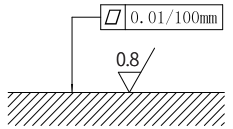
Valve fixing screw
M6x90-10.9 grade GB/T70.1-2000
Tightening torque M_A=13.7Nm

3/2-way poppet directional valve, 630bar

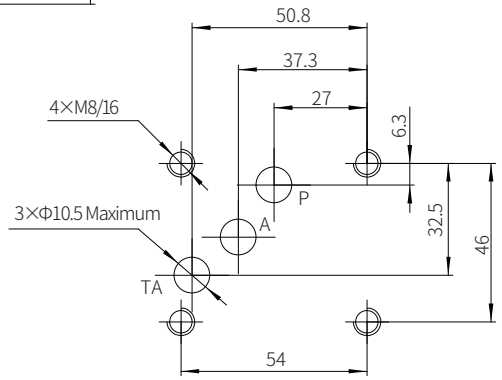








Required surface finishing of mating components

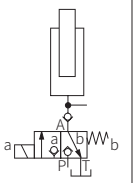
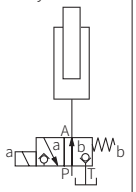
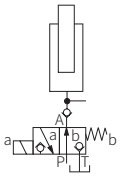
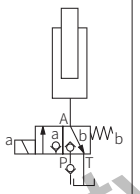
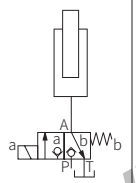
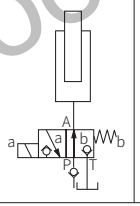
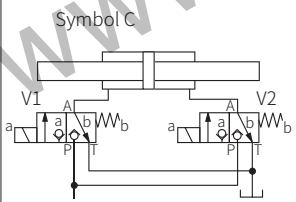
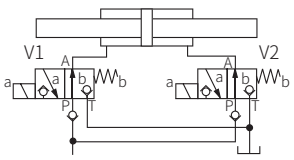


1 Solenoid
2 Hidden emergency button
3 O-ring 10x2(for oil ports A, B, T)
O-ring 14x1.78(for oil port P)
4 Name plate
5 Valve connecting holes

Valve fixing screw
M8x60-10.9 grade GB/T70.1-2000
Tightening torque M_A=34.3Nm

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!		