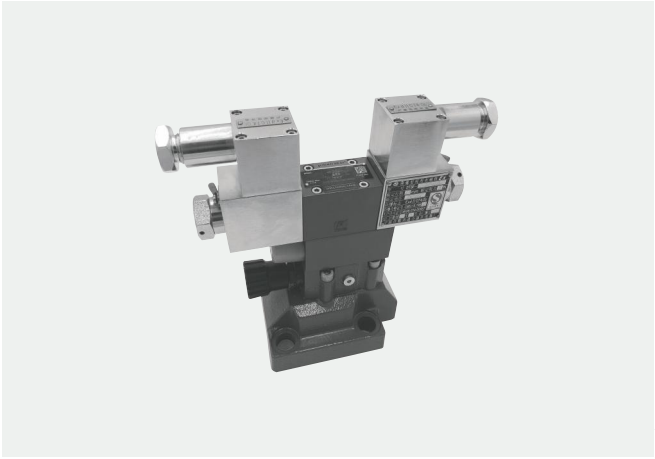
Explosion-proof Multistage Electro-hydraulic Pilot Relief Valve

Model: G-DB3U...-5X



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

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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).

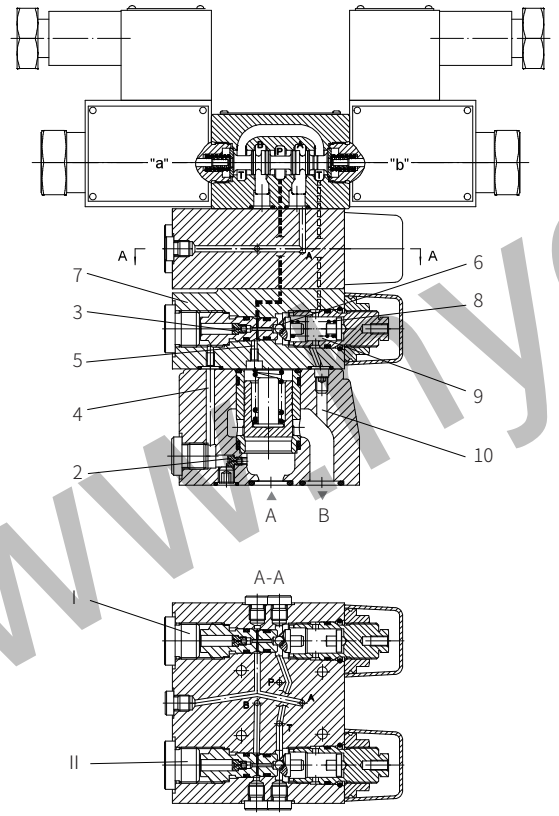
In this way, a differential pressure is formed on the main spool when the pressure oil flows through orifices(2 and 3) and it opens the main spool. The pressure oil flows from A to B at a set pressure.

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).



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

Models and specifications

DB ☐ ☐ ☐ ☐ – – 5X ☐ ☐ ☐ ☐ ☐ *

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

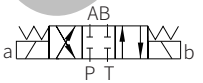
electro-hydraulic relief valve =No code

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

three-staged pressure regulation

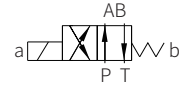
size	ordering code: subplate mounting	ordering code: threaded connection
10	10	10(G1/2") or M22x1.5
15	–	15 (G3/4") or M27x2
20	20	20(G1") or M33x2
25	–	25(G1 1/4") or M42x2
32	30	30(G1 1/2") or M48x2

subplate mounting =No code
threaded connection =G



=H

=E



=D

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

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

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

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

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

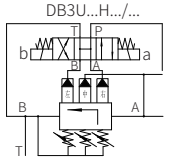
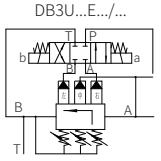
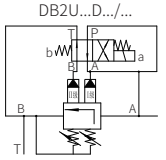
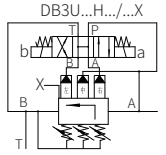
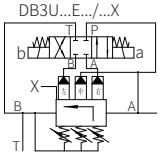
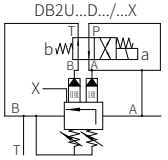
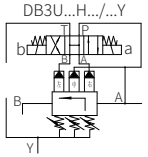
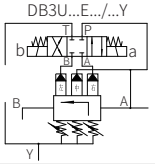
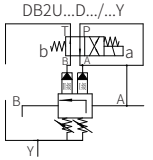
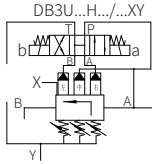
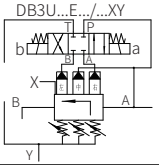
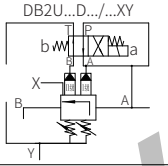
sealing material
No code= NBR seals
V= FKM seals
(consult for other seals)

more information in text

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

02

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

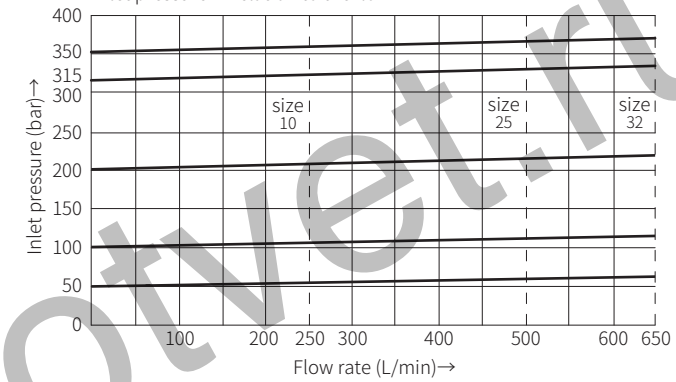
Size		10	15	20	25	30
Flow (L/min)	threaded connection valve	200		400		600
	subplate mounting valve	200	–	400	–	600
Working pressure	MPa	Port A, B, X to 35				
Port Y back pressure	MPa	to 31.5				
Minimum setting pressure	MPa	Related to flow, see characteristic curve				
Maximum setting pressure	MPa	35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

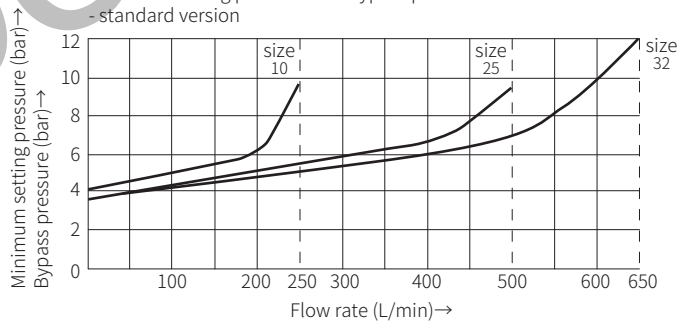
(Measured when using HLP46, ϑ_{oil}=40°C ± 5°C)

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.

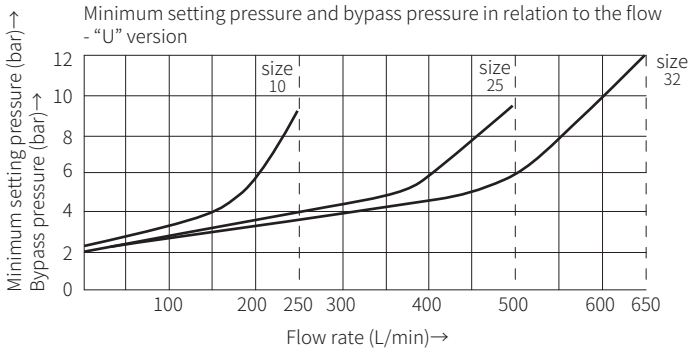
Inlet pressure in relation to the flow



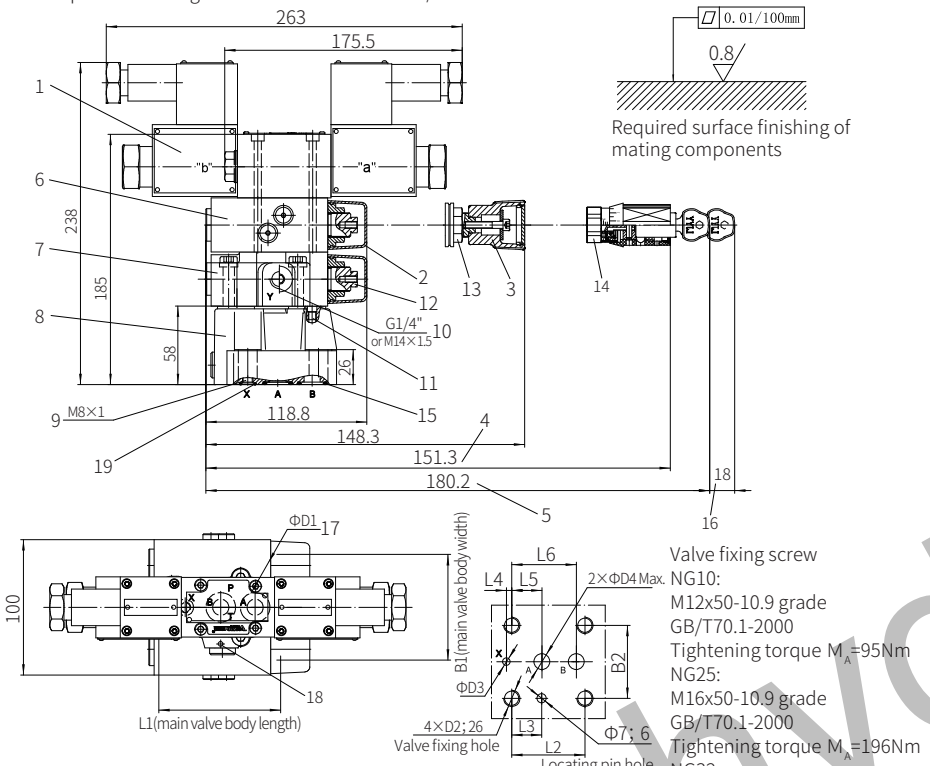
Minimum setting pressure and bypass pressure in relation to the flow - standard version



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)

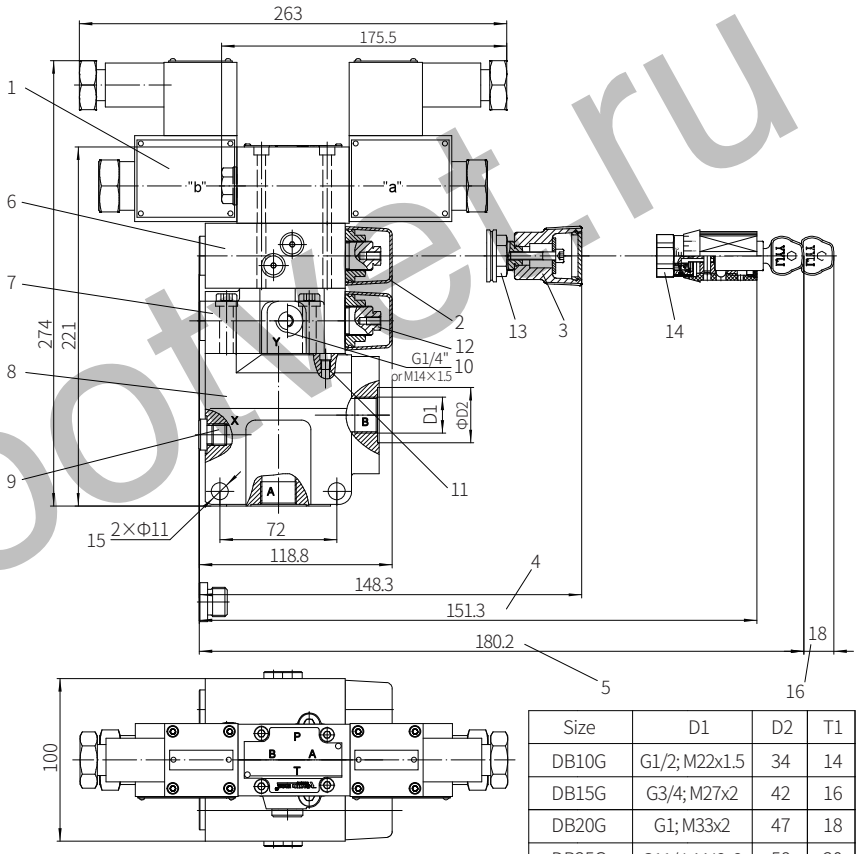
It must be ordered separately if connection subplate is needed.

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)

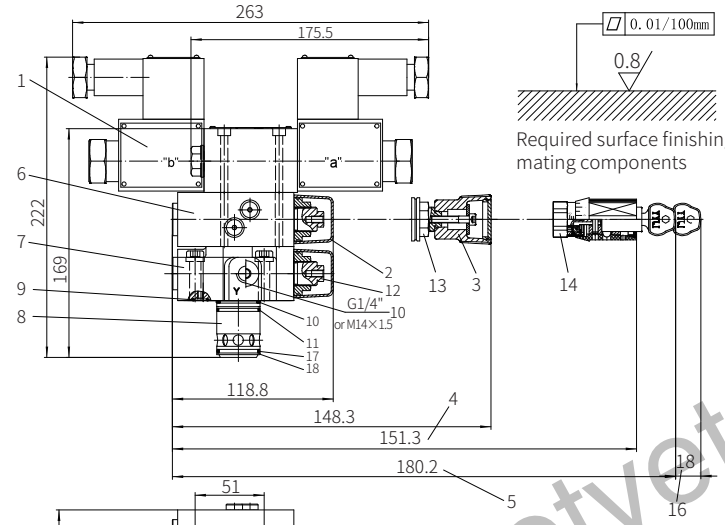
Threaded connection valve model G-DB3U...G...-5XJ/...

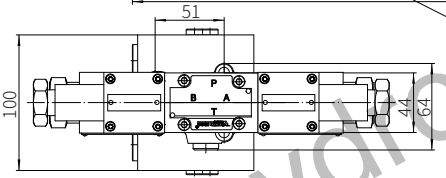


Size	D1	D2	T1
DB10G	G1/2; M22x1.5	34	14
DB15G	G3/4; M27x2	42	16
DB20G	G1; M33x2	47	18
DB25G	G11/4; M42x2	58	20
DB30G	G11/2; M48x2	65	22

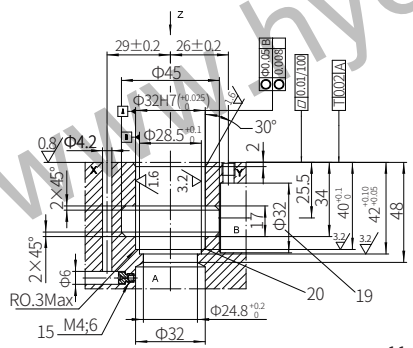
1 Solenoid directional valve (type H, type D, optional)
2 Adjustment form "2"
3 Adjustment form "1"
4 Adjustment form "3"
5 Adjustment form "7"
6 Secondary or tertiary pilot valve
7 Primary pilot valve
8 Main valve
9 Port X for external pilot oil supply
10 Port Y for external pilot oil drain (G1/4" and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

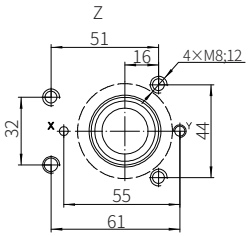
With (G-DBC3U10 or 30) or without (G-DBC3U)





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