3.2

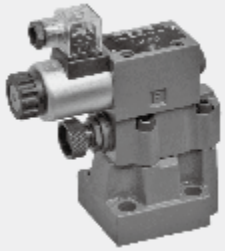
Pressure relief valve pilot operated

Type DB/DBW...L5X

Remote pressure adjusting valve

Type DBT

Sizes 10 to 32
up to 350 bar
up to 650 L/min



Contents

Features

- For sub-plate mounting
- Porting pattern to DIN 24 340 form E and ISO 6264
- For threaded connection and installation in manifolds
- 5 pressure ratings
- Unloading operation via a built-on solenoid directional valve
- 2 adjustment versions
  · Knob
  · Adjusting bolt with protective cap
- Optional switching shock damping (Only for DBW)

Function and configuration

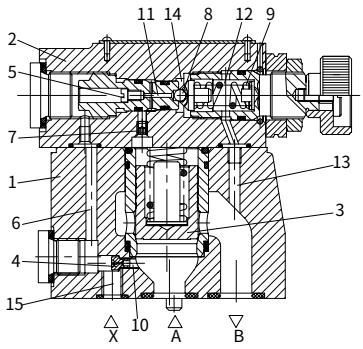
Types DB and DBW pressure valves are pilot operated pressure relief valves, used to limit (DB) or limit and unload (DBW) pressure via solenoid operation. The pressure relief valves consist of main valve (1) with main spool cartridge (3) and pilot operated valve (2) with pressure adjustment elements.

· Type DB pressure relief valves

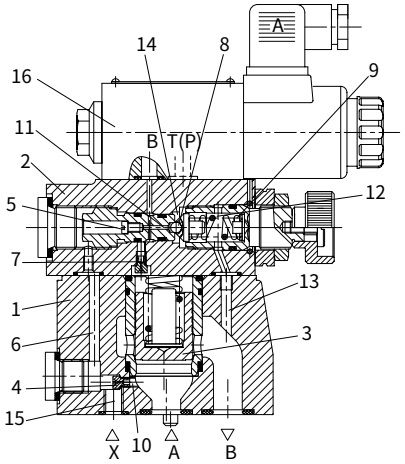
The pressure of channel A acts on the main spool (3), meanwhile, pressure is applied via control line (6) and (7) with orifice (4) and (5) on the spring loaded side of the main spool (3) and on the ball (8) in the pilot operated valve(2). If the pressure in channel A rises excess the setting value at the spring (9), the ball (8) opens against the spring (9). As for the internal control forms, signal is given by control oil (10) and (6) supplied by channel A. The oil from the spring loaded side of the main spool (3), via control line (7), orifice(11), and ball (8), then flows into spring chamber (12). External drain - type DB...L5X...Y, oil flows via control line(14) into the tank. In virtue of the orifice (4) and (5), the pressure drop arises at the main spool (3), and the connection from port A to port B is open while theoperational pressure setting maintained stable. The pressure relief valve may unload or shift the different pressure (second rated pressure value) in virtue of external control port X (15).

· Type DBW pressure relief valves

The function of pressure relief valve type DBW is the same with pressure relief valve type DB, the difference is that valve type DBW operates unloading via a built-on directional valve(16).



Type DB pressure relief valves



Type DBW pressure relief valves

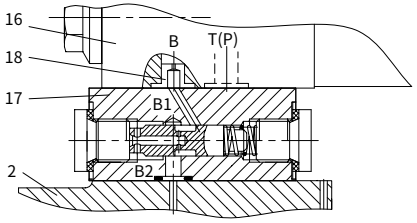
Function and configuration

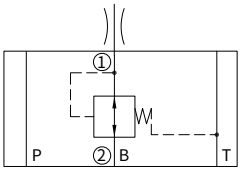
· Pressure relief valves with switching shock damping (sandwich) , type DBW../..S..R12

Switching shock damping (17), the connection from B2 to B1 opens with delay to avoid peak pressure spikes and decompression in the return line. It is fitted between pilot valve (2) and the directional valve (16).

The relief degree (decompression impact) is determined by the size of the orifice (18).

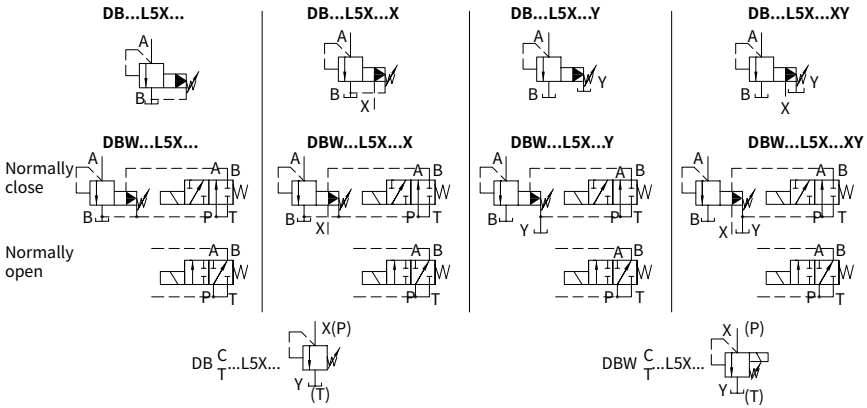
Orifice Ø1.2mm is recommended. (ordering detail:..R12 ..).





Indication: the directional valve is open

Symbols



Technical data

Fixing position				Optional					
Weight				DB...10	DB...15	DB...20	DB...25	DB...30	
	Sub-plate mounting	DB	kg	Approx.3	-	Approx.3.9	-	Approx.5.3	
		DBW	kg	Approx.4.5	-	Approx.5.4	-	Approx.6.8	
		DBC	kg	Approx.1.2 (Type DBWC add 1.5)kg					
		DBC10 or 30	kg	Approx.1.5 (Type DBWC10 and 30 add 1.5)kg					
	Threaded connection	DB..G..	kg	Approx.5.3	Approx.5.2	Approx.5.1	Approx.5.9	Approx.5.8	
		DBW..G..	kg	Approx.6.8	Approx.6.7	Approx.6.6	Approx.7.4	Approx.7.3	
	Switching shock damping		kg	Approx.0.6					
Techinical parameters of directional valve				Refer to the solenoid valvetype WE6,normally close use 3WE6A9,normally open use3WE6B9					
Fluid				Mineral oil - suitable for NRB and FRMseal					
				phosphate ester-suitable for FKM seal					
Fluid temperature range			°C	-30 to +80 (NRB seal)					
				-20 to +80 (FKM seal)					
viscosity range			mm^2/s	10 to 800					
Degree of contamination				Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406					
Max. operating pressure	Port A,B,X,P		bar	350					
	Port T (DB)		bar	315					
Max. back pressure	Port Y	DB	bar	315					
	Port Y or T	DBW	bar	AC up to 160, DC up to 210					
Max. setting pressure			bar	50;100;200;315;350					
Min. setting pressure			bar	Interrelated with Q(refer to the curve)					
Sizes				10	15	20	25	30	
Max. flow-rate	sub-plate mounting		L/min	250	-	500	-	650	
	threaded connection		L/min	250	500	500	500	650	

Ordering code

Without directional valve= No code
With directional valve=W

Pressure relief valve, pilot operated = No code
Pilot operated valve = C
(without main spool cartridge, no mark for nom. size)
Pilot operated valve with main spool cartridge = C
(marked with size 10 or 30)
Remote pressure adjusting valve =T [1]
(no mark for nom. size)

Nominal size	Connection mode	
	sub-plate mounting	Threaded connection
	Marked	
10	=10	=10
15		=15
20	=20	=20
25		=25
32	=30	=30

For DBW:
Normally closed =A
(load breakaway, unload electrified)
Normally open =B
(contrary to the above)

Sub-plate mounting = -
Threaded connection = G

Rotary Knob =1
Adjusting bolt with protective cap =2

Series L50 to L59 =L5X
(L50 to L59: unchanged installation and connection dimensions)

1) DBT/DBWT are the same as DBC/DBWC, except that the small hole against the main valve hole is plugged.

5 = Pressure adjustable up to 50 bar
10 = Pressure adjustable up to 100 bar
20 = Pressure adjustable up to 200 bar
31.5 = Pressure adjustable up to 315 bar
35 = Pressure adjustable up to 350 bar

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

No code= Standard version
U = Valve for lower opening pressure
(not for version without main spool cartridge and not suitable for 350bar)

No code = Without switching shock damping
S = With switching shock damping
(only with type DBW)

Only DBW:
6E= With high performance directional spool valve

Only DBW:
G24 = 24V DC
W110R = Plug rectification 110V
W220 = 220V AC
W220R = Plug rectification 220V
(Other voltage refer to type WE6)

Only DBW:
N = With hand override

Only DBW:
Z4 = Electrical plug without lamp
Z5L = Electrical plug with lamp

Only DBW../...S... :
R12= orifice Ø1.2 mm in port B of directional valve

Only for port Y1 in pilot valve of threaded connection or sub-plate mounting
No code = Inch thread
2= Metric thread

No code = NBR seals
V = FKM seals

Further details in clear text

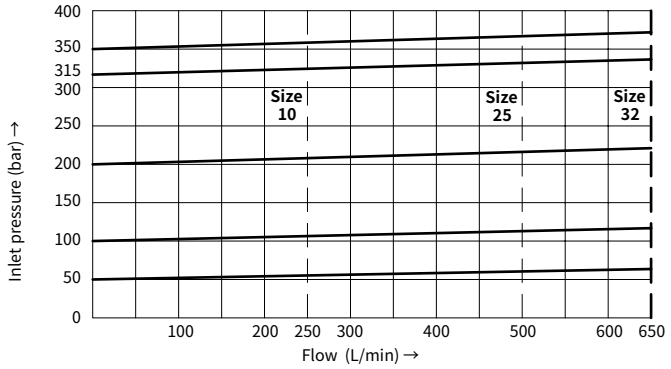
Notes:

1. The pilot relief valves may have lower starting pressure and higher flow, but have higher internal leakage, If lower leakage is required, such as safety valve, it is recommended to choose direct operated pressure relief valves, DBD type.
2. The integrative performance of pilot relief valves with 'U' is not good as the standard version, except lower opening pressure.

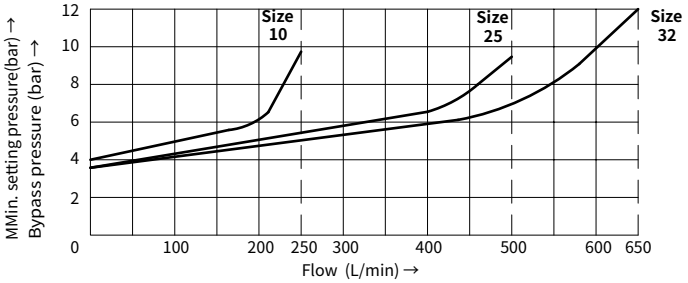
Performance curves (Measured at ϑ_{oil} =40°C ±5°C , using HLP 46)

The characteristic curves are measured with external pilot oil drain at zero pressure. With internal pilot oil drain, the inlet pressure at port B should be added to the value presented as curves.

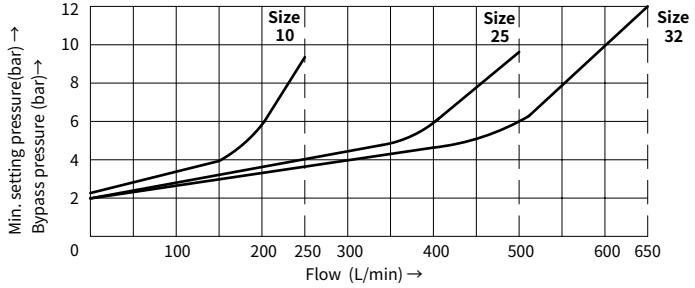
Inlet pressure in relation to the flow-rate



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



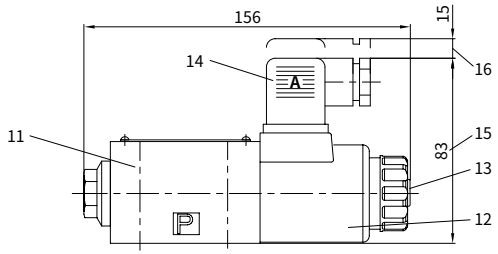
Minimum setting pressure and bypass pressure in relation to the flow-rate!
·Version "U"



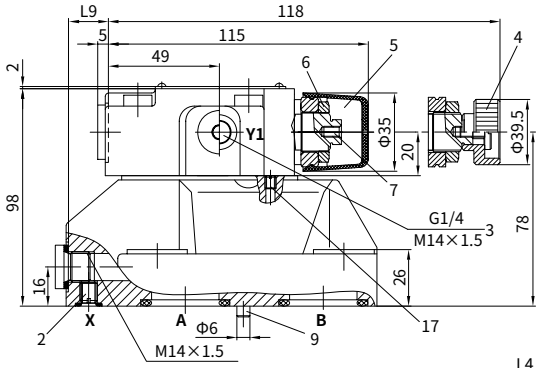
Unit dimensions

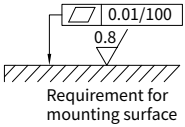
(Dimensions in mm)

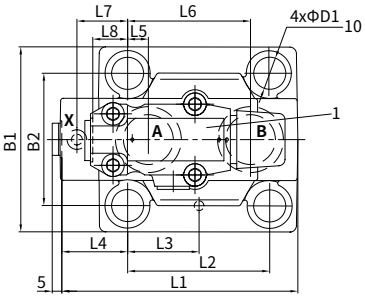
·Sub-plate mounting

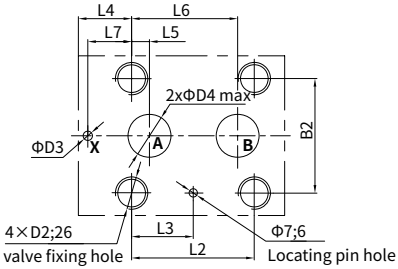


Valve fixing screws:
DB/DBW10:
GB/T 70.1-M12×50-10.9
Internal hexagon screw
Tighten torque M_A=130Nm
DB/DBW20:
GB/T 70.1-M16×50-10.9
Internal hexagon screw
Tighten torque M_A=310Nm
DB/DBW30:
GB/T 70.1-M18×50-10.9
Internal hexagon screw
Tighten torque M_A=430Nm









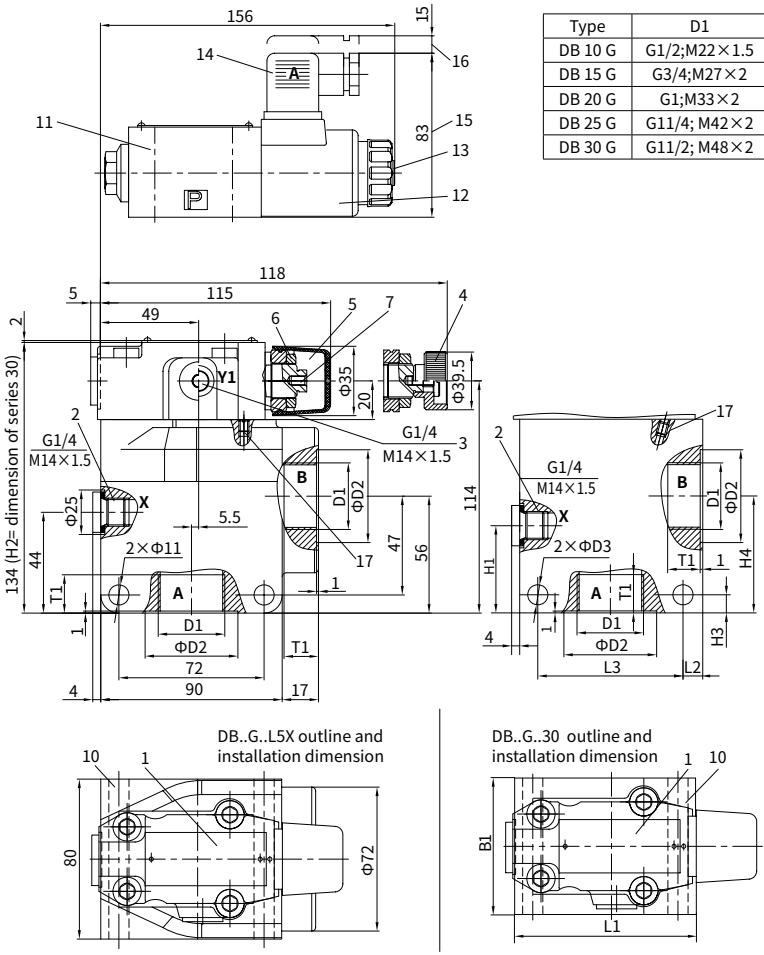
Dimensions of
mounting surface

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	B1	B2	D1	D2	D3	D4	O-ring(A, B)	O-ring(X)
DB/DBW 10	91	53.8	22.1	27.5	22.1	47.5	0	25.5	2	78	53.8	14	M12	6	12	17.12×2.62	9.25×1.78
DB/DBW 20	116	66.7	33.4	33.3	11.1	55.6	23.8	22.8	10.5	100	70	18	M16	6	22	28.17×3.53	9.25×1.78
DB/DBW 30	147.5	88.9	44.5	41	12.7	76.2	31.8	20	21	115	82.6	20	M18	7	30	34.52×3.53	9.25×1.78

Unit dimensions

(Dimensions in mm)

·Threaded connection



Type	D1	D2	T1
DB 10 G	G1/2;M22×1.5	34	14
DB 15 G	G3/4;M27×2	42	16
DB 20 G	G1;M33×2	47	18
DB 25 G	G11/4; M42×2	58	20
DB 30 G	G11/2; M48×2	65	22

Note:
On threaded connection valve, series L5X and series 30 have different connection dimensions. If series 30 valves need to be replaced by series L5X ones, the pitch of installation holes and the position of external tapping shall be changed.

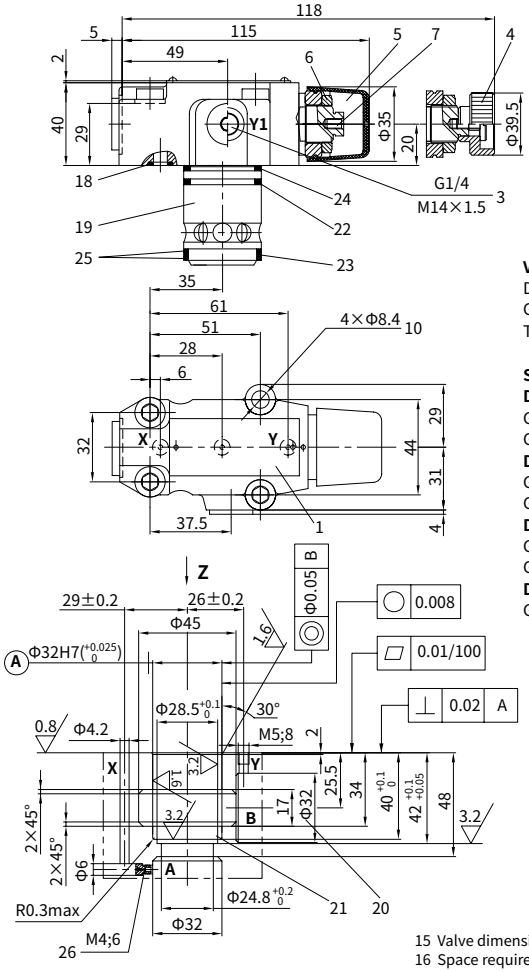
Outline and installation dimension of series 30 threaded connection valve:

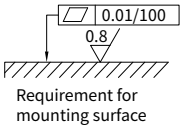
Type	B1	D3	H1	H2	H3	H4	L1	L2	L3
DB 10 G	63	9	27	125	10	62	85	14	62
DB 15 G									
DB 20 G						57			
DB 25 G	70	11	42	138	13	66	100	18	72
DB 30 G									

Unit dimensions

(Dimensions in mm)

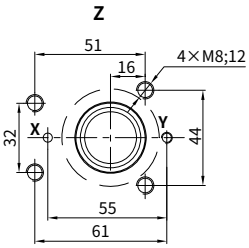
·With main spool valve (DBC10 or 30) or without main spool valve (DBC, DBT)





Valve fixing screws:
DBC/DBWC and DBC30/DBWC30, DBT/DBWT:
GB/T 70.1-M8×40-10.9 Internal hexagon screw
Tighten torque M_A=37Nm

Sub-plate(must be ordered separately):
DB/DBW10:
G 545/01(G3/8), G 545/02(M18×1.5)
G 546/01(G1/2), G 546/02(M122×1.5)
DB/DBW20:
G 408/01(G3/4), G 408/02(M27×2)
G 409/01(G1), G 409/02(M33×2)
DB/DBW30:
G 410/01(G1 ¼), G 410/02(M42×2)
G 411/01(G1 ½), G 411/01(M48×2)
DBT/DBWT:
G 51/01(G1/4), G51/02(M14×1.5)



1 Nameplate
2 Port X for external pilot oil supply
3 Port Y for external pilot oil drain
4 Adjustment element "1"
5 Adjustment element "2"
6 Lockable nut S=24
7 Internal hexagon screw S=10
9 Locating pin
10 Valve fixing hole
11 Directional valve, size6
12 Solenoid "a"
13 Hand override "N" button, optional
14 Plug-in connector Z4
15 Valve dimension with standard solenoid A
16 Space required to remove plug-in connector
17 Pluged not for internal pilot oil drain
18 O-ring 9.25×1.78
19 Main spool cartridge
20 The Ø32 bore may connect the Ø45 bore at any position. Please take care that the connection hole X and the fixing holes are not damaged.
21 Back-up ring and O-ring must be inserted into this bore before assembling the main spool.
22 O-ring 28×1.8
23 O-ring 27.3×2.4
24 O-ring 28×2.65
25 Back-up ring 28.4×32×0.8
26 Flow controller must be ordered separately

Remote pressure adjusting valve

·Ordering code

DBT	G	1	— L3X	/	

Remote pressure adjusting valve

Threaded connection =G

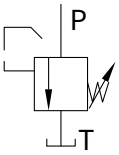
Adjusting handle =1

Series L30 to L39 =L3X
(L30 to L39: unchanged installation and connection dimensions)

No code= NBR seals
V = FKM seals

10 = Max. secondary pressure 100bar
31.5 = Max. secondary pressure 315bar

·Symbol



·Connection dimension