3 Pressure valves

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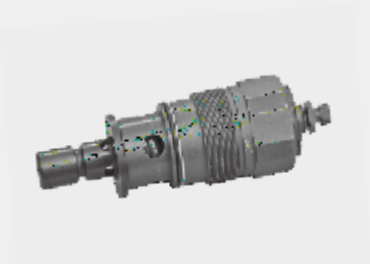
3.1

Pressure relief valve direct operated

Type DBD...10

Sizes 6 to 30
up to 400 bar
up to 330 L/min



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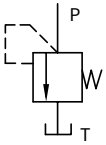
Features

- 3 connected versions
  Inserted cartridge
  Threaded connection
  Sub-plate mounting
- 6 pressure ratings
  25, 50, 100, 200, 315, 400 bar
- 2 adjustment versions
  Adjusting bolt with protective cap
  Regulating handle

Symbol



Ordering code

DBD				10 /	/			*

Pressure relief valve,
Direct operated

Adjusting bolt
with protective cap =S
Regulating handle =H

Connection		G	K	P
Nominal size	6=	6	6	6
	8=	8	-	-
	10=	10	10	10
	15=	15	-	-
	20=	20	20	20
	25=	25	-	-
	30=	30	30	30

Size

Connection version
Inserted cartridge =K
Threaded connection =G
Sub-plate mounting =P

Size	10	6, 8, 15 and 20	25 and 30
Pressure ratings (up to...)	2.5=25bar 5=50bar 10=100bar 20=200bar 31.5=315bar 40=400bar	2.5=25bar 5=50bar 10=100bar 20=200bar 31.5=315bar 40=400bar	2.5=25bar 5=50bar 10=100bar 20=200bar 31.5=315bar

10= 10 series

For threaded connection valve
No code = Inch
2 = Metric

No code = NBR seals
V = FKM seals

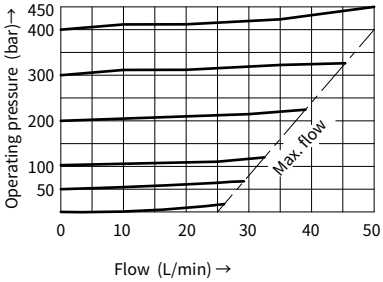
Further details
in clear text

Technical data

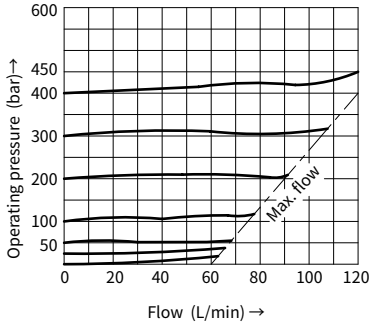
Fluid		Mineral oil suitable for NBR and FKM seal			
		Phosphate ester for FKM seal			
Fluid temperature range seature seature					

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

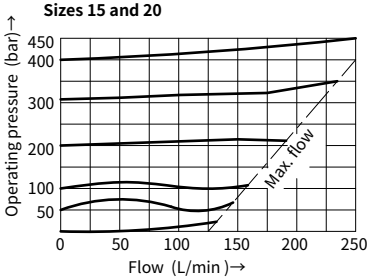
Size 6



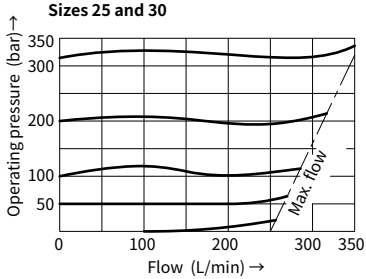
Sizes 8 and 10

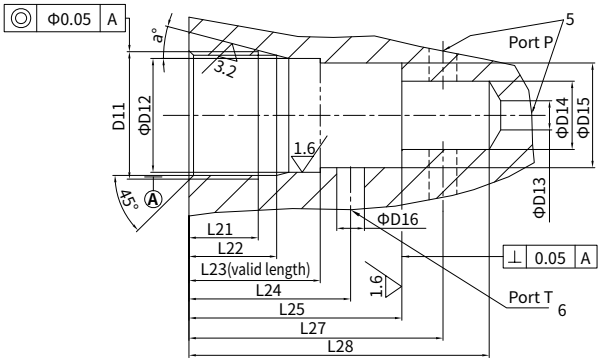


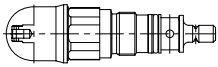
Sizes 15 and 20

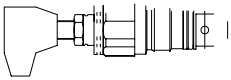


Sizes 25 and 30




Φ0.05
A
a°
3.2
5
Port P
D11
ΦD12
ΦD14
ΦD15
1.6
45°
A
ΦD13
ΦD16
L21
L22
L23(valid length)
L24
L25
L27
L28
0.05
A
1.6
Port T
6

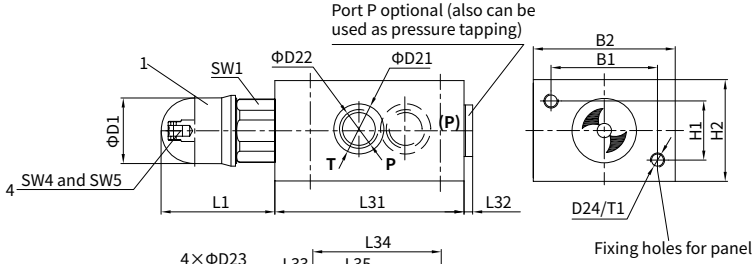


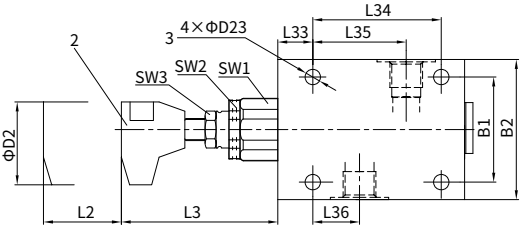


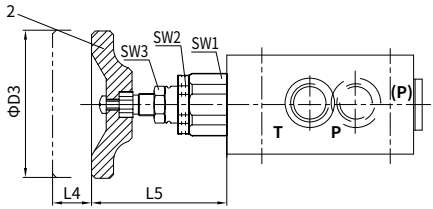
Unit dimensions

(Dimensions in mm)

· Threaded connection valve







1 Adjustment element "S"
2 Adjustment element "H" (use pressure adjustment handwheel for sizes 25 and 30)
3 Valve fixing screw hole
4 Internal hexagon screw S=6 for under size 20(SW4) and external hexagon S=13 for above size 25 (SW5)

Size	Weight(kg)	B1	B2	D1	D2	D3	D21	D22	D23	D24
6	Approx. 1.6	45	60	34	60	-	25	G1/4; M14×1.5	6.6	M6
(8)+10	Approx. 3.7	60	80	38			(28) 34	G3/8 M18×1.5; G1/2 M22×1.5	9	M8
(15)+20	Approx. 6.9	70	100	48			(42) 47	G3/4 M27×2; G1 M33×2		
(25)+30	Approx. 15.2	100	130	63	-	80	(56) 61	G1 1/4 M42×2; G1 1/2 48×2	11	M10

Size	L1	L2	L3	L4	L5	L31	L32	L33	L34	L35	L36	SW1	SW2	SW3	SW4	SW5	H1	H2	T1
6	72	11	83	-	-	80	2	15	55	40	20	32	30	19	6	-	25	40	10
(8)+10	68		79			100	(2) 3	20	70	49	21	36					40	60	20
(15)+20	65		77			135	(3) 4		100	65	34	46	36				50	70	
(25)+30	83	-	-	11	56	180	4	25	130	85	35	60	46		-	13	60	90	25

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- 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 adj ☒ thq ishpp ☒

Function and configuration

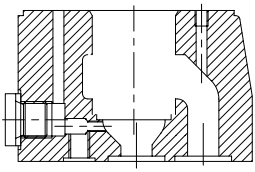
Types DB and DBW pressure valves are pilot operated pressure relief valves, used to limit (DB) or limit and unload (DBW) pressure via solenoid operation. The pressure relief valves consist of main valve (1) with main spool cartridge (3) and pilot operated valve (2) with pressure adjustment elements.

· 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).



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

DB | | | | | –L5X/ | | | – | | | | / | | *

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

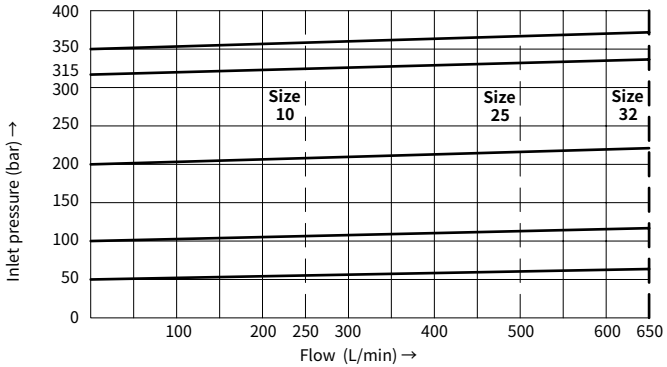
Notes:

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.

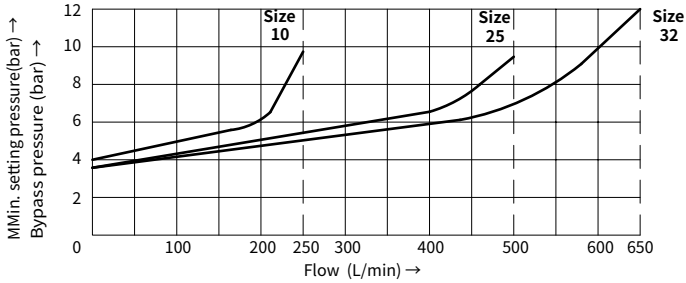
Performance curves (Measured at ϑ_{oil} =40°C ±5°C , using HLP 46)

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.

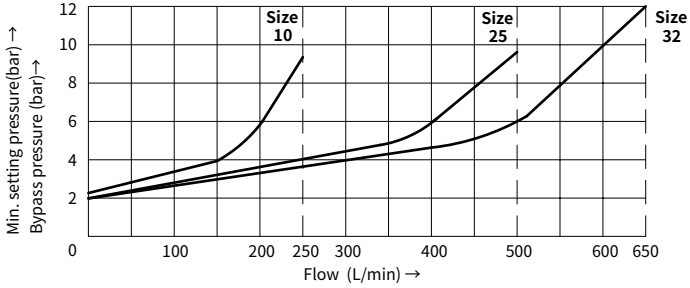
Inlet pressure in relation to the flow-rate



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



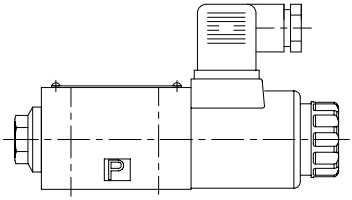
Minimum setting pressure and bypass pressure in relation to the flow-rate!
·Version "U"

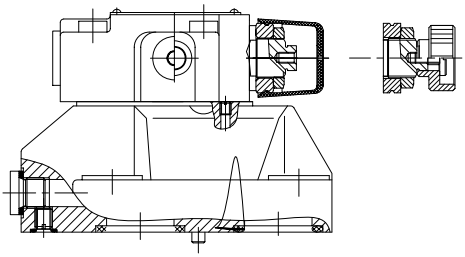


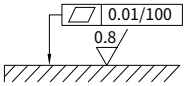
Unit dimensions

(Dimensions in mm)

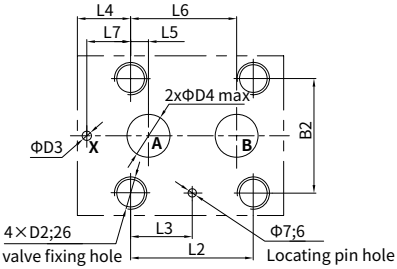
·Sub-plate mounting







Requirement for mounting surface

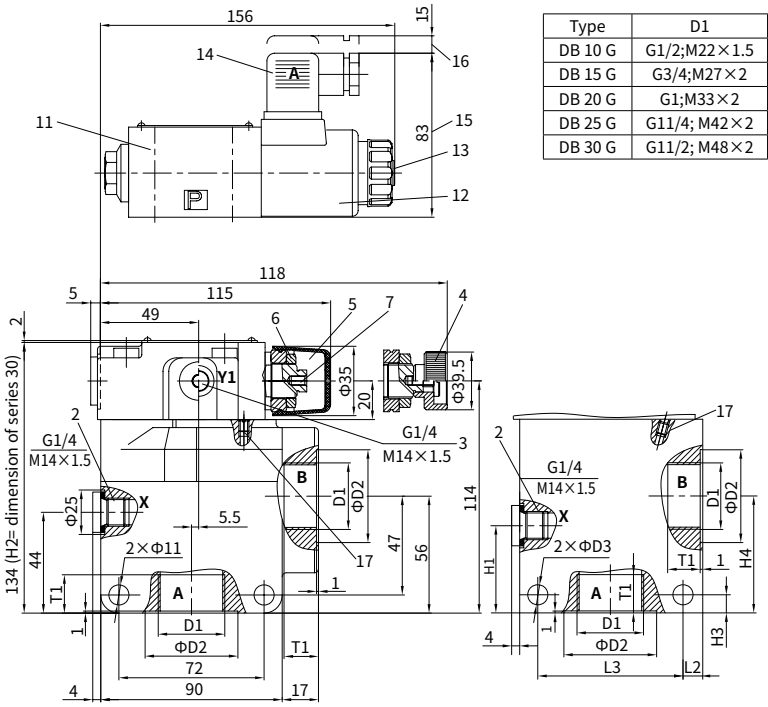


Dimensions of mounting surface

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.

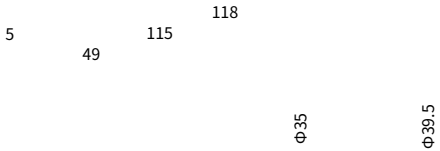
Outline and installation dimension of series 30 threaded connection valve:

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									

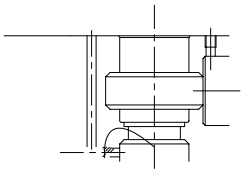
Unit dimensions

(Dimensions in mm)

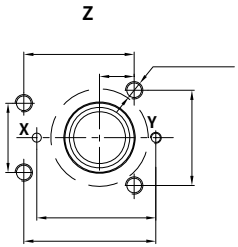
·With main spool valve (DBC10 or 30) or without main spool valve (DBC, DBT)



Requirement for mounting surface

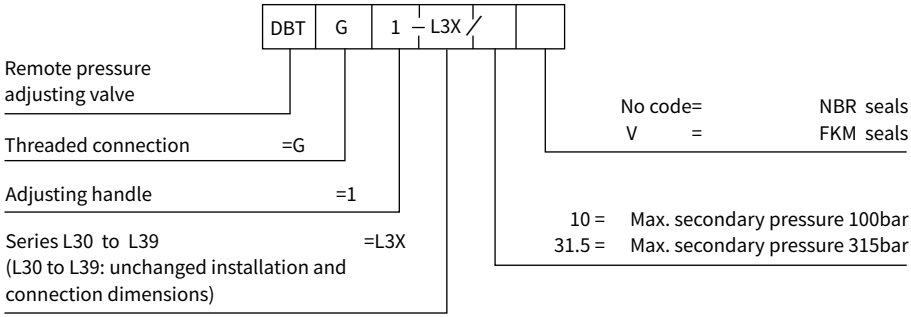


R0.3max

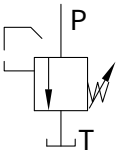


Remote pressure adjusting valve

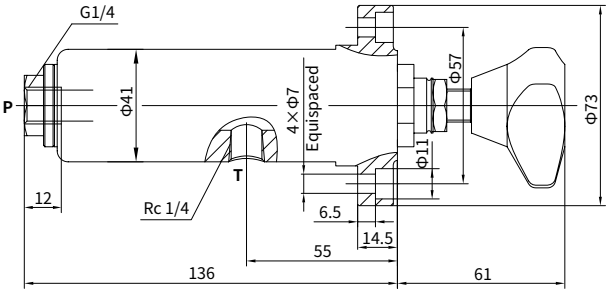
·Ordering code



·Symbol



·Connection dimension



3.3

Pressure relief valve pilot operated

Type DB...K...L4X

Sizes 6 and 10
up to 315 bar
up to 100L/min

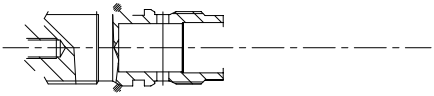
Contents

Function and configuration	02
Ordering code	02
Technical data	03
Characteristic curves	03
Unit dimensions	04-05

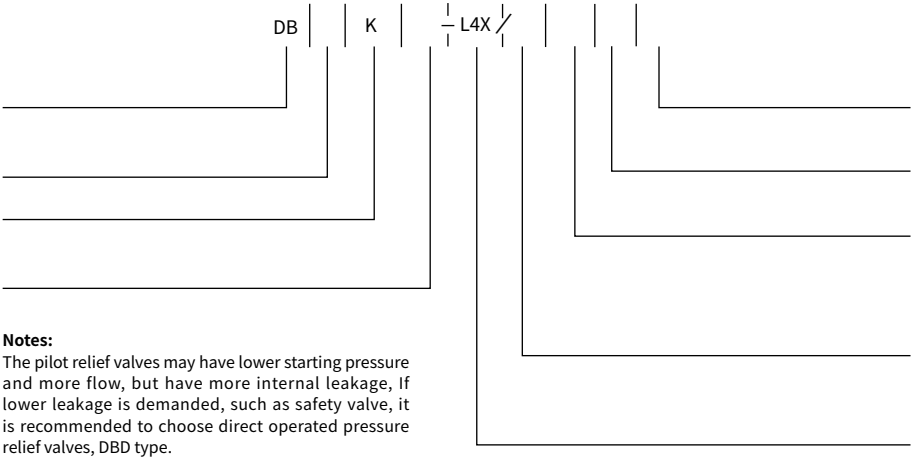
Features

- Cartridge valve
- 4 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap

Pressure relief valves type DB..K.. are pilot operated pressure relief valves for installation in manifolds. They are used to limit the pressure in a hydraulic system. The system pressure is set via adjustment element (4). At static position, the valves are closed. Pressure in port A acts on the spool (1). Pressure fluid flows through orifice (2) to the spring loaded side of the spool (1) and through orifice (3) to the pilot poppet (6). If the pressure in port A rises beyond the value setting at spring (5), the pilot poppet (6) opens. Fluid can flow from the spring loaded side of spool (1), orifice (3),and channel (8) into port T(Y). The pressure drop moves spool (1) to open the connection from A to B, while the setting pressure at spring (5) is maintained. Pilot oil returns from the two spring chambers via port T(Y) externally.



Ordering code



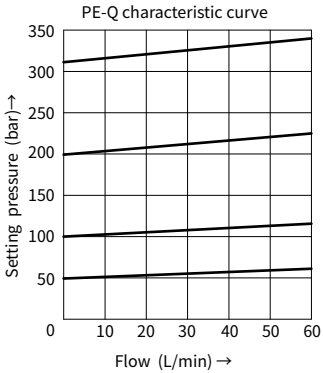
Notes:
The pilot relief valves may have lower starting pressure and more flow, but have more internal leakage, If lower leakage is demanded, such as safety valve, it is recommended to choose direct operated pressure relief valves, DBD type.

Technical data

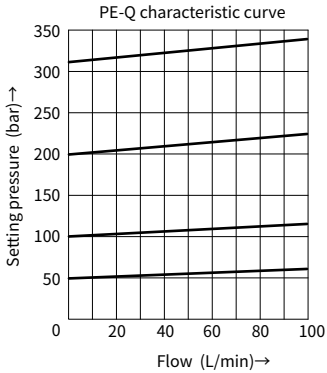
Size		6	10
Fluid		Mineral oil suitable for NBR and FKM seal	
		Phosphate ester for FKM seal	
Fluid temperature range	°C	-30 to +80 (NBR seal)	
		-20 to +80 (FKM seal)	
Viscosity range	mm^2/s	10 to 800	
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406	
Max.operating pressure	bar	315	
Max.setting pressure	bar	50; 100; 200; 315	
Max. flow-rate	L/min	to 60	to 100
Weight	kg	Approx. 0.22	Approx. 0.3

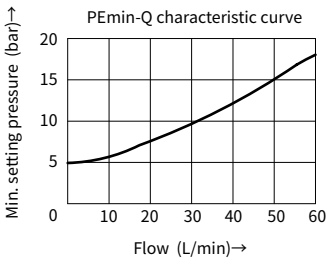
Characteristic curves (Measured at ϑ_{oil} =40°C ±5°C , using HLP46)

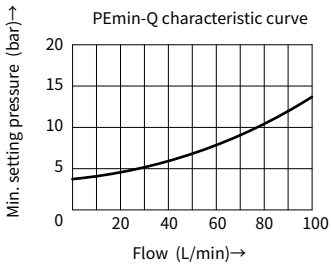
Size 6



Size 10







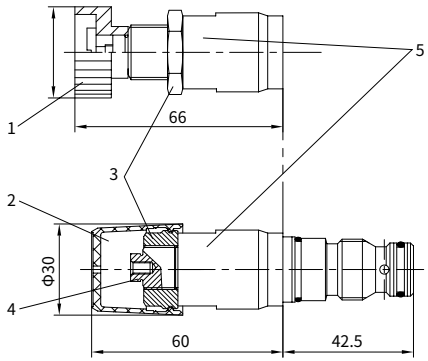
The curves are measured at zero back pressure.

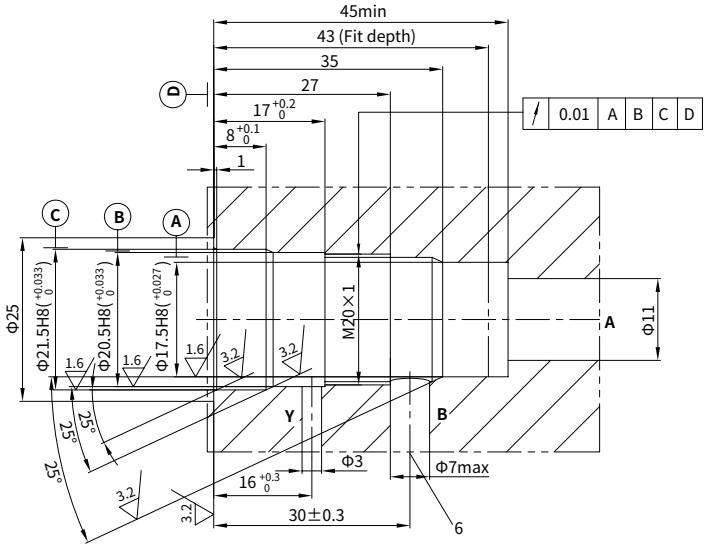
Unit dimensions

(Dimensions in mm)

·Type DB6K...-L4X/...

1 Adjustment element "1"
2 Adjustment element "2"
3 Nut for locking S=24
4 Internal hexagon screw S=10
5 External hexagon S=24
Tightening torque M_A = 50Nm
6 Port B arranged around circumference as required





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3.4

Pressure relief valve pilot operated

Type DB20K...L1X

Size 20
up to 315bar
up to 400L/min

Contents

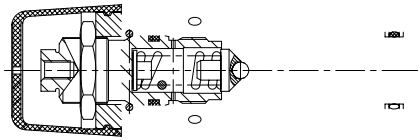
Function and configuration	02
Ordering code	02
Technical data	03
Characteristic curves	03
Unit dimensions	04

Features

-Cartridge valve
-4 pressure ratings
-2 adjustment elements:
• Rotary knob
• Adjustable bolt with protective cap

Pressure relief valves type DB..K.. are pilot operated pressure relief valves for installation in manifolds. They are used to limit the pressure in a hydraulic system. The system pressure is set via adjustment element (4). At static position, the valves are closed. Pressure in port A acts on the spool (1). Pressure fluid flows through orifice (2) to the spring loaded side of the spool (1) and through orifice (3) to the pilot poppet (6). If the pressure in port A rises beyond the value setting at spring (5), the pilot poppet (6) opens. Fluid can flow from the spring loaded side of spool (1), orifice (3), and channel (8) into port T(Y). The pressure drop moves spool (1) to open the connection from A to B, while the setting pressure at spring (5) is maintained. Pilot oil returns from the two spring chambers via port T(Y) externally.

DB20K2-L1X/...XY



DB...XY... **DB...Y...**

Symbols

Ordering code

Notes:

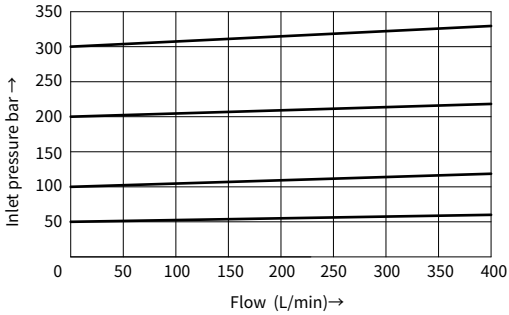
The pilot relief valves may have lower starting pressure and more flow, but have more internal leakage, If lower leakage is demanded, such as safety valve, it is recommended to choose direct operated pressure relief valves, DBD type.

Technical data

Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR 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		bar	315
Max. back pressure	Port Y	bar	250
Max.adjustable pressure		bar	50; 100; 200; 315
Max. flow-rate		L/min	To 400
Weight		kg	Approx. 0.35

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

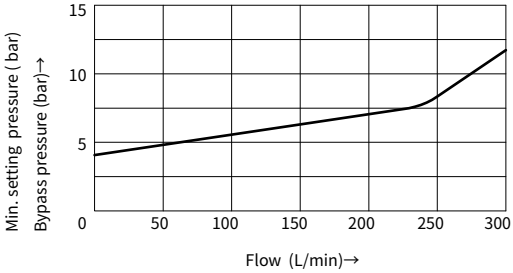
Inlet pressure in relation to the flow-rate



The curves are measured with external pilot oil drain at zero pressure.

With internal pilot oil drain the inlet pressure will increase with pressure at port B.

Min. setting pressure and bypass pressure in relation to the flow-rate



The curves are valid for outlet pressure PB=0

Φ29H8( )

Φ21H8( )

Φ29H8( )

3.5

Pilot operated pressure relief valve

Type ZDB/ Z2DB 6V..L4X

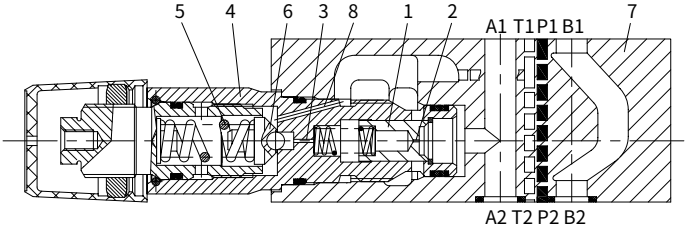
Size 6
up to 315bar
up to 60 L/min

Contents

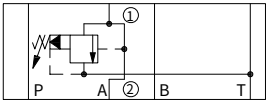
Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	03
Unit dimensions	04-05

Features

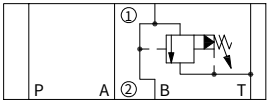
- Sandwich plate valve
- Porting pattern to DIN 24 340 form A and ISO 4401
- For threaded connection and sub-plate mounting
- 4 pressure ranges
- 5 circuit options
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap



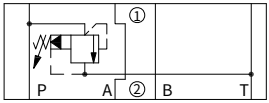
Type ZDB6VA...



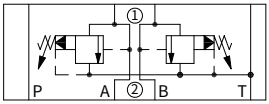
Type ZDB6VB...



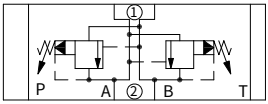
Type ZDB6VP...



Type ZDB6VC...



Type ZDB6VD...



Ordering code

Z		DB	6		– L4X /		★

Sandwich plate = Z

Only applies to versions VC and VD:
With 2 pressure relief valve cartridges =2

Pressure relief valve = DB

Nominal size 6 =6

Relief function from → to:
A → T =VA
P → T =VP
B → T =VB
A → T and B → T =VC
A → B and B → A =VD

Further details in clear text

No code = NBR seals
V = FKM seals

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

L4X = Series L40 to L49
(L40 to L49: unchanged installation and connection dimensions)

1= Rotary knob
2= Adjustable bolt with protective cap

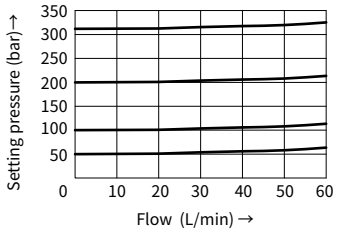
Technical data

Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR 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		bar	to 315
Max.adjustable pressure		bar	50;100;200;315
Max. flow-rate		L/min	60
Weight	Type ZDB6	kg	Approx.1.2
	Type Z2DB6	kg	Approx.1.9

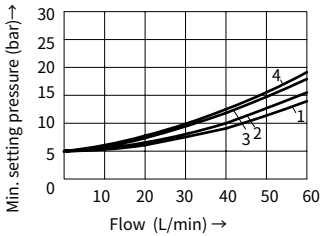
Characteristic curves

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

PE-Q characteristic curve



PEmin-Q characteristic curve



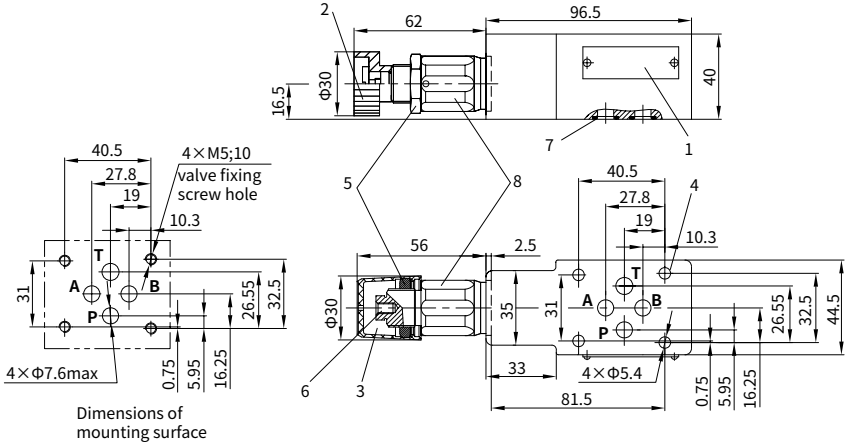
The curves are measured at zero back pressure.

1. VD(A to B)
2. VA
3. VB and VC
4. VP and VD (B to A)

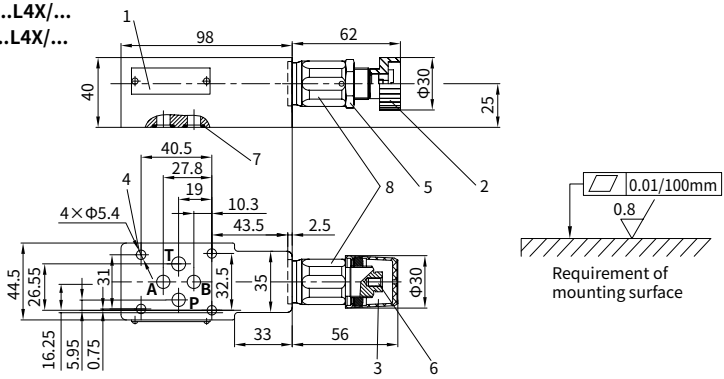
Unit dimensions

(Dimensions in mm)

Type ZDB6VA...L4X/...

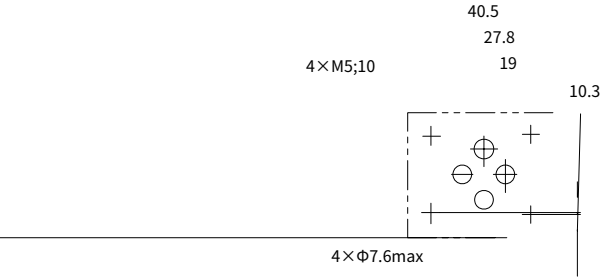


Type ZDB6VB...L4X/...
Type ZDB6VP...L4X/...



1 Nameplate
2 Adjustment element "1"
3 Adjustment element "2"
4 Valve fixing holes
5 Nut for locking S=24
6 External hexagon screw S=10
7 O-ring 9.25×1.78 (A2, B2, P2, T2)
8 External hexagon S=24
Tightening torque M_A =50 Nm

Valve fixing screws:
M5 according to GB/T 70.1-10.9, the length according to sandwich, tightening torque M_A =8.9 Nm, must be ordered separately.



Dimensions of mounting surface

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3.6

Pilot operated pressure relief valve

Type ZDB / Z2DB 10V..L4X

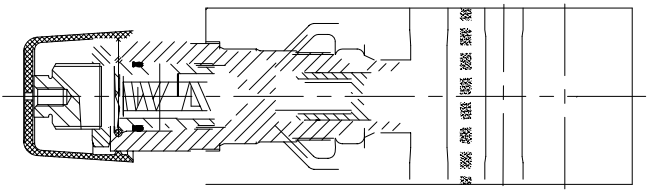
Size 10
up to 315bar
up to 100 L/min

Contents

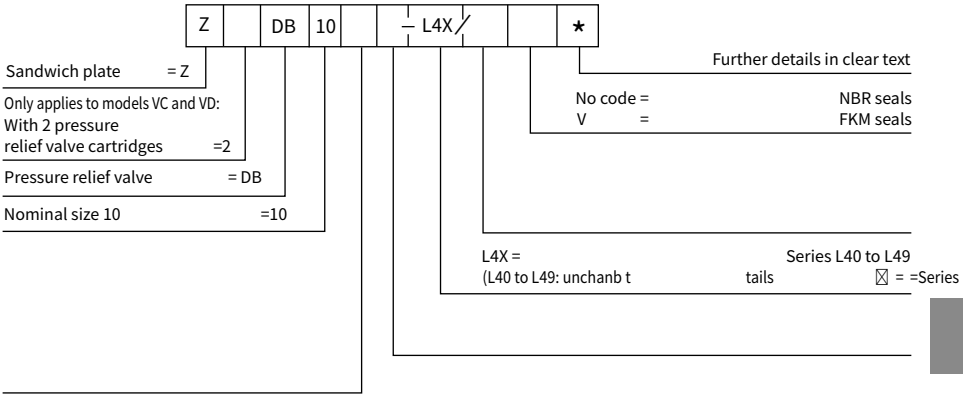
Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	03
Unit dimensions	04-06

Features

- Sandwich plate valve
- Porting pattern to DIN 24 340 form A and ISO 4401
- For threaded connection, and sub-plate mounting
- 4 pressure ratings
- 6 circuit options
- With one or two pressure relief cartridges
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap



Ordering code



Technical data

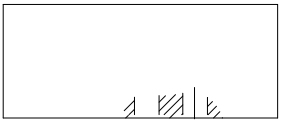
Characteristic curves

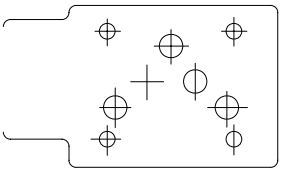
(Measured at ϑ_{oil} =40°C ±5°C , using HLP46)

Unit dimensions

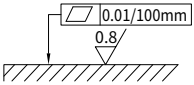
(Dimensions in mm)

Type ZDB10VA...L4X/.. **Type ZDB10VP...L4X/..** **Type ZDB10VT...L4X/..**

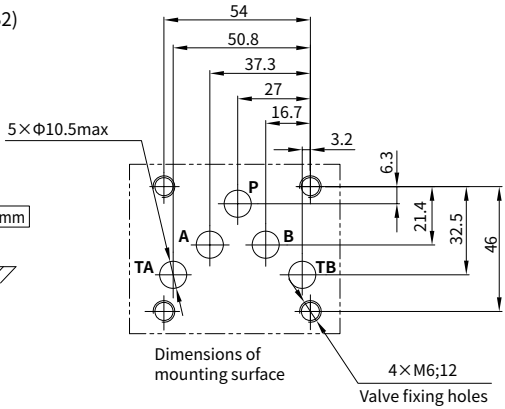




1 Nameplate
2 Adjustment element "1"
3 Adjustment element "2"
4 Valve fixing holes
5 Lockable nut S=24
6 External hexagon screw S=10
7 O-ring 12×2 (A2, B2, P2, TA2, TB2)
8 Type ZDB10 VA and VP version
9 Type ZDB10 VT version
10 External hexagon S=30
Tightening torque M_A=50Nm

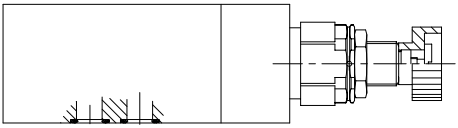


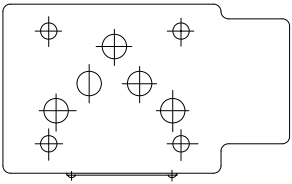
Requirement of mounting surface

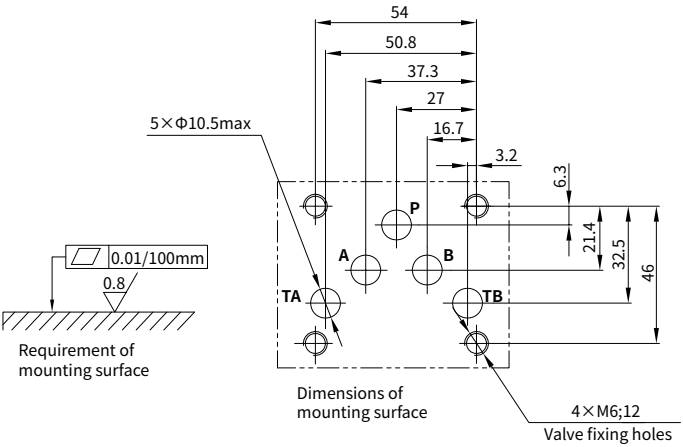


Dimensions of mounting surface

Valve fixing screws:
M6 according to GB/T 70.1-10.9,
the length according to sandwich,
tightening torque M_A=15.5 Nm,
must be ordered separately.



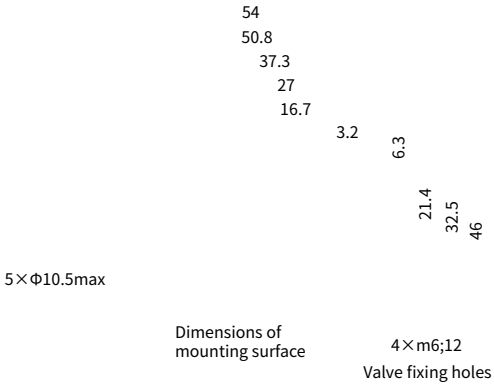



54
50.8
37.3
27
16.7
3.2
6.3
21.4
32.5
46
5×Φ10.5max
P
A
B
TA
TB
0.01/100mm
0.8
Requirement of
mounting surface
Dimensions of
mounting surface
4×M6;12
Valve fixing holes

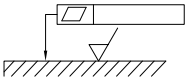
Unit dimensions

(Dimensions in mm)

Type Z2DB10VC...L4X/..
Type Z2DB10VD...L4X/..



1 Nameplate
2 Adjustment element "1"
3 Adjustment element "2"
4 Valve fixing holes
5 Lockable nut S=24
6 External hexagon bolt S=10
7 O-ring 12×2 (A2, B2, P2, TA2, TB2)
8 External hexagon S=30
Tightening torque M_A =50 Nm

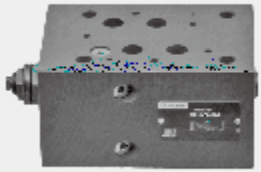


Valve fixing screws:
M6 according to GB/T 70.1-10.9, the length according to sandwich, tightening torque M_A=15.5 Nm, must be ordered separately.

Pilot operated pressure relief valve

Type ZDB /Z2DB..V...L3X

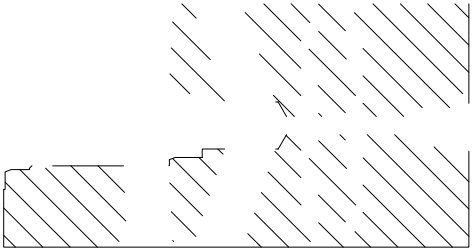
Sizes 16 and 22
up to 315bar
up to 200 /400L/min



Contents

Features

-Sandwich plate valve
-Porting pattern to DIN 24 340 form A and ISO4401
-For threaded connection, and sub-plate mounting
-4 pressure ratings
-5 circuit options
-With one or two pressure relief cartridges
-1 adjustment elements:
• Adjustable bolt with protective cap



Ordering code

Z | | DB | | | – L3X / | | *

Sandwich plate = Z

Only applies to versions VC and VD:
With 2 pressure relief valve cartridges = 2

Pressure relief valve = DB

Nominal size 16 = 16
Nominal size 22 = 22

Relief function from – to:
A → T =VA
P → T =VP
B → T =VB
A → T and B → T =VC
A → B and B → A =VD

Regulation form: 2= Adjustable bolt with protective cap

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

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

No code = NBR seals
V = FKM seals

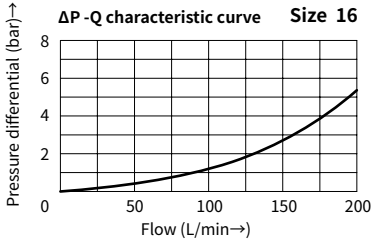
Further details in clear text

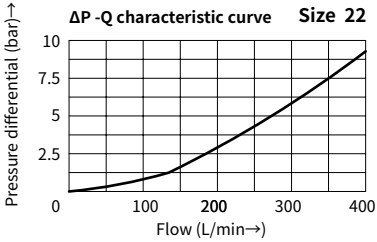
Technical data

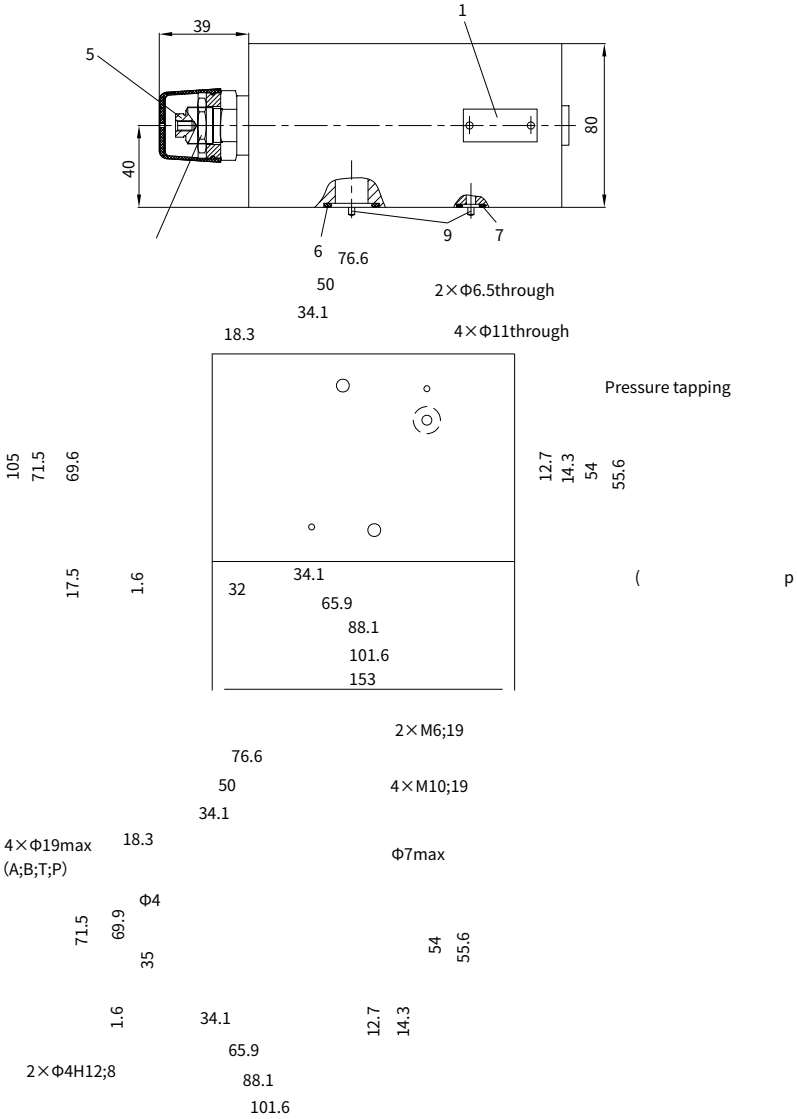
Fluid			Mineral oil suitable for NBR and FKM seal	
			Phosphate ester for FKM seal	
Fluid temperature range		°C	-30 to +80 (NBR seal)	
			-20 to +80 (FKM seal)	
Viscosity range		mm^2/s	10 to 800	
Degree of contamination			Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406	
Max.operating pressure		bar	to 315	
Max.adjustable pressure		bar	50; 100; 200; 315	
Size			16	22
Max. flow-rate		L/min	200	400
Weight	Type ZDB	kg	Approx. 9.4	Approx. 9.2
	Type Z2DB	kg	Approx. 11.8	Approx. 10.3

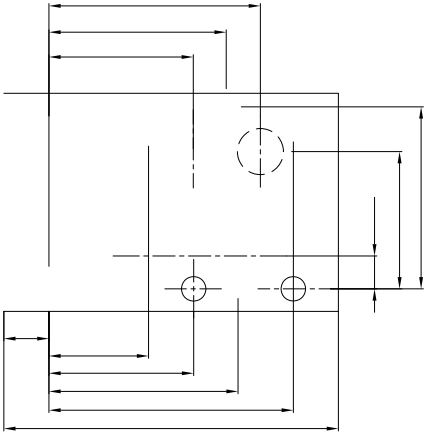
Characteristic curves

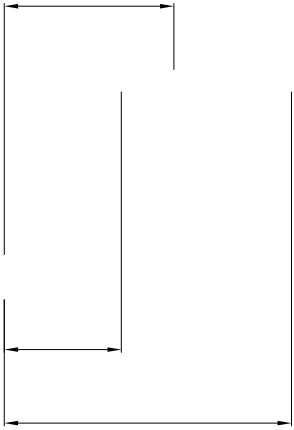
(Measured at ϑ_{oil} =40°C ±5°C , using HLP46)

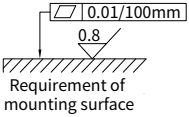





39
1
5
80
40
6
9
7
76.6
50
2×Φ6.5through
34.1
18.3
4×Φ11through
Pressure tapping
105
71.5
69.6
12.7
14.3
54
55.6
17.5
1.6
34.1
32
65.9
88.1
101.6
153
(
p
2×M6;19
76.6
50
4×M10;19
34.1
4×Φ19max
(A;B;T;P)
18.3
Φ7max
Φ4
71.5
69.9
35
54
55.6
1.6
34.1
12.7
14.3
65.9
2×Φ4H12;8
88.1
101.6







17.5

73

96.8

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3.8

Direct operated pressure relief valve

Type ZDBD...L1X

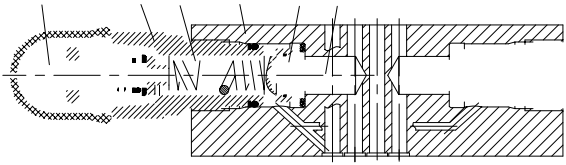
Sizes 6 to 32
up to 315bar
up to 250 L/min

Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Unit dimensions	04-10

Features

- Sandwich plate valve
- Porting pattern to DIN 24 340 form A and ISO 4401
- Threaded connection, sub-plate mounting
- 3 pressure ratings
- 4 circuit options
- With one or two pressure relief cartridges
- 1 adjustment element:
  ·Adjustable bolt with protective cap



Ordering code

ZDBD		–	L1X	/	A		B		

Sandwich pressure relief valve =ZDBD

Nominal size 6 =6
Nominal size10 =10
Nominal size16 =16
Nominal size22 =22
Nominal size32 =32

Relief function from → to:
A → T =A
B → T =B
A → T and B → T =C
A → B and B → A =D

Series L10 to L19 =L1X
(L10 to L19: unchanged installation and connection dimensions)

No code = NBR seals
V = FKM seals

10 = Pressure adjustable up to 100bar
20 = Pressure adjustable up to 200bar
31.5 = Pressure adjustable up to 315bar

Note:
Relief function type A and B omit AB;
Relief function type C and D in cavity AB,
Omit AB when the pressure stages is the same,
Pressure stages levels, e.g. A5B10

Technical data

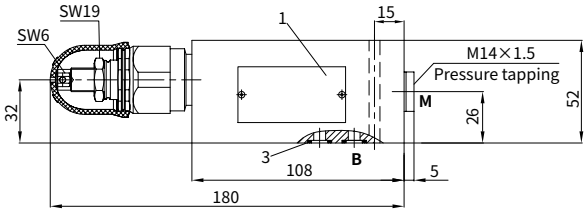
Fluid		Mineral oil suitable for NBR and FKM seal																			
		Phosphate ester for FKM seal																			
Fluid temperature range	°C	-30 to +80 (NBR seal)																			
		-20 to +80 (FKM seal)																			
Viscosity range	mm^2/s	10 to 800																			
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406																			
Max.operating pressure	bar	To 315																			
Max.adjustable pressure	bar	50; 100; 200; 315																			
Size		6				10				16				22				32			
Max. flow-rate	L/min	30				80				160				250				250			
Weight	Relief function	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
	kg	2		3	4	4		6	9	13		16	12	25		32	29	47	55	57	53

Unit dimensions (A, B and C)

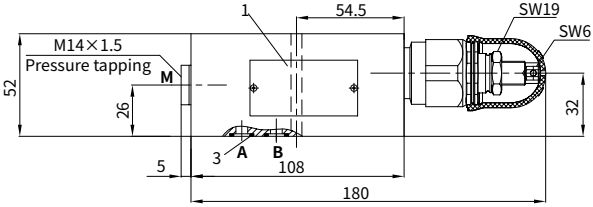
(Dimensions in mm)

Size 6

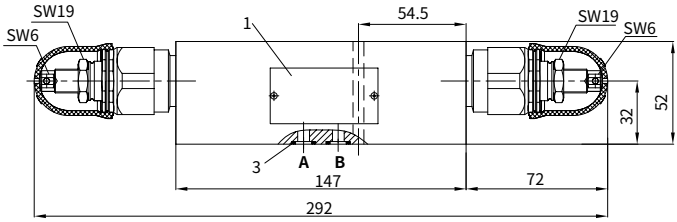
·Type ZDBD6A-L1X/...

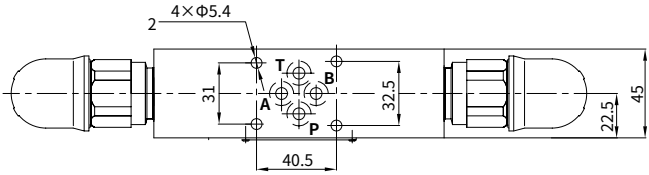


·Type ZDBD6B-L1X/...



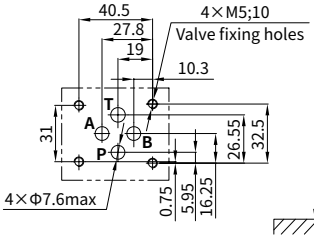
·Type ZDBD6C-L1X/...



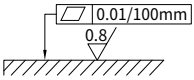


1 Nameplate
2 Valve fixing holes
3 O-ring 9.25×1.78(A,B,P,T)

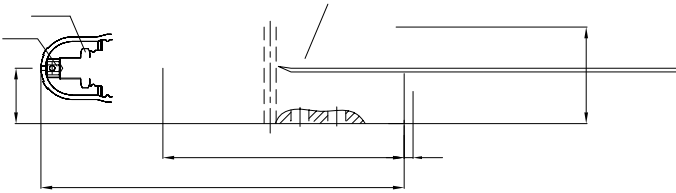
Valve fixing screws:
M5 according to GB/T 70.1-10.9, the length according to sandwich, Tightening torque M_A= 8.9 Nm, must be ordered separately.



Dimensions of mounting surface



Requirement for mounting surface

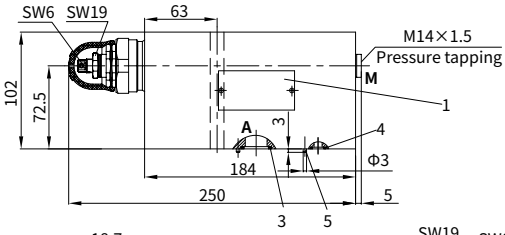


Unit dimensions (A, B and C)

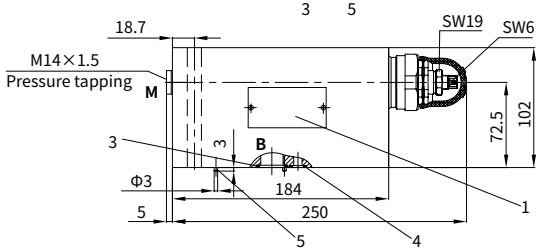
(Dimensions in mm)

Size 16

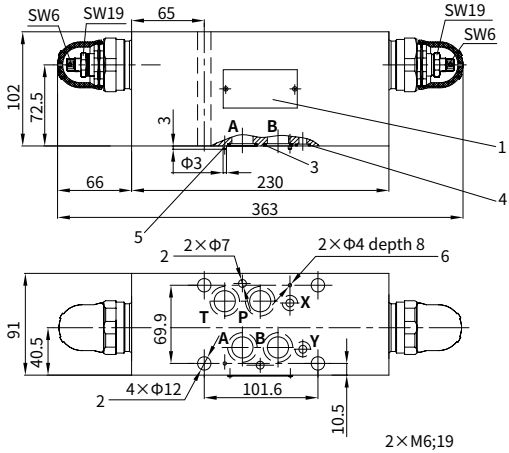
·Type ZDBD16A-L1X/...



·Type ZDBD16B-L1X/...

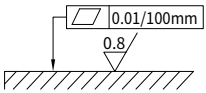


·Type ZDBD16C-L1X/...

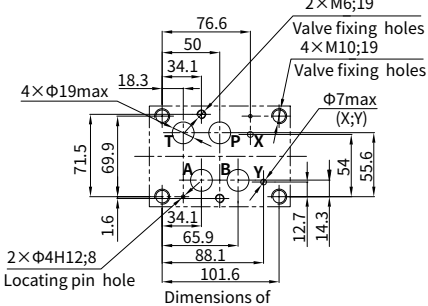


1 Nameplate
2 Valve fixing holes
3 O-ring 22×2.5(A, B, P, T)
4 O-ring 10×2(X, Y)
5 Locating pin 3×8
6 Locating pin hole

Valve fixing screws:
M6 according to GB/T 70.1-10.9,
the length according to sandwich,
4 pcs M10 tightening torque M_A=75 Nm,
2 pcs M6 tightening torque M_A=15.5 Nm,
must be ordered separately.

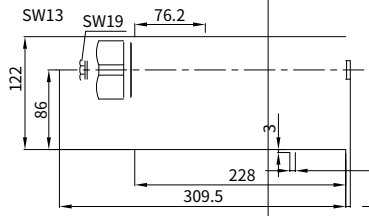


Requirement for mounting surface

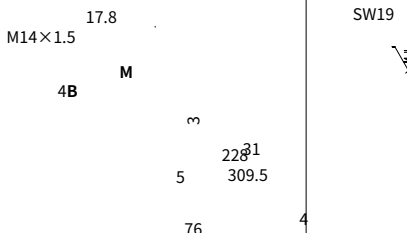


Dimensions of mounting surface

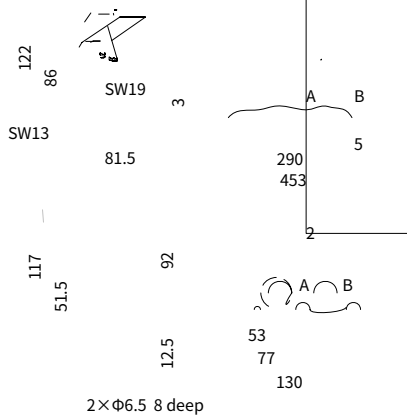
?A-L1X/...



?B-L1X/...



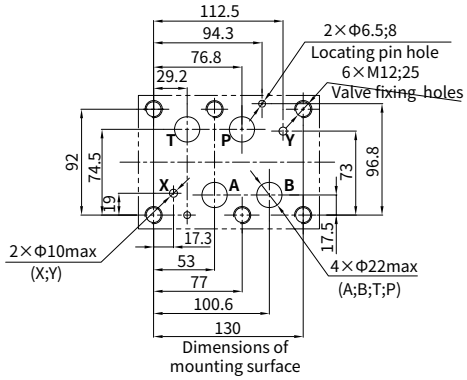
?C-L1X/...



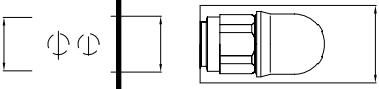
ing holes
7×3 (A, B, P and T)
9×3 (X, Y)
pin 6×12 P Y
pin hole
X

6

according to sandwich,
torque M_A=130Nm, must be
parately.



0.01/100mm
0.8


56.5
SW19

Unit dimensions (D)

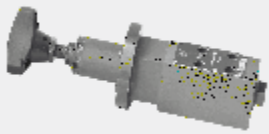
(Dimensions in mm)

3.9

Pressure reducing valve direct operated

Type DR5DP...10

Size 5
up to 315 bar
up to 15 L/min



Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

Features

- Direct operated structure
- Porting pattern to DIN 24 340 form A and ISO4401
- 5 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap,
- Check valve, optional

Ordering code

	DR5DP	– 10 /				*

Without plate fixing flange (Standard version)=No code
With plate fixing flange =F

Direct operated pressure reducing valve nominal size 5

Rotary knob =1
Adjustable bolt with protective cap =2

Series 10 = 10

Notes :315bar only for version without check valve

Further details in clear text

No code = NBR seals
V = FKM seals

No code = With check valve
M = Without check valve

Y = Pilot oil supply internal Oil drain external
XY = Pilot oil supply external Oil drain external

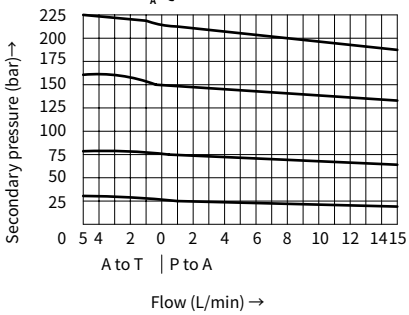
2.5 = Max. secondary pressure 25 bar
7.5 = Max. secondary pressure 75 bar
15 = Max. secondary pressure150 bar
21 = Max. secondary pressure 210 bar
31.5 = Max. secondary pressure 315 bar

Technical data

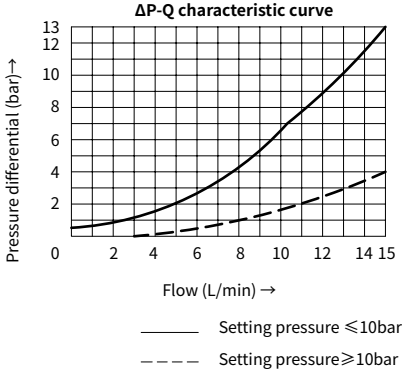
Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Viscosity range		mm^2/s	10 to 800
Degree of contamination			Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406
Max.operating pressure	Port P	bar	315
Max.secondary pressure	Port A	bar	25; 75; 150; 210; 315 (without check valve)
Max.backing pressure	PortT(Y)	bar	60
Max. flow-rate		L/min	15
Weight		kg	Approx.1.4

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

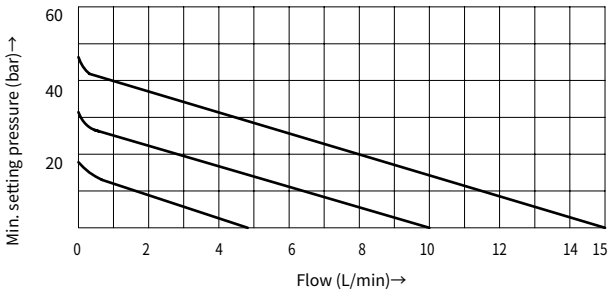
P_A-Q characteristic curve



ΔP-Q characteristic curve



P_{Amin}-Q characteristic curve

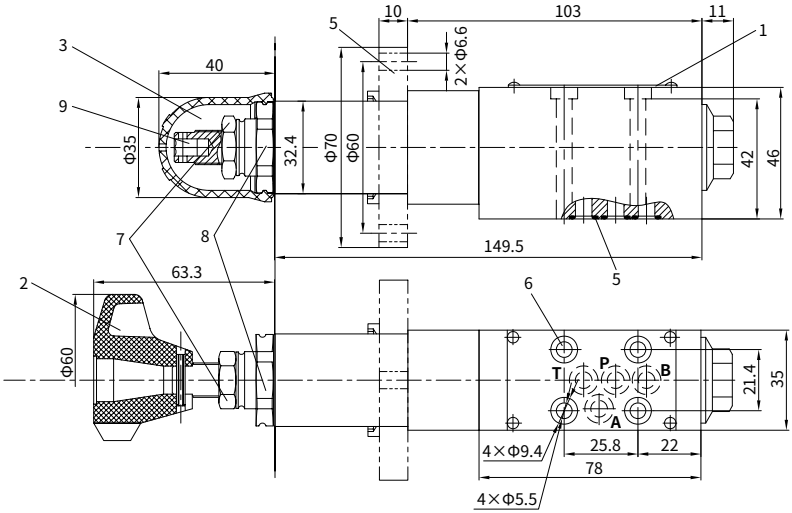


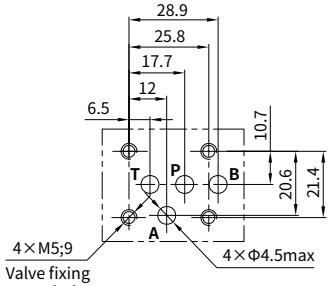
P_{Amin}-Q Characteristic curve shows the flow-rate in relation to the adjustable min. pressure rating from P to A.

For instance:
pressure is 25 bar and flow-rate is 10L/min,
adjusts the pressure of port A to 20bar,
when the secondary pressure increases to 23bar,
the flow-rate trends to zero.

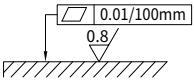
Unit dimensions

(Dimensions in mm)





Dimensions of mounting surface



Requirement for mounting surface

1 Nameplate
2 Adjustment element "1"
3 Adjustment element "2"
4 Plate fixing flange
5 O-ring 7×1.5 (P, T, A, B)
6 Valve fixing holes
7 Lockable nut S=19
8 External hexagon screw S=30
9 Internal hexagon screw S=6

It must be ordered separately, if connection plate is needed
Type: G 115/01A (G1/4) G 115/02A (M14×1.5)

Valve fixing screws:
GB/T 70.1-M5×50 -10.9, internal hexagon screw
Tightening torque M_A =9Nm

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Pressure reducing valve direct operated

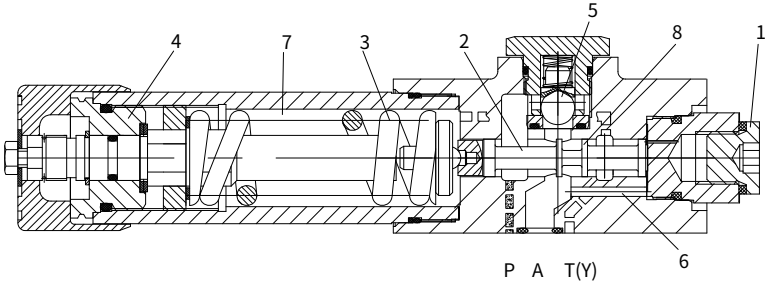
Type DR6DP...L5X

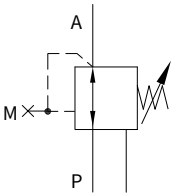
Size 6
up to 315 bar
up to 60 L/min

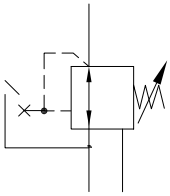
Contents

Features

- Direct operated structure
- Porting pattern to DIN 24 340 form A, ISO4401
- 5 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- With pressure gauge connection
- Check valve, optional


5
4
7
3
2
8
1
6
P A T(Y)


A
M
P



Ordering code

DR6DP | – L5X / | | | | | *

Direct operated pressure reducing valve nominal size 6

Rotary knob =1
Adjustable bolt with protective cap =2

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

Max. secondary pressure 25 bar =2.5
Max. secondary pressure 75 bar =7.5
Max. secondary pressure 150 bar =15
Max. secondary pressure 210 bar =21
Max. secondary pressure 315 bar =31.5 (Note1)

Y = Pilot oil supply internal
Oil drain external

No code = With check valve
M = Without check valve

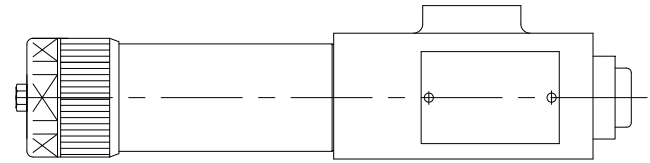
Pressure tapping thread
No code = Inch G1/4
2 = Metric M14×1.5

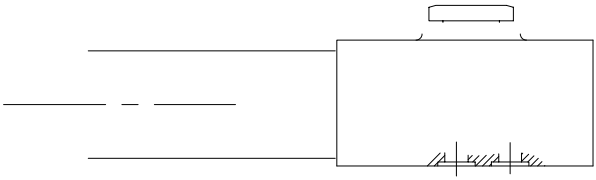
No code = NBR seals
V = FKM seals

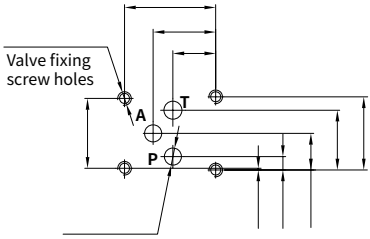
Further details in clear text

Technical data

Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR 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 P	bar	315
Max.secondary pressure	Port A	bar	25; 75; 150; 210; 315(without check valve)
Max.backing pressure	PortT(Y)	bar	16
Max. flow-rate		L/min	60
Weight		kg	Approx.p eight L L flow-r valve)valve) AA






Valve fixing
screw holes
A
T
P
Dimensions of
mounting surface

China
+86 400 101 8889

America

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Pressure reducing valve direct operated

Type DR10DP...L4X

Size 10
up to 210 bar
up to 80 L/min

Contents

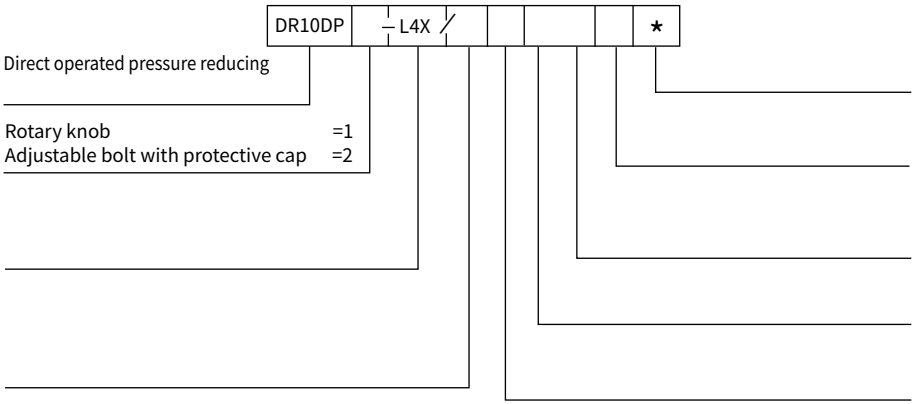
Features

- Direct operated structure
- Porting pattern conforms to DIN 24 340 form D and ISO5781
- 4 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- With pressure gauge connection
- Check valve, optional

The valve type DR10DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side. It is used to reduce the system pressure.
The secondary pressure is set by the pressure adjustment element (1).
At static position, the valve is normally open and the pressure fluid flows unhindered from port B to port A. The pressure in port A acts at the small spool(9) area opposite to the compression spring (3) via the control line (4). When the pressure in port A get the value setting at the compression spring (3), the small spool(9) pushes the control spool (2) into the control position and keeps the setting pressure in port A constant. The internal control oil is se prc i port the port control

Symbols

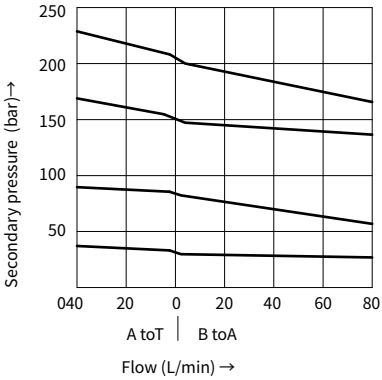
Ordering code



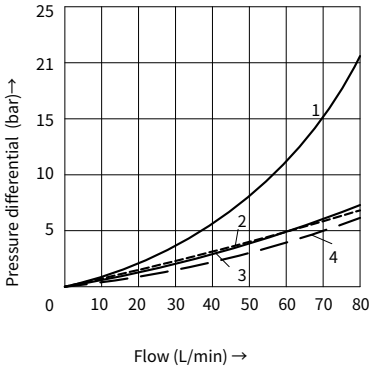
Technical data

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

P_A-Q characteristic curve



ΔP-Q characteristic curve

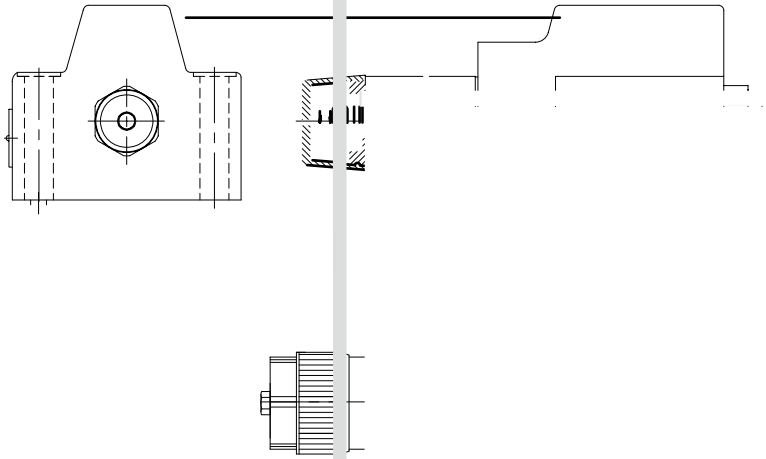


Notes:

The curve characteristics remain in a certain pressure range, with a low setting pressure.

The characteristic curves for the pressure relief function are valid when the back pressure is zero!

1 A to Y (pressure differential)
2 B to A (Y) (min. pressure differential)
3 Pressure differential) only over the check valve
4 Pressure differential) over the check valve and fully opened control cross section



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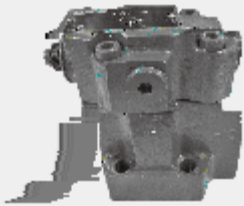
Pilot operated pressure reducing valves

Type DR...L5X

Sizes 10 to 32
up to 350 bar
up to 400L/min



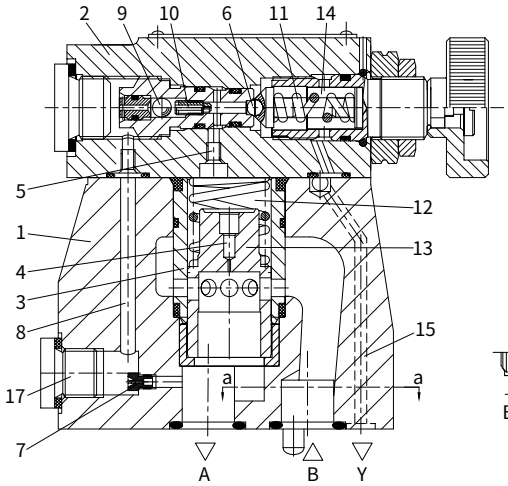
Contents

Features

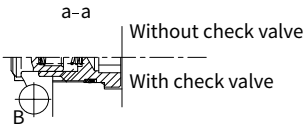
- Sub-plate mounting
- Porting pattern conforms to DIN 24 340, form D and ISO 5781
- Threaded connections
- Installation in manifolds
- 5 pressure ratings
- 4 adjustment elements
  - Rotary knob
  - Adjustable bolt with protective cap
- Check valve ,optional (only for sub-plate mounting)

Function and configurations

Pressure control valves type DR series L5X are pilot operated pressure reducing valves. They are used to control secondary circuit in a system. They consist mainly of the main valve (1) with main spool assembly (3) and pilot valve (2) with pressure adjustment element.
At static state, the valves are normally open, fluid flows free from port B to port A via the main spool (3). Pressure at port A acts on the underside of main spool(3) and its spring-loaded side via throttle orifice(4). Fluid also acts on the ball valve(6) of the pilot valve(2) via the channel (5). Meanwhile, pressure fluid flows via throttle orifice (7), control line (8),check valve (9) and throttle orifice (10) to the ball valve(6). Based on the setting value of the spring (11), control piston(13) keeps open, then fluid can flow free from port B to port A, until pressure at port A exceed the setting value of spring(11), and then ball valve (6) is opened. Control piston (13) moves to close position. When pressure at port A is balanced with setting value at spring, pressure reducing is achieved as expected. Control oil returns from spring chamber(14) to tank via channel (15).
A check valve(16) can be fitted optionally to give free return flow from line A to B.
Pressure gauge connection(17), used for monitoring the reduced pressure at the port A.

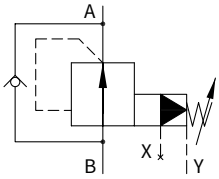


Type DR...-4-L5X/...Y

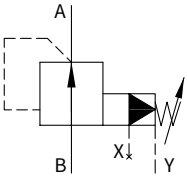


Symbols

DR...L5X/...Y



DR...L5X/...YM



Ordering code

DR [ ] [ ] [ ] – L5X / [ ] Y [ ] / [ ] [ ] *

Further details in clear text

No code = NBR seals
V = FKM seals

Only for Port X1 and Y1 of threaded connection valves and sub-plate mounting valves

No code = Inch thread
2 = Metric thread

No code = With check valve (only for sub-plate mounting)
M = Without check valve

Y = Pilot oil drain external

5 = Max. secondary pressure 50bar
10 = Max. secondary pressure 100bar
20 = Max. secondary pressure 200bar
31.5 = Max. secondary pressure 315bar
35 = Max. secondary pressure 350bar
(350bar only for the version without check valve)

L5X= Series L50 to L59
(L50 to L59 series: unchanged installation andconnection dimensions)

Pressure reducing valve, pilot operated =No code
Pilot operated valve
Without main spool assembly
(No mark for size) =C
Pilot operated valve
With main spool assembly
(Marked with size 30)=C

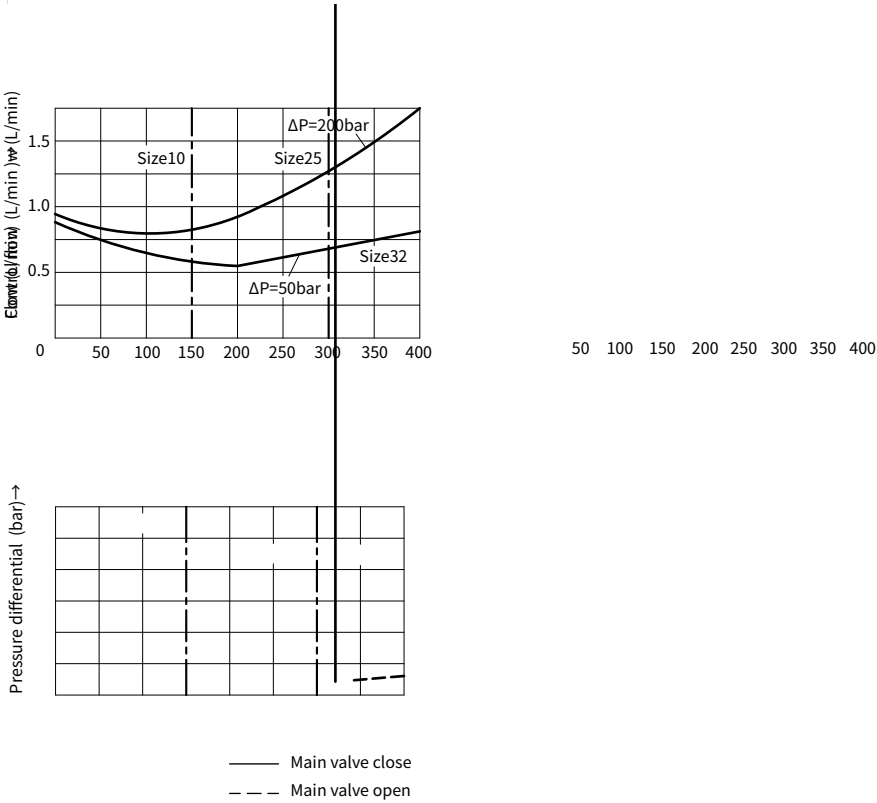
Size	Connection	
	sub-plate mounting	threaded connection
10	=10	=10
15		=15
20	=20	=20
25		=25
32	=30	=30

Sub-plate mounting = -
Threaded connection =G

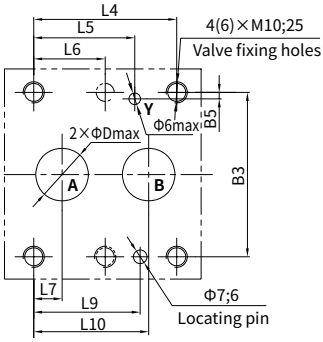
Regulating element:
Rotary knob =4
Adjustable bolt with protective cap =5

Technical data

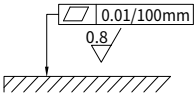
Fluid				Mineral oil suitable for NBR and FKM seal				
				Phosphate ester for FKM seal				
Fluid temperature range			°C	-30 to +80 (NBR seal)				
				-20 to +80 (FKM seal)				
Viscosity range			mm^2/s	10 to 800				
Degree of contamination				Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406				
Max.operating pressure		Port B	bar	350				
Operating pressure range		Port A	bar	10 to 350				
Max.backing pressure		Port Y	bar	350 (only for without check valve); 315 (with check valve)				
Adjustable pressure		Max.	bar	50; 100; 200; 315; 350				
		Min.	bar	Related with flow-rate (refer to the curves)				
Size				DR10	DR15	DR20	DR25	DR30
Max. flow-rate		Sub-plate mounting	L/min	150	-	300	-	400
		Threaded connection	L/min	150	300	300	400	400
Fixing position				Optional				
Size				DR10	DR15	DR20	DR25	DR30
Weight	Sub-plate mounting	DR	kg	Approx.3.6	-	Approx.5.3	-	Approx.8.2
	Threaded connection	DR...G	kg	Approx.5.3	Approx.5.5	Approx.5.1	Approx.5.0	Approx.5.0
		DRC	kg	Approx.1.2				
		DRC30	kg	Approx.1.5				



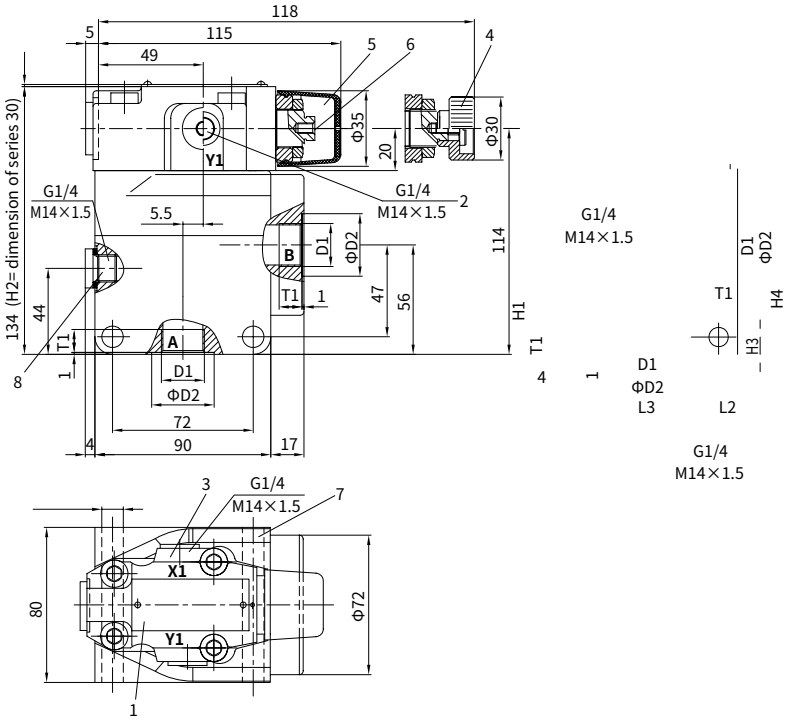
Flow (L/min) (L/min)
1.5
1.0
0.5
0
50
100
150
200
250
300
350
400
ΔP=200bar
Size10
Size25
Size32
ΔP=50bar
Pressure differential (bar)→
Main valve close
Main valve open



Dimensions of mounting surface



Requirement for mounting surface


118
115
49
5
5
6
4
Φ35
Φ30
20
Y1
G1/4
M14×1.5
2
G1/4
M14×1.5
5.5
B
D1
ΦD2
T1
1
47
56
114
H1
134 (H2= dimension of series 30)
44
T1
A
D1
ΦD2
72
90
4
17
8
1
G1/4
M14×1.5
T1
4
1
D1
ΦD2
L3
L2
D1
ΦD2
T1
H4
H3
G1/4
M14×1.5
3
G1/4
M14×1.5
7
X1
Y1
80
Φ72
1

3.13

Pressure reducing valve pilot operated

Type 3DR10P...L6X

Size 10
up to 315 bar
up to 120 L/min

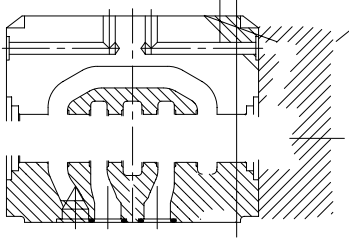
Contents

Function and configuration	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

Features

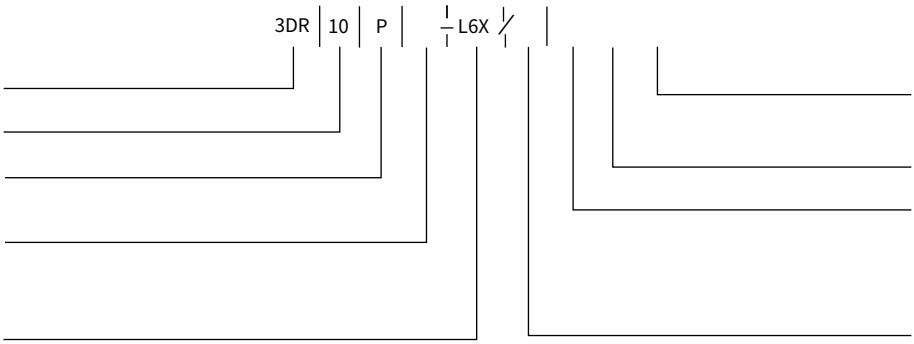
-Porting pattern conforms to DIN 24 340 form A and ISO 4401
-4 pressure ratings
-2 adjustment elements
· Rotary knob
· Adjustable bolt with protective cap
-Pressure gauge fitting

The pressure valve type 3DR10P is a pilot operated 3-way pressure reducing valve with pressure limitation in the secondary circuit. It is used for reducing pressure in a hydraulic system.
The pressure reducing valve consists mainly of main valve (1) , control spool (2) and pilot control valve (3) with pressure adjustment element (10).
At static state, the valves are normally open, fluid flows free from port P to port A. The pressure in port A is applied via the channel (4) to the spool area opposite to the compression spring (9). Fluid also acts on the ball valve (7) of the pilot valve (3) via the throttle orifice (6) and channel (5). Based on the setting value of the spring (11), control piston keeps open, then fluid can flow free from port P to port A, until pressure at port A exceed the setting value of spring (11), and then ball valve (7) is opened. Control piston (2) moves to close position. When pressure at port A is balanced with setting value at spring (11), pressure reducing is achieved as expected.
If the pressure in port A continuously increases due to external forces, the control spool (2) is moved still further against the compression spring (9). Thus port A is connected to port T via the control lands (8) at the control spool (2). Enough fluid flows to tank to ensure that the pressure does not rise any further.
The pilot oil returns from spring chamber (12) to tank without back pressure via control line (13) to port Y.
A pressure gauge connection(14) makes it possible to monitor the reduced pressure in port A.



Type 3DR10P5-L6X/...

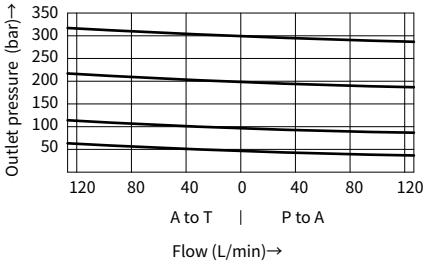
Ordering code



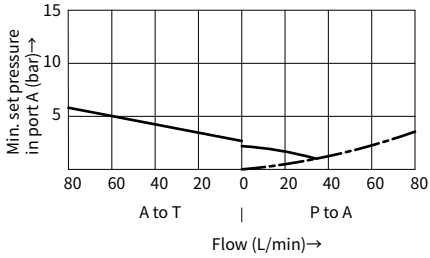
Technical data

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

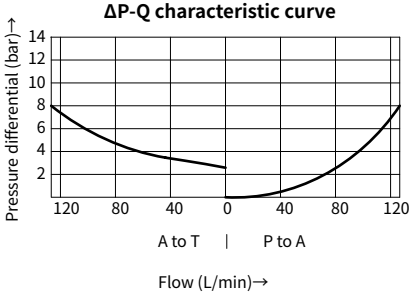
P_A-Q Characteristic curve



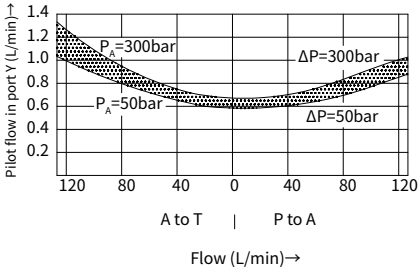
P_{min}-Q characteristic curve



ΔP-Q characteristic curve

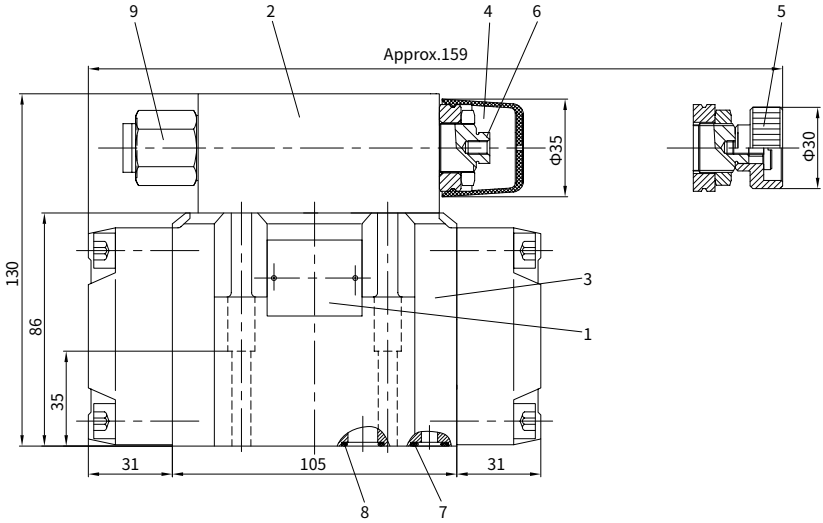


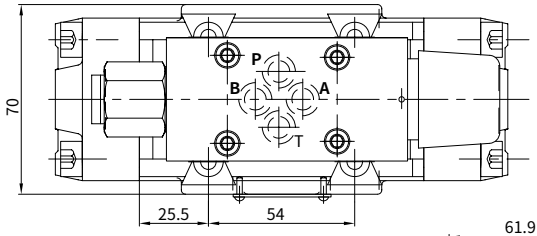
Pilot flow in relation to the main flow

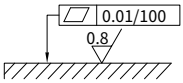


Unit dimensions

(Dimensions in mm)

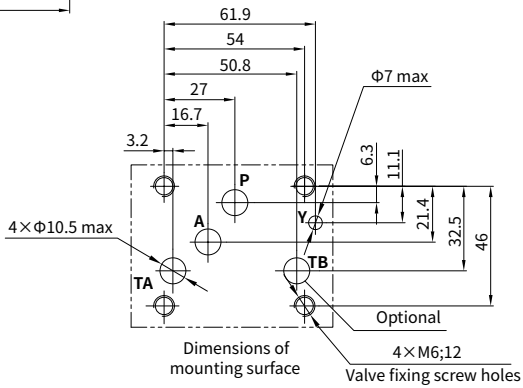






Requirement for mounting surface

1 Name plate
2 Pilot control valve
3 Main valve
4 Adjustment element "5"
5 Adjustment element "4"
6 Internal hexagon screw S=10
7 O-rings 10.82×1.78
(Port X and Y)
8 O-rings 12×2
(Ports A2, B2, P2, TA2 and TB2)
9 Pressure gauge connection G1/4



Dimensions of mounting surface

It must be ordered separately, if connection plate is needed.
Type: G535/01(G3/4) G535/02(M27×2)
G536/01(G1) G536/02(M33×2)

Valve fixing screws:
4 pcs GB/T -10.9,
internal hexagon screw
Tightening torque M_A =15.5 Nm

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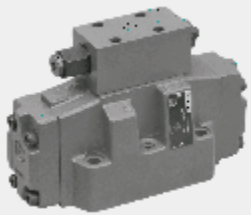
3.14

Pressure Reducing Valve Pilot Operated

Type 3DR16P...L7X

Size 16
up to 250bar
up to 220 L/min



Contents

Function and configuration	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

Features

- Porting pattern to DIN 24 340 form A and ISO 4401
- 4 pressure ratings
- 2 adjustment elements
  - ·Rotary knob
  - ·Adjustable bolt with protective cap
- Pressure gauge fitting

The pressure valve type 3DR16P is a pilot operated 3-way pressure reducing valve with pressure limitation in the secondary circuit. It is used for reducing pressure in a hydraulic system.
The pressure reducing valve consists mainly of main valve (1), control spool (2) and pilot control valve (3) with pressure adjustment element (10).
At static state, the valves are normally open, oil can flow free from port P to port A. The pressure in port A is applied through the channel (4) to the spool area opposite to the compression spring (9). At the same time pressure acts at the ball valve (7) within the pilot valve (3), via throttle orifice (6) and the channel (5). According to the setting value at the spring (11), pressure build up in front of the ball valve (7) and channel (5) which holds the control spool (2) in an open position. Oil freely flows from port P to A through control spool (2), until the pressure of port A exceeds the setting value at the spring (11), and then opens the ball valve (7), meanwhile the control spool (2) moves to the close position. The expected reducing pressure is achieved when a balance between the pressure in port A and the pressure setting value at the compression spring (11) is reached.
If the pressure in port A continuously increases due to external forces, the control spool (2) moves still further against the compression spring (9). Thus port A is connected to port T through the control lands (8) at the control spool (2). Enough pressure fluid flows to the tank to ensure that the pressure does not rise any further.
The pilot oil fr[redacted]er (12) is always external through the control line (13) and port Y to the tank witho[redacted]
A pressure gau[redacted]ossible to monitor the reduced pressure in port A.

Type 3DR16[redacted]

Ordering code

3DR | 16 | P | – L7X / | Y / | ★

3-way pressure reducing valve

Nominal size 16 =16

Sub-plate mounting = P

Rotary knob =4

Adjustable bolt with protective cap =5

Series L70 to L79 = L7X
(L70 to L79 series: unchanged installation and connection dimensions)

Further details in clear text

No code = NBR seals

V = FKM seals

Y= Pilot oil drain external

5 = Max. secondary pressure 50 bar

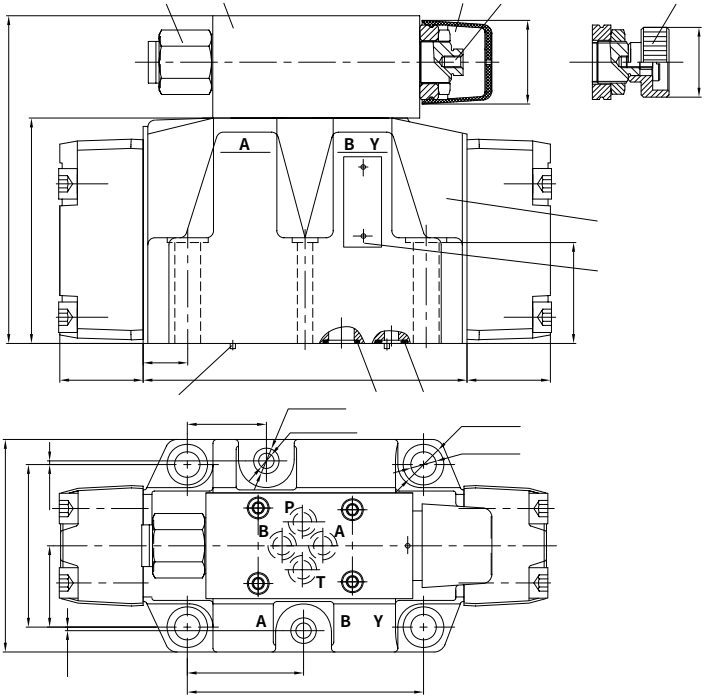
10 = Max. secondary pressure 100 bar

20 = Max. secondary pressure 200 bar

25 = Max. secondary pressure 250 bar

Technical data

Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR 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
Nominal pressure		bar	315
Max.operating pressure	port P	bar	315
Max.operating pressure	port A	bar	250
Max.operating pressure	port Y	bar	Separate and at zero pressure to tank
Setting pressure	Min.	bar	Dependent on the flow (see curves on page 04/06)
	Max.	bar	50; 100; 200; 250
Max. flow-rate		L/min	220
Weight		kg	Approx.8.8


A
B Y
P
B
A
T
A
B Y

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3.15

Pressure Reducing Valve Direct Operated

Type ZDR6D...L4X

Size 6
Up to 210 bar
Up to 50L/min

Contents

Features

- Sandwich plate design
- Mounting face meeting requirements for DIN24340 A and ISO4401
- 4 pressure ranges
- 2 adjustment forms
  Rotary Knob
  Adjusting screw with protective cover
- Connector with pressure gauge
- Selectable one-way valve

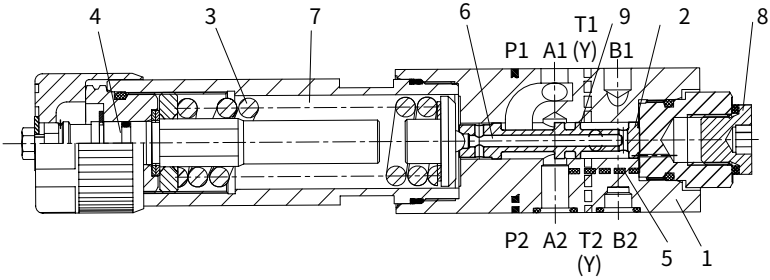
Function and configuration

Pressure reducing valves type ZDR6D.. are 3-way direct operated, sandwich plate design with a pressure reducing function on the secondary side. It is used to reduce the system pressure. The pressure reducing valve basically consists of the housing (1), the control spool (2), two compression springs (3) and the adjustment element (4) as well as with an optional check valve.

Model DA:
At static state, the valve is normally open, and fluid can flow freely from port P2 to port P1 (version "DP") or from port A1 to port A2 (version "DA"). Pressure in port P1 acts at the spool area via control line (5) and is balanced with the setting value of the compression spring (3).
When the pressure in port P1 exceeds the setting value of the spring (3), the control spool (2) moves further towards the compression spring (3), the opening aperture at port P is getting smaller until fluid at port P1 flows back to the tank through the orifice (6) of the control spool (2) to prevent any further rise in pressure. The leakage oil in spring chamber (7) is always drained to tank through port T (Y).
A check valve can be fitted optionally in version "DA" for free flow from ports A2 to ports A1 .
A pressure gauge connection (8) permits the secondary pressure to be monitored.
In model DA, one-way valve can only be mounted with the oil port from A2 to A1 to make the flow passage smooth.

Model DP and DB:
In model DP, oil port P1 is pressure reduced; signal and control oil is provided from the inside of oil port P1.
In model DB, oil port P1 is pressure reduced; but control oil is from oil port B.

Type: ZDR6DA1-L4X/...YM...



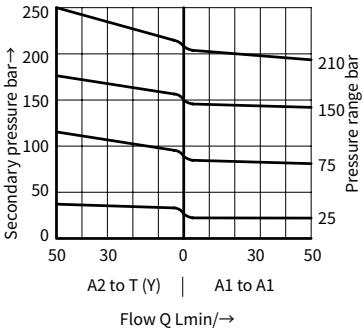
Note:
1. In model DB, when directional valve is in position from P to A, please make sure the pressure of oil port B is no more than the set value, otherwise, the pressure of oil port A is reduced.

2. For internal leakage, superposition relief value for in pair with superposition (hydraulic controlled) one-way valve shall be installed between the superposition (hydraulic control) one-way valve and the directional change valve.

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

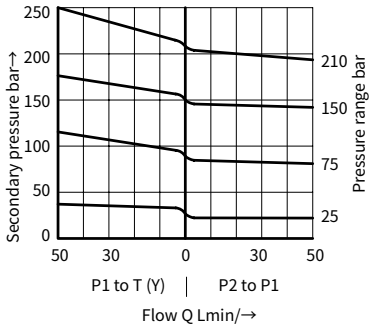
Type ZDR6DA

p_A-q_v Characteristic curves



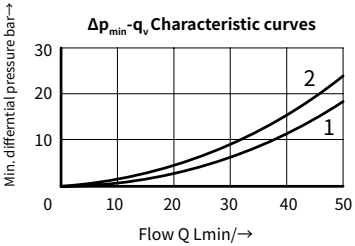
Type ZDR6DP and ZDR6DB

p_A-q_v Characteristic curves

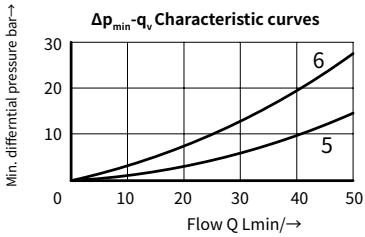


Note: if the set pressure is low, the performance curve is within the corresponding pressure level range.

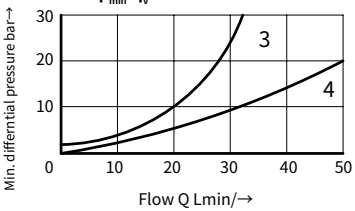
Δp_{min}-q_v Characteristic curves



Δp_{min}-q_v Characteristic curves

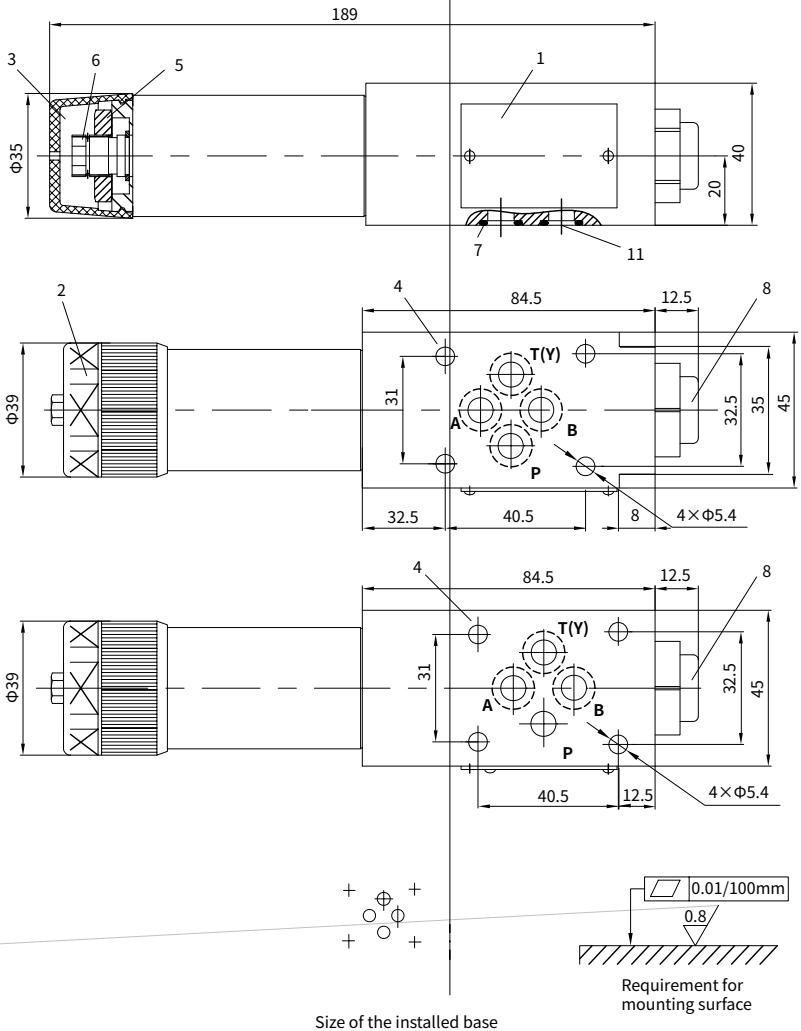


Δp_{min}-q_v Characteristic curves



This work curve is effective to the relief function in case of outlet pressure = 0 within the overall range.

1 A1 to A2
2 A2 to T(Y) (the third flow route)
3 Flow from A2 to A1 just goes through one-way valve.
4 Flow from A2 to A1 just goes through one-way valve and fully-open main valve.
5 P2 to P1
6 P1 to T(Y) (the third flow route)



Size of the installed base

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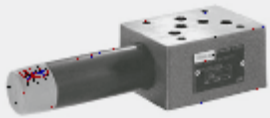
Pressure reducing valve direct operated

Type ZDR10D...L5X

Size 10
up to 210 bar
up to 80 L/min

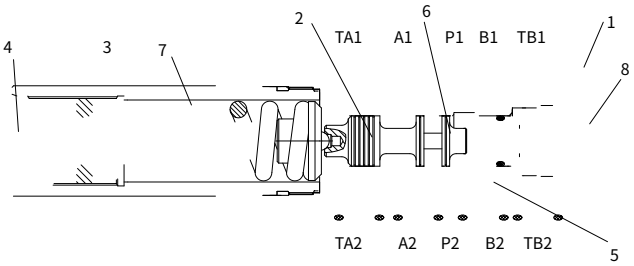


Contents

Function and configuration	02
Symbols	02
Order	

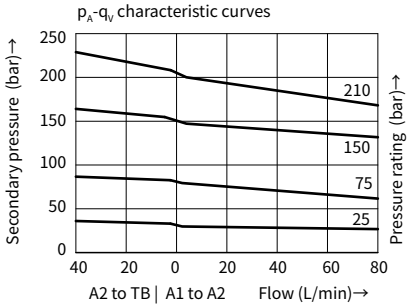
Features

- Sandwich plate structure
- Porting pattern to DIN 24 340, form A and ISO 4401
- 4 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- Pressure reduction in ports A, B or P
- Check valve, optional

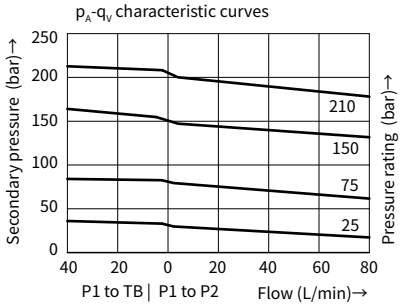

2
6
1
TA1
A1
P1
B1
TB1
4
3
7
8
TA2
A2
P2
B2
TB2
5

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

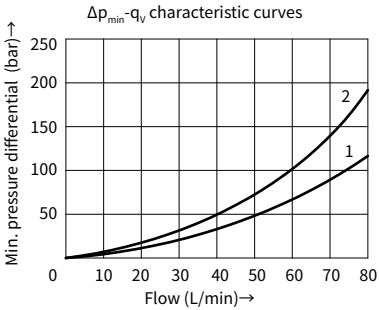
Type ZDR 10 DA..–L5X/...

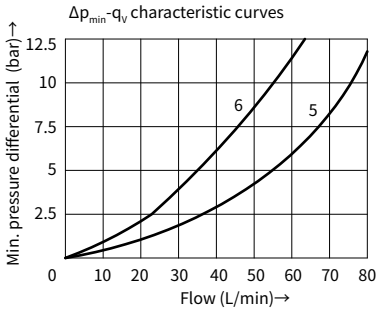


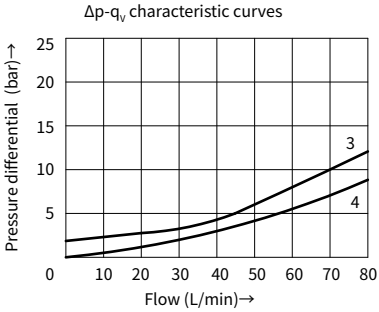
Type ZDR 10 DP..–L5X/... and
Type ZDR 10 DB..–L5X/...



Note:
The curve characteristics remain, with low set pressures, the same in relation to the pressure rating.







1 A1 to A2
2 A2 to TB (3rd. flow path)
3 A2 to A1 flow via check valve only
4 A2 to A1 flow via check valveand fully open controlcross section
5 P2 to P1
6 P1 to TB (3rd. flow path)

The characteristic curves for the pressure relief function are valid for the outlet pressure = 0bar over the entireflow range!

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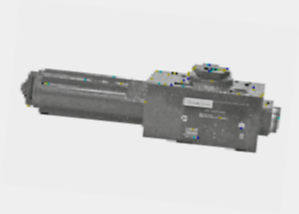
3.17

Pressure sequence valve direct operated

Type DZ6DP...L5X

Size 6
up to 315 bar
up to 60 L/min



Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	03
Unit dimensions	04

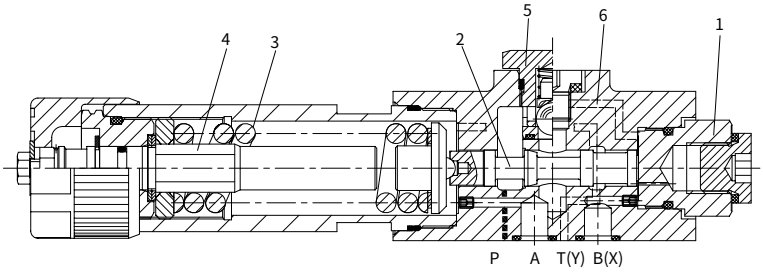
Features

- Direct operated
- Porting pattern to DIN 24 340, form A and ISO 4401
- 5 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- Pressure gauge connection
- Check valve, optional

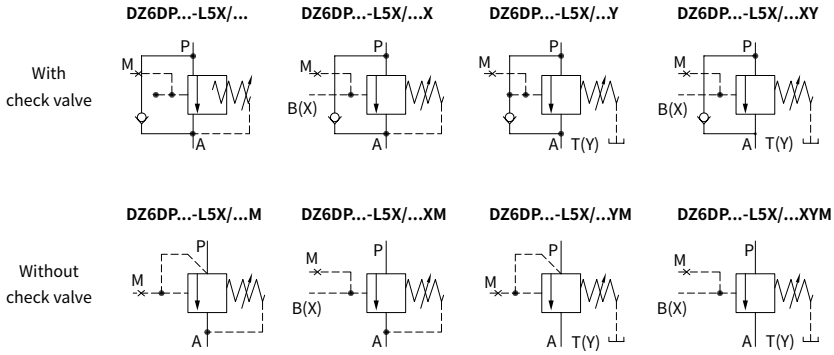
Function and configuration

The valve type DZ6DP is a direct operated pressure sequence valve. It is used for the switching over for pressure dependent connection of a secondary system. The sequence pressure is setting via the adjusting element(4).
The spring (3) holds the control spool (2) in the neutral position, the valve is blocked. The pressure in channel P is acting at the end surface of the control spool (2) opposite the spring (3) via the control line (6). If the pressure in channel P reaches the setting value of the spring(3), the control spool (2) is moved to the left and the connection P to A is opened. In this case, fluid flows from channel P to A without pressure drop in channel P.
The control signal is adopted internally via the control line (6) from channel P or externally via port B (X).
Depending on the use of the valve the leakage oil drain is externally via port T (Y) or internally via A.

Type DZ6DP1-L5X/...



Symbols



Ordering code

DZ6DP – L5X / / *

Direct operated pressure sequence valve nominal size 6

Rotary knob =1
Adjustable bolt with protective cap =2

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

Max. secondary pressure 25 bar =2.5
Max. secondary pressure 75 bar =7.5
Max. secondary pressure150 bar =15
Max. secondary pressure 210 bar =21
Max. secondary pressure 315 bar =31.5 (Note 1)

No code = Pilot oil supply internal, oil drain internal
X = Pilot oil supply external, oil drain internal
Y = Pilot oil supply internal, oil drain external
XY = Pilot oil supply external, oil drain external

No code = With check valve
M = Without check valve

Pressure tapping thread
No code = Incha thread
2 = Metric thread

No code = NBR seals
V = FKM seals

Further details in clear text

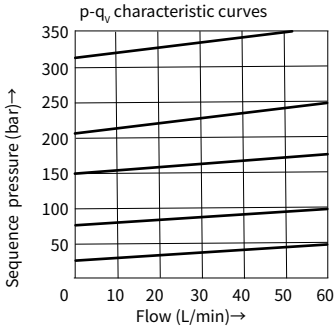
Notes 1: 315bar only for adjustment form "2"and without check valve .

Technical data

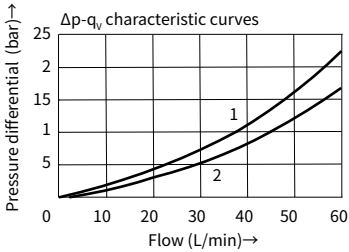
Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Viscosity range		mm^2/s	10 to 800
Degree of contamination			Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406
Max. operating pressure	Port P, A, B(X)	bar	315
	Port T(Y)	bar	160
Max. adjustable sequence pressure		bar	25; 75; 150; 210; 315
Max. flow-rate		L/min	60
Weight		kg	Approx. 1.6

Characteristic curves

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



1. Δp-qV characteristic curves A to P via check valve
2. Δp-qV characteristic curves P to A



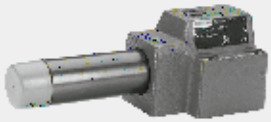
The characteristic curves are valid for output pressure = zero in the complete flow range.

3.18

Pressure sequence valve direct operated

Type DZ10DP...L4X

Size (NG)10
Up to 210 bar
Up to 80 L/min

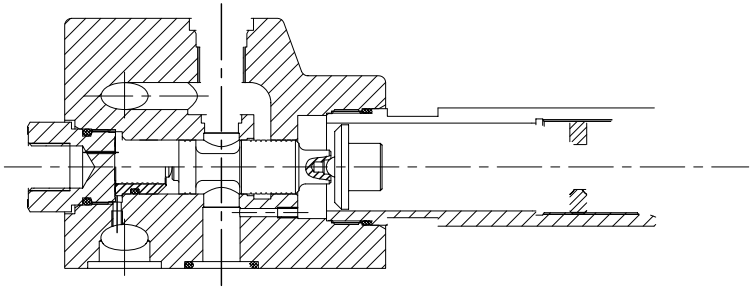


Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	03
Unit dimensions	04

Features

- Direct-acting structure
- Mounting face meeting requirements for DIN24340 A and ISO4401
- 4 pressure ranges
- 2 adjustment forms Knob
  - · Knob
  - · Adjusting screw with protective cover
- Connector with pressure gauge
- Selectable one-way valve



Ordering code

DZ10DP | – L4X / | | / | | *

Direct-acting relief valve diameter 10

Knob =1
Hex bolt with protective cover =2

Series L40 to L49 =L4X
(L40 to L49: unchanged installation and connection dimensions)

Max. secondary pressure 25 bar =2.5
Max. secondary pressure 75 bar =7.5
Max. secondary pressure 150 bar =15
Max. secondary pressure 210 bar =21

Further details in clear text

No code = NBR seals
V = FKM seals

Pressure measurement port thread
No mark = Inch thread G1/4
2 = Metric thread M14×1.5

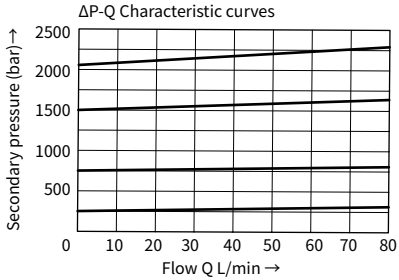
No mark = With one-way valve
M = Without one-way valve

No mark= Control oil supplied from inside and drained to the inside
X= Control oil supplied from outside and drained to the inside
Y= Control oil supplied from inside and drained to the outside
XY=Control oil supplied from outside and drained to the outside

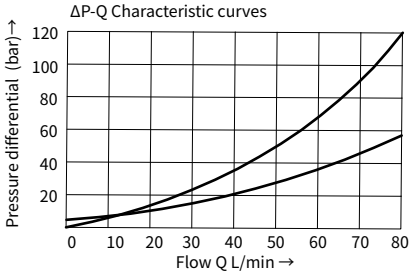
Technical data

Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR 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. operation pressure	oil port P, A, B(X)	bar	210
	Oil port T(Y)	bar	160
Max sequence pressure set (adjustable) with port B		bar	25; 75; 150; 210
Max flow		L/min	80
Weight		kg	About 3

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



Note:
This work curve is effective to the relief function in case of outlet pressure = 0 within the overall range.



ΔP-Q- characteristic curve, flowing via one-way valve B to A.

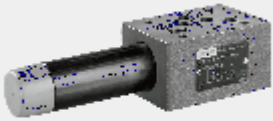
ΔP-Q characteristic curve, A to B

3.19

Pressure sequence valve direct operated

Type ZDZ6DP-L1X

Size (NG) 6
Up to 250 bar
Up to 60 L/min



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Function and configuration	02
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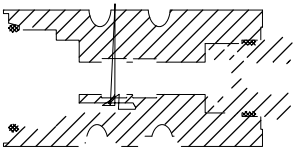
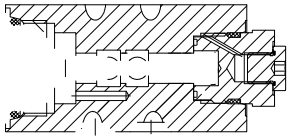
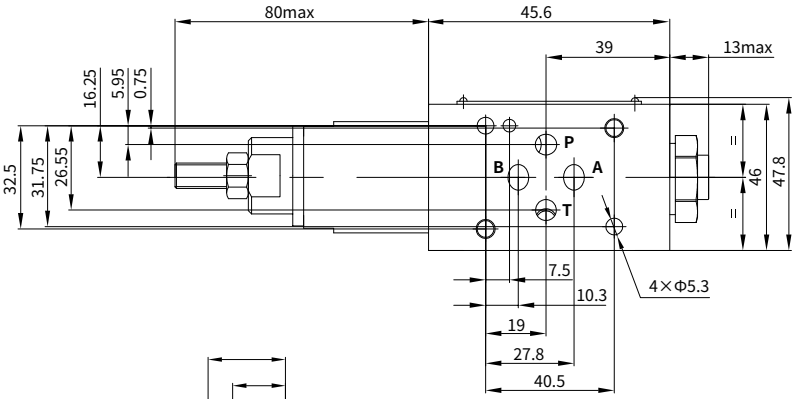
Technical data	02
Unit dimensions	03

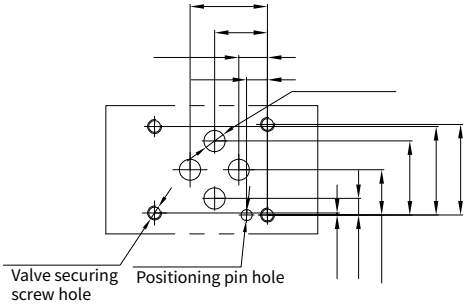
Features

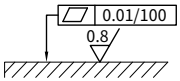
- Sub-plate mounting
- Mounting face conforms to DIN24340 A and ISO4401
- Poit option pressure gauge











Requirement for mounting surface

China
+86 400 101 8889

America
+01 630 995 3674

Germany
+49 172 3683463

Japan
+81 03 6809 1696

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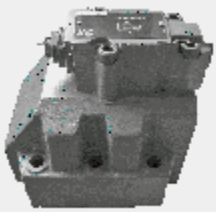
Pressure sequence valve pilot operated

Type DZ...L5X

Sizes 10 to 32
Up to 315bar
Up to 600 L/min



Contents

Features

- Sub-plate mounting
- Conforms to DIN 24 340, form D, and ISO 5781
- Manifold plate mounting
- 4 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- Check valve, optional

·Type DZ..-.-L5X/.....
(Control lines 4.1, 12 and 13 open;
control lines 4.2, 14 and 15 plugged)
The pressure in port A acts on the pilot spool (5) of the pilot valve (2) via the control line (4.1). At the same time it acts on the spring loaded side of the main spool (7) via orifice(6). When the pressure exceeds the setting value of spring (8), the pilot spool (5) is moved against the spring (8). The fluid on the spring loaded side of the main spool (7) flows to port B via orifice (9), control land (10) and control lines (11) and (12). There is now a pressure drop at main spool (7), the connection from port A to port B opens to maintain the pressure set by spring (8). The leakage oil at pilot spool (5) is led to port B internally via control line (13). An optional check valve (3) can be fitted for free flow from port B to A.

·Sequence valveType DZ..-.-L5X/...X..
(Control lines 4.2, 12 and 13 open;
control lines 4.1, 14 and 15 plugged)
The function of this valve is principally the same as valve DZ..-.-L5X/....However, on pressure sequence valve type DZ..-.-L5X/...X.. the signal is achieved externally by means of control line (4.2).

·Sequence valve Type DZ..-.-L5X/...Y..
(Control lines 4.1, 12 and 14 or 15 open;
control lines 4.2, and 13 plugged)
The function of this valve is principally the same as valve type DZ..-.-L5X/....However, for type DZ..-.-L5X/...Y.. leakage at pilot spool(5) must be drained to tank without pressure via line (14) or (15) . Pilot oil is fed to port B via line (12) .

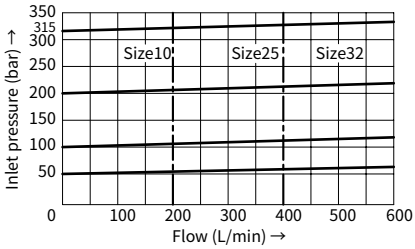
·Bypass valve Type DZ..-.-L5X/...XY..
(Control lines 4.2 14 or 15 open;
control lines 4.1, 12 and 13 plugged)
Pressure in port X acts on the pilot spool (5) in the pilot valve (2) via control line (4.2). At the same time pressure in port A acts on the spring loaded side of the main spool (7) via orifice (6). When the pressure in port X exceeds the setting value of the spring (8), the pilot spool (5) is moved against the spring (8), fluid can flow from the spring loaded side of the main spool (7) into v spool side into ilot

Technical data

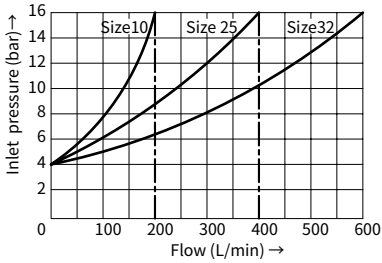
Fluid		Mineral oil suitable for NBR and FKM seal		
		Phosphate ester for FKM seal		
Fluid temperature range	°C	-30 to +80 (NBR seal)		
		-20 to +80 (FKM seal)		
Viscosity range	mm^2/s	10 to 800		
Degree of ☒ c gree				

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

Inlet pressure in relation to flow (A → B)

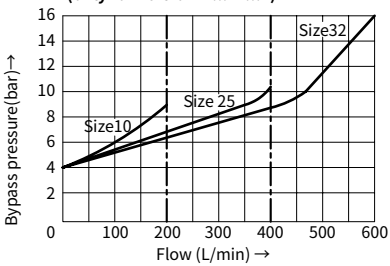


Minimum inlet pressure in relation to flow (A → B)
(= bypass pressure model "..X..")



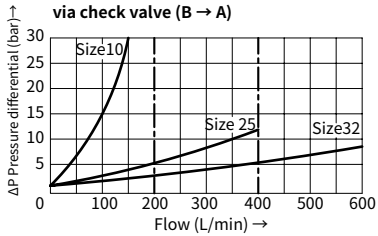
The curves are valid for outlet pressure PB=0 for the complete flow range

Bypass pressure in relation to flow (A → B)
(only for version "...XY...")



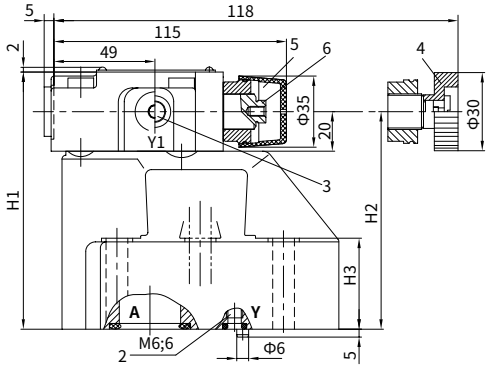
The curves are valid for outlet pressure PB=0 for the complete flow range

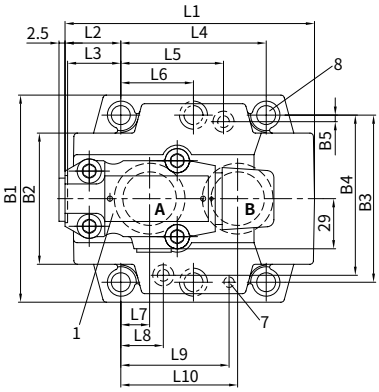
ΔP-Q Characteristic curves
via check valve (B → A)

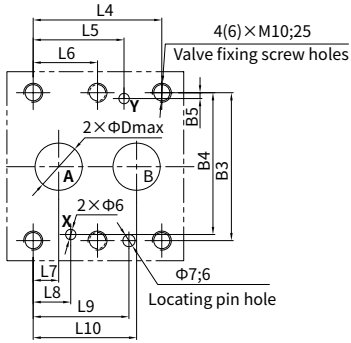


Unit dimensions

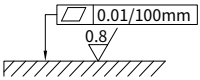
(Dimensions in mm)







Dimensions of mounting surface



Requirement for mounting surface

1 Nameplate
2 Port Y used for control oil drain external for use as bypass valve
3 Port Y1(G1/4;12) for control external drain when used as bypass valve, for unloading of spring chamber when used as sequence valve
4 Adjustment element "1"
5 Adjustment element "2"
6 Internal hexagon screw S=10
7 Locating pin
8 Valve fixing holes 4pcs (DZ10, DZ20); 6pcs(DZ30)

Valve fixing screws:
Internal hexagon screw
DZ10:GB/T 70.1-M10×50-10.9
DZ20:GB/T 70.1-M10×60-10.9
DZ30:GB/T 70.1-M10×70-10.9
Tightening torque M_A=75 Nm

It must be ordered separately, if connection plate is needed. Type:
DZ10: G 460/01(G3/8) G 460/02(M18×1.5)
G 461/01(G1/2) G 461/02(M22×1.5)
DZ20: G 412/01(G3/4) G 412/02 (M27×2)
G 413/01(G1) G 413/02 (M33×2)
DZ30: G 414/01(G1 1/4) G 414/02 (M42×2)
G 415/01(G1 1/2) G 415/02 (M48×2)

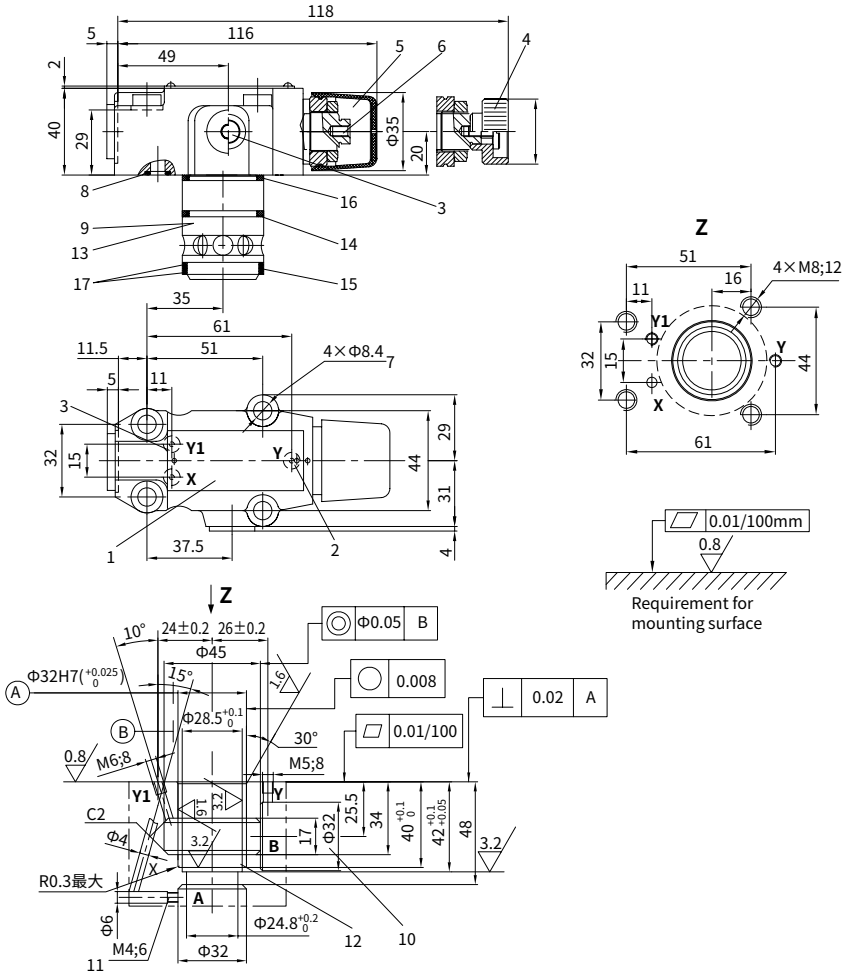
Type	B1	B2	B3	B4	B5	O-ring(PortA,B)	O-ring(PortX,Y)	D
DZ10	85	50	66.7	58.8	7.9	17.12×2.62	9.25×1.78	13
DZ20	102	59.5	79.4	73	6.4	28.17×3.53	9.25×1.78	22
DZ30	120	76	96.8	92.8	3.8	34.52×3.53	9.25×1.78	30

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	H1	H2	H3
DZ10	96	35.5	33	42.9	21.5	-	7.2	21.5	31.8	35.8	112	92	28
DZ20	116	37.5	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	122	102	38
DZ30	145	33	29.8	84.2	59.5	42.1	16.7	24.6	62.7	67.5	130	110	46

Unit dimensions

(Dimensions in mm)

With (DZC 30) or without (DZC) main spool insert

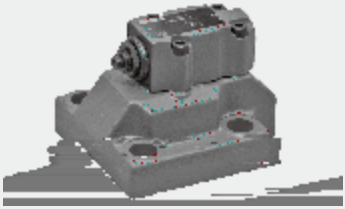


1 Nameplate
2 Port Y for control oil external drain when used as

Pressure shut-off valve pilot operated

Type DA/DAW...L5X

Sizes 10 to 32
Up to 315 bar
Up to 240 L/min



Contents

Features

- Sub-plate mounting
- Porting pattern conforms to DIN 24 340, form D, and ISO 5781
- Manifold plate mounting
- 4 pressure ratings
- 2 adjustment elements:
  - Rotary knob
  - Adjustable bolt with protective cap
- Solenoid unloading valve

Function and configuration

Pressure control valves type DA/DAW are pilot operated pressure shut-off valves.
They are used to charge fluid to accumulator in system, or to unload the low pressure pump in high/low pressure pump system.
Pressure shut-off valves basically consist of the main valve (1) with the spool assembly (3), pilot valve (2) with pressure adjustment element and check valve (4). In valves size 10, the check valve (4.1) is built into the main valve (1). In valve sizes 25 and 32, the check valve (4.2) is built into a separate plate installed under the main valve (1).

Pressure shut-off valve type DA

·Diverting pump flow from P to A to P to T.

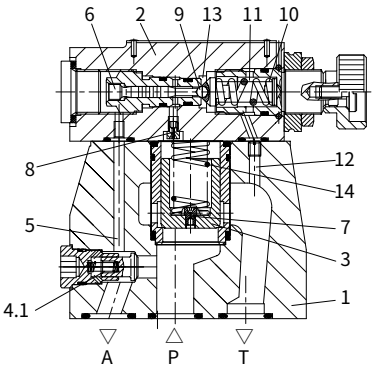
The pump delivers flow via check valve (4) into the hydraulic system (P to A). Pressure in port A acts on the pilot control spool (6)via pilot line (5). At the same time, pressure in port P passes to the spring loaded side of the main spool (3) and ball (9) in the pilot valve (2) via orifices (7) and (8) . As soon as the setting pressure in the hydraulic system is reached, the ball (9) lifts off against spring (10). Pressure fluid now flows via orifices (7) and (8) into spring chamber (11).The fluid returns to tank either internally via control line (12) in valve type DA..L5X/... or externally via control line (13) in valve type DA..L5X/..Y... Due to orifices (7) and (8), pressure drop is now presented at the main spool (3). The main spool (3) now lifts off its seat and opens the connection from P to T. The check valve (4) closes the connection from A to P. The ball valve (9) is kept opening by the system pressure via pilot spool (6).

·Diverting pump flow from P to T to P to A.

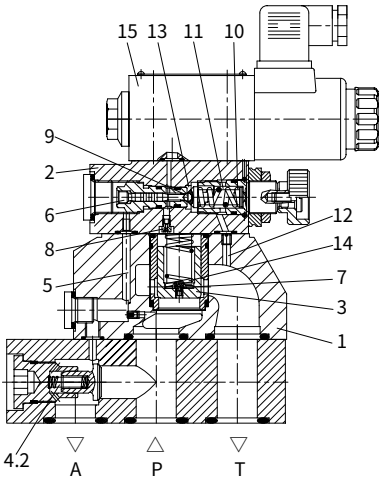
The area of the pilot spool (6) is 10% or optionally 17% greater than the effective area of the ball (9). The effective force on the pilot spool (6) is, therefore, 10 or 17% greater than the effective force on the ball (9).
When the actuator pressure falls to the cut-off pressure which corresponds to the switching pressure differential, spring (10) pushes ball (9) on to its seat. Pressure is then built up on the spring loaded side of the main spool (3). In conjunction with spring (14), the main spool (3) is closed the connection from P to T is isolated. The pump flow passes again via the check valve (4) into the hydraulic system (P to A).

Pressure shut-off valve type DAW

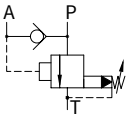
The function of this valve is basically the same as the DA valve. A solenoid directional valve (15) can, however switch the setting cut-off pressure of the pilot valve either from P to A or from P to T.

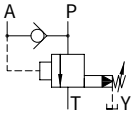


Type:DA10-1-L5X/...

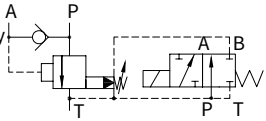


Type:DAW20-1-L5X/...

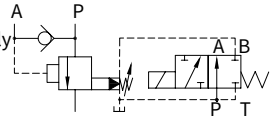




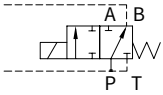
Normally close



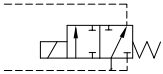
Normally close

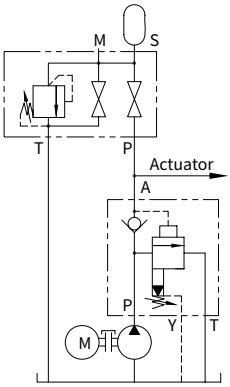


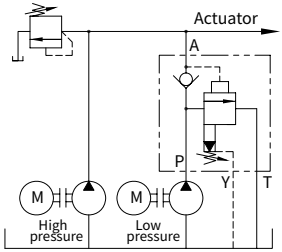
Normally open



Normally open







Ordering code

DA [ ] [ ] [ ] – – L5X / – [ ] / [ ] [ ] [ ] [ ] *

Without directional valve = No code
With directional valve=W

Pilot operated valve=No code
Pilot valve without main spool assembly = C
(No mark for nominal size)
Pilot valve with main spool assembly = C
(Marked with size 30)

Nominal size 10 =10
Nominal size 25 =20
Nominal size 32 =30

For DAW:
Normally closed
(load when breakaway, unload when electrified) =A
Normally open
(unload when breakaway, load when electrified) =B

Rotary knob =1
Adjustable bolt with protective c =2

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

Further details in clear text

No code= NBR seals
V = FKM seals

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

Only DAW:
N= With hand override

Only DAW:
G24 = 24V DC
W220 = 220V AC
W220R = 220V AC rectification
W110 = 110V AC
(Other voltage refer to type WE6)

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

No code= Internal pilot oil drain
Y = external pilot oil drain

Switching pressure differential (P → A)
17 = In the mid range 17 %

5 = Pressure adjustable 0~ 50bar
10 = Pressure adjustable 50~100bar
20 = Pressure adjustable 100~200bar
31.5 = Pressure adjustable 200~315bar

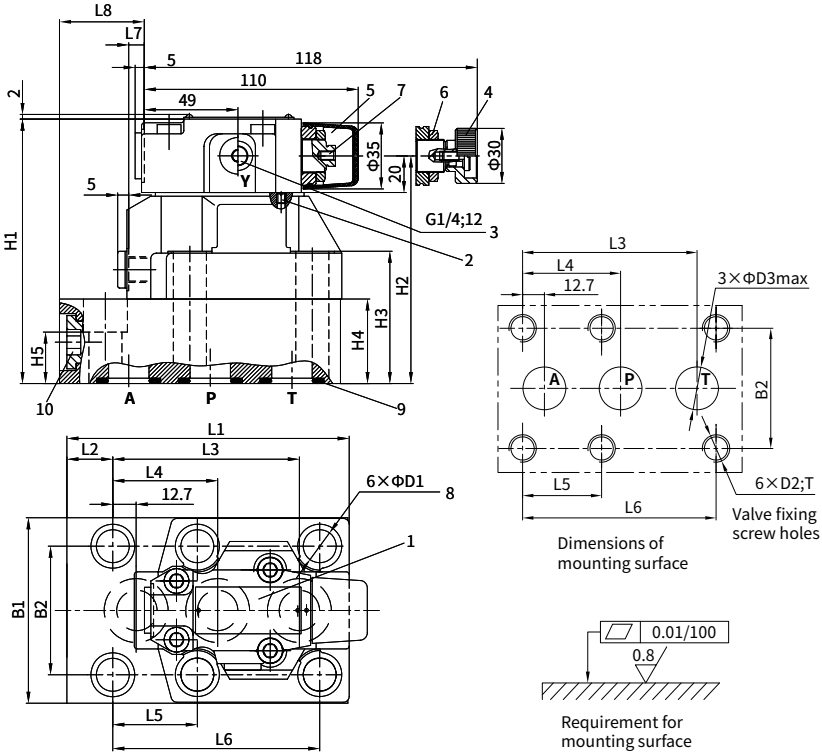
Technical data

Size			10	25	32
Fluid			Mineral oil suitable for NBR and FKM seal		
			Phosphate ester for FKM seal		
Fluid temperature range		°C	-30 to +80 (NBR 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	bar	315		
Max. setting pressure		bar	50, 100, 200, 315		
Max. flow-rate		L/min	60	120	240
Solenoid technical data			Refer to version WE6, normally close chooses 3WE6A9, normally open choose 3WE6B9		
Installation			Optional		
weight	DA	kg	Approx.3.8	Approx.7.9	Approx.12.3
	DAW	kg	Approx.5.3	Approx.9.4	Approx.13.8
	DAC	kg	Approx.1.2 (If version DAWC, add 1.5 kg)		
	DAC30	kg	Approx.1.5 (If version DAWC30, add 1.5 kg)		

Unit dimensions

(Dimensions in mm)

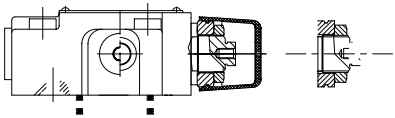
Sizes 25 and 32

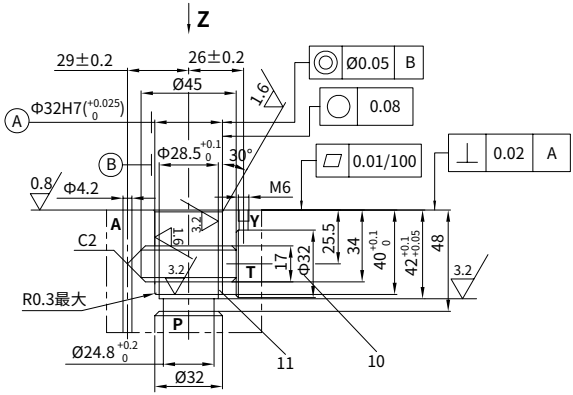


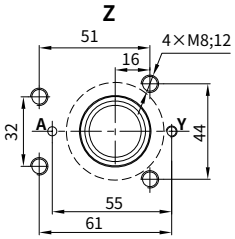
1 Nameplate
2 Without control oil internal returning
3 Port Y used for control oil external returning
4 Adjustment element"1"
5 Adjustment element"2"
6 Lockable Nut S=24
7 Internal hexagon bolt S=10
8 Valve fixing hole
9 Size 25: O-ring 28.17×3.53
Size 32: O-ring 34.52×3.53
10 Integrated check valve
Built-on directional valve's size, refer to Page 07/10.

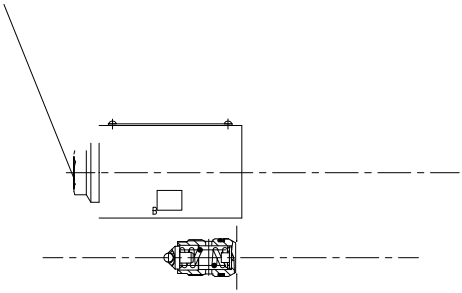
Valve fixing screws:
Size 25: 4pcs M16×100; 2pcs M16×60
Size 32: 4pcs M18×120; 2pcs M18×80
Internal hexagon screw GB/T 70.1-10.9,
Tightening torque M_A =75 Nm

It must be ordered separately, if connection plate is needed
Type:
Size 25: G 469/01; G 469/02 G 470/01; G 470/02
Size 32: G 471/01; G 471/02 G 472/01; G 472/02




Z
29±0.2
26±0.2
Ø45
Φ32H7(+0.025 0)
A
B
Φ28.5 +0.1 0
30°
1.6
Ø0.05 B
0.08
0.01/100
0.02 A
0.8
Φ4.2
M6
A
Y
C2
3.2
1.6
3.2
T
17
Φ32
25.5
34
40 +0.1 0
42 +0.1 +0.05
48
3.2
R0.3最大
P
Ø24.8 +0.2 0
Ø32
11
10


Z
51
16
4×M8;12
32
A
Y
44
55
61



Ordering code

–DBW | | | | –L5X / | | | – 6B2 | | / | | *

Explosion-proof type I = G1
Explosion-proof type II = G2

Relief valve,
pilot operated withbuilt-on
directional valve = DBW

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)

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 =No code
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)

Further details in
clear text

No code = NBR seals
V = FKM seals

Used for threaded junction
valve or Y1 on the pilot valve of
plate-type junction valve only
No code = Inch thread
2 = Metric thread

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

Voltage:
G12= DC12V
G24= DC24V
G36= DC36V
G110= DC110V

6B2= Threaded Explosion proofvalve

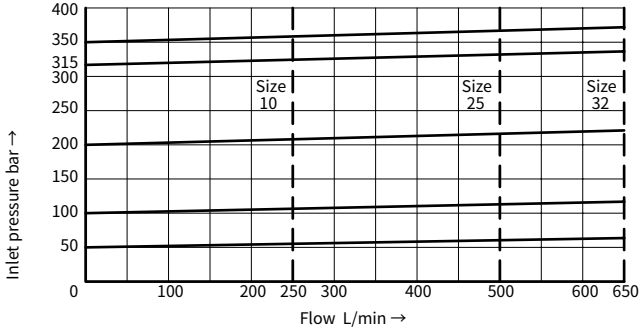
No code = Without switching shock damping
S = With switching shock damping

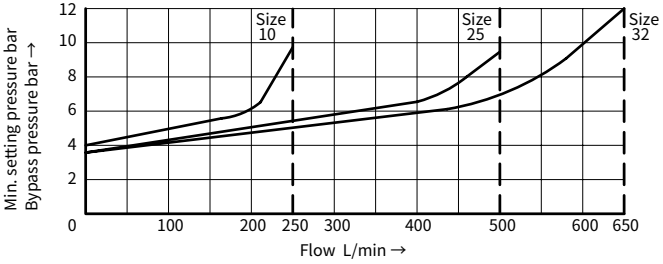
No code= Standard version
U = Valve for lower opening pressure
(not for version without main spool
cartridge and not suitable for 350bar)

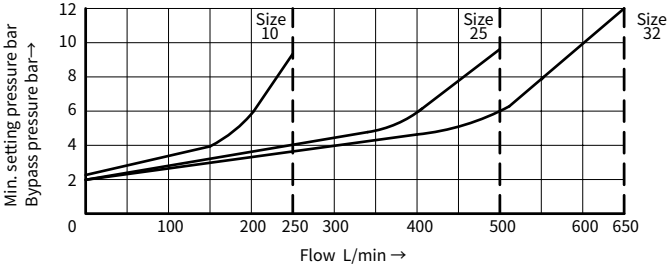
No code= Pilot oil supply and drain internal
X = Pilot oil supply external and drain internal
Y = Pilot oil supply internal and drain external
XY = Pilot oil supply and drain external

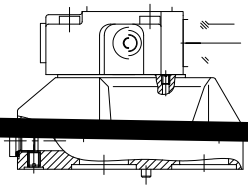
5 = Pressure adjustable up to 50bar
10 = Pressure adjustable up to 100bar
20 = Pressure adjustable up to 200bar
31.5 = Pressure adjustable up to 315bar
35 = Pressure adjustable up to 350bar

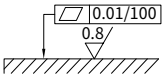
Note: G1 Explosion-proof grade EX d I Mb
G2 Explosion-proof grade EX d II C T4 Gb


Inlet pressure bar →
400
350
315
300
250
200
150
100
50
0
Size 10
Size 25
Size 32
100
200
250
300
400
500
600
650
Flow L/min →

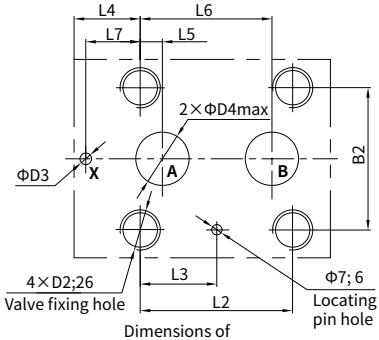

Min. setting pressure bar
Bypass pressure bar →
12
10
8
6
4
2
0
Size 10
Size 25
Size 32
100
200
250
300
400
500
600
650
Flow L/min →


Min. setting pressure bar
Bypass pressure bar→
12
10
8
6
4
2
0
Size 10
Size 25
Size 32
100
200
250
300
400
500
600
650
Flow L/min →

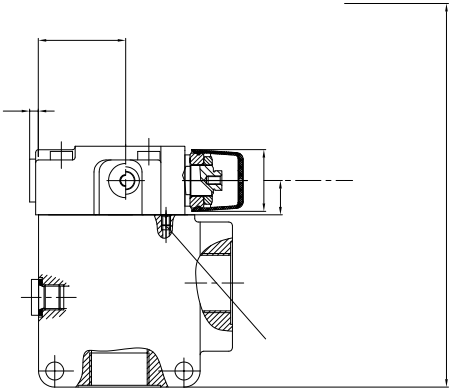


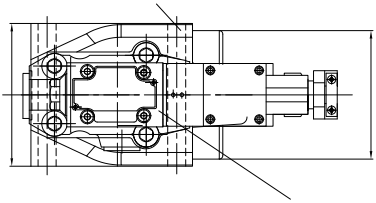


Requirement for mounting surface



Dimensions of mounting surface

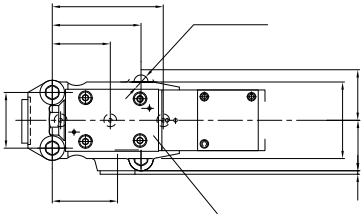




Unit dimensions

(Dimensions in mm)

With main spool valve(G...DBWC10or30)
or without main spool valve(G...DBWC)



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