



Pressure valves

Contents

	Page
3.1 Pressure relief valve, direct operated, type DBD...10	0263-0270
3.2 Pressure relief valve, pilot operated, types DB(W), remote pressure adjusting valve, type DBT	0271-0280
3.3 Pilot operated pressure relief valve, type DB...K...L4X	0281-0286
3.4 Pilot operated pressure relief valve, type DB20K...L1X	0287-0290
3.5 Pilot operated pressure relief valve, types ZDB/Z2DB 6V...L4X	0291-0296
3.6 Pilot operated pressure relief valve, types ZDB/Z2DB 10V...L4X	0297-0302
3.7 Pilot operated pressure relief valve, types ZDB/Z2DB...V...L3X	0303-0312
3.8 Direct operated pressure relief valve, type ZDBD...L1X	0313-0322
3.9 Pressure reducing valve, direct operated, type DR5DP...10	0323-0328
3.10 Pressure reducing valve, direct operated, type DR6DP...L5X	0329-0334
3.11 Direct operated pressure reducing valve, type DR10DP...L4X	0335-0340
3.12 Pilot operated pressure reducing valve, type DR...L5X	0341-0348
3.13 Pressure reducing valve, pilot operated, type 3DR10P...L6X	0349-0354
3.14 Pressure reducing valve, pilot operated, type 3DR16P...L7X	0355-0360
3.15 Pressure reducing valve, direct operated, type ZDR6D...L4X	0361-0366
3.16 Pressure reducing valve, direct operated, type ZDR10D...L5X	0367-0372
3.17 Pressure sequence valve, direct operated, type DZ6DP...L5X	0373-0376
3.18 Pressure sequence valve, direct operated, type DZ10DP...L4X	0377-0380
3.19 Pressure sequence valve, direct operated, type ZDZ6DP...L1X	0381-0384
3.20 Pressure sequence valve, pilot operated, type DZ...L5X	0385-0390
3.21 Pressure shut-off valve, pilot operated, types DA/DAW...L5X	0391-0400
3.22 Explosion-proof pressure relief valve, pilot operated, type G...DBW	0401-0410



3.1

Pressure relief valve direct operated

Type DBD...10

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



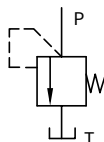
Contents

Function and configuration	02
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05-07

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



Function and configuration

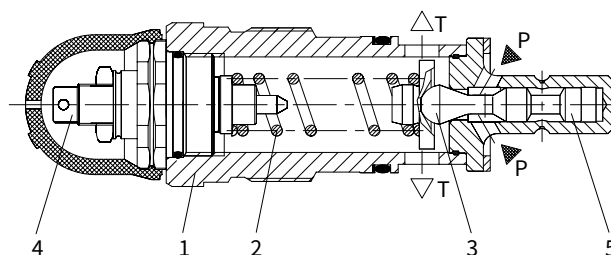
The DBD pressure relief valves are direct operated, used to limit the pressure of hydraulic system. It comprises the sleeve (1), spring (2), poppet spool with damping (3) and pressure adjustment element (4). The system pressure may be set infinitely by the adjustment element. The spring (2) presses poppet spool (3) onto the valve seat. The channel P is connected to the system and the system pressure affect on the area of poppet spool.

If the pressure in channel P rises in excess of the value set at the spring (2), the poppet spool (3) will opens against the spring (2). The pressure oil flows from channel P to channel T. The stroke of the spool is limited by spin shaft (5).

To gain accurate setting value within the whole pressure range, the pressure scope is divided into 6 pressure ratings, and every rating has a corresponding spring which may be set maximum pressure.

03

Type DBDS...K. 10/...
pressure stages 25 to 400bar



Notes:

Pressure relief valves, direct operated, type DBD has low internal leakage, and higher pressures at flow, and are suitable as a safety valve. Choose pilot operated pressure relief valves if lower adjustable pressure with low internal leakage is needed.

Ordering code

	DBD				10 / /		*
--	-----	--	--	--	--------	--	---

Pressure relief valve,
Direct operated

Adjusting bolt
with protective cap =S

Regulating handle =H

Further details
in clear text

No code = NBR seals
V = FKM seals

For threaded connection valve
No code = Inch
2 = Metric

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

Size

Connection version

Inserted cartridge =K

Threaded connection =G

Sub-plate mounting =P

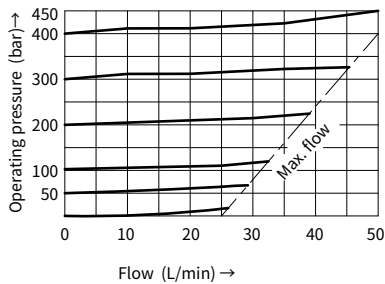
10= 10 series

Technical data

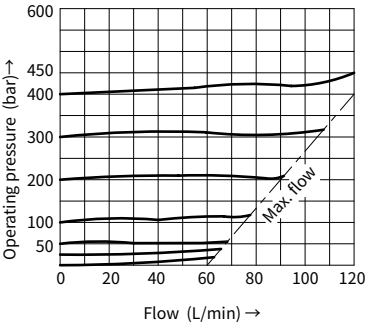
Fluid		Mineral oil suitable for NBR and FKM seal			
		Phosphate ester for FKM seal			
Fluid temperature range °C		-30 to +80 (NBR seal)			
		-20 to +80 (FKM seal)			
Viscosity range mm²/s		10 to 800			
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406			
Nominal size		6 and 8	10	15 and 20	25 and 30
Operating pressure range	Inlet bar	Up to 400	up to 400	up to 400	up to 315
	Outlet bar	315			
Max. flow-rate L/min		See the Characteristic curve			

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

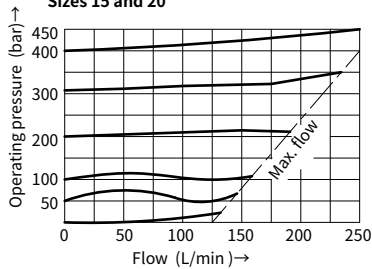
Size 6



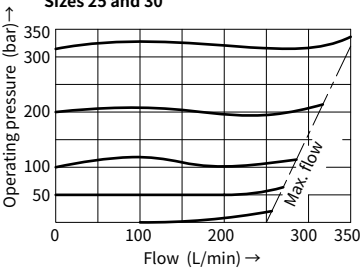
Sizes 8 and 10



Sizes 15 and 20



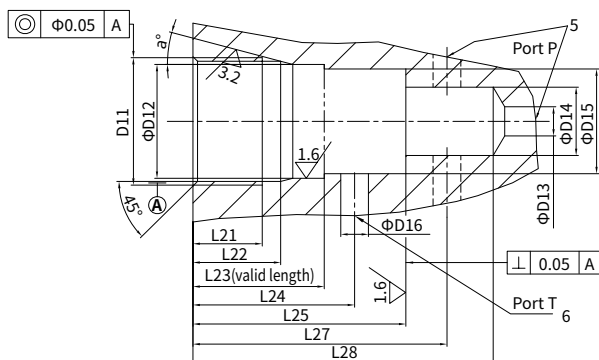
Sizes 25 and 30



Unit dimensions

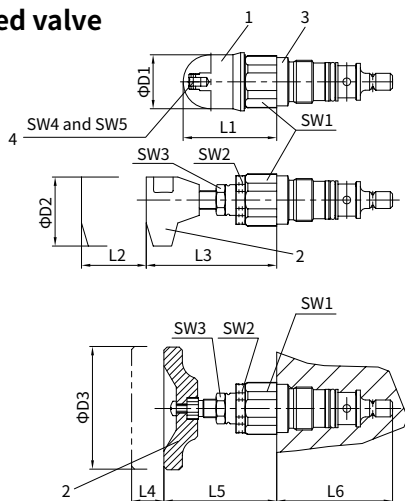
(Dimensions in mm)

- Cartridge cavity



- **Inserted valve**

- 1 Adjustment element "S"
- 2 Adjustment element "H"
(use pressure
adjustment handwheel for
sizes 25 and 30)
- 3 Steel seal (type, size)
- 4 Internal hexagon screw S=6 for
under size 20 (SW4) and external
hexagon S=13 for above size 25 (Sw5)
- 5 Port P, arranged optionally around
periphery or bottom
- 6 Port T, arranged optionally
around periphery

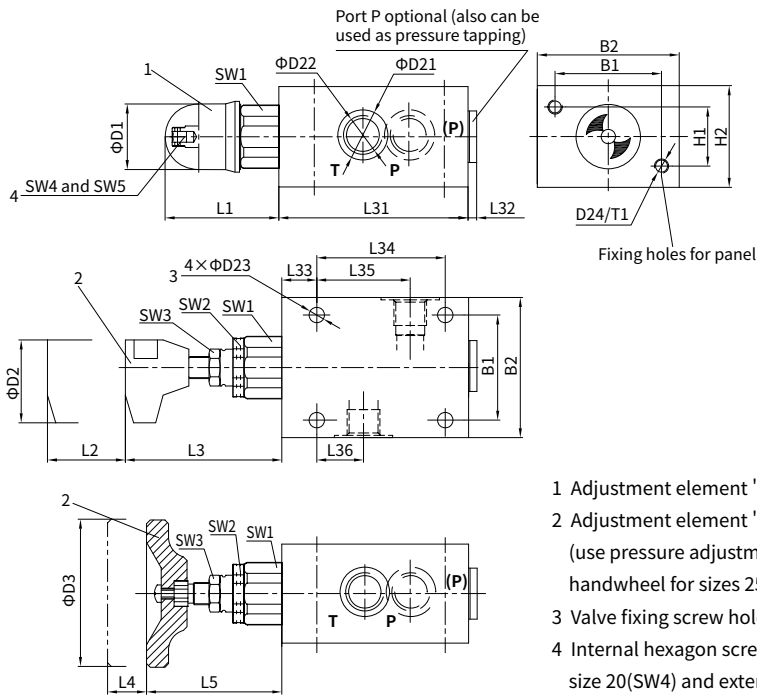


Size	Weight (kg)		D1	D2	D3	L1	L2	L3	L4	L5	L6	SW1	Torque(Nm)		SW3	SW4	SW5
6	Approx. 0.4		34	60	-	72	11	88	-	-	64	32	80		19	6	-
10	Approx. 0.5		38			68		79		75	36	150					
20	Approx. 1		48			65		77		106	46	250					
30	Approx. 2.3		63	-	80	83	-	-	11	56	131	60	450				
Size	D11	D12	D13	D14	D15		D16	L21	L22	L23	L24	L25	L27		L28	α	
6	M28×1.5	25H9	6	15	24.9		6	15	19	39	35	45	56.5±5.5		65	15	
10	M35×1.5	32H9	10	18.5	31.9		10	18	23	35	41	52	67.5±7.5		80		
20	M45×1.5	40H9	20	24	39.9		20	21	27	45	54	70	91.5±8.5		110	20	
30	M60×2	55H9	30	38.75	54.9		30	23	29		60	84	113.5±11.5		140		

Unit dimensions

(Dimensions in mm)

• Threaded connection valve



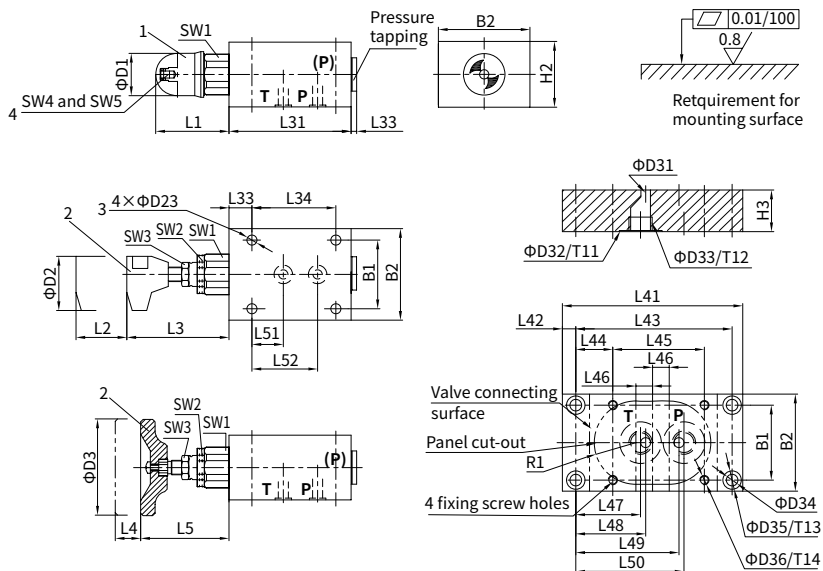
- 1 Adjustment element "S"
- 2 Adjustment element "H"
(use pressure adjustment
handwheel for sizes 25 and 30)
- 3 Valve fixing screw hole
- 4 Internal hexagon screw S=6 for under
size 20(SW4) and external hexagon
S=13 for above size 25 (SW5)

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							
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	
(25)+30	83		-			-	11	56	180	4	25	130					85	35	60

Unit dimensions

(Dimensions in mm)

• Sub-plate mounting valve



Size	O-ring (P and T)	Dimension of pressure tapping	Valve fixing hole (GB/T70.1-10.9)	Torque(Nm)
6	8.75×1.8	G1/4	M6×50	Approx.10
10	12.3×2.4	G1/2	M8×70	Approx.25
20	22×3	M27×2	M8×90	Approx.50
30	34×3	M42×2	M10×110	Approx.50

- 1 Adjustment element "S"
- 2 Adjustment element "H" (Sizes 25 and 30 use pressure adjustment handwheel)
- 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	D23	H2	L1	L2	L3	L4	L5	L31	L32	L33	L34	SW1	SW2	SW3	SW4	SW5		
6	Approx. 1.6	45	60	34			6.6	40	72	11	83			80	2	15	55	32	30	19	6	-		
10	Approx. 3.7	60	80	38	60	-	9	60	68		79	-	-	100	3	20	70	36						
20	Approx. 7.1	70	100	48					70	65	77			135	4		100	46	36					
30	Approx. 15.7	100	130	63	-	80	11	90	83	-	-	11	56	180	4	25	130	60	46		-	13		
Size	Sub-plate type				Weight (kg)				D31				D32				D33				D34	D35	H3	L41
6	G300/1				约 1.5				6				25				G1/4				7	11	25	110
10	(G301/1) G302/1				约 2				10				(28) 34				(G3/8) G							135
20	(G303/1) G304/1				约 5.5				(15) 20				(42) 47				(G3/4) G1				11.5	17.5	40	170
30	(G305/1) G306/1				约 8				30				(56) 61				(G1 1/4) G11/2							190
D36	L42	L43	L44	L45	L46	L47	L48	L49	L50	L51	L52	T11	T12	T13	T14	R1								
M6	8	94	22	55	10	39	42	62	65	20	40		15	1	9	15	25+2							
M8	10	115	27.5	70	12.5	40.5	48.5	72.5	80.5	21	45	(15) 16												
	15	140	20	100	20	(45) 42	54	85	(94) 97	34	65													
M10	12.5	165	17.5	130	22.5	42	52.5	102.5	(113) 117	35	85	24	11.5	22	55+4									

China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



Pressure relief valve pilot operated

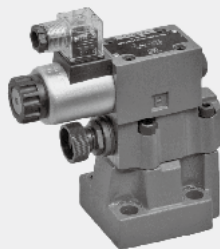
3.2

Type DB/DBW...L5X

Remote pressure adjusting valve

Type DBT

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



Contents

Function and configuration	02
Symbols	03
Technical data	04
Ordering code	05
Performance curves	06
Unit dimensions	07-09
Remote pressure adjusting valve	10

Features

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

Function and configuration

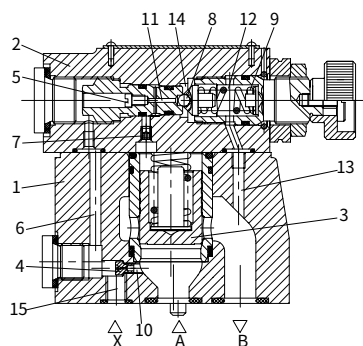
Types DB and DBW pressure valves are pilot operated pressure relief valves, used to limit (DB) or limit and unload (DBW) pressure via solenoid operation. The pressure relief valves consist of main valve (1) with main spool cartridge (3) and pilot operated valve (2) with pressure adjustment elements.

• Type DB pressure relief valves

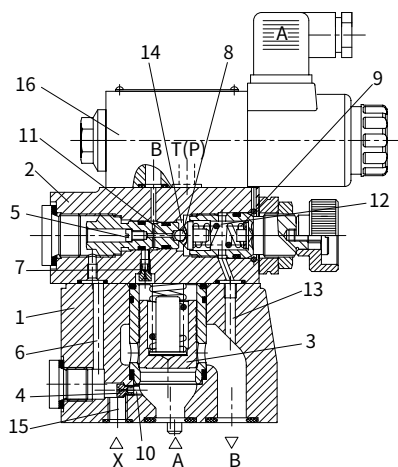
The pressure of channel A acts on the main spool (3), meanwhile, pressure is applied via control line (6) and (7) with orifice (4) and (5) on the spring loaded side of the main spool (3) and on the ball (8) in the pilot operated valve(2). If the pressure in channel A rises excess the setting value at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

• Type DBW pressure relief valves

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



Type DB pressure relief valves



Type DBW pressure relief valves

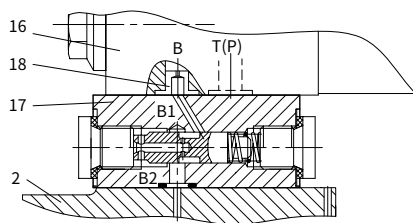
Function and configuration

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

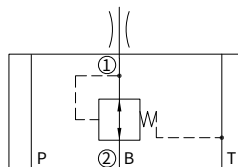
Switching shock damping (17), the connection from B2 to B1 opens with delay to avoid peak pressure spikes and decompression in the return line. It is fitted between pilot valve (2) and the directional valve (16).

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

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

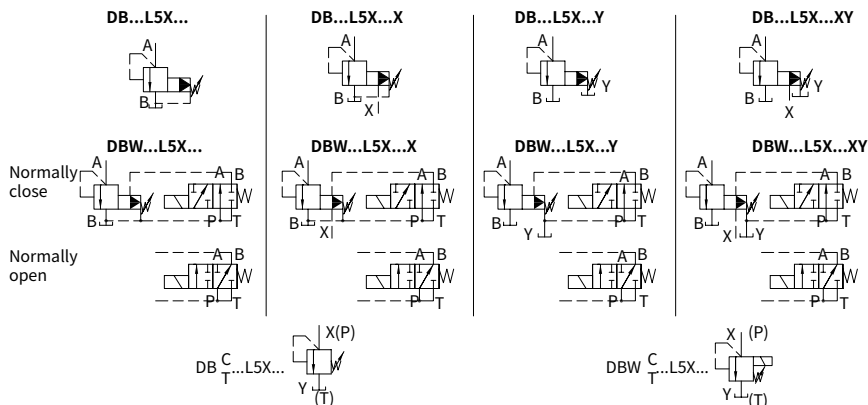


Indication: the directional valve is open



03

Symbols



Technical data

Fixing position				Optional				
Weight	Sub-plate mounting	DB	kg	DB...10	DB...15	DB...20	DB...25	DB...30
		DBW	kg	Approx.3	-	Approx.3.9	-	Approx.5.3
		DBC	kg	Approx.4.5	-	Approx.5.4	-	Approx.6.8
		DBC10 or 30	kg	Approx.1.2 (Type DBWC add 1.5)kg				
	Threaded connection	DB..G..	kg	Approx.1.5 (Type DBWC10 and 30 add 1.5)kg				
		DBW..G..	kg	Approx.5.3	Approx.5.2	Approx.5.1	Approx.5.9	Approx.5.8
	Switching shock damping		kg	Approx.6.8	Approx.6.7	Approx.6.6	Approx.7.4	Approx.7.3
Technical 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[illegible]

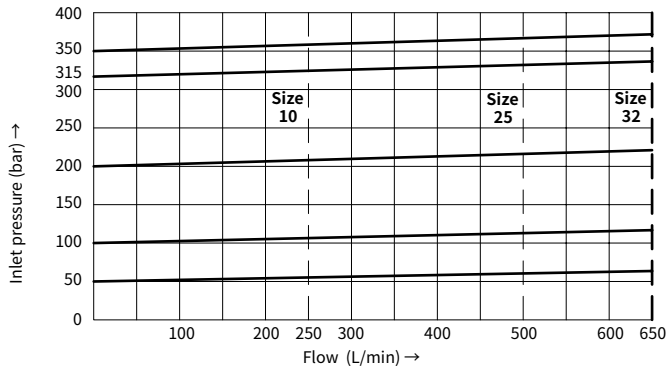
Notes:

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.

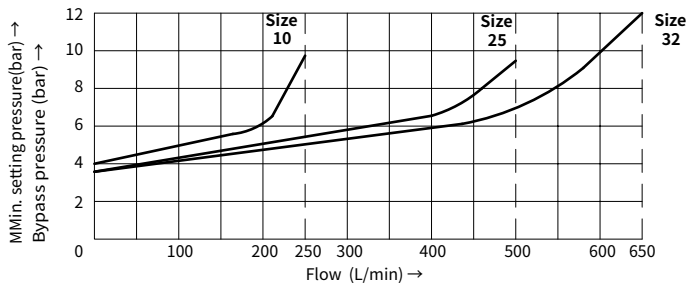
Performance curves (Measured at $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using HLP 46)

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

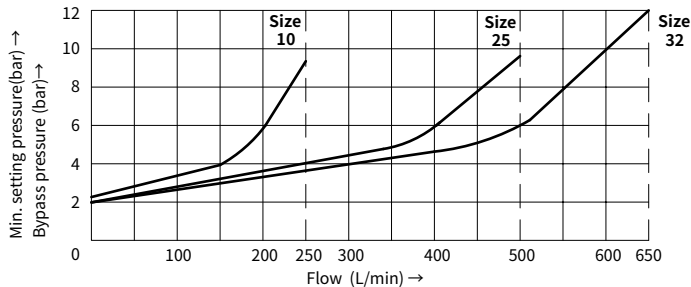
Inlet pressure in relation to the flow-rate



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



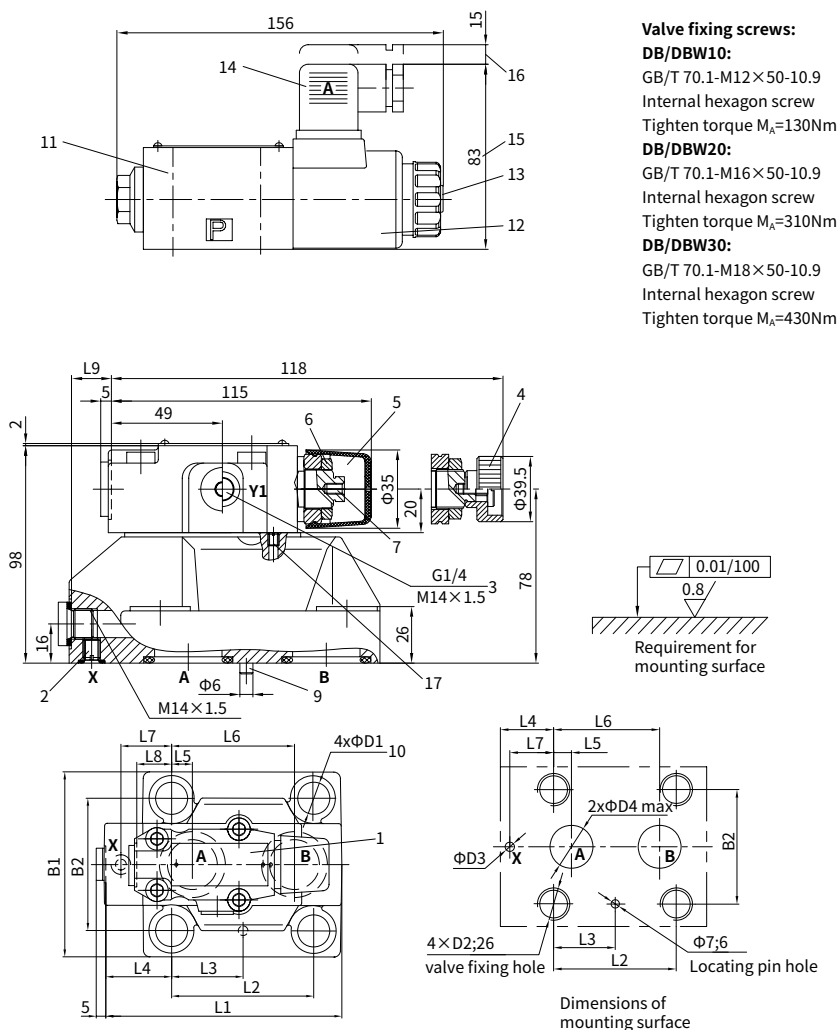
Minimum setting pressure and bypass pressure in relation to the flow-rate!
• Version "U"



Unit dimensions

(Dimensions in mm)

- **Sub-plate mounting**



Valve fixing screws:

DB/DBW10:

GB/T 70.1-M12×50-10.9

Internal hexagon screw

Tighten torque $M_A=130\text{Nm}$

DB/DBW20:

GB/T 70.1-M16×50-10.9

Internal hexagon screw

Tighten torque $M_A=310\text{Nm}$

DB/DBW30:

GB/T 70.1-M18×50-10.9

Internal hexagon screw

Tighten torque $M_A=430\text{Nm}$

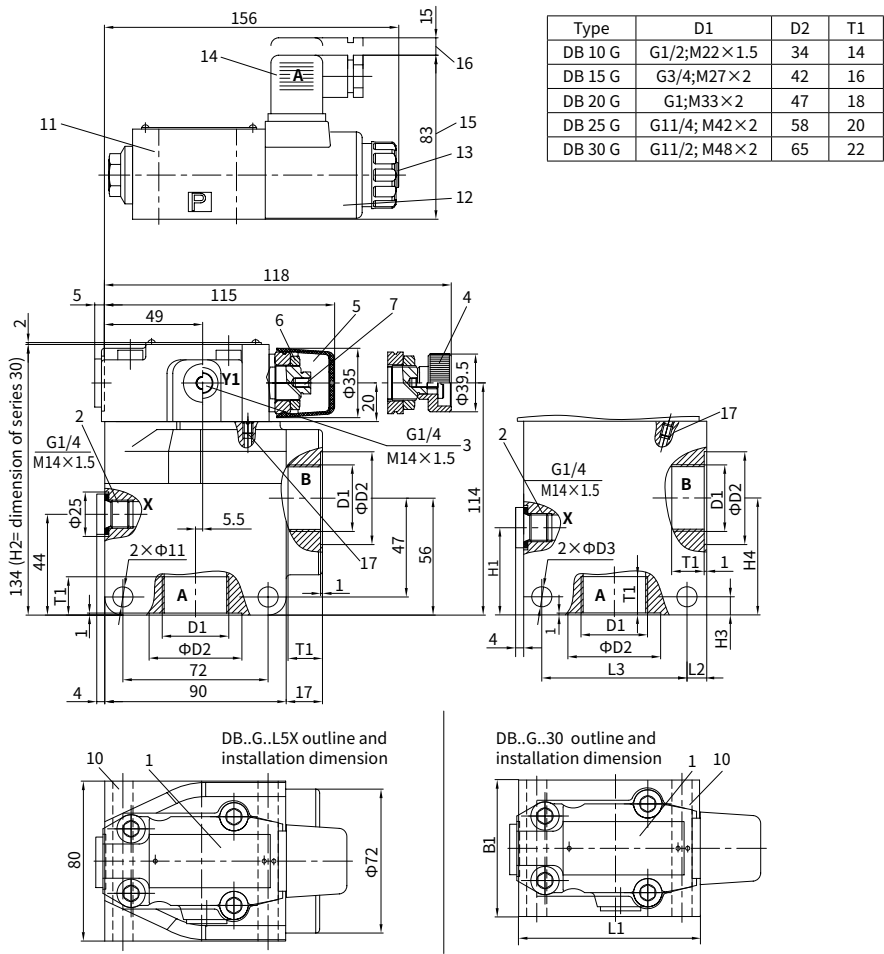
03

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

Unit dimensions

(Dimensions in mm)

• Threaded connection



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.

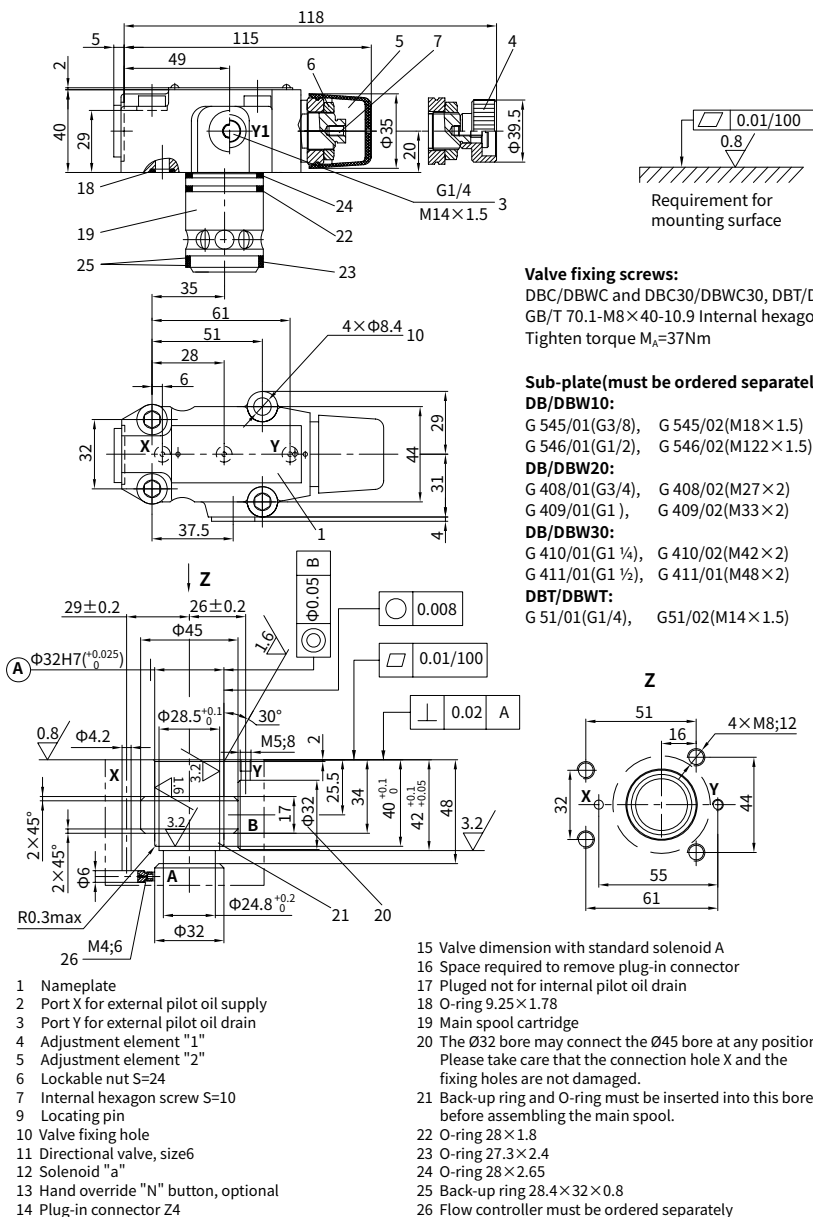
Outline and installation dimension of series 30 threaded connection valve:

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						57			
DB 20 G									
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)

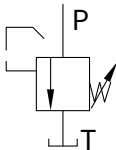


Remote pressure adjusting valve

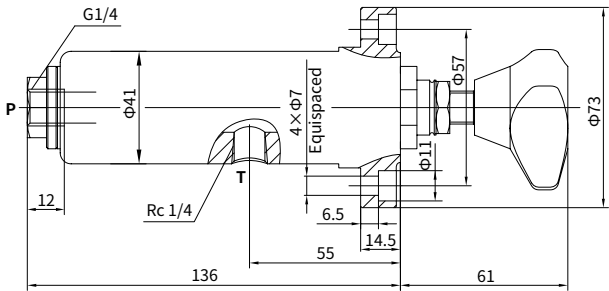
• Ordering code

	DBT	G	1	L3X	/		
Remote pressure adjusting valve							
Threaded connection		=G				No code=	NBR seals
Adjusting handle			=1			V =	FKM seals
Series L30 to L39 (L30 to L39: unchanged installation and connection dimensions)				=L3X			
						10 =	Max. secondary pressure 100bar
						31.5 =	Max. secondary pressure 315bar

• 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

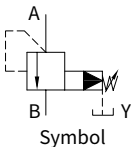
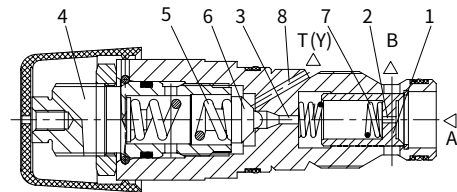
Features

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

Function and configuration

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.

Type DB10K2-L4X/Y...



Ordering code

	DB		K		- L4X /		Y		*
Pressure relief valve	=DB								Further details in clear text
Nominal size 6	= 6								No code = NBR seals
Nominal size 10	=10								V = FKM seals
Cartridge		=K							Y = Pilot oil supply internal Pilot oil drain external
Rotary knob			=1						5= Pressure adjustable up to 50bar
Sleeve with hexagon and protective cap			=2						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)

Notes:

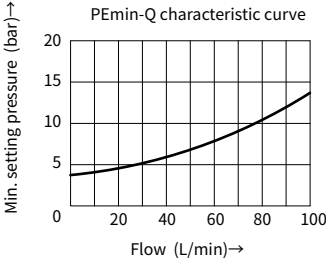
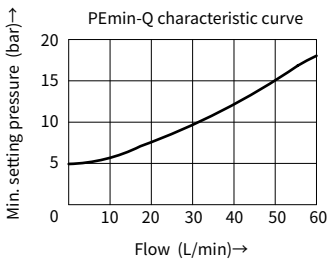
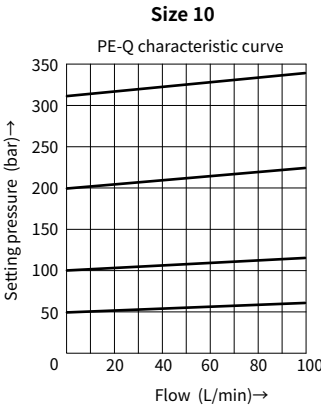
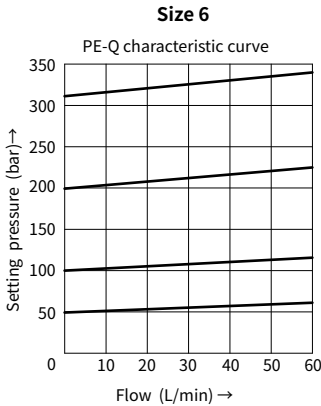
The pilot relief valves may have lower starting pressure and more flow, but have more internal leakage. If lower leakage is demanded, such as safety valve, it is recommended to choose direct operated pressure relief valves, DBD type.

Technical data

Size	610	
Fluid	Mineral oil suitable for NBR and FKM seal	
	Phosphate ester for FKM seal	
Fluid temperature range	°C	
	-30 to +80 (NBR seal)	
Viscosity range	mm²/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 60to 100
Weight	kg	Approx. 0.22Approx. 0.3

03

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



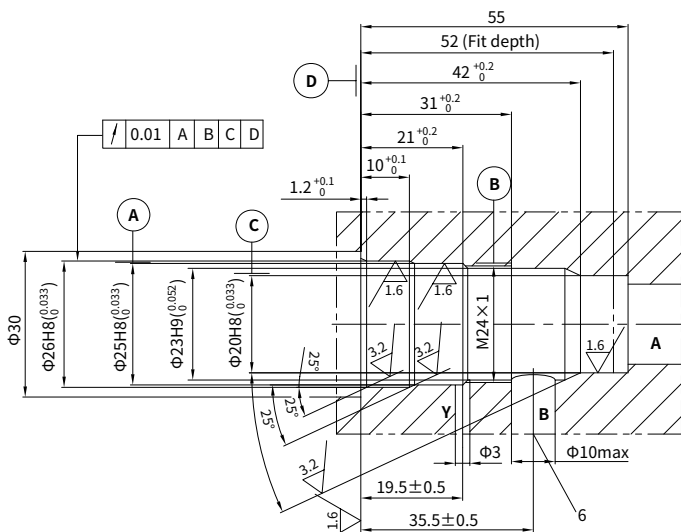
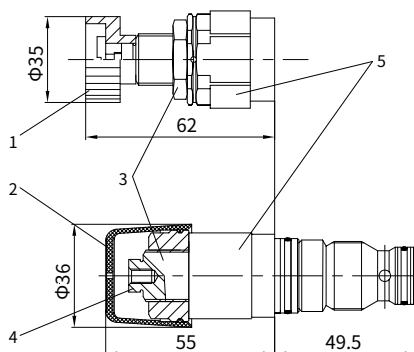
The curves are measured at zero back pressure.

Unit dimensions

(Dimensions in mm)

- Type DB10K..-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=30
Tightening torque $M_A = 50\text{Nm}$
- 6 Port B arranged around
circumference as required



China +86 400 101 8889	America +01 630 995 3674
Germany +49 172 3683463	Japan +81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



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

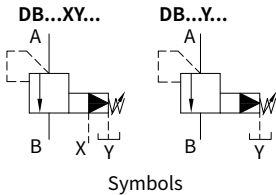
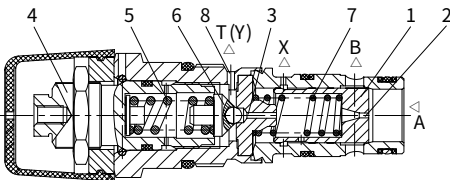
Features

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

Function and configuration

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



Ordering code

DB	20	K	L1X			*
Pressure relief valve =DB						Further details in clear text
Nominal size 20 =20						No code = NBR seals
Cartridge =K						V = FKM seals
Rotary knob =1						Y = Pilot oil supply internal and drain external
Adjustable bolt with protective cap =2						XY = Pilot oil supply and drain external
Series L10 to L19 =L1X (L10 to L19 : 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

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.

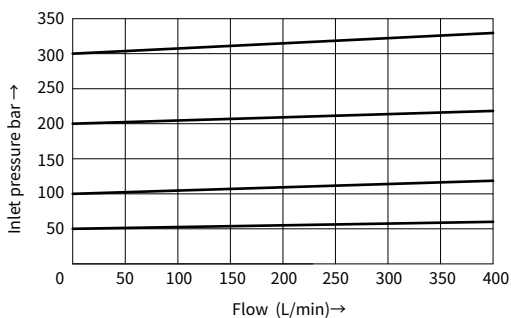
Technical data

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

03

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

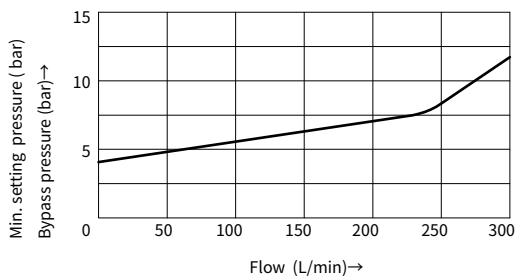
Inlet pressure in relation to the flow-rate



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.

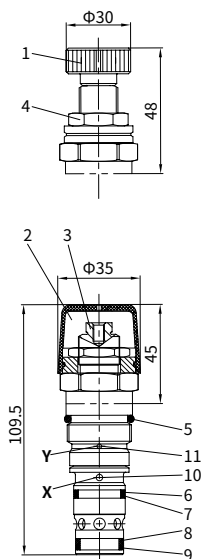
Min. setting pressure and bypass pressure in relation to the flow-rate



The curves are valid for outlet pressure PB=0

Unit dimensions

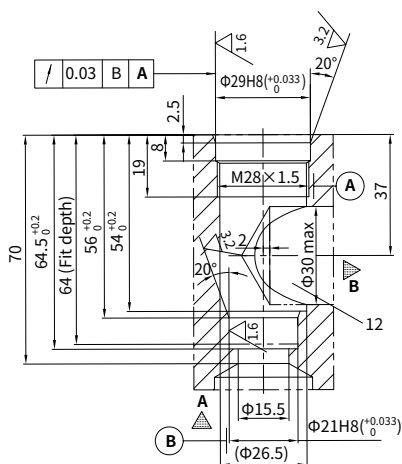
(Dimensions in mm)



- 1 Adjustment element "1"
- 2 Adjustment element "2"
- 3 Internal hexagon screw S=10
- 4.1 Nut for locking S=22
- 4.2 External hexagon S=30
Tightening torque $M_A = 50\text{Nm}$
- 5 O-ring 25 × 2.65
- 6 O-ring 17 × 1.8
- 7 Back-ring 22.5 × 19.7 × 1.1
- 8 2 Back-ring 21 × 16.2 × 1.1
- 9 O-ring 18 × 1.8
- 10 Port X used only for
DB20K...L1X/XY...
- 11 Port Y used for
DB20K...L1X/XY...and
DB20K...L1X/Y...
- 12 Port X, T and B arranged around
circumference used for DB20K...L1X/XY...
Port B arranged around circumference,
used for DB20K...L1X/Y...
- 13 Hole A, optional

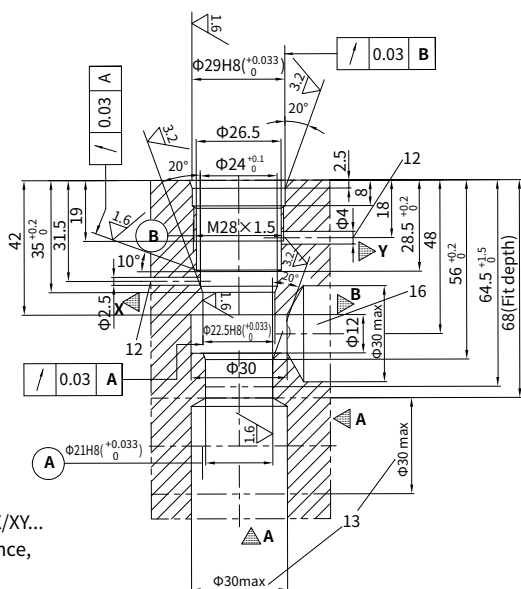
Fixing holes for cartridge Y

(pilot oil supply internal and drain external)



Fixing holes for cartridge XY

Fixing notes for cartridge XI
(pilot oil supply external and drain external)





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

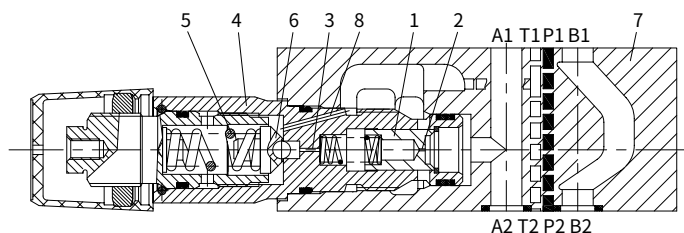
Features

- 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

Function and configuration

Pressure relief valve types ZDB and Z2DB are pilot operated and sandwich structure. They are used to limit the pressure in a hydraulic system. They consist of the housing (7), together with one or two pressure relief valve cartridges (4). The system pressure is set by the inserted relief valve (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. The pressure drop moves spool (1) to open the connection from A to T, while the setting pressure at spring (5) is maintained. Pilot oil returns from the two spring chambers via port T externally.

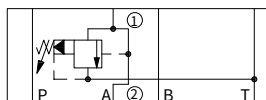


Notes:

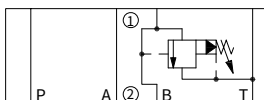
The pilot relief valves have more internal leakage, If lower leakage is demanded, such as safety valve, it is recommended to choose direct operated pressure relief valves, ZDBD type.

Symbols

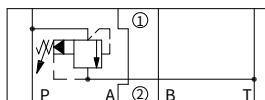
Type ZDB6VA...



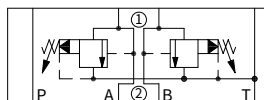
Type ZDB6VB...



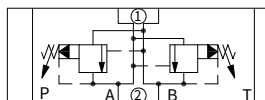
Type ZDB6VP...



Type ZDB6VC...



Type ZDB6VD...



① = valve side

② = sub-plate side

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)

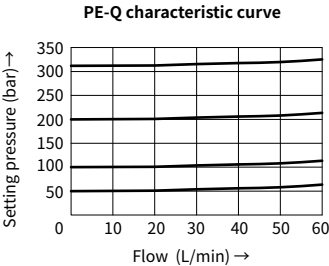
1 = Rotary knob

2 = Adjustable bolt with protective cap

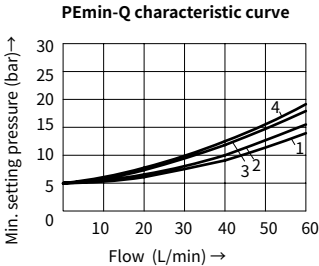
Technical data

Fluid		Mineral oil suitable for NBR and FKM seal
		Phosphate ester for FKM seal
Fluid temperature range		-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 $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using HLP46)



The curves are measured
at zero back pressure.

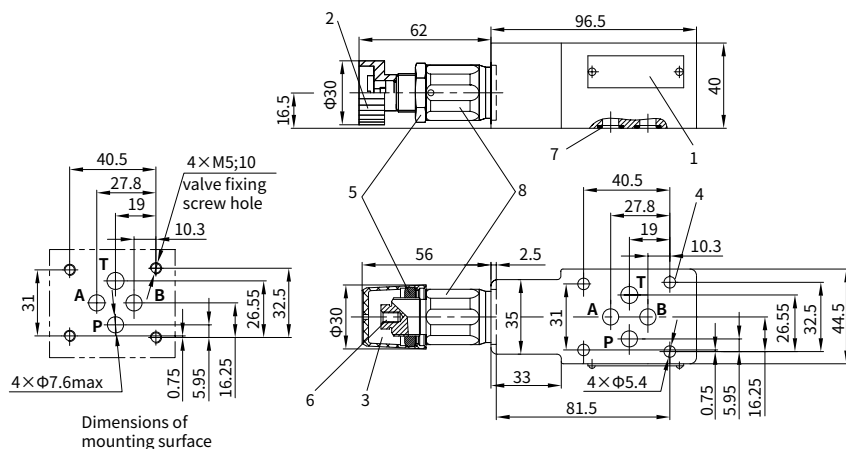


1. VD(A to B)
2. VA
3. VB and VC
4. VP and VD (B to A)

Unit dimensions

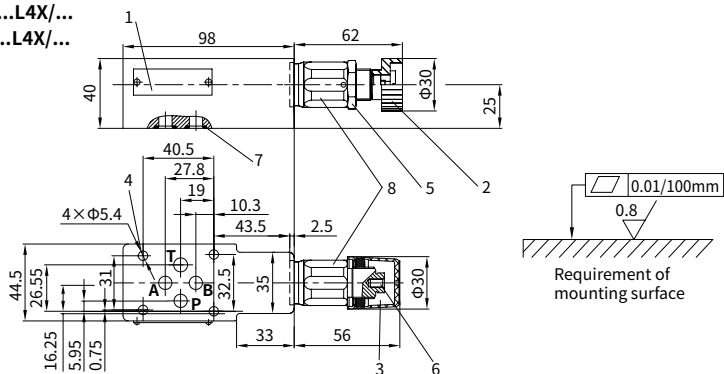
(Dimensions in mm)

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 $M_A = 50 \text{ Nm}$

Valve fixing screws:

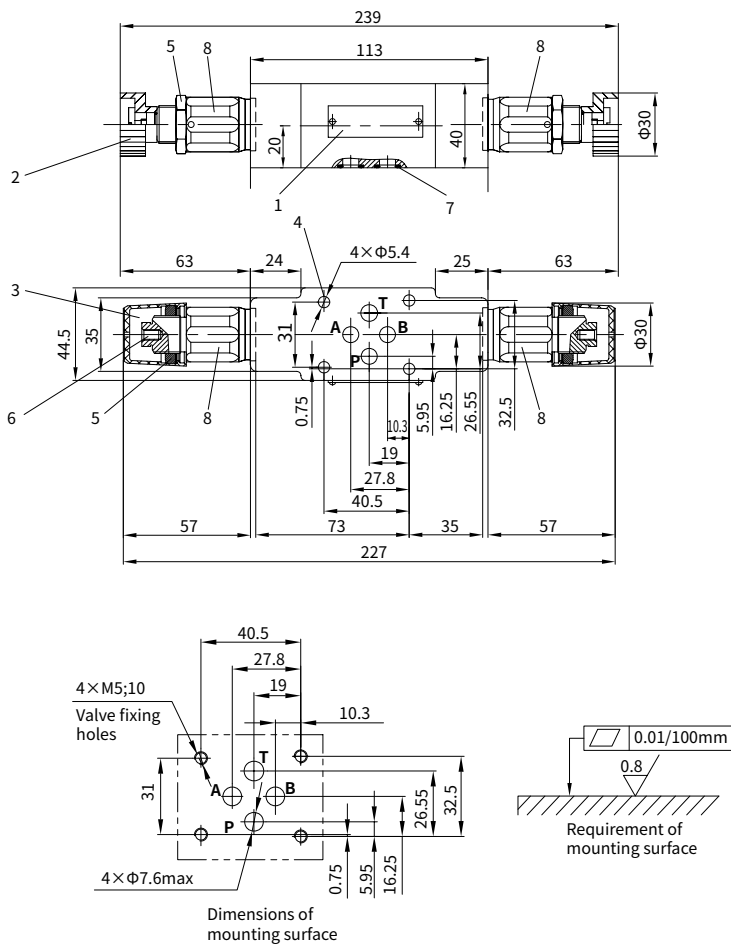
M5 according to GB/T 70.1-10.9, the length according to sandwich, tightening torque $M_A = 8.9 \text{ Nm}$, must be ordered separately.

Unit dimensions

(Dimensions in mm)

Type Z2DB6VC...L4X/...

Type Z2DB6VD...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 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.

China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



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

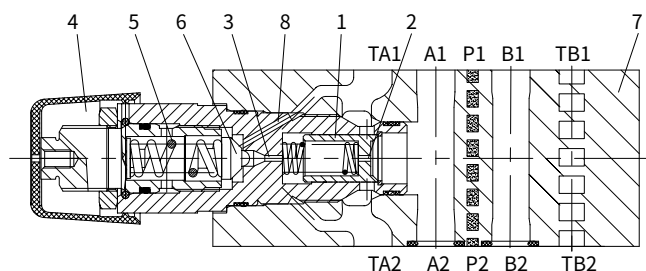
Function and configuration

Pressure relief valve types ZDB and Z2DB are pilot operated and sandwich structure. They are used to limit the pressure in a hydraulic system.

They basically consist of the housing (7), together with one or two pressure relief valves cartridges. And the system pressure is set by means of relief valve(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. The pressure drop moves spool (1) to open the connection from A to T, while the setting pressure at spring (5) is maintained. Pilot oil returns from the two spring chambers via port T externally.

Type ZDB10VA2-L4X/...

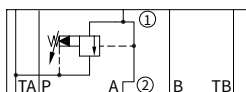


Notes:

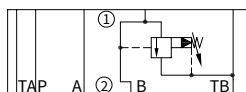
The pilot relief valves have more internal leakage,
If lower leakage is demanded, such as safety valve,
it is recommended to choose direct operated pressure relief valves, ZDBD type.

Symbols

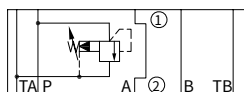
Type ZDB10VA..



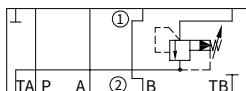
Type ZDB10VB..



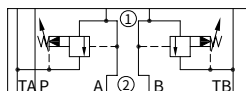
Type ZDB10VP..



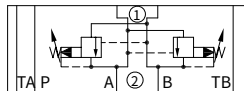
Type ZDB10VT..



Type Z2DB10VC..



Type Z2DB10VD..



① = valve side ② = sub-plate side

Ordering code

Z

DB

10

- L4X

★

Sandwich plate = Z

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

Pressure relief valve = DB

Nominal size 10 = 10

Relief function from → to:
A → TA =VA
P → TA =VP
TB1 → TA2 =VT
B → TB =VB
A → TA and B → TB =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

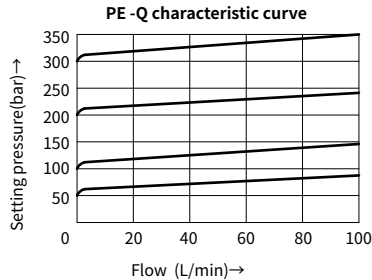
L4X = Series L40 to L49
(L40 to L49: unchanged installation and connection dimensions)

1 = Rotary knob
2 = Adjustable bolt with protective cap

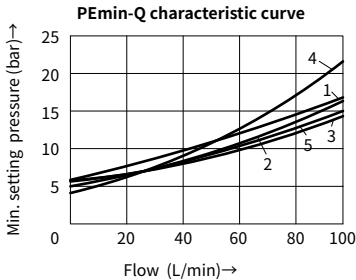
Technical data

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		mm²/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	100
Weight	Type ZDB10	kg	Approx. 2.7
	Type Z2DB10	kg	Approx. 3.1

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



The curves were measured
at zero back pressure.



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

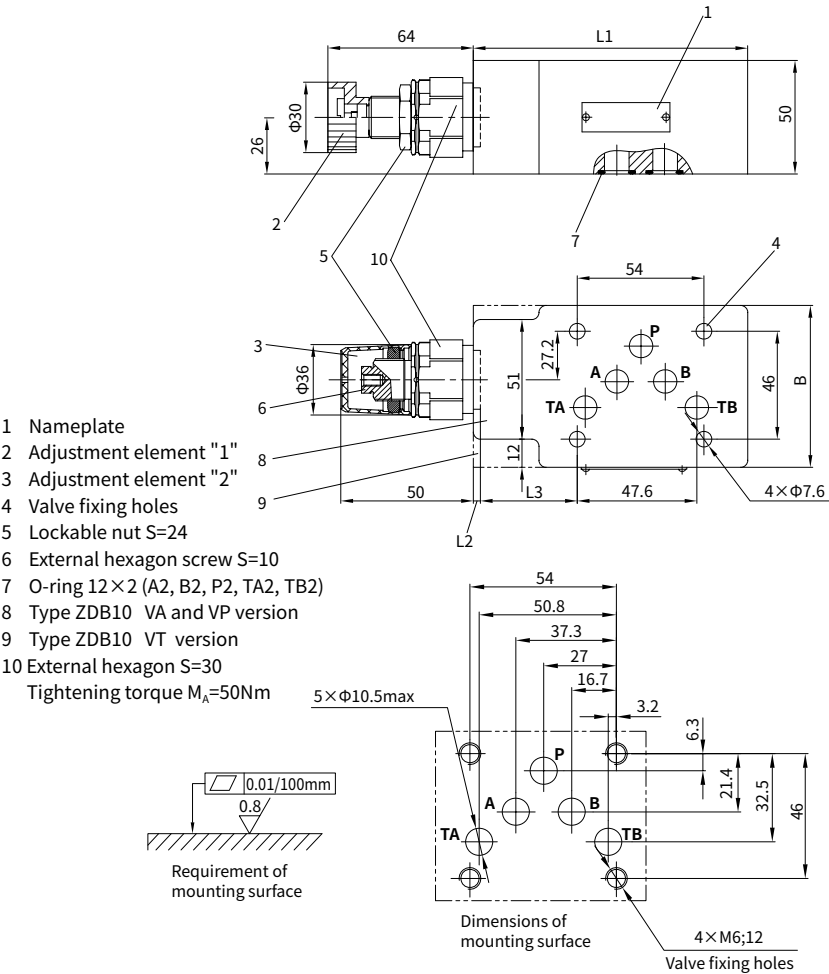
Unit dimensions

(Dimensions in mm)

Type ZDB10VA...L4X/..

Type ZDB10VP...L4X/..

Type ZDB10VT...L4X/..



Valve fixing screws:

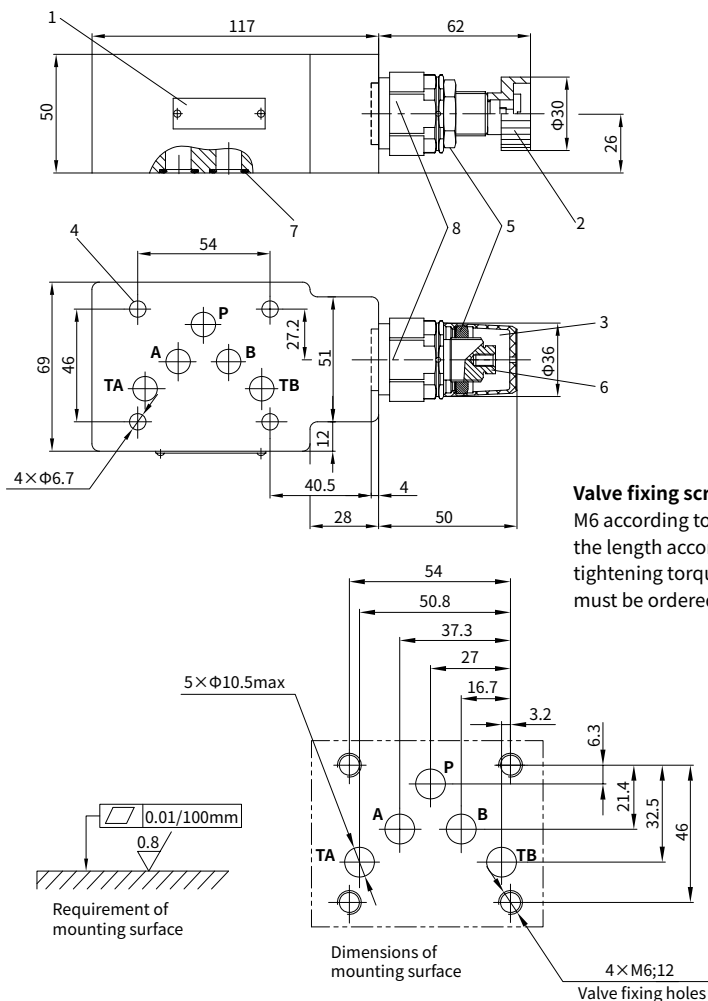
M6 according to GB/T 70.1-10.9, the length according to sandwich, tightening torque $M_A=15.5\text{ Nm}$, must be ordered separately.

Type	B	L1	L2	L3
VA and VP	69	117	4	40.5
VT	70	105	2	27.8

Unit dimensions

(Dimensions in mm)

Type ZDB10VB...L4X/...



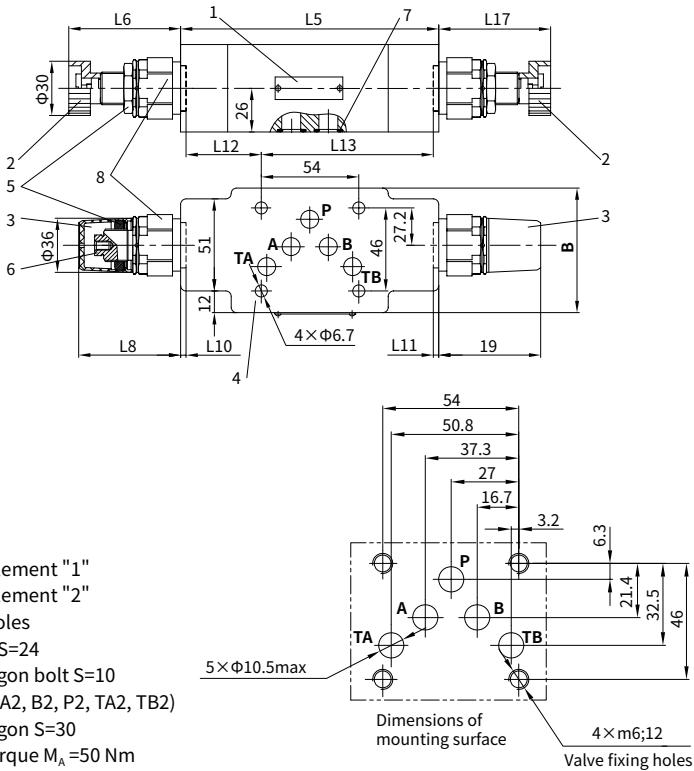
- 1 Nameplate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Valve fixing holes
- 5 Lockable nut S=24

- 6 External hexagon screw S=10
- 7 O-ring 12x2 (A2, B2, P2, TA2, TB2)
- 8 External hexagon S=30
Tightening torque $M_A=50$ Nm

Unit dimensions

(Dimensions in mm)

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



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

Type	B	L5	L6	L7	L8	L9	L10	L11	L12	L13
VC	69	123	64	65	52	53	2	1	32.5	87.5
VD	70	132	60	60	48	48	6	6	33	87

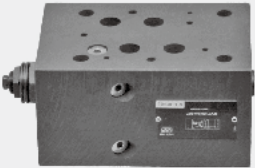


3.7

Pilot operated pressure relief valve

Type ZDB /Z2DB..V...L3X

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



Contents

Function and configuration	02
Symbols	02
Ordering code	03
Technical data	03
Characteristic curves	03
Unit dimensions	04-09

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

Function and configuration

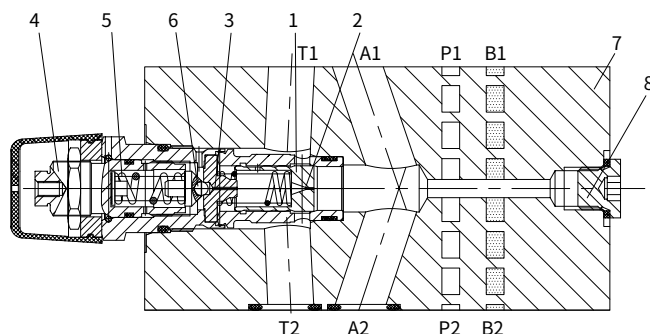
Pressure relief valve types ZDB and Z2DB are pilot operated and sandwich structure. They are used to limit the pressure in a hydraulic system.

They basically consist of the housing (7), together with one or two pressure relief valve cartridges. The system pressure is set by means of 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. The pressure drop moves spool (1) to open the connection from A to T, while the setting pressure at spring (5) is maintained. Pilot oil returns from the two spring chambers via port T externally.

Pressure tapping (8) can measure the pressure.

Type ZDB16VA2-L3X/...

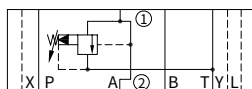


Notes:

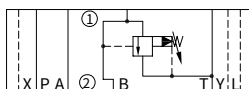
The pilot relief valves have more internal leakage. If lower leakage is demanded, such as safety valve, it is recommended to choose direct operated pressure relief valves, Z2DB type.

Symbols

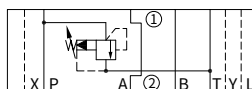
Type ZDB..VA..



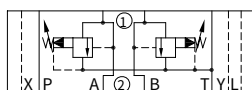
Type ZDB..VB..



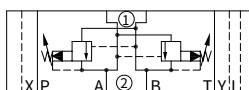
Type ZDB..VP..



Type Z2DB..VC..



Type Z2DB..VD..



Notes: only size 16 has port L

① = valve side ② = sub-plate side

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

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

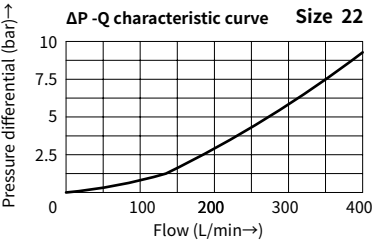
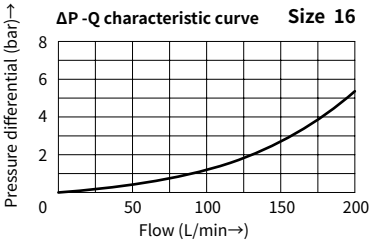
L3X = Series L30 to L39
(L30 to L39: unchanged installation and connection dimensions)

Regulation form: 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		-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
	Type Z2DB	kg	Approx. 11.8
			Approx. 10.3

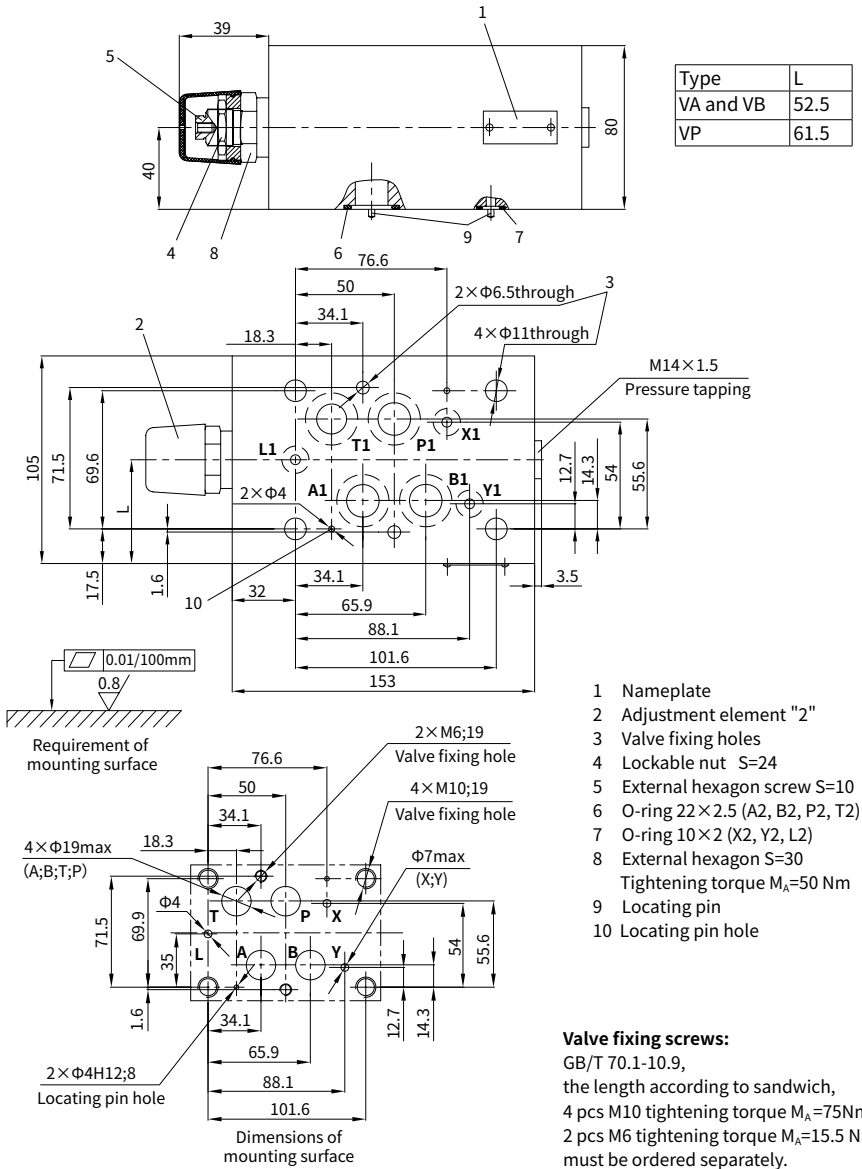
Characteristic curves (Measured at $\vartheta_{oil}=40^{\circ}C \pm 5^{\circ}C$, using HLP46)



Unit dimensions

(Dimensions in mm)

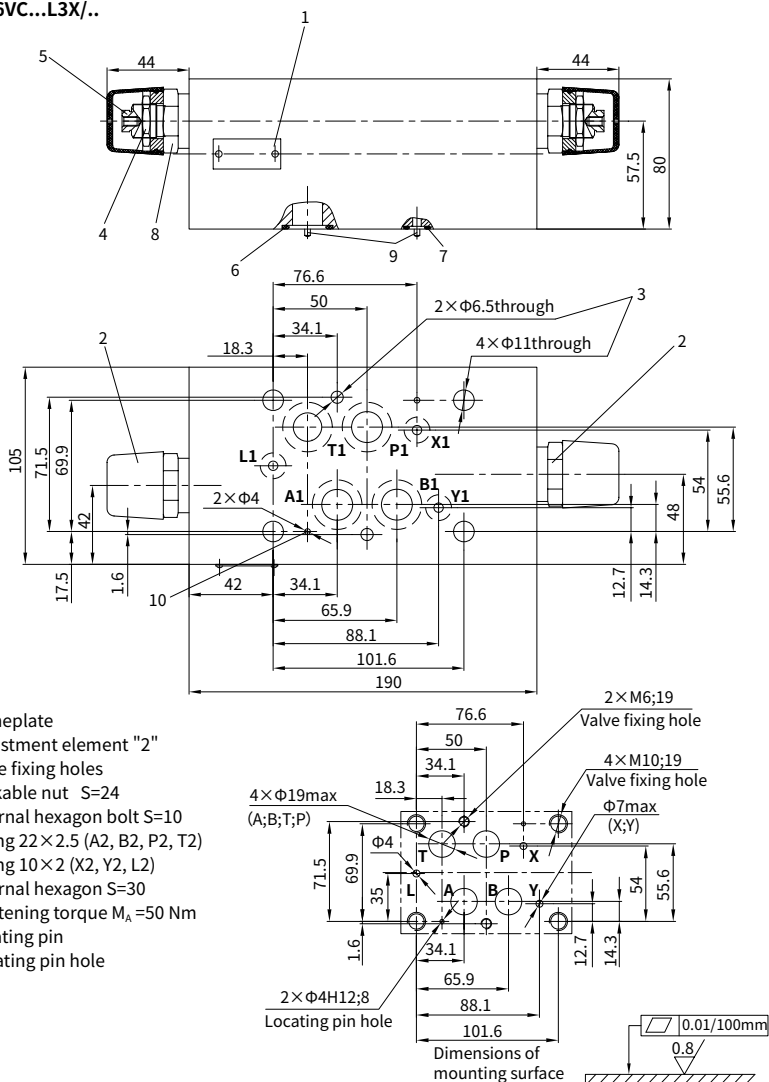
Type ZDB16VA...L3X/.. Type ZDB16VB...L3X/.. Type ZDB16VP...L3X/..



Unit dimensions

(Dimensions in mm)

Type Z2DB16VC...L3X/..



Valve fixing screws:

GB/T 70.1-10.9,

the length according to sandwich,

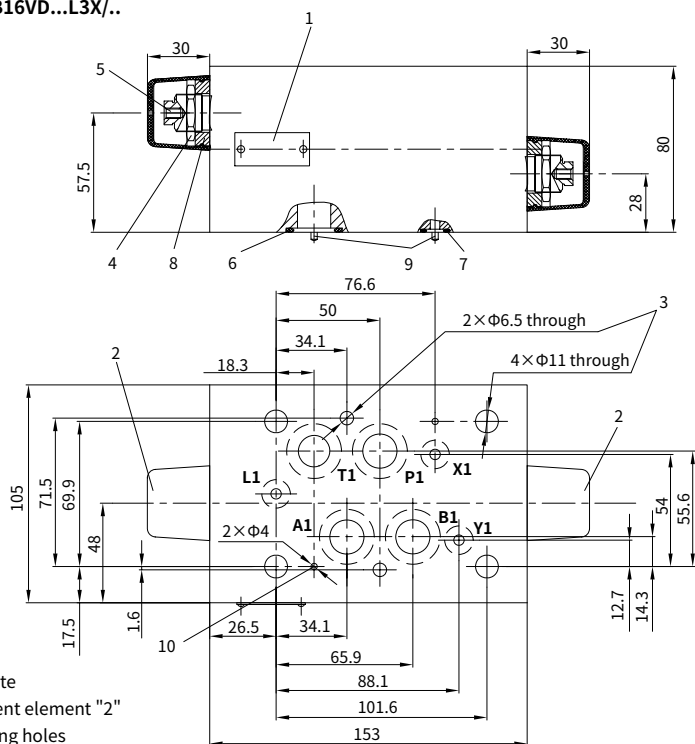
4 pcs M10 tightening torque $M_A=75$ Nm2 pcs M6 tightening torque $M_A=15.5$ Nm,

must be ordered separately.

Unit dimensions

(Dimensions in mm)

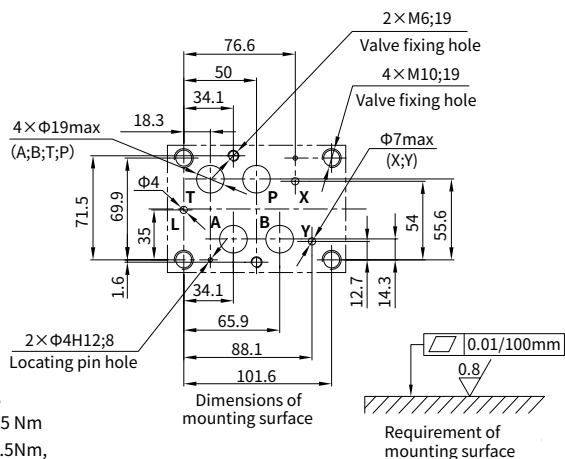
Type Z2DB16VD...L3X/..



- 1 Nameplate
- 2 Adjustment element "2"
- 3 Valve fixing holes
- 4 Lockable nut S=24
- 5 External hexagon screw S=10
- 6 O-ring 22x2.5 (A2,B2,P2,T2)
- 7 O-ring 10x2 (X2,Y2,L2)
- 8 External hexagon S=30
Tightening torque $M_A=50$ Nm
- 9 Locating pin
- 10 Space locating pin hole

Valve fixing screws:

GB/T 70.1-10.9,
the length according to sandwich,
4 pcs M10 tightening torque $M_A=7.5$ Nm
2 pcs M6 tightening torque $M_A=15.5$ Nm,
must be ordered separately.



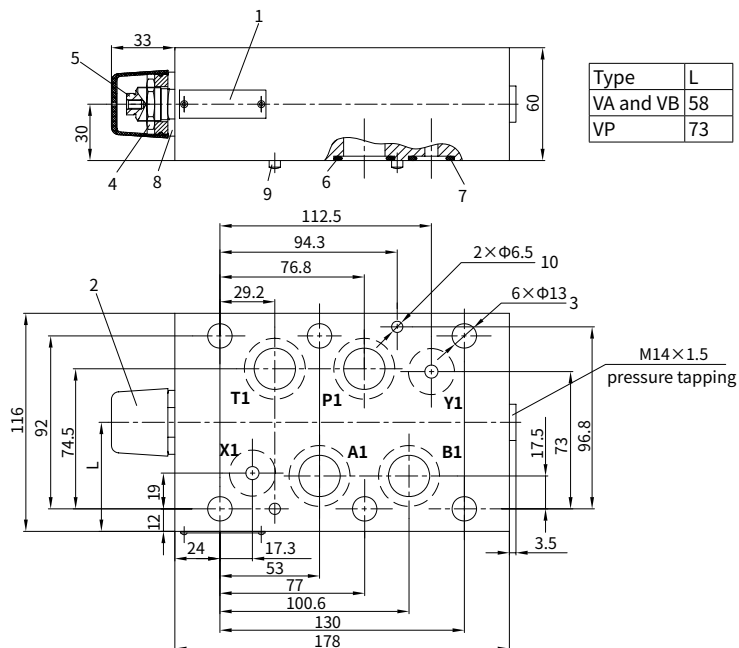
Unit dimensions

(Dimensions in mm)

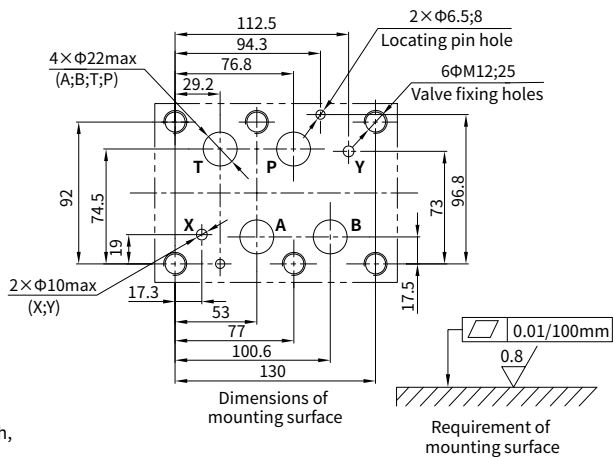
Type ZDB22VA...L3X/..

Type ZDB22VB...L3X/..

Type ZDB22VP...L3X/..



- 1 Nameplate
- 2 Adjustment element "2"
- 3 Valve fixing holes
- 4 Lockable nut S=24
- 5 External hexagon screw S=10
- 6 O-ring 27×3 (A2,B2,P2,T2)
- 7 O-ring 19×3 (X2,Y2,L2)
- 8 External hexagon S=30
Tightening torque $M_A = 50\text{Nm}$
- 9 Locating pin
- 10 Locating pin hole



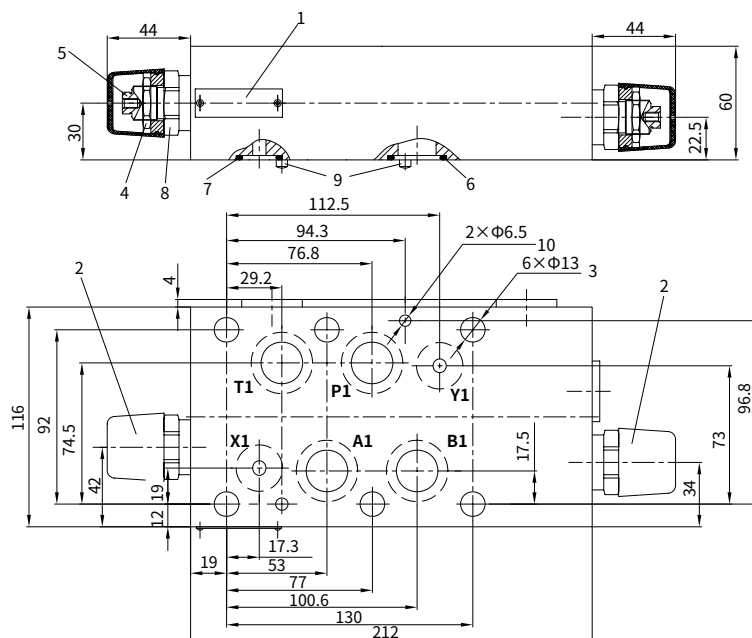
Valve fixing screws:

GB/T 70.1-10.9,
the length according to sandwich,
Tightening torque $M_A = 130\text{Nm}$,
must be ordered separately.

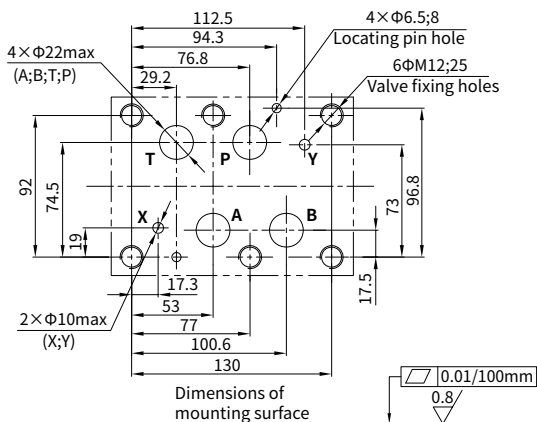
Unit dimensions

(Dimensions in mm)

Type Z2DB22VC...L3X/..



- 1 Nameplate
- 2 Adjustment element "2"
- 3 Valve fixing holes
- 4 Lockable nut S=24
- 5 External hexagon screw S=10
- 6 O-ring 27×3 (A2,B2,P2,T2)
- 7 O-ring 19×3 (X2,Y2,L2)
- 8 External hexagon S=30
Tightening torque $M_A = 50 \text{ Nm}$
- 9 Locating pin
- 10 Locating pin hole



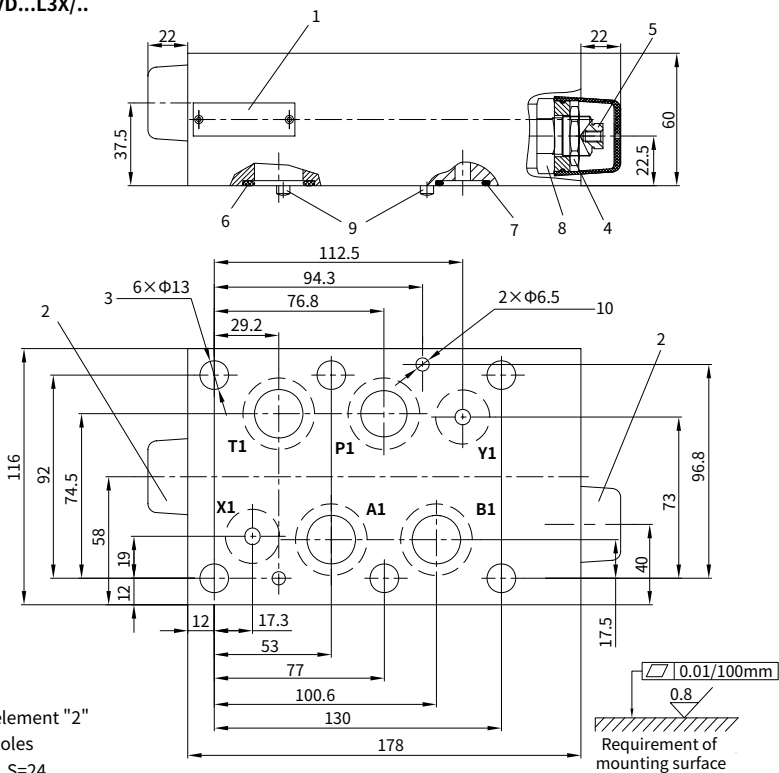
Valve fixing screws:

GB/T 70.1-10.9,
the length according to sandwich,
Tightening torque $M_A = 130 \text{ Nm}$,
must be ordered separately.

Unit dimensions

(Dimensions in mm)

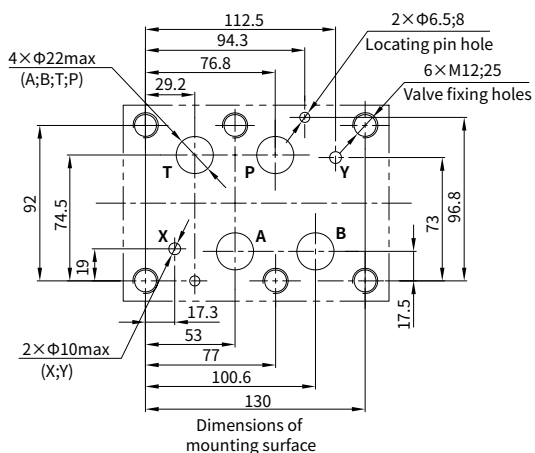
Type Z2DB22VD...L3X/..



- 1 Nameplate
- 2 Adjustment element "2"
- 3 Valve fixing holes
- 4 Lockable nut S=24
- 5 External hexagon screw S=10
- 6 O-ring 27×3 (A2,B2,P2,T2)
- 7 O-ring 19×3(X2,Y2,L2)
- 8 External hexagon S=30
Tightening torque $M_A = 50\text{Nm}$
- 9 Locating pin
- 10 Space locating pin hole

Valve fixing screws:

GB/T 70.1-10.9,
the length according to sandwich,
Tightening torque $M_A = 130\text{Nm}$,
must be ordered separately.



China +86 400 101 8889	America +01 630 995 3674
Germany +49 172 3683463	Japan +81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



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

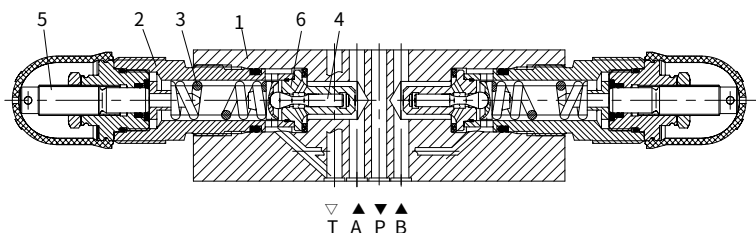
Function and configuration

The type ZDBD pressure relief valves are direct operated poppet valve, and they are sandwich structure, used to limit the pressure in a hydraulic system.

The pressure relief valves consist mainly of the housing (1), together with one or two pressure relief valve cartridges. And the pressure relief valve cartridges mainly include the sleeve (2), spring (3), poppet (4), adjustment elements (5) and valve seat (6).

If the pressure in lines rises excess the value setting at the spring (3), the poppet spool(4) opens. While lower the value, the poppet spool(4) are pushed onto the valve seat(6) by the spring(3). When the difference between the setting value and the actual pressure in the lines get one quite value, the poppet(4) and the valve seat(6) can realize seal up without any leakage, then it can work together with hydraulic lock to make the cylinder conquers its descent because of gravity and maintain on its "stop" position.

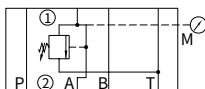
They are especially suitable to be used as sandwich plate safety valves for actuators which are strictly in demand for internal leakage.



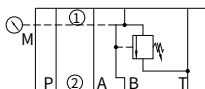
Notes: The ZDBD pressure relief valves are direct operated, have less internal leakage, but higher starting pressure and little flow, If lower starting pressure is not demanded, they can be used as safety valves.

Symbols

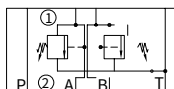
Type ZDBD... A-L1X...



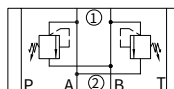
Type ZDBD... B-L1X...



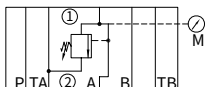
Type ZDBD... C-L1X...



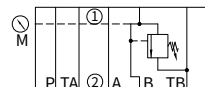
Type ZDBD... D-L1X...



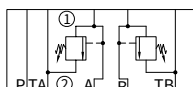
Type ZDBD 10A-L1X...



Type ZDBD 10B-L1X...



Type ZDBD 10C-L1X...



① = valve side
② = sub-plate side

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

03

Technical data

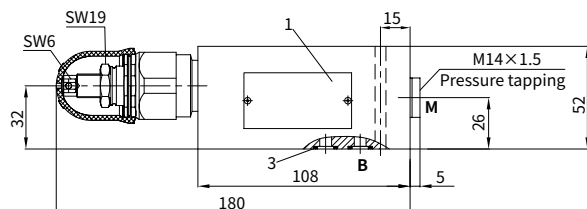
Fluid		Mineral oil suitable for NBR and FKM seal															
		Phosphate ester for FKM seal															
Fluid temperature range	°C	-30 to +80 (NBR seal)															
		-20 to +80 (FKM seal)															
Viscosity range	mm ² /s	10 to 800															
Degree of contamination		Maximum permissible 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			
Max. flow-rate	L/min	30				80				160				250			
Weight	Relief function	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)

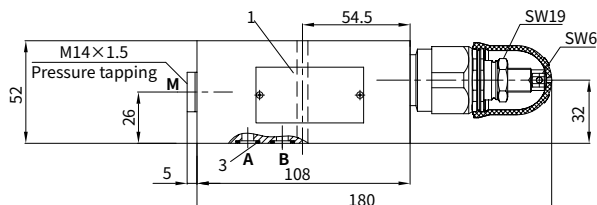
(Dimensions in mm)

Size 6

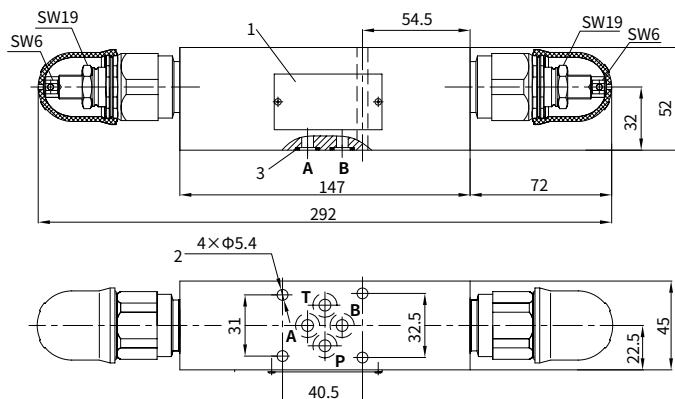
•Type ZDBD6A-L1X/...



•Type ZDBD6B-L1X/...



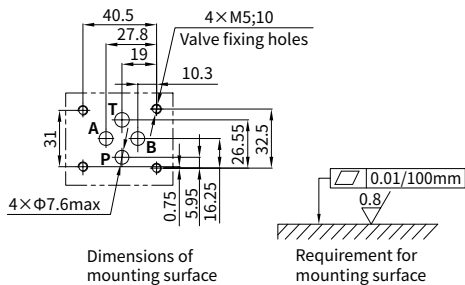
•Type ZDBD6C-L1X/...



- 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 $M_t = 8.9 \text{ Nm}$, must be ordered separately.

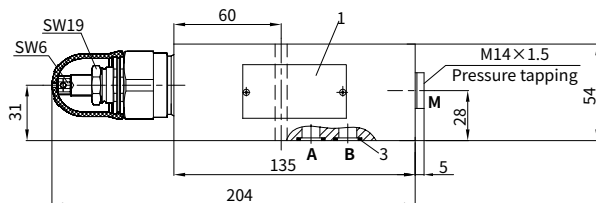


Unit dimensions (A,B and C)

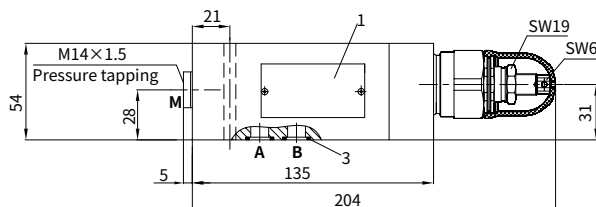
(Dimensions in mm)

Size 10

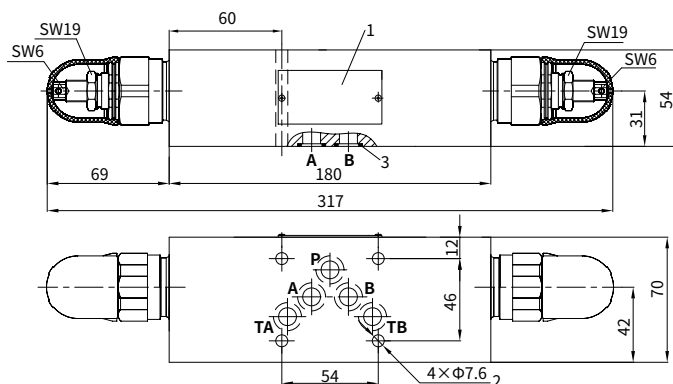
- Type ZDBD10A-L1X/...



- Type ZDBD10B-L1X/...



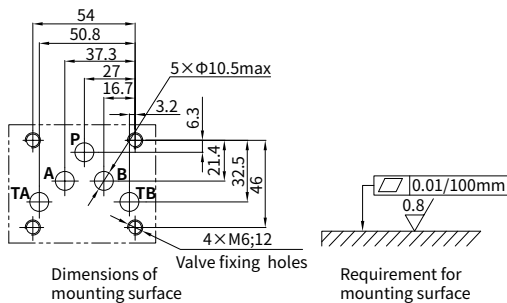
- Type ZDBD10C-L1X/...



- 1 Nameplate
- 2 Valve fixing holes
- 3 O-ring 12×2 (A, B, P, A, TB)

Valve fixing screws:

M6 according to GB/T 70.1-10.9,
the length according to sandwich,
Tightening torque $M_A=15.5 \text{ Nm}$,
must be ordered separately.

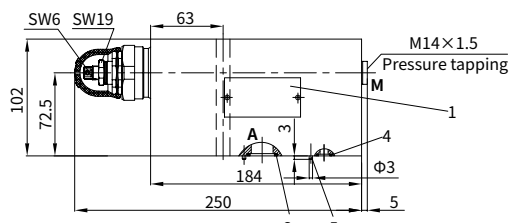


Unit dimensions (A, B and C)

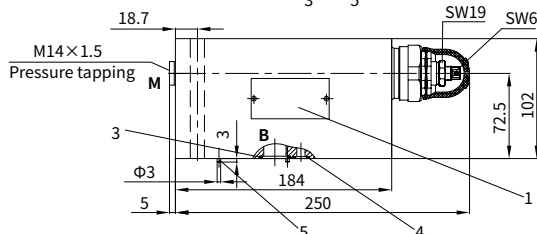
(Dimensions in mm)

Size 16

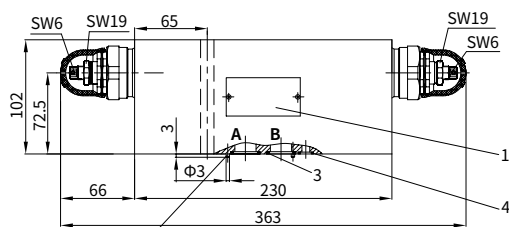
•Type ZDBD16A-L1X/...



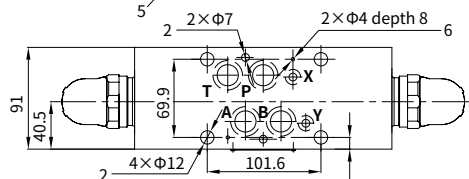
•Type ZDBD16B-L1X/...



•Type ZDBD16C-L1X/...

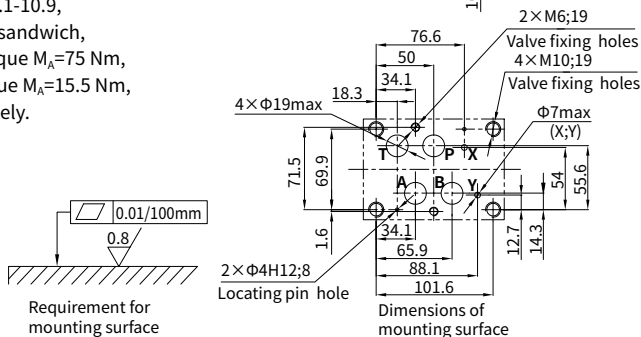


- 1 Nameplate
- 2 Valve fixing holes
- 3 O-ring 22×2.5(A, B, P, T)
- 4 O-ring 10×2(X, Y)
- 5 Locating pin 3×8
- 6 Locating pin hole



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.

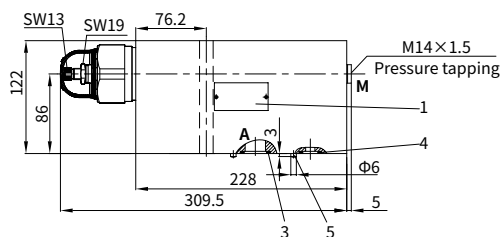


Unit dimensions (A, B and C)

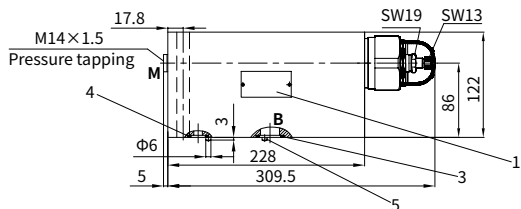
(Dimensions in mm)

Size 22

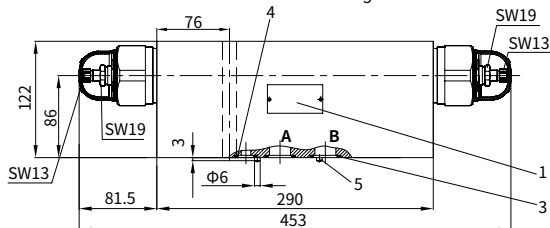
•Type ZDBD22A-L1X/...



•Type ZDBD22B-L1X/...



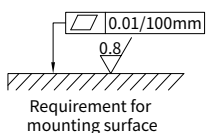
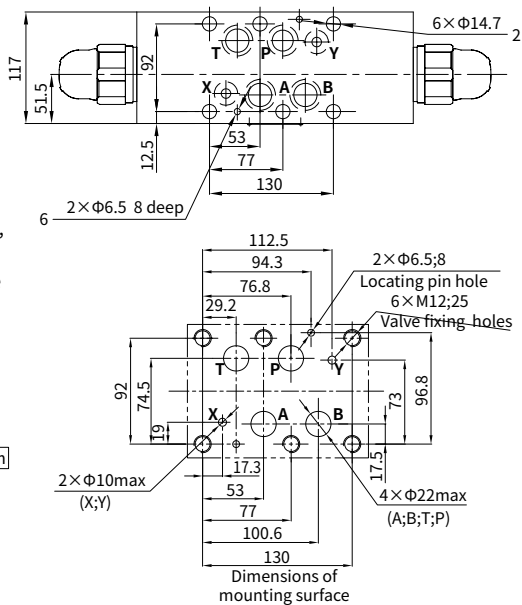
•Type ZDBD22C-L1X/...



- 1 Nameplate
- 2 Valve fixing holes
- 3 O-ring 27×3 (A, B, P and T)
- 4 O-ring 19×3 (X, Y)
- 5 Locating pin 6×12
- 6 Locating pin hole

Valve fixing screws:

6 pcs M12 according to GB/T 70.1-10.9, the length according to sandwich, tightening torque $M_A=130\text{Nm}$, must be ordered separately.

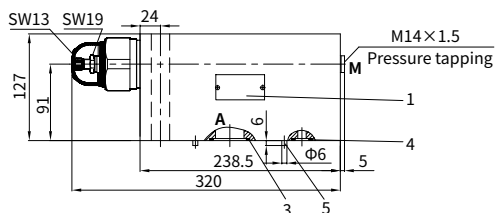


Unit dimensions (A,B and C)

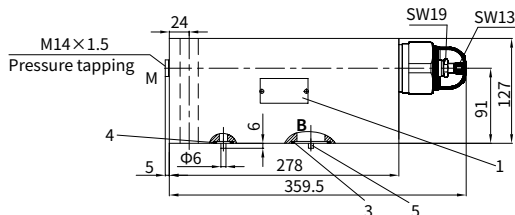
(Dimensions in mm)

Size 32

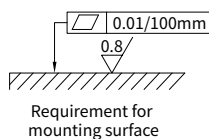
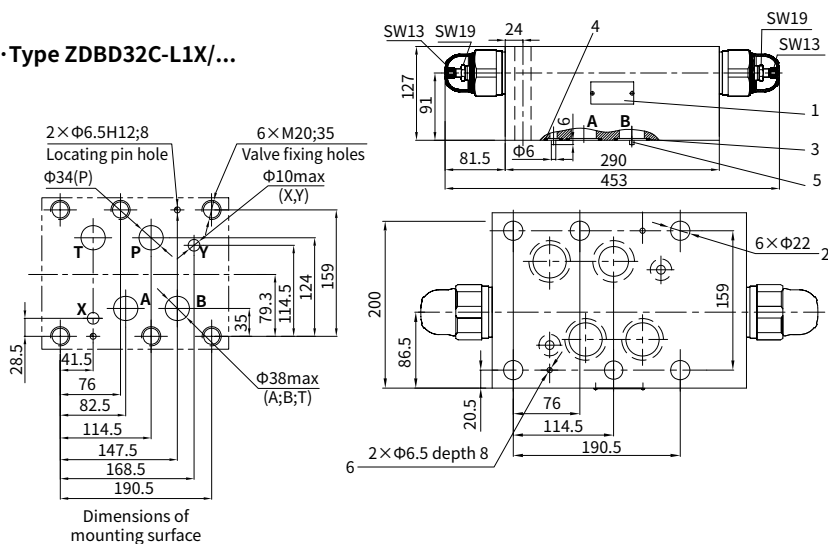
•Type ZBD32A-L1X/...



•Type ZBD32B-L1X/...



•Type ZBD32C-L1X/...



- 1 Nameplate
- 2 Valve fixing holes
- 3 O-ring 42x3(A, B, P and T)
- 4 O-ring 19x3(X,Y)
- 5 Locating pin 6x12
- 6 Locating pin hole

Valve fixing screws:

6 pcs M20 according to GB/T 70.1-10.9, the length according to sandwich, tightening torque $M_A=580\text{Nm}$, must be ordered separately.

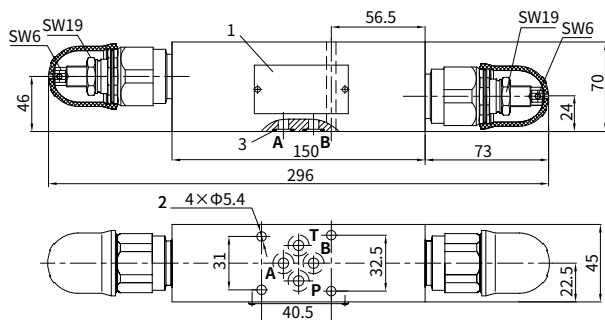
Unit dimensions (D)

(Dimensions in mm)

•Size 6

Type ZDBD6D-L1X/...

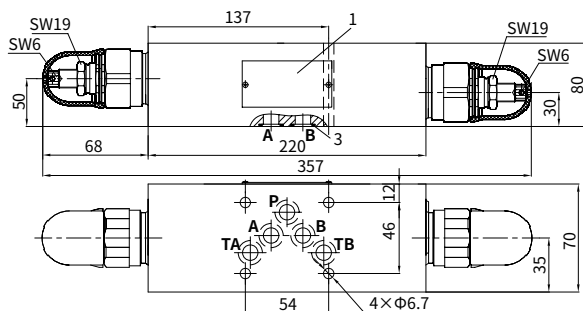
Illustration of sequence number, valve fixing screw, and the dimensions of mounting surface, please see the page 04/10.



•Size 10

Type ZDBD10D-L1X/...

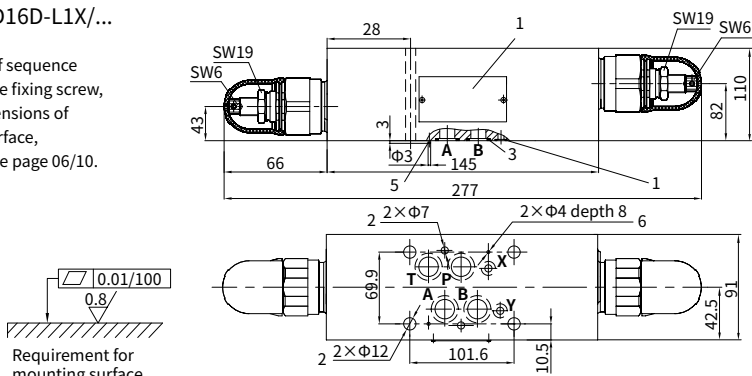
Illustration of sequence number, valve fixing screw, and the dimensions of mounting surface, please see the page 05/10



•Size 16

Type ZDBD16D-L1X/...

Illustration of sequence number, valve fixing screw, and the dimensions of mounting surface, please see the page 06/10.

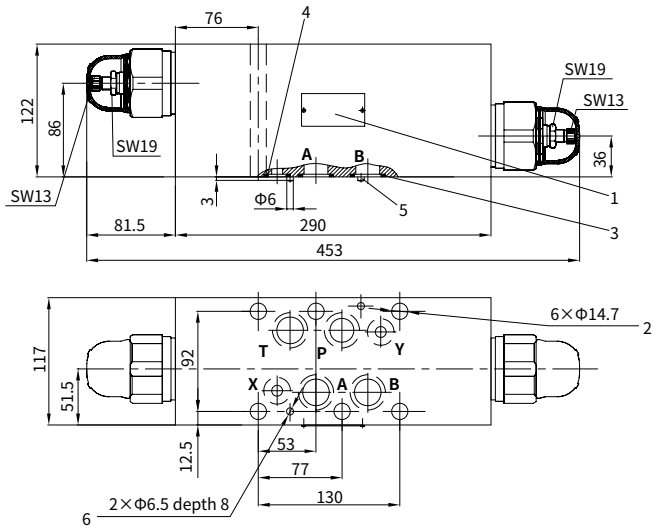


Unit dimensions (D)

(Dimensions in mm)

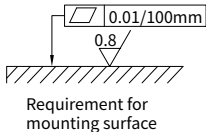
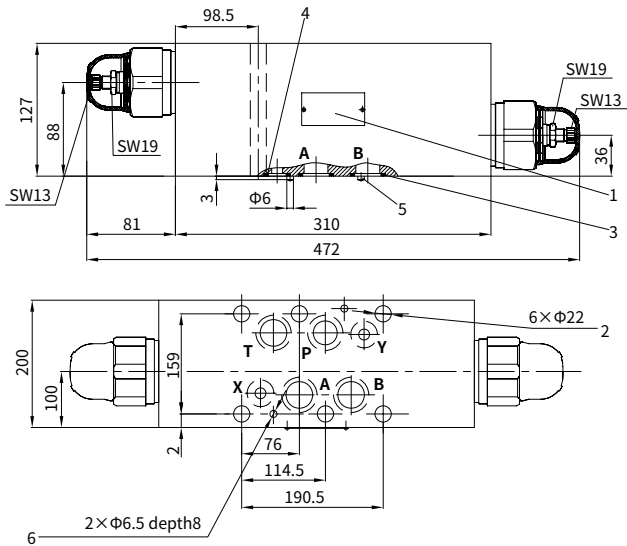
•Size 22
Type ZDBD22D-L1X/...

Illustration of sequence number, valve fixing screw, and the dimensions of mounting surface, please see the page 7/10.



•Size 32
Type ZDBD32D-L1X/...

Illustration of sequence number, valve fixing screw, and the dimensions of mounting surface, please see the page 8/10.



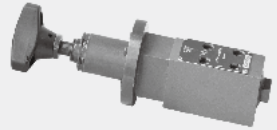


3.9

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

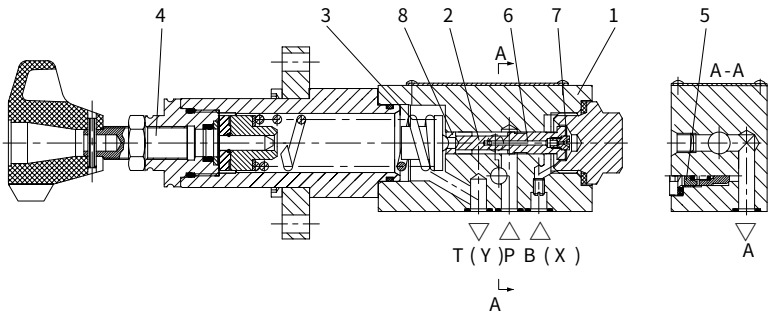
Function and configuration

The valve type DR5DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side.

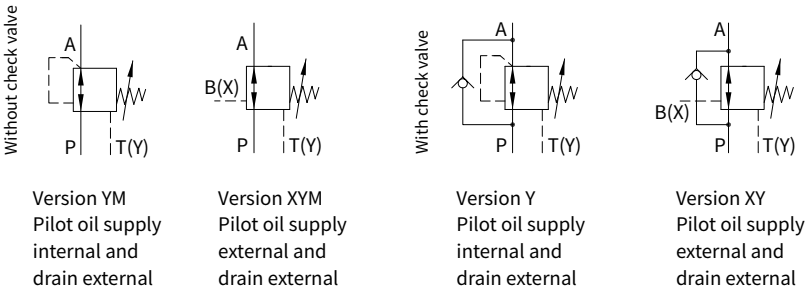
It is used to reduce the system pressure. The secondary pressure is set by the pressure adjustment element (4).

At static position, the valve is normally open and the pressure fluid flows unhindered from port P to port A. The pressure in port A acts at the spool area opposite to the compression spring (3) via the control line (6) and the spray nozzle(7). When the pressure in port A get the value setting at compression spring (3), the control spool (2) moves into the control position and keeps the setting pressure in port A constant. The internal control oil is taken from port A, or from external by port X. If the pressure in port A still increases due to external forces on the actuator, the control spool (2) moves still further towards the compression spring (3).This causes a flow path to be opened via control land(8) on the control spool (2). Sufficient fluid then flows back to tank to prevent any further pressure rise.

Fluid in spring chamber always drained to tank externally via port Y. For free return flow from port A to port P an optional check valve(5) can be fitted.



Symbols



Ordering code

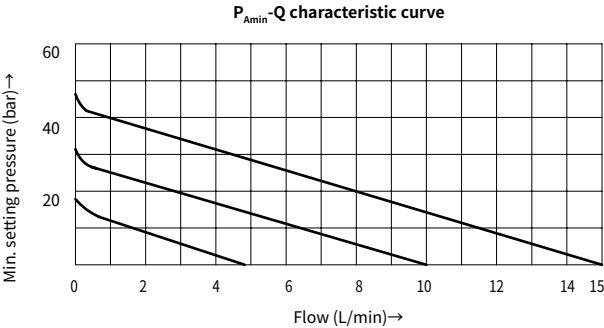
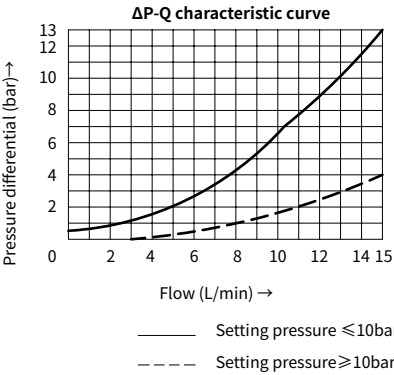
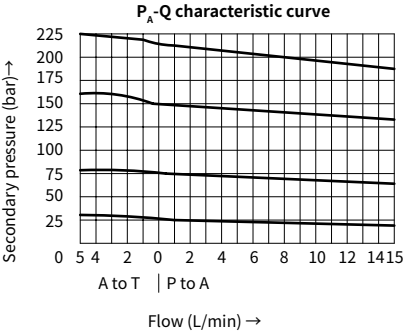
		DR5DP	10	/				*	
Without plate fixing flange (Standard version)=No code									Further details in clear text
With plate fixing flange =F									
Direct operated pressure reducing valve nominal size 5									No code = NBR seals V = FKM seals
Rotary knob =1									No code = With check valve M = Without check valve
Adjustable bolt with protective cap =2									Y = Pilot oil supply internal Oil drain external
Series 10 = 10									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 pressure 150 bar
									21 = Max. secondary pressure 210 bar
									31.5 = Max. secondary pressure 315 bar

Notes : 315bar only for version 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	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 $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using HLP46)

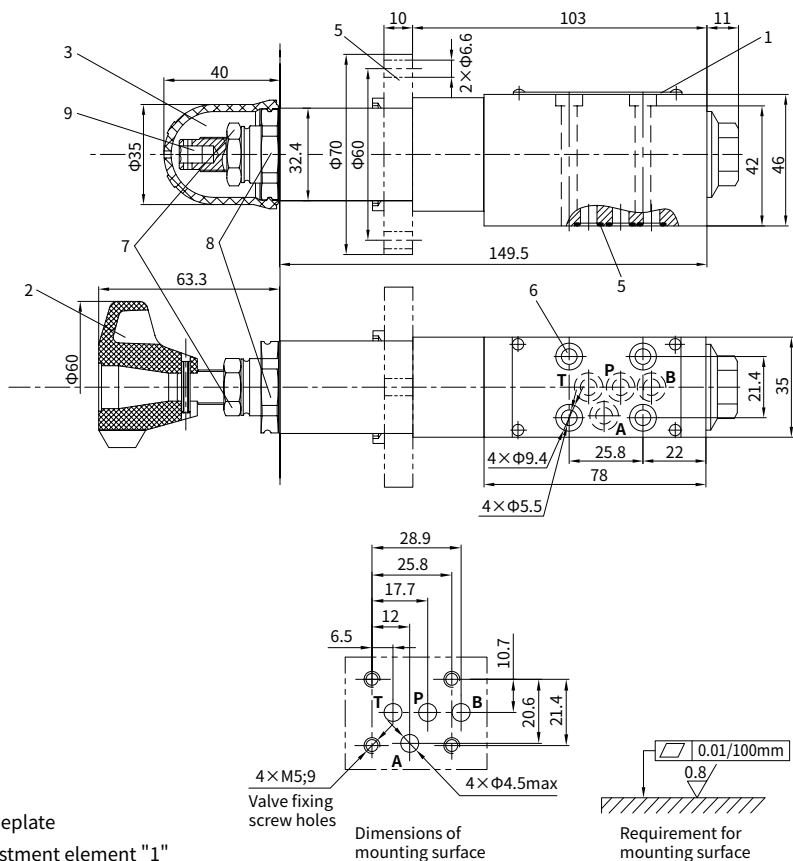


P_{Amin} -Q Characteristic curve shows the flow-rate in relation to the adjustable min. pressure rating from P to A.

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)



- 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 $M_A = 9\text{Nm}$

China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



3.10

Pressure reducing valve direct operated

Type DR6DP...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	04
Unit dimensions	05

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

Function and configuration

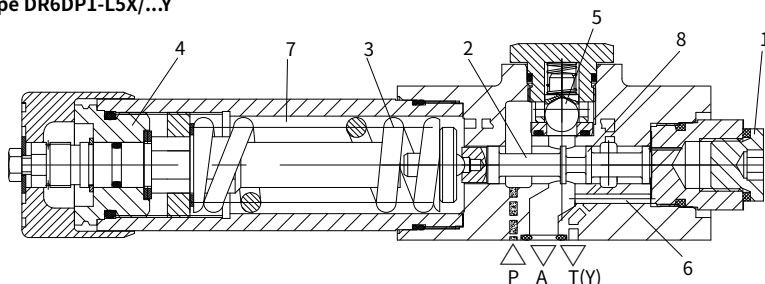
The valve type DR6DP is a 3-way direct operated pressure reducing valve with a pressure relief function on the secondary side, to insure the secondary pressure steady. It is used to reduce the system pressure. The secondary pressure is set by the pressure adjustment element (4).

At static position, the valve is normally open and the pressure fluid flows unhindered from port P to port A. The pressure in port A acts at the spool (2) area opposite to the compression spring (3) via the control line (6). When the pressure in port A get the value setting at compression spring (3), the control spool (2) moves into the control position and keeps the setting pressure in port A constant. The internal control oil is taken from port A via the control line (6). If the pressure in port A still increases due to external forces on the actuator, the control spool (2) moves still further towards the compression spring (3). This causes a flow path to be opened via control land (8) on the control spool (2). Sufficient fluid then flows back to tank to prevent any further pressure rise.

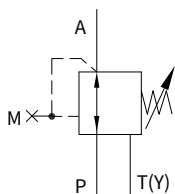
Fluid in spring chamber always drained to tank externally via port T(Y).

For free return flow from port A to port P an optional check valve (5) can be fitted. One pressure gauge connection (1) used for monitoring the secondary pressure at the valve.

Type DR6DP1-L5X/...Y



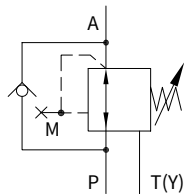
Symbols



Version "YM"

Pilot oil supply internal
oil drain external

Without check valve



Version "Y"

Pilot oil supply internal
oil drain external

With check valve

Ordering code

DR6DP

-

L5X

/

Y

/

*

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)

Further details in
clear text

No code = NBR seals
V = FKM seals

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

No code = With check valve
M = Without check valve

Y = Pilot oil supply internal
Oil drain external

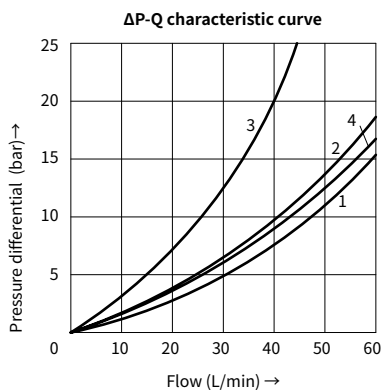
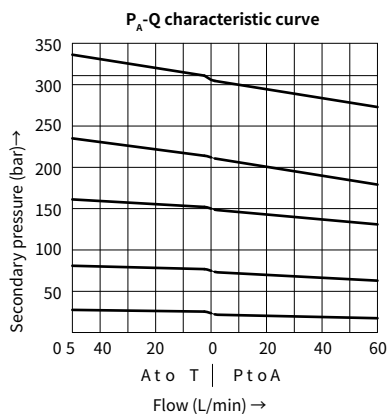
Notes 1: Only for adjustment form "2" and without check valve

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	bar	315
Max.secondary pressure	Port A		25; 75; 150; 210; 315(without check valve)
Max.backing pressure	PortT(Y)		16
Max. flow-rate	L/min	60	
Weight	kg	Approx.1.6	

Characteristic curves

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



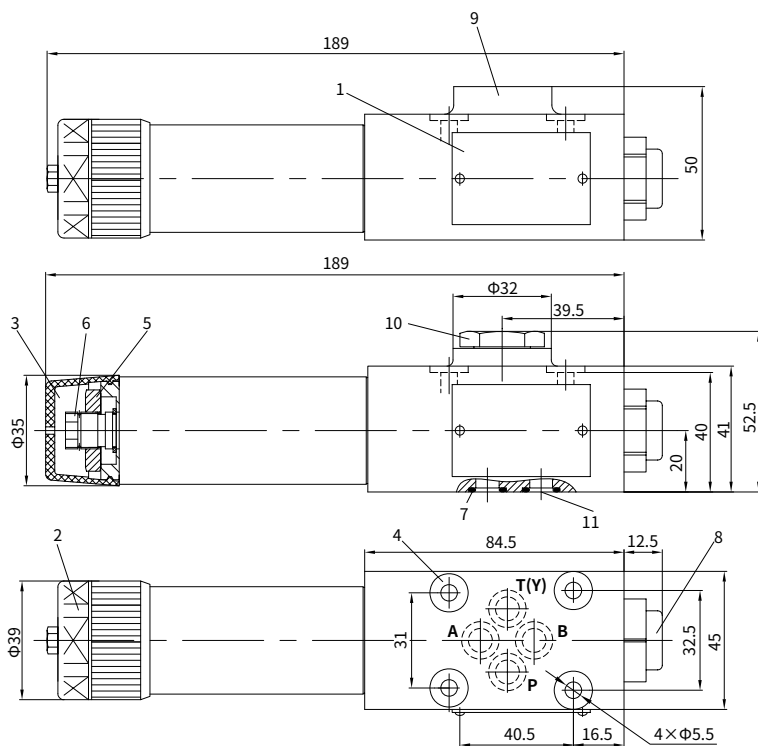
Notes:

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 P to A (min. pressure differential)
- 2 A to T (Y) (min. pressure differential)
- 3 Pressure differential only over the check valve
- 4 Pressure differential over the check valve and fully opened cross section

Unit dimensions

(Dimensions in mm)



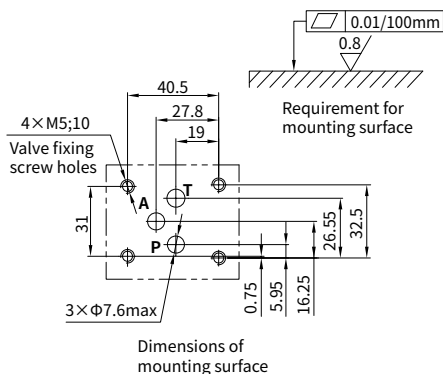
- 1 Nameplate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Valve fixing holes
- 5 Lockable nut S=24
- 6 Internal hexagon screw S=10
- 7 O-ring 9.25×1.78 (A, B, P, T)
- 8 Pressure gauge connection:
G1/4 or M14×1.5; 12 deep
Hex wrench S=6
- 9 Without check valve
- 10 With check valve
- 11 Port B blocked, has no function

**It must be ordered separately,
if connection plate is needed**

Type: G341/01(G1/4), G341/02(M14×1.5) G342/01(G3/8), G342/02(M18×1.5)
G502/01(G1/2), G502/02(M22×1.5)

Valve fixing screws:

M5×50 internal hexagon screw GB/T 70.1-10.9, Tightening torque $M_A=8.9\text{Nm}$



China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.

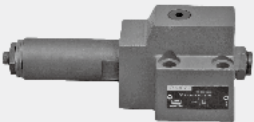


3.11

Pressure reducing valve direct operated

Type DR10DP...L4X

Size 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	04
Unit dimensions	05

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

Function and configurations

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).

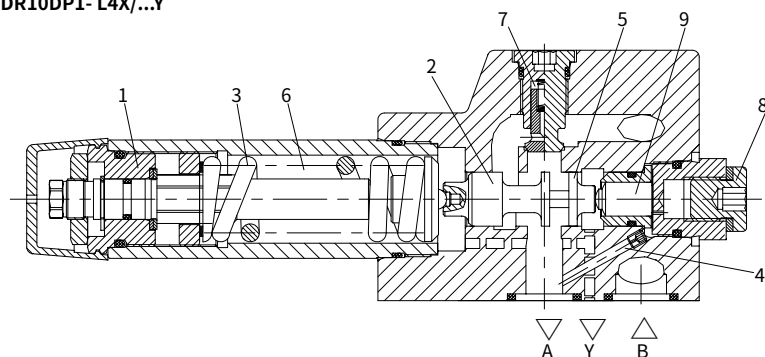
At static position, the valve is normally open and the pressure fluid flows unhindered from port B to port A. The pressure in port A acts at the small spool(9) area opposite to the compression spring (3) via the control line (4). When the pressure in port A get the value setting at the compression spring (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 taken from port A via the control line (4). If the pressure in port A still increases due to external forces on the actuator, a flow path is to be opened via control land(5) on the control spool (2). Port Y is open and sufficient fluid then flows back to tank to prevent any further pressure rise.

Fluid in spring chamber (6) always drained to tank externally via port Y.

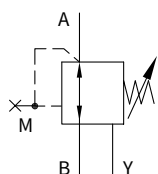
For free return flow from port A to port B an optional check valve(7) can be fitted.

One pressure gauge connection (8) used for monitoring the secondary pressure at the valve.

Type DR10DP1- L4X/...Y



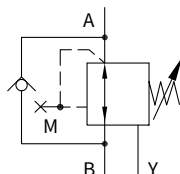
Symbols



Version "YM"

Pilot oil supply internal
oil drain external

Without check valve



Version "Y"

Pilot oil supply internal
oil drain external

With check valve

Ordering code

DR10DP

— L4X /

Y

/

*

Direct operated pressure reducing valve nominal size 10

Rotary knob =1

Adjustable bolt with protective cap =2

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

Max. secondary pressure 25bar =2.5

Max. secondary pressure 75bar =7.5

Max. secondary pressure 150bar =15

Max. secondary pressure 210bar =21

Further details in clear text

No code = NBR seals

V = FKM seals

Pressure tapping thread

No code = Inch G1/4

2 = Metric M14×1.5

No code = With check valve

M = Without check valve

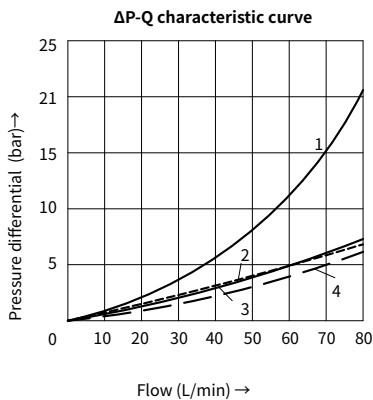
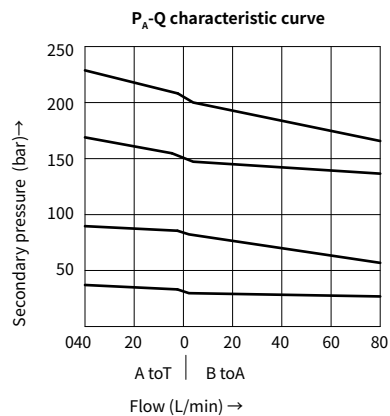
Y = Pilot oil supply internal

Oil drain external

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		315
Max.secondary pressure	Port A	bar	25; 75; 150; 210
Max.backing pressure	Port Y		160
Max. flow-rate		L/min	80
Weight		kg	Approx.3.3

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



Notes:

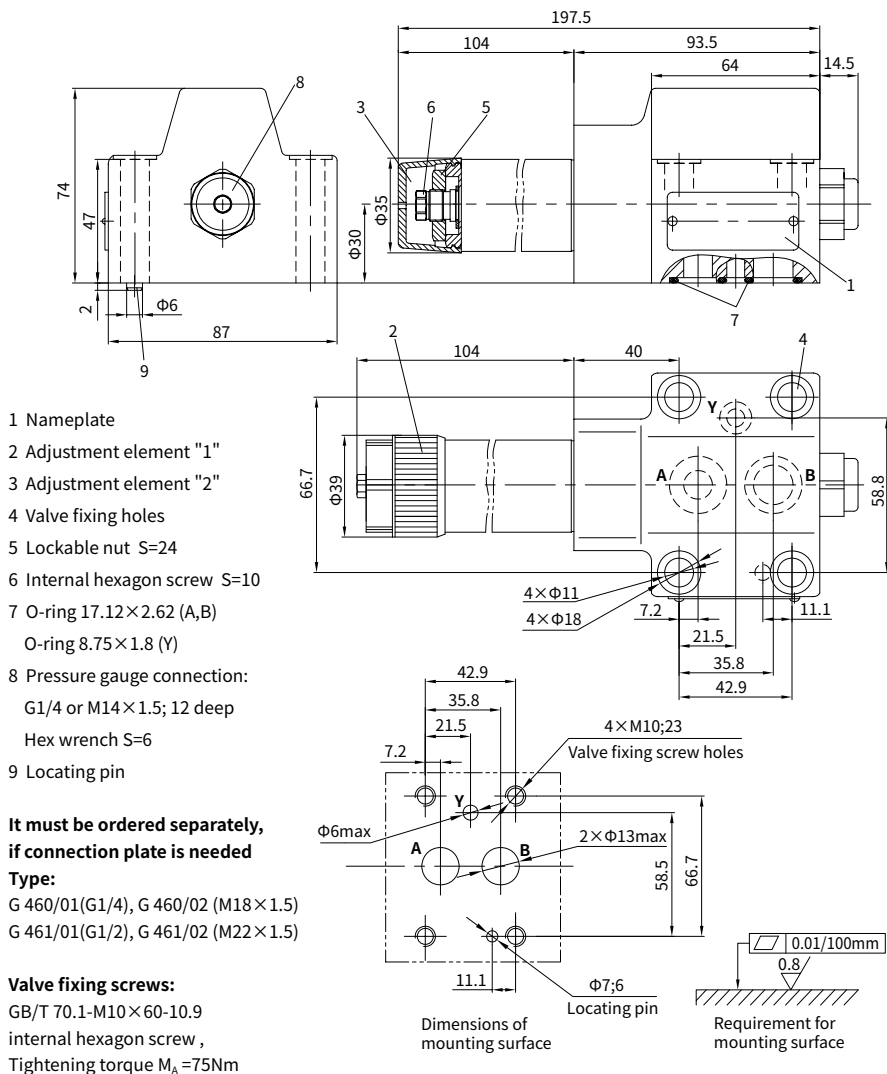
The curve characteristics remain in a certain pressure range, with a low setting pressure.

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

Unit dimensions

(Dimensions in mm)



China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.

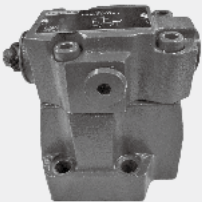


3.12

Pilot operated pressure reducing valves

Type DR...L5X

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



Contents

Function and configurations	02
Symbols	02
Ordering code	03
Technical data	04
Characteristic curves	05
Unit dimensions	06-08

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

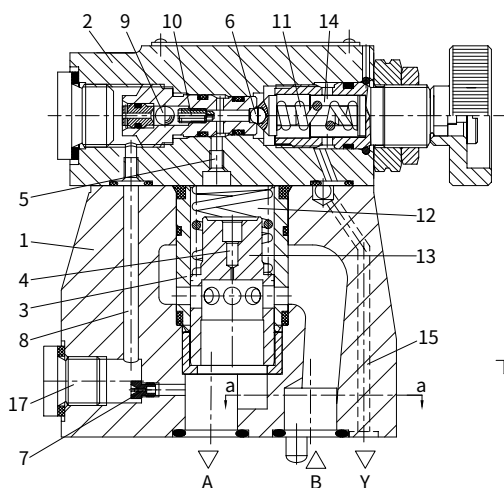
Pressure control valves type DR series L5X are pilot operated pressure reducing valves. They are used to control secondary circuit in a system. They consist mainly of the main valve (1) with main spool assembly (3) and pilot valve (2) with pressure adjustment element.

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

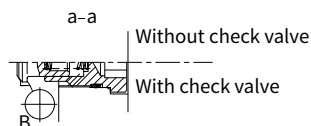
setting value of the spring (11), control piston (13) keeps open, then fluid can flow free from port B to port A, until pressure at port A exceed the setting value of spring (11), and then ball valve (6) is opened. Control piston (13) moves to close position. When pressure at port A is balanced with 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.

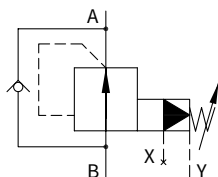


Type DR...-4-L5X/...Y

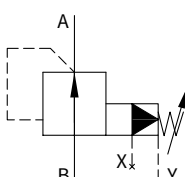


Symbols

DR...L5X/...Y



DR...L5X/...YM



Ordering code

DR **L5X** **Y** *****

Further details in clear text

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

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)

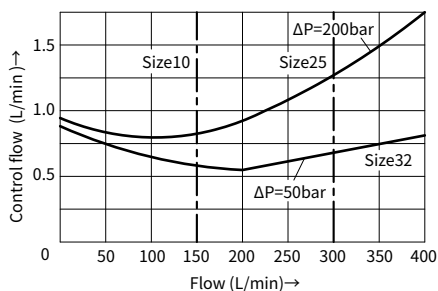
L5X= Series L50 to L59 (L50 to L59 series: unchanged installation and connection dimensions)

Technical data

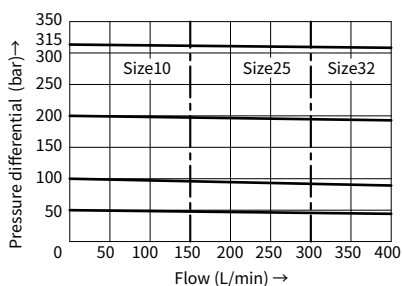
Fluid				Mineral oil suitable for NBR and FKM seal				
Fluid temperature range				°C				
Viscosity range				mm²/s				
Degree of contamination				Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406				
Max.operating pressure	Port B	bar		350				
Operating pressure 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
		DR...G	kg	Approx.5.3	Approx.5.5	Approx.5.1	Approx.5.0	Approx.5.0
	Threaded connection	DRC	kg	Approx.1.2				
		DRC30	kg	Approx.1.5				

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

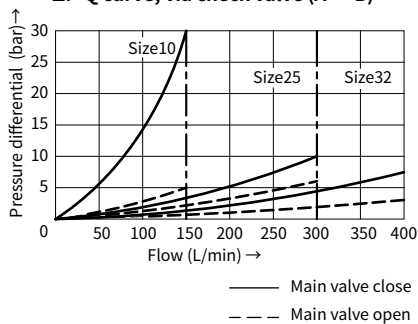
**Control oil flow related with flow (B → A)
and pressure differential**



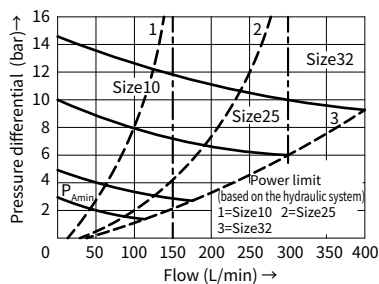
**Outlet pressure PA and
in relation to (B → A)**



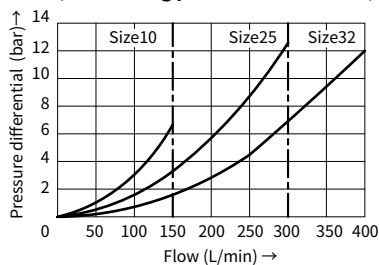
ΔP -Q curve, via check valve (A → B)



**Min. setting pressure PA min
in relation to flow (B → A)**



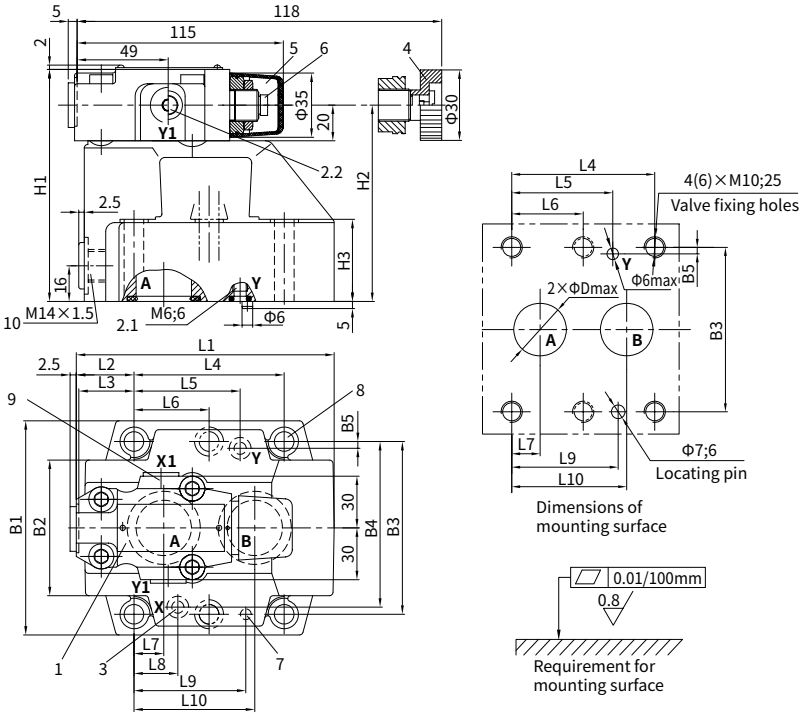
**P-Q curve(B → A)
(Min. setting pressure differential)**



Unit dimensions

(Dimensions in mm)

Sub-plate mounting



- 1 Nameplate
- 2.1 Port Y used for control oil external drain
- 2.2 Port Y1 optional for control oil external drain (G1/4 or M14×1.5)
- 3 Port X no function
- 4 Adjustment element "4"
- 5 Adjustment element "5"
- 6 Internal hexagon screw S=10
- 7 Locating pin
- 8 Valve fixing holes 4pcs(DR10,DR20) , 6pcs(DR30)
- 9 Port X1 for control external (G1/4or M14×1.5)
- 10 Pressure gauge connection

The sub-plate must be ordered separately.

Type:

Dr10: G460/01 (G3/8) G460/02 (M18×1.5)

G461/01 (G1/2) G461/02 (M22×1.5)

Dr20: G412/01 (G3/4) G412/02 (M27×2)

G413/01 (G1) G413/02 (M33×2)

DR30: G414/01 (G1 1/4) G414/02 (M42×2)

G415/01 (G1 1/2) G415/02 (M48×2)

Valve fixing screws:

Internal hexagon screw

DR10: GB/T 70.1-M10×50 -10.9

DR30: GB/T 70.1-M10×70 -10.9

DR20: GB/T 70.1-M10×60 -10.9

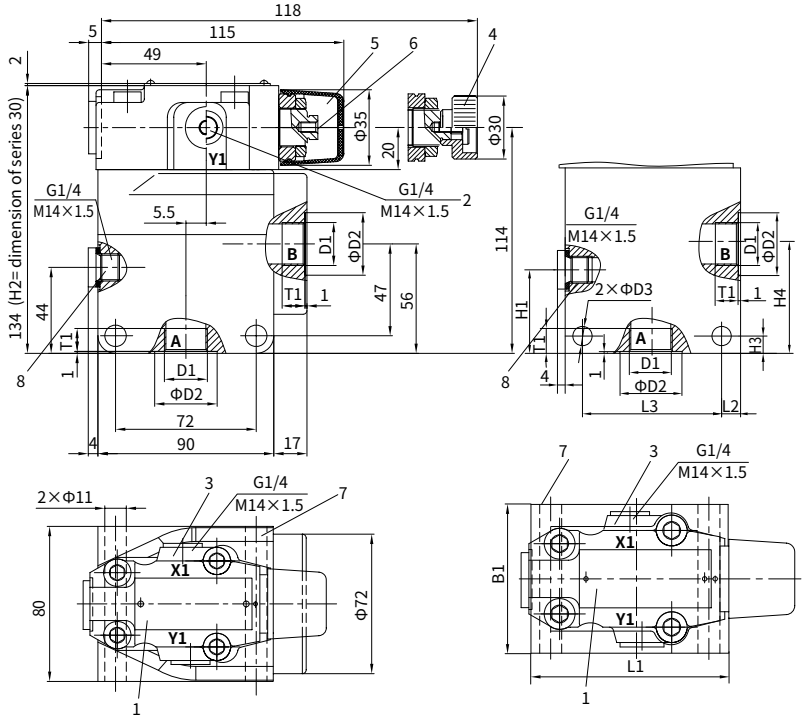
Tightening torque $M_A = 75 \text{ Nm}$

Type	B1	B2	B3	B4	B5	O-ring (PortA,B)					O-ring (PortX,Y)			D
DR10	85	50	66.7	58.8	7.9	17.12×2.62					9.25×1.78			13
DR20	102	59.5	79.4	73	6.4	28.17×3.53					9.25×1.78			22
DR30	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	
DR10	96	35.5	33	42.9	21.5	-	7.2	21.5	31.8	35.8	112	92	28	
DR20	116	37.5	35.4	60.3	39.7	-	11.1	20.6	44.5	49.2	122	102	38	
DR30	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)

Threaded connections



DR..G..L5X outline and installation dimension

DR..G..30 outline and installation dimension

Note:

For threaded connection valve, there is different installation dimension between series L5X and series 30. If series 30 valve need to be changed to series L5X, the pitch of installation holes and the pitch of external tapping will be changed.

- 1 Nameplate
- 2 Port Y1 for control oil external drain
- 3 Port X1 for control oil external supply
- 4 Adjustment element "4"
- 5 Adjustment element "5"
- 6 Internal hexagon screw S=10
- 7 Valve mounting holes
- 8 Pressure gauge connection

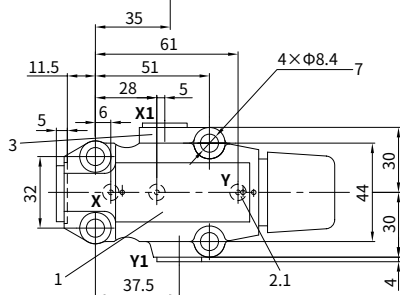
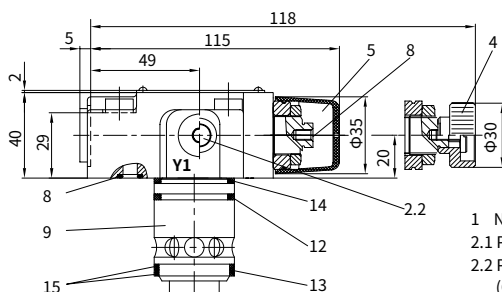
Outline and installation dimension of Series 30 threaded connection valve:

Type	B1	D3	H1	H2	H3	H4	L1	L2	L3	D1	D2	T1
DR10G	63	9	27	125	10	62	85	11.5	62	G1/2;M22×1.5	34	14
DR15G						57				G3/4;M27×2	42	16
DR20G						57				G1;M33×2	47	18
DR25G	70	11	42	138	13	64	100	14	72	G1 1/4;M42×2	58	20
DR30G										G1 1/2;M48×2	65	22

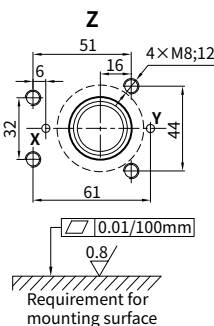
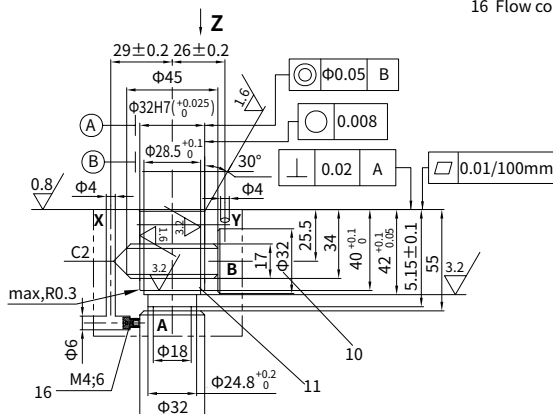
Unit dimensions

(Dimensions in mm)

(DRC30) pilot valve with or (DRC30) without main spool assembly



- 1 Nameplate
- 2.1 Port Y for control oil external drain
- 2.2 Port Y1 optional for control oil external drain (G1/4 or M14×1.5)
- 3 Port X1 for control oil external feed (G1/4 or M14×1.5)
- 4 Adjustment element "4"
- 5 Adjustment element "5"
- 6 Internal hexagon screw S=10
- 7 Valve fixing holes
(Valve fixing screw GB/T70.1-M8×40-10.9 $M_s=37\text{Nm}$)
- 8 O-ring 8.75×1.8(X, Y)
- 9 Main spool
- 10 Ø32 and Ø45 holes can meet each other at any position, but it can't damage the port X and the fixing holes
- 11 It must fix the O-ring and back-up ring into this hole before assembling the main spool
- 12 O-ring 28×1.8
- 13 O-ring 27.3×2.4
- 14 O-ring 28×2.65
- 15 O-ring 28.4×32×0.6
- 16 Flow controller (must be ordered separately)



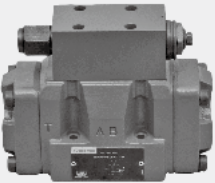


3.13

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

Function and configurations

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).

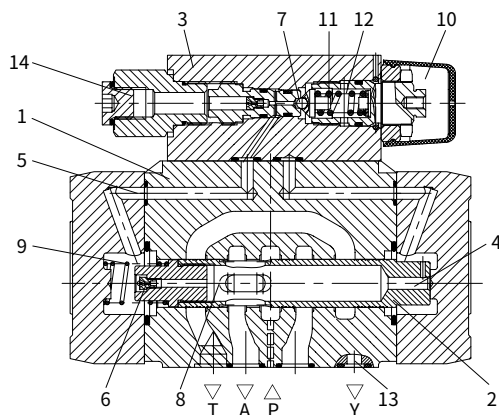
At static state, the valves are normally open, fluid flows free from port P to port A. The pressure in port A is applied via the channel (4) to the spool area opposite to the compression spring (9). Fluid also acts on the ball valve (7) of the pilot valve (3) via the throttle orifice (6) and channel (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.

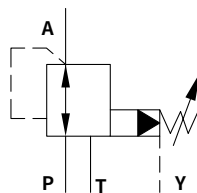
The pilot oil returns from spring chamber (12) to tank without back pressure via control line (13) to port Y.

A pressure gauge connection(14) makes it possible to monitor the reduced pressure in port A.



Type 3DR10P5-L6X/...

Symbol:



Ordering code

3DR	10	P	- L6X /	Y /	★
3-way pressure reducing valve			Further details in clear text		
Nominal size 10			No code = NBR seals		
Sub-plate mounting			V = FKM seals		
Rotary knob			Y= Pilot oil drain external		
Adjustable bolt with protective cap			5 = Max. secondary pressure 50 bar		
Series L60 to L69			10 = Max. secondary pressure 100 bar		
(L60 to L69 series: unchanged installation and connection dimensions)			20 = Max. secondary pressure 200 bar		
			31.5 = Max. secondary pressure 315 bar		

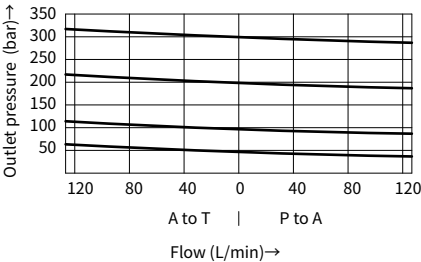
03

Technical data

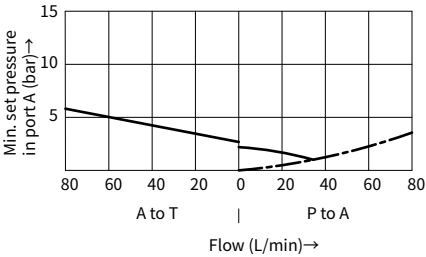
Fluid			Mineral oil suitable for NBR and FKM seal
			Phosphate ester for FKM seal
Fluid temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Viscosity range		mm ² /s	10 to 800
Degree of contamination			Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406
Nominal pressure		bar	315
Max. operating pressure	port P	bar	315
Max. operating pressure	port A	bar	315
Max. operating pressure	port Y	bar	Separate and at zero pressure to tank
Setting pressure	Min.	bar	Dependent on the flow (see curves)
	Max.	bar	50; 100; 200; 315
Max. flow-rate		L/min	120
Weight		kg	Approx. 6.5

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

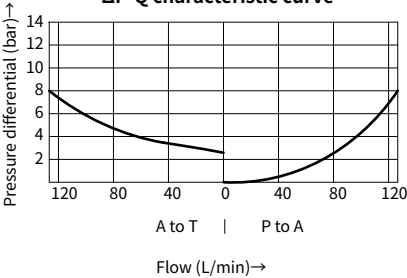
P_A-Q Characteristic curve



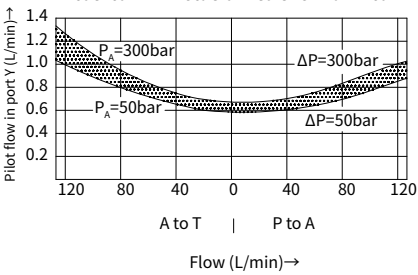
P_{min}-Q characteristic curve



ΔP -Q characteristic curve

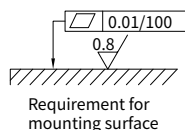
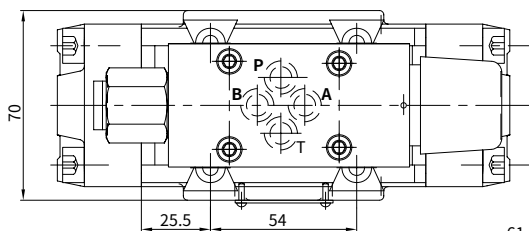
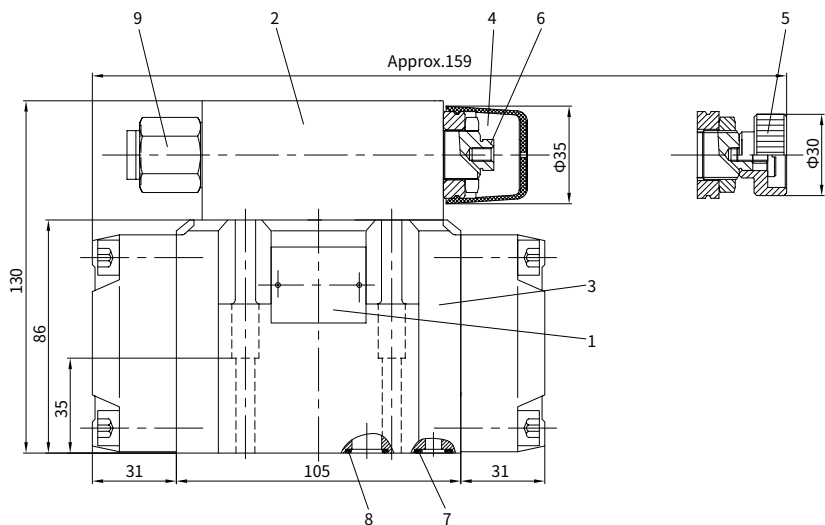


Pilot flow in relation to the main flow

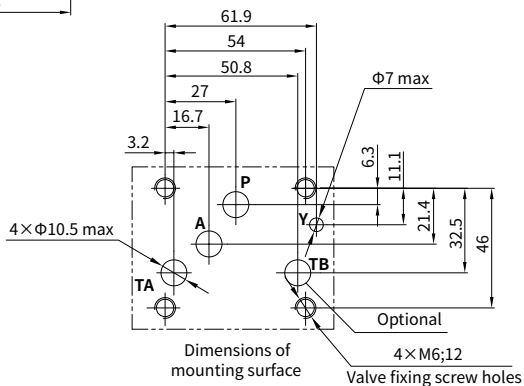


Unit dimensions

(Dimensions in mm)



- 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 x 1.78
(Port X and Y)
- 8 O-rings 12 x 2
(Ports A2, B2, P2, TA2 and TB2)
- 9 Pressure gauge connection G1/4



**It must be ordered separately,
if connection plate is needed.**

Type: G535/01(G3/4) G535/02(M27 x 2)
G536/01(G1) G536/02(M33 x 2)

Valve fixing screws:

4 pcs GB/T -10.9,
internal hexagon screw
Tightening torque $M_A = 15.5$ Nm

China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.

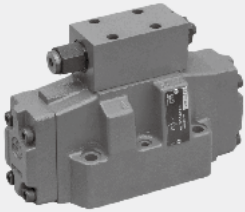


3.14

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

Function and configuration

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).

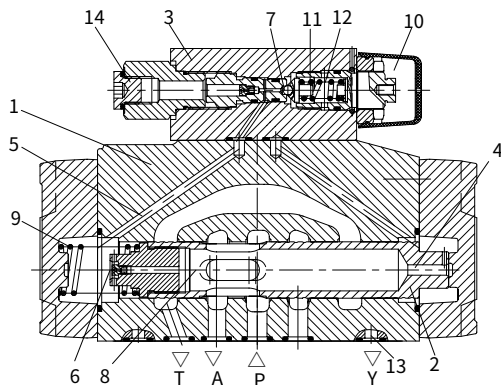
At static state, the valves are normally open, oil can flow free from port P to port A. The pressure in port A is applied through the channel (4) to the spool area opposite to the compression spring (9). At the same time pressure acts at the ball valve (7) within the pilot valve (3), via throttle orifice (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.

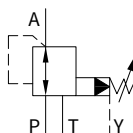
The pilot oil from the spring chamber (12) is always external through the control line (13) and port Y to the tank without back pressure.

A pressure gauge connection (14) makes it possible to monitor the reduced pressure in port A.

Type 3DR16P5-L7X/...



Symbol:



Ordering code

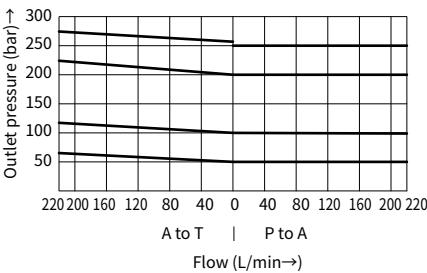
3DR		16	P	-	L7X	/	Y	/	*
3-way pressure reducing valve									Further details in clear text
Nominal size 16		=16							No code = NBR seals
Sub-plate mounting			= P						V = FKM seals
Rotary knob			=4						Y= Pilot oil drain external
Adjustable bolt with protective cap			=5						
Series L70 to L79 (L70 to L79 series: unchanged installation and connection dimensions)				= L7X					
									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

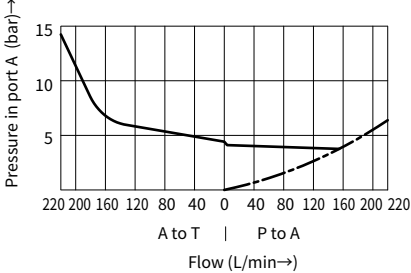
Fluid		Mineral oil suitable for NBR and FKM seal	
		Phosphate ester for FKM seal	
Fluid temperature range		°C	-30 to +80 (NBR seal)
			-20 to +80 (FKM seal)
Viscosity range		mm ² /s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406	
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

Characteristic curves (Measured at $\vartheta_{oil}=40^{\circ}\text{C}$, using HLP46)

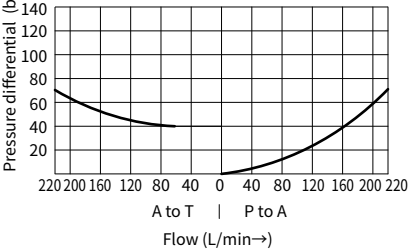
P_A-Q Characteristic curve



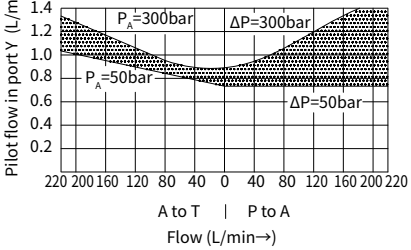
P_{min}-Q characteristic curve



ΔP -Q characteristic curve

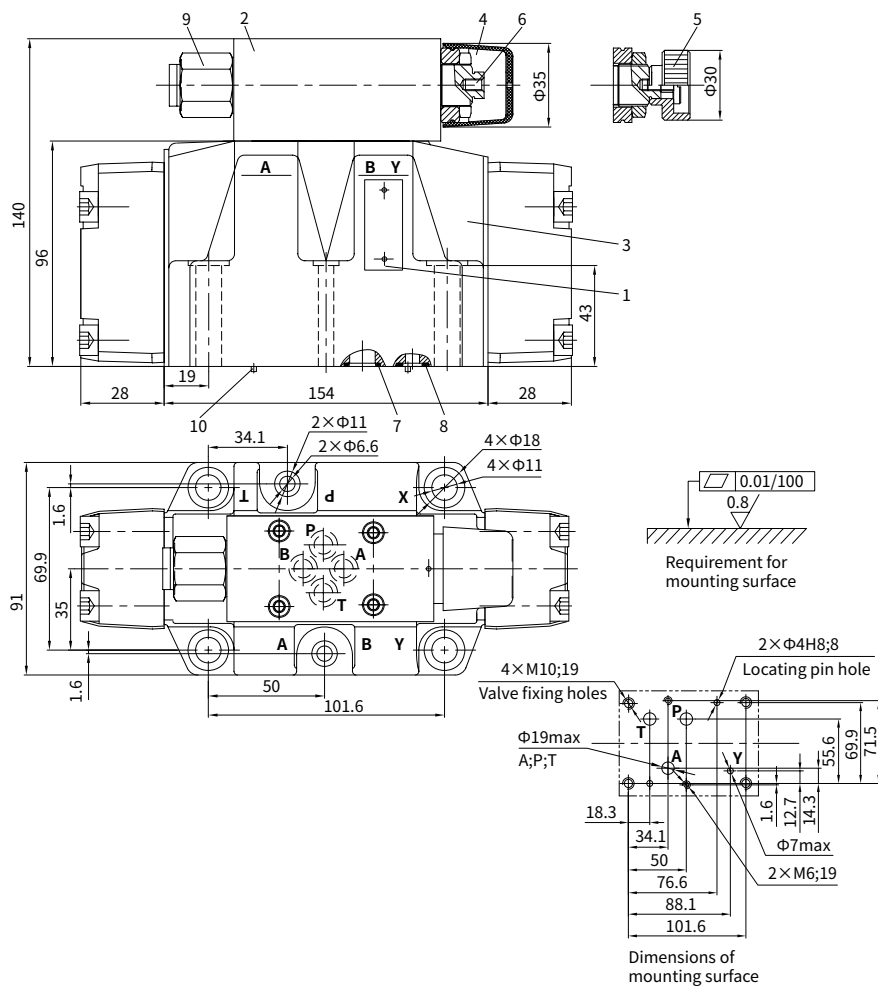


Pilot flow in relation to the main flow



Unit dimensions

(Dimensions in mm)



- 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 22×2.5
(Ports A, B, P and T)
- 8 O-rings 10×2 (Port X, Y and L)
- 9 Pressure gauge connection G1/4
- 10 Locating pin

**It must be ordered separately,
if connection plate is needed.**

Type: G172/01 (G3/4) G172/02 (M27×2)
G174/01 (G1) G174/02 (M33×2)

Valve fixing screws:

2 pcs GB/T 70.1-M6×55-10.9 internal hexagon screw
(Tightening torque $M_A = 15.5 \text{ Nm}$) and
4 pcs GB/T 70.1-M10×60-10.9 internal hexagon screw
(Tightening torque $M_A = 75 \text{ Nm}$)

China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



3.15

Pressure Reducing Valve Direct Operated

Type ZDR6D...L4X

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



Contents

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

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.

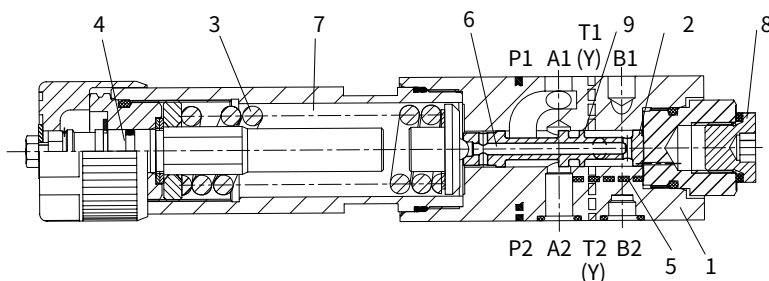
In model DA, one-way valve can only be mounted with the oil port from A2 to A1 to make the flow passage smooth.

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...



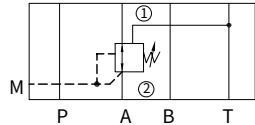
Note:

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.

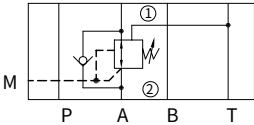
2. For internal leakage, superposition relief value for in pair with superposition (hydraulic control) one-way valve shall be installed between the superposition (hydraulic control) one-way valve and the directional change valve.

Symbols

Type:ZDR6DA...L4X/..YM



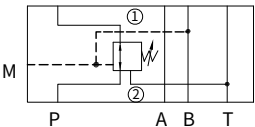
Type:ZDR6DA...L4X/..Y



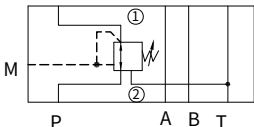
① =valve side;

② =bottom plate side

Type:ZDR6DB...L4X/..YM



Type:ZDR6DP...L4X/..YM



Ordering code

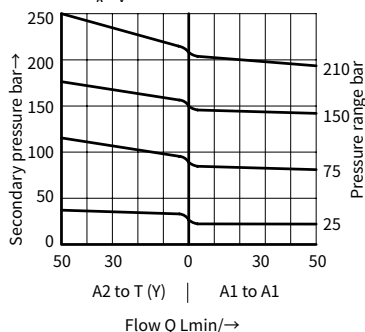
Z	DR	6	D		L4X	/	Y			★
Superposition structure =Z										Further details in clear text
Relief valve = DR										No code = NBR seals
Diameter 6 = 6										V = FKM seals
Direct-acting type = D										Pressure tapping thread
Oil port A2 pressure relieved = A										No code = Inch G1/4
Oil port B2 pressure relieved = B										2 = Metric M14×1.5
Oil port P1 pressure relieved = P										No mark = With one-way valve (just for model DA)
Knob =1										M = Without one-way valve
Adjusting bolt with protective cover =2										Y= Control oil supplied from inside and drained to the outside
Series L40 to L49 =L4X										2.5= Max. secondary pressure 25bar
(L40 to L49: unchanged installation and connection dimensions)										7.5= Max. secondary pressure 75bar
										15= Max. secondary pressure 150bar
										21= Max. secondary pressure 210bar

Technical data

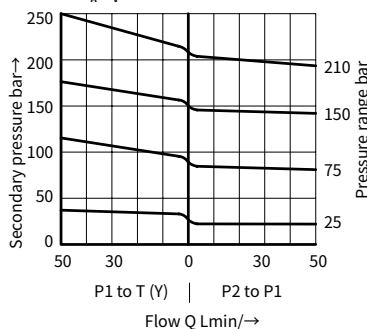
Fluid		Mineral oil suitable for NBR and FKM seal
		Phosphate ester for FKM seal
Fluid temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm ² /s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406
Max secondary pressure (inlet)	bar	315
Max secondary pressure (outlet)	bar	25; 75; 150; 210
Backpressure oil port T (Y)	bar	160
Max flow	L/min	50
Weight	kg	About 1.2

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

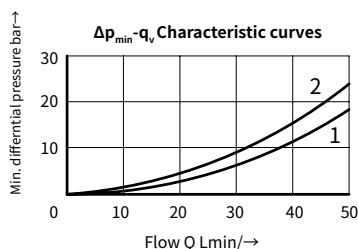
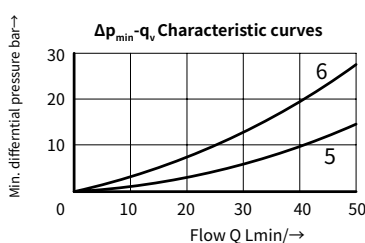
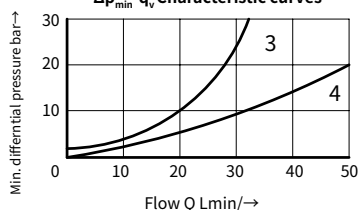
Type ZDR6DA

 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.

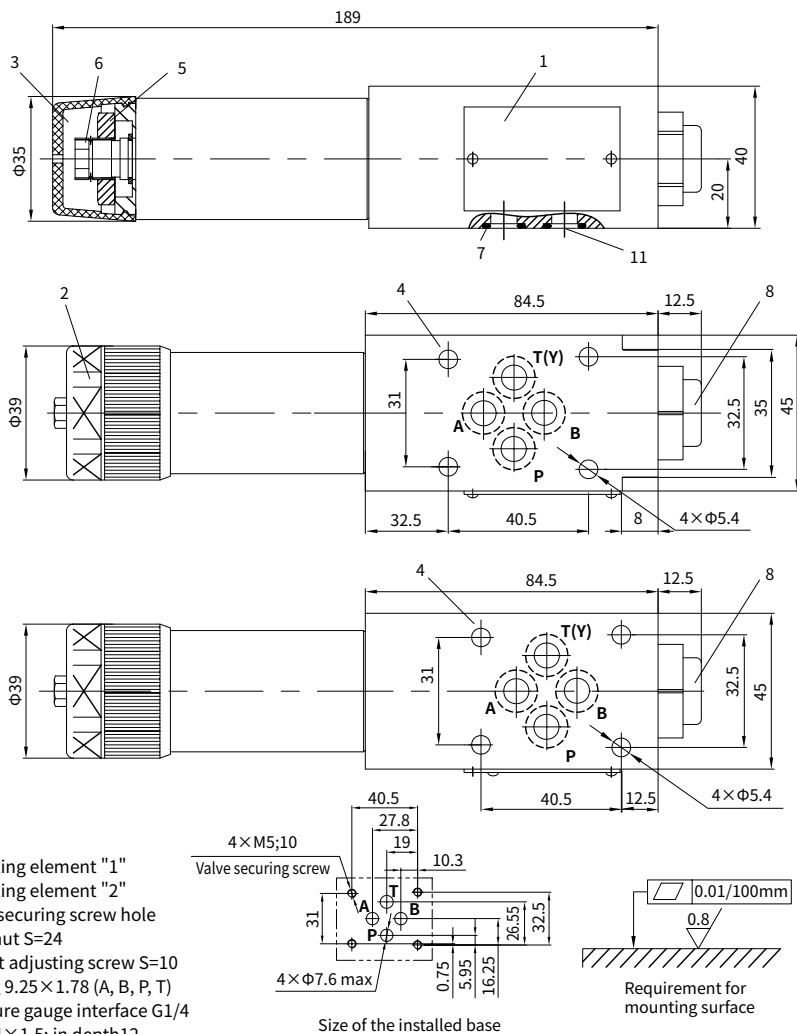
 Δp_{min} - q_v Characteristic curves Δp_{min} - q_v Characteristic curves Δp_{min} - q_v Characteristic curves

- 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)

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

Unit dimensions

(Dimensions in mm)



For connection of bottom plate, order shall be made separately
Type:

G341/01(G1/4), G341/02 (M14×1.5)

G342/01(G3/8), G342/02 (M18×1.5)

G 502/01(G1/2), G502/02 (M22×1.5)

Valve fixing screws:

M5 internal hexagon screw or LT 30.02 double-screw bolt added LT 30.01 nut GB/T 70.1-10.9, the length according to sandwich, tightening torque $M_A = 8.9 \text{ Nm}$, must be ordered separately.

China +86 400 101 8889	America +01 630 995 3674
Germany +49 172 3683463	Japan +81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



3.16

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
Ordering code	03
Technical data	03
Characteristic curves	04
Unit dimensions	05

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

Function and configuration

The pressure reducing valve type ZDR 10 D.. is a 3-way direct operated valve of sandwich plate design with a pressure relief 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), a compression spring (3), and the adjustment (4) as well as an optional check valve.

The secondary pressure is set by the pressure adjustment element (4).

Model "DA"

At rest, the valve is normally open, and fluid can flow unhindered from port A1 to port A2. The pressure in port A2 is at the same time via the control line (5) present at the spool area opposite to the compression spring (3). When the pressure in port A2 exceeds the pressure level set at the compression spring (3), the control spool (2) moves into the control position against the compression spring (3) and holds the set pressure in port A2 constant. The control pressure and pilot oil are taken from port A2 via control line (5).

If the pressure in port A2 rises still further due to external forces, the control spool (2) is moved still further towards the compression spring (3). This

causes a flow path to be opened at port A2 via control land (6) on the control spool (2) and housing (1) to tank (port TB). Sufficient fluid then flows to tank to prevent any further rise in pressure.

The spring chamber (7) is always drained to tank externally via port TA.

A pressure gauge connection (8) permits the secondary pressure at the valve to be monitored.

It is only possible to fit a check valve for free flow in ports A2 to A1 in version "DA".

Models "DP" and "DB"

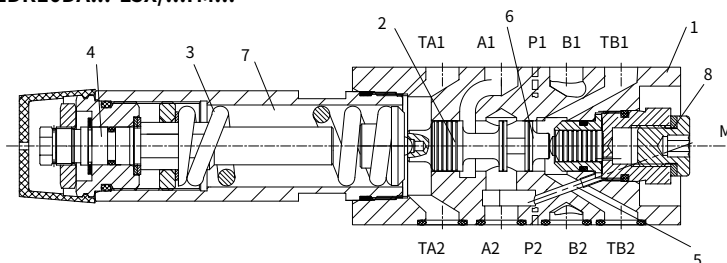
In model "DP", the pressure is reduced in port P1. The control pressure and the pilot oil is taken internally from port P1. In model "DB", the pressure in port P1 is reduced, and the pilot oil taken from port B.

Attention!

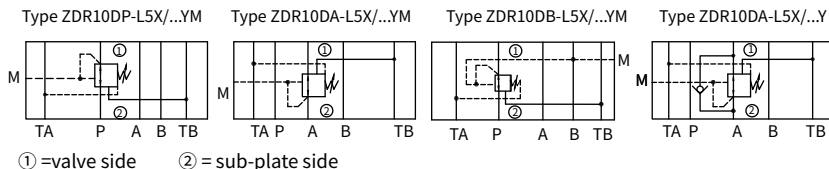
When the directional valve is in the switched position P to A, pressure in port B must not exceed the set secondary pressure. Otherwise, pressure in port A will be reduced.

If used without a directional valve, TA and TB must be interconnected (e.g. in the cover plate).

Type ZDR10DA...-L5X/...YM...



Symbols



Ordering code

Z	DR	10	D			- L5X /	Y			*
---	----	----	---	--	--	---------	---	--	--	---

Sandwich plate = Z

Pressure reducing valve = DR

Nominal size 10 =10

Direct operated = D

Pressure reduction in port A2 = A

Pressure reduction in port P1 = B

(Pilot oil from port B)

Pressure reduction in port P1 = P

Rotary knob =1

Adjustable bolt with protective cap =2

Series L50 to L59 =L5X

Further details in clear text

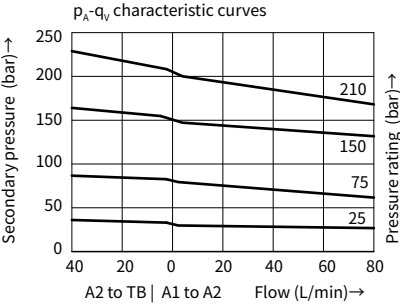
No code =	NBR seals
V =	FKM seals
No code =	With check valve (not possible for pressure reduction in port P1)
M =	Without check valve
Y=	Pilot oil supply internal and drain external
2.5 =	Max. secondary pressure 25 bar
7.5 =	Max. secondary pressure 75 bar
15 =	Max. secondary pressure 150 bar
21 =	Max. secondary pressure 210 bar

Technical data

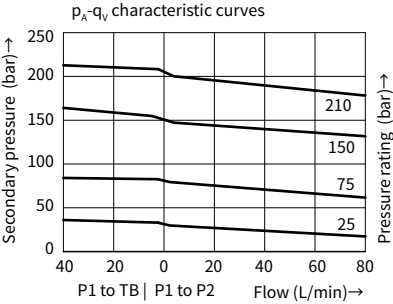
Fluid		Mineral oil suitable for NBR and FKM seal
		Phosphate ester for FKM seal
Fluid temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm ² /s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406
Max.operating pressure (inlet)	bar	up to 315
Max.secondary pressure (output)	bar	up to 25; up to 75; up to 150; up to 210
Back pressure	bar	150
Max. flow-rate	L/min	80
Weight	Kg	Approx. 2.8

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

Type ZDR 10 DA...-L5X/...



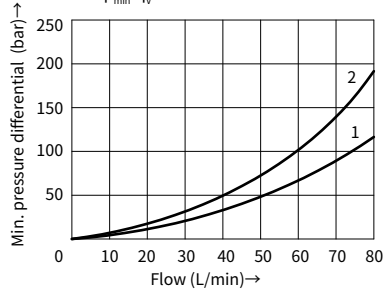
Type ZDR 10 DP...-L5X/... and
Type ZDR 10 DB...-L5X/...



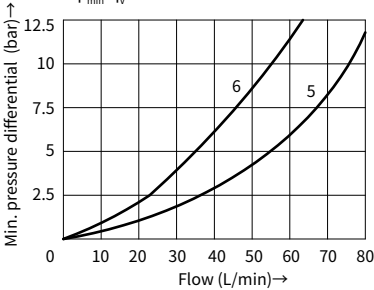
Note:

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

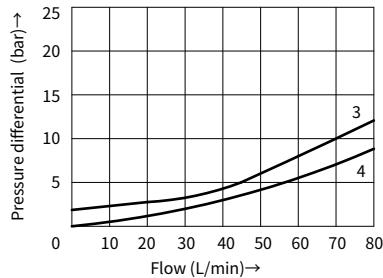
Δp_{min} - q_v characteristic curves



Δp_{min} - q_v characteristic curves



Δp - q_v characteristic curves

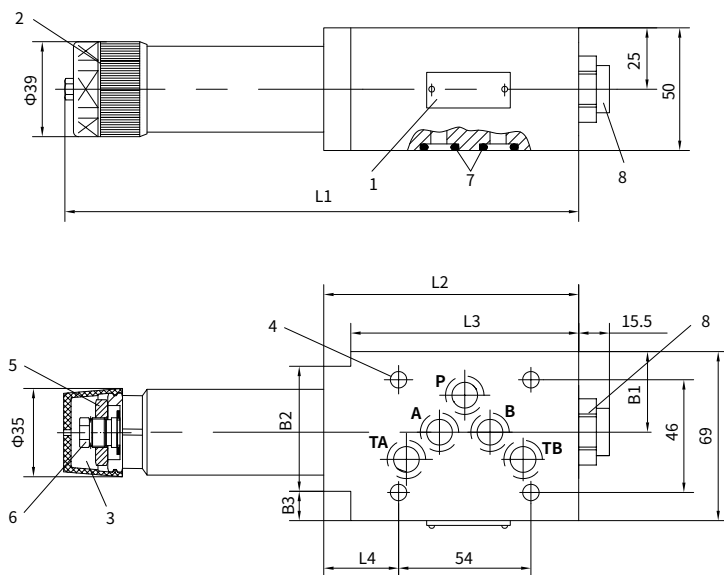


- 1 A1 to A2
- 2 A2 to TB (3rd. flow path)
- 3 A2 to A1 flow via check valve only
- 4 A2 to A1 flow via check valve and fully open control cross section
- 5 P2 to P1
- 6 P1 to TB (3rd. flow path)

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

Unit dimensions

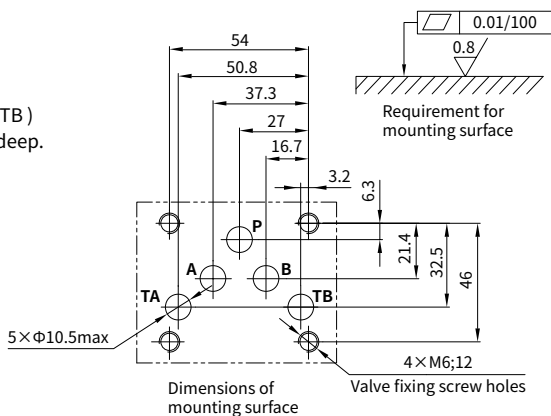
(Dimensions in mm)



- 1 Name plate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Valve mounting screw holes
- 5 Lock nut 24 A/F
- 6 Hexagon 10 A/F
- 7 O-rings 12×2 (Port A, B, P, TA, TB)
- 8 Pressure gauge port G 1/4; 12 deep.
internal hexagon 6 A/F

Valve mounting screws:

M6 internal hexagon bolt or
LT 30.02 double-screw bolt
with LT 30.03 nut
GB/T 70.1-10.9, the length
according to sandwich,
tightening torque $M_A = 15.5 \text{ Nm}$
must be ordered separately.



Model	L1	L2	L3	L4	L5	L6	B1	B2	B3
"DA"	254	230	210	104	93	31.5	32.9	51	12
"DB" and "DP"	242	218	198	91	-	18.5	35	-	-

China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.



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

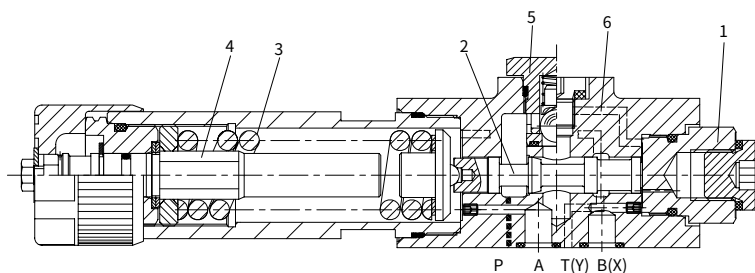
Function and configuration

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).

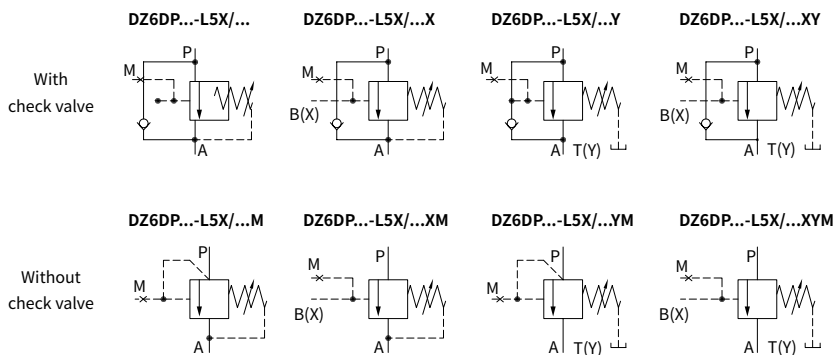
The spring (3) holds the control spool (2) in the neutral position, the valve is blocked. The pressure in channel P is acting at the end surface of the control spool (2) opposite the spring (3) via the control line (6). If the pressure in channel P reaches the setting value of the spring(3), the control 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								Further details in clear text	
Rotary knob =1								No code = NBR seals	
Adjustable bolt with protective cap =2								V = FKM seals	
Series L50 to L59 = L5X								Pressure tapping thread	
(L50 to L59 series: unchanged installation and connection dimensions)								No code = Incha thread	
								2 = Metric thread	
Max. secondary pressure 25 bar =2.5								No code = With check valve	
Max. secondary pressure 75 bar =7.5								M = Without check valve	
Max. secondary pressure 150 bar =15								No code = Pilot oil supply internal, oil drain internal	
Max. secondary pressure 210 bar =21								X = Pilot oil supply external, oil drain internal	
Max. secondary pressure 315 bar =31.5 (Note 1)								Y = Pilot oil supply internal, oil drain external	
								XY = Pilot oil supply external, oil drain external	

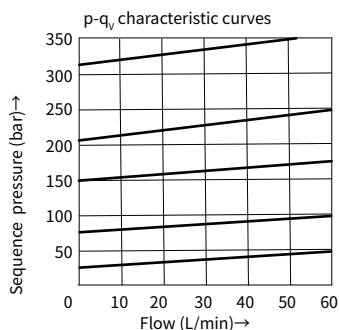
Notes 1: 315bar only for adjustment form "2" and without check valve .

03

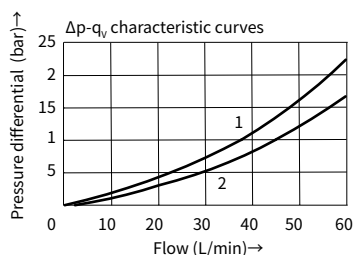
Technical data

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 $\theta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using HLP46)



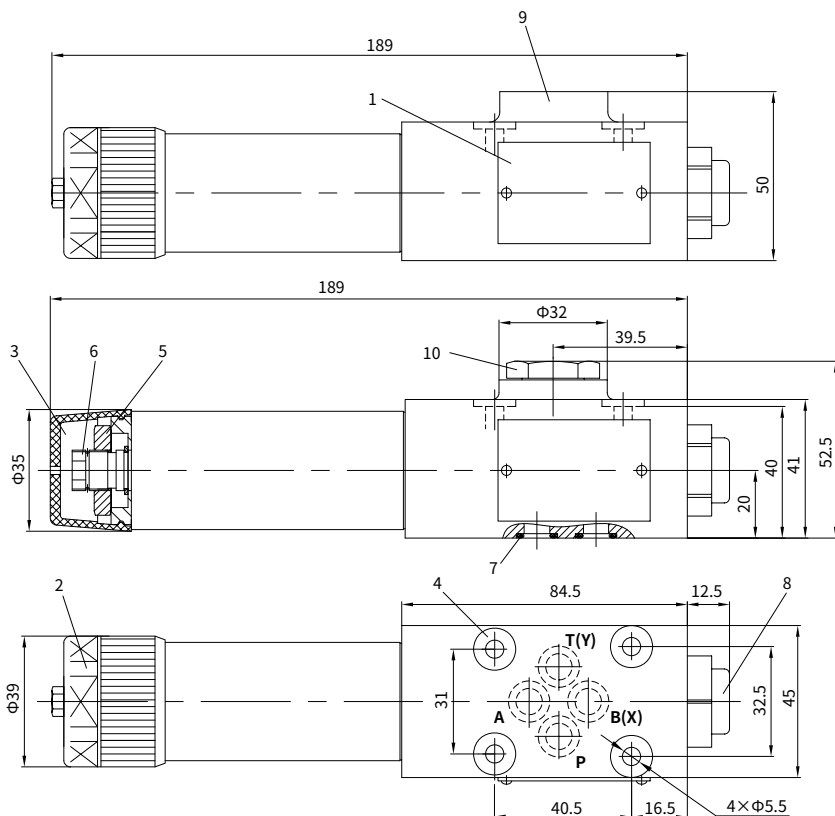
1. Δp -q_v characteristic curves A to P via check valve
2. Δp -q_v characteristic curves P to A



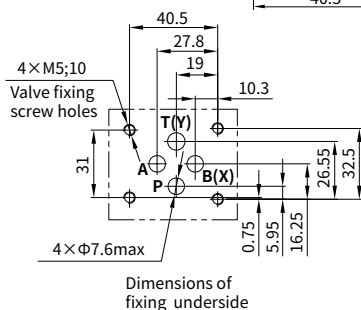
The characteristic curves are valid for output pressure = zero in the complete flow range.

Unit dimensions

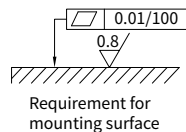
(Dimensions in mm)



- 1 Name plate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Valve mounting holes
- 5 Lockable screw S=24
- 6 Internal hexagon bolt S=10
- 7 O-rings 9.25×1.78
(Ports A, B, P, T)
- 8 Pressure gauge connection
G1/4 or M14×1.5, 12 deep
Hexagon wrench S=6
- 9 Without check valve
- 10 With check valve



Dimensions of
fixing underside



Requirement for
mounting surface

**It must be ordered separately,
if connection plate is need**

Type: G341/01(G1/4), G341/02 (M14×1.5)
G342/01(G3/8), G342/02 (M18×1.5)
G502/01(G1/2), G502/02 (M22×1.5)

Valve mounting screws:

GB/T 70.1- M5×50-10.9 internal hexagon screw
Tightening torque $M_A = 8.9 \text{ Nm}$



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

Function and configuration

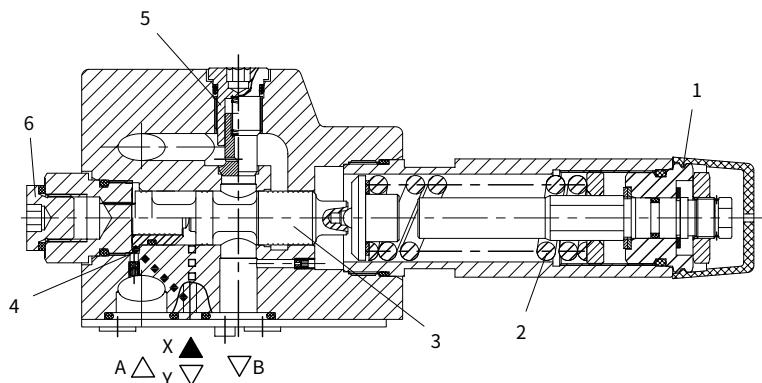
DZ10DP sequence valve is direct-acting valve for sequence switching related with secondary loop and pressure. Set sequence pressure through adjusting elements (1).

Compression spring (2) holds valve element (3) in initial position and the valve is closed. Pressure of Port A enters the valve element end through control route (4), of which the produced force acting on the valve element (3) on the opposite side of spring (2).

When the pressure reaches the set value of spring (2), valve element (3) is pushed to connect port A and B; systems connected with oil port B is connected in sequence while the pressure of port A will not drop; control signal is acquired from port A via control route (4) or acquired from the outside via port X.

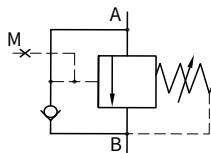
According to the valve purpose, leaked oil can return from the outside of port Y or the inside of port B.

Type: DR10DP1-L4X/...Y

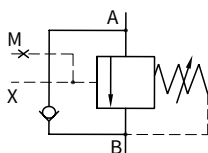


Symbols

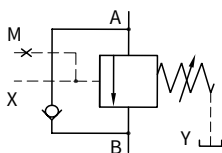
Structure "-"



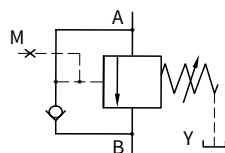
Structure "X"



Structure "XY"



Structure "Y"



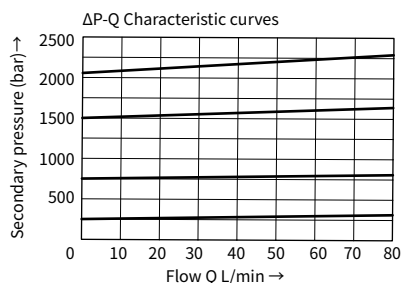
Ordering code

Direct-acting relief valve diameter 10		DZ10DP	-	L4X	/		/		*
Knob	=1								
Hex bolt with protective cover	=2								
Series L40 to L49 (L40 to L49: unchanged installation and connection dimensions)	=L4X								
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

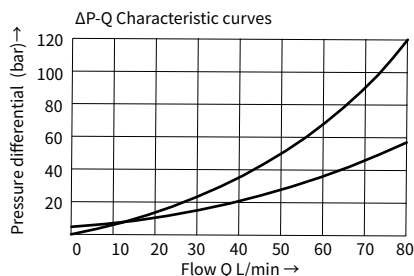
Fluid		Mineral oil suitable for NBR and FKM seal	
		Phosphate ester for FKM seal	
Fluid temperature range	°C	-30 to +80 (NBR seal)	
		-20 to +80 (FKM seal)	
Viscosity range	mm ² /S	10 to 800	
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406	
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 $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using HLP46)



Note:

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

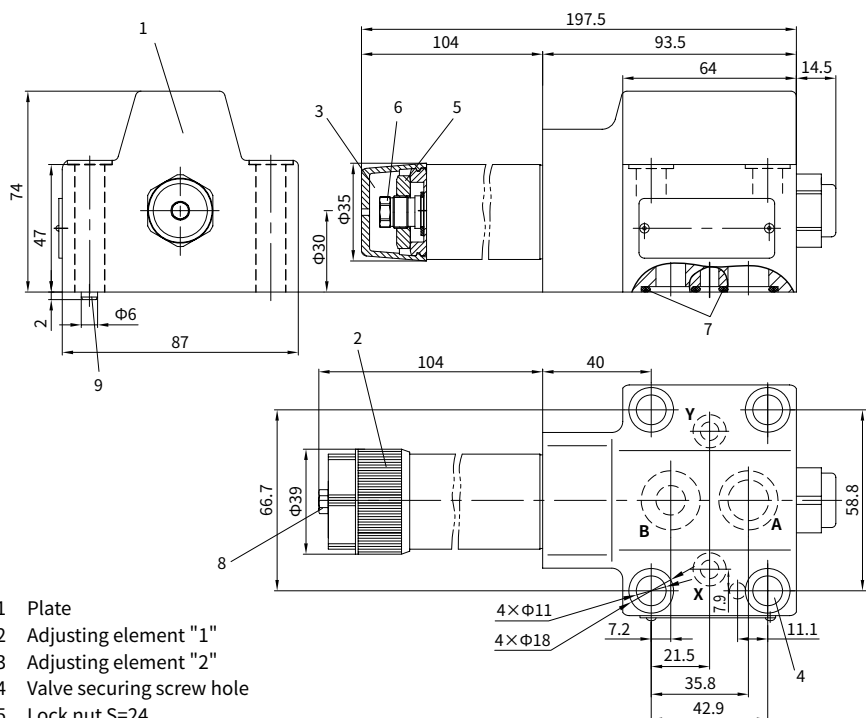


ΔP-Q- characteristic curve, flowing via one-way valve B to A.

ΔP-Q characteristic curve, A to B

Unit dimensions

(Dimensions in mm)



- 1 Plate
- 2 Adjusting element "1"
- 3 Adjusting element "2"
- 4 Valve securing screw hole
- 5 Lock nut S=24
- 6 Inner hex adjusting screw S=10
- 7 O-ring 17.12×2.62(A, B)
O-ring 8.75×1.8 (X, Y)
- 8 Pressure gauge interface
G1/4 or M14×1.5; in depth 12
Hex wrench S=6
- 9 Positioning pin

**It must be ordered separately,
if connection plate is need**
Type: G460/01(G3/8); G46101(G1/2)

Valve securing screw:

M10×60 as per GB/T70.1- class 10.9
 Socket head cap screw
 Tightening torque $M_A=75\text{Nm}$

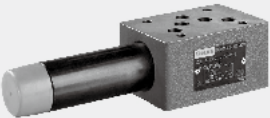


3.19

Pressure sequence valve direct operated

Type ZDZ6DP-L1X

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



Contents

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

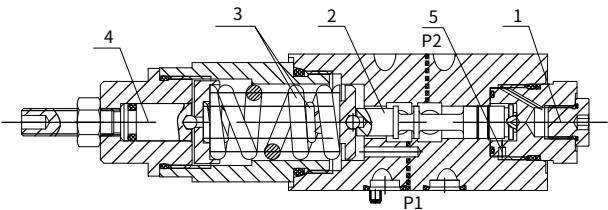
Features

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

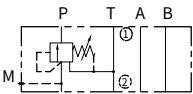
Function and configuration

ZDZ6D valve is direct-acting sequence valve related to the pressure of the secondary loop, with sequence pressure set through the pressure adjusting mechanism (4); 2 pressure adjusting springs (3) hold the control valve element (2) in initial position and the valve is closed. Pressure of oil port P1 acts on the valve element end face via control channel (5), get balanced each other with the spring force of the slide valve. If the pressure of oil port P1 is over the setting of the spring (3), valve element (2) moves in direction to the spring to open oil port P, so that oil flows from P1 to P2.

Pressure gauge interface (1), a pressure gauge can be installed to monitor the pressure of the sequence oil route.



symbol



- ① =valve side;
- ② =bottom plate side

Ordering code

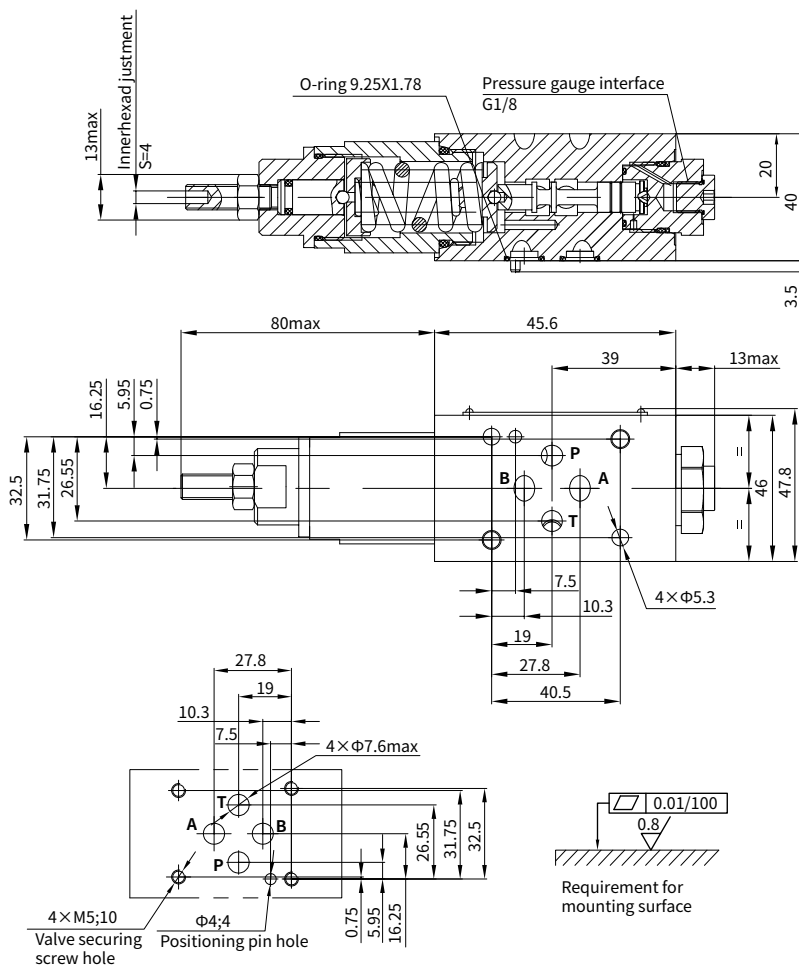
	Z	DZ	6	D	P	2 – L1X	/	25 – B	*	
Superposition structure =Z										Further details in clear text
Sequence valve =DZ								B=		Pressure measurement port thread G1/8
Diameter 6 =6										
Direct-acting type =D								25=		Pressure adjustment range 20~250bar
Oil port P sequence =P										
Screw adjustment =2										
							L1X=			Series L10 to L19 (L10 to L19: unchanged installation and connection dimensions)

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 (input)		bar	315
Highest order pressure setting		bar	250
Min. initial pressure		bar	20
Max flow		L/min	60
Weight		kg	About 1.3

Unit dimensions

(Dimensions in mm)



Valve securing screw

M5 as per GB/T70.1-10.9 grade, Length determined with regard to height
 Tightening torque $M_A=8.9\text{Nm}$, Order must be placed separately

China

+86 400 101 8889

America

+01 630 995 3674

Germany

+49 172 3683463

Japan

+81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.

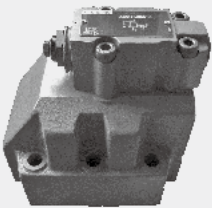


3.20

Pressure sequence valve pilot operated

Type DZ...L5X

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



Contents

Function and configuration	02
Symbols	03
Ordering code	03
Technical data	04
Characteristic curves	04
Unit dimensions	05-06

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

Function and configuration

Pressure valves type DZ are pilot operated pressure sequence valves. They are used for pressure dependent sequence switching of a secondary circuit.

The pressure sequence valves basically consist of main valve (1) with main spool insert (7), pilot valve (2) with pressure adjustment element and optional check valve (3).

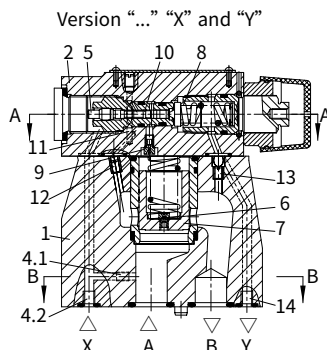
The valve function is dependent on pilot oil drain configuration:

• 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 valve Type DZ...-L5X/...X..

(Control lines 4.2, 12 and 13 open;

control lines 4.1, 14 and 15 plugged)

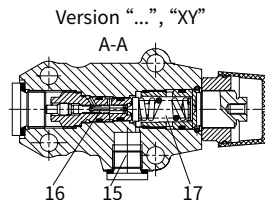
The function of this valve is principally the same as valve DZ...-L5X/.... However, on pressure sequence valve type DZ...-L5X/...X.. the signal is achieved externally by means of control line (4.2).

• 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).

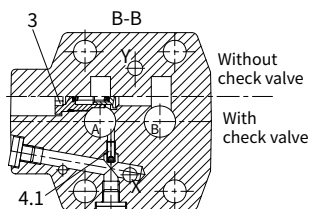


• Bypass valve Type DZ...-L5X/...XY..

(Control lines 4.2 14 or 15 open;

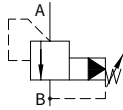
control lines 4.1, 12 and 13 plugged)

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 the spring chamber (17) of the pilot valve (2) via orifice (9) and line (16) and pressure decreases on the spring loaded side of the main spool (7). The fluid can, therefore, flow from port A to B with minimum pressure loss. The pilot oil in spring chamber (17) should be drained to tank without pressure via line (14) or (15). An optional check valve (3) can be fitted for free flow from port B to A.

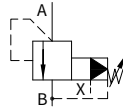


Symbols

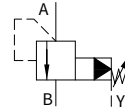
DZ...L5X/...M...
DZC...L5X/...M...



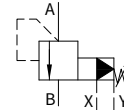
DZ...L5X/...XM...



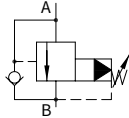
DZ...L5X/...YM...



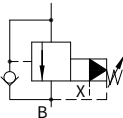
DZ...L5X/...XYM...
DZC...L5X/...XYM...



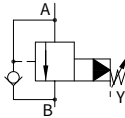
DZ...L5X/...



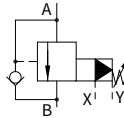
DZ...L5X/...X...



DZ...L5X/...Y...



DZ...L5X/...XY...



Ordering code

Pressure sequence 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

Nominal size 10 =10

Nominal size 25 =20

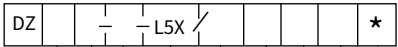
Nominal size 32 =30

Rotary knob =1

Adjustable bolt with protective cap =2

Series L50 L59 =L5X

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



Further details
in clear text

No code = NBR seals

V = FKM seals

No code= With check valve

M = Without check valve

Pilot oil supply and drain :

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

(for bypass valve, B port back to tank

XY2= Pilot oil supply and drain external

(for sequence valve, B port connect system)

5 = Max. secondary pressure 50 bar

10 = Max. secondary pressure 100 bar

20 = Max. secondary pressure 200 bar

31.5 = Max. secondary pressure 315 bar

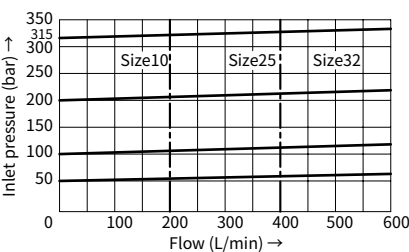
Technical data

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		mm²/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	bar	315		
	Port Y	bar	315		
Adjustable pressure	Max.	bar	50;100;200;315		
	Min.	bar	Interrelated to the flow (refer to the characteristic curve)		
Size			DZ10	DZ20	DZ30
Max. flow-rate		L/min	200	400	600
Fixing position			Optional		
Size			DZ10	DZ20	DZ30
Weight	sub-plate mounting DZ	kg	Approx.3.6	Approx.5.5	Approx.8.2
	DZC	kg	Approx.1.2		
	DZC30	kg	Approx.1.5		

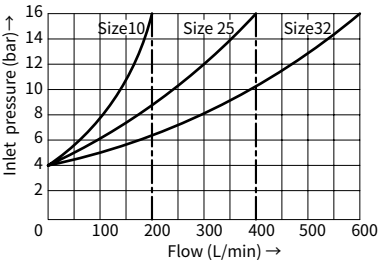
Characteristic curves

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

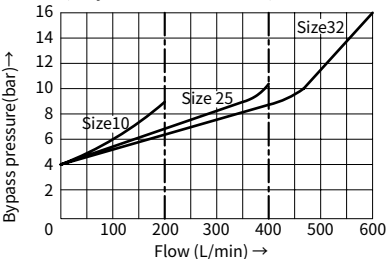
Inlet pressure in relation to flow (A → B)



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

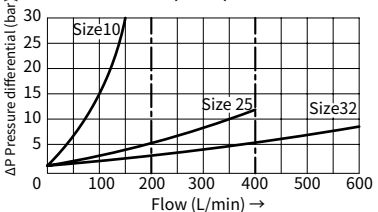


Bypass pressure in relation to flow (A → B)
(only for version "...XY...")



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

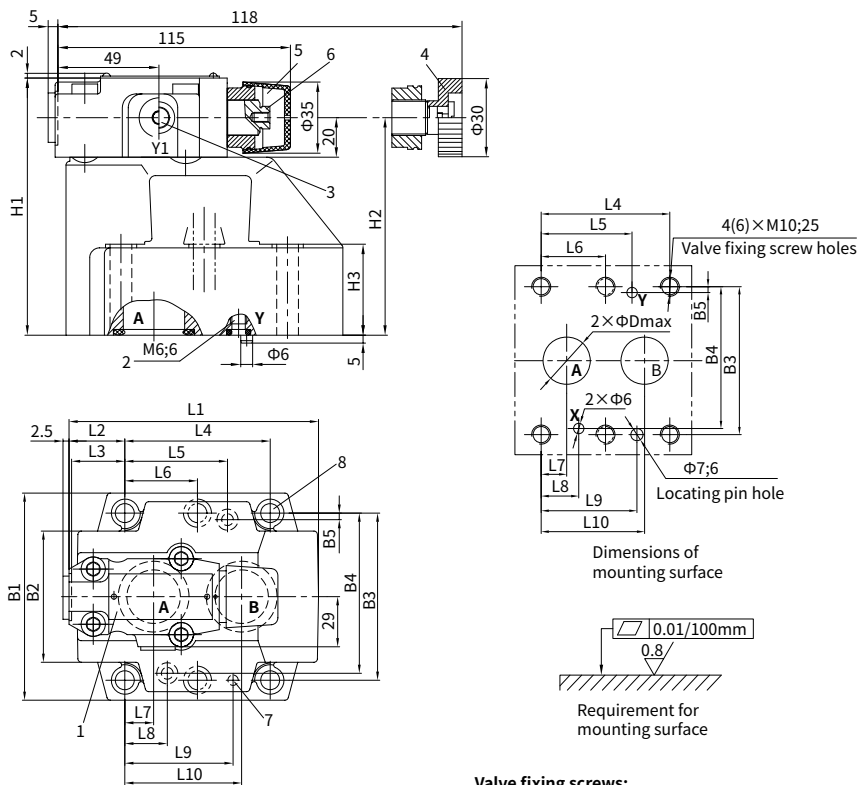
ΔP-Q Characteristic curves
via check valve (B → A)



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

Unit dimensions

(Dimensions in mm)



- 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 $\times$ 50-10.9
 DZ20: GB/T 70.1-M10 $\times$ 60-10.9
 DZ30: GB/T 70.1-M10 $\times$ 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 $\times$ 1.5)
 G 461/01(G1/2) G 461/02(M22 $\times$ 1.5)
DZ20: G 412/01(G3/4) G 412/02 (M27 $\times$ 2)
 G 413/01(G1) G 413/02 (M33 $\times$ 2)
DZ30: G 414/01(G1 1/4) G 414/02 (M42 $\times$ 2)
 G 415/01(G1 1/2) G 415/02 (M48 $\times$ 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 $\times$ 2.62					9.25 $\times$ 1.78			13
DZ20	102	59.5	79.4	73	6.4	28.17 $\times$ 3.53					9.25 $\times$ 1.78			22
DZ30	120	76	96.8	92.8	3.8	34.52 $\times$ 3.53					9.25 $\times$ 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	

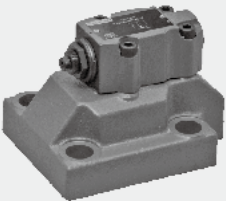


3.21

Pressure shut-off valve pilot operated

Type DA/DAW...L5X

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



Contents

Function and configuration	02
Symbols	03
Sample circuit	03
Ordering code	04
Technical data	05
Characteristic curves	06
Unit dimensions	07-09
Sub-plate	10

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/... 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).

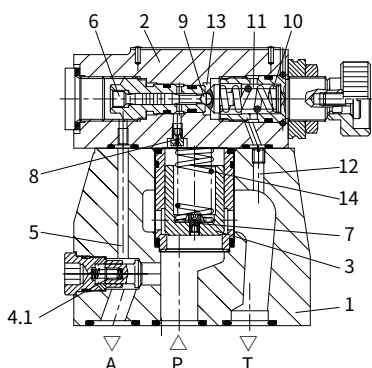
· Diverting pump flow from P to T to P to A.

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).

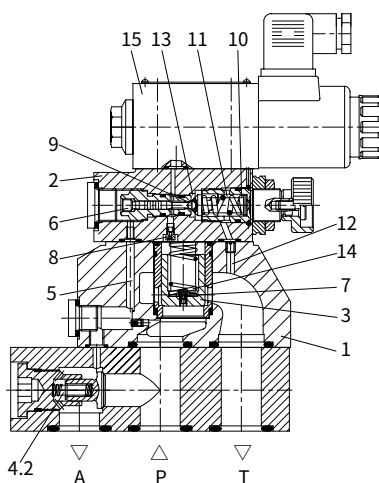
When the actuator pressure falls to the cut-off pressure which corresponds to the switching pressure differential, spring (10) pushes ball (9) on to its seat. Pressure is then built up on the spring loaded side of the main spool (3). In conjunction with spring (14), the main spool (3) is closed the connection 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.



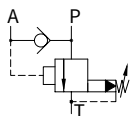
Type:DA10-1-L5X/...



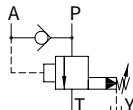
Type:DAW20-1-L5X/...

Symbols

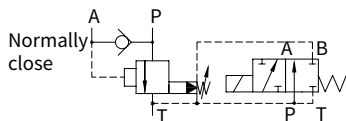
Type:DA...-L5X/...



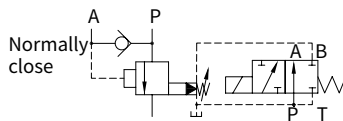
Type:DA...-L5X/...-Y..



Type:DAW...A...-L5X/...



Type:DAW...A...-L5X/...Y..



Type:DAW...B...-L5X/...

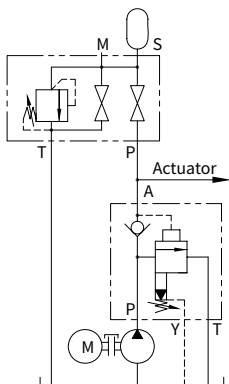


Type:DAW...B...-L5X/...Y..

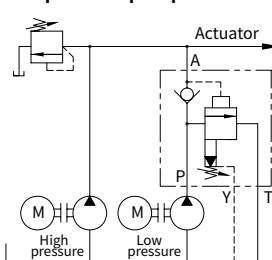


Sample circuit

Hydraulic system with accumulator



Hydraulic system with high and low pressure pumps



Notes for fixing:

- (1) Maintain the resistance as little as possible between the valve DA and accumulator.
- (2) For large flow pump and /or low pressure differential (10%), Version Y is best.

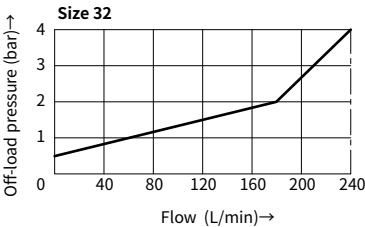
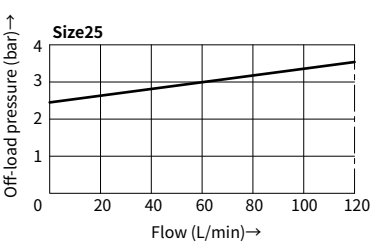
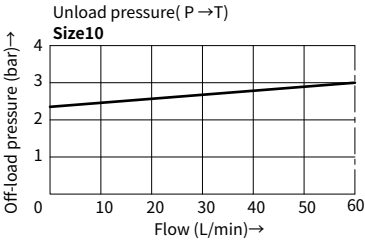
Ordering code

DA				-	-	L5X	/	-	/						*	
Without directional valve = No code															Further details in clear text	
With directional valve=W															No code= NBR seals	
Pilot operated valve=No code															V = FKM seals	
Pilot valve without main spool assembly = C															Only DAW:	
(No mark for nominal size)															Z4= Electrical plug without lamp	
Pilot valve with main spool assembly = C															Z5L= Electrical plug with lamp	
(Marked with size 30)															Only DAW:	
Nominal size 10 =10															N= With hand override	
Nominal size 25 =20															Only DAW:	
Nominal size 32 =30															G24 = 24V DC	
For DAW:															W220 = 220V AC	
Normally closed															W220R = 220V AC rectification	
(load when breakaway, unload when electrified) =A															W110 = 110V AC	
Normally open															(Other voltage refer to type WE6)	
(unload when breakaway, load when electrified) =B															Only DAW:	
Rotary knob =1															6E= With high performance directional spool valve	
Adjustable bolt with protective c =2															No code= Internal pilot oil drain	
Series L50 to L59 = L5X															Y = external pilot oil drain	
(L50 to L59 series : unchanged installation and connection dimensions)															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

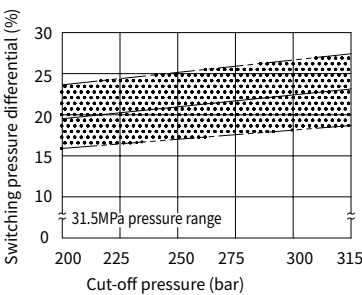
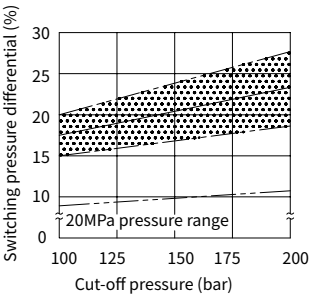
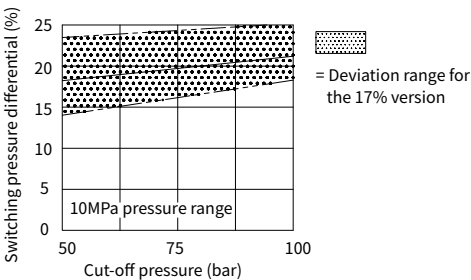
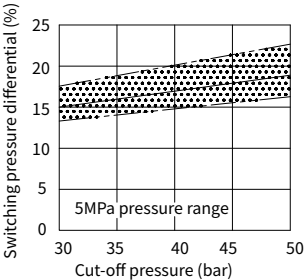
Size			10	25	32
Fluid			Mineral oil suitable for NBR and FKM seal		
			Phosphate ester for FKM seal		
Fluid temperature range		°C	-30 to +80 (NBR seal)		
			-20 to +80 (FKM seal)		
Viscosity range		mm ² /s	10 to 800		
Degree of contamination			Maximum permissible degree of fluid contamination: Class 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)		

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



These curves are valid for an outlet pressure (T) = 0bar over the full flow range.

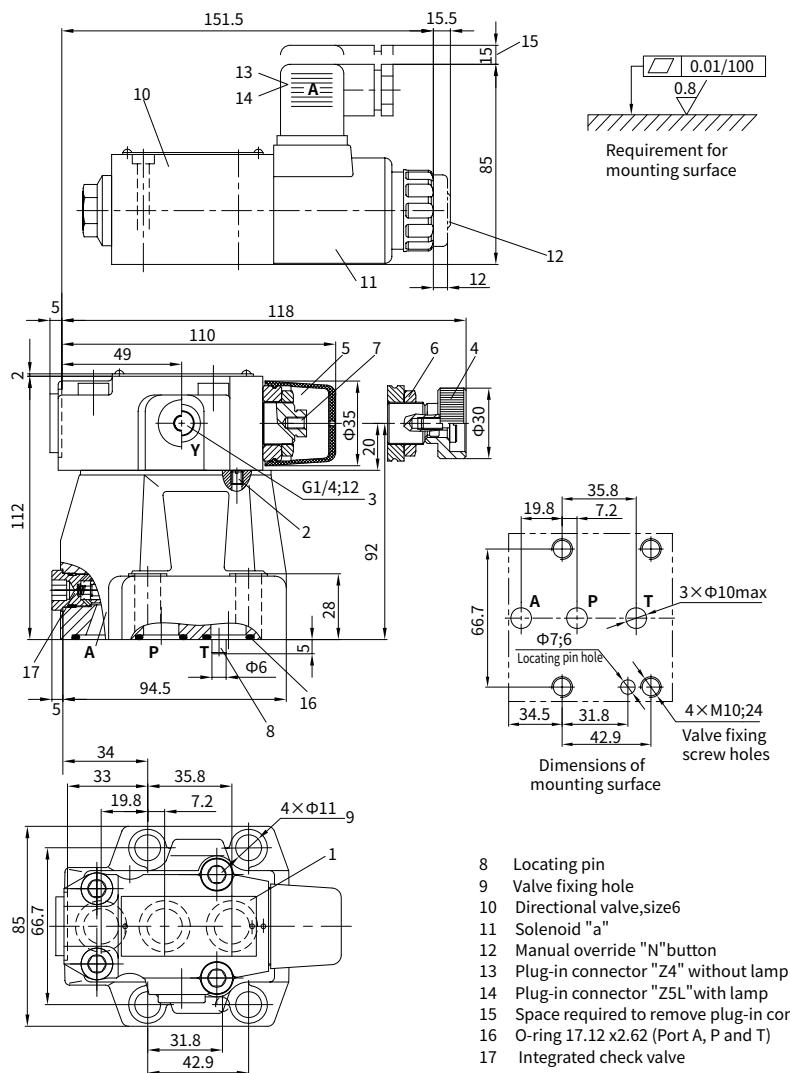
Switching pressure differential based on setting value (P → A)



Unit dimensions

(Dimensions in mm)

Size 10



- 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 screw S=10

- 8 Locating pin
- 9 Valve fixing hole
- 10 Directional valve, size 6
- 11 Solenoid "a"
- 12 Manual override "N" button
- 13 Plug-in connector "Z4" without lamp
- 14 Plug-in connector "Z5L" with lamp
- 15 Space required to remove plug-in connector
- 16 O-ring 17.12 x 2.62 (Port A, P and T)
- 17 Integrated check valve

Valve fixing screws:

Internal hexagon screw GB/T 70.1-M10×50-10.9,
Tightening torque $M_A = 75 \text{ Nm}$

**It must be ordered separately,
if connection plate is needed.**

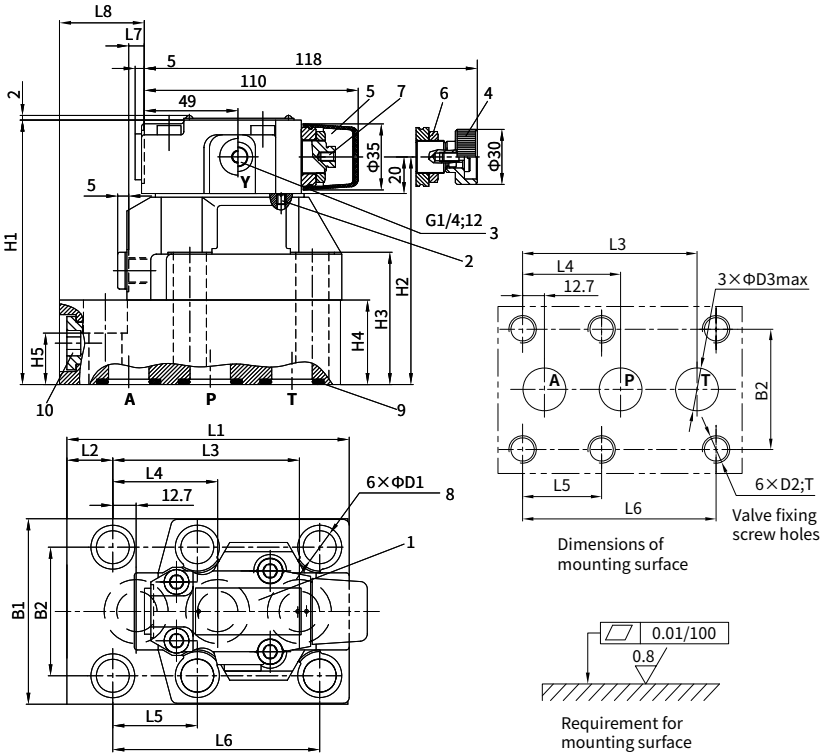
Type:

G 467/01 G 467/02 G 468/01 G 468/02

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.

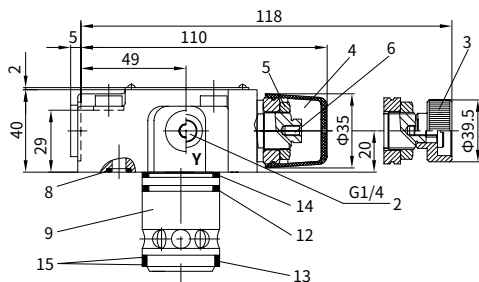
Valve fixing screws:
Size 25: 4pcs M16×100; 2pcs M16×60
Size 32: 4pcs M18×120; 2pcs M18×80
Internal hexagon screw GB/T 70.1-10.9,
Tightening torque $M_A=75\text{ Nm}$

**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

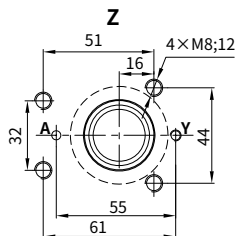
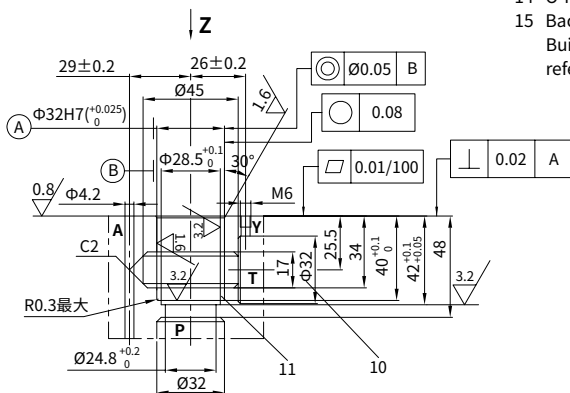
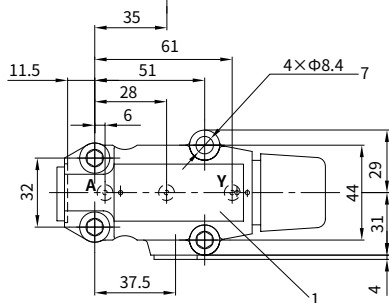
Size	L1	L2	L3	L4	L5	L6	L7	L8	H1	H2	H3	H4	H5	B1	B2	D1	D2	T	D3
25	153	25	101.6	57.1	46	112.7	10.5	48.2	144	124	72	46	28	100	70	18	M16	34	22
32	198	41	127	63.5	50.8	139.7	21	69.8	165	145	93	67	45	115	82.5	20	M18	37	30

Unit dimensions

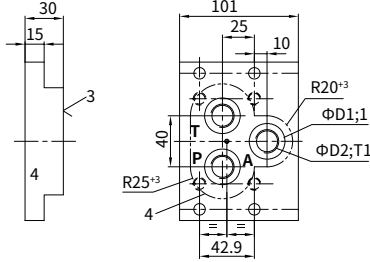
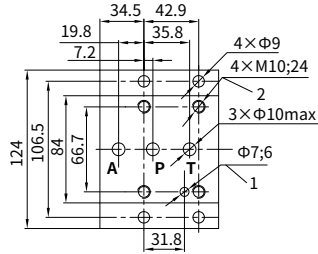
(Dimensions in mm)

Pilot with main spool (DAC30) or without main spool assembly (DAC)

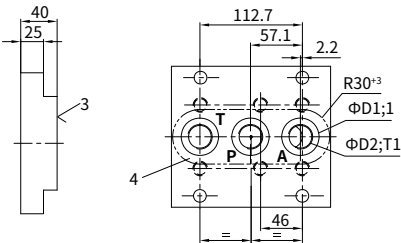
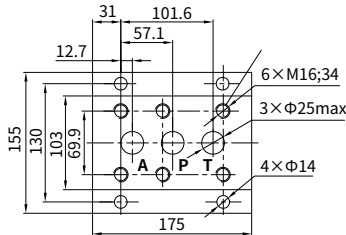
- 1 Nameplate
- 2 Port Y used for control oil external returning
- 3 Adjustment element "1"
- 4 Adjustment element "2"
- 5 Lockable Nut S=24
- 6 Internal hexagon bolt S=10
- 7 Space required to remove the key
- 8 O-ring 9.25×1.78 (Port A and T)
Valve fixing screws M8 $\times$ 40;
Internal hexagon bolt GB/T 70.1-10.9,
Tightening torque $M_k = 37$ Nm
- 9 Main spool
- 10 The $\varnothing 32$ hole can intersect the $\varnothing 45$
hole in any position. Care, however, must be
taken to ensure that the connection hole A
and the fixing screw holes are not damaged.
- 11 The back-up ring and O-ring are to
be fitted into this bore before the
main spool assembly is fitted.
- 12 O-ring 38×1.8
- 13 O-ring 27.3×2.4
- 14 O-ring 28×2.65
- 15 Back-up ring $28.4 \times 32 \times 0.8$
Built-on directional valve's size,
refer to Page 07/10.



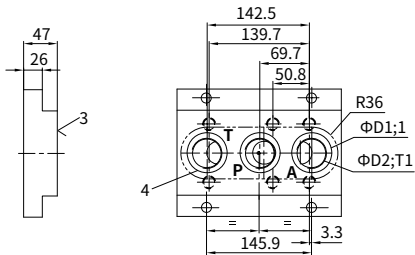
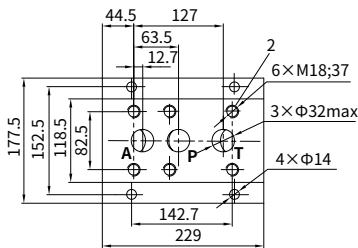
Sub-plate



Size	Type	D1	D2	T1	Valve fixing screw	Torque	Weight
10	G467/01	28	G3/8	12	Accessory: 4pcs M10×50 (GB/T70.1-10.9)	75Nm	2.0kg
	G467/02	28	M18×1.5	12			
	G468/01	34	G1/2	14			
	G468/02	34	M22×1.5	14			



Size	Type	D1	D2	T1	Valve fixing screw	Torque	Weight
25(20)	G469/01	42	G3/4	16	Accessory: 4pcs M16×100 (GB/T70.1-10.9) 2pcs M16×60 (GB/T70.1-10.9)	310Nm	6.4kg
	G469/02	42	M27×2	16			
	G470/01	47	G1	18			
	G470/02	47	M33×2	18			



Size	Type	D1	D2	T1	Valve fixing screw	Torque	Weight
32	G471/01	56	G11/4	20	Accessory: 4pcs M18×120 (GB/T70.1-10.9) 2pcs M18×80 (GB/T70.1-10.9)	430Nm	10.6kg
	G471/02	56	M42×2	20			
	G472/01	61	G11/2	22			
	G472/02	61	M48×2	22			

1 Locating pin hole 2 Valve fixing holes 3 Valve mounting surface 4 Valve panel cut-out

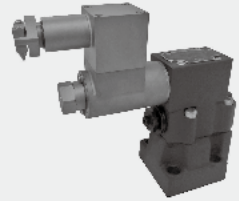


Explosion-proof pilot perated pressure relief valve

3.22

Type G...DBW

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



Contents

Function and configuration	02
Symbols	03
Technical data	03
Ordering code	04
Characteristic curves	05
Unit dimensions	06-08

Features

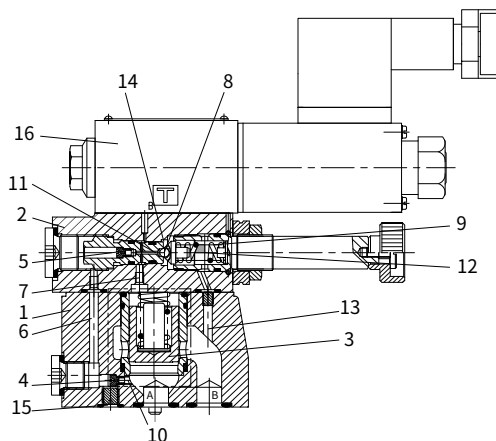
- For sub-plate mounting
- Porting pattern conforms to DIN 24 340 form E and ISO 6264
- For threaded connection and installation in manifolds
- 5 pressure ratings
- Unloading operation via a built-on solenoid directional valve
- 2 adjustment versions
 - Knob
 - Adjusting bolt with protective cap
- Optional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

Function and configuration

G...DBW type Explosion-proof operated relief valve is used for restricting and discharging system pressure. It mainly consists of main valve (1) with plug-in (3), pilot valve (2) with pressure regulating element and magnetic exchange valve (16).

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). About internal drain - type DBW..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 the setting operation pressure maintain invariable. The pressure relief valve may unload or shift the different pressure (second rated pressure value) in virtue of external control port X (15).

The basis 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).

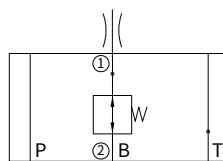
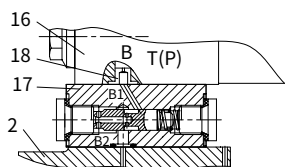


Pressure relief valves with switching shock damping (sandwich)

Type DBW../..S..R12

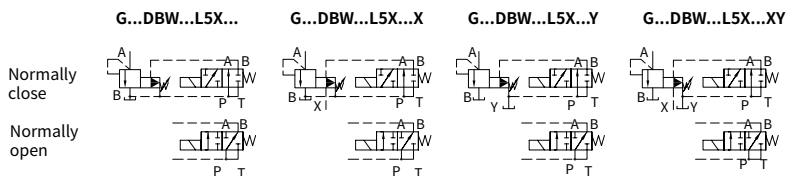
Due to switching shock damping (17), the connection from B2 to B1 opens delayed to avoid the impact of the peak pressure and decompression in the return line. It is fitted between pilot valve (2) and the directional valve (16).

The relief degree (decompression impact) is determined by the size of the orifice (18). Orifice $\varnothing 1.2\text{mm}$ is recommended. (ordering detail: ..R12 ..).



Indication: the directional valve is open

Symbols



Technical data

Fixing position			Optional				
Weight			G...DBW...10	G...DBW...15	G...DBW...20	G...DBW...25	G...DBW...30
	Sub-plate mounting	kg	Approx.5.6	-	Approx.6.5	-	Approx.7.9
	Threaded connection	kg	Approx.7.9	Approx.7.8	Approx.7.7	Approx.8.5	Approx.8.4
	Switching shock damping	kg	Approx.0.6				
Technical parameters of directional valve			See G...WE6 type Explosion-proof magnetic exchange valve, G...3WE6A9 is used as the normally closed type, G...3WE6B9 is used as the normally opened type.				
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: Class9. NAS 1638 or 20/18/15, ISO4406.				
Max.operating pressure	PortA, B, X, P	bar	350				
	PortY or T DBW	bar	210				
Max. back pressure		bar	50; 100; 200; 315; 350				
Min.		bar	Interrelated with Q (refer to the curve)				
Sizes			10	15	20	25	30
Max. flowrate	sub-plate mounting	L/min	250	-	500	-	650
	threaded connection	L/min	250	500	500	500	650

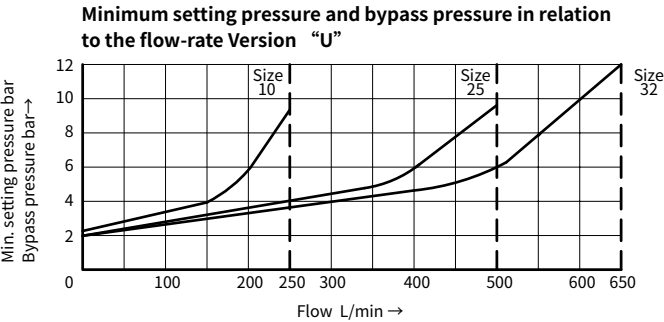
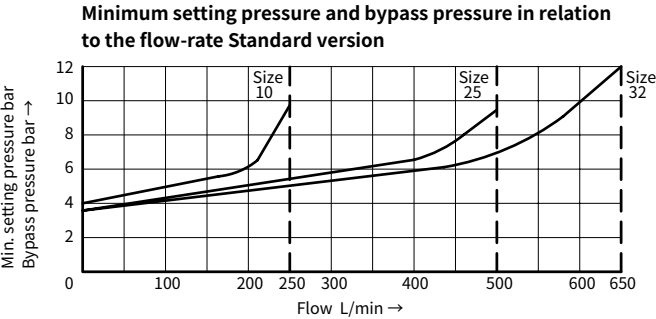
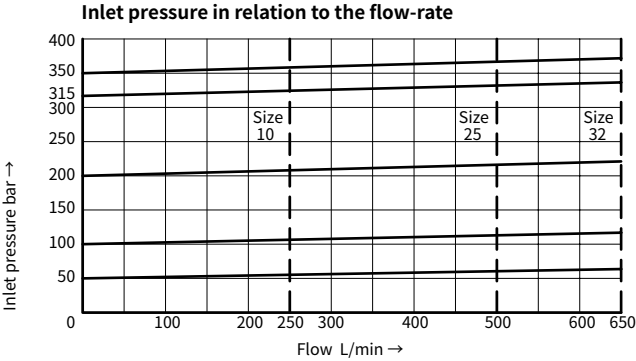
-DBW					-L5X/				- 6B2		/		*
------	--	--	--	--	-------	--	--	--	-------	--	---	--	---

35 = Pressure adjustable up to 350bar

0404

Characteristic curves (Measured at $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 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.

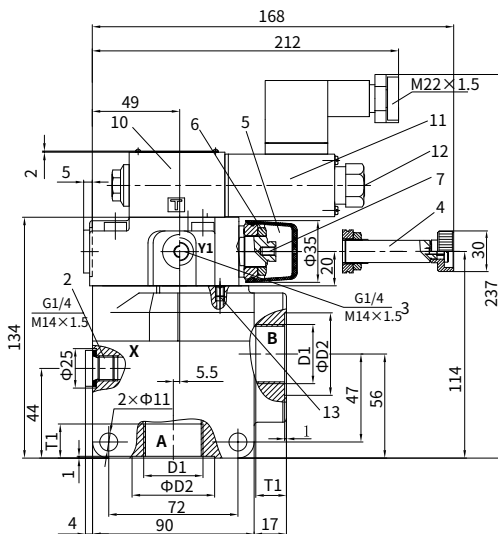


Unit dimensions

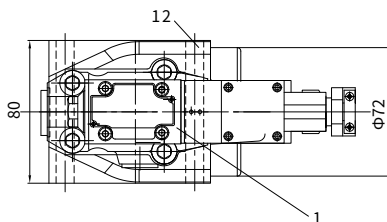
(Dimensions in mm)

Threaded connection

Type	D1	D2	T1
G...DBW 10 G	G1/2; M22×1.5	34	14
G...DBW 15 G	G3/4; M27×2	42	16
G...DBW 20 G	G1; M33×2	47	18
G...DBW 25 G	G1 1/4; M42×2	58	20
G...DBW 30 G	G1 1/2; M48×2	65	22



- 1 Nameplate
- 2 Port X for external pilot oil supply
- 3 Port Y for external pilot oil drain
- 4 Adjustment element "1"
- 5 Adjustment element "2"
- 6 Lockable nut S=24
- 7 Internal hexagon screw S=10
- 8 Locating pin
- 9 Valve fixing hole
- 10 Directional valve, size6
- 11 Solenoid "a"



Sub-plate(must be ordered separately):

G...DBW10: G 545/01(G 3/8), G 545/02 (M18×1.5)

G 546/01(G 1/2), G 546/02 (M22×1.5)

G...DBW20: G 408/01(G 3/4), G 408/02 (M27×2)

G 409/01(G1), G 409/02 (M33×2)

G...DBW30: G 410/01(G1 1/4), G 410/02 (M42×2)

G 411/01(G1 1/2), G 411/02 (M48×2)

China +86 400 101 8889	America +01 630 995 3674
Germany +49 172 3683463	Japan +81 03 6809 1696



© This brochure can be reproduced, edited, reproduced or transmitted electronically without the authorization of Hengli Hydraulic Company. Due to the continuous development of the product, the information in this brochure is not specific to the specific conditions or applicability of the industry, thus, Hengli does not take any responsibility for any incomplete or inaccurate description.