Hengli®

3.17

Pressure Reducing Valve Direct Operated

Type ZDR6D...30

Size 6
up to 210 bar
up to 30L/min

Contents

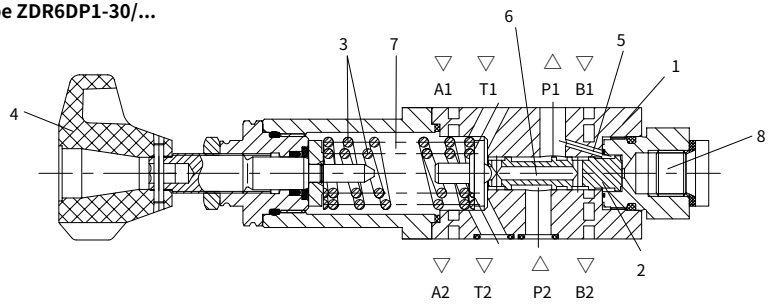
Features

-Sandwich plate structure
-Porting pattern to DIN 24 340 form A, and ISO 4401
-4 pressure ratings
-3 adjustment elements
・Rotary knob
・Adjustable bolt with protective cap
・Lockable rotary knob
-Pressure gauge connection
-Check valve optional

Function and configuration

Pressure reducing valves type ZDR 6 D.. 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.
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 through the 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 tank through the 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 the 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.

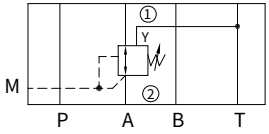
Type ZDR6DP1-30/...



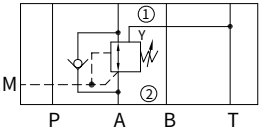
Note: Because there is internal leakage, when sandwich plate pressure reducing valve is used in pairs with sandwich pilot operated check valve , pressure reducing valve must be fixed between the check valve and directional control valve.

Symbols (① =valve side ② = sub-plate side)

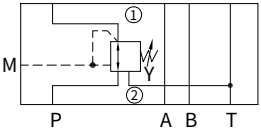
Type ZDR6DA ...30/...YM



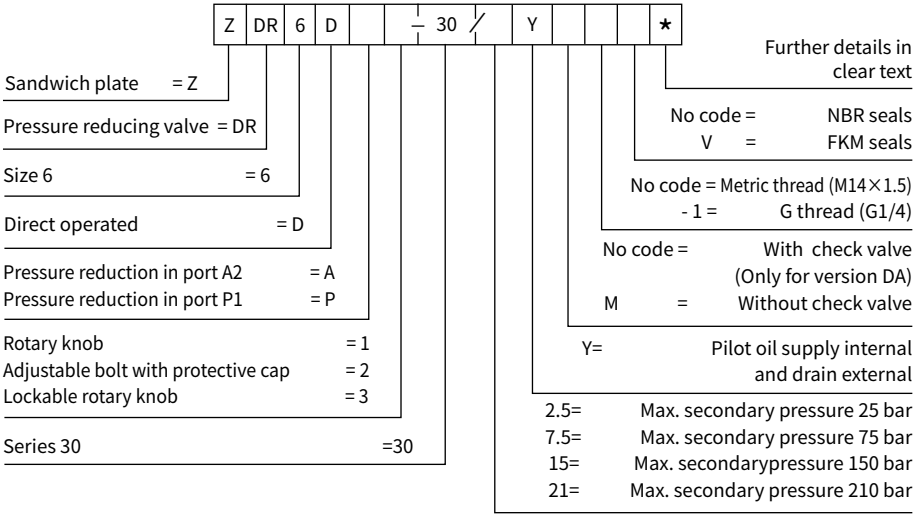
Type ZDR6DA...30/...Y



Type ZDR6DP...30/...YM



Ordering code

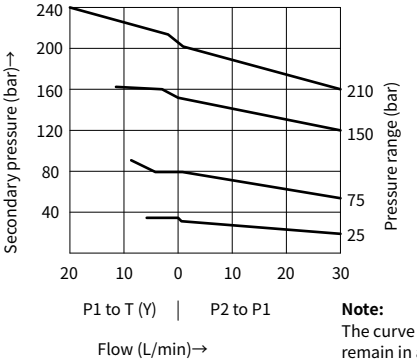


Technical data

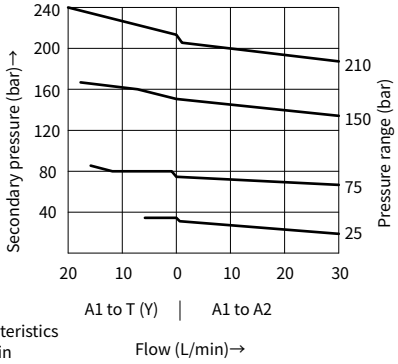
Fluid		Mineral oil suitable for NBR and FKM seal
		Phosphate ester for FKM seal
Fluid temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406
Max.operating pressure (inlet)	bar	315
Max.secondary pressure (output)	bar	25; 75; 150; 210
Back pressure	bar	60
Max. flow-rate	L/min	30
Weight	Kg	Approx. 1.2

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

Type ZDR6DP ...30/...

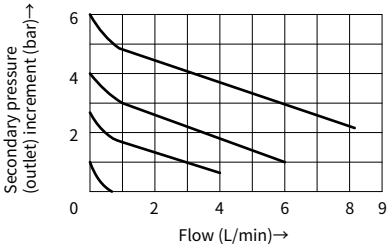


Type ZDR6DA...30/...

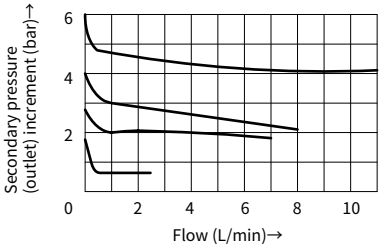


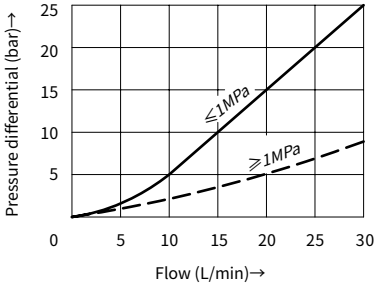
Note:
The curve characteristics remain in a certain pressure range with a low setting pressure.

Type ZDR6DP ...30/...



Type ZDR6DA...30/...

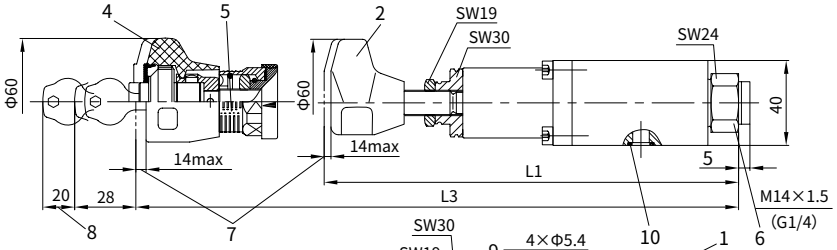


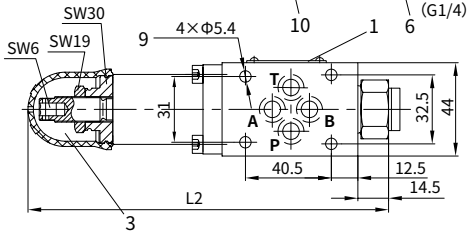


Example:
If the pressure of port A2 or P1 is setting to 30bar under the flow of 10L/min, when the secondary pressure increases to 36 bar, the flow-rate reduces and trends to zero.

Unit dimensions

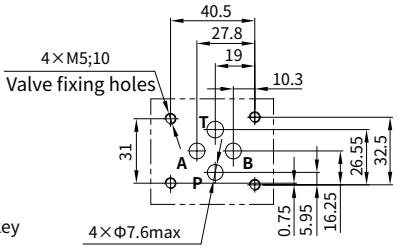
(Dimensions in mm)



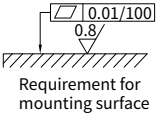


Valve fixing screws:
M5 internal hexagon screw or LT 30.02 double-screw bolt added LT 30.01 nut GB/T 70.1-10.9, the length according to sandwich, tightening torque M_A = 8.9 Nm must be ordered separately.

1 Name plate
2 Adjustment element "1"
3 Adjustment element "2"
4 Adjustment element "3"
5 Sleeve with scale
6 Pressure gauge connection M14×1.5 (G1/4), 12 deep
7 Adjustable stroke
8 Space required to move out the key
9 Valve fixing holes
10 O-rings 9.25×1.78 (Port A,B,P and T)



Dimensions of mounting surface



Type	Max.L1	L2	Max.L3
DA	208	182	203
DP	196	170	191

China
+86 400 101 8889

America
+01 630 995 3674

Germany
+49 172 3683463

Japan
+81 03 6809 1696

Hengli®

3.18

Pressure Reducing Valve Direct Operated

Type ZDR6D...L4X

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

Contents

Features

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

Function and configuration

Pressure reducing valves type ZDR 6 D.. are 3-way direct operated, sandwich plate design with a pressure reducing function on the secondary side. It is used to reduce the system pressure. The pressure reducing valve basically consists of the housing (1), the control spool (2), two compression springs (3) and the adjustment element (4) as well as with an optional check valve.

Model DA:

At static state, the valve is normally open, and fluid can flow freely from port P2 to port P1 (version "DP") or from port A1 to port A2(version "DA"). Pressure in port P1 acts at the spool area via control line (5) and is balanced with the setting value of the compression spring (3).

When the pressure in port P1 exceeds the setting value of the spring (3), the control spool (2) moves further towards the compression spring (3), the opening aperture at port P is getting smaller until fluid at port P1 flows back to the tank through the orifice (6) of the control spool (2) to prevent any further rise in pressure. The leakage oil in spring chamber(7) is always drained to tank through port T (Y).

A check valve can be fitted optionally in version "DA" for free flow from ports A2 to ports A1 .

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

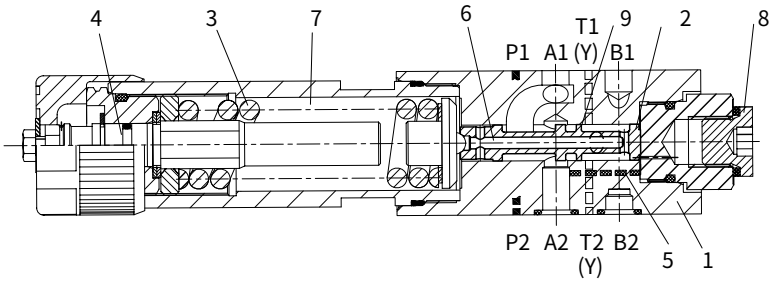
In model DA, one-way valve can only be mounted with the oil port from A2 to A1 to make the flow passage smooth.

Model DP and DB:

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

In model DB, oil port P1 is pressure reduced; but control oil is from oil port B.

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



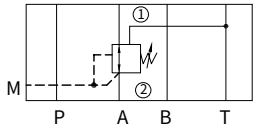
Note:

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

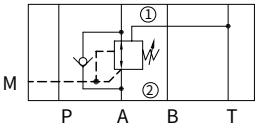
2. For internal leakage, superposition relief value for in pair with superposition (hydraulic controlled) one-way valve shall be installed between the superposition (hydraulic control) one-way valve and the directional change valve.

Symbols

Type:ZDR6DA...L4X/..YM



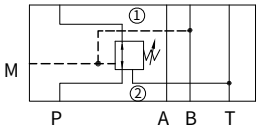
Type:ZDR6DA...L4X/..Y



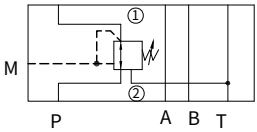
① =valve side;

② =bottom plate side

Type:ZDR6DB...L4X/..YM



Type:ZDR6DP...L4X/..YM



03

Ordering code

Z	DR	6	D		– L4X /	Y				★

Superposition structure =Z

Relief valve = DR

Diameter6 = 6

Direct-acting type = D

Oil port A2 pressure relieved = A
Oil port B2 pressure relieved = B
Oil port P1 pressure relieved = P

Knob =1
Adjusting bolt with protective cover =2
Knob with lock =3

Series L40 toL49 =L4X
(L40 to L49: unchanged installation and connection dimensions)

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

Y= Control oil supplied from inside and drained to the outside

M = Without one-way valve

No mark = With one-way valve (just for model DA)

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

No code = NBR seals
V = FKM seals

Further details in clear text

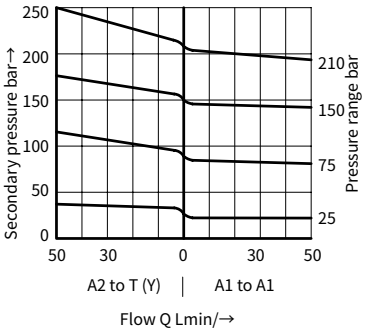
Technical data

Fluid		Mineral oil suitable for NBR and FKM seal
		Phosphate ester for FKM seal
Fluid temperature range	℃	-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	About1.2

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

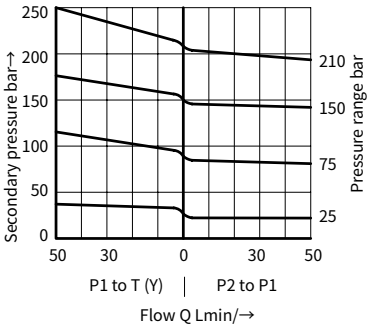
Type ZDR6DA

p_A-q_v Characteristic curves



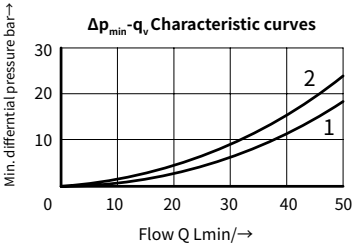
Type ZDR6DP and ZDR6DB

p_A-q_v Characteristic curves

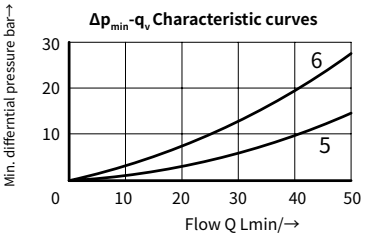


Note: if the set pressure is low, the performance curve is within the corresponding pressure level range.

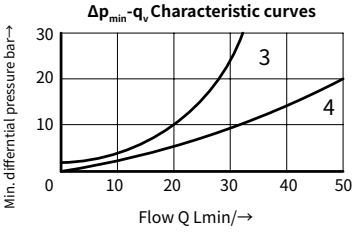
Δp_{min}-q_v Characteristic curves



Δp_{min}-q_v Characteristic curves



Δp_{min}-q_v Characteristic curves

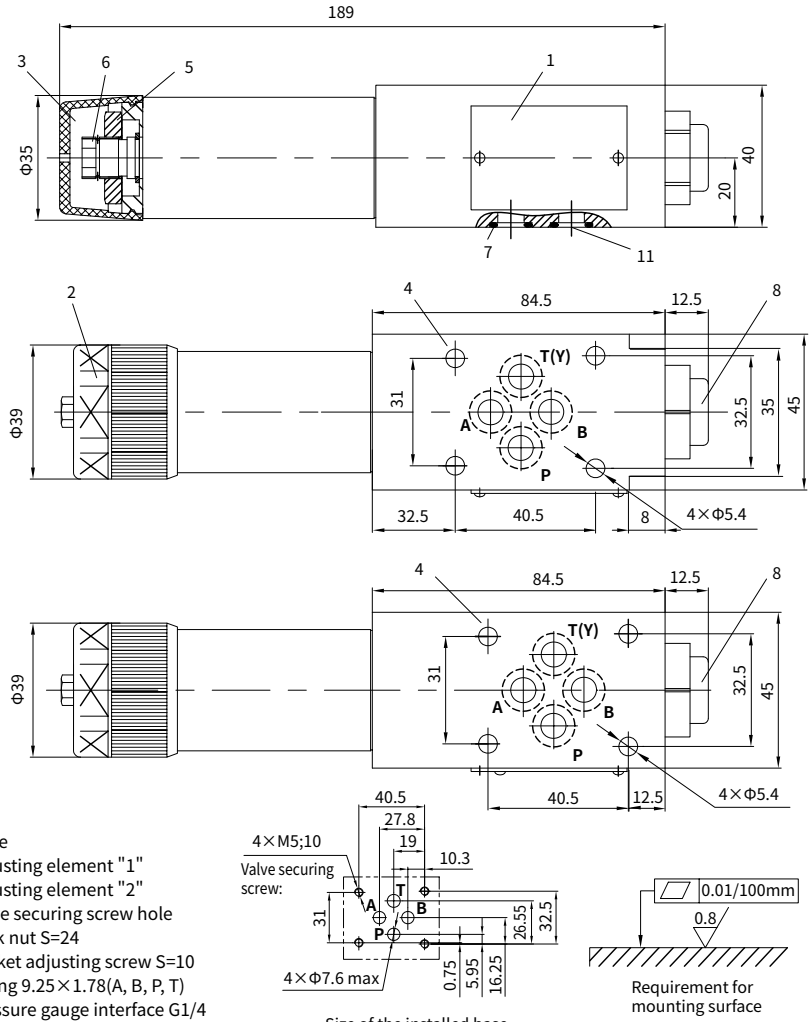


1 A1 to A2
2 A2 to T(Y) (the third flow route)
3 Flow from A2 to A1 just goes through one-way valve.
4 Flow from A2 to A1 just goes through one-way valve and fully-open main valve.
5 P2 to P1
6 P1 to T(Y) (the third flow route)

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

Unit dimensions

(Dimensions in mm)



Size of the installed base

1 Plate
2 Adjusting element "1"
3 Adjusting element "2"
4 Valve securing screw hole
5 Lock nut S=24
6 Socket adjusting screw S=10
7 O-ring 9.25×1.78(A, B, P, T)
8 Pressure gauge interface G1/4 or M14×1.5; in depth12, Hex wrench S=6

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 Nm, must be ordered separately.

China
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America
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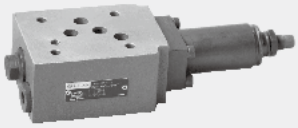
Hengli®

3.19

Pressure reducing valve direct operated

Type ZDR10D...40

Size 10
up to 210 bar
up to 50 L/min



Contents

Features

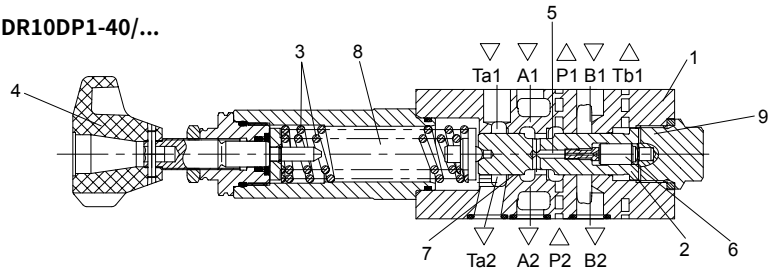
- Sandwich plate structure
- Porting pattern to DIN 24 340, form A and ISO 4401
- 4 pressure ratings
- 3 adjustment elements:
  • Rotary knob
  • Adjustable bolt with protective cap
  • Lockable rotary knob
- Pressure gauge fitting
- Check valve, optional

Function and configuration

Pressure reducing valves type ZDR10D.. are 3-way direct operated pressure reducing valves of sandwich plate design with a pressure reducing function on the secondary side. It is used to reduce the system pressure. The pressure reducing basically consists of the housing (1), the control spool (2), one or two compression spring (3) and the adjustment element (4) as well as with an optional check valve.
At static state, the valve is normally open, fluid can flow free from port P2 to port P1 (version "DP") or port A1 to port A2 (version "DA"). Pressure in port P1 acts at the spool area (6) via control line (5) and is balanced with the setting value of the compression spring. 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 tank via the control land (7) to prevent any further rise in pressure. The leakage oil in spring chamber (8) is always drained to tank via port T.
A check valve can be fitted optionally in version "DA" for free flow from ports A2 to ports A1 .
A pressure gauge connection (9) permits the secondary pressure to be monitored.

03

Type ZDR10DP1-40/...



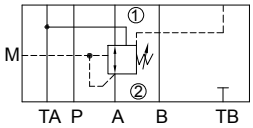
Note:

1. Because there is internal leakage, when sandwich plate pressure reducing valve is used in pairs with sandwich pilot operated check valve, pressure reducing valve must be fixed between the check valve and directional control valve.

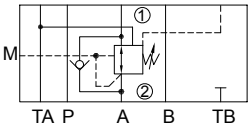
2. As for ZDR10DP and ZDR10DA, leakage oil from port TB1 flows via the built-up valve to port TA2, so manifold(plate) must have a port TA, while for ZDR10D, leakage oil from port TA1 flows via the built-up valve to port TB2, so manifold(plate) must have a port TB.

Symbols

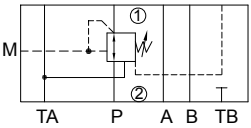
Type ZDR10DA-40/...YM



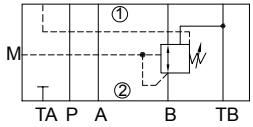
Type ZDR10DA-40/...Y



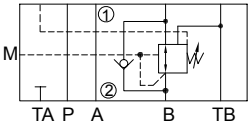
Type ZDR10DP-40/...YM



Type ZDR10DB-40/...YM



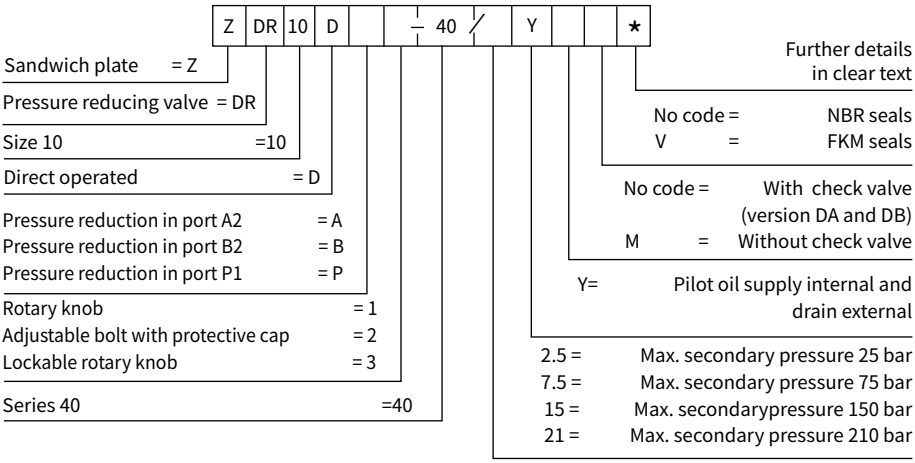
Type ZDR10DB-40/...Y



① =valve side

② = sub-plate side

Ordering code

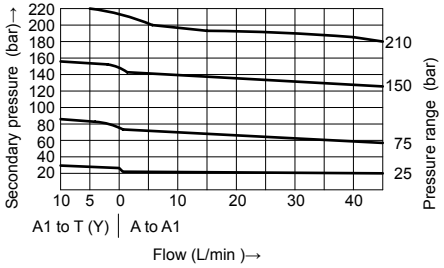


Technical data

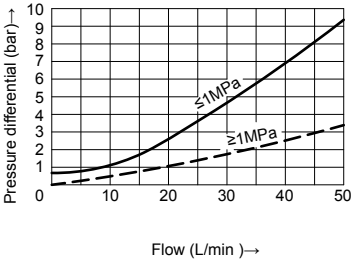
Fluid		Mineral oil suitable for NBR and FKM seal
		Phosphate ester for FKM seal
Fluid temperature range	°C	-30 to +80 (NBR seal)
		-20 to +80 (FKM seal)
Viscosity range	mm^2/s	10 to 800
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15 , ISO4406
Max.operating pressure (inlet)	bar	315
Max.secondary pressure (output)	bar	25;75;150;210
Back pressure	bar	150
Max. flow-rate	L/min	50
Weight	Kg	Approx. 2.8

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

P_A-Q characteristic curve

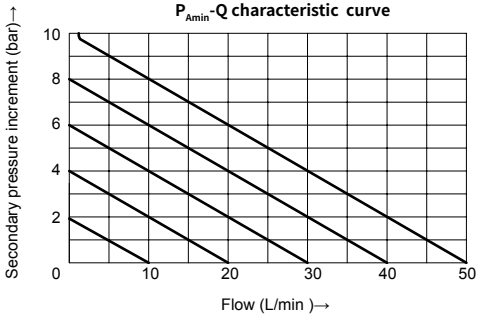


P-Q characteristic curve via the check valve



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

P_{Amin}-Q characteristic curve



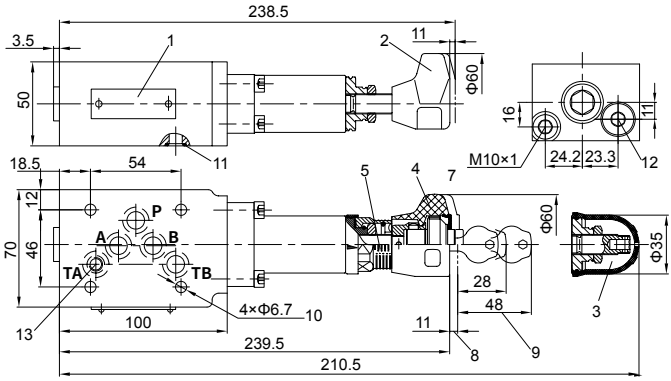
25 bar PA min-Q characteristic curve shows the flow from A1 to A2 in relation to the adjustable min. setting pressure from P2 to P1.

Example:
If the pressure of port A2 or P1 is setting to 30bar under the flow of 10L/min, when the secondary pressure increases to 34 bar, the flow-rate reduces and trends to zero.

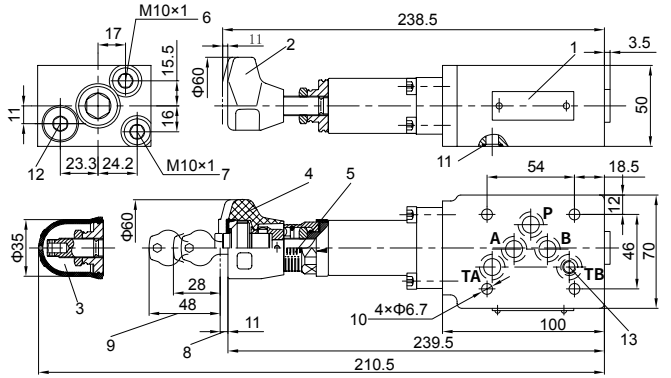
Unit dimensions

(Dimensions in mm)

·Type ZDR10DB

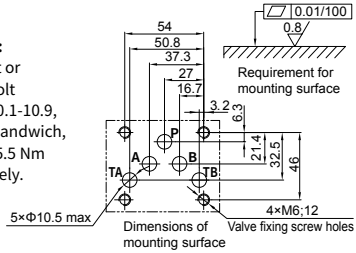


·Type: ZDR10DA or ZDR10DP



1 Name plate
2 Adjustment element "1"
3 Adjustment element "2"
4 Adjustment element "3"
5 Sleeve with scale
6 Pressure gauge connection for version DP M10 x1, 12 deep
7 Pressure gauge connection for version DA M10 x1, 12 deep
8 Adjustable stroke
9 Space required to move out the key
10 Valve mounting holes
11 O-rings 12×2 (Port A,B,P,TA,TB)
12 Check valve optional for version DA
13 This hole(hole TB for version DA, TA for version DB)is plugged when it is version ZDR10...40/2.5, and works as drain port when the version are ZDR10...40/7.5, ZDR10...40/15 and ZDR10...40/ 21, however, this hole don't interconnect to the side with O-rings.
When this hole is used as a return oil port, a hole (Ø5) must be drilled from the opposite side(with O-rings) as a drain port.(ZDR10...40/2.5 is prohibited) Suggestion for selecting port TA and TB on.

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 Nm must be ordered separately.



Manifold (plate) :
ZDR10DP and ZDR10DA use port TA as drain port, while ZDR10DB use port TB.

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3.20

Pressure reducing valve direct operated

Type ZDR10D...L5X

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

Contents

Features

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

Function and configuration

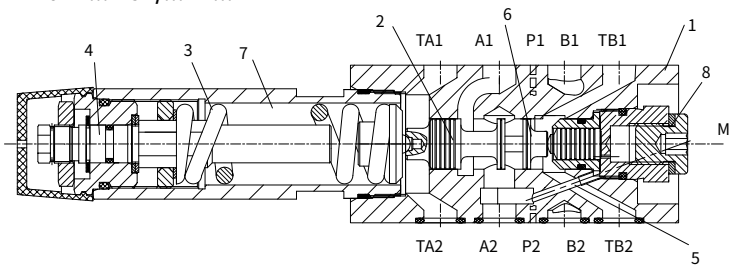
The pressure reducing valve type ZDR 10 D.. is a 3-way direct operated valve of sandwich plate design with a pressure relief function on the secondary side. It is used to reduce the system pressure.
The pressure reducing valve basically consists of the housing (1), the control spool (2), a compression 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 inpressure.
The spring chamber (7) is always drained to tank externally via port TA .
A pressure gauge connection (8) permitts 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".

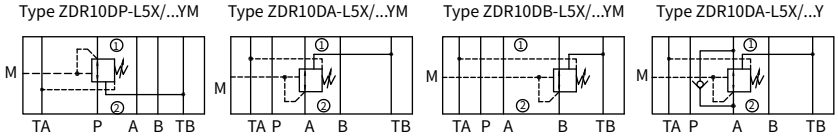
Models "DP" and "DB"
In model "DP", the pressure is reduced in port P1. The control pressure and the pilot oil is taken internally from port P1. In model "DB", the pressure in port P1 is reduced, and the pilot oil taken from port B.

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).

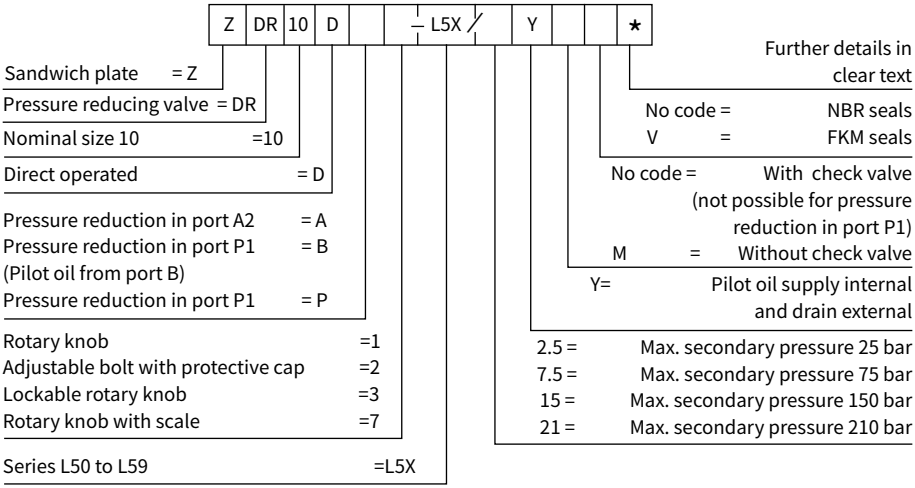
Type ZDR10DA...-L5X/...YM...



Symbols



Ordering code



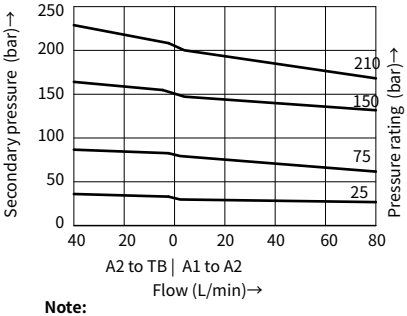
Technical data

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 ϑ_{oil} =40°C ±5°C , using HLP46)

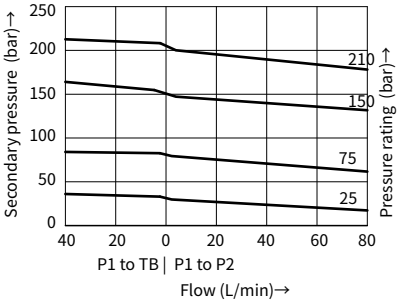
Type ZDR 10 DA..–L5X/...

p_A-q_V characteristic curves



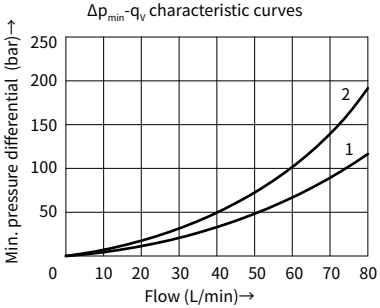
Type ZDR 10 DP..–L5X/... and
Type ZDR 10 DB..–L5X/...

p_A-q_V characteristic curves

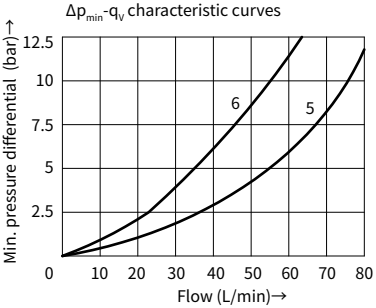


Note:
The curve characteristics remain, with low set pressures, the same in relation to the pressure rating.

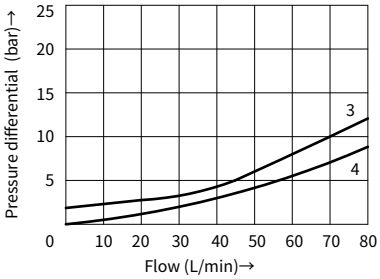
Δp_{min}-q_V characteristic curves



Δp_{min}-q_V characteristic curves



Δp-q_V characteristic curves

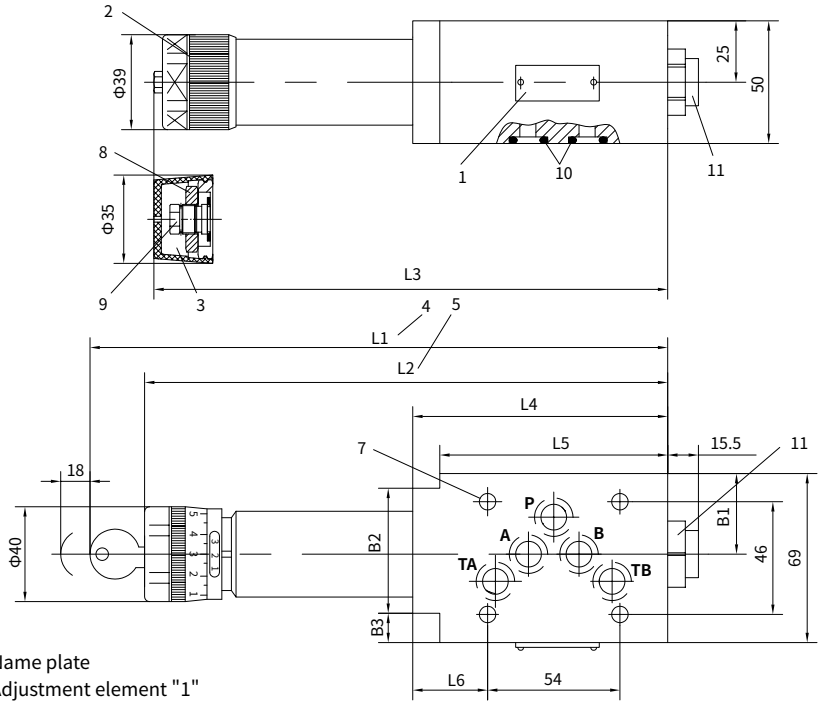


1 A1 to A2
2 A2 to TB (3rd. flow path)
3 A2 to A1 flow via check valve only
4 A2 to A1 flow via check valveand fully open controlcross section
5 P2 to P1
6 P1 to TB (3rd. flow path)

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

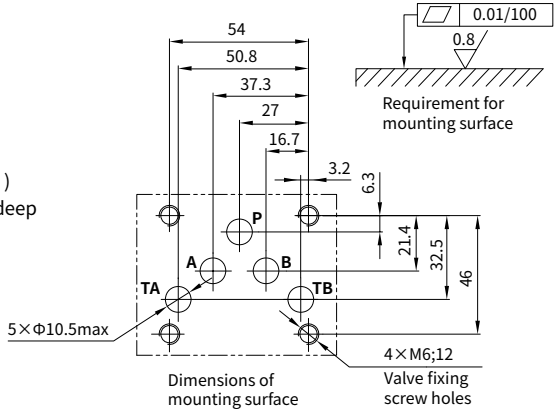
Unit dimensions

(Dimensions in mm)



1 Name plate
2 Adjustment element "1"
3 Adjustment element "2"
4 Adjustment element "3"
5 Adjustment element "7"
6 Space required to remove key
7 Valve mounting screw holes
8 Lock nut 24 A/F
9 Hexagon 10 A/F
10 O-rings 12×2 (Port A,B,P,TA,TB)
11 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 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	-	-

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