

The Drive & Control Company

**Rexroth**  
Bosch Group

Pressure reducing valve,  
direct operated

Type ZDR

**RE 26570**

Edition: 2018-03

Replaces: 2018-02



- ▶ Size 6
- ▶ Component series 4X
- ▶ Maximum operating pressure 350 bar
- ▶ Maximum flow 50 l/min

## Features

- ▶ Sandwich plate valve
- ▶ Porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole)
- ▶ 4 pressure ratings
- ▶ 4 adjustment types, optionally:
  - Rotary knob
  - Bushing with hexagon and protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- ▶ Pressure reduction in channel A, B or channel P
- ▶ Check valve, optional (version "A" only)
- ▶ Corrosion-protected design

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2/10 ZDR | Pressure reducing valve

## Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Z	DR	6	D			-	4X	/		Y			*

01	Sandwich plate valve	Z
02	Pressure reducing valve	DR
03	Size 6	6
04	Direct operated	D
05	Pressure reduction in channel A②	A
	Pressure reduction in channel B②	B
	Pressure reduction in channel P①	P

## Adjustment type

06	Rotary knob	1
	Sleeve with hexagon and protective cap ("J3" version without protective cap)	2
	Lockable rotary knob with scale	3 <sup>1)</sup>
	Rotary knob with scale	7
07	Component series 40 ... 49 (40 ... 49: unchanged installation and mounting dimensions)	4X
08	Secondary pressure up to 25 bar	25
	Secondary pressure up to 75 bar	75
	Secondary pressure up to 150 bar	150
	Secondary pressure up to 210 bar	210
	Secondary pressure up to 315 bar (only version "B", "P", and "2")	315
09	Pilot oil supply internal, pilot oil return external	Y
10	With check valve (only version "A")	no code
	Without check valve	M

## Corrosion resistance

11	None	no code
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227); (only version "2")	J3

## Seal material

12	NBR seals	no code
	FKM seals	V
	Observe compatibility of seals with hydraulic fluid used.	
13	Without locating hole	no code
	With locating hole	/60 <sup>2)</sup>
	With locating hole and locking pin ISO 8752-3x8-St	/62
14	Further details in the plain text	

- <sup>1)</sup> H-key with material no. **R900008158** is included in the scope of delivery.
- <sup>2)</sup> Locking pin ISO 8752-3x8-St, material no. **R900005694** (separate order)

### Notes:

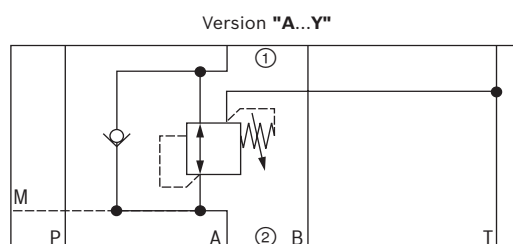
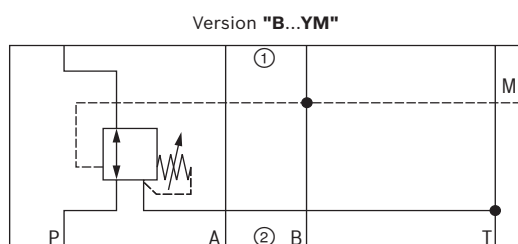
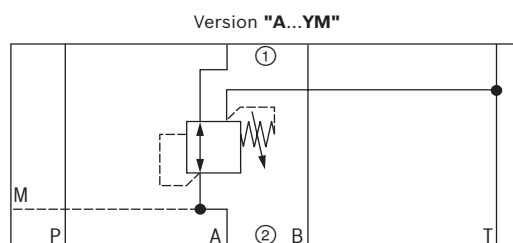
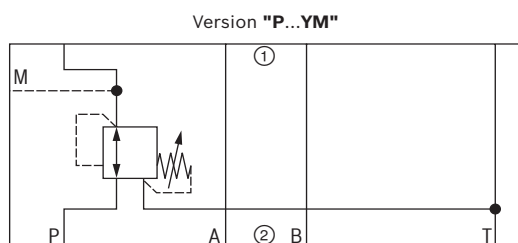
- For valve types for use in potentially explosive areas, refer to data sheet 07011.
- Preferred types and standard units are contained in the EPS (standard price list).

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**Symbols** (① = component side, ② = plate side)



## Function, section

The valve type ZDR is a direct operated pressure reducing valve in sandwich plate design with pressure limitation of the secondary circuit. It is used to reduce the system pressure.

The pressure reducing valve basically comprises housing (1), control spool (2), compression spring (3), adjustment type (4) and an optional check valve.

The secondary pressure is set via the adjustment type (4).

### Version "A"

The valve is open in initial position. Hydraulic fluid can flow from channel A① to channel A② without restrictions. The pressure in channel A② is simultaneously applied via the control line (5) at the piston area opposite the compression spring (3). If the pressure in channel A② exceeds the value set at the compression spring (3), the control spool (2) is pushed against the compression spring (3) to control position and keeps the set pressure in channel A② at a constant level.

Control signal and pilot oil are supplied internally via the control line (5) from channel A②.

If the pressure in channel A② increases further due to an external force effect at the actuator, it pushes the control spool (2) even further against the compression spring (3).

In this way, channel A② is connected to the tank via the control edge (9) at the control spool (2) and the housing (1). So much hydraulic fluid is discharged into the tank that the pressure does not increase any further.

The leakage oil drain from the spring chamber (7) is always effected externally via the bore (6) and channel T (Y).

A pressure gauge connection (8) allows for the control of the secondary pressure at the valve.

A check valve can be used for free flow back from channel A② to A① with version "A".

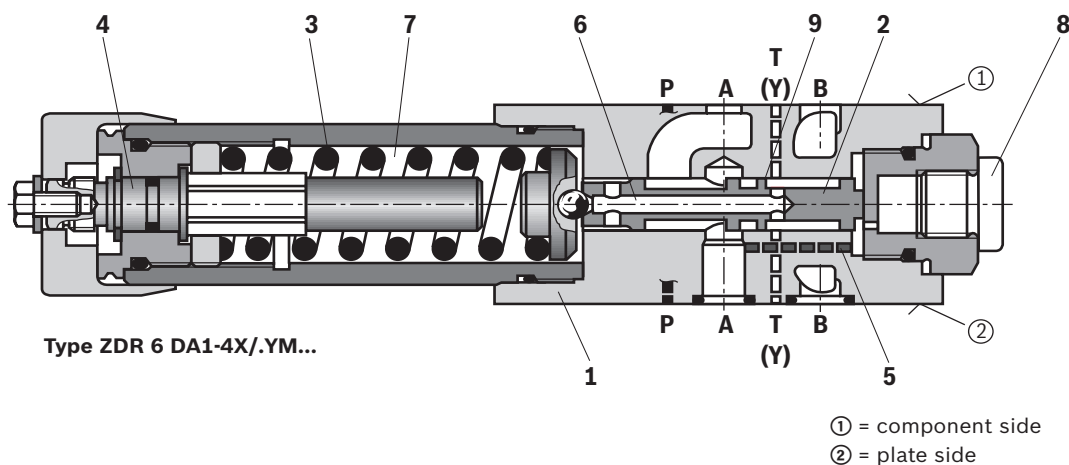
### Versions "P" and "B"

With version "P", the pressure reduction is effected in channel P①. Control signal and pilot oil are supplied internally from channel P①.

With version "B", the pressure is reduced in channel P①; but the pilot oil is extracted from channel B.

#### Notice:

If the directional valve is in spool position P to A, the pressure in channel B may not exceed the set secondary pressure. Otherwise, there is pressure reduction in channel A.



## Technical data

(For applications outside these parameters, please consult us!)

general		
Weight	kg	ca. 1.2
Installation position		any
Ambient temperature range	°C	–30 ... +80 (NBR seals) –20 ... +80 (FKM seals)
MTTF <sub>d</sub> values according to EN ISO 13849	Years	150 ... 1200 (for more information see data sheet 08012)

hydraulic		
Maximum operating pressure	► Input	
	– Versions „B“, „P“	bar 350
	– Versions „A“	bar 315
Maximum secondary pressure	► Output	bar 25; 75; 150; 210; 315 <sup>1)</sup>
Maximum counter pressure	► Port T(Y)	bar 160
Maximum flow		l/min 50
Hydraulic fluid		see table below
Hydraulic fluid temperature range	°C	–30 ... +80 (NBR seals) –20 ... +80 (FKM seals)
Viscosity range	mm <sup>2</sup> /s	10 ... 800
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)		Class 20/18/15 <sup>2)</sup>

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP, HLPD	NBR, FKM	DIN 51524	90220
Bio-degradable <sup>3)</sup>	► Insoluble in water	HETG	ISO 15380	90221
		HEES		
	► Soluble in water	HEPG	ISO 15380	
Flame-resistant	► Water-free	HFDU (glycol base)	ISO 12922	90222
		HFDU (ester base) <sup>3)</sup>		
		HFDR <sup>3)</sup>		
	► Containing water <sup>3)</sup>	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	ISO 12922	90223



### Important information on hydraulic fluids:

- For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.

### ► Flame-resistant – containing water:

- Maximum pressure differential 210 bar, otherwise, increased cavitation erosion
- Life cycle as compared to operation with mineral oil HL, HLP 30 ... 100%
- Maximum hydraulic fluid temperature 60 °C

<sup>1)</sup> Only with version „B“ and „P“

<sup>2)</sup> The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.

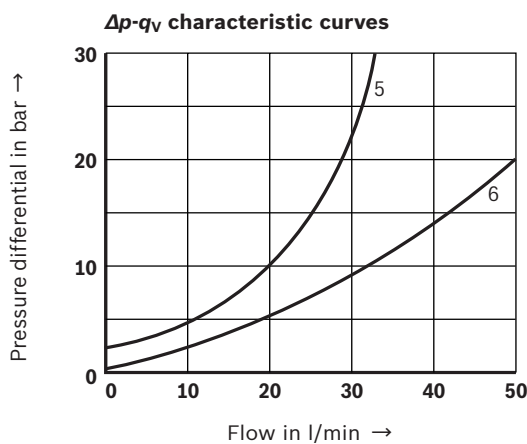
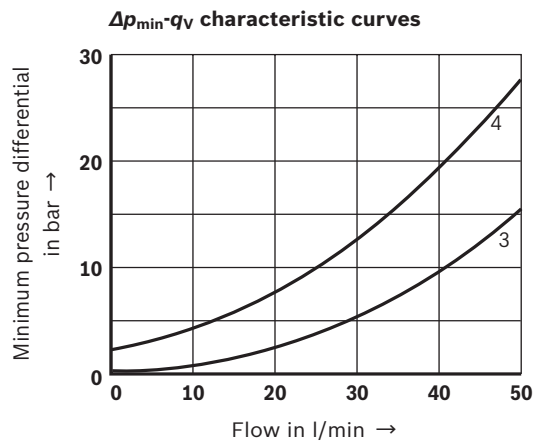
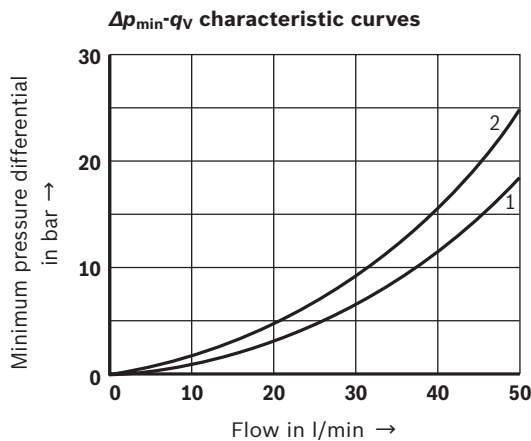
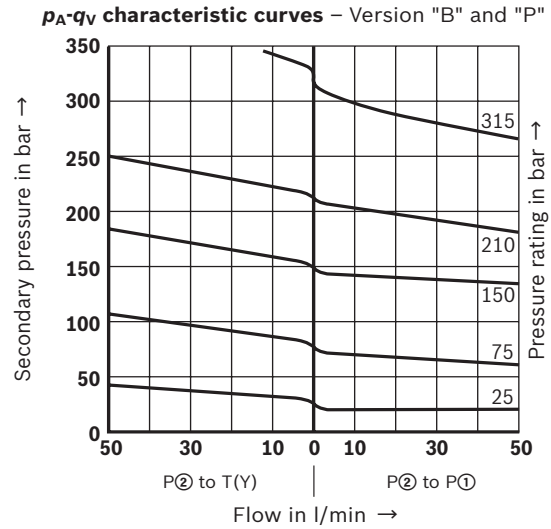
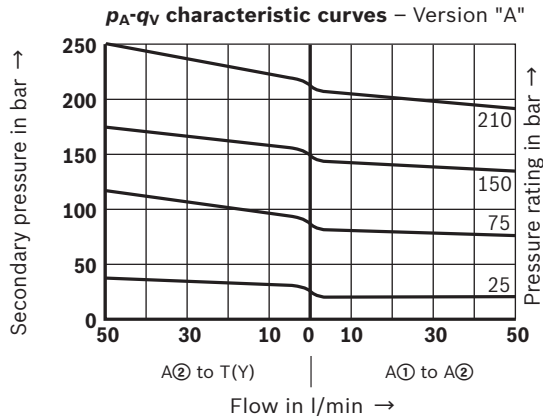
For the selection of filters, see [www.boschrexroth.com/filter](http://www.boschrexroth.com/filter).

<sup>3)</sup> In connection with the corrosion-protected version "J3", small amounts of dissolved zinc may get into the hydraulic system.

6/10 ZDR | Pressure reducing valve

## Characteristic curves

(measured with HLP46,  $\vartheta_{oil} = 40 \pm 5 \text{ }^{\circ}\text{C}$ )



- 1 A1 to A2
- 2 A2 to T(Y) (3rd path)
- 3 P2 to P1
- 4 P1 to T(Y) (3rd path)
- 5 A2 to A1; flow only via check valve
- 6 A2 to A1; flow via check valve and fully opened control cross-section

### Notes:

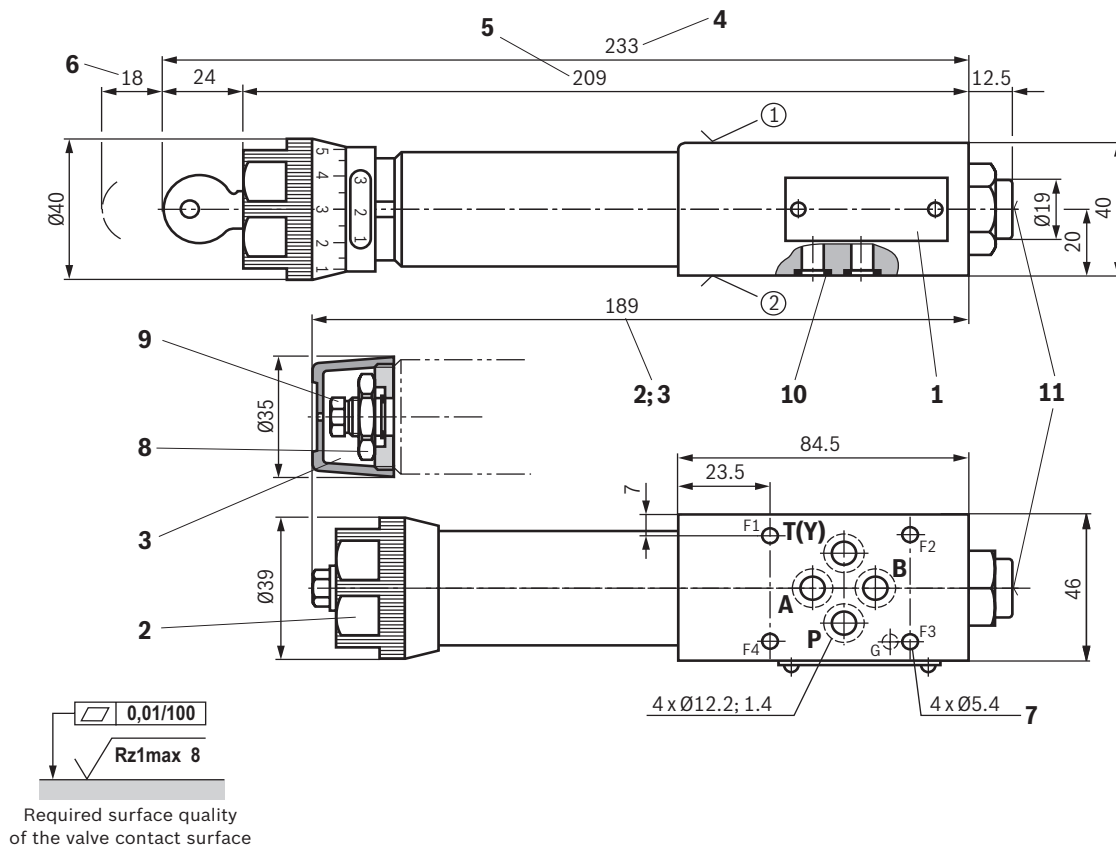
- The curve development is maintained if the pressure is set lower according to the pressure rating.
- The characteristic curves apply to the pressure at the valve output  $p_T = 0 \text{ bar}$  across the entire flow range.

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**Dimensions:** Version "B" and "P"  
(dimensions in mm)



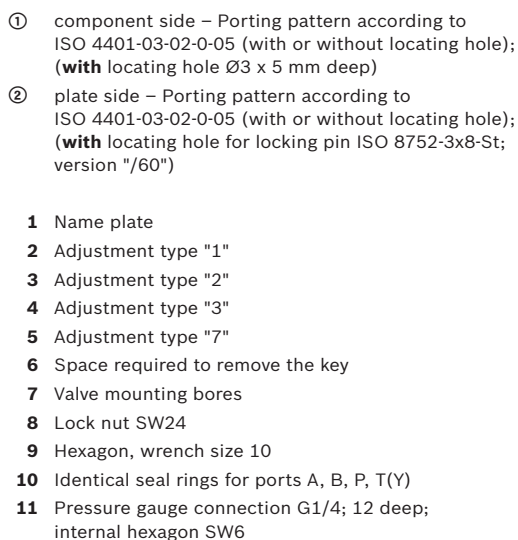
- ① component side – Porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole); **(with)** locating hole Ø3 x 5 mm deep)
- ② plate side – Porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole); **(with)** locating hole for locking pin ISO 8752-3x8-St; version "/60")

- 1 Name plate
- 2 Adjustment type "1"
- 3 Adjustment type "2"
- 4 Adjustment type "3"
- 5 Adjustment type "7"
- 6 Space required to remove the key
- 7 Valve mounting bores
- 8 Lock nut SW24
- 9 Hexagon, wrench size 10
- 10 Identical seal rings for ports A, B, P, T(Y)
- 11 Pressure gauge connection G1/4; 12 deep;  
internal hexagon SW6

**Valve mounting screws (separate order)**  
**4 hexagon socket head cap screws ISO 4762 - M5 - 10.9**

 **Notes:**

- ▶ Length and tightening torque of the valve mounting screws must be calculated according to the components mounted under and over the sandwich plate valve.
- ▶ The dimensions are nominal dimensions which are subject to tolerances.



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## Accessories (separate order)

Denomination	Material no.
Protective cap	R900135501

## Further information

- ▶ Hydraulic valves for industrial applications
  - ▶ Subplates
  - ▶ Hydraulic fluids on mineral oil basis
  - ▶ Environmentally compatible hydraulic fluids
  - ▶ Flame-resistant, water-free hydraulic fluids
  - ▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)
  - ▶ Reliability characteristics according to EN ISO 13849
  - ▶ Use of non-electrical hydraulic components in an explosive environment (ATEX)
  - ▶ Selection of filters
  - ▶ Information on available spare parts
- Operating instructions 07600-B  
Data sheet 45100  
Data sheet 90220  
Data sheet 90221  
Data sheet 90222  
Data sheet 90223  
Data sheet 08012  
Data sheet 07011