

Pressure reducing valve, direct operated

Type ZDR



H7750

- Size 6
- Component series 4X
- Maximum operating pressure 350 bar
- Maximum flow 80 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
 - Sleeve 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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Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13
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 P① (pilot oil supply from channel B)	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 ¹⁾
	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 "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 (observe compatibility of seals with hydraulic fluid used, see page 5)

12	NBR seals	no code ♦
	FKM seals	V
13	Without locating hole	no code
	With locating hole and locking pin ISO 8752-3x8-St	/62

¹⁾ H-key with material no. **R900008158** is included in the scope of delivery.

**Notice:**

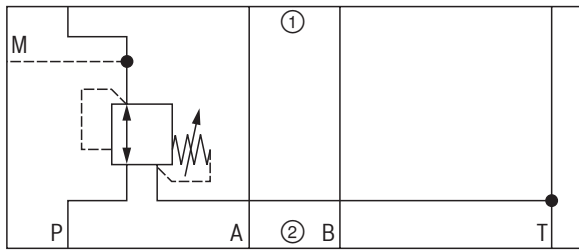
For valve types for use in potentially explosive atmospheres, refer to data sheet 07011.



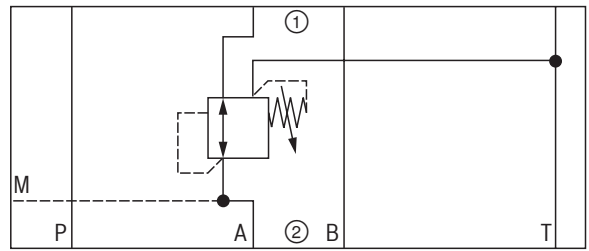
Notice: ♦ = Preferred type

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

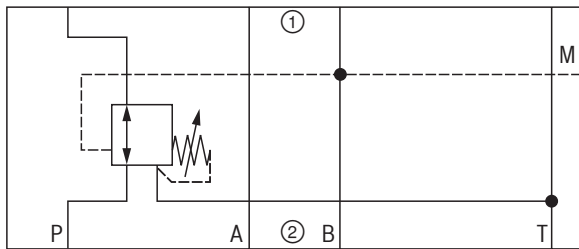
Version "P...YM"



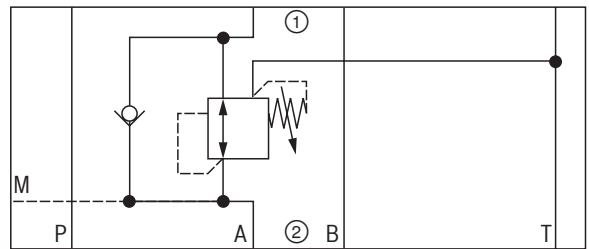
Version "A...YM"



Version "B...YM"



Version "A...Y"



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".

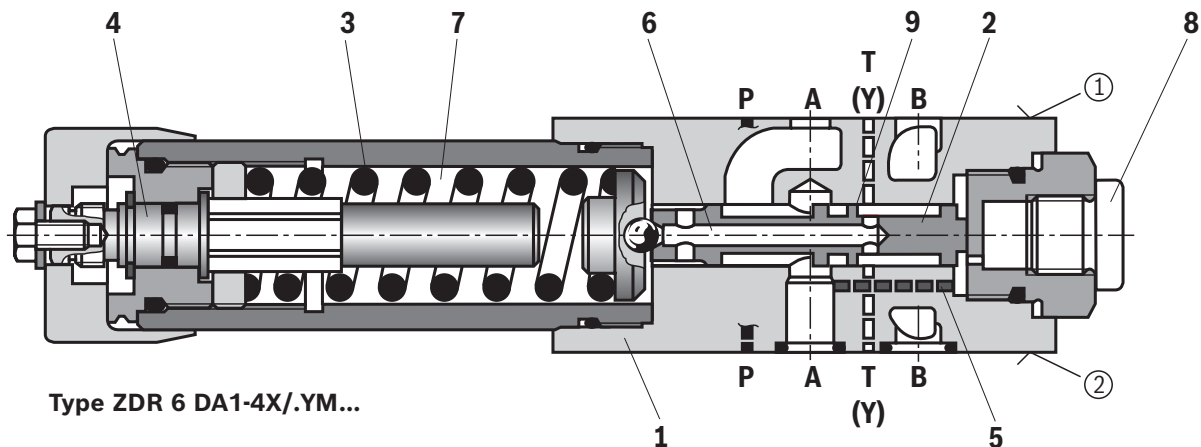
Versions "P" and "B"

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→A, the pressure in channel B may not exceed the set secondary pressure. Otherwise, there is pressure reduction in channel A.



① = component side
② = plate side

Technical data

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

General		
Type of connection		Subplate mounting
Porting pattern		ISO 4401-03-02-0-05
Weight	kg	1.2
Installation position		Any
Ambient temperature range	°C	–30 ... +80 (NBR seals) –20 ... +80 (FKM seals)
MTTF _D values according to EN ISO 13849	Years	150 ... 1200 (for more information see data sheet 08012)

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

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP, HLPD, HVLP, HVLDPD	NBR, FKM	DIN 51524	90220
Bio-degradable	► 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)		
		HFDR		
	► Containing water	HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	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.
- **Bio-degradable and flame-resistant – containing water:**
If components with galvanic zinc coating (e.g., version "J3" or "J5") or parts containing zinc are used, small amounts of dissolved zinc may get into the hydraulic system and cause accelerated aging of the hydraulic fluid. Zinc soap may form as a chemical reaction product, which may clog filters, nozzles and solenoid valves – particularly in connection with local heat input.

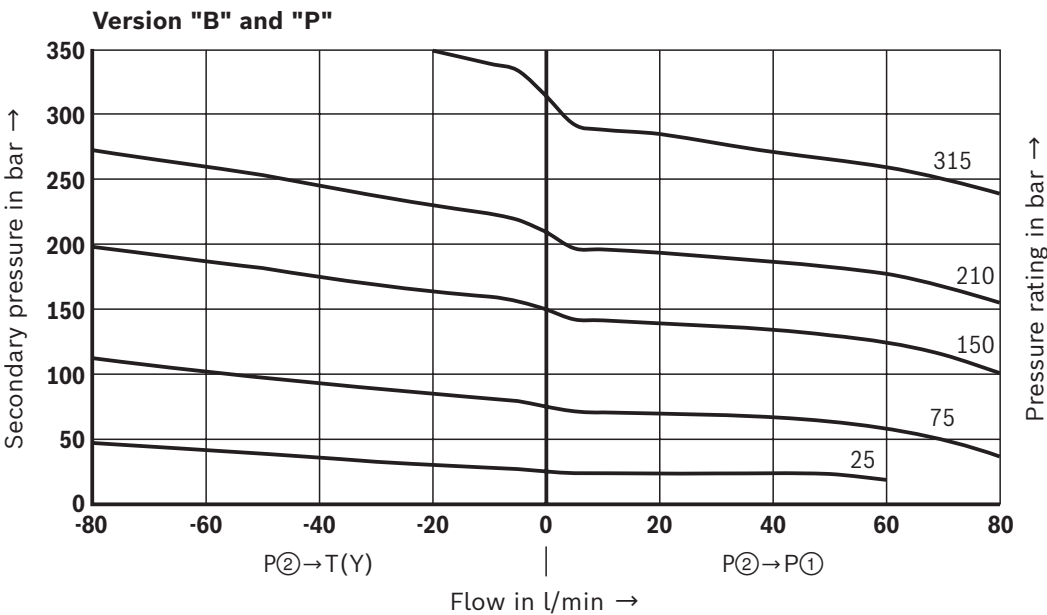
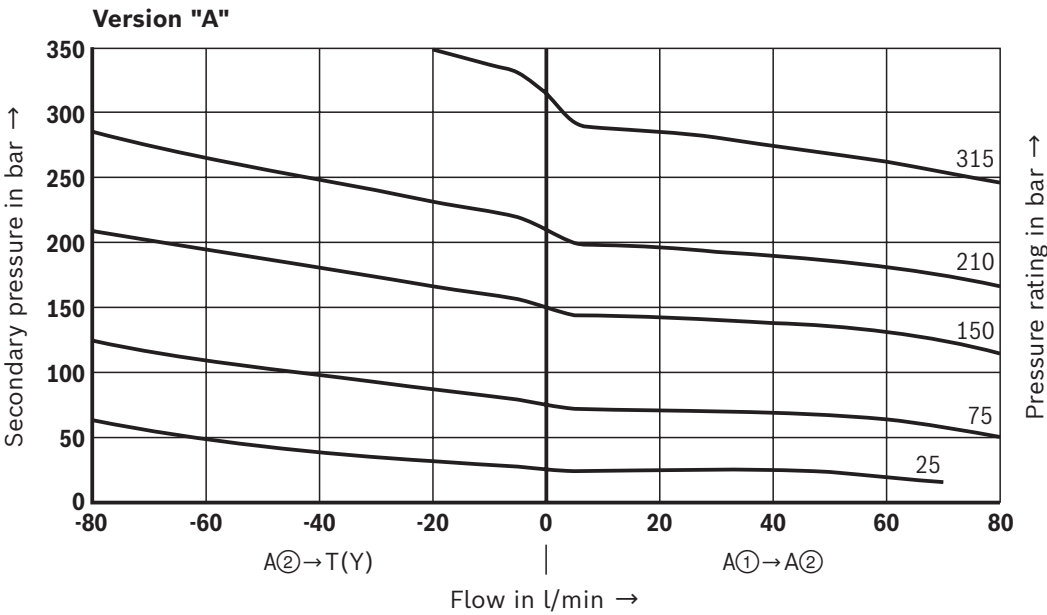
► Flame-resistant – containing water:

Due to the increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP. In order to reduce the cavitation effect, it is recommended – if possible considering conditions specific to the installation – to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

¹⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.

Characteristic curves
(measured with HLP46, $\vartheta_{oil} = 40\pm5\text{ }^{\circ}\text{C}$)

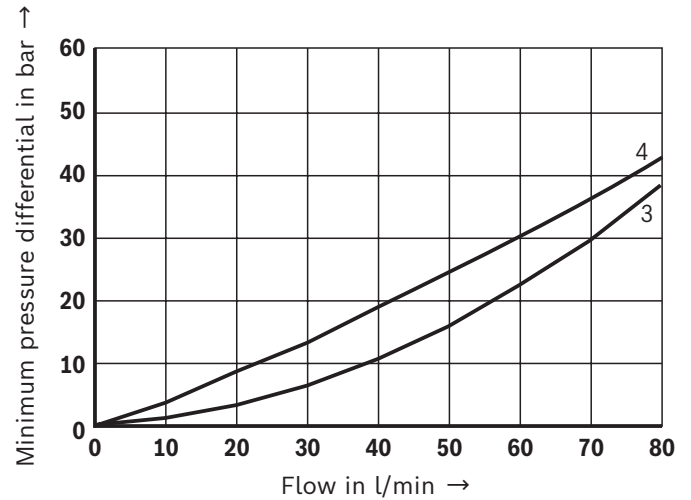
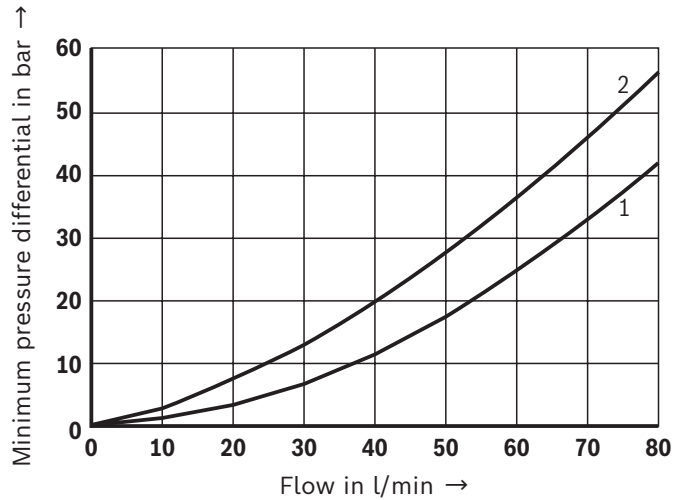
p_A - q_V characteristic curves



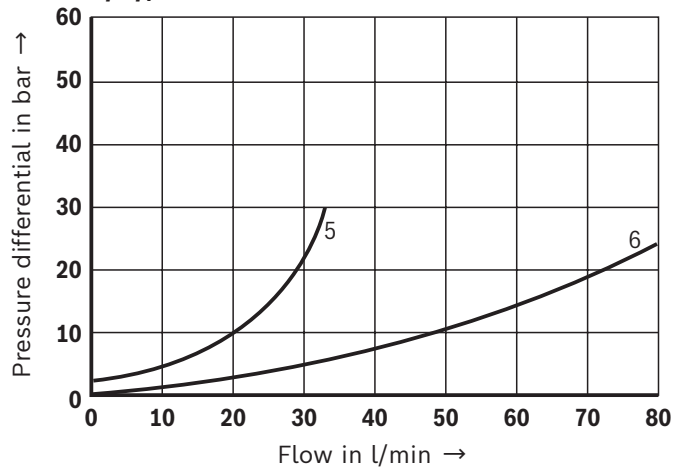
Characteristic curves

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

$\Delta p_{min}-q_v$ characteristic curves



$\Delta p-q_v$ characteristic curves

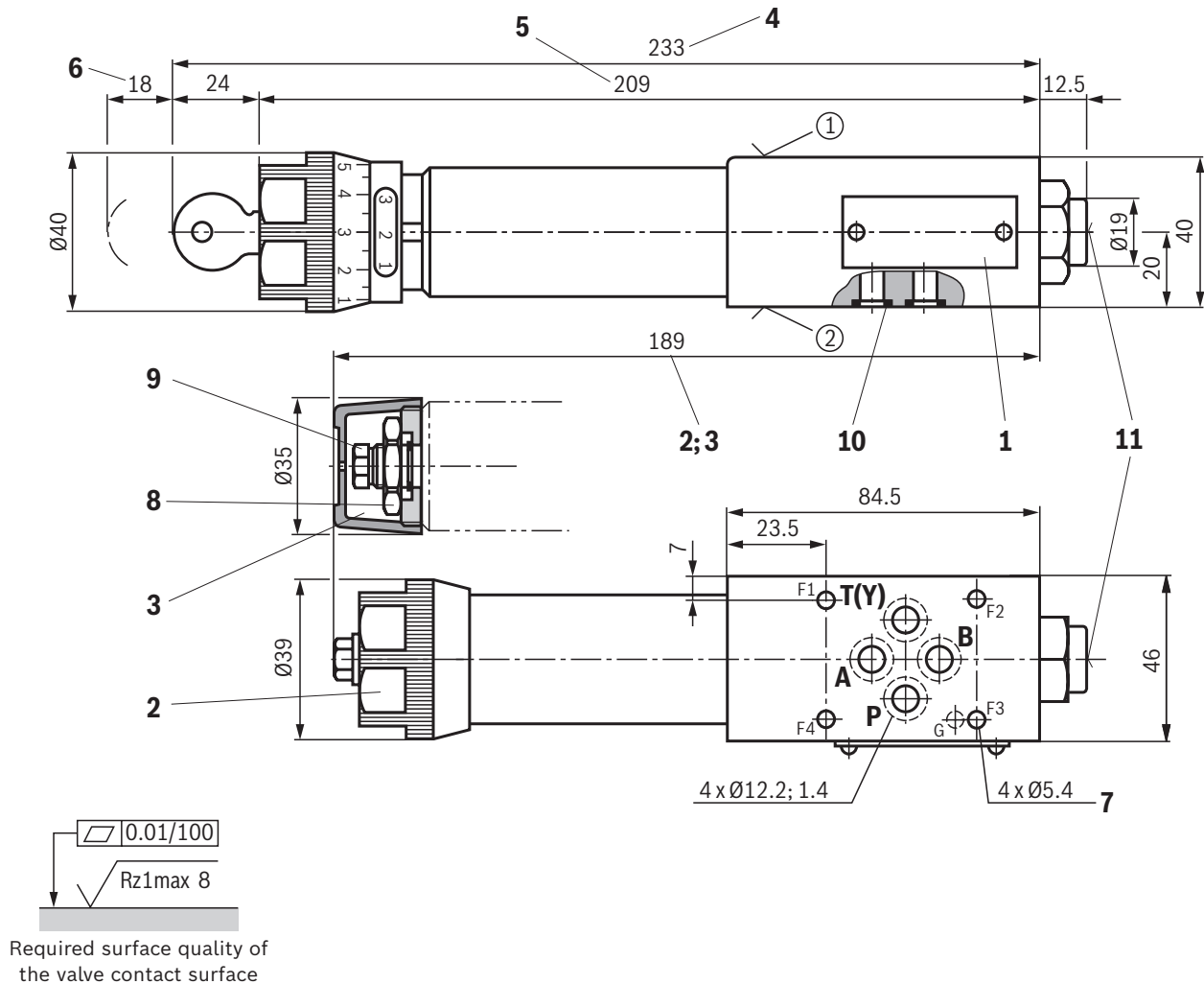


- 1 A①→A②
- 2 A②→T(Y) (3rd way) (Version "210")
- 3 P②→P①
- 4 P①→T(Y) (3rd way) (Version "210")
- 5 A②→A①; flow only via check valve
- 6 A②→A①; flow via check valve and fully opened control cross-section



Notice:

- The curve development is maintained if the pressure is set lower according to the pressure rating.
- The characteristic curves apply for output pressure $p_T = 0 \text{ bar}$ in the entire flow range.
- Typical characteristic curves which are subject to tolerance variations.

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

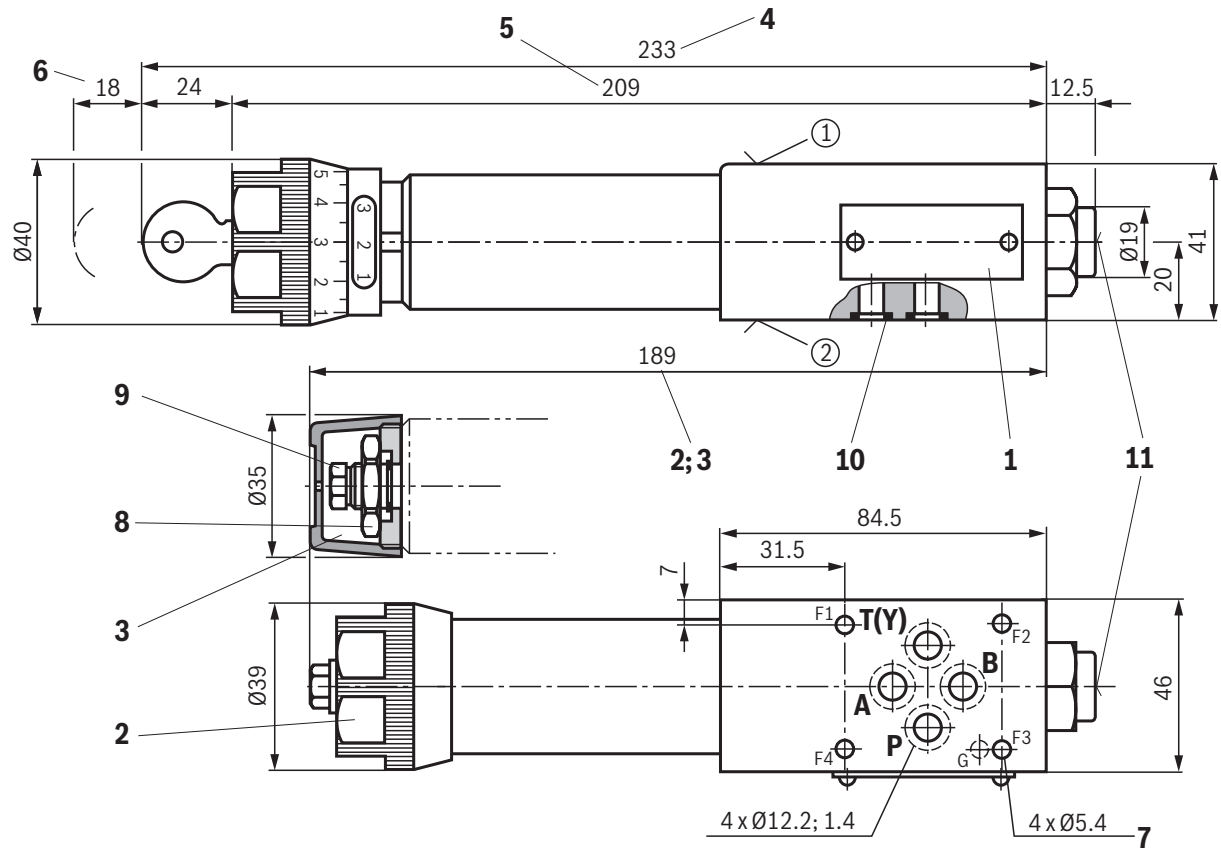
- ① Component side – porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole); **(with** locating hole $\varnothing 3 \times 5$ mm deep)
- ② Plate side – porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole); **(with** locating hole and locking pin ISO 8752-3x8-St; version "/62")

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

- 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.

- 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, wrench size 24
- 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

Dimensions: Version "A" (dimensions in mm)



Required surface quality of
the valve contact surface

- 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 and locking pin ISO 8752-3x8-St; version "/62")

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- 2 Adjustment type "1"
- 3 Adjustment type "2"
- 4 Adjustment type "3"
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Valve mounting screws (separate order)

4 hexagon socket head cap screws ISO 4762 – M5 – 10.9



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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)
 - ▶ Information on available spares
- 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

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Notes

Notes

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