

Pressure relief valve, pilot-operated

Type ZDB and Z2DB



H7746

- ▶ 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)
- ▶ 5 pressure ratings
- ▶ 5 directions of action, optional
- ▶ 1 or 2 pressure valve cartridges
- ▶ 4 adjustment types for pressure adjustment, optional
 - Rotary knob
 - Bushing with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale
- ▶ Corrosion-protected design

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Ordering code

01	02	03	04	05	06	07	08	09	10	11
Z		DB	6			-	4X	/		V

01	Sandwich plate	Z
02	1 Screw-in cartridge valve (only with version "VA", "VB" and "VP")	no code ♦
	2 Screw-in cartridge valve (only with version "VC" and "VD")	2 ♦
03	Pressure relief valve	DB
04	Size 6	6

Relief function from → to:

05	A → T	VA ♦
	P → T	VP ♦
	B → T	VB
	A → T and B → T	VC ♦
	A → B and B → A	VD

Adjustment type for pressure adjustment

06	Rotary knob	1
	Bushing with hexagon and 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

Pressure rating

08	Set pressure up to 50 bar	50
	Set pressure up to 100 bar	100 ♦
	Set pressure up to 200 bar	200 ♦
	Set pressure up to 315 bar	315 ♦
	Set pressure up to 350 bar (not version "VD")	350 ♦

Corrosion resistance

09	None	no code ♦
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227)	J3 ²⁾

Seal material (observe compatibility of seals with hydraulic fluid used, see page 6)

10	NBR seals	M ♦
	FKM seals	V
11	Without locating hole	no code ♦
	With locating hole	/60 ³⁾

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

²⁾ Only with adjustment type "2", however, without protective cap

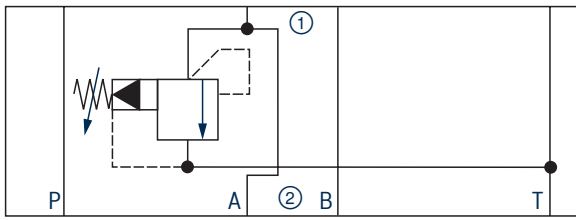
³⁾ Locking pin ISO 8752-3x8-St, material no. **R900005694** (separate order)



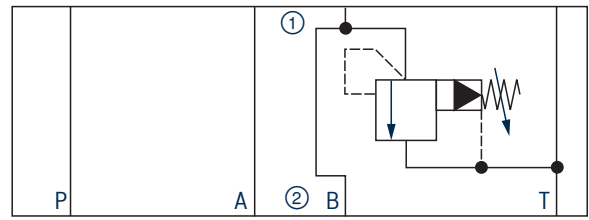
Note: ♦ = Preferred type

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

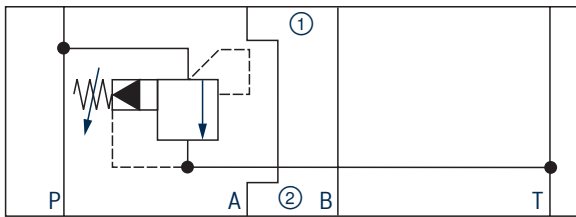
Version "VA"



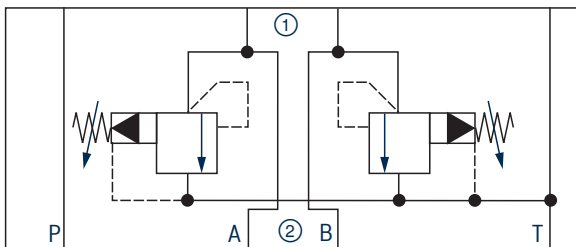
Version "VB"



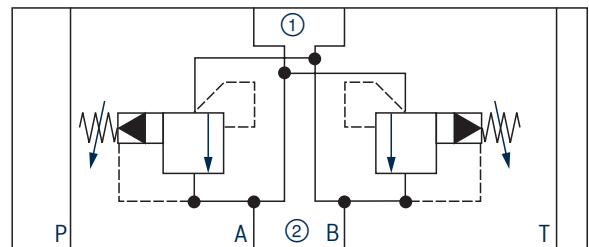
Version "VP"



Version "VC"



Version "VD"

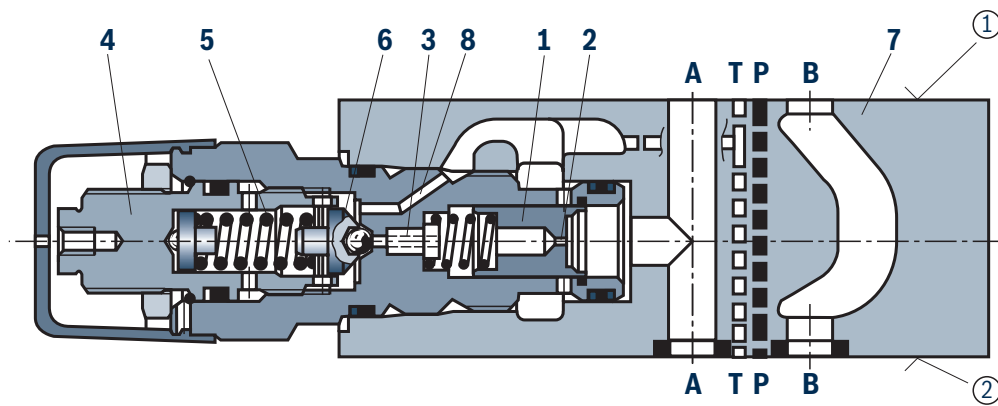


Function, section

Pressure valves of type ZDB and Z2DB are pilot-operated pressure relief valves in sandwich plate design. They are used for limiting a system pressure. The valves basically consist of the housing (7) and one or two pressure valve cartridges. The system pressure can be set via the adjustment type (4).

Example version "VA":

In the initial position the valves are closed. The pressure in channel A acts on the spool (1). At the same time, pressure is applied to the spring-loaded side of the spool (1) via nozzle (2) and to the pilot poppet (6) via nozzle (3). If the pressure in channel A exceeds the value set at the spring (5), the pilot poppet (6) opens. Hydraulic fluid flows from the spring-loaded side of the spool (1), nozzle (3), channel (8) into channel T. The resulting pressure drop moves the spool (1) and thus opens the connection A to T while maintaining the pressure set at spring (5). The pilot oil drain from the two spring chambers is effected externally, via channel T.



Type ZDB 6 VA2-...

- ① = component side
- ② = plate side

Technical data

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

General			
Type of connection		Sandwich plate valve	
Porting pattern		ISO 4401-03-02-0-05	
Weight	► Type ZDB	kg	1
	► Type Z2DB	kg	1.2
Installation position		Any	
Ambient temperature range		°C	-20 ... +80 (NBR seals) -15 ... +80 (FKM seals)
Storage temperature range		°C	+5 ... +40

Hydraulic			
Maximum operating pressure	► Port A, P, B		
	- "VA," "VP," "VB," "VC"	bar	350
	- "VD"	bar	315
	► Port T	bar	40 (observe the maximum operating pressure in port T of the subplate-mounted valve/directional valve)
Hydraulic fluid		See table on page 6	
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
Maximum set pressure	► "VA," "VP," "VB," "VC"	bar	50; 100; 200; 315; 350
	► "VD"	bar	50; 100; 200; 315

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.

Technical data

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

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP, HLPD, HVLP, HVLDP	NBR, FKM	DIN 51524	90220
Bio-degradable	► Insoluble in water	HETG	FKM	ISO 15380	90221
		HEES	FKM		
	► Soluble in water	HEPG	FKM	ISO 15380	
Flame-resistant	► Water-free	HFDU (glycol base)	FKM	ISO 12922	90222
		HFDU (ester base)	FKM		
		HFDR	FKM		
	► Containing water	HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	NBR	ISO 12922	90223

**Important notes on hydraulic fluids:**

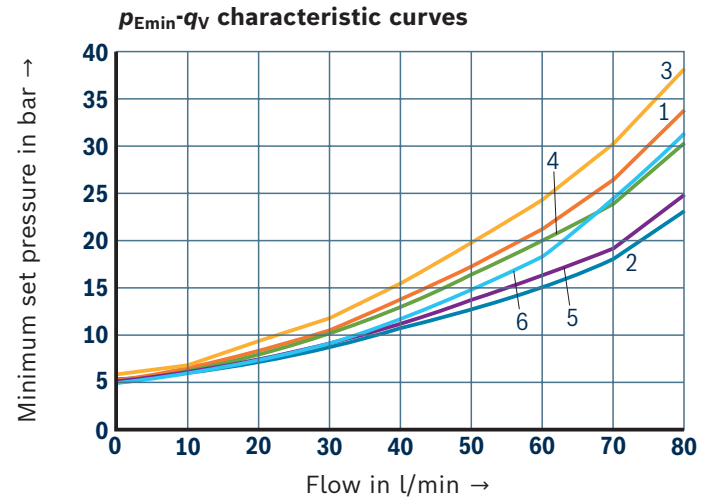
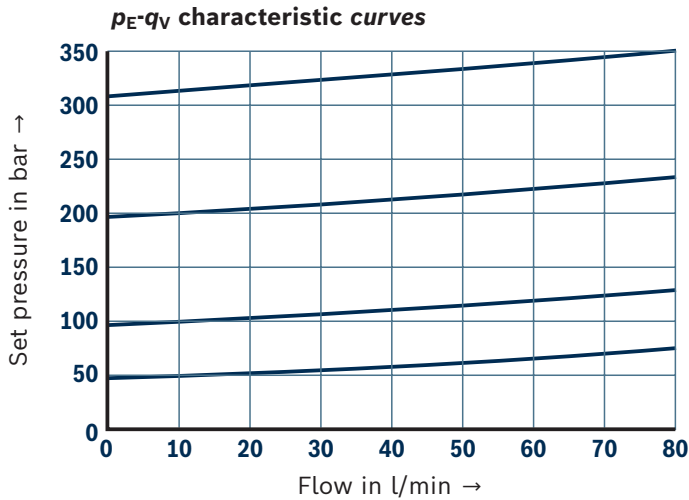
- For further information and data on the use of other hydraulic fluids, see the data sheets above or contact us.
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- The ignition temperature of the hydraulic fluid used 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 an increased cavitation tendency with the use of HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to use with HLP mineral oil. In order to reduce the cavitation effect, it is recommended – if possible, specific to the installation – to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

Characteristic curves

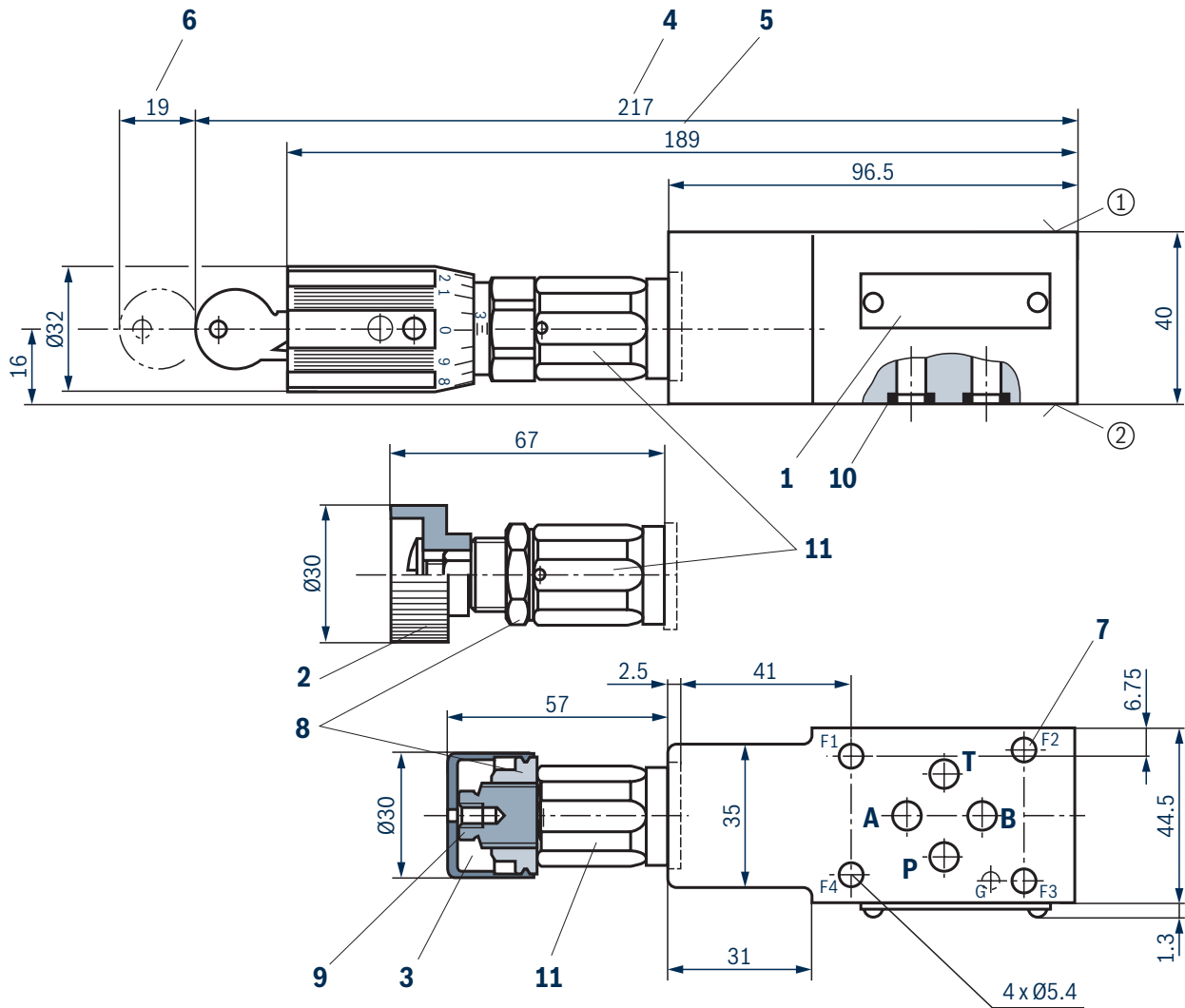
(measured with HLP46, $\vartheta_{\text{oil}} = 40 \pm 5 \text{ }^{\circ}\text{C}$)



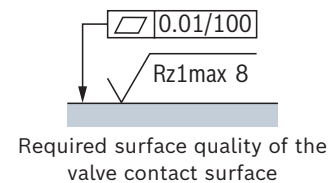
Information:

- The characteristic curves apply to the pressure at the valve output $p_T = 0 \text{ bar}$ across the entire flow range.
- Typical characteristic curves which are subject to tolerance variations.

- 1 "VA"
- 2 VD (B①→A②)
- 3 VD (A①→B②)
- 4 "VP"
- 5 "VB"
- 6 "VC"

Dimensions: Type ZDB 6 VA...
 (Dimensions in mm)


- 1 Name plate
- 2 Adjustment type "1"
- 3 Adjustment type "2" (with version "J3" without protective cap)
- 4 Adjustment type "3"
- 5 Adjustment type "7"
- 6 Dimension required to remove the key
- 7 Valve mounting bores
- 8 Lock nut SW24, tightening torque $M_A = 10^5 \text{ Nm}$
- 9 Hexagon, SW10
- 10 Identical seal rings for ports A, B, P, T (plate side)
- 11 Hexagon SW24, tightening torque $M_A = 50 \text{ Nm}$

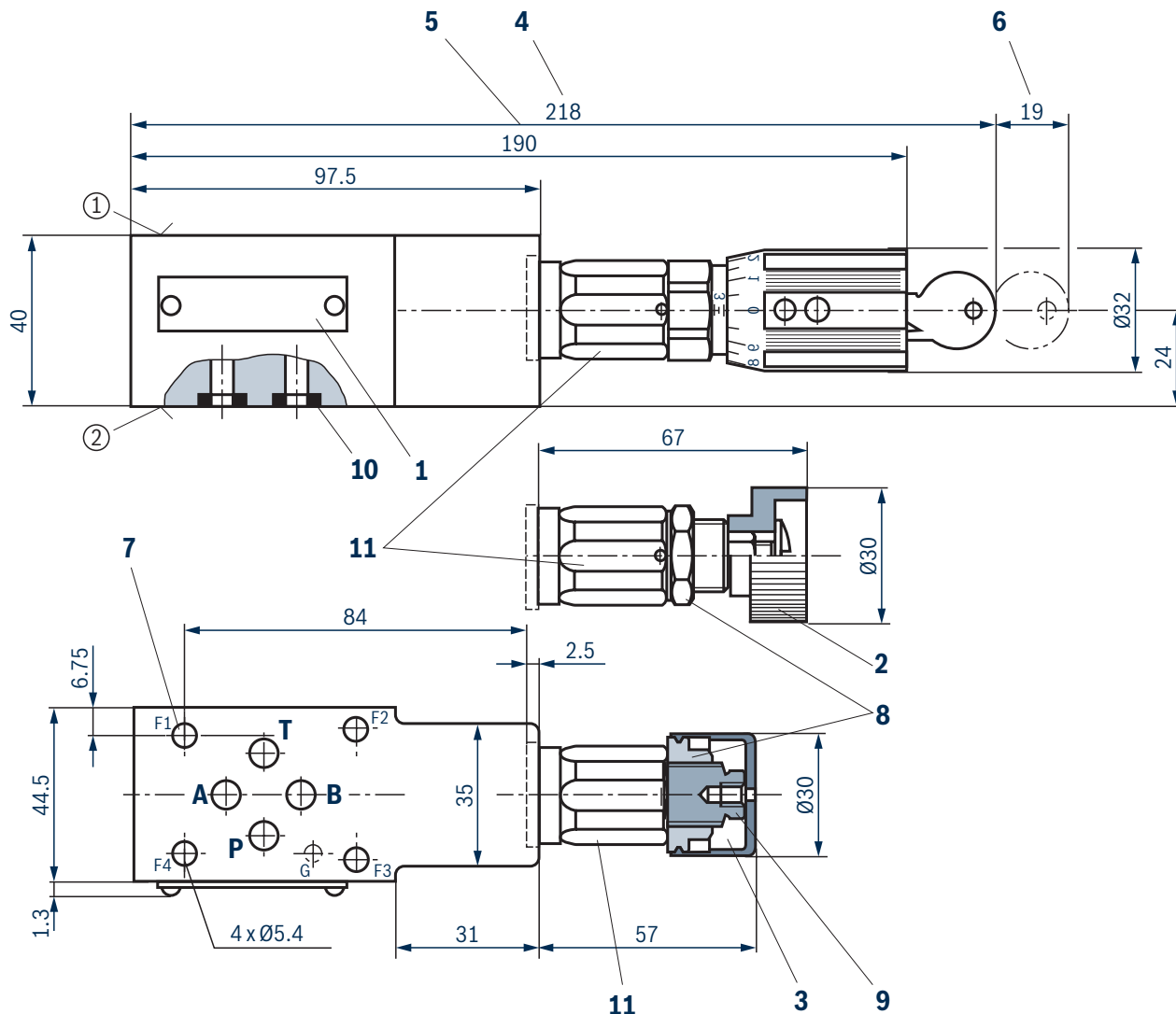

Valve mounting screws see page 11.

- ① component side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole Ø4 x 4 mm deep)
- ② plate side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole Ø3 x 5 mm deep for locking pin ISO 8752-3x8-St, material no. **R900005694**, separate order)

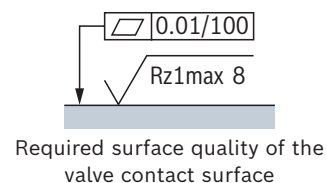

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Type ZDB 6 VB... and type ZDB 6 VP...
(Dimensions in mm)



- 1 Name plate
- 2 Adjustment type "1"
- 3 Adjustment type "2" (with version "J3" without protective cap)
- 4 Adjustment type "3"
- 5 Adjustment type "7"
- 6 Dimension required to remove the key
- 7 Valve mounting bores
- 8 Lock nut SW24, tightening torque $M_A = 10^{+5}$ Nm
- 9 Hexagon, SW10
- 10 Identical seal rings for ports A, B, P, T (plate side)
- 11 Hexagon SW24, tightening torque $M_A = 50$ Nm



- ① component side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole Ø4 x 4 mm deep)
- ② plate side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole Ø3 x 5 mm deep for locking pin ISO 8752-3x8-St, material no. **R900005694**, separate order)

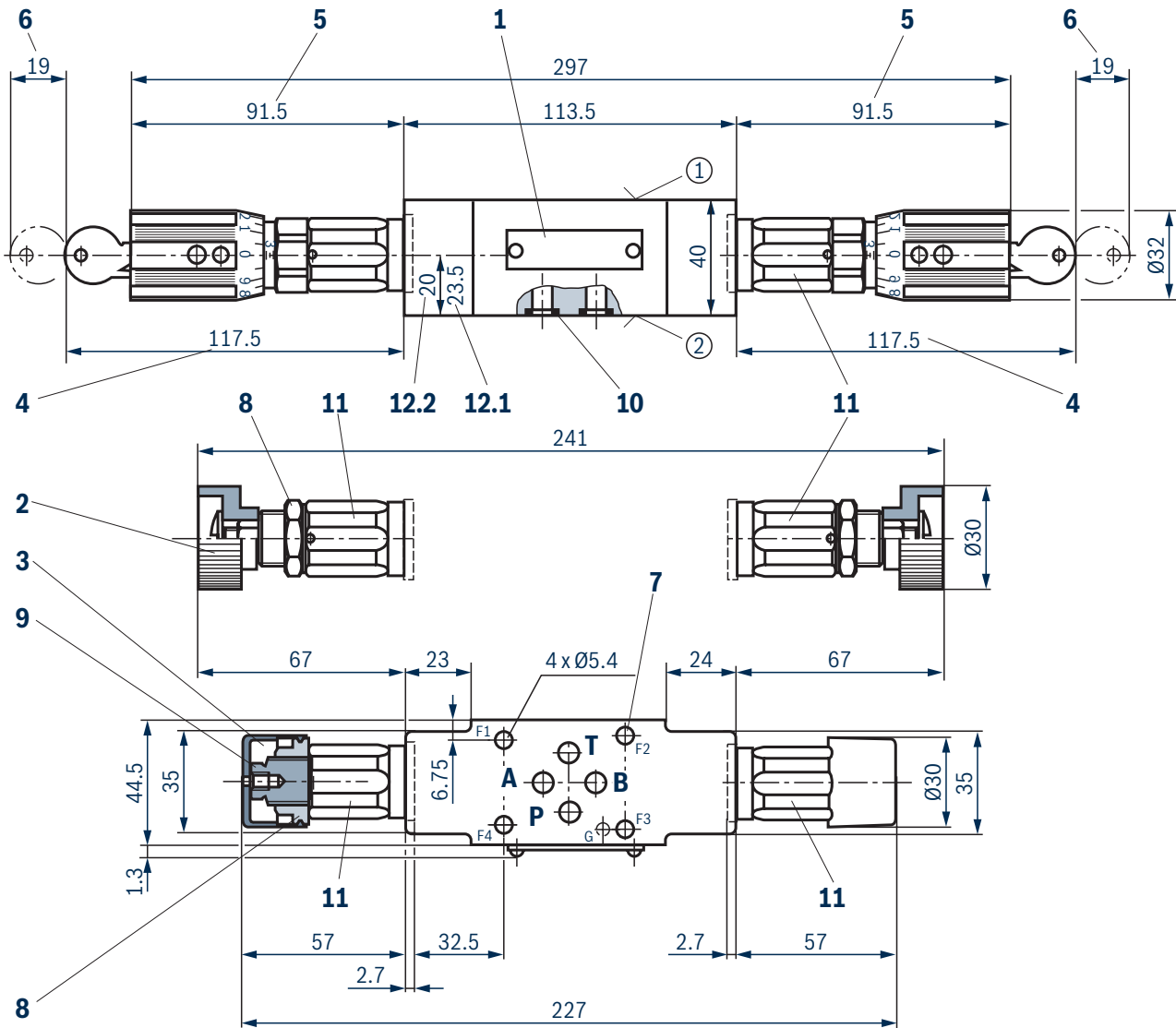
Valve mounting screws see page 11.



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Type Z2DB 6 **VC**... and type Z2DB 6 **VD**...
(Dimensions in mm)



- 1 Name plate
- 2 Adjustment type "1"
- 3 Adjustment type "2" (with version "J3" without protective cap)
- 4 Adjustment type "3"
- 5 Adjustment type "7"
- 6 Dimension required to remove the key
- 7 Valve mounting bores
- 8 Lock nut SW24, tightening torque $M_A = 10^{+5}$ Nm
- 9 Hexagon, SW10
- 10 Identical seal rings for ports A, B, P, T (plate side)
- 11 Hexagon SW24, tightening torque $M_A = 50$ Nm
- 12.1 Version "VC"
- 12.2 Version "VC"

Required surface quality of the
valve contact surface

- ① component side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole Ø4 x 4 mm deep)
- ② plate side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole Ø3 x 5 mm deep for locking pin ISO 8752-3x8-St, material no. **R900005694**, separate order)

Notice:

The dimensions are nominal dimensions which are subject to tolerances.

Valve mounting screws see page 11.

Dimensions

Valve mounting screws (separate order)

Version	Quantity	Hexagon socket head cap screws	Material number
"J3"	4	ISO 4762 - M5 - 10.9-CM-Fe-ZnNi-5-Cn-T0-H-B Friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$; tightening torque $M_A = 7.4 \text{ Nm} \pm 10\%$	Not included in the Rexroth delivery range
Without corrosion protection	4	ISO 4762 - M5 - 10.9 Friction coefficient $\mu_{\text{total}} = 0.12 \dots 0.17$; tightening torque $M_A = 8.1 \text{ Nm} \pm 10\%$	Not included in the Rexroth delivery range

Accessories (separate order)

Denomination	Material no.
Protective cap	R900692658

Further information

► Subplates	Data sheet 45100
► Pressure relief valve, pilot-operated	Data sheet 25731
► Hydraulic fluids on mineral oil basis	Data sheet 90220
► Environmentally compatible hydraulic fluids	Data sheet 90221
► Flame-resistant, water-free hydraulic fluids	Data sheet 90222
► Flame-resistant hydraulic fluids – containing water (HFAE, HFAS, HFB, HFC)	Data sheet 90223
► Use of non-electrical hydraulic components in an explosive environment (ATEX)	Data sheet 07011
► Hydraulic valves for industrial applications	Operating instructions 07600-B

Notes

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