

# Pressure relief valve, pilot-operated

## Type ZDB and Z2DB

**RE 25751**

Edition: 2016-12

Replaces: 10.05



H7746

- ▶ Size 6
- ▶ Component series 4X
- ▶ Maximum operating pressure 315 bar
- ▶ Maximum flow 60 l/min

### Features

- ▶ Sandwich plate valve
- ▶ Porting pattern according to ISO 4401-03-02-0-05 (with or without locating hole)
- ▶ 4 pressure ratings
- ▶ 5 directions of action, optional
- ▶ 1 or 2 pressure valve cartridges
- ▶ 4 adjustment types for pressure adjustment, optionally
  - 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	12
<b>Z</b>		<b>DB</b>	<b>6</b>			<b>-</b>	<b>4X</b>	<b>/</b>		<b>V</b>	<b>*</b>

01	Sandwich plate	<b>Z</b>
02	1 pressure valve cartridge (only with version "VA", "VB" and "VP")	<b>no code</b>
	2 pressure valve cartridges (only with version "VC" and "VD")	<b>2</b>
03	Pressure relief valve	<b>DB</b>
04	Size 6	<b>6</b>

**Relief function from – to:**

05	A – T	<b>VA</b>
	P – T	<b>VP</b>
	B – T	<b>VB</b>
	A – T and B – T	<b>VC</b>
	A – B and B – A	<b>VD</b>

**Adjustment type for pressure adjustment**

06	Rotary knob	<b>1</b>
	Bushing with hexagon and protective cap	<b>2</b>
	Lockable rotary knob with scale	<b>3</b> <sup>1)</sup>
	Rotary knob with scale	<b>7</b>
07	Component series 40 ... 49 (40 ... 49: unchanged installation and mounting dimensions)	<b>4X</b>

**Pressure rating**

08	Set pressure up to 50 bar	<b>50</b>
	Set pressure up to 100 bar	<b>100</b>
	Set pressure up to 200 bar	<b>200</b>
	Set pressure up to 315 bar	<b>315</b>

**Corrosion resistance**

09	None	<b>no code</b>
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227)	<b>J3</b> <sup>2)</sup>
	High corrosion protection (720 h salt spray test according to EN ISO 9227)	<b>J5</b> <sup>2)</sup>


**Seal material**

10	NBR seals	<b>no code</b>
	FKM seals	<b>V</b>
	Observe compatibility of seals with hydraulic fluid used. (Other seals upon request)	
11	<b>Without</b> locating hole	<b>no code</b>
	<b>With</b> locating hole	<b>/60</b> <sup>3)</sup>
12	Further details in the plain text	<b>*</b>

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

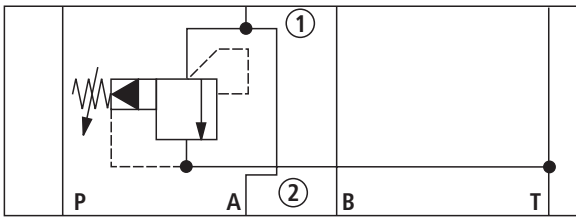
<sup>2)</sup> Only with adjustment type "2", however without protective cap

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

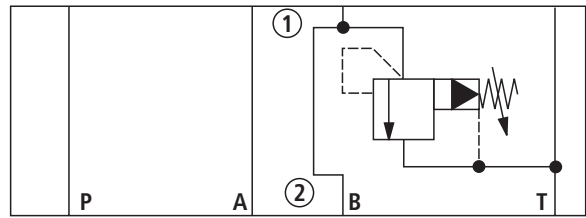
 **Notice:** Preferred types and standard units are contained in the EPS (standard price list).

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

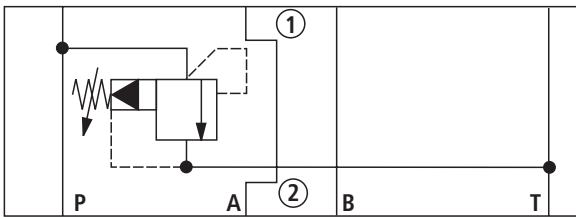
Type ZDB 6 **VA**...



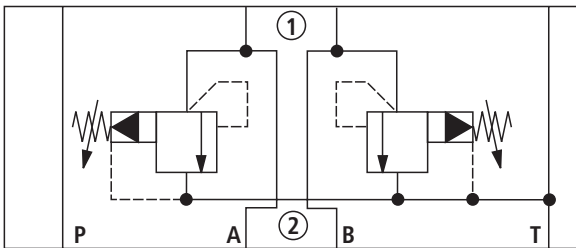
Type ZDB 6 **VB**...



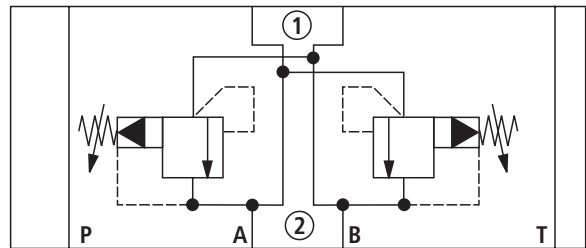
Type ZDB 6 **VP**...



Type Z2DB 6 **VC**...



Type Z2DB 6 **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.

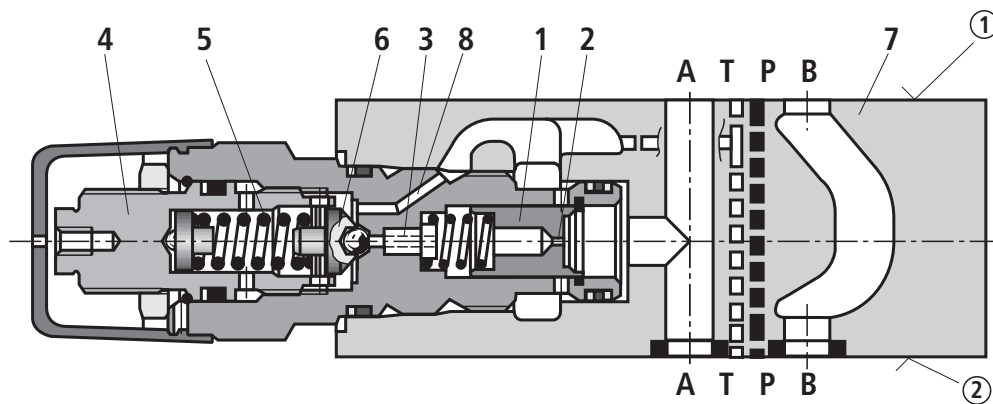
The valves basically consist of the housing (7) and one or two pressure valve cartridges.

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 parameters, please consult us!)

general			
Weight	▶ Type ZDB	kg	Approx. 1
	▶ Type Z2DB	kg	Approx. 1.2
Installation position			Any
Ambient temperature range			°C -20 ... +80

hydraulic			
Maximum operating pressure	bar	315	
Maximum set pressure	bar	50; 100; 200; 315	
Maximum counter pressure	bar	315 (observe the maximum tank pressure of the subplate-mounted valve/directional valve)	
Maximum flow	l/min	60	
Hydraulic fluid	See table below		
Hydraulic fluid temperature range	°C	-20 ... +80	
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>1)</sup>		

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP	NBR, FKM	DIN 51524	90220
Bio-degradable <sup>2)</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>2)</sup>		
		HFDR		
	▶ Containing water	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 solenoid 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

- ▶ **Bio-degradable and flame-resistant:** If this hydraulic fluid is used, small amounts of dissolved zinc may get into the hydraulic system.

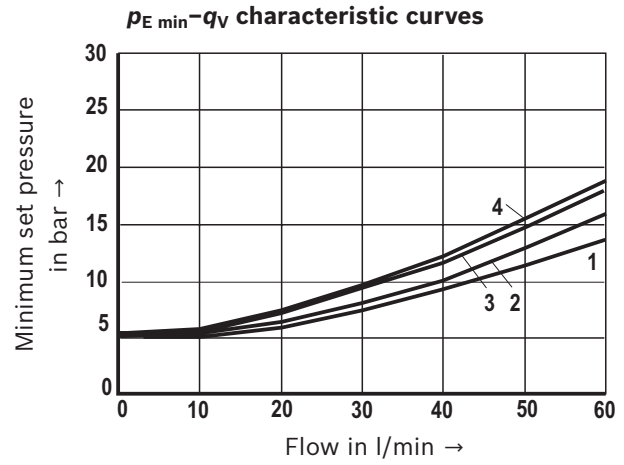
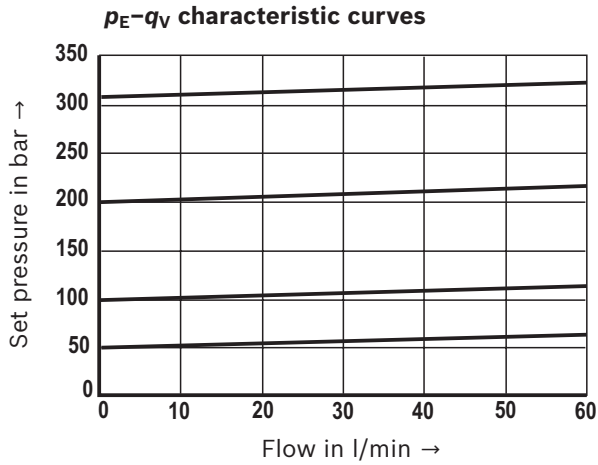
<sup>1)</sup> The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.

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

<sup>2)</sup> Not recommended for corrosion-protected versions "J3" and "J5" (contains zinc)

### Characteristic curves

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

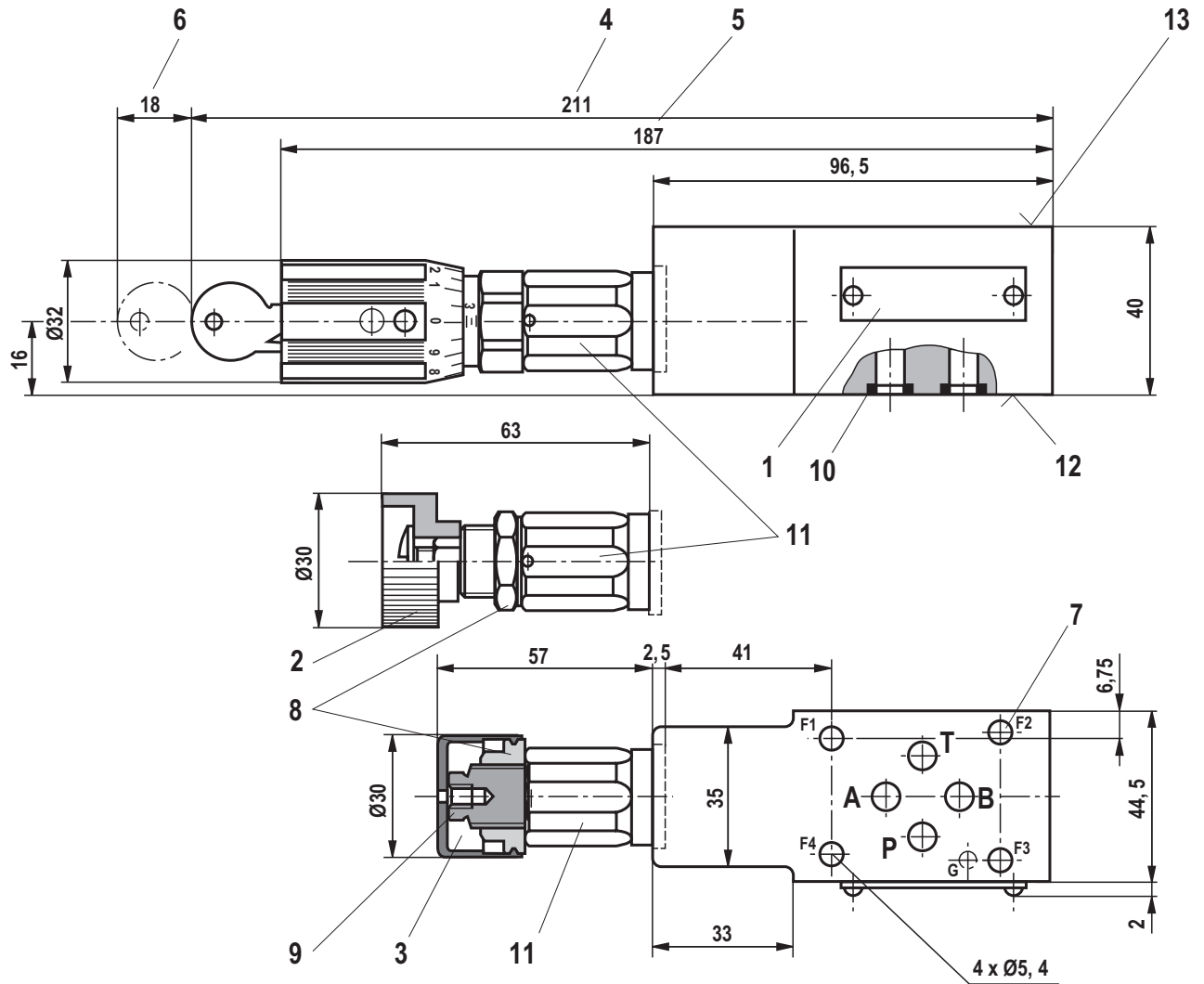


**Notice:**

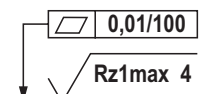
The characteristic curves apply to the pressure at the valve output  $p = 0$  bar across the entire flow range.

- 1 VD (A to B)
- 2 VA
- 3 VB, VC
- 4 VP, VD

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

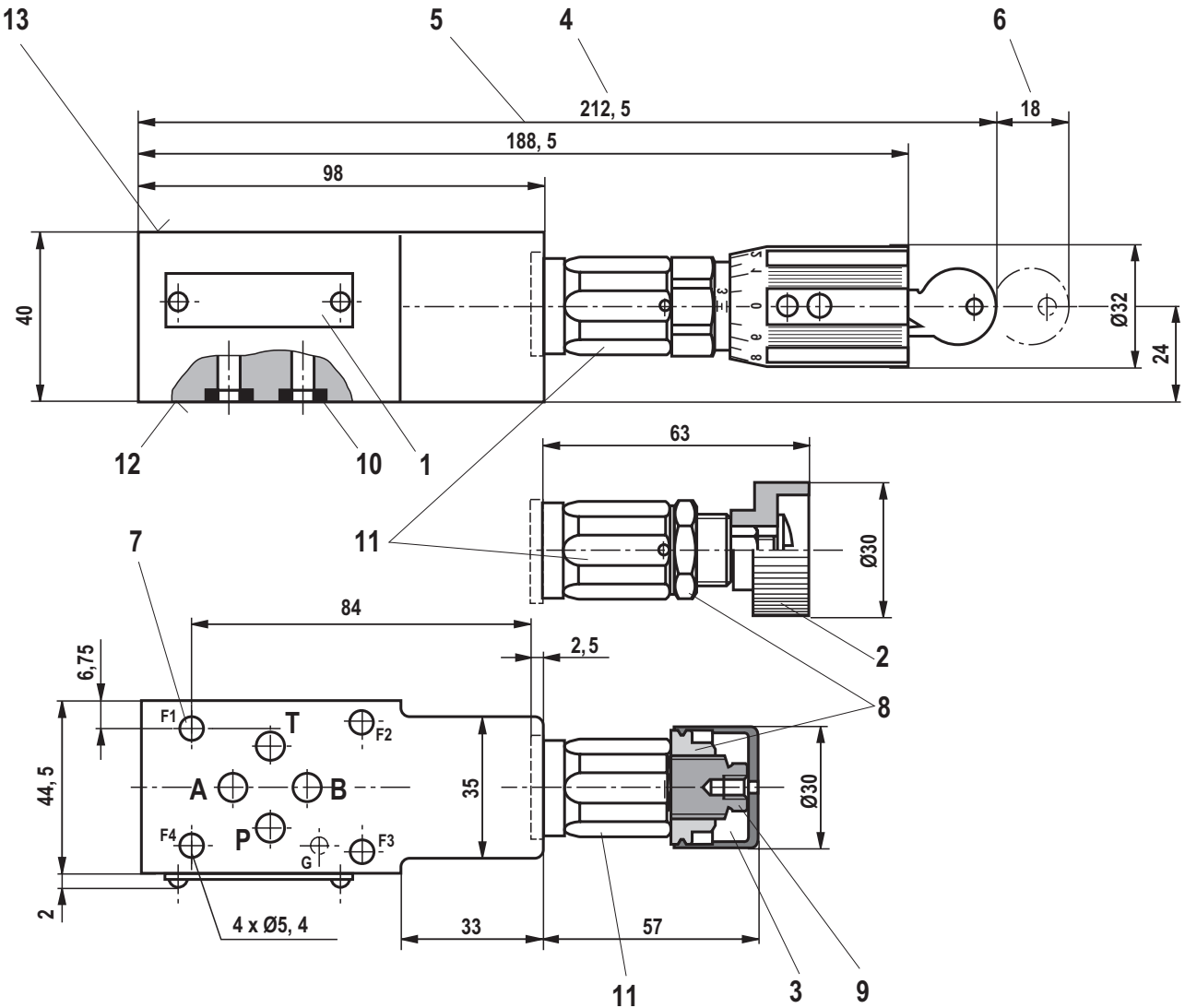


- 1 Name plate
- 2 Adjustment type "1"
- 3 Adjustment type "2" (with version "J3" and "J5" without protective cap)
- 4 Adjustment type "3"
- 5 Adjustment type "7"
- 6 Dimensions required to remove the key
- 7 Valve mounting bores
- 8 Lock nut SW24, tightening torque  $M_A = 10^{+5}$  Nm
- 9 Hexagon SW10
- 10 Identical seal rings for ports A, B, P, T (plate side)
- 11 Hexagon SW24, tightening torque  $M_A = 50$  Nm
- 12 plate side – porting pattern according to DIN 24340 form A (**without** locating hole), or ISO 4401-03-02-0-05 (**with** locating hole  $\varnothing 3 \times 5$  mm deep for locking pin ISO 8752-3x8-St, material no. **R900005694**, separate order)
- 13 component side – porting pattern according to DIN 24340 form A (**without** locating hole), or ISO 4401-03-02-0-95 (**with** locating hole  $\varnothing 4 \times 4$  mm deep)

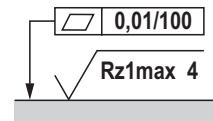
  
 Required surface quality of the valve contact surface

**Valve mounting screws** see page 10.

**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" and "J5" without protective cap)
- 4 Adjustment type "3"
- 5 Adjustment type "7"
- 6 Dimensions 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 plate side – porting pattern according to DIN 24340 form A (**without** locating hole), or 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)
- 13 component side – porting pattern according to DIN 24340 form A (**without** locating hole), or ISO 4401-03-02-0-95 (**with** locating hole Ø4 x 4 mm deep)

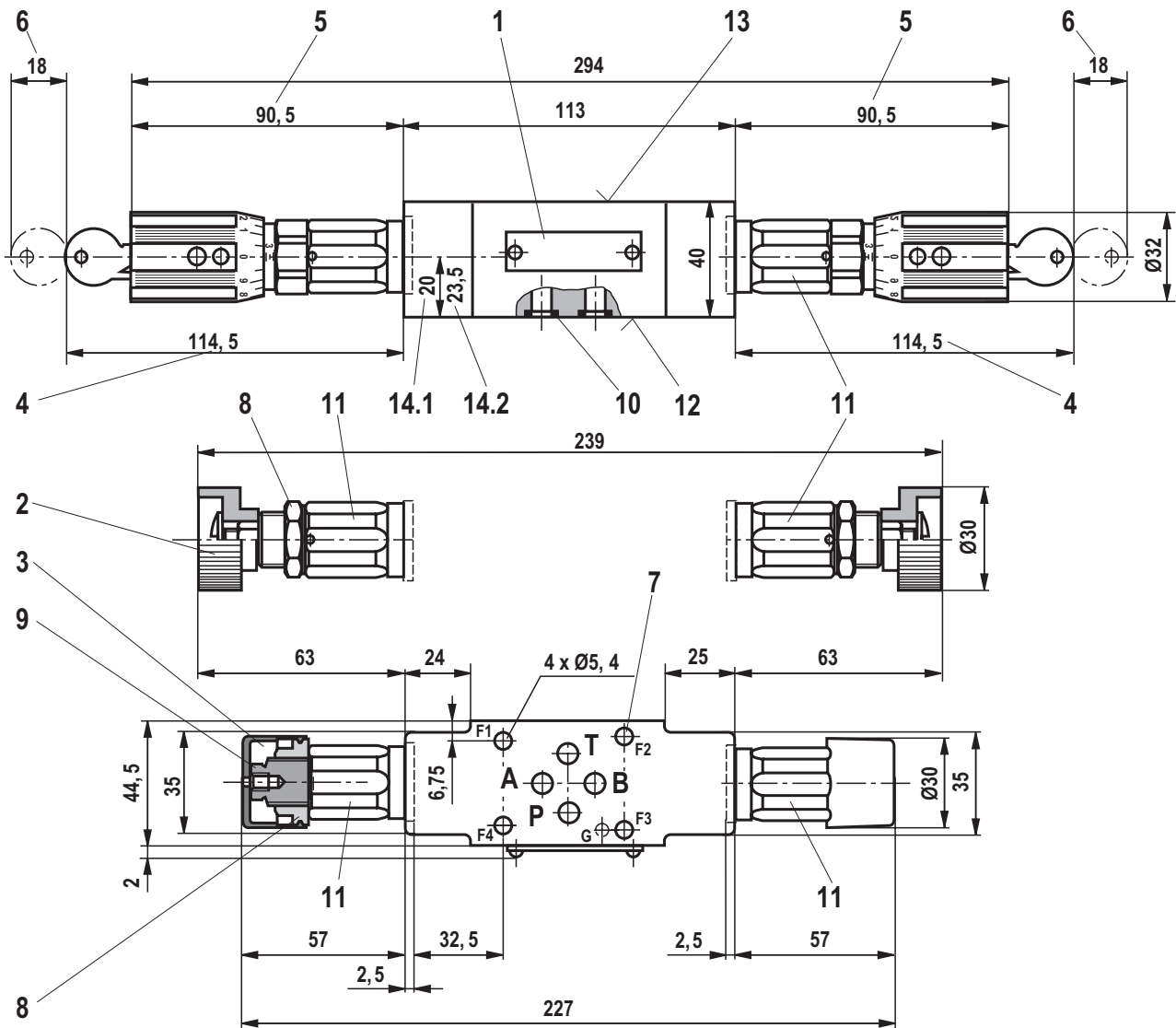


Required surface quality of the valve contact surface

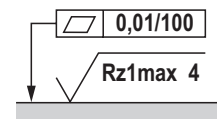
**Valve mounting screws** see page 10.



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



- |  |  |
|--|--|
| <p>1 Name plate<br/>2 Adjustment type "1"<br/>3 Adjustment type "2" (with version "J3" and "J5" without protective cap)<br/>4 Adjustment type "3"<br/>5 Adjustment type "7"<br/>6 Dimensions required to remove the key<br/>7 Valve mounting bores<br/>8 Lock nut SW24, tightening torque <math>M_A = 10^{+5}</math> Nm<br/>9 Hexagon SW10<br/>10 Identical seal rings for ports A, B, P, T (plate side)<br/>11 Hexagon SW24, tightening torque <math>M_A = 50</math> Nm<br/>12 plate side – porting pattern according to DIN 24340 form A (<b>without</b> locating hole), or ISO 4401-03-02-0-05 (<b>with</b> locating hole Ø3 x 5 mm deep for locking pin ISO 8752-3x8-St, material no. <b>R900005694</b>, separate order)</p> | <p>13 component side – porting pattern according to DIN 24340 form A (<b>without</b> locating hole), or ISO 4401-03-02-0-95 (<b>with</b> locating hole Ø4 x 4 mm deep)<br/>14.1 Version "VC"<br/>14.2 Version "VD"</p> |
|--|--|



Required surface quality of the valve contact surface

**Valve mounting screws** see page 10.

## Dimensions

### Valve mounting screws (separate order)

► Version "J3"

**4 hexagon socket head cap screws**

**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  $M_A = 7.4 \text{ Nm} \pm 10 \%$

► Version "J5"

**4 hexagon socket head cap screws**

**ISO 4762 - M5 - 10.9-CM-Fe-ZnNi-8-Cn-T0-H-B**

friction coefficient  $\mu_{\text{total}} = 0.09 \dots 0.14$ ;

tightening torque  $M_A = 7.4 \text{ Nm} \pm 10 \%$

► Without corrosion protection

**4 hexagon socket head cap screws**

**ISO 4762 - M5 - 10.9**

with friction coefficient  $\mu_{\text{total}} = 0.12 \dots 0.17$ ;

tightening torque  $M_A = 8.1 \text{ Nm} \pm 10 \%$

### Accessories (separate order)

Denomination	Material no.
Protective cap	R900692658

## Further information

- |   |  |
|---|--|
| ► 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   |
| ► Selection of the filters  | <a href="http://www.boschrexroth.com/filter">www.boschrexroth.com/filter</a> |

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## Notes

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