

**RE 25751**

Edition: 2022-05

Replaces: 2016-12

**rexroth**  
A Bosch Company

## Pressure relief valve, pilot-operated

### Type ZDB and Z2DB



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
  - Sleeve with hexagon and protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- ▶ Corrosion-protected design

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RE 25751, edition: 2022-05, **Bosch Rexroth AG**

Knowledge is POWER – Motion Force Control is our Business

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2/12 ZDB; Z2DB | Pressure relief valve

## Ordering code

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

01	Sandwich plate	Z
02	1 pressure valve cartridge (only with version "VA", "VB" and "VP")	no code ♦
	2 pressure valve cartridges (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
	Sleeve with hexagon and 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

### 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 ♦


### Corrosion resistance

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

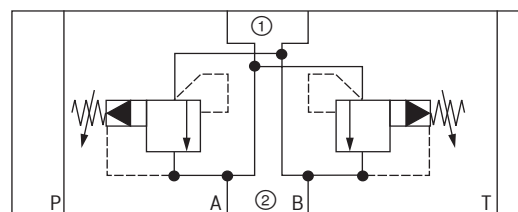
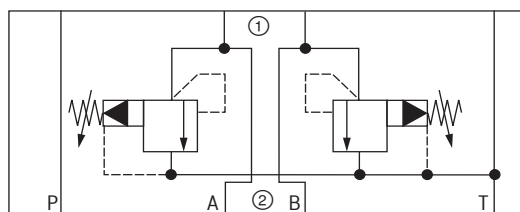
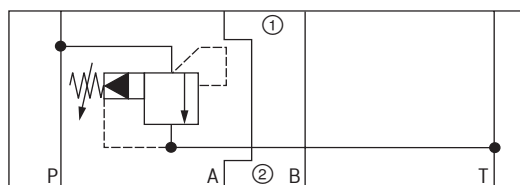
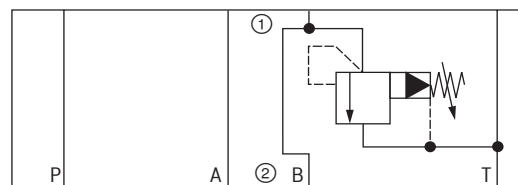
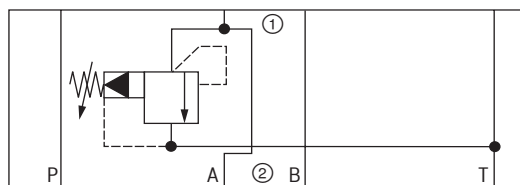
### Seal material (observe compatibility of seals with hydraulic fluid used, see page 5)

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

- <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 type

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



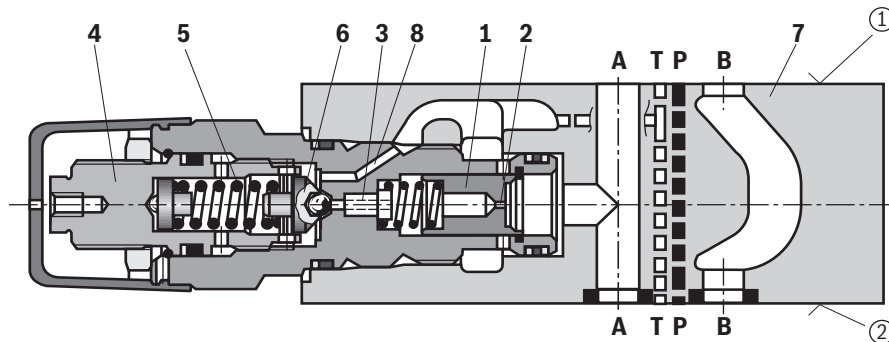
4/12 ZDB; Z2DB | Pressure relief valve

## 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	Approx. 1
	► Type Z2DB	kg	Approx. 1.2
Installation position	Any		
Ambient temperature range			°C
			-20 ... +80 (NBR seals) -15 ... +80 (FKM seals)

Hydraulic		
Maximum operating pressure	bar	315
Hydraulic fluid		See table below
Hydraulic fluid temperature range	°C	−20 ... +80 (NBR seals) −15 ... +80 (FKM seals)
Viscosity range	mm²/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>
Maximum flow	l/min	60
Maximum set pressure	bar	50; 100; 200; 315
Maximum counter pressure	bar	40 (observe the maximum tank pressure of the subplate-mounted valve/directional valve)

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	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, Fuchs 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:

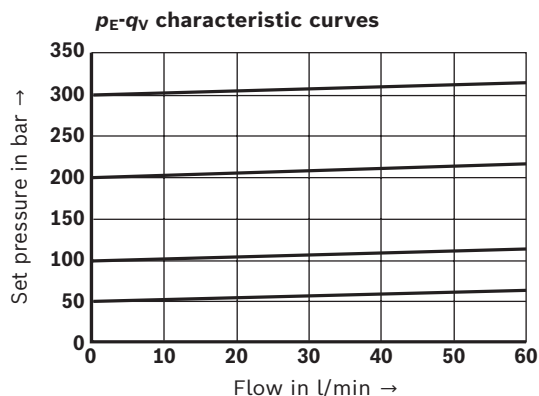
Due to the increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP. In order to reduce the cavitation effect, it is recommended - if possible specific to the installation - to back up the return flow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

<sup>1)</sup> 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.

6/12 ZDB; Z2DB | Pressure relief valve

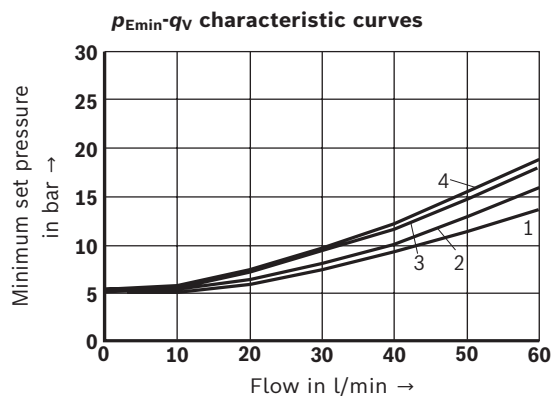
## Characteristic curves

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



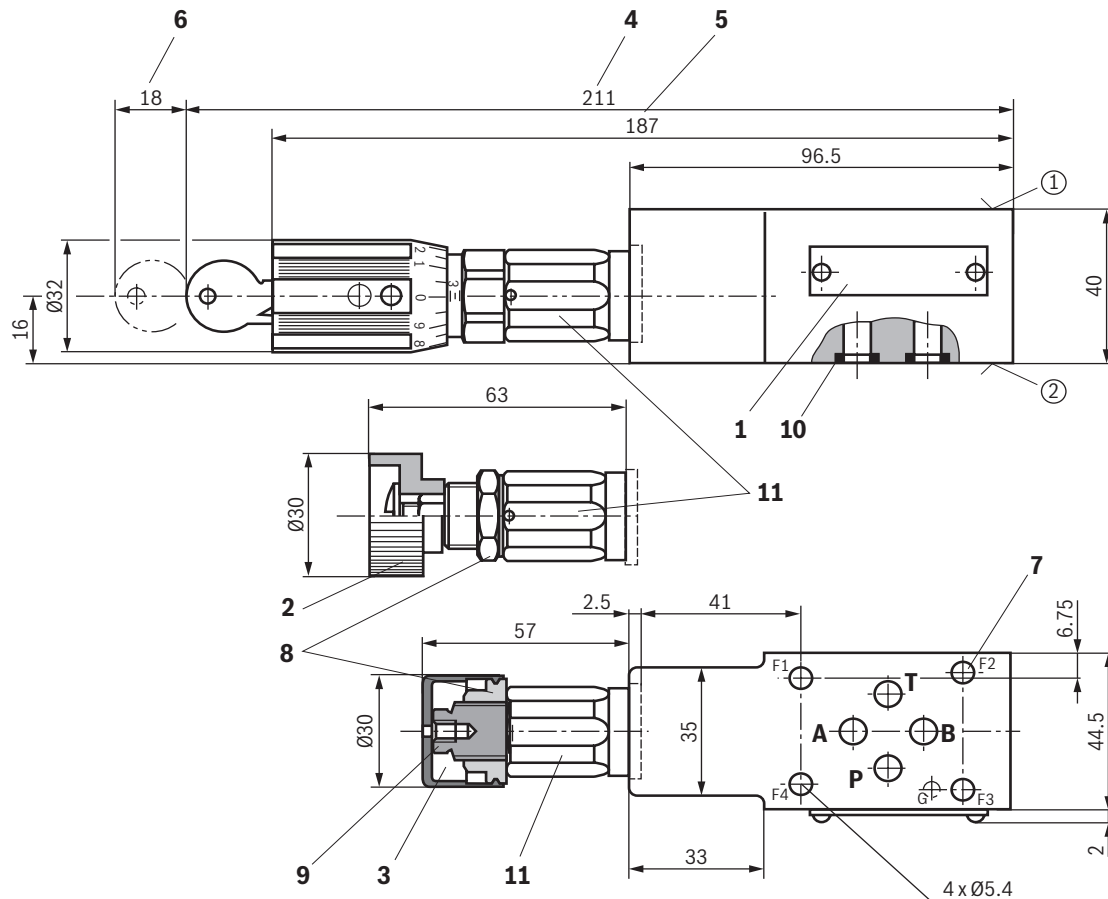
### Notice:

The characteristic curves apply to the pressure at the valve output  $p_T = 0 \text{ bar}$  across the entire flow range.

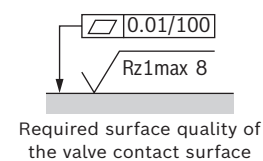


- 1 VD (A to B)
- 2 VA
- 3 VB, VC
- 4 VP, VD

**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 Dimension required to remove the key
- 7 Valve mounting bores
- 8 Lock nut SW24, tightening torque  $M_A = 10^{+5}$  Nm
- 9 Hexagon, wrench size 10
- 10 Identical seal rings for ports A, B, P, T (plate side)
- 11 Hexagon SW24, tightening torque  $M_A = 50$  Nm

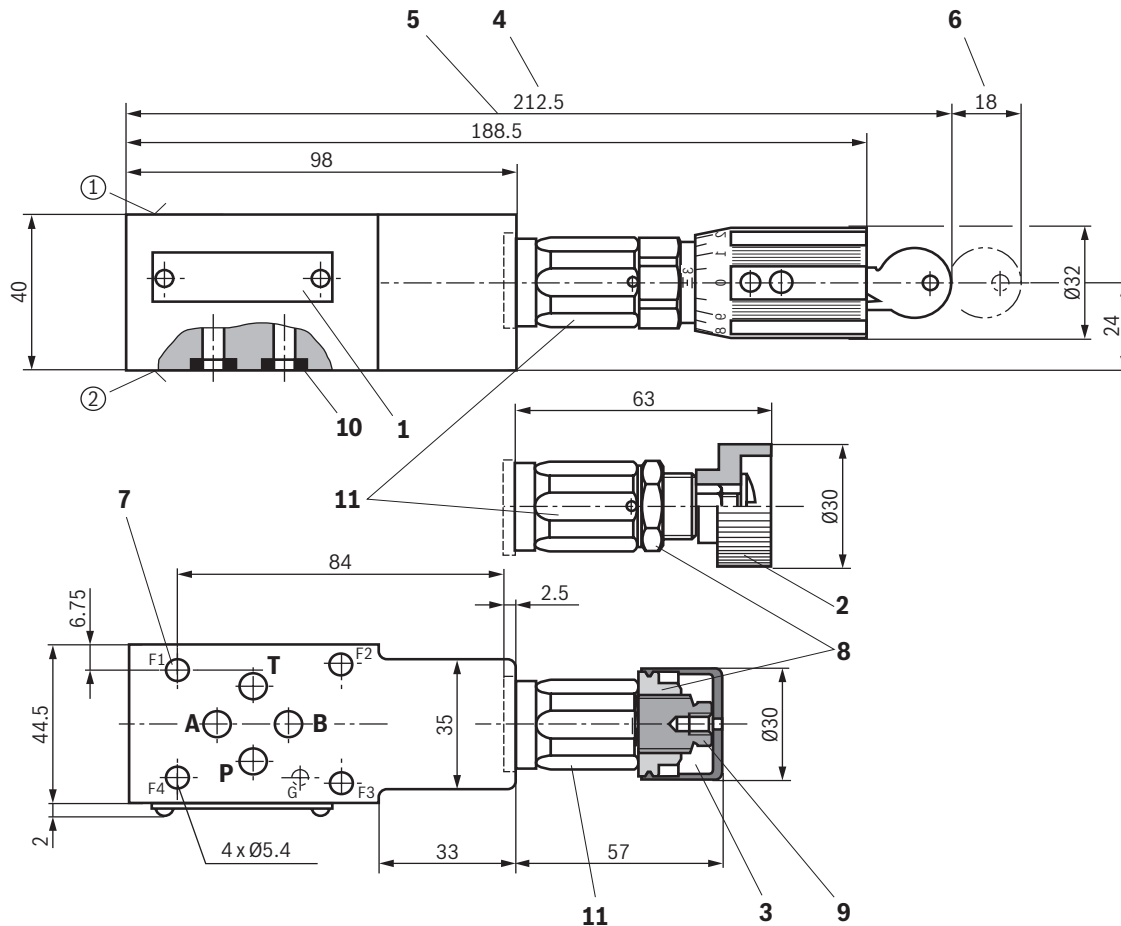


- ① component side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole  $\varnothing 4 \times 4$  mm deep)
- ② plate side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole  $\varnothing 3 \times 5$  mm deep for locking pin ISO 8752-3x8-St, material no. **R900005694**,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

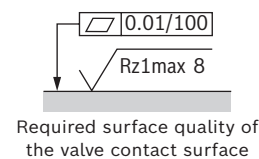
**Valve mounting screws** see page 10.

8/12 ZDB; Z2DB | Pressure relief valve

**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 Dimension required to remove the key
- 7 Valve mounting bores
- 8 Lock nut SW24, tightening torque  $M_A = 10^{+5}$  Nm
- 9 Hexagon, wrench size 10
- 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)

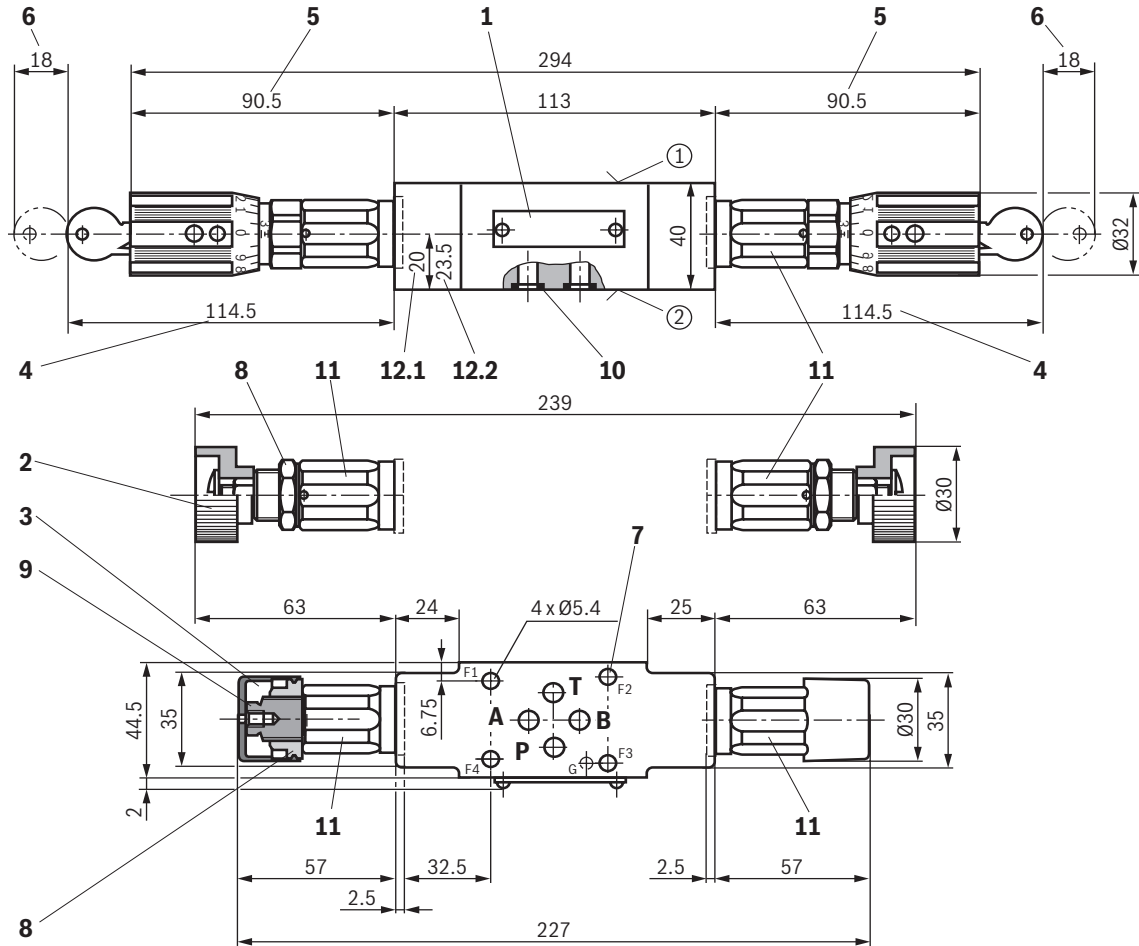


- ② plate side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole Ø3 x 5 mm deep for locking pin ISO 8752-3x8-St, material no. **R900005694**, separate order)

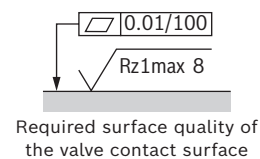
Valve mounting screws see page 10.



**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" and "J5" 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, wrench size 10
- 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 "VD"



- ① component side – Porting pattern according to ISO 4401-03-02-0-05 (with locating hole  $\varnothing 4 \times 4$  mm deep)
- ② plate side – Porting pattern according to 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)

Valve mounting screws see page 10.

10/12 ZDB; Z2DB | Pressure relief valve

## 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
"J5"	4	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 $M_A = 7.4 \text{ Nm} \pm 10\%$	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

- ▶ Pressure relief valve, pilot-operated
- ▶ 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)
- ▶ Use of non-electrical hydraulic components in an explosive environment (ATEX)
- ▶ Hydraulic valves for industrial applications

Data sheet 25731  
 Data sheet 90220  
 Data sheet 90221  
 Data sheet 90222  
 Data sheet 90223  
 Data sheet 07011  
 Operating instructions 07600-B