RE 25761
Edition: 2023-02
Replaces: 2016-12

rexroth
A Bosch Company

Pressure relief valve, pilot-operated

Type ZDB and Z2DB

H7747

- Size 10
- Component series 4X
- Maximum operating pressure 315 bar
- Maximum flow 100 l/min

Features

- Sandwich plate valve
- Porting pattern according to ISO 4401-05-04-0-05
- 4 pressure ratings
- 5 directions of action, optional
- 1 or 2 pressure valve cartridges
- 4 adjustment types for pressure adjustment, optional
  - Rotary knob
  - Sleeve with hexagon and protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- Improved corrosion protection

Contents

Ordering code

01	02	03	04	05	06		07		08	09	10
Z		**DB**	**10**			**–**	**4X**	**/**			

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 10	**10**

Relief function from - to:

05	A – TA	**VA**
	P – TA	**VP ◊**
	B – TB	**VB ◊**
	A – TA and B – TB	**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** [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 ◊**

Corrosion resistance

09	None	**no code ◊**
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227)	**J3** [2)]
	Improved corrosion protection (720 h salt spray test according to EN ISO 9227)	**J5** [2)]

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

10	NBR seals	**no code ◊**
	FKM seals	**V**

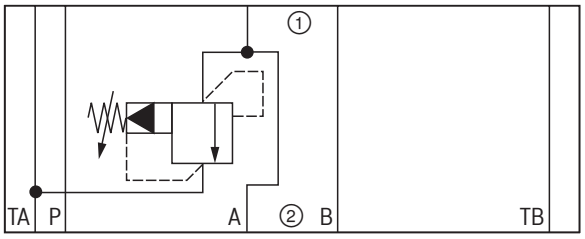
1) H-key with material no. **R900008158** is included in the scope of delivery.

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

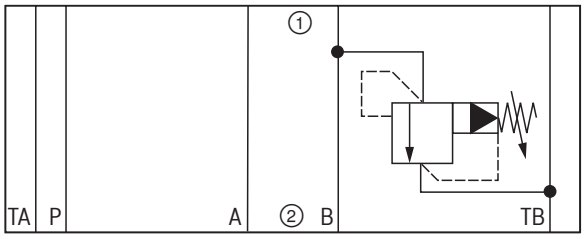
☞ **Notice: ◊** = Preferred type

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

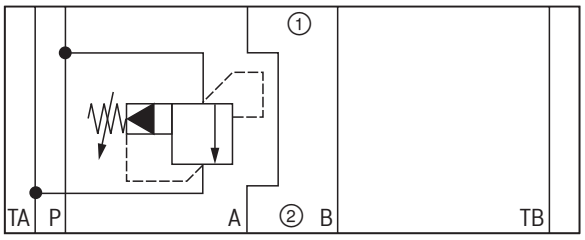
"ZDB 10 **VA**..."



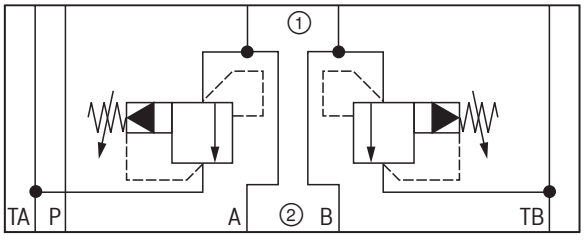
"ZDB 10 **VB**..."



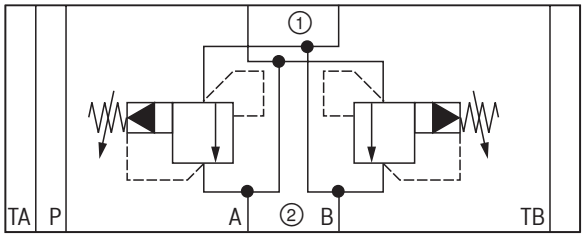
"ZDB 10 **VP**..."



"Z2DB 10 **VC**..."



"Z2DB 10 **VD**..."

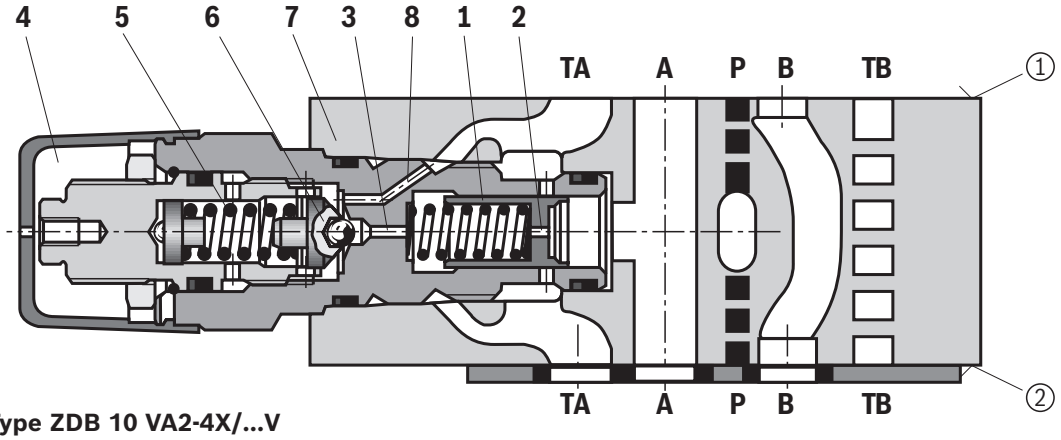


☞ **Notice:**
Deviating from ISO 4401, port T is called TA and port T1 is called TB in this data sheet.

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).

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) and channel (8) into channel T (TA). The resulting pressure drop moves the spool (1) and opens the connection from A to T (TA). Channel A is pressurized to the pressure set at the spring (5).



Type ZDB 10 VA2-4X/...V

① = component side
② = plate side

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

General			
Weight	▶ Type ZDB	kg	Approx. 2.4
	▶ Type Z2DB	kg	Approx. 2.6
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	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	100
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, HVLPD	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, Fuchs Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	NBR	ISO 12922	90223

☞ **Important information on hydraulic fluids:**

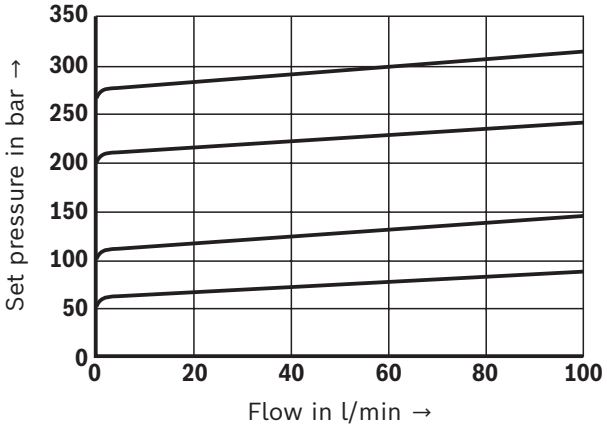
- For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- The ignition temperature of the hydraulic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

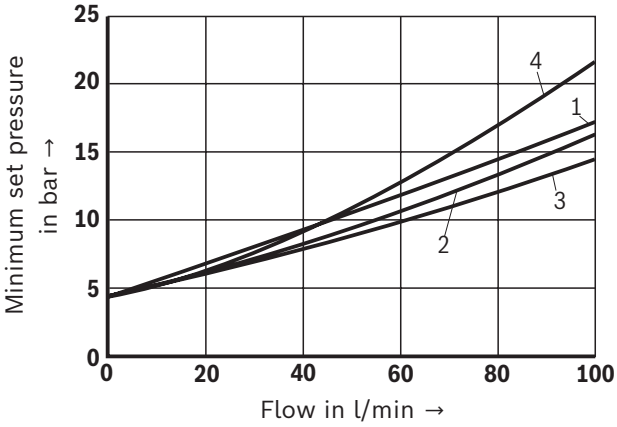
Characteristic curves

(measured with HLP46, ϑ_{oil} = 40 ±5 °C)

p_E-q_V characteristic curves



p_{Emin}-q_V characteristic curves

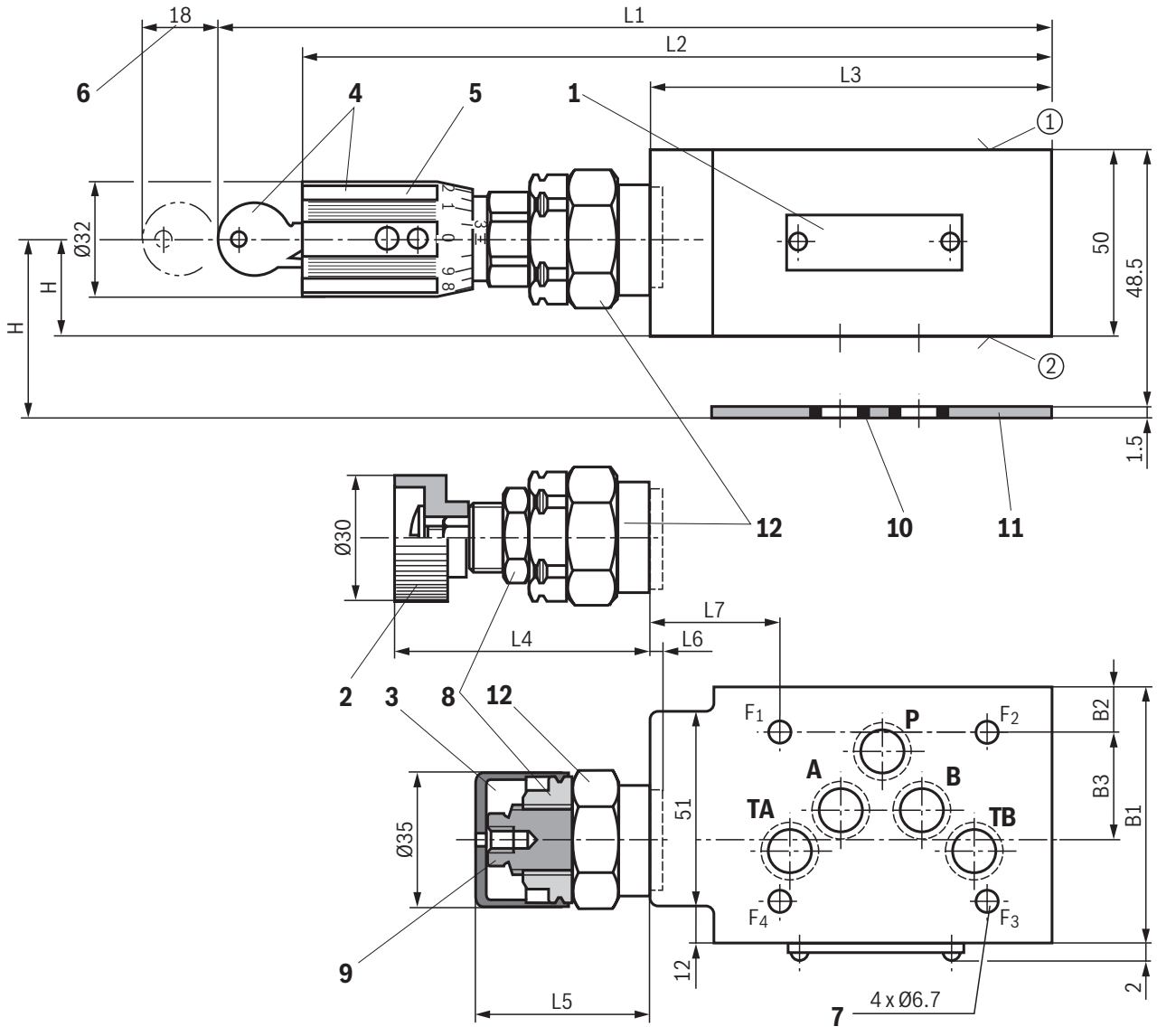


☞ **Notice:**

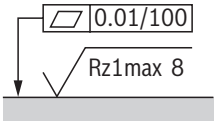
- The characteristic curves apply to the pressure at the valve output p_T = 0 bar across the entire flow range.
- Typical characteristic curves which are subject to tolerance variations.

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

Dimensions: Type ZDB 10 **VA**... and type ZDB 10 **VP**...
(dimensions in mm)



Item explanations and valve mounting screws see page 10.

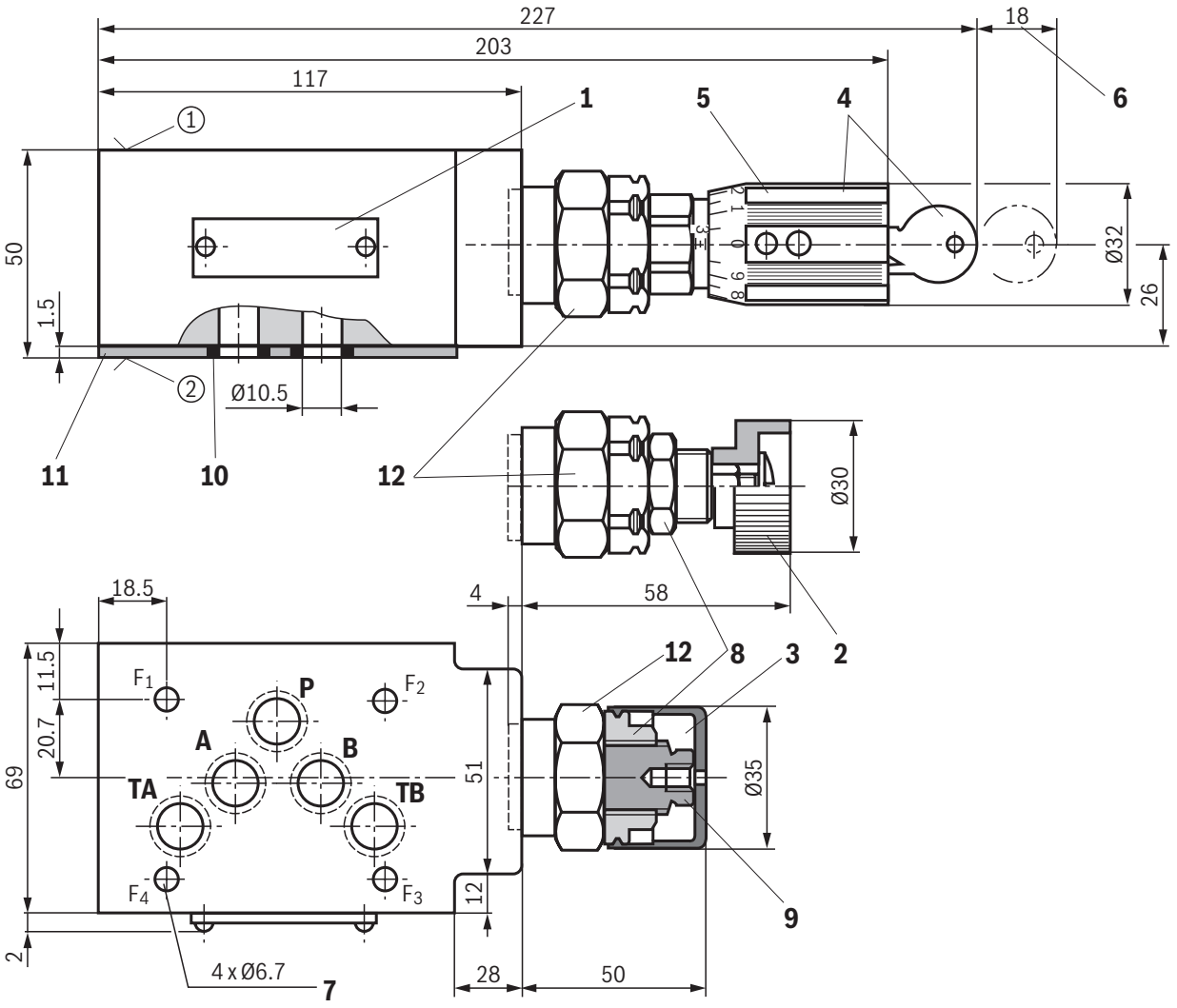


Required surface quality of the valve contact surface

☞ **Notice:**
Deviating from ISO 4401, port T is called TA and port T1 is called TB in this data sheet.

Type	B1	B2	B3	H	L1	L2	L3	L4	L5	L6	L7
VA, VP	69	11.5	20.7	26	227	203	117	57.6	50.3	4	45.5

Dimensions: Type ZDB 10 **VB**
(dimensions in mm)



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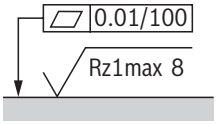
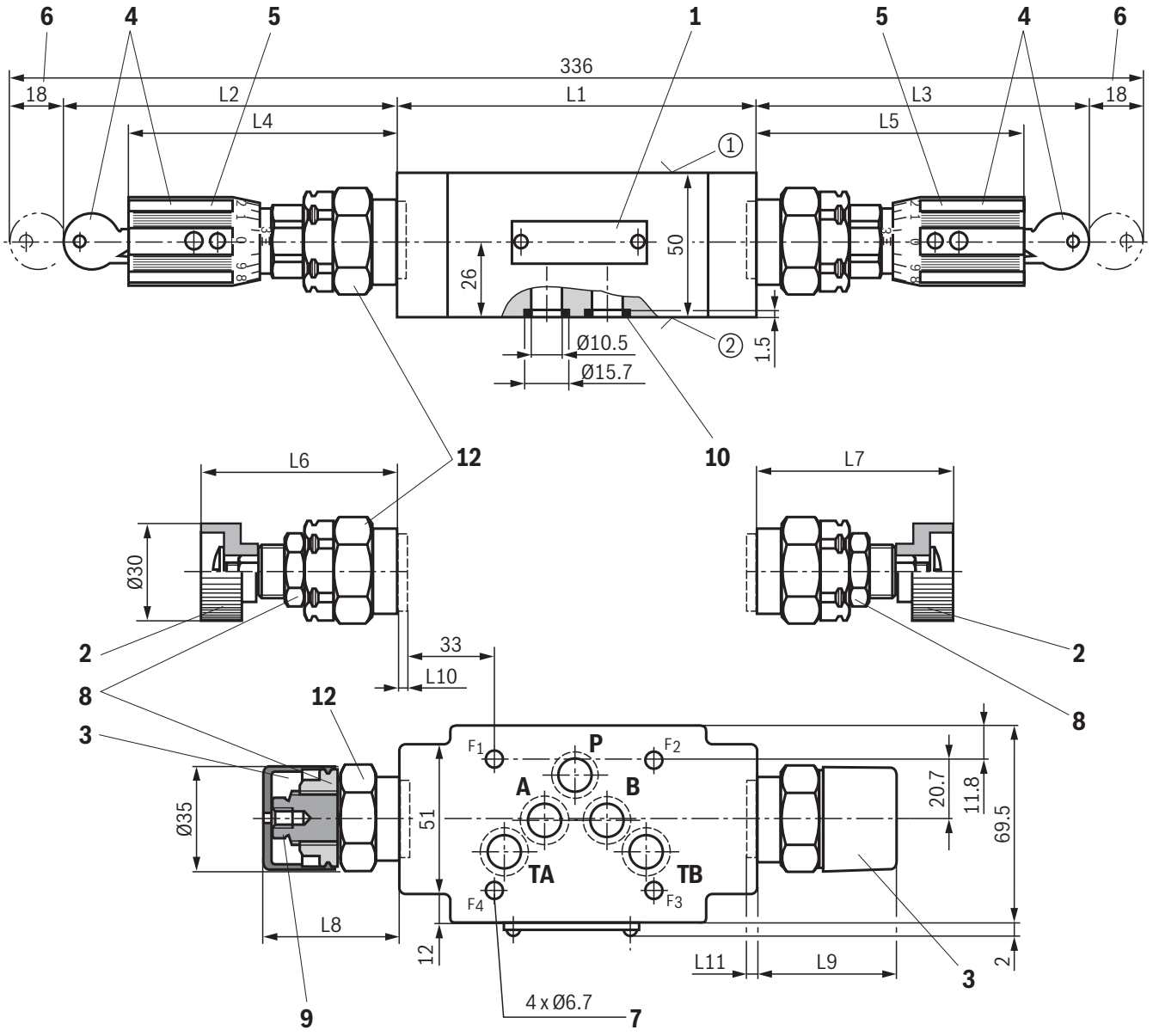


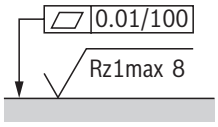
Required surface quality of the valve contact surface

☞ **Notice:**
Deviating from ISO 4401, port T is called TA and port T1 is called TB in this data sheet.

Dimensions: Type Z2DB 10 **VC**... and type Z2DB 10 **VD**...
(dimensions in mm)



Item explanations and valve mounting screws see page 10.



Required surface quality of the valve contact surface

☞ **Notice:**
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Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
VC	123	111	112	89	90	59	60	52	53	2	1
VD	132	107	112	85	90	56	56	49	49	6	6

Dimensions

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, TA, TB (plate side)
11 Seal plate 80 x 70 x 1.5
12 Hexagon SW30, tightening torque $M_A = 50$ Nm

① component side – Porting pattern according to ISO 4401-05-04-0-05
② plate side – Porting pattern according to ISO 4401-05-04-0-05

Valve mounting screws (separate order)

Version	Quantity	Hexagon socket head cap screws	Material number
"J3"	4	**ISO 4762 - M6 - 10.9-CM-Fe-ZnNi-5-Cn-T0-H-B** Friction coefficient μ_{total} = 0.09 ... 0.14	Not included in the Rexroth delivery range
"J5"	4	**ISO 4762 - M6 - 10.9-CM-Fe-ZnNi-8-Cn-T0-H-B** Friction coefficient μ_{total} = 0.09 ... 0.14	Not included in the Rexroth delivery range
Without corrosion protection	4	▶ **ISO 4762 - M6 - 10.9** Friction coefficient μ_{total} = 0.12 ... 0.17	Not included in the Rexroth delivery range

☞ **Notice:**
Length and tightening torque of the valve mounting screws must be calculated in connection with the components mounted underneath and above the sandwich plate valve.

Accessories (separate order)

Denomination	Material no.
Protective cap	R900135501

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