

# Pressure relief valve, pilot operated

**RE 25761/05.11**  
Replaces: 02.03

1/10

## Type ZDB and Z2DB

Size 10  
Component series 4X  
Maximum operating pressure 315 bar [4600 psi]  
Maximum flow 100 l/min [26.4 US gpm]



H7747

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## Features

- Sandwich plate valve
- Porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
- 4 pressure ratings
- 6 circuit options
- With 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

Information on available spare parts:  
[www.boschrexroth.com/spc](http://www.boschrexroth.com/spc)

## Ordering code

Z		DB	10			4X		*
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Sandwich plate	= Z
1 pressure valve cartridge (Only with version "VA", "VB", "VT" and "VP")	= No code
2 pressure valve cartridges (Only with version "VC" and "VD")	= 2
Pressure relief valve	= DB
Size 10	= 10
<b>Relief function from - to:</b>	
A - TA	= VA
P - TA	= VP
TB1 - TA2	= VT
B - TB	= VB
A - TA and B - TB	= VC
A - B and B - A	= VD

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

 **Note!**

To port X and Y bored according to ISO 4401-05-05-0-05 (e.g. for pilot operated directional valve size 10), version "**SO30**" at the end of the ordering code applies!

Further details in the plain text

**Seal material**

**No code =** NBR seals  
**V =** FKM seals  
 (other seals upon request)  
 Attention!  
 Observe compatibility of seals with hydraulic fluid used!

**50 =** Setting pressure up to 50 bar [725 psi]  
**100 =** Setting pressure up to 100 bar [1450 psi]  
**200 =** Setting pressure up to 200 bar [2900 psi]  
**315 =** Setting pressure up to 315 bar [4600 psi]

**4X =** Component series 40 to 49  
 (40 to 49: Identical installation and connection dimensions)

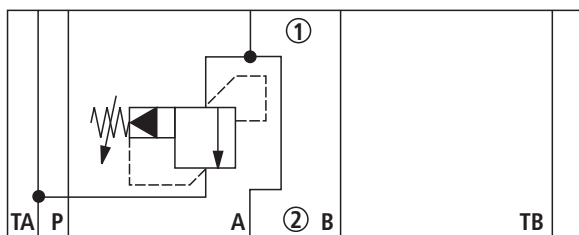
**Adjustment type for pressure adjustment**

**1 =** Rotary knob  
**2 =** Bushing with hexagon and protective cap  
**3 =** Lockable rotary knob with scale <sup>1)</sup>  
**7 =** Rotary knob with scale

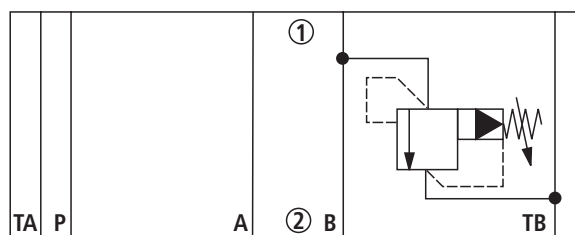
**Standard types and standard units are contained in the EPS (standard price list).**

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

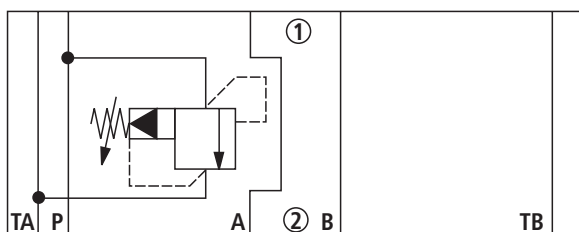
Type ZDB 10 VA...



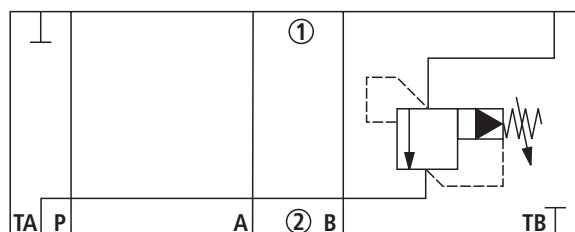
Type ZDB 10 VB...



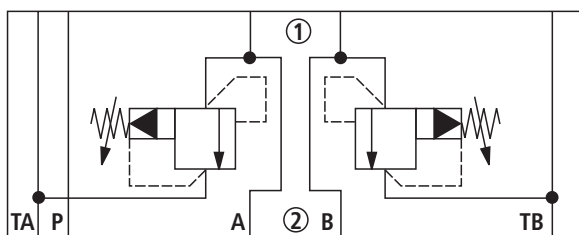
Type ZDB 10 VP...



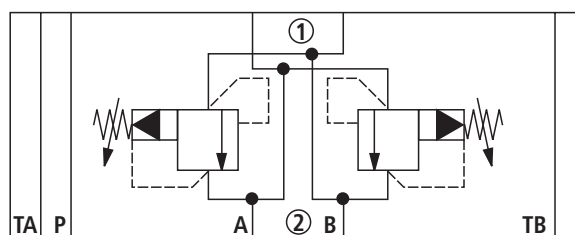
Type ZDB 10 VT...



Type Z2DB 10 VC...



Type Z2DB 10 VD...


**Note!**

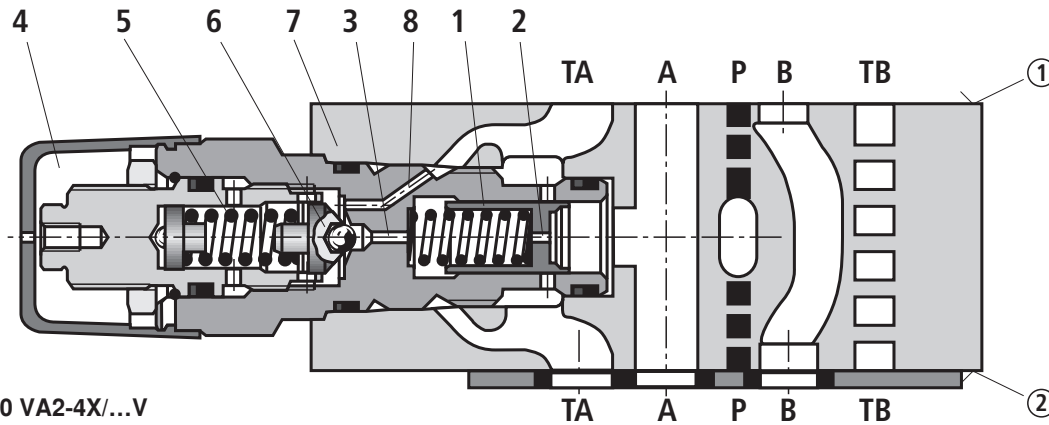
Deviating from ISO 4401, port T is in this data sheet called TA, port T1 is called TB.

## 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 a 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, the 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 the channel T (TA). The resulting pressure drop moves the spool (1) and opens the connection A to T (TA). In channel A, the pressure set at the spring (5) is set.



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

① = component side

② = plate side

## Technical Data (For applications outside these parameters, please consult us!)


### general

Weight	- Type ZDB	kg [lbs]	Approx. 2.4 [5.3]
	- Type Z2DB	kg [lbs]	Approx. 2.6 [5.7]

### hydraulic

Maximum operating pressure	bar [psi]	315 [4600]
Maximum setting pressure	bar [psi]	50 [725]; 100 [1450]; 200 [2900]; 315 [4600]
Maximum flow	l/min [US gpm]	100 [26.4]
Hydraulic fluid		See table below
Hydraulic fluid temperature range	°C [°F]	-20 to +80 [-4 to +176]
Viscosity range	mm <sup>2</sup> /s [SUS]	10 to 800 [60 to 3710]
Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)		Class 20/18/15 <sup>1)</sup>

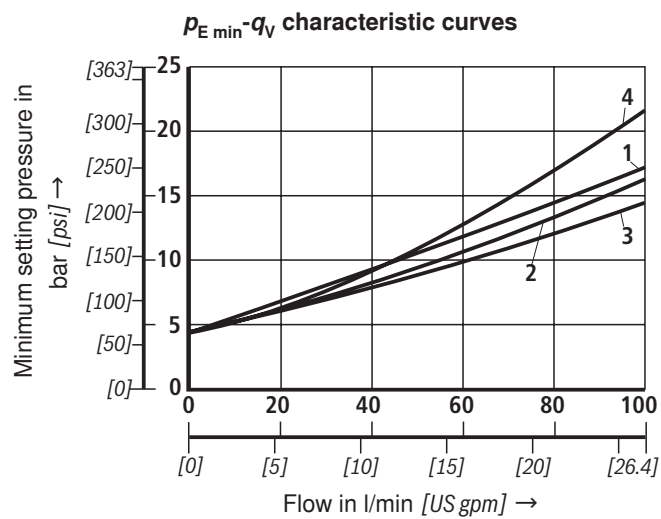
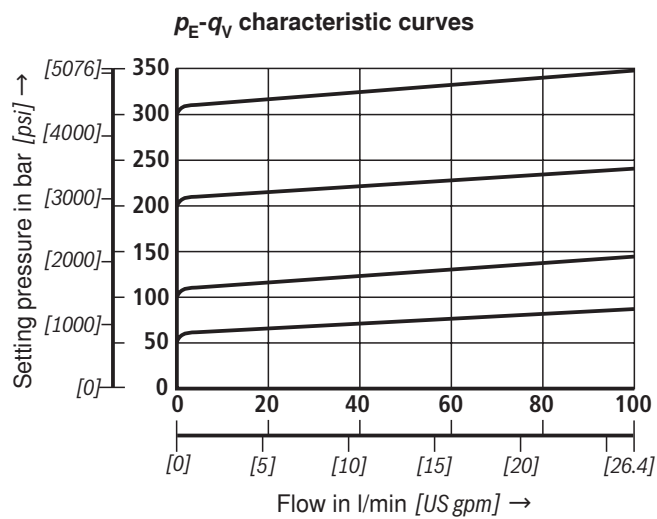
Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oils and related hydrocarbons	HL, HLP, HLPD	NBR, FKM	DIN 51524
Environmentally compatible	- Insoluble in water	HETG HEES	NBR, FKM FKM
	- Soluble in water	HEPG	FKM
Flame-resistant	- Water-free	HFDU, HFDR	FKM
	- Water-containing	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	NBR

<p> <b>Important information on hydraulic fluids!</b></p> <ul style="list-style-type: none"> <li>- For more information and data on the use of other hydraulic fluids refer to data sheet 90220 or contact us!</li> <li>- There may be limitations regarding the technical valve data (temperature, pressure range, service life, maintenance intervals, etc.)!</li> </ul>	<ul style="list-style-type: none"> <li>- <b>Flame-resistant – water-containing:</b> <ul style="list-style-type: none"> <li>• Maximum operating pressure 210 bar</li> <li>• Maximum hydraulic fluid temperature 60 °C</li> <li>• Expected service life as compared to HLP hydraulic oil 30 % to 100 %</li> </ul> </li> </ul>
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<sup>1)</sup> The cleanliness classes stated for the components need to be maintained in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components.

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

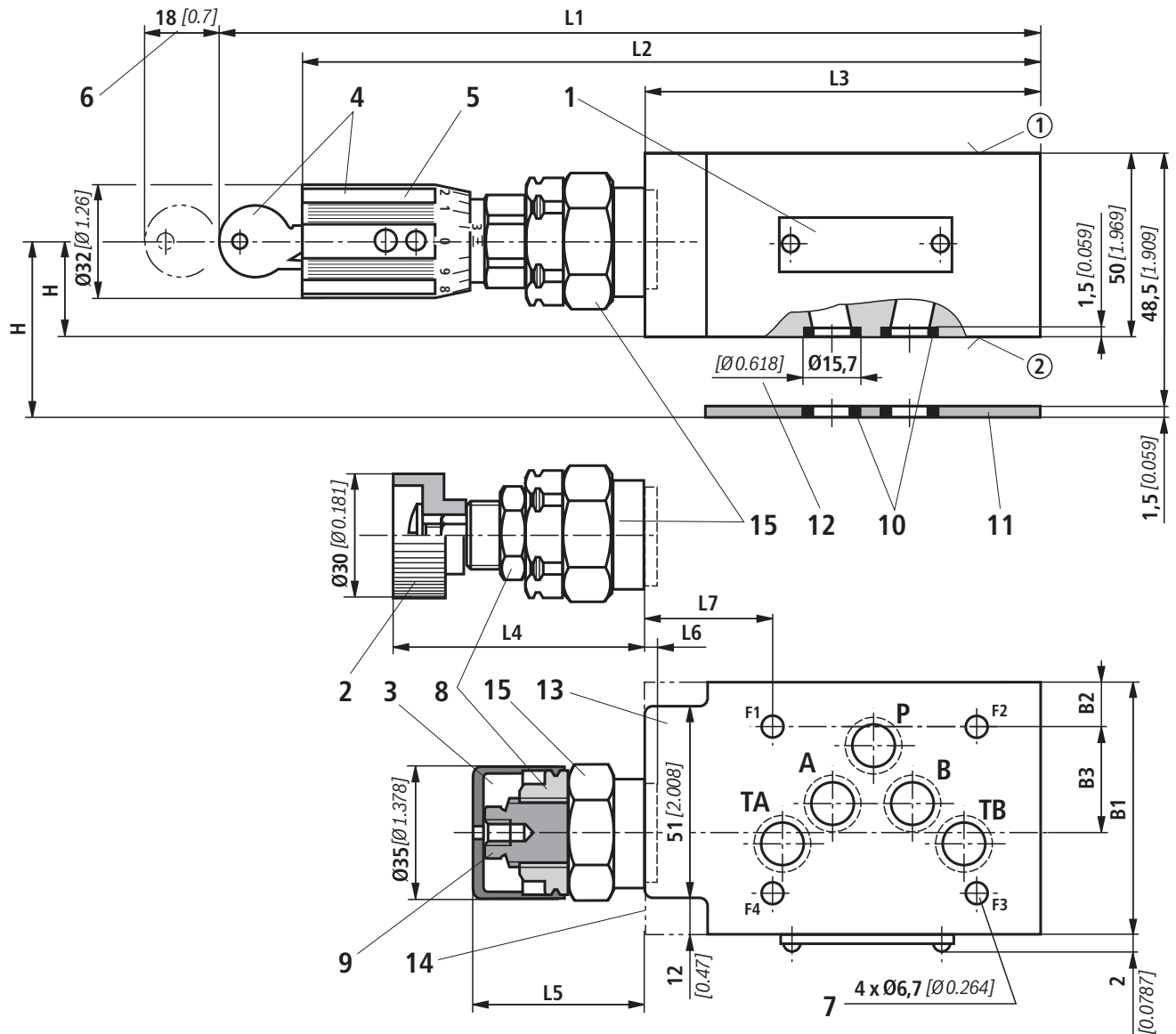
## Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$ [ $104 \pm 9 \text{ }^\circ\text{F}$ ])



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, VT
- 4 VP, VD (B to A)

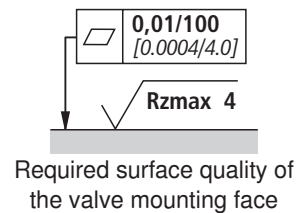
**Unit dimensions: Type ZDB 10 VA, VP and VT (dimensions in mm [inch])**



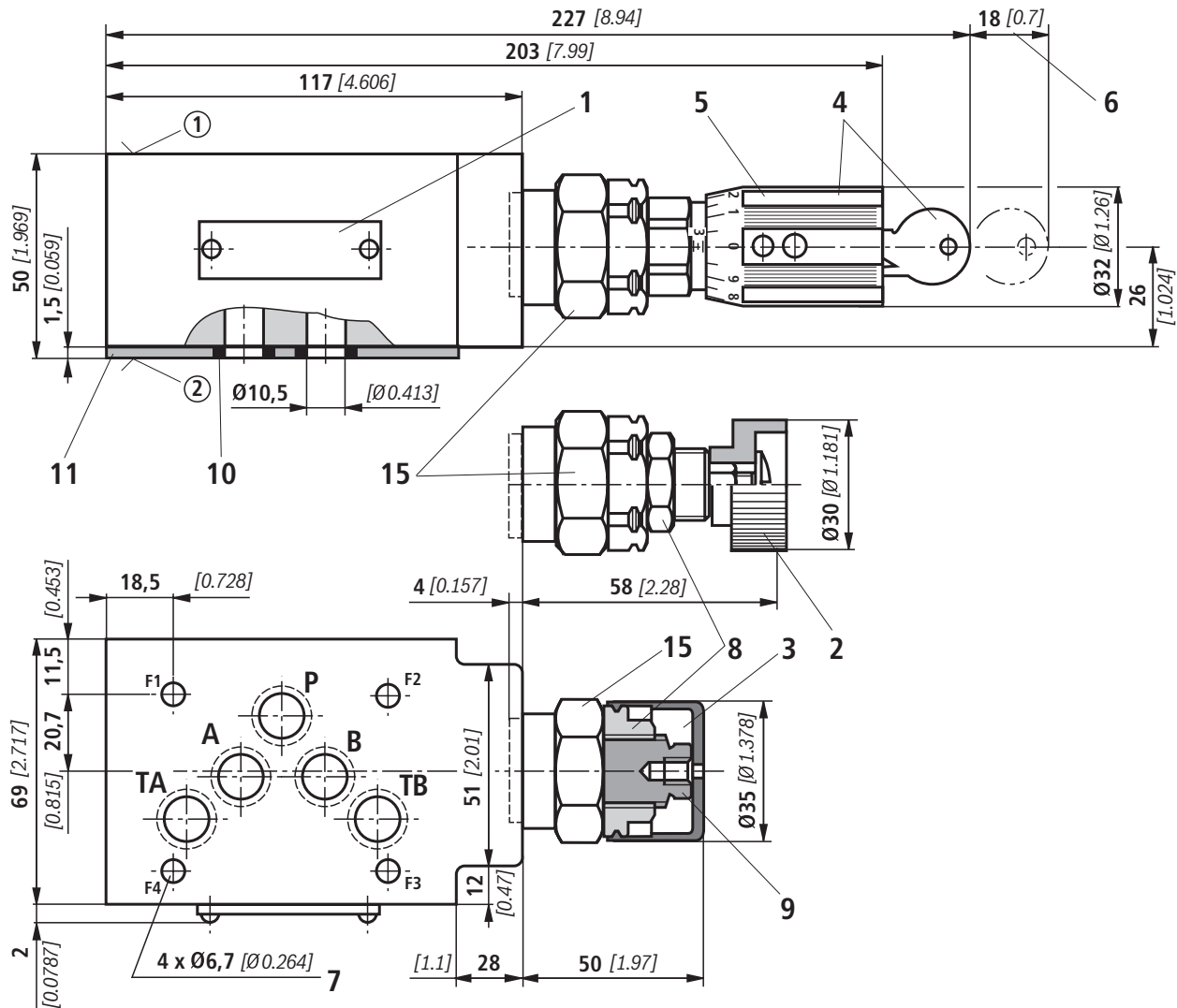
Item explanations and valve mounting screws see page 10.

**Notes!**

- To port X and Y bored according to ISO 4401-05-05-0-05 (e.g. for pilot operated directional valve size 10), version "SO30" at the end of the ordering code applies!
- Deviating from ISO 4401, port T is in this data sheet called TA, port T1 is called TB.



Type	B1	B2	B3	H	L1	L2	L3	L4	L5	L6	L7
VA and VP	69 [2.72]	11.5 [0.45]	20.7 [0.82]	26 [1.02]	227 [8.94]	203 [7.99]	117 [4.61]	57.6 [2.27]	50.3 [1.98]	4 [0.16]	45.5 [1.79]
VT	70 [2.76]	12 [0.47]	27 [1.06]	25 [0.98]	218 [8.58]	194 [7.64]	105 [4.13]	60.9 [2.40]	53.6 [2.11]	0.7 [0.027]	32.5 [1.28]

**Unit dimensions: Type ZDB 10 VB (dimensions in mm [inch])**


Item explanations and valve mounting screws see page 10.

**Notes!**

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- Deviating from ISO 4401, port T is in this data sheet called TA, port T1 is called TB.

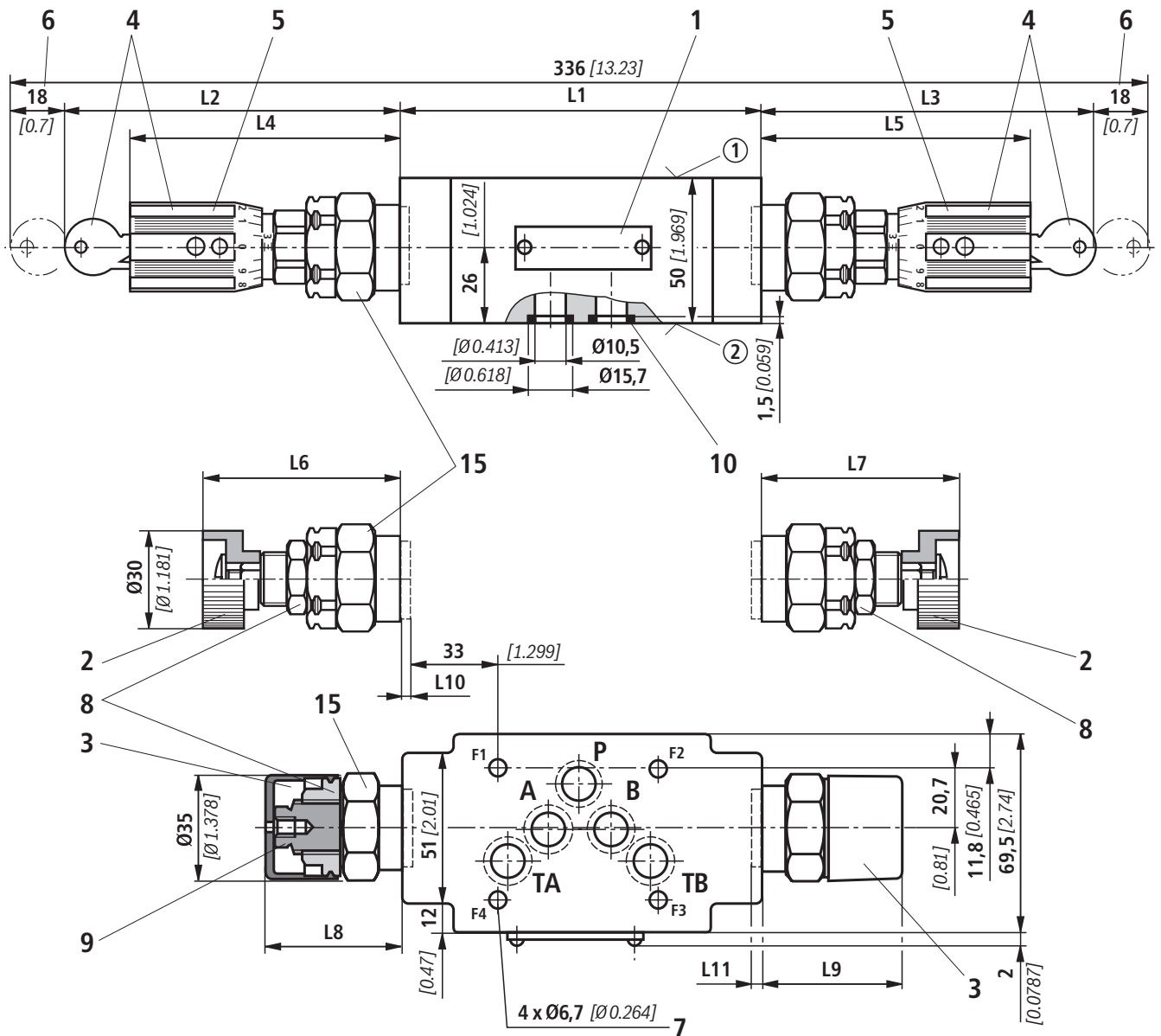
$\sqrt{0,01/100}$   
[0.0004/4.0]

Rzmax 4

Required surface quality of the valve mounting face



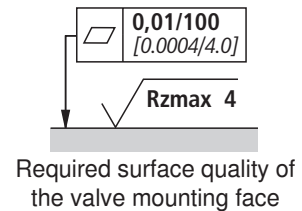
**Unit dimensions: Type Z2DB 10 VC and VD (dimensions in [inch])**



Item explanations and valve mounting screws see page 10.

**Notes!**

- To port X and Y bored according to ISO 4401-05-05-0-05 (e.g. for pilot operated directional valve size 10), version "SO30" at the end of the ordering code applies!
- Deviating from ISO 4401, port T is in this data sheet called TA, port T1 is called TB.



Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
VC	123 [4.84]	111 [4.37]	112 [4.40]	89 [3.50]	90 [3.54]	59 [2.32]	60 [2.36]	52 [2.05]	53 [2.09]	2 [0.08]	1 [0.04]
VD	132 [5.20]	107 [4.20]	112 [4.40]	85 [3.30]	90 [3.54]	56 [2.20]	56 [2.20]	49 [1.93]	49 [1.93]	6 [0.24]	6 [0.24]

## Unit dimensions

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- 1 Name plate
  - 2 Adjustment type "1"
  - 3 Adjustment type "2"
  - 4 Adjustment type "3"
  - 5 Adjustment type "7"
  - 6 Dimensions required to remove the key
  - 7 Valve mounting bores
  - 8 Lock nut SW24
  - 9 Hexagon SW10
  - 10 Identical seal rings for ports A, B, P, TA, TB (plate side)
  - 11 Sealing plate 80 x 70 x 1.5 [2.76 x 3.15 x 0.06] (only with version "VA" and "VP")
  - 12 Counterbore (only with version "VT")
  - 13 Version "VA" and "VP"
  - 14 Version "VT"
  - 15 Hexagon SW30, tightening torque  $M_A = 50 \text{ Nm}$   
[36.8 ft-lbs]
- ① Component side – porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05
- ② Component side – porting pattern according to ISO 4401-05-04-0-05 and NFPA T3.5.1 R2-2002 D05

**Valve mounting screws** (separate order)

**4 hexagon socket head cap screws metric**  
ISO 4762 - M6 - 10.9-fIZn-240h-L

**4 hexagon socket head cap screws 1/4-20 UNC**

 **Note!**

Length and tightening torque of the valve mounting screws must be calculated according to the components mounted under and over the sandwich plate valve.

## Notes

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## Notes

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