

Pressure relief valve, pilot operated

RA 25761/02.03
Replaces: 06.98

1/8

Models ZDB and Z2DB

Nominal size 10
Series 4X
Maximum operating pressure 315 bar (4600 PSI)
Maximum flow 100 L/min (26.4 GPM)

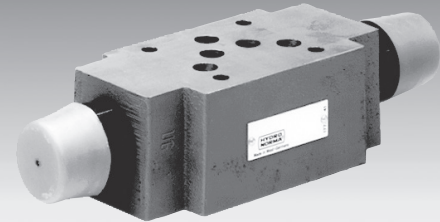


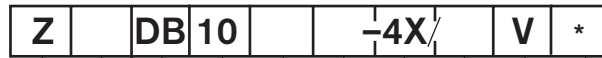
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Features

- Sandwich plate valve
- Porting pattern to ISO 4401-3, NFFPA T3.5.1M R1 and ANSI B93.7 D 05
- 4 pressure stages
- 6 circuit options
- With 1 or 2 pressure relief cartridges
- 4 adjustment elements:
 - Rotary knob
 - Sleeve with hexagon and protective cap
 - Lockable rotary knob with scale
 - Rotary knob with scale

Ordering details



- Sandwich plate = Z
- With 2 pressure valve cartridges = 2
(only for versions VC and VD)
- Pressure relief valve = DB
- Nominal size 10 = 10
- Relief function from – to:**
- A – TA = VA
- P – TA = VP
- TB1 – TA2 = VT
- B – TB = VB
- A – TA and B – TB = VC
- A – B and B – A = VD

¹⁾ H-key to Material No. **R900008158** is included within the scope of supply

Further details in clear text
 V = FKM seals
 (other seals on request)
⚠ Attention!
 The compatibility of the seals and pressure fluid has to be taken into account!

- 50 = Settable pressure up to 50 bar (725 PSI)
- 100 = Settable pressure up to 100 bar (1450 PSI)
- 200 = Settable pressure up to 200 bar (2900 PSI)
- 315 = Settable pressure up to 315 bar (4600 PSI)

4X = Series 40 to 49
 (40 to 49: unchanged installation and connection dimensions)

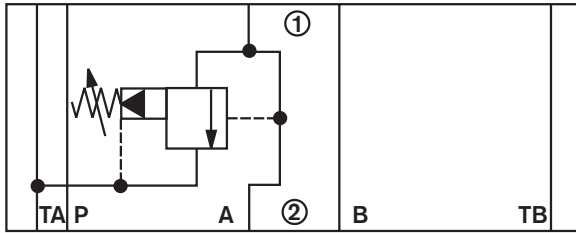
- Adjustment element**
- 1 = Rotary knob
 - 2 = Sleeve with hexagon and protective cap
 - 3 = Lockable rotary knob with scale ¹⁾
 - 7 = Rotary knob with scale

Standard types

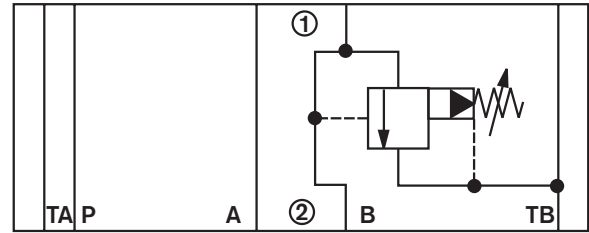
Type	Material No.
ZDB 10 VA2-4X/50V	R900423244
ZDB 10 VA2-4X/100V	R900424537
ZDB 10 VA2-4X/315V	R900409955
ZDB 10 VB2-4X/50V	R900425723
ZDB 10 VB2-4X/100V	R900409951
ZDB 10 VB2-4X/315V	R900409956
ZDB 10 VP2-4X/50V	R900422752
ZDB 10 VP2-4X/100V	R900409959
ZDB 10 VP2-4X/315V	R900409958
Z2DB 10 VC2-4X/50V	R900441974
Z2DB 10 VC2-4X/100V	R900425700
Z2DB 10 VC2-4X/315V	R900411430

Symbols (1) = valve side, (2) = subplate side

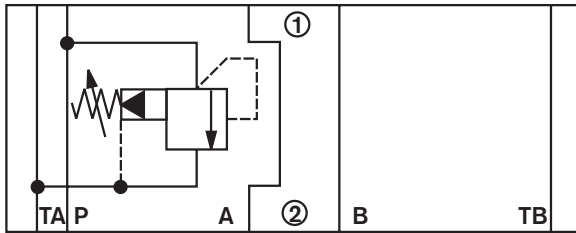
Type ZDB 10 VA..



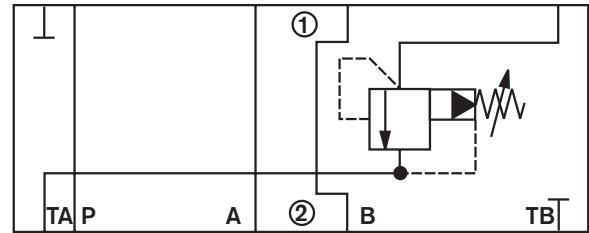
Type ZDB 10 VB..



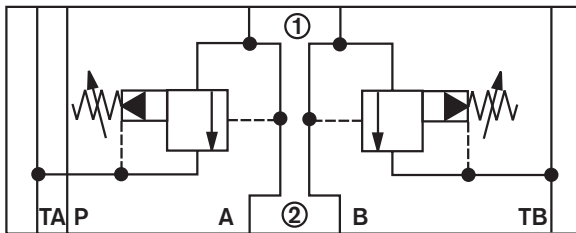
Type ZDB 10 VP..



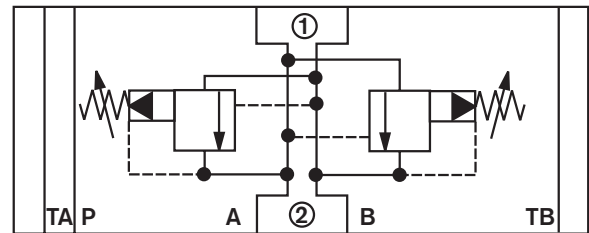
Type Z2DB 10 VT..



Type Z2DB 10 VC..



Type Z2DB 10 VD..



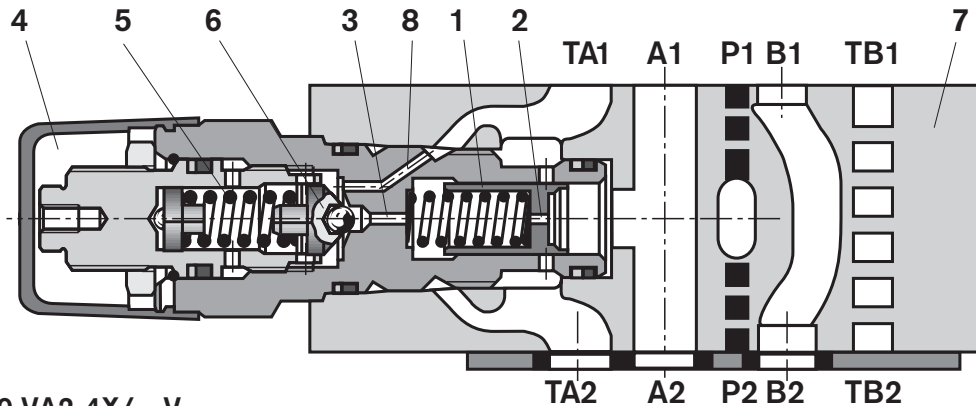
Functional description, cross-section

Pressure valves types ZDB and Z2DB are pilot operated pressure relief valves of sandwich plate design. They are used to limit the pressure within a hydraulic system. They basically consist of the housing (7) together with one or two pressure relief valve cartridges. The system pressure is set by means of the adjustment element (4).

At rest, the valve is closed. Pressure in port A acts on the spool (1). At the same time pressure is applied via orifice (2), on to the spring loaded side of the spool (1) and via orifice (3) on to the

pilot poppet (6). If the pressure in port A rises above the value set on spring (5), then the pilot poppet (6) opens. Fluid can now flow from the spring loaded side of spool (1), orifice (3) and channel (8) into port T. The resulting pressure drop moves the spool (1) causing this to open the connection from A to T, while the pressure set at spring (5) is maintained.

Pilot oil return from the two spring chambers is taken externally via port T.



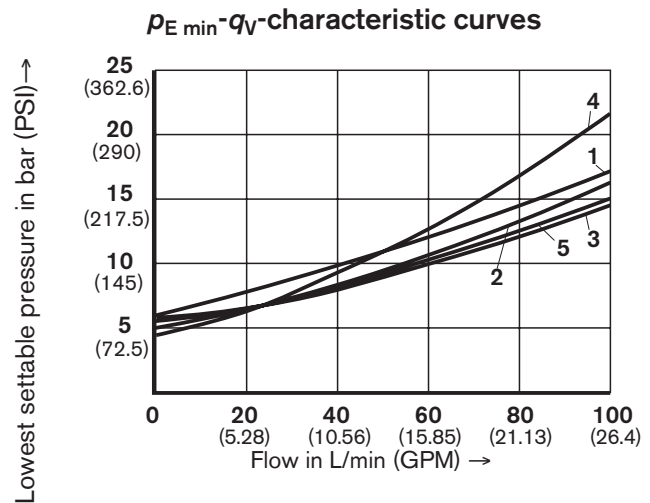
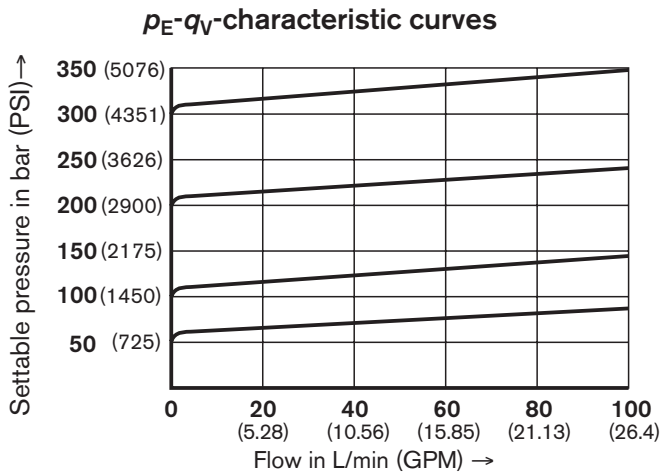
Type ZDB 10 VA2-4X/...V

Technical data (for applications outside these parameters, please consult us!)

Pressure fluid	Mineral oil (HL, HLP) to DIN 51 524; Fast bio-degradable pressure fluids to VDMA 24 568 (also see RE 90 221); HETG (rape seed oil); HEPG (polyglycols); HEES (synthetic ester); Other pressure fluids on request		
Pressure fluid temperature range	°C (°F)	-20 to +80 (-4 to 176)	
Viscosity range	mm ² /s (SUS)	10 to 800 (60 to 3710)	
ISO code cleanliness class	Maximum permissible degree of contamination of the pressure fluid is to ISO 4406 (C) class 20/18/15 ¹⁾		
Maximum operating pressure	bar (PSI)	315 (4600)	
Maximum settable pressure	bar (PSI)	50; 100; 200; 315 (725; 1450; 2900; 4600)	
Maximum flow	L/min (GPM)	100 26.4)	
Weight	Type ZDB 10	kg (lbs)	Approx. 2.4 (5.3)
	Type Z2DB 10	kg (lbs)	Approx. 2.6 (5.7)

¹⁾ The cleanliness class stated for the components must be adhered to in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life.
For the selection of filters see catalogue sheets:
RE 50 070, RE 50 076 and RE 50 081.

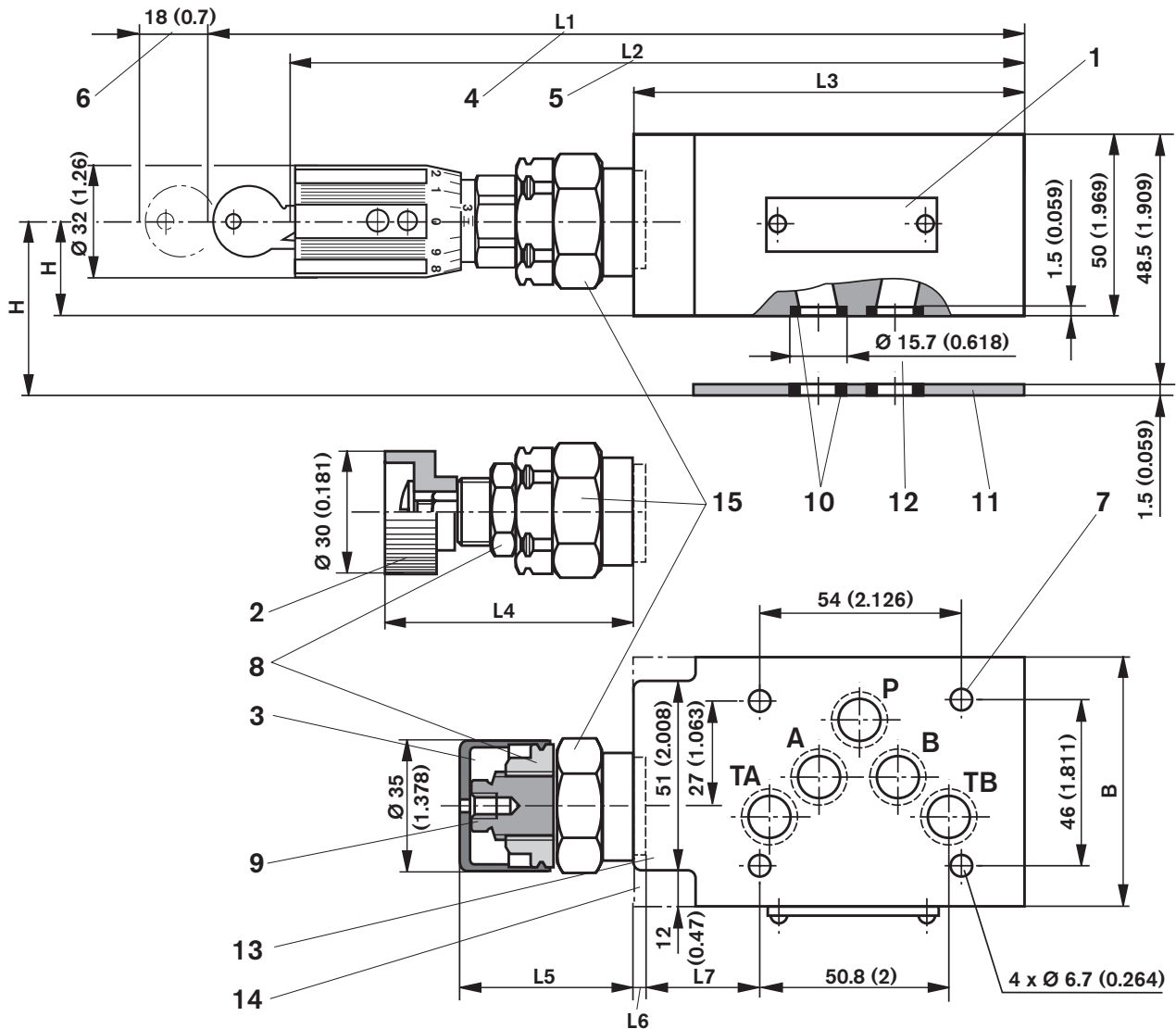
Characteristic curves – measured with HLP46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$ (104 °F \pm 41 °F)



The characteristic curves are valid for the outlet pressure = zero over the entire flow range!

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

Unit dimensions: types ZDB 10 VA, VP and VT – dimensions in mm (inches)



0.01/100 mm
0.0004/4.0 in
 $\sqrt{R_{\max} 4}$
Required surface finish of the mating piece

	VA and VP	VT
B	69 (2.72)	70 (2.76)
H	26 (1.02)	25 (0.98)
L1	227 (8.94)	218 (8.58)
L2	203 (7.99)	194 (7.64)
L3	117 (4.61)	105 (4.13)
L4	57.6 (2.27)	60.9 (2.40)
L5	50.3 (1.98)	53.6 (2.11)
L6	4 (0.16)	0.7 (0.028)
L7	41.5 (1.63)	31.8 (1.25)

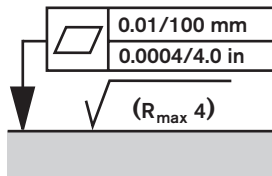
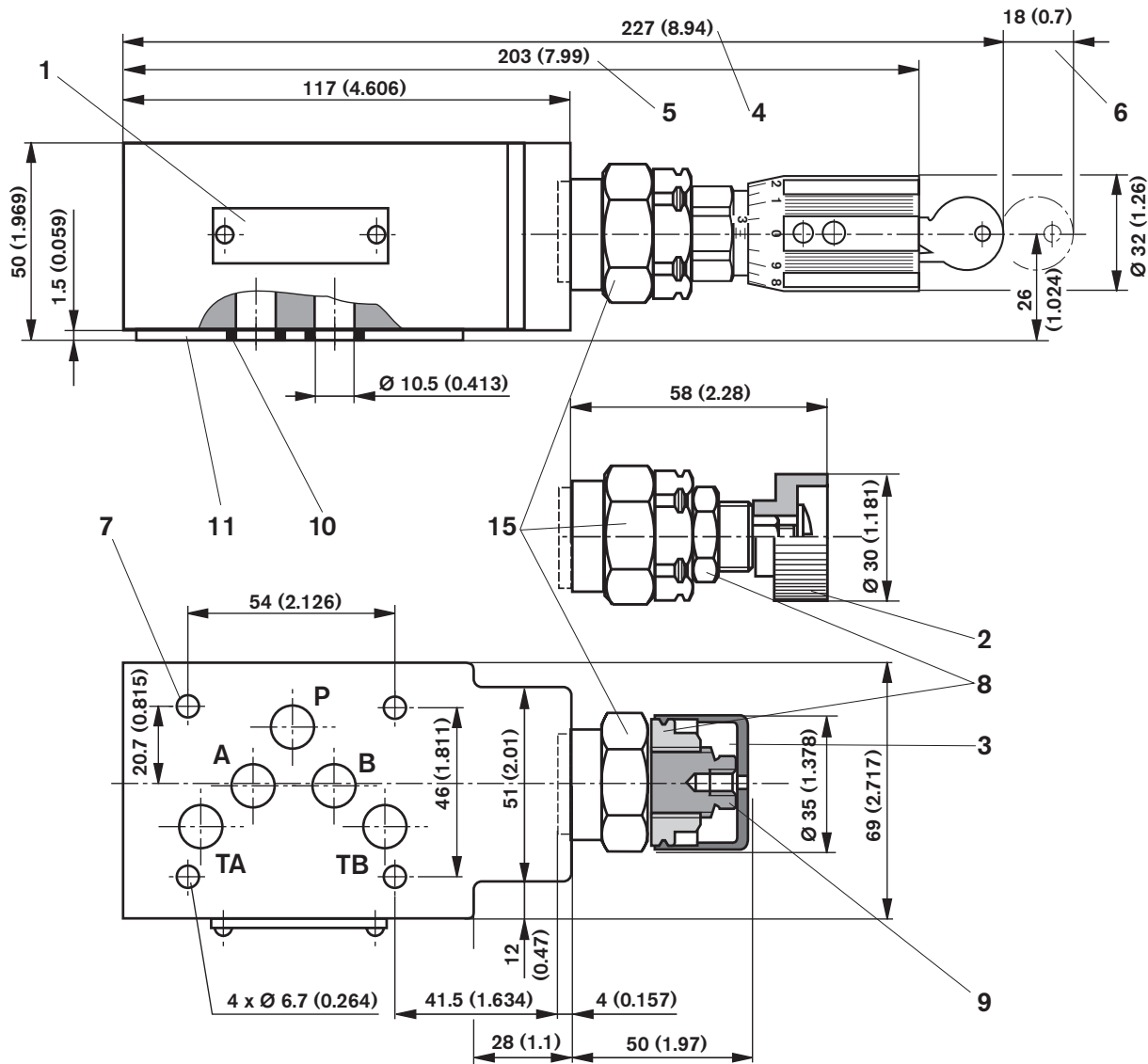
- 1 Name plate
- 2 Adjustment element "1"
- 3 Adjustment element "2"
- 4 Adjustment element "3"
- 5 Adjustment element "7"
- 6 Space required to remove the key
- 7 Valve fixing holes
- 8 Locknut 24A/F
- 9 Hexagon 10A/F
- 10 Identical seal rings for ports A2, B2, P2, TA2, TB2
- 11 Seal plate 70 x 80 x 1.5 (2.76 x 3.15 x 0.06) (only for versions VA and VP)
- 12 Counter bores (only for version VT)
- 13 Versions ZDB 10 VA and VP
- 14 Version ZDB 10 VT
- 15 Hexagon 30A/F, tightening torque $M_A = 50 \text{ Nm}$ (36.8 lb-ft)

Valve fixing screws

M6 DIN 912-10.9 (1/4-20 UNC), tightening torque $M_A = 15.5 \text{ Nm}$ (11.43 lb-ft), must be ordered separately.

For X and Y ports (e.g. for NS 10 pilot operated directional valves) the special version SO30 is required!

Unit dimensions: type ZDB 10 VB – dimensions in mm (inches)



Required surface finish of the mating piece

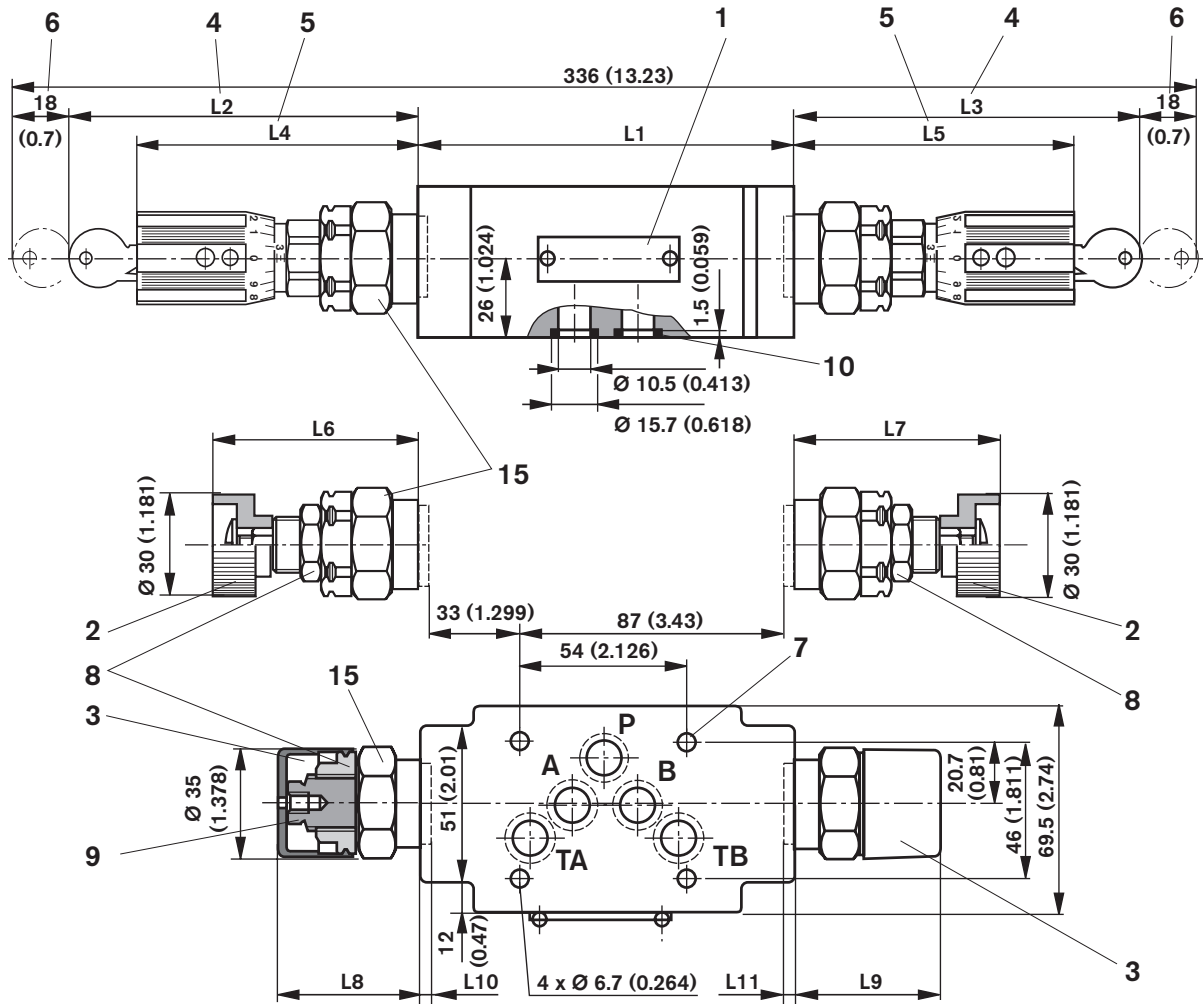
- 1 Name plate
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For X and Y ports (e.g. for NS 10 pilot operated directional valves) the special version SO30 is required!

Unit dimensions: types Z2DB 10 VC and VD – dimensions in mm (inches)



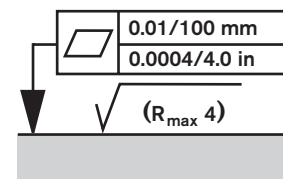
	VC	VD
L1	123 (4.84)	132 (5.20)
L2	111 (4.37)	107 (4.20)
L3	112 (4.40)	112 (4.40)
L4	89 (3.50)	85 (3.30)
L5	90 (3.54)	90 (3.54)
L6	59 (2.32)	56 (2.20)
L7	60 (2.36)	56 (2.20)
L8	52 (2.05)	49 (1.93)
L9	53 (2.09)	49 (1.93)
L10	2 (0.08)	6 (0.24)
L11	1 (0.04)	6 (0.24)

- 1 Name plate
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- 8 Locknut 24A/F
- 9 Hexagon 10A/F
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Valve fixing screws

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For X and Y ports (e.g. for NS 10 pilot operated directional valves) the special version SO30 is required!



Required surface finish of the mating piece

Notes

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