

# Check valve, pilot operated

**RE 21553/07.10**  
Replaces: 08.05

1/8

## Type Z2S

Size 10  
Component series 3X  
Maximum operating pressure 315 bar [4568 psi]  
Maximum flow 120 l/min [31.7 US gpm]



K4258/1

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## Features

- Sandwich plate valve for use in vertical stackings
- Porting pattern according to ISO 4401-05-04-0-05, ISO 4401-05-05-0-05 and NFPA T3.5.1 R2-2002 D05
- For the leak-free blocking of one or two actuator ports, optionally
- Different cracking pressures
- With pre-opening (standard); without pre-opening optional
- Check valve installation sets separately available
- Special versions upon request
- Amending documentation:
  - "Sandwich plates size 10", data sheet 48052
  - "Hydraulic fluids on a mineral oil basis", data sheet 90220

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

## Ordering code

Z2S	10			-3X/				*
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Check valve, sandwich plate

Further details in the plain text

Size 10 = 10

Leak-free blocking in channel A and B = -

Leak-free blocking in channel A = A

Leak-free blocking in channel B = B

### Cracking pressure

1.5 bar [21.7 psi] = 1

3 bar [43.5 psi] = 2

6 bar [87.0 psi] = 3

10 bar [145.0 psi] = 4

Component series 30 to 39 = 3X  
(30 to 39: Unchanged installation and connection dimensions)

Surface without corrosion resistance <sup>1)</sup> = no code

### Seal material

NBR seals = no code

FKM seals = V

### Note!

The selection depends on the operating parameters (fluid, temperature, etc.)!

### Special version

no code = Without

SO14 = Check valve with stroke limitation

SO40 = Control open by external port G1/4 (only version "A" or "B")

SO41 = Without pre-opening

SO60 = Control spool to "T" port unloaded

SO150 = With pre-opening and control open from channel "P"

Symbols (examples) see page 3

### Additional pilot oil ports X and Y <sup>2)</sup>

no code = Without X and Y

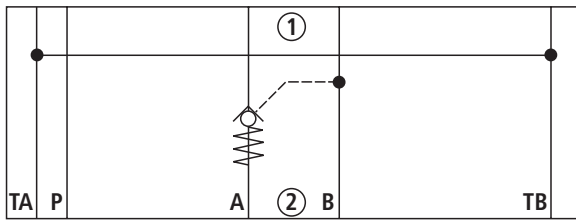
XY = With X and Y

<sup>1)</sup> Corrosion-resistant surface upon request:  
e.g. "J50" thick layer passivated  
(DIN 50979 Fe//Zn8//Cn//T0)

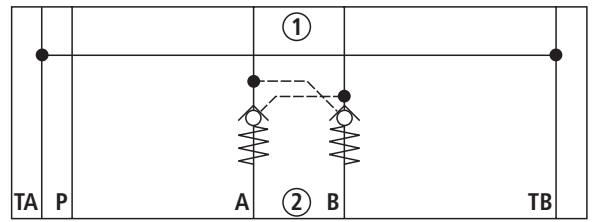
<sup>2)</sup> With version "SO150", ports X and Y are already available.  
(No ordering code required)

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

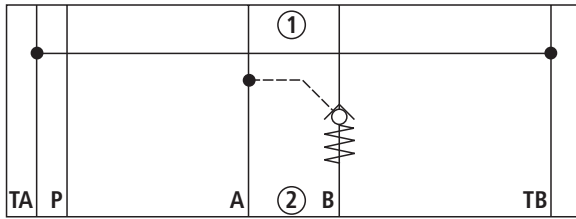
**Type Z2S 10 A...**



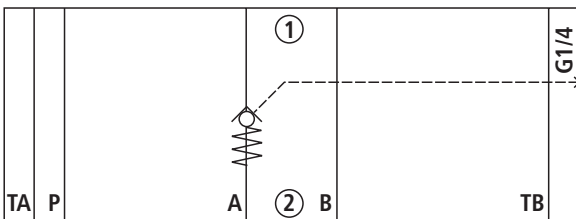
**Type Z2S 10 -..., Z2S 10 -...SO41 and Z2S 10 -...SO14**



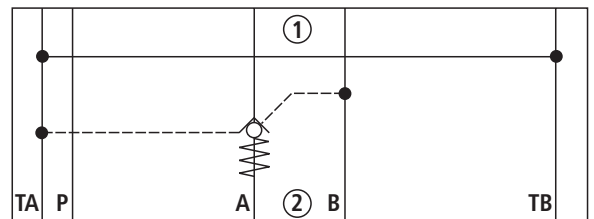
**Type Z2S 10 B...**



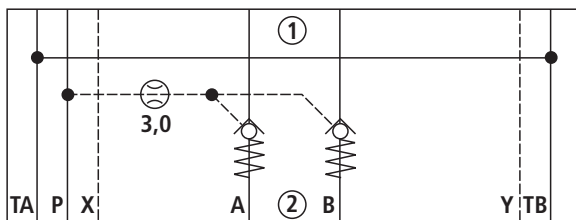
**Type Z2S 10 A...SO40**



**Type Z2S 10 A...SO60**



**Type Z2S 10 -...SO150**



### Function, sections, circuit example

The isolator valve Type Z2S is a releasable check valve in sandwich plate design.

It is used for the leak-free blocking of one or two actuator ports, also in case of longer standstill times.

In the direction A① to A② or B① to B②, there is a free flow, in the opposite direction, the flow is blocked.

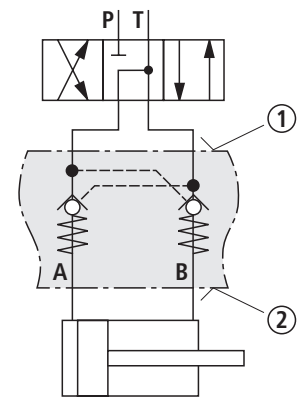
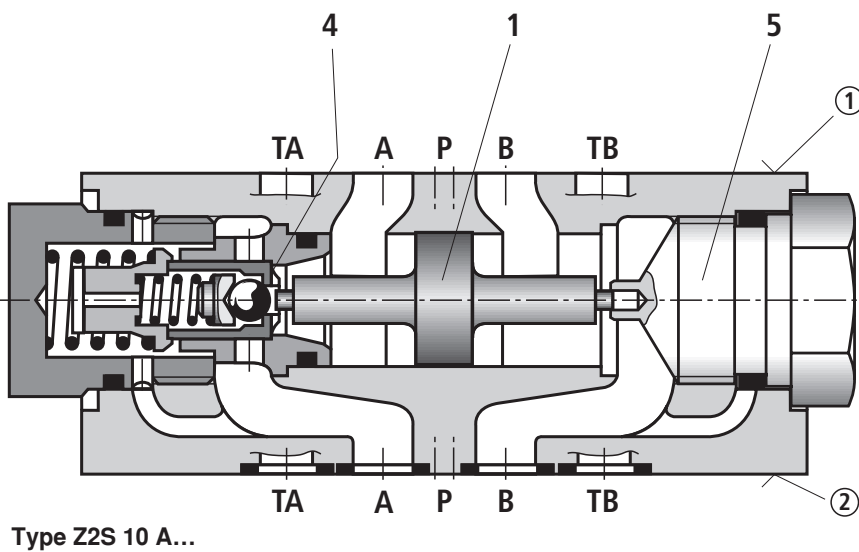
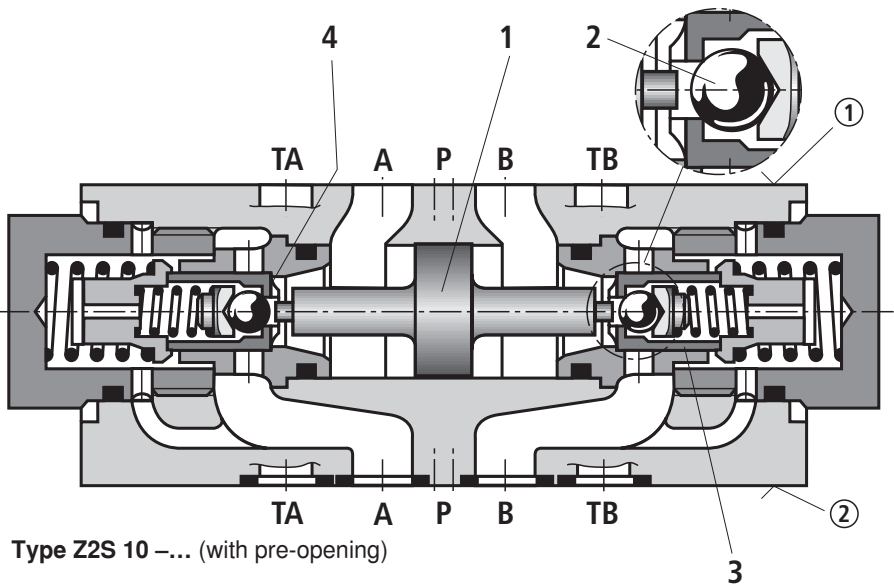
If the valve is, for example, flown through in the direction A① to A②, the control spool (1) is moved in the direction B side, opens the ball seat valve (2) and then pushes the poppet (3) off its seat. Now, hydraulic fluid can flow from B② to B①.

In order to allow for safe closing of the ball seat valve (2), the control spool (1) must be hydraulically unloaded (see circuit example).

Due to the pre-opening, there is a damped decompression of the pressurized liquid. Thus, possible switching shocks are avoided.

#### Pre-opening

- Due to the two-stage structure with enlarged control open ratio, safe unloading is also possible with lower pilot pressure.
- Avoidance of switching shocks due to dampened decompression of the pressure volume on the actuator side.



① = component side

② = plate side

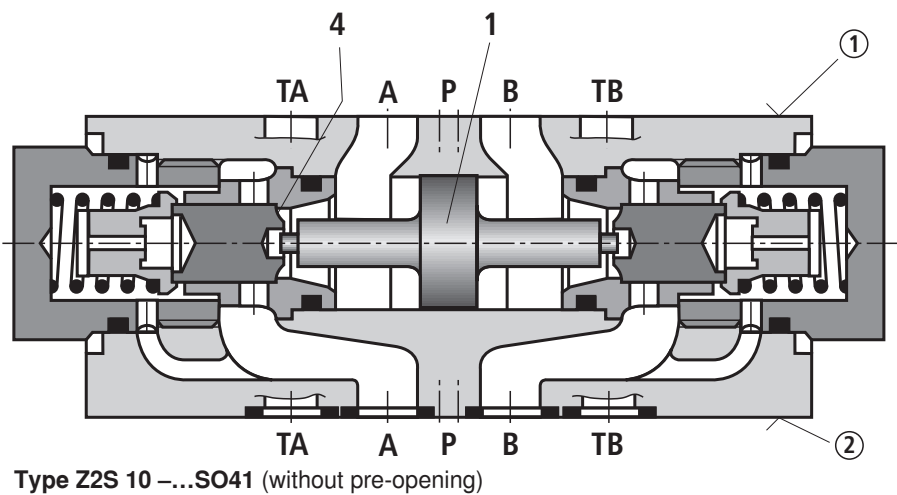
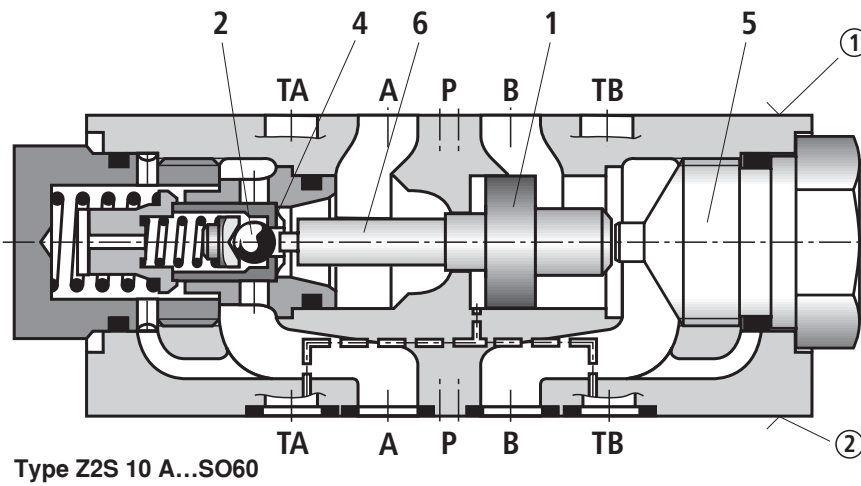
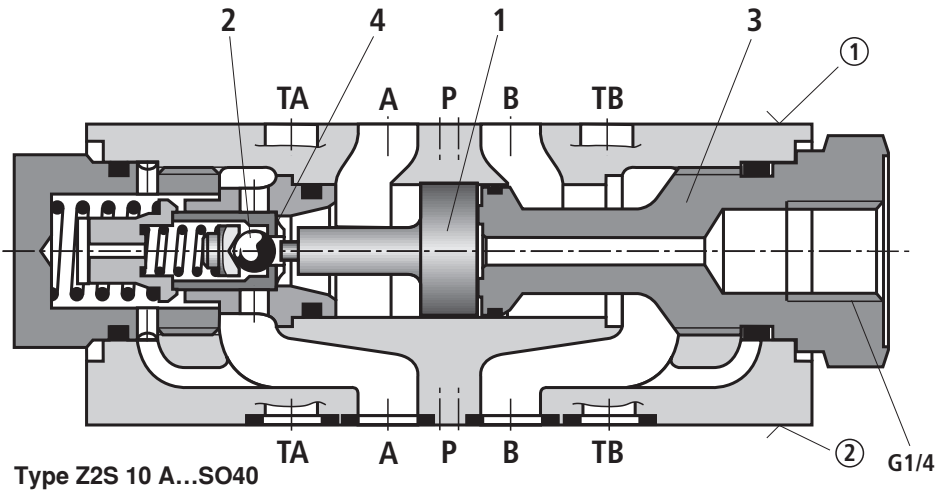
1 Control spool, area  $A_2$

2 Ball, area  $A_3$

4 Poppet, area  $A_1$

5 Positive stop

Function, sections



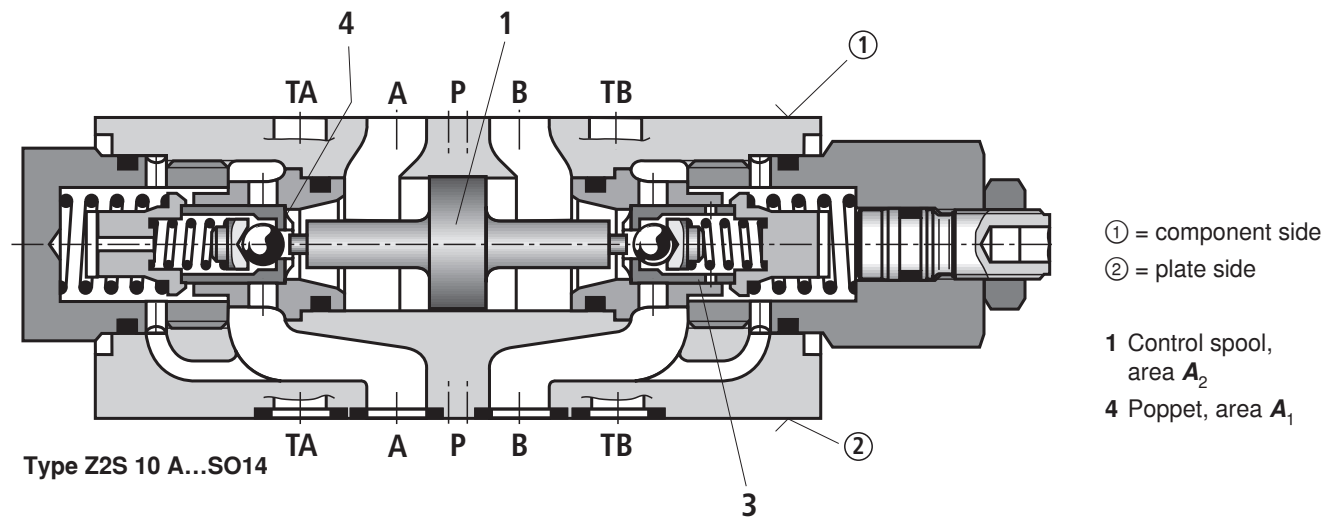
- ① = component side
- ② = plate side

- 1 Control spool, area  $A_2$
- 2 Ball, area  $A_3$
- 4 Poppet, area  $A_1$
- 5 Positive stop
- 6 Control spool, area  $A_4$

**Note!**

In case of valves without pre-opening, the included pressure volume may be unloaded suddenly. Resulting switching shocks may not only lead to noise formation but also to early wear at installed components.

## Function, sections



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

### general

Weight	kg [lbs]	Approx. 3 [6.6]
Installation position		Any
Ambient temperature range	°C [°F]	-30 to +80 [-22 to +176] (NBR seals) -20 to +80 [-4 to +176] (FKM seals)

### hydraulic

Maximum operating pressure	bar [psi]	315 [4568]
Cracking pressure in free direction		See characteristic curves page 7
Maximum flow	l/min [US gpm]	120 [31.7]
Direction of flow		See symbols page 3
Hydraulic fluid		<ul style="list-style-type: none"> <li>- On mineral oil basis and related hydrocarbons (HL, HLP, HVL, HVLDP, etc.) according to DIN 51524</li> <li>- Flame-resistant (HFC, HFDP, HFDR) according to ISO 12922<sup>1)</sup></li> <li>- Environmentally compatible (HETG, HEES, HEPG, HEPR) according to ISO 15380<sup>1)</sup></li> </ul> Other hydraulic fluids upon request
Hydraulic fluid temperature range (at the valve working ports)	°C [°F]	-30 to +80 [-22 to +176] (NBR seals) -20 to +80 [-4 to +176] (FKM seals)
Viscosity range	mm <sup>2</sup> /s [SUS]	2.8 to 500 [35 to 2320]
Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)		Class 20/18/15 <sup>2)</sup>
Area ratio		
- without pre-opening		$A_1/A_2 \sim 1/3$ (see sectional drawing pages 4 to 6)
- with pre-opening		$A_3/A_2 \sim 1/11.5$ (see sectional drawing pages 4 and 5)
- Version "SO60"		$A_1/A_4 \sim 1/6$ (see sectional drawing page 5)

Footnotes see page 7!

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

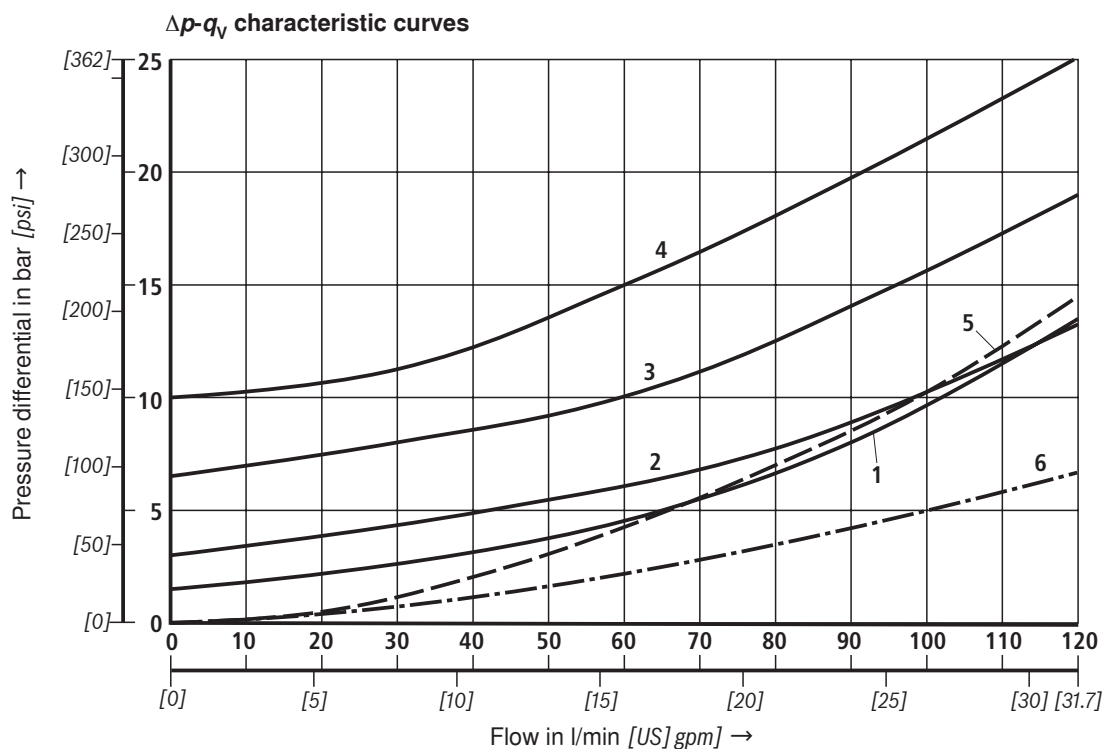
- 1) When using flame-resistant or environmentally compatible hydraulic fluids, restrictions with regard to the technical data may be applicable (temperature, pressure range, life time, maintenance intervals, etc.).
- 2) The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components.

**Note!**

Selection of the perfect sealing material (see ordering code page 2) also depends on the hydraulic fluid used.

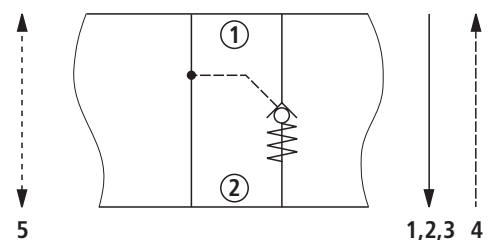
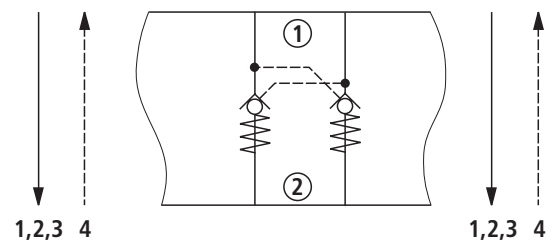
For the selection of the filters see [www.boschrexroth.com/filter](http://www.boschrexroth.com/filter).

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

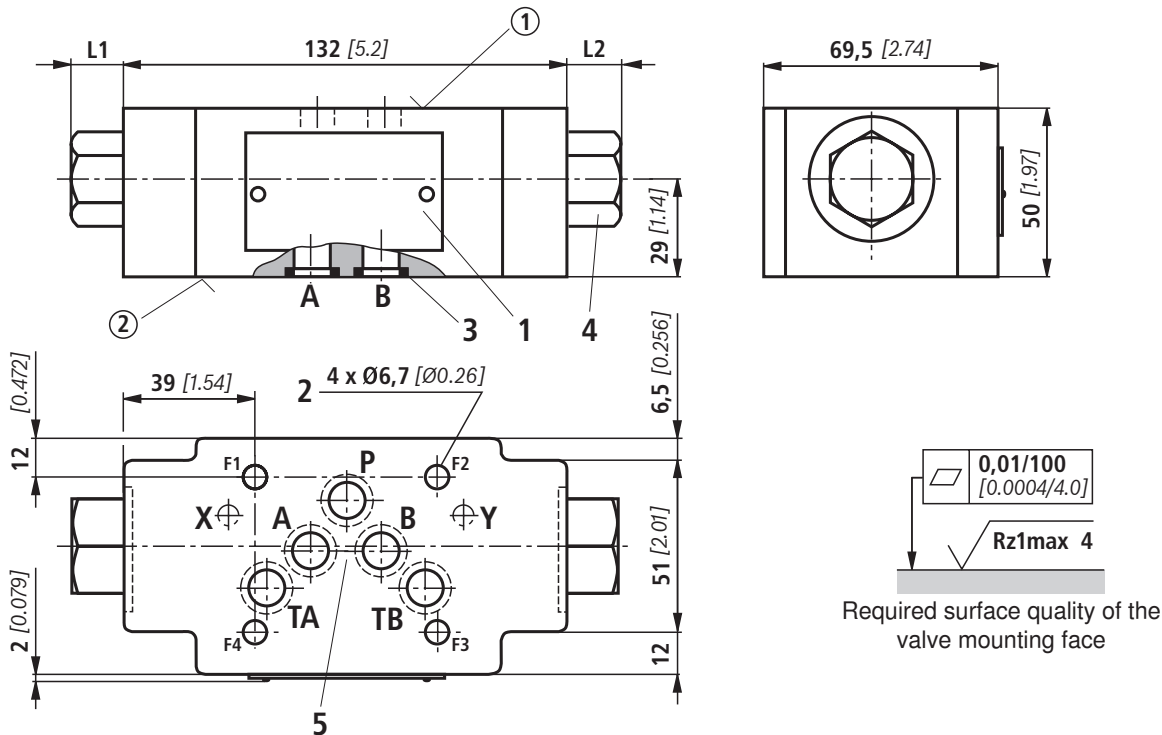


Cracking pressure:

- 1 1.5 bar [21.7 psi]
- 2 3 bar [43.5 psi]
- 3 6 bar [87.0 psi]
- 4 10 bar [145.0 psi]
- 5 Check valve controlled open via control spool
- 6 Free flow (without check valve use), version "A" or "B"



## Unit dimensions (dimensions in mm [inch])



	"SO14"	"no code"	"SO40"		"SO41"	"SO60"	"SO150"
			Version "A"	Version "B"			
L1 in mm [inch]	13.5 [0.53]	13.5 [0.53]	6.5 [0.26]	13.5 [0.53]	13.5 [0.53]	13.5 [0.53]	13.5 [0.53]
L2 in mm [inch]	38.5 [1.52]	13.5 [0.53]	13.5 [0.53]	6.5 [0.26]	13.5 [0.53]	13.5 [0.53]	13.5 [0.53]

- ① component side  
② plate side

- 1 Name plate
- 2 Through hole for valve mounting
- 3 Identical seal rings for ports A, B, P, TA and TB
- 4 Plug screw SW30, tightening torque  $M_A = 40^{+5} \text{ Nm}$  [29.5<sup>+3.7</sup> ft-lbs]
- 5 Porting pattern according to ISO 4401-05-04-0-05, ISO 4401-05-05-0-05 and NFPA T3.5.1 R2-2002 D05; deviating from ISO 4401, port T is in this data sheet called TA, port T1 is called TB.

### Valve mounting screws (separate order)

- 4 hexagon socket head cap screws ISO 4762 - M6 - 10.9  
4 hexagon socket head cap screws 1/4-20 UNC

### Note!

The length of the valve mounting screws of the sandwich plate valve must be selected according to the components mounted under and over the isolator valve.

Depending on the application, screw type and tightening torque must be adjusted to the circumstances.

Please ask Rexroth for screws with the required length.