

# Check valve, pilot operated

## Type Z2S

**RE 21548**

Edition: 2013-06

Replaces: 07.10



tb0256

- ▶ Size 6
- ▶ Component series 6X
- ▶ Maximum operating pressure 315 bar [4568 psi]
- ▶ Maximum flow 60 l/min [15.8 US gpm]

### Features

- ▶ Sandwich plate valve for use in vertical stackings
- ▶ Porting pattern according to DIN 24340 form A (**without** locating hole)
- ▶ Porting pattern according to ISO 4401-03-02-0-05 and NFPA T3.5.1 R2-2002 D03 (**with** locating hole)
- ▶ For the leakage-free blocking of one or two actuator ports, optional
- ▶ Various cracking pressures, optional
- ▶ With pre-opening, optional
- ▶ Check valve installation sets available individually
- ▶ Special versions upon request

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**Ordering code**

01	02	03	04	05	06	07	08	09	10
<b>Z2S</b>	<b>6</b>			<b>-</b>	<b>6X</b>	<b>/</b>			<b>*</b>

01	Check valve, sandwich plate	<b>Z2S</b>
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02	Size 6	<b>6</b>
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**Leakage-free blocking**

03	In channel A and B	<b>-</b>
	In channel A	<b>A</b>
	In channel B	<b>B</b>

**Cracking pressure**

04	1.5 bar [21.7 psi]	<b>1</b>
	3 bar [43.5 psi]	<b>2</b>
	6 bar [86.0 psi]	<b>3</b>

05	Component series 60 to 69 (60 to 69: Unchanged installation and connection dimensions)	<b>6X</b>
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06	Surface without corrosion resistance <sup>1)</sup>	<b>no code</b>
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**Seal material**

07	NBR seals	<b>no code</b>
	FKM seals	<b>V</b>
The selection is dependent on the operating parameters (hydraulic fluid, temperature, etc).		

**Locating hole**

08	<b>Without</b> locating hole	<b>no code</b>
	<b>With</b> locating hole	<b>/60</b>
	<b>With</b> locating hole and locking pin ISO 8752-3x8-St	<b>/62</b>

**Special versions**

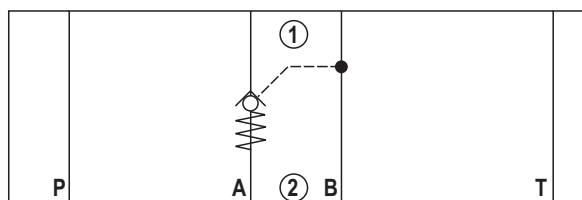
09	<b>Without</b> special version	<b>no code</b>
	Control open by external port G1/4 (only version "A" and "B")	<b>SO40</b>
	With pre-opening	<b>SO55</b>
	Control spool unloaded to port T	<b>SO60</b>
	With pre-opening and control open from channel P	<b>SO150</b>
Symbols (examples) see page 3		

10	Further details in the plain text	
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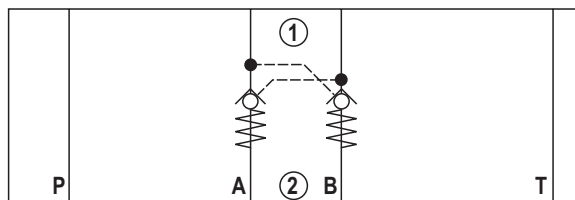
- 1) Corrosion-resistant surface upon request:  
e.g. "J50" thick film passivated (DIN 50979 Fe//Zn8//Cn//T0)
- 2) Locking pin ISO 8752-3x8-St, material no. **R900005694**  
(separate order)

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

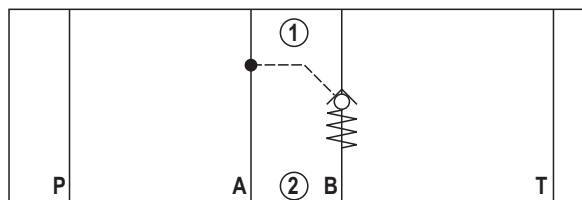
**Type Z2S 6 A...**



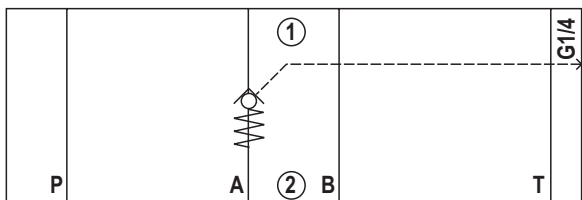
**Type Z2S 6 -... and Z2S 6 -...SO55**



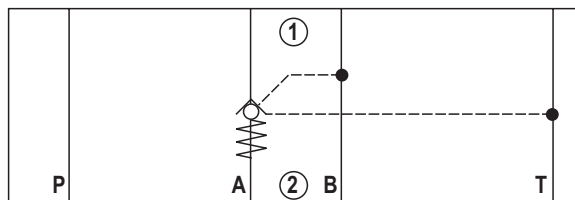
**Type Z2S 6 B...**



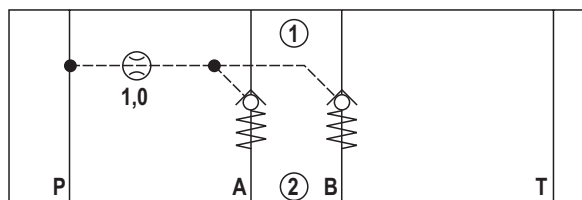
**Type Z2S 6 A...SO40**



**Type Z2S 6 A...SO60**



**Type Z2S 6 -...SO150**



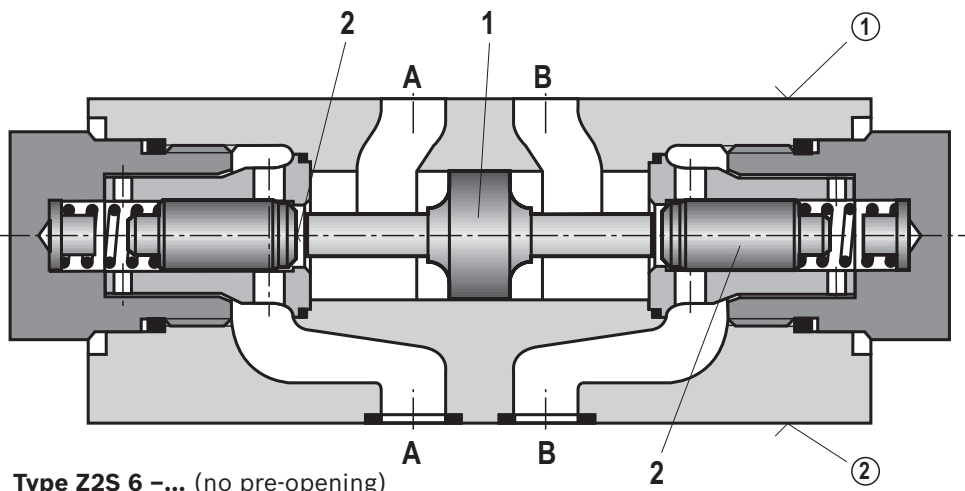
### Function, sections, circuit example

The isolator valve type Z2S is a releasable check valve in sandwich plate design. It is used for the leakage-free blocking of one or two actuator ports, even for long standstill times. In direction A① to A② or B① to B②, there is a free flow; in the opposite direction, the flow is blocked. If, for example, there is a flow through the valve in direction A① to A②, control spool (1) is moved in direction B side and pushes the poppet (2) off its seat. Hydraulic fluid can now flow from B② to B①.

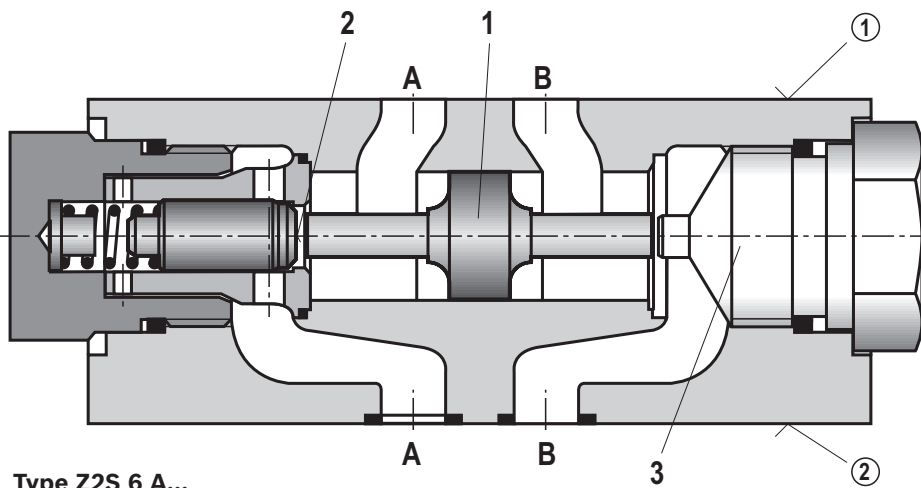
In order to allow the poppets to be safely closed (2), the control spool (1) must be hydraulically unloaded (see circuit example).

#### Pre-opening

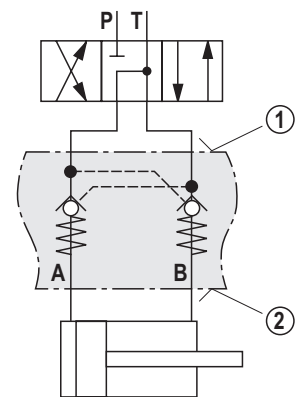
- ▶ The two-stage set-up with an increased control open ratio means even low pilot pressure can be released securely.
- ▶ Avoidance of switching shocks due to dampened decompression of the pressure volume on the actuator side.



Type Z2S 6 -... (no pre-opening)



Type Z2S 6 A...



Circuit example, schematic

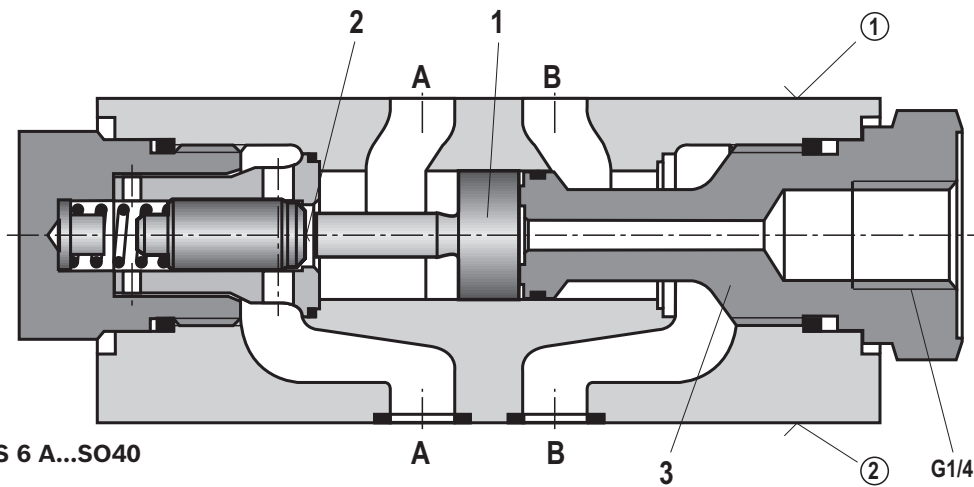
- ① = component side
- ② = plate side

- 1** Control spool, area  $A_2$
- 2** Poppet, area  $A_1$
- 3** Stop

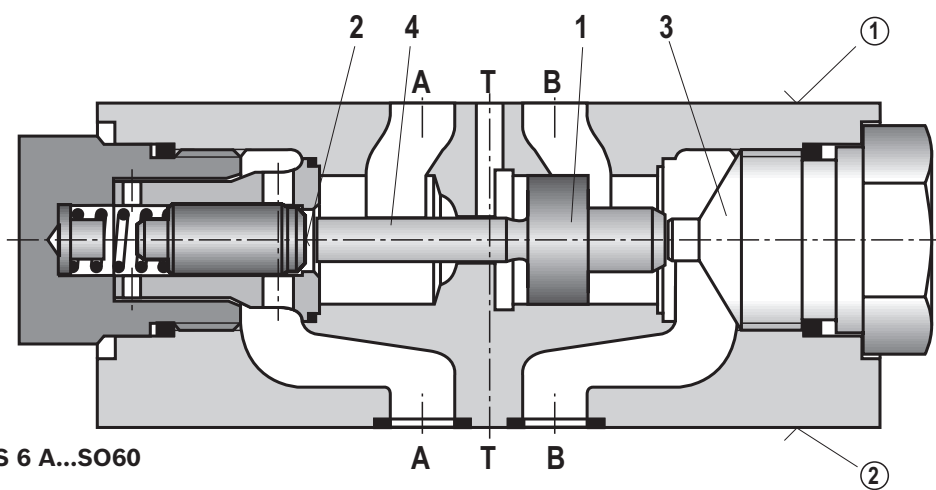
#### Notices!

In valves without pre-opening, sudden release of pent-up pressure volume may occur. Resulting switching shocks may lead to premature wear on installed components, as well as noise.

Function, sections

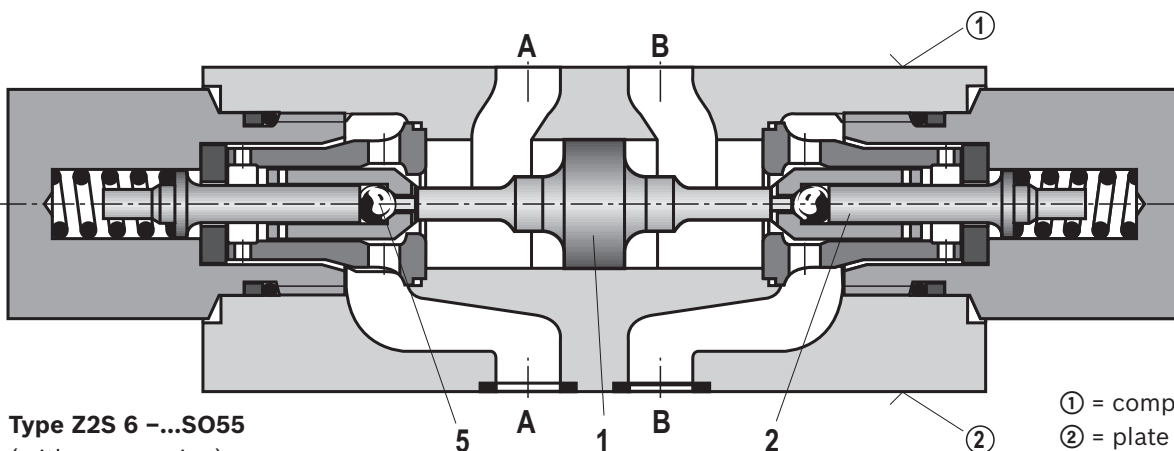


Type Z2S 6 A...SO40



Type Z2S 6 A...SO60

- 1 Control spool, area  $A_2$
- 2 Poppet, area  $A_1$
- 3 Stop
- 4 Control spool, area  $A_4$
- 5 Pre-opening, area  $A_3$



Type Z2S 6 -...SO55  
(with pre-opening)

- ① = component side
- ② = plate side

**Technical data**

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

general		
Weight	kg [lbs]	Approx. 0.8 [1.76]
Installation position		Any
Ambient temperature range	°C [°F]	-30 ... +80 [-22 ... +176] (NBR seals) -20 ... +80 [-4 ... +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]	60 [15.8]
Direction of flow		See Symbols page 3
Hydraulic fluid		See table below
Hydraulic fluid temperature range (at the valve service ports)	°C [°F]	-30 ... +80 [-22 ... +176] (NBR seals) -20 ... +80 [-4 ... +176] (FKM seals)
Viscosity range	mm <sup>2</sup> /s [SUS]	2.8 ... 500 [35 ... 2320]
Maximum permitted degree of contamination of the hydraulic fluid – cleanliness class according to ISO 4406 (c)		Class 20/18/15 <sup>1)</sup>
Area ratio	- Without pre-opening	A <sub>1</sub> /A <sub>2</sub> ~ 1/3.5 (see sectional drawing page 4)
	- With pre-opening	A <sub>3</sub> /A <sub>2</sub> ~ 1/12.5 (see sectional drawing page 5)
	- "SO60" version	A <sub>1</sub> /A <sub>4</sub> ~ 1/7 (see sectional drawing page 5)

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oils	HL, HLP, HLPD	NBR, FKM	DIN 51524
Bio-degradable	- insoluble in water	HETG	VDMA 24568
		HEES	
	- soluble in water	HEPG	VDMA 24568
Flame-resistant	- water-free	HFDR, HFDR	ISO 12922
	- containing water	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	ISO 12922

**Important information on hydraulic fluids**

- ▶ See data sheet 90220 or make an inquiry for further information and details concerning use of other hydraulic fluids.
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.)!
- ▶ The flash point of the hydraulic fluid used must be 40 K higher than the maximum solenoid surface temperature.

**▶ Flame-resistant – containing water:**

- Maximum operating pressure of 210 bar
- Maximum hydraulic fluid temperature of 60 °C
- Life cycle compared to operation with mineral oil HL, HLP 30 to 100 %

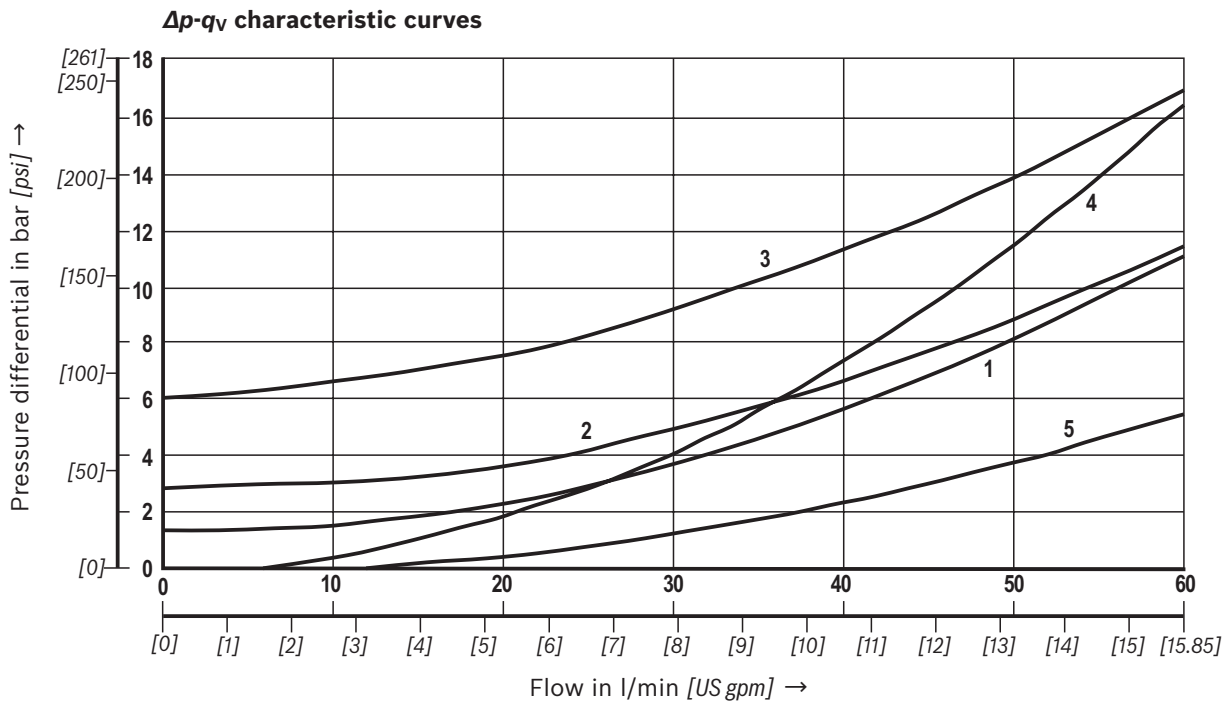
<sup>1)</sup> The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components. Available filters can be found at [www.boschrexroth.com/filter](http://www.boschrexroth.com/filter).

**Notice!**

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

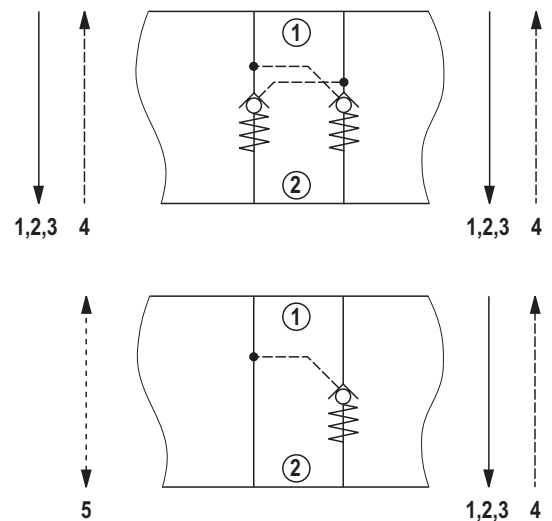
### Characteristic curves

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



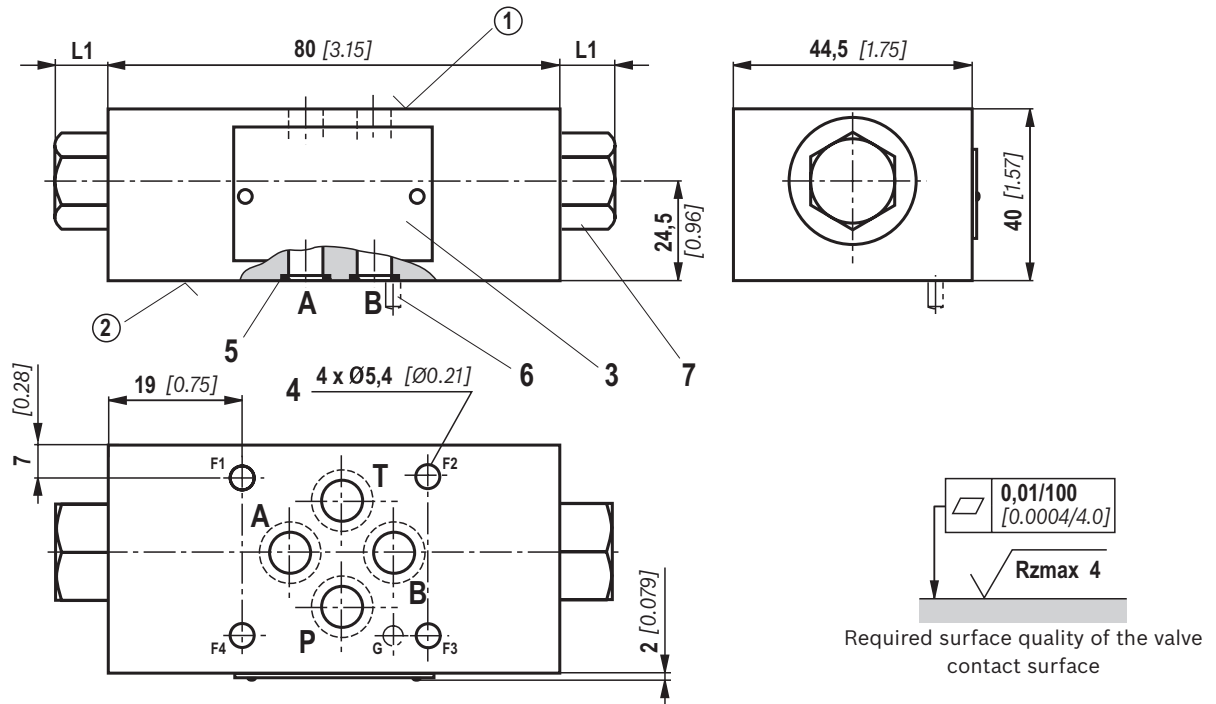
**Cracking pressure:**

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



## Unit dimensions

(dimensions in mm [inch])



L1 in mm [inch]

"no code"	"SO40"	"SO55"		"SO60"	"SO150"
11 [0.43]	11 [0.43]	11 [0.43]	21.5 <sup>1)</sup> [0.85]	11 [0.43]	21.5 [0.85]

<sup>1)</sup> Maximum dimension on the side of the check valve use

- ① Component side – porting pattern according to DIN 24340 form A (**without** locating hole), or ISO 4401-03-02-0-05 (**with** locating hole Ø4 x 4 mm deep) and NFPA T3.5.1 R2-2002 D03
- ② Plate side – porting pattern according to DIN 24340 form A (**without** locating hole), or ISO 4401-03-02-0-05 (**with** locating hole for locking pin ISO 8752-3x8-St; version "/60" and "/62") and NFPA T3.5.1 R2-2002 D03
- 3 Name plate
- 4 Through hole for valve mounting
- 5 Identical seal rings for ports A, B, P, T
- 6 Locking pin ISO 8752-3x8-St (only version "/62")
- 7 Plug screw SW22

**Valve mounting screws** (separate order)  
**4 hexagon socket head cap screws ISO 4762 - M5 - 10.9**  
**4 hexagon socket head cap screws N10-24 UNC**

**Notice:**

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.



## More information

- ▶ Sandwich plates, size 6
- ▶ Mineral oil-based hydraulic fluids
- ▶ General product information on hydraulic products
- ▶ Installation, commissioning and maintenance of industrial valves
- ▶ Hydraulic valves for industrial applications
- ▶ Selection of the filters

Data sheet 48050

Data sheet 90220

Data sheet 07008

Data sheet 07300

Data sheet 07600-B

[www.boschrexroth.com/filter](http://www.boschrexroth.com/filter)

## Notes

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## Notes

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## Notes