

RE 21548

Edition: 2020-10

Replaces: 2013-06

rexroth
A Bosch Company

Check valve, pilot operated

Type Z2S



- ▶ Size 6
- ▶ Component series 6X
- ▶ Maximum operating pressure 350 bar
- ▶ Maximum flow 80 l/min

Features

- ▶ Sandwich plate valve for use in vertical stackings
- ▶ Porting pattern according to ISO 4401-03-02-0-05 and NFPA T3.5.1 R2-2002 D03 (**with** or **without** locating hole)
- ▶ For the leakage-free blocking of one or two actuator ports, optional
- ▶ Various cracking pressures, optional
- ▶ With pre-opening, optional
- ▶ Corrosion-protected design optional

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RE 21548, edition: 2020-10, Bosch Rexroth AG

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HYQUIP Limited New Brunswick Street Horwich Bolton Lancashire BL6 7JB UK

2/12 **Z2S** | Check valve

Ordering code

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

01	Check valve, sandwich plate design	Z2S
02	Size 6	6

Leakage-free blocking

03	In channel A and B	-
	In channel A	A
	In channel B	B

Cracking pressure

04	1.5 bar	1
	3 bar	2
	6 bar	3
	10 bar	4

05	Component series 60 ... 69 (60 ... 69: unchanged installation and connection dimensions)	6X
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Seal material (observe compatibility of seals with hydraulic fluid used, see page 6)

06	NBR seals	no code
	FKM seals	V

Corrosion resistance (outside)

07	None (valve housing primed)	no code
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227)	J3

Locating hole

08	Without locating hole	no code
	With locating hole	/60¹⁾

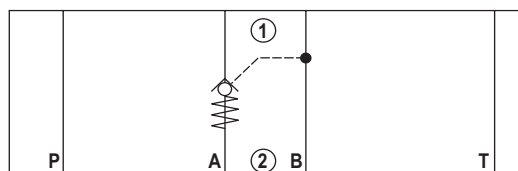
Special versions

09	Without special version	no code
	Control open by external port G1/4 (only version "A" or "B")	SO40
	With pre-opening	SO55
	Control spool unloaded to port T	SO60
	With pre-opening and control open from channel P	SO150
	Symbols (examples) see page 3	
10	Further details in the plain text	

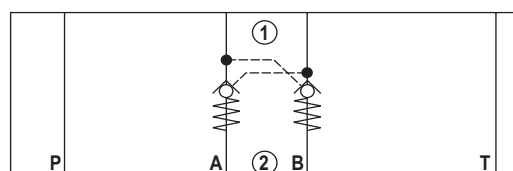
¹⁾ Locking pin ISO 8752-3x8-St, material no. **R900005694**
(separate order)

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

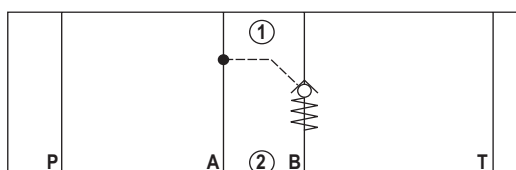
Type Z2S 6 A...



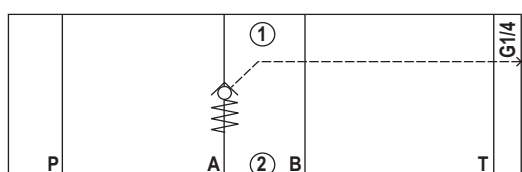
Type Z2S 6 - ... and Z2S 6 -...SO55



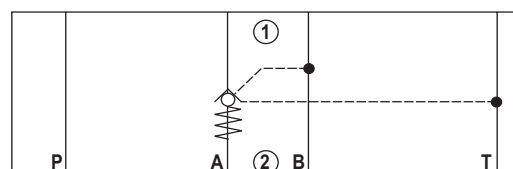
Type Z2S 6 B...



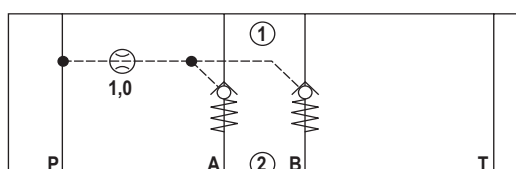
Type Z2S 6 A...SO40



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.

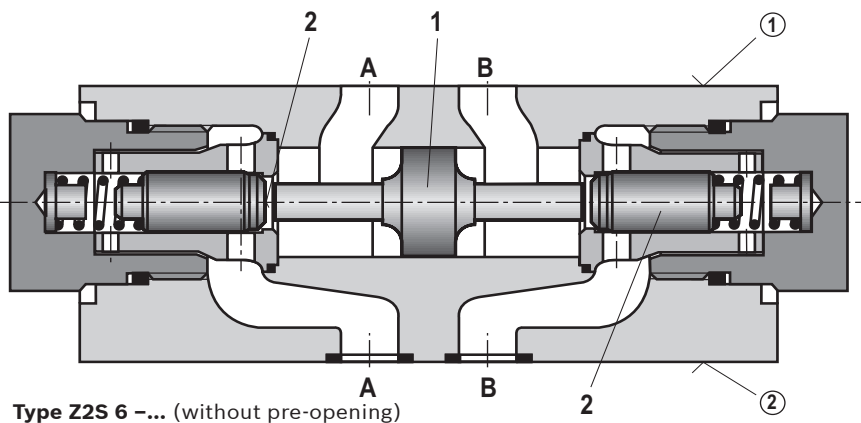
In direction A① to A② or B① to B②, there is a free flow; in the opposite direction, the flow is blocked.

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.

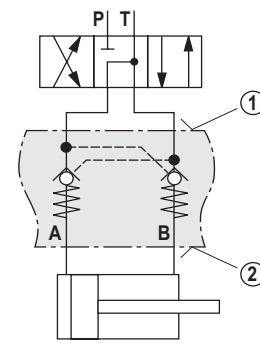
In order to allow the poppets to be safely closed (2), the control spool (1) must be hydraulically unloaded (see circuit example).

Pre-opening

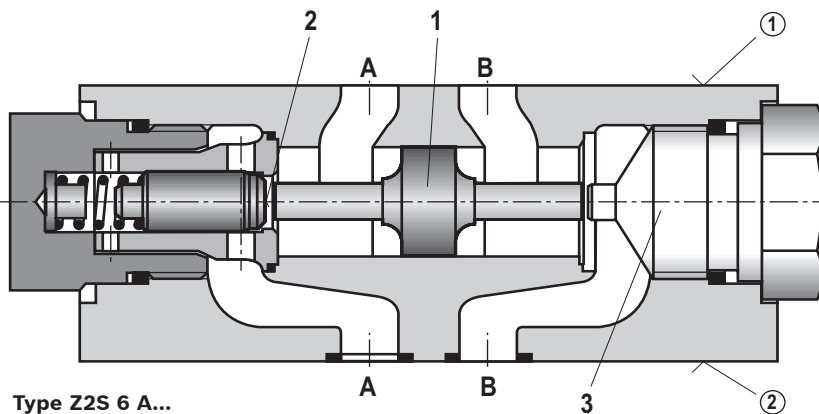
- The two-stage set-up with an increased control open ratio means even low pilot pressure can be unloaded securely.
- Avoidance of switching shocks due to dampened decompression of the pressure volume on the actuator side.



Type Z2S 6 -... (without pre-opening)



Circuit example, schematic



Type Z2S 6 A...

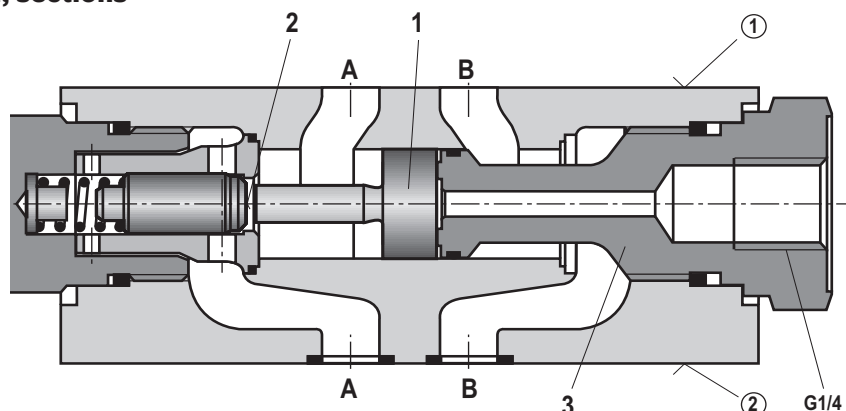
- ① = component side
② = plate side

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

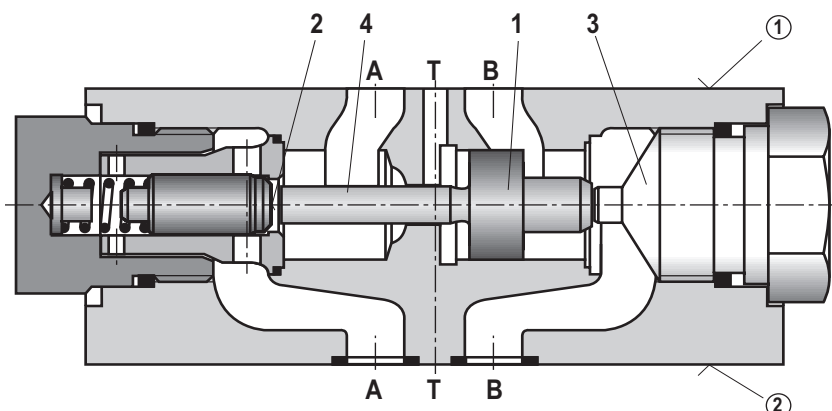
Notice:

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

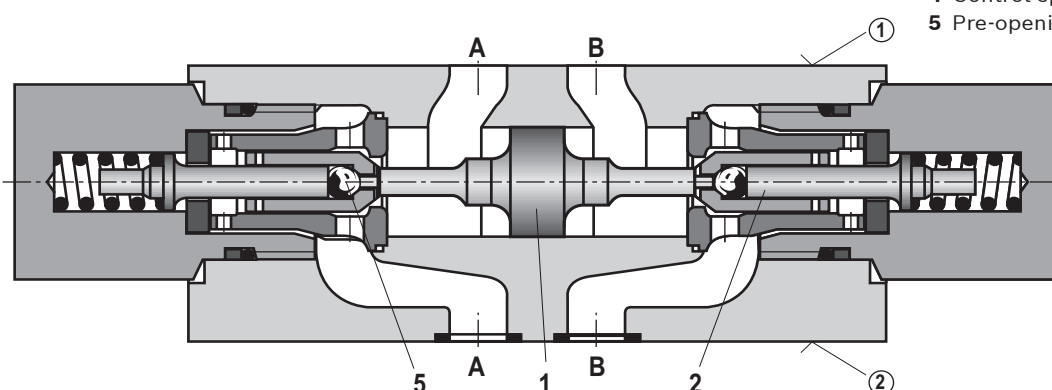
Function, sections



Type Z2S 6 A...SO40



Type Z2S 6 A...SO60



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

- 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

- ① = component side
- ② = plate side

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Technical data

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

General		
Weight	kg	approx. 0.8
Installation position		any
Ambient temperature range	°C	-30 ... +80 (NBR seals) -20 ... +80 (FKM seals)
Storage temperature range		see operating instructions 07600-B
MTTF _D values according to EN ISO 13849	years	150 ... 1200 (for more information see data sheet 08012)
Hydraulic		
Maximum operating pressure	bar	350
Cracking pressure in free direction		see characteristic curves page 7
Maximum flow	l/min	80
Direction of flow		see symbols page 3
Hydraulic fluid		see table below
Hydraulic fluid temperature range (at the valve working ports)	°C	-30 ... +80 (NBR seals) -20 ... +80 (FKM seals)
Viscosity range	mm ² /s	2,8 ... 500
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)		Class 20/18/15 ¹⁾
Area ratio	► Without pre-opening	A ₁ /A ₂ ~ 1/3.5 (see sectional drawing page 4)
	► With pre-opening	A ₃ /A ₂ ~ 1/12.5 (see sectional drawing page 5)
	► Version "SO60"	A ₁ /A ₄ ~ 1/7 (see sectional drawing page 5)

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP, HLPD, HVL, HVPD	NBR, FKM	DIN 51524	90220
Bio-degradable	► Insoluble in water	HETG	ISO 15380	90221
		HEES		
Flame-resistant	► Soluble in water	HEPG	ISO 15380	
	► Water-free	HFDU (glycol base)	ISO 12922	90222
		HFDU (ester base)		
		HFDR		
	► Containing water	HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	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 specific to the installation - to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

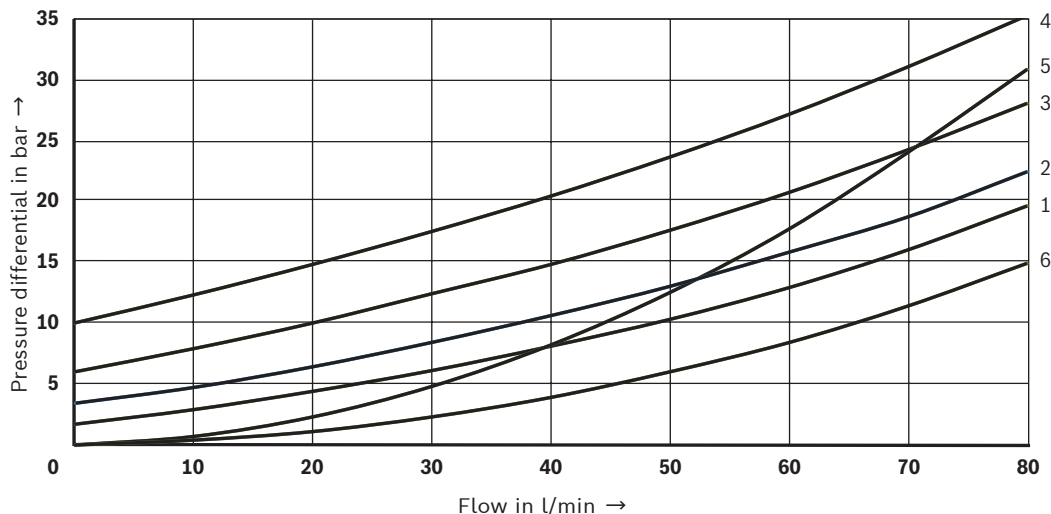
¹⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.

For the selection of filters, see www.boschrexroth.com/filter.

Characteristic curves

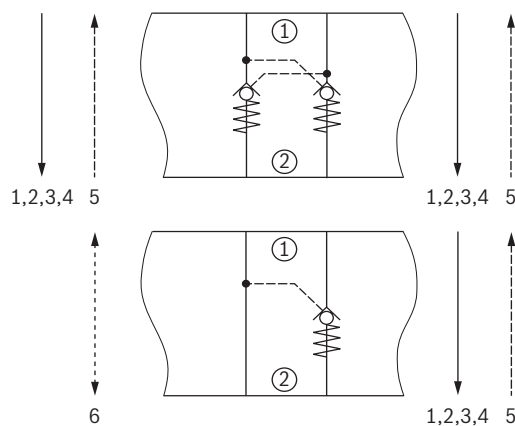
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^{\circ}\text{C}$, averages)

Δp - q_v characteristic curves



Cracking pressure:

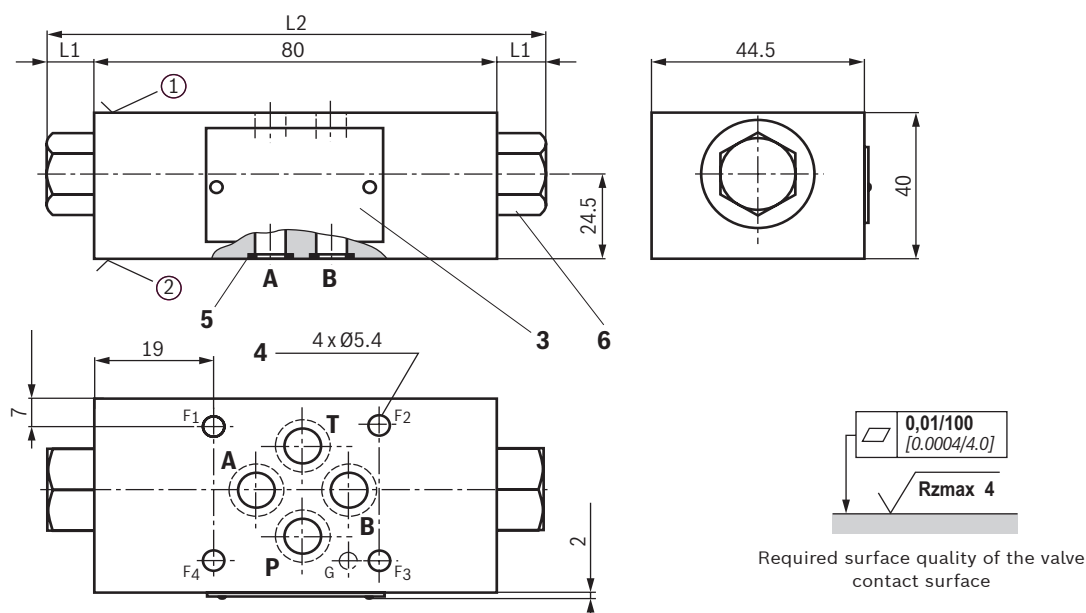
- 1 1.5 bar
- 2 3 bar
- 3 6 bar
- 4 10 bar
- 5 Check valve controlled open via control spool
- 6 Free flow (without check valve use), version "A" and "B"



8/12 **Z2S** | Check valve

Dimensions

(dimensions in mm)



Notice:

The dimensions are nominal dimensions which are subject to tolerances.

	"no code" "SO40" "SO60"	"-"	"SO55" "A"	"B"	"SO150"
L1	11	21.5 ¹⁾ 21.5 ¹⁾	21.5 ¹⁾ 11	11 21.5 ¹⁾	21.5
L2	102	123	112.5	112.5	123

¹⁾ Maximum dimension on the side of the check valve cartridge

- ① component side – porting pattern according to ISO 4401-03-02-0-05 and NFPA T3.5.1 R2-2002 D03 (**with** locating hole Ø4 x 4 mm deep or **without** locating hole)
- ② plate side – porting pattern according to ISO 4401-03-02-0-05 and NFPA T3.5.1 R2-2002 D03 (**with** locating hole for locking pin ISO 8752-3x8-St, design "/60" or **without** locating hole)
- 3 Name plate
- 4 Through hole for valve mounting
- 5 Identical seal rings for ports A, B, P, T
- 6 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 ASTM - A574

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.

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Further information

- ▶ Hydraulic fluids on mineral oil basis
- ▶ Environmentally compatible hydraulic fluids
- ▶ Flame-resistant, water-free hydraulic fluids
- ▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)
- ▶ Hexagon socket head cap screw, metric/UNC
- ▶ Hydraulic valves for industrial applications
- ▶ Use of non-electrical hydraulic components in explosive atmospheres (ATEX)
- ▶ Selection of filters
- ▶ Information on available spare parts

Data sheet 90220
Data sheet 90221
Data sheet 90222
Data sheet 90223
Data sheet 08936
Data sheet 07600-B
Data sheet 07011
www.boschrexroth.com/filter
www.boschrexroth.com/spc