# Bosch Rexroth Z2S10-1-3X/ pilot-operated check valve

Manufacturer: Bosch Rexroth

Manufacturer part number / published order designation: R900407394

Published model: Z2S10-1-3X/

## About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

## Execution notes and conditions

No SO40/SO55/position-monitoring suffix is assigned. Their separate sections, switch wiring and accessories are omitted.

## Source-page index

Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

## Source A: Rexroth Check Valve Pilot Operated Re21553


| Original pages | Compiled pages | Relevant content |
|---|---|---|
| 2-4 | 2-4 | Existing blocked-port, cracking-pressure, series, seal and variant coding. Published execution: Z2S10-1-3X/.; Actual A/B/both-port circuit symbol.; Standard pilot-operated check principle, pre-opening and pilot conditions. |
| 6-7 | 5-6 | Pressure, backpressure, flow, pilot ratio, fluid, viscosity, temperature and cleanliness limits.; Unmonitored standard opening and pressure-drop curves with test conditions. |
| 9 | 7 | Actual size 10 sandwich body, A/B/both-port dimensions, mounting pattern, seals and screws. |

## Ordering code

| 01 | 02 | 03 | 04 | | 05 | | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Z2S** | **10** | | | **–** | **3X** | **/** | | | | | | ***** |

| | | |
|---|---|---|
| 01 | Check valve, sandwich plate | **Z2S** |
| 02 | Size 10 | **10** |

**Leakage-free blocking**

| | | |
|---|---|---|
| 03 | In channel A and B | **–** |
| | In channel A | **A** |
| | In channel B | **B** |

**Cracking pressure**

| | | |
|---|---|---|
| 04 | 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** |
| 05 | Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimensions) | **3X** |

**Corrosion resistance** (outside; thick film passivation according to DIN 50979 – Fe//Zn8//Cn//T0)

| | | |
|---|---|---|
| 06 | None (valve housing primed) | **no code** |
| | Improved corrosion protection (240 h salt spray test according to EN ISO 9227) | **J3** |

**Seal material** (observe compatibility of seals with hydraulic fluid used, see page 6)

| | | |
|---|---|---|
| 07 | NBR seals | **no code** |
| | FKM seals | **V** |

**Additional pilot oil ports X and Y** [1)]

| | | |
|---|---|---|
| 08 | **Without** X and Y | **no code** |
| | **With** X and Y | **XY** |

**Spool position monitoring**

| | | |
|---|---|---|
| 09 | **Without** position switch | **no code** |
| | **– Inductive position switch type QM** (version "3" on side with leakage-free blocking only, cracking pressure 6 bar) | |
| | Monitored spool position "a" | **QMAG24** |
| | Monitored spool position "b" | **QMBG24** |
| | Monitored spool position "a" and "b" | **QMABG24** |

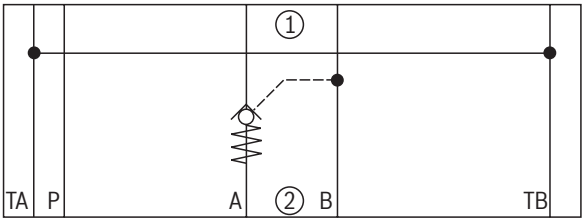
**Special version**

| | | |
|---|---|---|
| 10 | **Without** | **no code** |
| | Control open by external port G1/4 (only version "A" or "B") | **SO40** |
| | Control spool unloaded to port T | **SO60** |
| | **With** pre-opening and control open from channel P | **SO150** |
| | For symbols (examples), see page 3 | |
| 11 | Further details in the plain text | ***** |

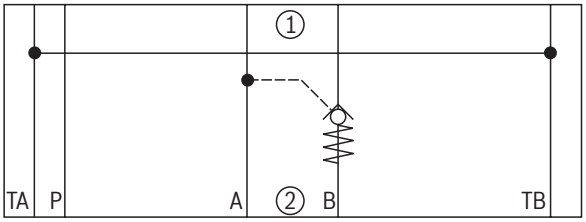
1) With version "SO150", ports X and Y are already in place.
(No ordering code required)

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

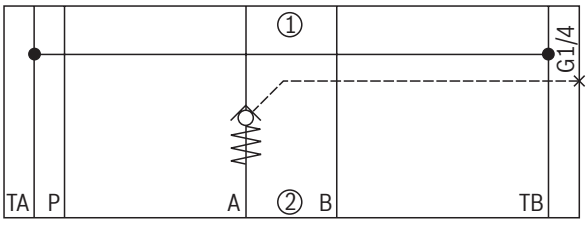
**Version "A"**



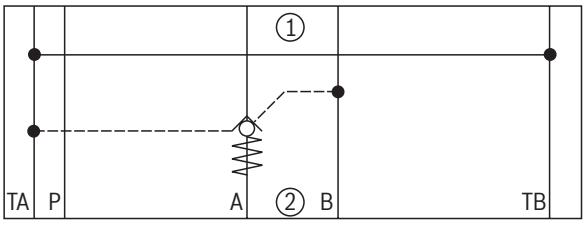

**Version "B"**



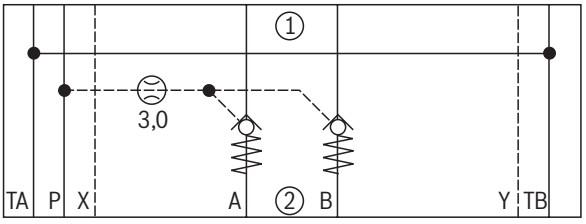

**Version "A...SO40"**



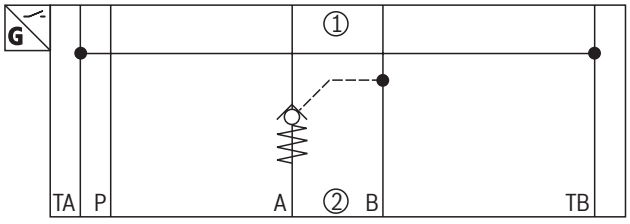

**Version "A...SO60"**



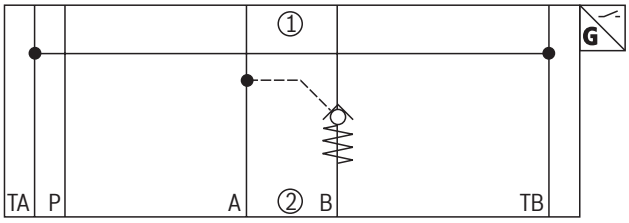

**Version "–...SO150"**



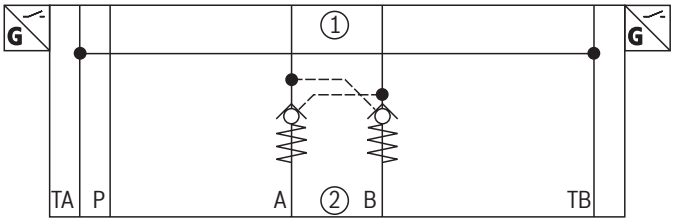

**Version "A3...QMAG24"**




**Version "B3...QMAG24"**




**Version "–3...QMABG24"**




☞ **Notice:**
Deviating from ISO 4401, port T is called TA and port T1 is called TB in this data sheet.

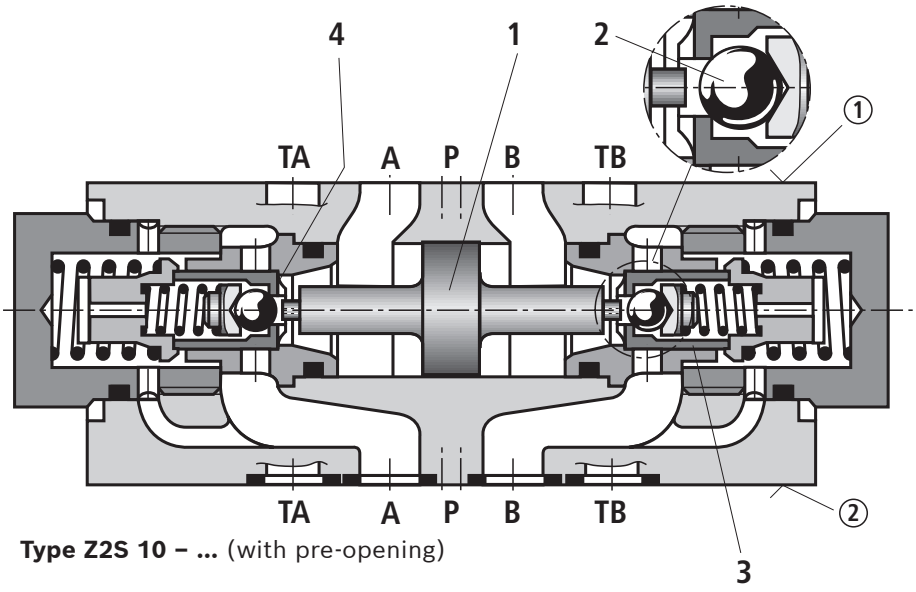
## Function, sections, circuit example

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, the control spool (1) is moved in the direction of the B side, opens the ball seat valve (2) and then pushes the poppet (3) off its seat. Hydraulic fluid can now flow from B② to B①.

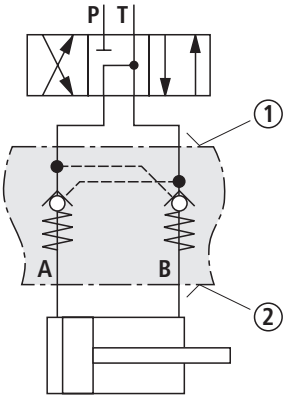
In order to allow the ball seat valve (2) to be safely closed, the control spool (1) must be hydraulically unloaded (see circuit example).
Due to the pre-opening, there is a damped decompression of the pressurized liquid. Thus, possible switching shocks are avoided.

**Pre-opening**

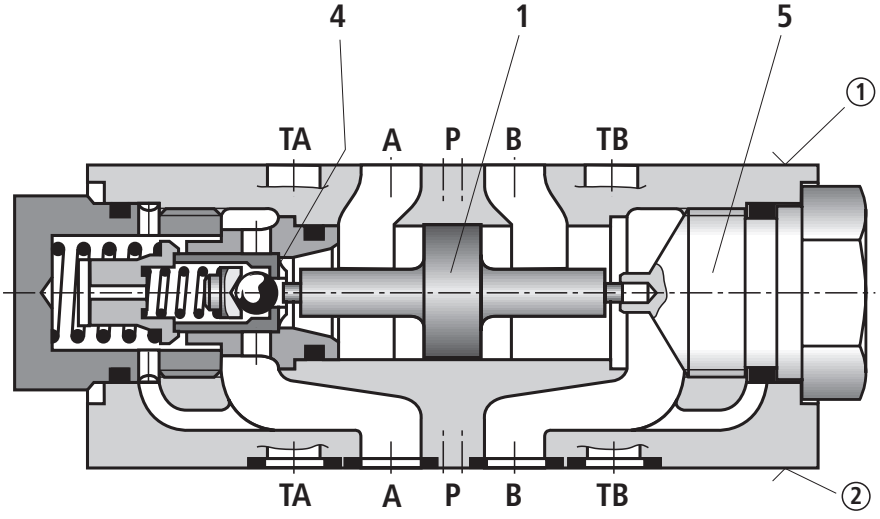
- The two-stage set-up with an increased control open ratio means even low pilot pressure can be unloaded securely.
- Avoidance of switching shocks due to dampened decompression of the pressure volume on the actuator side.




**Type Z2S 10 – ...** (with pre-opening)




Circuit example, schematic




**Type Z2S 10 A...**

① = component side
② = plate side

**1** Control spool, area $A_2$
**2** Ball, area $A_3$
**4** Poppet, area $A_1$
**5** Stop

☞ **Notice:**
Deviating from ISO 4401, port T is called TA and port T1 is called TB in this data sheet.

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

| **General** | | |
|---|---|---|
| Weight | kg | approx. 3 |
| Installation position | | any |
| Ambient temperature range | °C | –30 ... +80 (NBR seals)<br>–20 ... +80 (FKM seals) |
| Storage temperature range | | see operating instructions 07600-B |
| $MTTF_d$ value 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 on page 7 and 8 |
| Maximum flow | l/min | 160 |
| 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)<br>–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 (see sectional drawing page 4 ... 5) |
| | ▶ With pre-opening | $A_3/A_2$ ~ 1/11.5 (see sectional drawing page 5) |
| | ▶ Version "SO60" | $A_1/A_4$ ~ 1/6 (see sectional drawing page 5) |

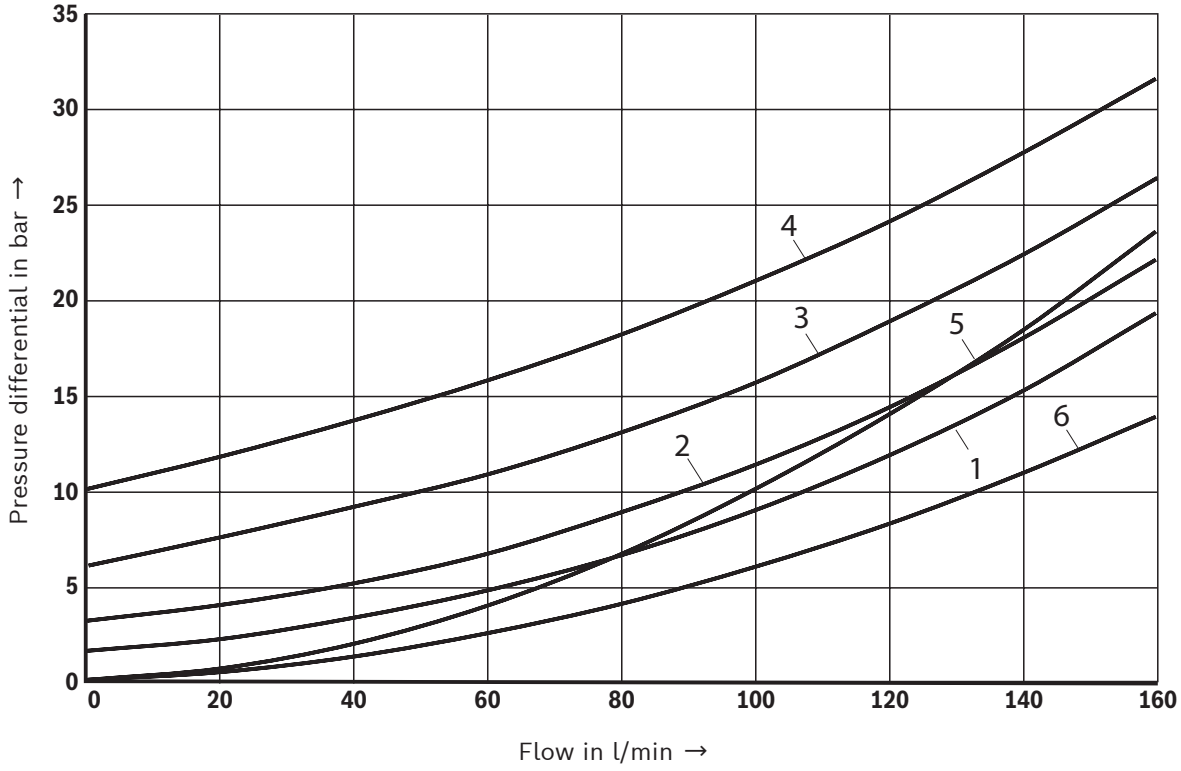
| **Hydraulic fluid** | | **Classification** | **Suitable sealing materials** | **Standards** | **Data sheet** |
|---|---|---|---|---|---|
| Mineral oils | | HL, HLP, HLPD, HVLP, HVLPD | NBR, FKM | DIN 51524 | 90220 |
| Bio-degradable | ▶ Insoluble in water | HETG | FKM | ISO 15380 | 90221 |
| | | HEES | FKM | | |
| | ▶ Soluble in water | HEPG | FKM | ISO 15380 | |
| Flame-resistant | ▶ Water-free | HFDU (glycol base) | FKM | ISO 12922 | 90222 |
| | | HFDU (ester base) | FKM | | |
| | | HFDR | FKM | | |
| | ▶ Containing water | HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046) | NBR | 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.

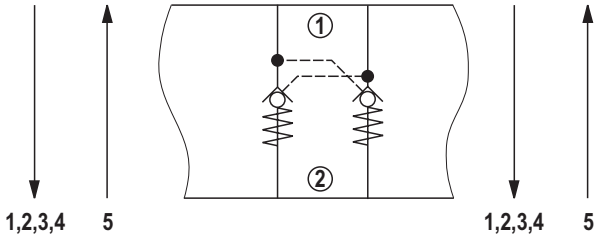
**Characteristic curves:** Without spool position monitoring
(measured with HLP46, $\vartheta_{oil}$ = 40 ±5 °C, averages)

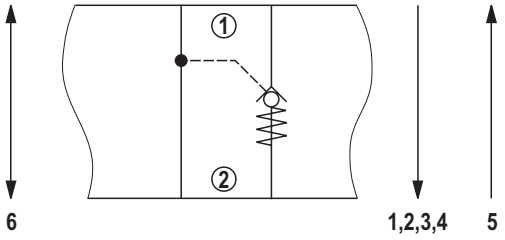
***Δp-q*V characteristic curves**



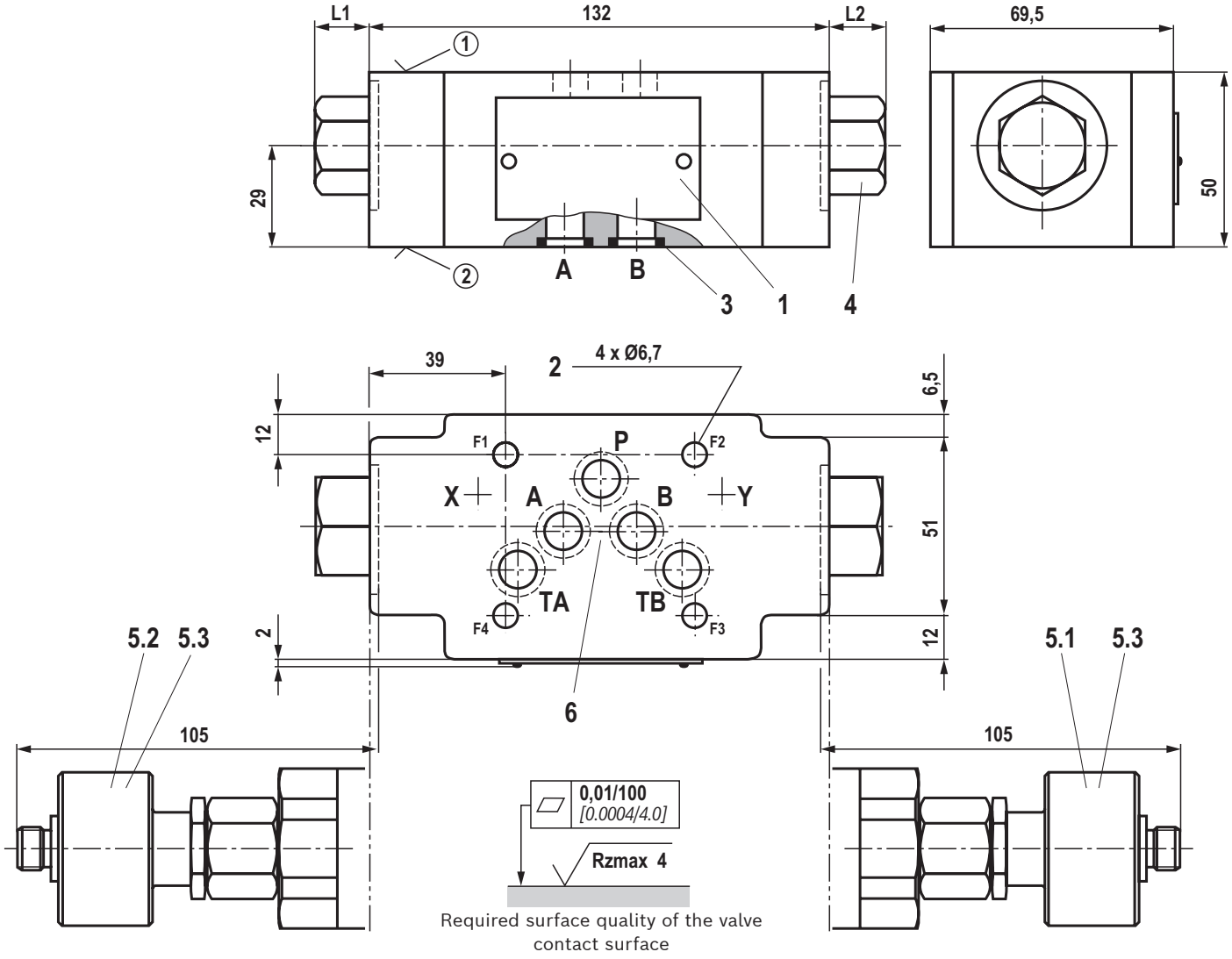

**Cracking pressure:**

- **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"



## Dimensions
(dimensions in mm)




Required surface quality of the valve contact surface

| | "no code" | "SO40" | | "SO60“ | "SO150" |
|---|---|---|---|---|---|
| | | Version "A" | Version "B" | | |
| L1 in mm | 13.5 | 6.5 | 13.5 | 13.5 | 13.5 |
| L2 in mm | 13.5 | 13.5 | 6.5 | 13.5 | 13.5 |

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 $M_A = 40^{+5}$ Nm
**5.1** Version "QMAG24" (circuitry see page 10)
**5.2** Version "QMBG24" (circuitry see page 10)
**5.3** Version "QMABG24" (circuitry see page 10)
**6** 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 called TA and port T1 is called TB in this data sheet.

**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 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.