RE 21553
Edition: 2021-01
Replaces: 2020-03

rexroth
A Bosch Company

Check valve, pilot operated

Type Z2S

H8028_d

- Size 10
- Component series 3X
- Maximum operating pressure 350 bar
- Maximum flow 160 l/min

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 leakage-free blocking of one or two actuator ports, optional
- Various cracking pressures
- With pre-opening (standard); without pre-opening (optional)
- Check valve installation sets available individually
- Special versions upon request

Contents

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**

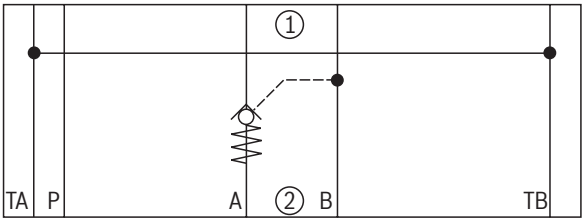
Special version

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	*****

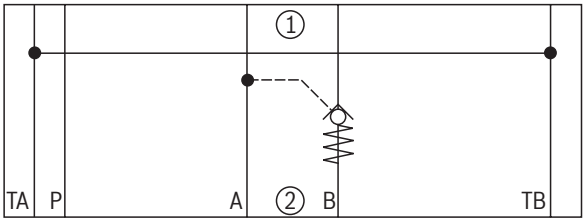
1) With version "SO150", ports X and Y are already in place.
(No ordering code required)

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

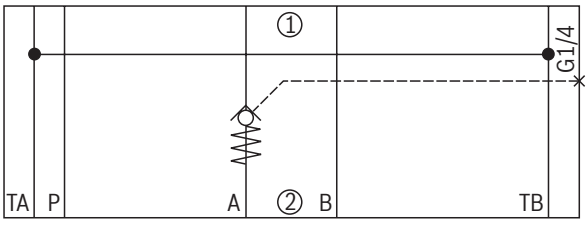
Version "A"



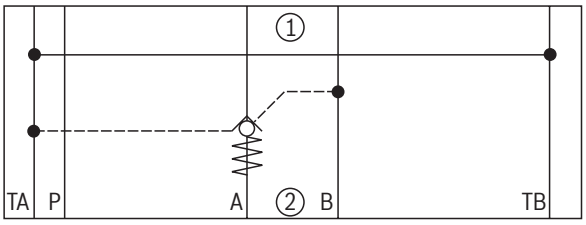
Version "B"



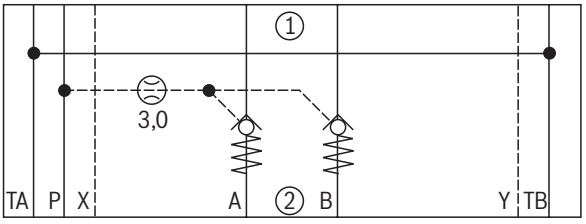
Version "A...SO40"



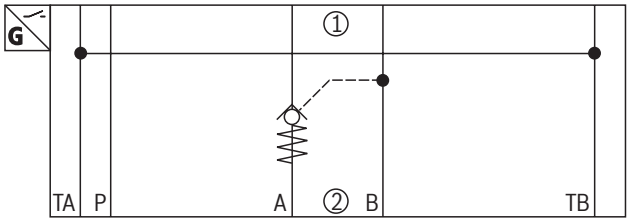
Version "A...SO60"



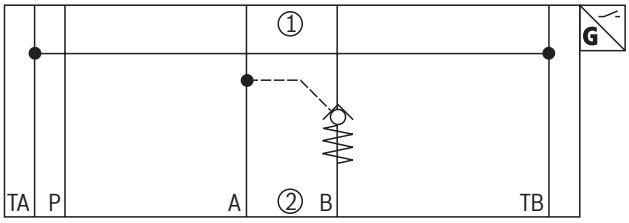
Version "–...SO150"



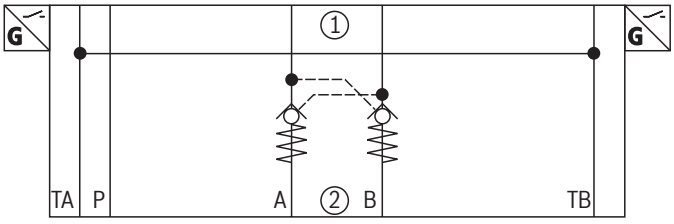
Version "A3...QMAG24"



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.

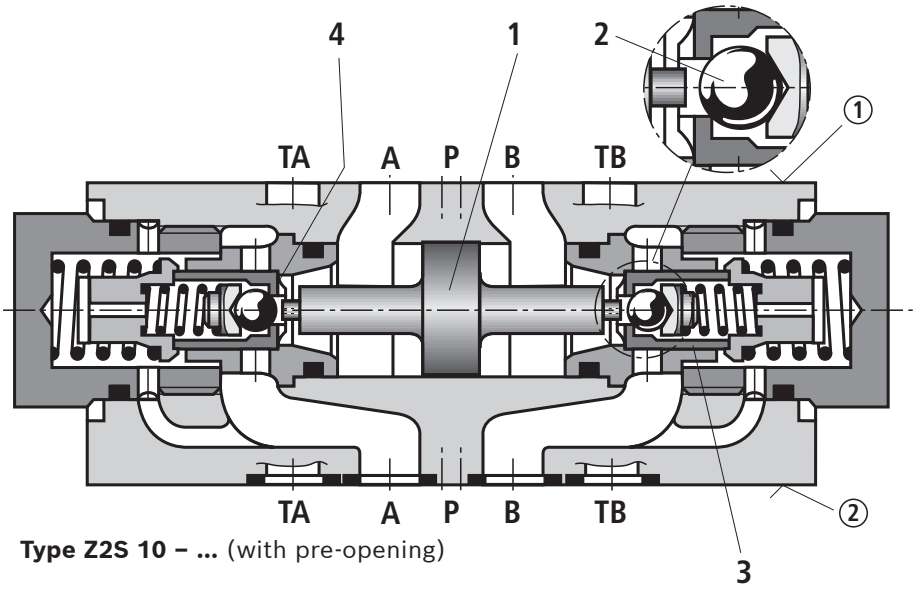
Function, sections, circuit example

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.

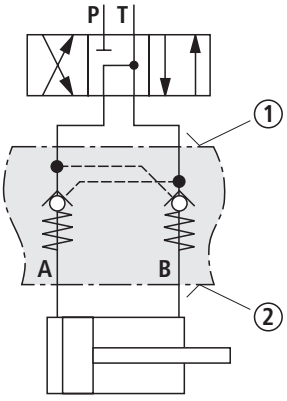
In order to allow the ball seat valve (2) to be safely closed, the control spool (1) must be hydraulically unloaded (see circuit example).
Due to the pre-opening, there is a damped decompression of the pressurized liquid. Thus, possible switching shocks are avoided.

Pre-opening

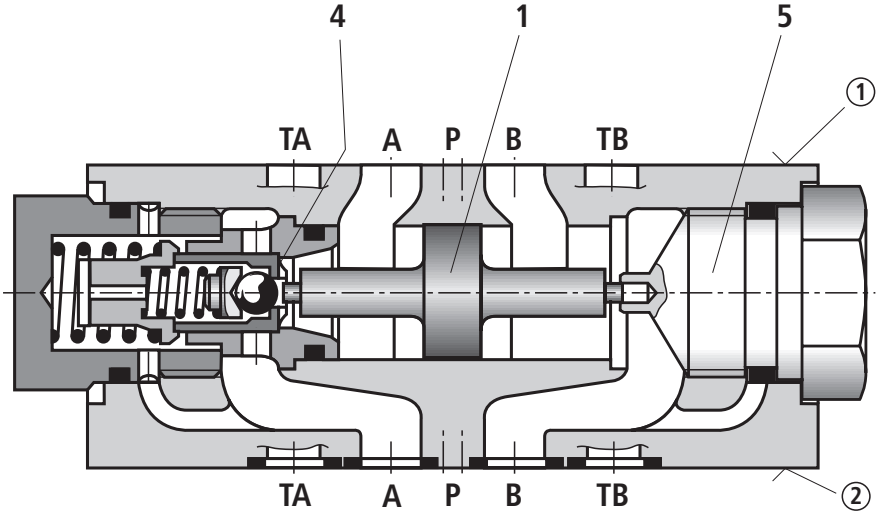
- The two-stage set-up with an increased control open ratio means even low pilot pressure can be unloaded securely.
- Avoidance of switching shocks due to dampened decompression of the pressure volume on the actuator side.



Type Z2S 10 – ... (with pre-opening)



Circuit example, schematic



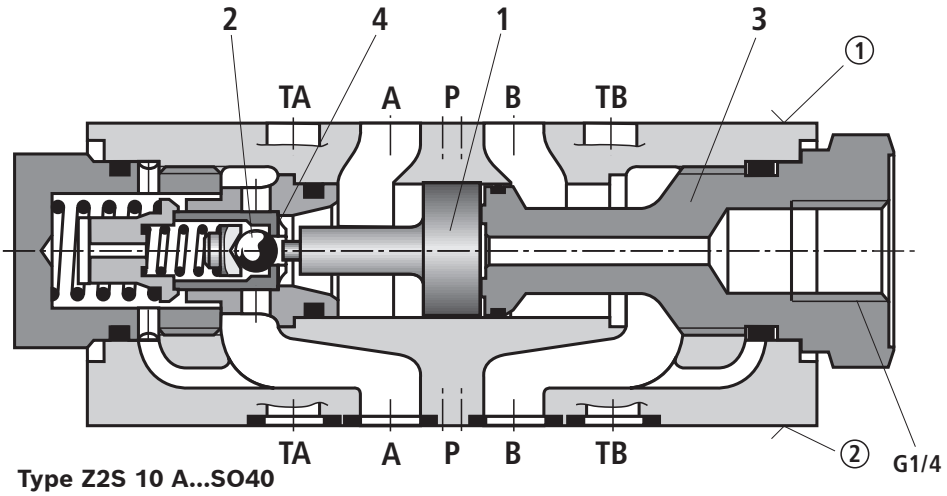
Type Z2S 10 A...

① = component side
② = plate side

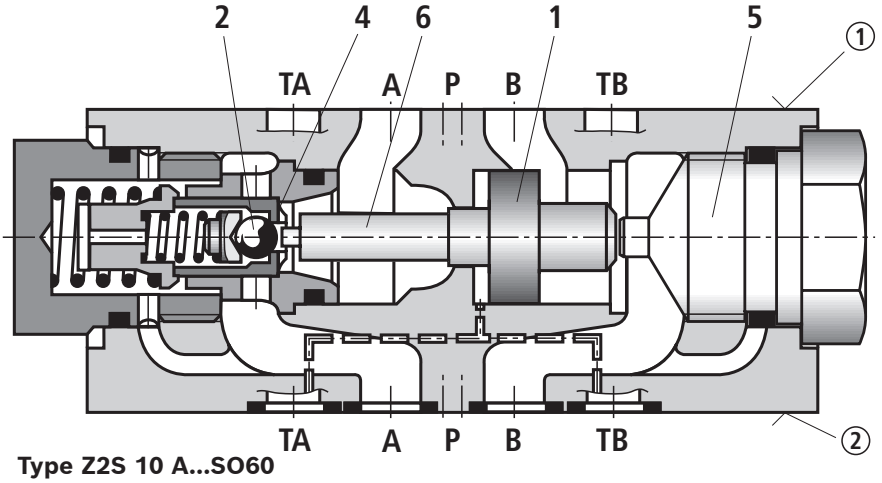
1 Control spool, area A_2
2 Ball, area A_3
4 Poppet, area A_1
5 Stop

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

Function, sections



Type Z2S 10 A...SO40



Type Z2S 10 A...SO60

① = component side
② = plate side

1 Control spool, area A_2
2 Ball, area A_3
4 Poppet, area A_1
5 Stop
6 Control spool, area A_4

☞ **Notices:**

- 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.
- 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) –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) –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)

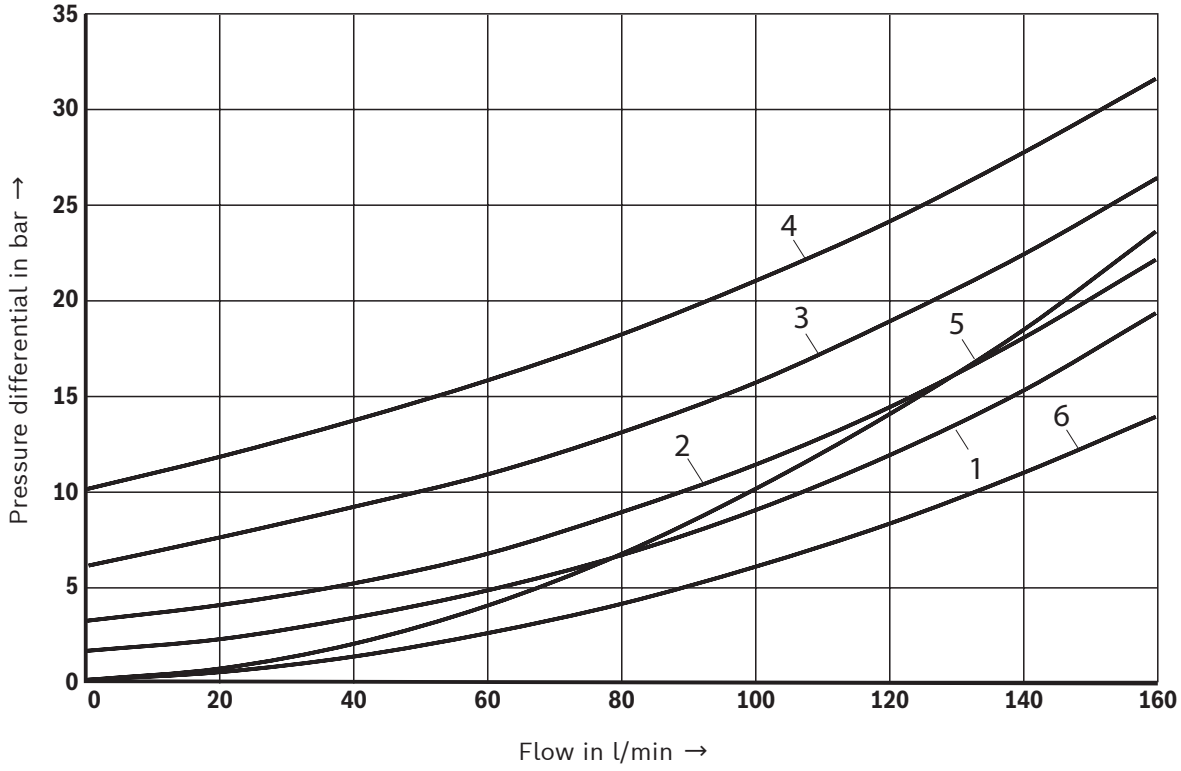
Hydraulic fluid		**Classification**	**Suitable sealing materials**	**Standards**	**Data sheet**
Mineral oils		HL, HLP, HLPD, HVLP, HVLPD	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	FKM	ISO 15380	90221
		HEES	FKM		
	▶ Soluble in water	HEPG	FKM	ISO 15380	
Flame-resistant	▶ Water-free	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.

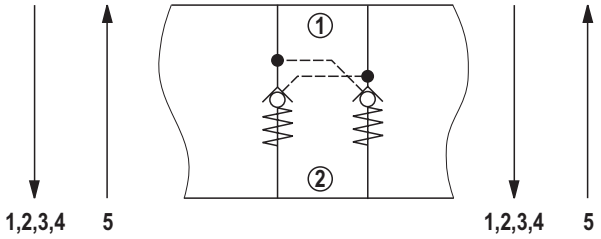
Characteristic curves: Without spool position monitoring
(measured with HLP46, ϑ_{oil} = 40 ±5 °C, averages)

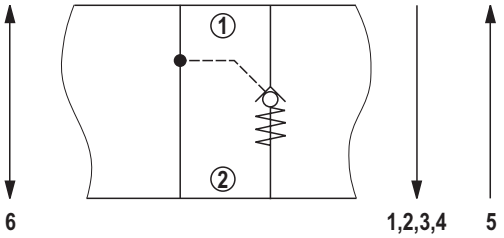
***Δp-q*V characteristic curves**



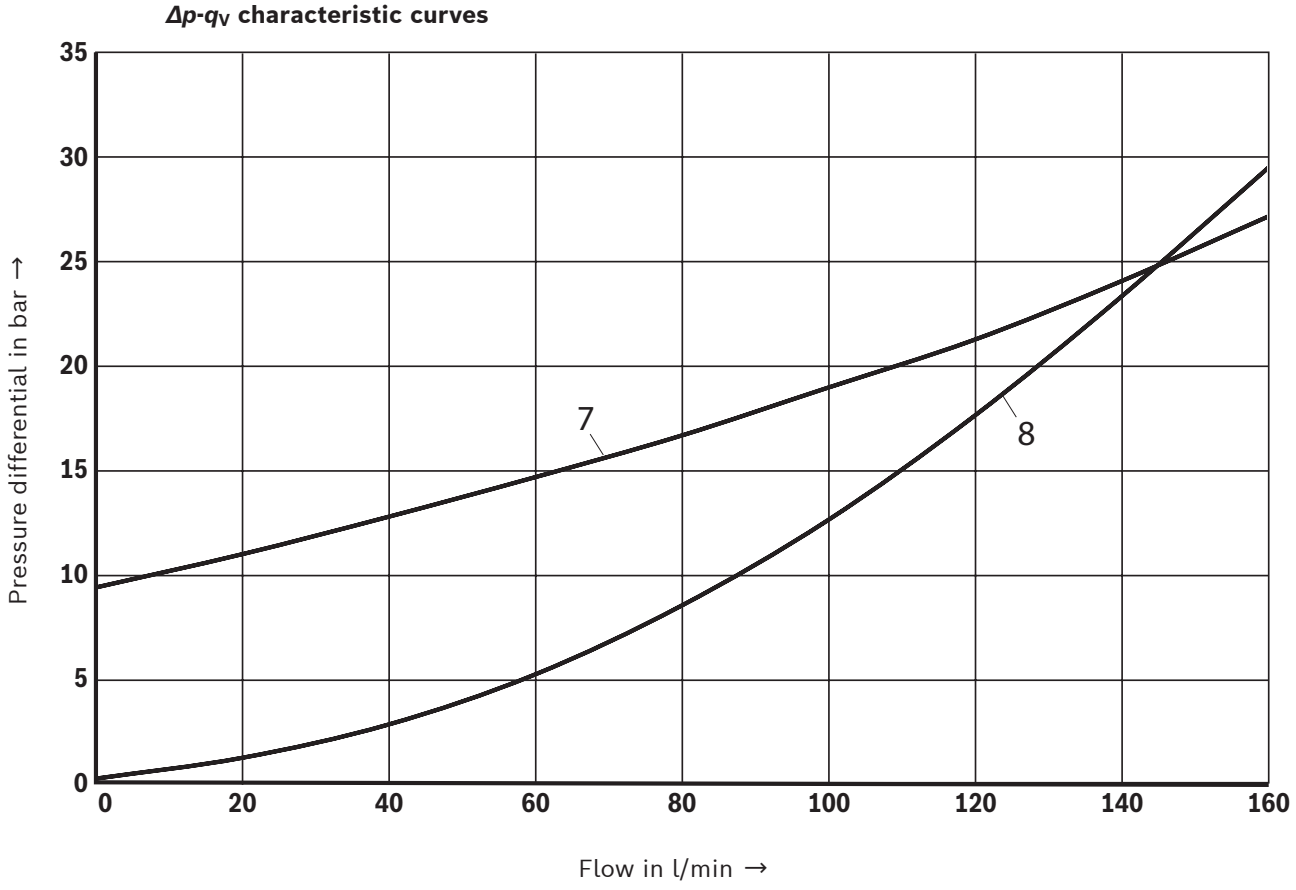
Cracking pressure:

- **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"



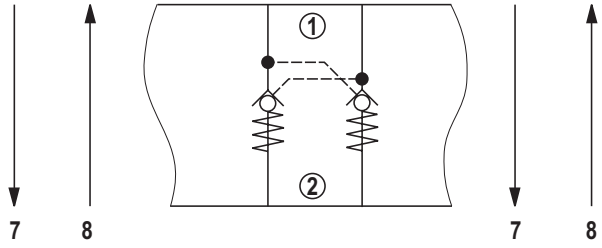


Characteristic curves: With spool position monitoring
(measured with HLP46, ϑ_{oil} = 40 ±5 °C, averages)

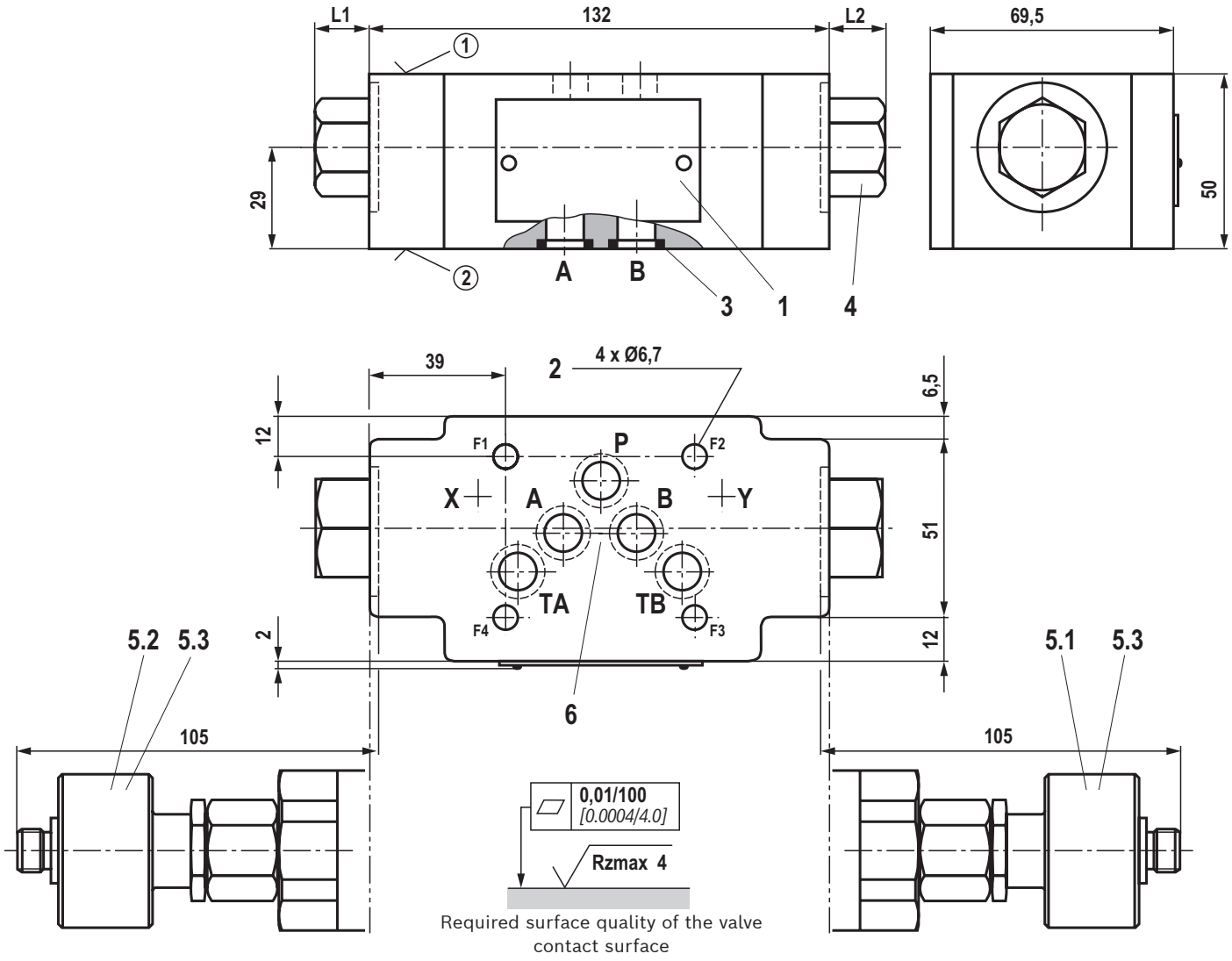


Cracking pressure:

- **7** Version "QMAG24", "QMBG24", "QMABG24"
- **8** Check valve controlled open via control spool (version "QMAG24", "QMBG24", "QMABG24")



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

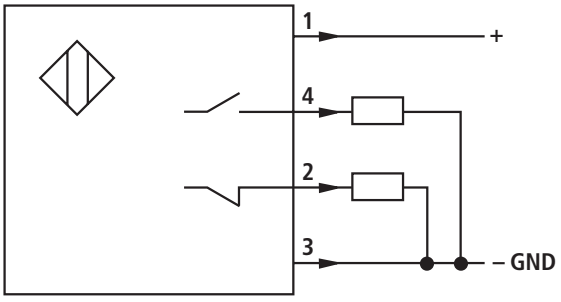
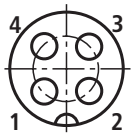
① component side
② plate side
1 Name plate
2 Through hole for valve mounting
3 Identical seal rings for ports A, B, P, TA, and TB
4 Plug screw SW30, tightening torque $M_A = 40^{+5}$ Nm
5.1 Version "QMAG24" (circuitry see page 10)
5.2 Version "QMBG24" (circuitry see page 10)
5.3 Version "QMABG24" (circuitry 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

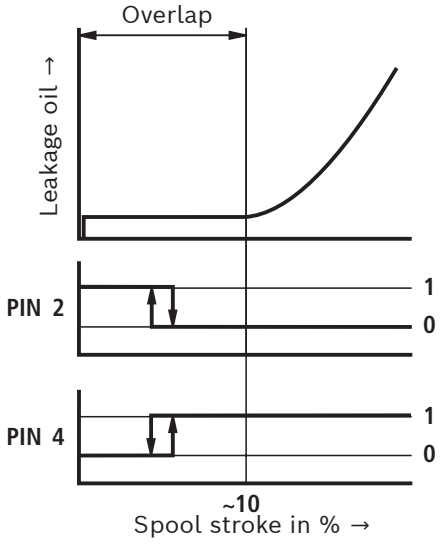
☞ **Notice:**
The length of the valve mounting screws of the sandwich plate valve must be selected according to the components mounted under and over the isolator valve.
Depending on the application, screw type and tightening torque must be adjusted to the circumstances.
Please ask Rexroth for screws with the required length.

Inductive position switch type QM: Electrical connection

The electrical connection is realized via a 4-pole mating connector (separate order, see page 11) with connection thread M12 x 1.

Connection voltage:	24 V +30%/-15%, direct voltage
Admissible residual ripple:	≤ 10%
Load capacity:	maximum 400 mA
Switching outputs: 	PNP transistor outputs, load between switching outputs and GND
Pinout: 	**1** +24 V **2** Switching output: 400 mA **3** 0 V, GND **4** Switching output: 400 mA

Inductive position switch type QM: Switching logics



Accessories (separate order)

Mating connectors and cable sets

Designation	Version	Short designation	Material number	Data sheet
Mating connectors; for sensors and valves with "K24", "K35" and "K72" connectors, 4-pole	M12 x 1, straight, PG 9	4PZ24	**R900031155**	08006
	M12 x 1, angled, PG 7		**R900082899**	
Cable sets; for sensors and valves with "K24", "K35" and "K72" connectors, 4-pole	M12 x 1, straight, 3.0 m	4PZ24	**R900064381**	

Further information

▶ Subplates	Data sheet 45100
▶ Inductive position switch and proximity sensors (contactless)	Data sheet 24830
▶ Hydraulic fluids on mineral oil basis	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)	Data sheet 90223
▶ Reliability characteristics according to EN ISO 13849	Data sheet 08012
▶ Hexagon socket head cap screw, metric/UNC	Data sheet 08936
▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ Use of non-electrical hydraulic components in explosive atmospheres (ATEX)	Data sheet 07011
▶ Selection of filters	www.boschrexroth.com/filter
▶ Information on available spare parts	www.boschrexroth.com/spc

Notes

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