

Piezo-pneumatic switch valve Type S9/S29

Intrinsically safe according to ATEX

Brief operating instructions

Version 01



For complete up-to-date operating instructions, visit <http://www.hoerbiger.com/>

ID no.: PS09566B



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1 Note for using the brief operating instructions

These brief operating instructions do not replace the associated operating instructions for this product (PS09567_).

The brief operating instructions describe the pneumatic and electrical connection of the device, as well as its start-up. They include notes about electrical and pneumatic characteristics.

The brief operating instructions do not include any basic safety instructions and warnings. Therefore, they may only be used by qualified personnel who have read and understood the **up-to-date** operating instructions belonging to the product. These operating instructions can be downloaded from the HOERBIGER company website <http://www.hoerbiger.com>.

For additional information, contact the manufacturer at the following address:

HOERBIGER Flow Control GmbH
Südliche Römerstraße 15
86972 Altenstadt
Germany

Information on the Internet: www.hoerbiger.com

2 Ex characteristics

2.1 Thermal Ex characteristics

The following safety-technical ambient temperatures in various temperature classes apply for use in areas subject to explosion (see valve type plate):

Temperature class	Permissible ambient temperature range	Permissible medium temperature
T6	$-40\text{ °C} \leq t_a \leq 40\text{ °C}$	$-40\text{ °C} \leq t_m \leq 40\text{ °C}$
T5	$-40\text{ °C} \leq t_a \leq 80\text{ °C}$	$-40\text{ °C} \leq t_m \leq 70\text{ °C}$
T4	$-40\text{ °C} \leq t_a \leq 90\text{ °C}$	$-40\text{ °C} \leq t_m \leq 70\text{ °C}$

The table serves to explain Ex-technical data and not as specification for the valves. In normal operation, intrinsic heating is very slight.



The function of the valves is only given in the temperature range specified in the current data sheet.

3 Product description

3.1 Connections

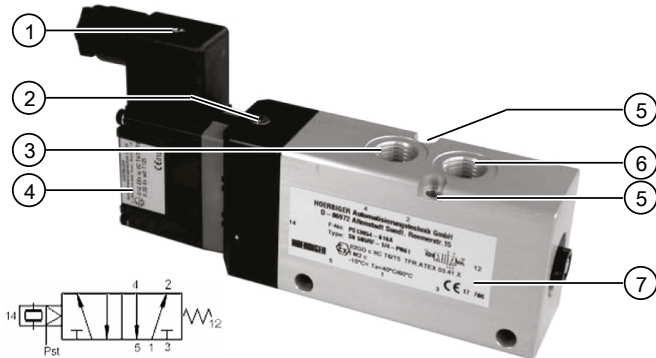


Fig. 1: Valve type series S9 with pipe connection using the example of 5/2-way RF

1	Electrical connection (device outlet)	5	Holes for fastening on RPS strip
2	Manual operation on the adapter	6	Working connection -2 (optionally G1/4 or G1/8)
3	Working connection -4 (optionally G1/4 or G1/8)	7	Type plate spool valve S9
4	Type plate piezo valve P8		

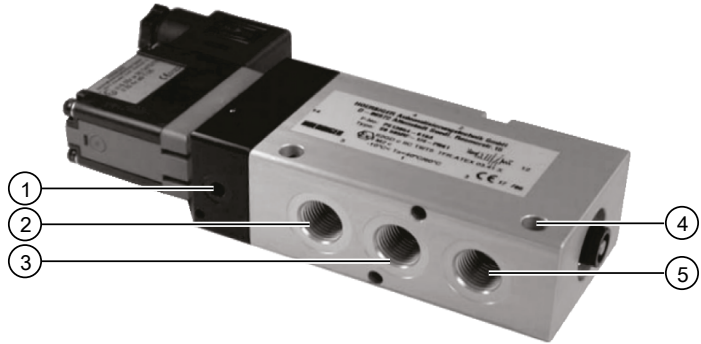


Fig. 2: Valve type series S9 with pipe connection - underside

1	External control air (optional, on the adapter). Connection M5 internal thread	4	Fastening holes for screw connections
2	Ventilation -5 (optionally G $\frac{1}{4}$ or G $\frac{1}{8}$)	5	Ventilation -3 (optionally G $\frac{1}{4}$ or G $\frac{1}{8}$)
3	Supply pressure -1 (optionally G $\frac{1}{4}$ or G $\frac{1}{8}$)		

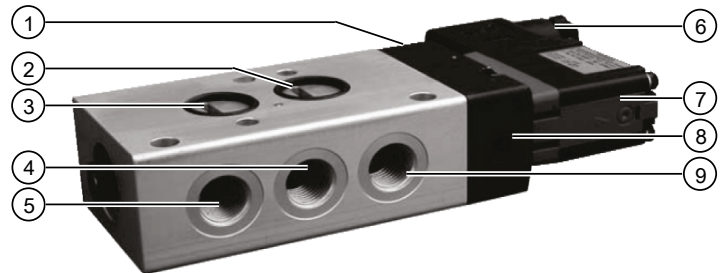
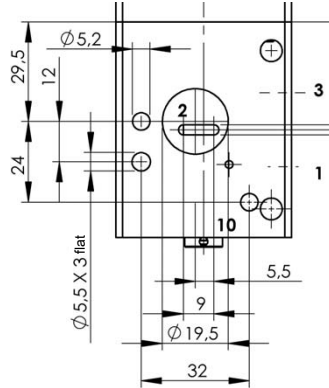


Fig. 3: Valve type series S9 with NAMUR-working connection using the example of 5/2-way RF

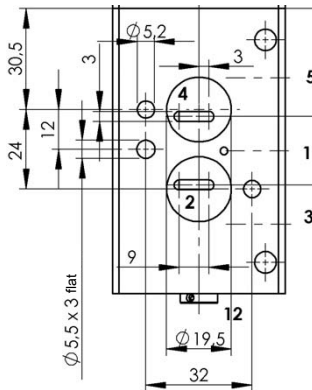
1	Manual operation (on the adapter)	6	Electrical connection
2	Working connection -4 (NAMUR)	7	Piezo pilot valve P8 385
3	Working connection -2 (NAMUR)	8	External control air (optional, on the adapter). Connection M5 internal thread
4	Supply -1 (G $\frac{1}{4}$)	9	Ventilation -5 (G $\frac{1}{4}$)
5	Ventilation -3 (G $\frac{1}{4}$)		

3.2 Connection patterns according to NAMUR

- ⇒ For the pneumatic connection of the working connections 2 or 2 and 4, mount the valve S29 according to the connection pattern according to NAMUR on a flange.



3/2-way valve with connection pattern according to NAMUR



4/2-way or 5/2-way valve with connection pattern according to NAMUR

3.3 Technical data

General technical data

Installation position	Any (preferred position: plug on top); possible compromising of emergency manual operation depending on installation position
Medium ¹⁾	Compressed air and nitrogen According to ISO 8573-1:2010 (7:3:4)
On-time (ED)	100 % ED with maximum 6000 hours constant operation

¹⁾ Use below the freezing point requires dried air (pressure dew point 10 K below ambient or medium temperature)

Subject to change without notice

Model series	S9 G $\frac{1}{4}$	S9 G $\frac{3}{8}$	S29 G $\frac{1}{4}$ -NAMUR
Protection type according to IEC 60529/A1:2000 ¹⁾	IP65	IP43	IP65

¹⁾ Only with mounted device outlet and correctly connected control cable

Subject to change without notice

Safety technical data according to EU design type certificate

HOERBIGER code	PT(63)	PM(64)	PN(61)	PN(65) ¹⁾	PT(67) ¹⁾
Voltage (U _i)	9 V DC	16 V DC	30 V DC	30 V DC	9 V DC
Current (I _i)	Not relevant				
External capacity (C _i)	12 nF	12 nF	12 nF	12 nF	12 nF
External inductance (L _i)	Negligible				

¹⁾ Not S9-G $\frac{3}{8}$ P8 381

4 Assembly and installation

4.1 Assembly



DANGER

Mortal danger due to electrical voltage!

- Switch off current before assembling and dismantling the valve.



WARNING

Danger of crushing due to uncontrolled movement of the machines

Personal injury and/or property damage possible.

- Before restarting the system, take measures to prevent uncontrolled movement of the machines.
- Make sure that nobody is in the danger zone.



WARNING

Personal injury or property damage due to fault arcs

Fault arcs can cause extremely severe injuries and fire.

- Use low-spark tools.
- Wear work clothing to protect against fault arcs.



WARNING

Personal injury or property damage due to overpressure

Improperly connected or defective pneumatic connections can loosen under pressure and cause extremely severe injuries.

- Before assembly and dismantling of valves, switch off compressed air.
- Make sure that there is neither input nor output pressure on the valves.
- Only use components that are suitable for the permissible pressure ranges (see Technical data).
- Proceed according to the special country-specific safety regulations.



During installation of the valves in a system/machine in Ex areas, adhere to standards EN1127-1 and relevant standards.



WARNING

Personal injury and property damage due to explosion

- Only install devices within the categories specified on the data sheet.
- Undertake installation of the intrinsically safe circuits according to the applicable building regulations (demonstrate knowledge of the builder, protected laying of the intrinsically safe circuits).
- Maintain a safety distance of at least 50 mm between intrinsically safe and non intrinsically safe conductive connection parts.
- For the interconnection of the devices with the intrinsically safe circuits of the associated tools, heed the respective maximum values of the field device (valves) and the associated device in the interest of explosion protection (proof of intrinsic safety).
- In adverse ambient conditions, protect devices against spray water or dirt according to the protection type in the current data sheet.
- For the special conditions of the EU design test certificate, see EU design type certificate.

1. Only remove the valve from the packaging immediately before assembly.
2. Remove all residues completely and thoroughly from the surface of pipelines/hoses to be connected.
3. Blow out pipelines/hoses thoroughly with compressed air. **NOTICE! There may be no residues inside the lines.**
4. Clean all mounting surfaces with a clean, lint-free cloth and a commercially available cold cleanser.
5. Only valve S29 (NAMUR): Use the included fastening kit.
6. Only valve S29 (NAMUR): Make sure that the appropriate O-rings are inserted in the valve and connection plate.
7. Optionally place the valve on a connection plate for direct connection of lines or on a pneumatic amplifier stage. **NOTICE! All holes must be perfectly flush so that there is no twisting.**
8. Only for use in Ex areas: Maintain a safety distance of at least 50 mm between intrinsically safe and non intrinsically safe conductive connection parts.
9. Screw on the valve with 2 fastening screws (for screw type, see the table below).

Type series S9-G¼
<ul style="list-style-type: none"> ■ Horizontal mounting: 2x M6 ■ Vertical mounting on air distributor strip: 2x cylinder screw ISO 4762 - M4x55; material: 8.8-A2K or A2-70
Type series S9-G½
<ul style="list-style-type: none"> ■ Horizontal mounting: 2x M5 ■ Vertical mounting on air distributor strip: 2x cylinder screw ISO 4762 - M3x45; material: 8.8-A2K or A2-70
Type series S29-G¼
<ul style="list-style-type: none"> ■ 2x cylinder screw ISO 4762 - M5; material: 8.8-A2K or A2-70

Tab. 1: Screw types for mounting



Compromising of the valve function possible

- Make sure that the ventilation openings are not covered.
- Protect valve against excessive heat radiation.
- Protect valve against adverse ambient conditions such as spray water or dirt, in order to guarantee the protection type according to the data sheet.

4.2 Electrical installation



DANGER

Mortal danger due to electrical voltage!

- Only have the device connected to the power supply and control lines by a specialist.
- Installation may only be done when the device is de-energized.
- Secure against unintentional switching on.
- Check electric cables for damage before connecting.



For electrical connections in Ex areas, heed the applicable standards.



! DANGER

Mortal danger due to explosion

- In Ex areas, only use with device outlet according to chapter *Device socket*, page 11.
- Only use the device in areas subject to explosion together with appropriately approved voltage sources and safety equipment (e.g. separator modules or similar).
- Have the interconnection assessed by a specialized electrician with knowledge of the set-up of electrical systems in areas subject to explosion.
- Lay intrinsically safe lines protected.
- For the electrical connection, heed the prescribed switching voltage and the protection type of the cable.

4.3 Device socket

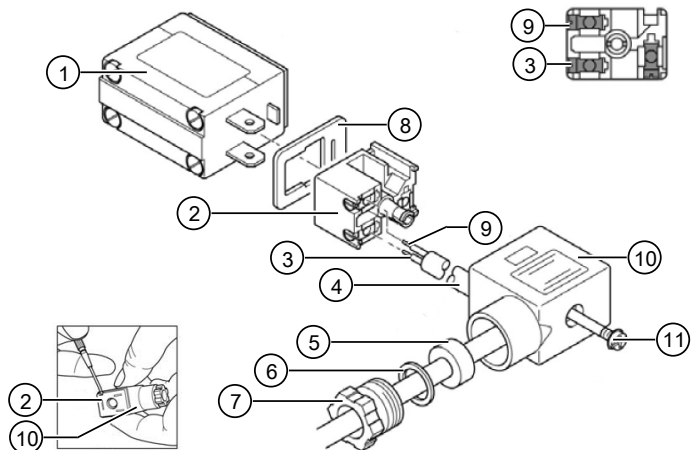
The device outlet corresponds to design B according to industry standard according to DIN EN 175301-803-B (= type GSD-22).



Use in Ex areas is only permitted with GSD-22 according to DIN EN 175301-803-B.

Use of a GSD with LED in Ex areas is not permitted.

4.4 Connect control cable to device outlet





The terminal assignments are depicted at the top right of the figure.

1. Loosen the connection locking screw (11).
2. Remove device outlet (10) from the blade contacts of the valve (1).
NOTICE! Heed the installation position of the plug seal (8). The seal must lie correctly and flat.
3. Pull the plug locking screw completely out of the device outlet (10).
4. Pull the connection block (2) completely out of the device outlet with a screwdriver.
5. Turn the screw connection (7) out of the device outlet.
6. Remove the washer (6) and seal (5) from the device outlet.
7. Feed the control cable (4) through the screw connection (7), washer (6), seal (5) into the device outlet.
8. Adjust the control cable of the seal in diameter so that the cable is tight in the seal.
9. Remove insulation at the end of the control cable. **NOTICE! Do not damage the two wires.**
10. Strip the wires with a cable stripper. **NOTICE! For the installation, a two-line cable is sufficient.**
11. Clamp both wires of the cable to the screw terminals of the connection block: Wire "0 Volt" to terminal 1 (3), wire "control voltage" to terminal 2 (9). **NOTICE! The ground clamp is not used. The terminal numbering is engraved in both sides of the connection block.**
12. Place the seal (5), washer (6), and the screw connection (7) to the control cable.
13. Turn screw connection in the device outlet.
14. Place device outlet with connected cable on the contacts of the valve.
15. Tighten with plug locking screw. **NOTICE! Make sure that the plug seal (8) is placed on the valve over the blade contacts and there is no strain on the cables.**

5 Start-up

5.1 Start-up



With use in environments with flammable gases, heed the Ex directive and other applicable regulations and the respectively valid local regulations (e.g. flush with inert gas, avoid adiabatic processes, etc.).



⚠ WARNING

Personal injury and property damage possible

- Only have the start-up done by people who have sufficient knowledge and experience with respect to compressed air systems and the machine/system to be started up.
- Before operation with combustible gases, consult the manufacturer.
- Heed additional measures according to the local set-up provisions (e.g. incorporation into the repeated pressure test).
- For start-up of the valves, adhere to the following sequence of steps.

- ✓ The power supply is switched off.
- ✓ There is neither input nor output pressure present.

1. Check proper mounting.
2. Open compressed air supply.



⚠ WARNING

Danger of crushing due to uncontrolled movement of the machines

Personal injury and/or property damage possible.

- Before restarting the system, take measures to prevent uncontrolled movement of the machines.
- Make sure that nobody is in the danger zone.

3. Switch on electric signal control.

5.2 Manual operation

With manual operation, the spool valve can be operated without electrical activation. It functions both by pressing a button and by locking.

- By pressing a button:
 - On: by pressing the activation button.
 - Off: by releasing the activation button.
- By locking:
 - On: by pressing the activation button and turning to the right.
 - Off: by turning to the left and releasing the activation button.

6 Service



⚠ WARNING

Danger due to malfunction

Insufficiently serviced valves can cause malfunction and extremely severe injuries.

- Perform all inspection and maintenance activities on time and carefully.
- Only perform inspection and maintenance work that is described in this chapter.
- Switch off the device before inspection and maintenance activities.



Compromising of the valve function due to incorrect cleaning

- Do not use cleansers that contain solvents for cleaning work.
- No solvents or solids may penetrate the openings for ventilation and manual activation.



⚠ WARNING

Personal injury and property damage due to improper servicing

Malfunctions can result.

- In case of fault, do NOT service the device.
- In case of fault, shut the device down immediately.
- Remove the complete valve and send it to the manufacturer's local agent for servicing.

6.1 Inspection and maintenance plan

Work to be performed	ir	d	w	¼ y	y	oh
■ Check pneumatic connections for leaks				X		

Work to be performed	ir	d	w	¼ y	y	oh
<ul style="list-style-type: none"> ■ Check electrical cable for cracks, kinks, and damage to the cable insulation. ■ Replaced damaged lines. 				X		
<ul style="list-style-type: none"> ■ Check type plates to ensure they are present, visible, legible, and complete; replace if necessary 					1	
<ul style="list-style-type: none"> ■ Check fastening screws to ensure they are tight, tighten if necessary 				X		
Legend: ir= if required, d = daily, w = weekly , ¼ = quarterly, y = annually, oh = operating hours						

7 Repair and maintenance

1. Only have repair work on the valve performed by the manufacturer since only the manufacturer has the equipment for optimal adjustment after repair and can therefore guarantee perfect function.
2. Do NOT maintain the inner parts of the device.
3. Send the complete valve to the manufacturer for maintenance and service.