MOUNTING AND OPERATING INSTRUCTIONS

EB 3967 EN

Translation of original instructions

Type 3967 Solenoid Valve

Edition January 2022

CE Ex certified

TÜVRheinland CERTIFIED SIL/PL Capability www.tuv.com ID 0600000000

Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices. The images shown in these instructions are for illustration purposes only. The actual product may vary.

➔ For the safe and proper use of these instructions, read them carefully and keep them for later reference.

➔ If you have any questions about these instructions, contact SAMSON's After-sales Service Department (aftersalesservice@samsongroup.com).

Documents relating to the device, such as the mounting and operating instructions, are available on our website at ***www.samsongroup.com > Service & Support > Downloads > Documentation***.

Definition of signal words

⚠ DANGER
Hazardous situations which, if not avoided, will result in death or serious injury

⚠ WARNING
Hazardous situations which, if not avoided, could result in death or serious injury

NOTICE
Property damage message or malfunction

Note
Additional information

Tip
Recommended action

1 Safety instructions and measures

Intended use

The Type 3967 Solenoid Valve is mounted onto pneumatic linear or rotary actuators to control them. Upon failure of the air supply, the solenoid valve vents the actuator, causing the valve to move to the fail-safe position determined by the actuator. The device is designed to operate under exactly defined conditions (e.g. operating pressure, temperature). Therefore, operators must ensure that the solenoid valve is only used in applications where the operating conditions correspond to the technical data. In case operators intend to use the solenoid valve in applications or conditions other than those specified, contact SAMSON.

SAMSON does not assume any liability for damage resulting from the failure to use the device for its intended purpose or for damage caused by external forces or any other external factors.

➔ Refer to the technical data and nameplate for limits and fields of application as well as possible uses.

Reasonably foreseeable misuse

The solenoid valve is ***not*** suitable for the following applications:

– Use outside the limits defined during sizing and by the technical data

Furthermore, the following activities do not comply with the intended use:

– Use of non-original spare parts
– Performing maintenance activities not described

Qualifications of operating personnel

The solenoid valve must be mounted, started up, serviced and repaired by fully trained and qualified personnel only; the accepted industry codes and practices must be observed. According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible hazards due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.

Explosion-protected versions of this device must be operated only by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.

Personal protective equipment

Personal protective equipment is not required to mount or operate the solenoid valve. Work on the control valve may be necessary when mounting or removing the solenoid valve.

➔ Observe the requirements for personal protective equipment specified in the valve documentation.

➔ Check with the plant operator for details on further protective equipment.

Revisions and other modifications

Revisions, conversions or other modifications of the product are not authorized by SAMSON. They are performed at the user's own risk and may lead to safety hazards, for example. Furthermore, the product may no longer meet the requirements for its intended use.

Warning against residual hazards

The solenoid valve has a direct influence on the control valve when it has been installed. To avoid personal injury or property damage, plant operators and operating personnel must prevent hazards that could be caused in the control valve by the process medium, the operating pressure, the signal pressure or by moving parts by taking appropriate precautions. Plant operators and operating personnel must observe all hazard statements, warnings and caution notes in these mounting and operating instructions, especially for installation, start-up and service work.

Responsibilities of the operator

Operators are responsible for proper use and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions as well as the referenced documents to the operating personnel and to instruct them in proper operation. Furthermore, operators must ensure that operating personnel or third parties are not exposed to any danger.

Responsibilities of operating personnel

Operating personnel must read and understand these mounting and operating instructions as well as the referenced documents and observe the specified hazard statements, warnings and caution notes. Furthermore, operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.

Referenced standards, directives and regulations

Devices with a CE marking fulfill the following requirements of the Directives:

– Type 3967: 2014/30/EU, 2014/35/EU, 2011/65/EU, 2015/863/EU
– Type 3967-1 and Type 3967-8: 2014/30/EU, 2014/34/EU, 2011/65/EU

See Annex for declarations of conformity.

Referenced documentation

The following documents apply in addition to these mounting and operating instructions:

– The mounting and operating instructions of the components on which the solenoid valve is mounted (valve, actuator, valve accessories etc.)
– Safety manual ▶ SH 3967

The latest versions of the documents are available on our website at ▶ www.samsongroup.com.

1.1 Notes on possible severe personal injury

⚠ DANGER

Risk of fatal injury due to electric shock.

Before starting up the solenoid valve, electrical installation work must be performed. An electric shock due to incorrect work practices may cause fatal injuries.

➔ Before connecting wiring, performing any work on the device or opening the device, disconnect the supply voltage and protect it against unintentional reconnection.

➔ For electrical installation, observe the relevant electrotechnical regulations and the accident prevention regulations that apply in the country of use.

➔ In Germany, observe the VDE regulations and the accident prevention regulations of the employers' liability insurance.

Risk of fatal injury due to the ignition of an explosive atmosphere.

Incorrect installation, operation or maintenance of the solenoid valve in potentially explosive atmospheres may lead to ignition of the atmosphere and ultimately to death.

➔ The following regulations apply to installation in hazardous areas: EN 60079-14: 2008 (VDE 0165, Part 1).

➔ Installation, operation or maintenance of the solenoid valve is to be performed only by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.

➔ Observe the type of protection and the conditions for control specific for the type of protection according to the EC type examination certificate.

➔ Read the special instructions concerning explosion protection (see section 1.4).

1.2 Notes on possible personal injury

⚠ WARNING

Risk of personal injury due to moving parts on the valve.

During operation and when the solenoid valve is triggered, the valve moves through its entire travel range. Injury to hands or fingers is possible if they are inserted into the valve.

➔ While the valve moves, do not insert hands or fingers into the valve yoke and do not touch any moving valve parts.

Intrinsic safety rendered ineffective in intrinsically safe devices.

Every time the solenoid valve is operated, even when it is not installed in the plant (e.g. during maintenance, calibration and work on the device), it must be ensured that the conditions for intrinsically safe circuits are observed.

➔ Only connect intrinsically safe devices intended for use in intrinsically safe circuits to certified intrinsically safe input-connected units.

➔ Do not place intrinsically safe devices back into operation that were connected to intrinsically safe input-connected units without certification.

➔ Do not exceed the maximum permissible electric values specified in the EC type examination certificates when interconnecting intrinsically safe electrical equipment (U_i or U_0, I_i or I_0, P_i or P_0, C_i or C_0 and L_i or L_0).

1.3 Notes on possible property damage

NOTICE

Risk of damage to the solenoid valve due to incorrect mounting position.

➔ Do not mount the solenoid valve with the vent opening facing upward.

➔ Do not seal the vent opening when the device is installed on site.

Risk of damage to the solenoid valve due to impermissible pressures.

➔ Do not connect a supply pressure to the solenoid valve that exceeds the maximum supply pressure.

Incorrect assignment of the terminals will damage the solenoid valve and will lead to malfunction.

For the solenoid valve to function properly, the prescribed terminal assignment must be observed.

➔ Connect the electrical wiring to the solenoid valve according to the prescribed terminal assignment.

1.4 Special instructions concerning explosion protection

Equipment for use in zone 2/zone 22

➔ In equipment operated according to type of protection Ex nA II (non-sparking equipment) according to EN 60079-15: 2003, circuits may be connected, interrupted or switched while energized only during installation, maintenance or repair.

➔ Equipment connected to energy-limited circuits with type of protection Ex nL (energy-limited equipment) according to EN 60079-15: 2003 may be switched under normal operating conditions.

➔ The maximum permissible values specified in the statement of conformity and its addenda apply when interconnecting the equipment with energy-limited circuits in type of protection Ex nL IIC.

Conditions concerning connection according to PTB 06 ATEX 2028 X

- ➔ For type of protection Ex nA II, the input circuits may be connected, interrupted or switched while energized only during installation, maintenance or repair.
- ➔ For type of protection Ex nL IIC, the input circuits may be switched under normal operating conditions.
- ➔ If the Type 3967-8x Solenoid Valve is intended for use in explosive atmospheres with conductive dust according to EN 50281-1-1:1998, it must be installed in an enclosure. The enclosure must provide the degree of protection IP 54 according to IEC 60529:1989 at the minimum. The wiring must be connected in such a way that the connection is not subjected to pulling or twisting.

Servicing explosion-protected devices

- ➔ Observe the following for servicing equipment in a section relevant to explosion protection:
  - The equipment must not be put back into operation until a qualified inspector has assessed the equipment according to explosion protection requirements, has issued an inspection certificate or given the device a mark of conformity. Inspection by a qualified inspector is not required if the manufacturer performed a routine test on the device before putting it back into operation. Document the passing of the routine test by attaching a mark of conformity to the device.
  - Replace explosion-protected components only with original, routine-tested components by the manufacturer.
  - Devices that have already been operated outside hazardous areas and are intended for future use inside hazardous areas must comply with the safety requirements placed on serviced devices. Before being operated inside hazardous areas, test the devices according to the specifications for servicing explosion-protected devices.

Maintenance, calibration and work on equipment

- ➔ Only use intrinsically safe current/voltage calibrators and measuring instruments for interconnection with intrinsically safe circuits to check or calibrate the equipment inside or outside hazardous areas.
- ➔ Observe the maximum permissible values specified in the certificates for intrinsically safe circuits.

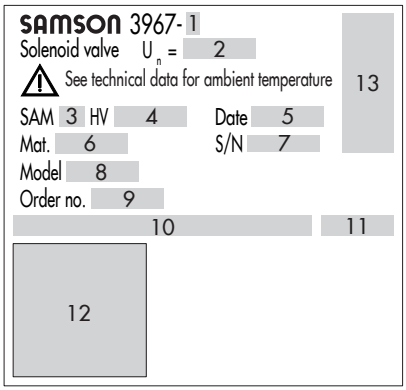
1.5 Warnings on the device

Warning symbols	Meaning of the warning
	Warning against sudden loud noise The solenoid valve mounted on the control valve can cause the pneumatic actuator to vent. A loud noise may occur during venting. This can cause hearing damage.

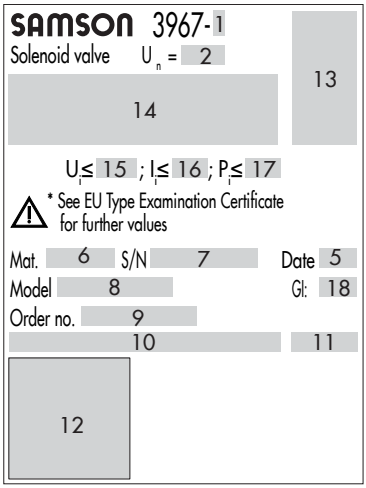
2 Markings on the device

2.1 Nameplate

Version without explosion protection



Version with explosion protection



1 Configuration
2 Nominal signal
3 Code for NAMUR Recommendation NE 53 (internal specification)
4 Hardware version
5 Date of manufacture
6 Material number
7 Serial number
8 Model number
9 Order number
10 Production site
11 Product origin
12 Data Matrix code (electronic nameplate)
13 Approvals (CE, EAC, UKCA etc.)
14 Type of protection for explosion-protected devices
15 Maximum input voltage
16 Maximum input current
17 Maximum power input
18 Device index

2.2 Article code

Note

*The versions "NAMUR rib according to IEC 60534 for linear actuators/threaded connection" (Type 3967-xxxxxxx**2**x…) and "NAMUR interface ¼ according to VDI/VDE 3845 for rotary actuators with adapter plate for external air connections" (Type 3967-xxxxxxx**5**x…) have an **Emataℓ** coating.*

Solenoid valve	Type 3967-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Type of protection																							
No explosion protection		0	0	0																			
ATEX	II 2G Ex ia IIC T6 Gb, II 2D Ex ia IIIC T80°C Db	1	1	0																			
CCC Ex	Ex ia IIC T4...T6 Gb, Ex ia IIIC T80 °C Db	1	1	1																			
IECEx	Ex ia IIC T6...T4 Gb, Ex ia IIIC T80°C Db	1	1	2																			
TR CMU 1055	II 2G Ex ia IIC T6...T4 Gb, II 2D Ex ia IIIC T80 °C Db	1	1	6																			
ATEX	II 3G Ex nA II T6, II 3G Ex ic IIC T6, II 3D Ex tc IIIC T80°C IP65	8	1	0																			
IECEx	Ex nA II T6, Ex nL IIC T6, Ex tD A22 IP65 T80°C	8	1	2																			
TR CMU 1055	II 3G Ex nA II T6 Gc, II 3G Ex ic IIC T6 Gc, II 3D Ex tc IIIC T80 °C Dc IP65	8	1	6																			
Nominal signal																							
6 V DC					1																		
12 V DC					2																		
24 V DC					3																		
Manual override																							
Pushbutton underneath the enclosure cover						0																	
Pushbutton in the enclosure cover						1																	
Switch in the enclosure cover						2																	
Without						3																	

Solenoid valve Type 3967-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Switching function																					
3/2-way function with spring-return mechanism **SIL** (all K_{VS} coefficients except K_{VS} 1.4 and 2.9)	0	0																			
5/2-way function with spring-return mechanism (K_{VS} 1.4 and 2.9)	0	1																			
5/2-way function with two detent positions (K_{VS} 1.4 and 2.9)	0	2																			
5/3-way function with spring-centered mid-position (ports 2 and 4 closed, K_{VS} 1.4)	0	3																			
5/3-way function with spring-centered mid-position (ports 2 and 4 vented, K_{VS} 1.4)	0	5																			
Mounting																					
NAMUR interface ¼ according to VDI/VDE 3845 for rotary actuators			0																		
NAMUR rib according to IEC 60534 for linear actuators/ threaded connection [1]			2																		
Direct attachment to mounting block with positioner according to VDI/VDE 3847			3																		
NAMUR interface ½ according to VDI/VDE 3845 for rotary actuators			4																		
NAMUR interface ¼ according to VDI/VDE 3845 for rotary actuators with adapter plate for external air connections [1]			5																		
K_{VS} coefficient [2]																					
0.32				0																	
1.4				1																	
2.0				2																	
2.9				3																	
4.3				4																	
Material																					
Aluminum					1																
Stainless steel					2																
Pneumatic connection																					
G ¼						1															
¼ NPT						2															
G ½						3															
½ NPT						4															

Markings on the device

Solenoid valve Type 3967-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pilot valve connection																					
Without (ports sealed by two blanking plugs)													0								
1 (with internal pilot supply)													1								
2 (with external pilot supply)													2								
Without (with dummy plate: no connections on the pilot head)													4								
Pilot supply																					
Internal pilot supply for actuators for on/off service														0							
External pilot supply for actuators for throttling service														1							
Electrical connection																					
Without cable gland															0	0					
M16x1.5 cable gland, black polyamide															0	1					
M16x1.5 cable gland, blue polyamide															1	1					
M16x1.5 cable gland made of black polyamide (Ex e, CEAG)															1	3					
M16x1.5 cable gland, nickel-plated brass															1	4					
M16x1.5 cable gland, brass, blue															1	5					
Degree of protection																					
IP 65																	0				
Ambient temperature [3]																					
−20 to +80 °C																		0			
−45 to +80 °C																		1			
Safety function																					
Without																			0		
SIL [4]																			1		
Special version																					
Without																				0	0	0
With exhaust air restrictor plate																				0	0	1
With supply air restrictor plate																				0	0	2
With exhaust air and supply air restrictor plates																				0	0	3

1) Version with Emataal coating.
2) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m^3/h.
3) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection and temperature class.
4) SIL according to IEC 61508, see Safety Manual ▶ SH 3967 for details

3 Design and principle of operation

The solenoid valve consists of an electropneumatic binary converter with manual override and integrated booster valve actuated on one side with return spring.

The pilot supply for the electropneumatic binary converter is fed internally over port 1 or externally over port 9. By turning the turnable gasket, the pilot supply can be changed.

In the idle position, the flapper is lifted off the outlet nozzle by the spring. As a result, a pressure lower than the deactivation pressure of the integrated booster valve builds up in the pressure divider, which consists of the restrictor and outlet nozzle. When the solenoid coil is energized by an electric binary signal, the outlet nozzle is closed by the flapper against the force of the spring. This causes the pressure in the pressure divider to rise above the activation pressure of the integrated booster valve and switches it to the operating position. After the solenoid coil is de-energized, the integrated booster valve is switched to the idle position again by a return spring.

The solenoid valve version with K_{VS} 0.32 can be fitted with a **restrictor plate** to adjust the actuating time of the pneumatic actuator. The available restrictor plates are fitted with either a supply air or exhaust air restrictor and are available in various versions (see section 3.1).

The restrictor plates suitable for SIL applications are designed to ensure the emergency venting of the actuator on demand. The construction inhibits the blocking of the supply air in the actuator. A check valve connected in parallel guarantees the emergency venting in the restrictor plate with supply air restrictor. In the restrictor plate with exhaust air restrictor, the restrictor spindle guarantees a minimum air flow and, as a result, prevents blocking. This also applies when the restrictor spindle is fully screwed in.

Optionally, the solenoid valve can be upgraded to become a pneumatic **booster valve** actuated on one side. This results in a higher K_{VS} coefficient (see Data Sheet ▶ T 3756).

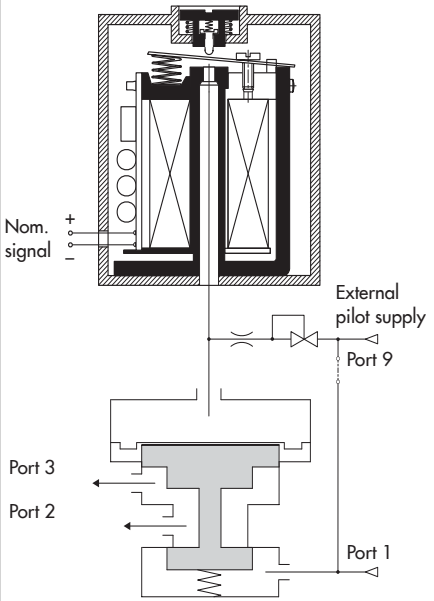


Fig. 1: *Functional diagram*

3.1 Accessories

Spare parts	
Order no.	**Designation**
1089-1527	Enclosure cover with pushbutton
1089-1528	Enclosure cover with switch
1099-6236	Enclosure cover
0430-1941	Gasket (for enclosure cover)
0070-0858	Blanking plug G ¼, stainless steel 1.4571 (for threaded connections)
0070-0862	Blanking plug ¼ NPT, stainless steel 1.4571 (for threaded connections)
8421-0070	O-ring 14x1.5 made of nitrile butadiene rubber (for blanking plug)
0430-1884	Turnable gasket (for connecting plate)
8336-1108	Screw DIN 7964, 5x20 (for connecting plate)
0550-0213	Filter ¼ (for connecting plate)
0430-1883	Molded seal (for NAMUR interface ¼, K_{VS} 0.32)
8421-9002	O-ring 13x3.5, –45 to +80 °C (for booster valves with NAMUR interface ¼, K_{VS} 1.4)
8421-0364	O-ring 16x2, –20 to +80 °C (for booster valves with NAMUR interface ¼, K_{VS} 2.0)
8421-0368	O-ring 16x2, –45 to +80 °C (for booster valves with NAMUR interface ¼, K_{VS} 2.0)
8421-0419	O-ring 28x2, –45 to +80 °C (for booster valves with NAMUR interface ½, K_{VS} 2.9)
8421-0439	O-ring 30x2, –45 to +80 °C (for booster valves with K_{VS} 2.9)
8421-1077	O-ring 24x2, –20 to +80 °C (for booster valves with NAMUR interface ½, K_{VS} 4.3)
8421-0425	O-ring 24x2, –45 to +80 °C (for booster valves with NAMUR interface ½, K_{VS} 4.3)
8421-0102	O-ring 36x2, –20 to +80 °C (for booster valves with K_{VS} 2.0, 2.9 and 4.3)
8333-1303	Screw M5x60 A4 (for booster valves with NAMUR interface, K_{VS} 2.0)
8392-0651	Spring washer A5-A4 (for booster valves with NAMUR interface, K_{VS} 2.0)
8333-0538	Screw M5x60 A4 (for booster valves with NAMUR interface, K_{VS} 4.3)
8392-0658	Spring washer A5-A4 (for booster valves with NAMUR interface, K_{VS} 4.3)

Accessories	
Order no.	**Designation**
8808-1010	M16x1.5 cable gland made of black polyamide, 5 to 10 mm cable diameter
8808-2007	Cable gland M16x1.5 made of black polyamide, 5.5 to 10 mm cable diameter (Ex e, CEAG)
8808-2008	Cable gland M16x1.5 made of blue polyamide, 4 to 8 mm cable diameter
8808-2009	Cable gland M16x1.5, nickel-plated brass, 4 to 8 mm cable diameter
1991-6471	Cable gland M16x1.5, brass, blue, 4 to 8 mm cable diameter

Accessories	
Order no.	**Designation**
8808-2011	Extension cable gland M16x1.5 on M20, black polyamide, 5.5 to 13 mm cable diameter (–20 to +70 °C) (Ex e)
8808-1024	Blanking plug M16x1.5, black polyamide (for cable entry)
8421-0070	O-ring 14x1.5 made of nitrile butadiene rubber (for cable gland and blanking plug)
1402-1378	Cover for start-up

Accessories for K_{VS} 0.32	
Order no.	**Designation**
	Adapter plate for NAMUR rib according to IEC 60534-6-1, panel, wall or rail mounting, including fastening screw
1400-9598	Aluminum, G ¼ connection [1]
1400-9599	Aluminum, powder coated, gray beige RAL 1019, ¼ NPT connection
1400-9600	Stainless steel 1.4404, G ¼ connection
1400-9601	Stainless steel 1.4404, ¼ NPT connection
	Mounting base according to EN 60715
1400-5930	G-profile rail 32 (2 pcs. required)
1400-5931	For 35 mm rail mounting (2 pcs. required)
1400-6726	Mounting plate for wall mounting including fastening screws
	Restrictor plate
100088769	With exhaust air restrictor and safety plate, K_{VS} 0 to 0.27, adjustable; made of aluminum [1]
100087311	With exhaust air restrictor and safety plate, K_{VS} 0.002 to 0.27, adjustable; made of aluminum [1] **SIL**
100200794	With exhaust air restrictor and lock nut, K_{VS} 0 to 0.28, adjustable; made of aluminum
100200795	With exhaust air restrictor and lock nut, K_{VS} 0.01 to 0.28, adjustable; made of aluminum
100200796	With exhaust air restrictor and lock nut, K_{VS} 0 to 0.28, adjustable; made of stainless steel 1.4404
100200797	With exhaust air restrictor and lock nut, K_{VS} 0.01 to 0.28, adjustable; made of stainless steel 1.4404 **SIL**
100084937	With supply air restrictor and safety plate, K_{VS} 0 to 0.27, adjustable; made of aluminum [1]
100084935	With supply air restrictor and safety plate, K_{VS} 0.002 to 0.27, adjustable; made of aluminum [1] **SIL**
100200790	With supply air restrictor and lock nut, K_{VS} 0 to 0.28, adjustable; made of aluminum
100200791	With supply air restrictor and lock nut, K_{VS} 0.01 to 0.28, adjustable; made of aluminum **SIL**
100200792	With supply air restrictor and lock nut, K_{VS} 0 to 0.28, adjustable; made of stainless steel 1.4404
100200793	With supply air restrictor and lock nut, K_{VS} 0.01 to 0.28, adjustable; made of stainless steel 1.4404 **SIL**

[1] Ematal coating

Accessories for K_{VS} 0.32	
Order no.	**Designation**
	Adapter plate for NAMUR interface ¼ on NAMUR rib ¼ with external connections
1402-0695	Aluminum, G ¼ connection [1]
1402-0697	Aluminum, powder coated, gray beige, ¼ NPT connection
1402-0696	Stainless steel 1.4404, G ¼ connection
1402-0698	Stainless steel 1.4404, ¼ NPT connection
	Double-axial adapter
1993-0089	90°, aluminum, powder coated, gray beige RAL 1019
1993-0220	270°, aluminum, powder coated, gray beige RAL 1019
1402-0280	180°, aluminum, powder coated, gray beige RAL 1019
	Adapter plate for NAMUR interface ¼ on NAMUR rib ½
1380-1652	Aluminum [1]
1380-1797	Stainless steel 1.4404
	Adapter plate with NAMUR interface ¼
1402-0095	For SAMSON Type 3351
1409-3001	For SAMSON Type 3353 and Type 3354
8333-1237	Hex socket head screw M5x6 (required in addition to 1409-3001)
0790-6118	M5 seal (required in addition to 1409-3001)
	Mounting block for SAMSON Type 3277 Pneumatic Actuator
1400-8817	G ¼ connection
1400-8818	¼ NPT connection
1400-6950	Pressure gauge mounting block, 1x Output and 1x Supply, made of stainless steel/brass (for mounting block)
	Piping for actuator with fail-safe action "stem retracts"
1400-6444	240 cm² actuator area, zinc-plated steel
1400-6445	240 cm² actuator area, CrNiMo steel
1400-6446	350 cm² actuator area, zinc-plated steel
1400-6447	350 cm² actuator area, CrNiMo steel
1400-6448	700 cm² actuator area, zinc-plated steel
1400-6449	700 cm² actuator area, CrNiMo steel

[1] Emaital coating

Accessories for K_{VS} 1.4 and 2.0	
Order no.	**Designation**
	Adapter plate for NAMUR rib acc. to IEC 60534-6-1
1400-6751	Aluminum, powder coated, gray beige RAL 1019, G ¼ connection
1400-9924	Aluminum, ¼ NPT connection [1]
	Adapter plate for NAMUR interface ¼ on NAMUR rib ½
1380-1652	Aluminum, powder coated, gray beige RAL 1019
1380-1797	Stainless steel 1.4404
	Distance plate with NAMUR interface ¼ on rotary actuators ¼ (K_{VS} 1.4 only)
1400-9741	Aluminum, G ¼ connection [1]
1402-0234	Stainless steel 1.4404, G ¼ connection

Accessories for K_{VS} 4.3 and 2.9	
Order no.	**Designation**
	Adapter plate for NAMUR interface ½ to thread ½
0360-3945	Aluminum, powder coated, gray beige RAL 1019, G ½ connection
0360-3946	Aluminum, powder coated, gray beige RAL 1019, ½ NPT connection
0360-3947	Stainless steel 1.4404, G ½ connection
0360-3948	Stainless steel 1.4404, ½ NPT connection
	Adapter plate for NAMUR interface ½ on NAMUR rib ½
1380-1795	Aluminum [1]
1380-1796	Stainless steel 1.4404
	Adapter plate for NAMUR rib acc. to IEC 60534-6-1
1402-0827	Aluminum, powder coated, gray beige RAL 1019, G ½ connection
1402-0829	Aluminum, powder coated, gray beige RAL 1019, ½ NPT connection
1402-0828	Stainless steel 1.4404, G ½ connection
1402-0830	Stainless steel 1.4404, ½ NPT connection
	Double-axial adapter
1402-0602	90°, aluminum, powder coated, gray beige RAL 1019
1402-0603	90°, stainless steel 1.4404

Other adapter plates, double-axial adapters and restrictor plates can be found in the Application Notes ▶ AB 11.

[1] Ematal coating

3.2 Technical data

General data					
Design			Solenoid with flapper/nozzle assembly and plug/seat valve with return spring		
Degree of protection			IP 65 with filter check valve		
Conformity			CE		
Material	Enclosure		Polyamide PA 6-3-T-GF35, black		
	Connecting plate		AlMgSiPb, powder coated, black or stainless steel 1.4404		
	Adapter plate		AlMgSiPb, powder coated, gray beige RAL 1019 or stainless steel 1.4404		
	Screws		Stainless steel A2-70		
	Springs		Stainless steel 1.4310		
	Seals		Silicone rubber		
Ambient temperature			See Electric data		
Mounting orientation			Any		
Service life			15 years		
Maximum storage period			24 months		

Electric data					
Nominal signal		U_N	**6 V DC**	**12 V DC**	**24 V DC**
		U_{max}	27 V	40 V	60 V
Switching point	ON	$U_{80\ °C}$	≥4.8 V	≥9.6 V	≥18 V
		$I_{20\ °C}$	≥1.41 mA	≥1.52 mA	≥1.57 mA
		$P_{20\ °C}$	≥5.47 mW	≥13.05 mW	≥26.71 mW
	OFF	$U_{-25\ °C}$	≤1.0 V	≤2.3 V	≤4.6 V
Input impedance		$R_{20\ °C}$	2.6 kΩ	5.3 kΩ	10.5 kΩ
Effect of temperature			0.4 %/°C	0.2 %/°C	0.1 %/°C
Type of protection [1]			Intrinsic safety		
			Non-sparking		
Output voltage [2]		U_i (V)	32		
Output current [2]		I_i (mA)	150		
Power dissipation [2]		P_i (mW)	250	No restrictions	
Outer inductance [2]		L_i	Negligibly small		
Outer capacitance [2]		C_i	Negligibly small		
Ambient temperature [3]			–45 to +60 °C (temperature class T6, Group IIC)		
			–45 to +70 °C (temperature class T5, Group IIC)		
			–45 to +80 °C (temperature class T4, Group IIC)		
			–45 to +60 °C (Group IIIC)		
Connection			Screw terminal, 2-pole, with cable gland M16x1.5		

1) See Table “Summary of explosion protection approvals” on page 27

2) Permissible maximum values when connected to a certified intrinsically safe circuit.

3) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection and temperature class.

Pneumatic data for solenoid valve with K_{VS} 0.32 [1], actuated on one side		
Switching function		3/2-way function
K_{VS} [2]		0.32
Safety approval		SIL [3]
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected
Pilot supply	Medium	Instrument air, free from corrosive substances and nitrogen
	Pressure [4]	1.4 to 10 bar
Operating medium		Instrument air, free from corrosive substances and nitrogen
Operating pressure		Max. 10 bar
Air consumption		≤80 l_n/h at 1.4 bar pilot supply in neutral position
		≤25 l_n/h at 1.4 bar pilot supply in operating position
Switching time		≤65 ms
Connection		G ¼ or ¼ NPT and NAMUR interface ¼ [5]
Weight		0.45 kg
		0.80 kg (with adapter plate)

1) The solenoid valve version with K_{VS} 0.32 can be fitted with a restrictor plate to adjust the actuating time of the pneumatic actuator.
2) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m³/h.
3) SIL according to IEC 61508
4) When using the solenoid valve with an operating pressure of 10 bar, a minimum pilot pressure of 1.9 bar is required.
5) NAMUR interface according to VDI/VDE 3845 and VDI/VDE 3847

Booster valve with NAMUR interface, K_{VS} 1.4 or 2.9, actuated on one side			
Switching function		3/2-way function with exhaust air feedback	5/2-way function
K_{VS} [1]		1.4 or 2.9	
Safety approval		–	–
Design		Spool, metal-to-metal seat, zero overlap, with return spring	
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019 1.4404 (see Versions and ordering data for special versions)	
	Seals	Silicone	
	Filter	Polyethylene	
	Screws	1.4571	
Actuation		Type 3797 Solenoid Valve	
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases	
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Max. operating pressure		10 bar	
Ambient temperature [2]		–45 to +80 °C	
Switching cycles		≥2 x 10^7	
Connection	K_{VS} 1.4	G ¼ or ¼ NPT, NAMUR interface [3]	
	K_{VS} 2.9	G ½ or ½ NPT, NAMUR interface [3]	
Approx. weight	K_{VS} 1.4	485 g (standard version)	
	K_{VS} 2.9	1760 g (standard version)	

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: Q = K_{VS} x 36.22 in m^3/h.

2) The permissible ambient temperature of the solenoid valve depends on the permissible ambient temperature of the components, type of protection and temperature class.

3) NAMUR interface according to VDI/VDE 3845

Booster valve with NAMUR interface, K_{VS} 1.4 or 2.9, actuated on both sides				
Switching function		5/2-way function with two detent positions	5/3-way function with spring-centered mid-position (ports 2 and 4 closed)	5/3-way function with spring-centered mid-position (ports 2 and 4 vented)
K_{VS} [1]		1.4 or 2.9	1.4 (2.9 on request)	1.4 (2.9 on request)
Safety approval		–	–	–
Design		Spool, metal-to-metal seat, zero overlap		
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019 1.4404 (see Versions and ordering data for special versions)		
	Seals	Silicone		
	Filter	Polyethylene		
	Screws	1.4571		
Actuation		Type 3797 Solenoid Valve		
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases		
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected		
Max. operating pressure		10 bar		
Ambient temperature [2]		–45 to +80 °C		
Switching cycles		≥2 x 10^7		
Connection	K_{VS} 1.4	G ¼ or ¼ NPT, NAMUR interface [3]		
	K_{VS} 2.9	G ½ or ½ NPT, NAMUR interface [3]		
Approx. weight	K_{VS} 1.4	685 g (standard version)		
	K_{VS} 2.9	2180 g (standard version)		

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: Q = K_{VS} x 36.22 in m^3/h.
2) The permissible ambient temperature of the solenoid valve depends on the permissible ambient temperature of the components, type of protection and temperature class.
3) NAMUR interface according to VDI/VDE 3845

Booster valve with NAMUR interface, K_{VS} 2.0 or 4.3, actuated on one side			
Switching function		3/2-way function	
K_{VS} [1] (direction of flow)		1.1 (4»3) 2.0 (3»5)	1.9 (4»3) 4.3 (3»5)
Safety approval		SIL [2]	
Design		Poppet valve with diaphragm actuator, soft seated, with return spring	
Material	Enclosure	Aluminum, powder coated, gray beige RAL 1019 or stainless steel 1.4404	
	Diaphragms	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Seals	Chloroprene rubber (–20 to +80 °C) or silicone rubber (–45 to +80 °C)	
	Screws	Stainless steel 1.4571	
	Springs	Stainless steel 1.4310	
Operating medium		Instrument air (free from corrosive substances) or nitrogen, air containing oil or non-corrosive gases	
Compressed air quality according to ISO 8573-1		Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Actuation		Type 3967 Solenoid Valve	
Pilot supply		1.4 to 6 bar	
Max. operating pressure		10.0 bar	
Ambient temperature [3]		–20 to +80 °C –45 to +80 °C	
Connection	Supply air	G ¼ or ¼ NPT and NAMUR interface ¼ [4] with G (NPT) 3/8	G ½ or ½ NPT and NAMUR interface ½ [4]
	Exhaust air	G ½ or ½ NPT and NAMUR interface ¼ [4] with G (NPT) ⅜	G ½ or ½ NPT and NAMUR interface ½ [4]
Approx. weight		1.38 kg	1.5 kg

1) The air flow rate when p_1 = 2.4 bar and p_2 = 1.0 bar is calculated using the following formula: $Q = K_{VS} \times 36.22$ in m^3/h.
2) SIL according to IEC 61508, see Safety Manual ▶ SH 3967 for details
3) The maximum permissible ambient temperature depends on the permissible ambient temperature of the components, type of protection and temperature class.
4) NAMUR interface according to VDI/VDE 3845

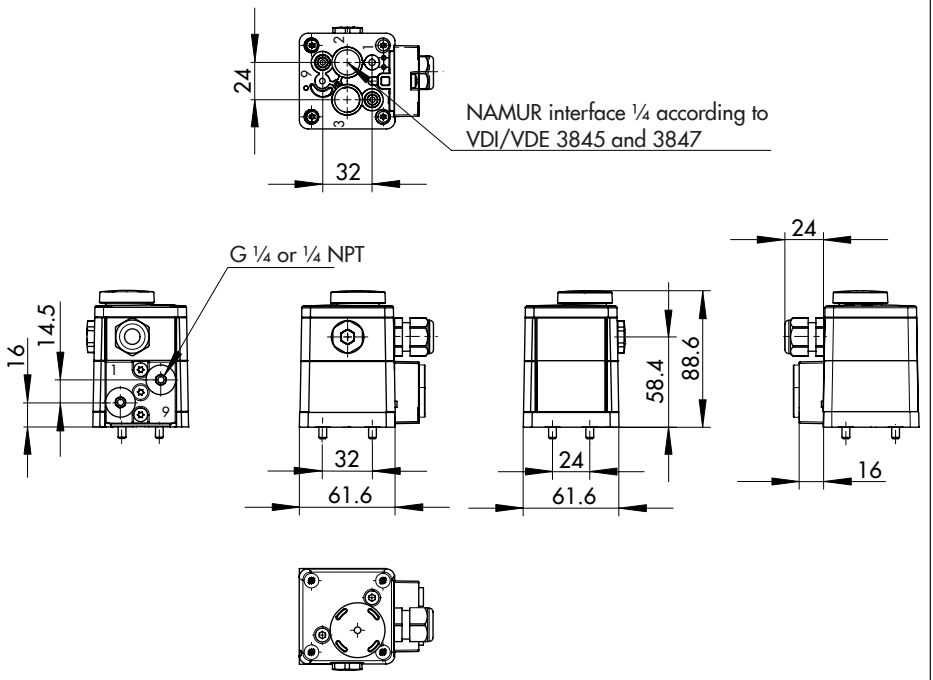
Summary of explosion protection approvals

Type	Certification			Type of protection/comments
3967-1	 1)	Number	PTB 06 ATEX 2027	II 2G Ex ia IIC T6 Gb II 2D Ex ia IIIC T80 °C Db
		Date	2019-07-03	
	IECEx	Number	IECEx PTB 08.0036	Ex ia IIC T6...T4 Gb Ex ia IIIC T80°C Db
		Date	2022-08-23	
	CCC Ex	Number	2021322307003632	Ex ia IIC T4...T6 Gb Ex ia IIIC T80 °C Db
		Date	2023-04-15	
		Valid until	2026-01-07	
	TR CMU 1055	Number	ZETC/111/2021	Module D
		Date	2021-08-25	
		Valid until	2024-08-24	
		Number	ZETC/37/2021	II 2G Ex ia IIC T6...T4 Gb II 2D Ex ia IIIC T80 °C Db
		Date	2021-07-26	
		Valid until	2024-07-25	
3967-8	 2)	Number	PTB 06 ATEX 2028 X	II 3G Ex nA II T6 II 3G Ex ic IIC T6 II 3D Ex tD A21 IP65 T80°C
		Date	2008-01-09	
	IECEx	Number	IECEx PTB 08.0038X	Ex nA II T6 Ex nL IIC T6 Ex tD A22 IP65 T80°
		Date	2008-08-28	
	TR CMU 1055	Number	ZETC/111/2021	Module D
		Date	2021-08-25	
		Valid until	2024-08-24	
		Number	ZETC/37/2021	II 3G Ex nA II T6 Gc II 3G Ex ic IIC T6 Gc II 3D Ex tc IIIC T80 °C Dc IP65
		Date	2021-07-26	
		Valid until	2024-07-25	

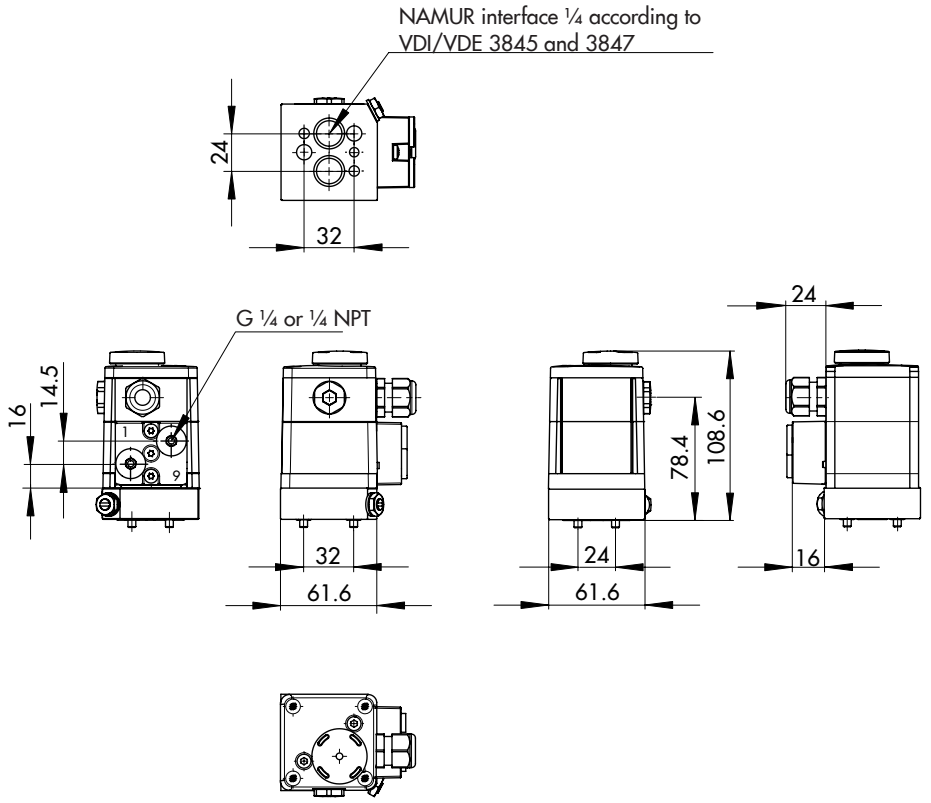
1) EC type examination certificate
2) Statement of conformity

3.3 Dimensions in mm

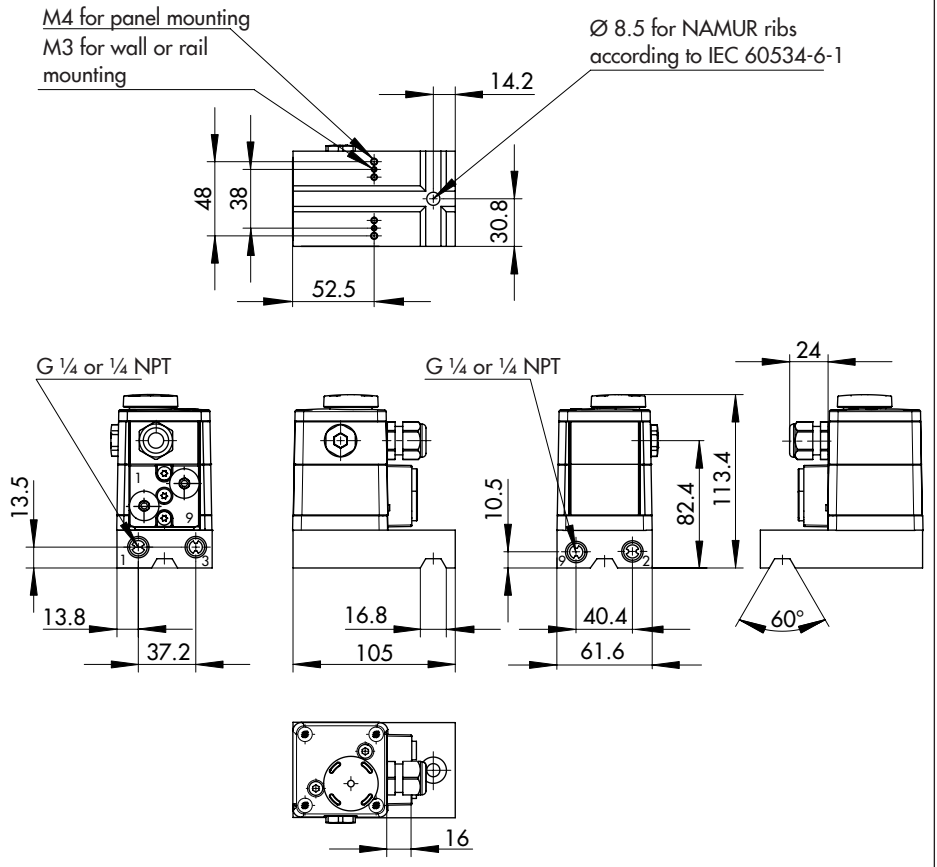
Version with NAMUR interface ¼ according to VDI/VDE 3845 and direct attachment according to VDI/VDE 3847



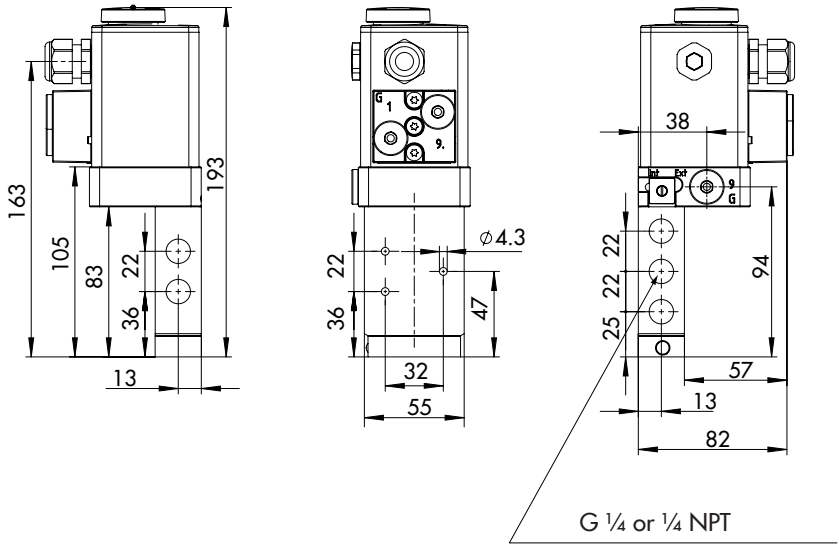
Version with NAMUR interface ¼ according to VDI/VDE 3845 and direct attachment according to VDI/VDE 3847 and restrictor plate



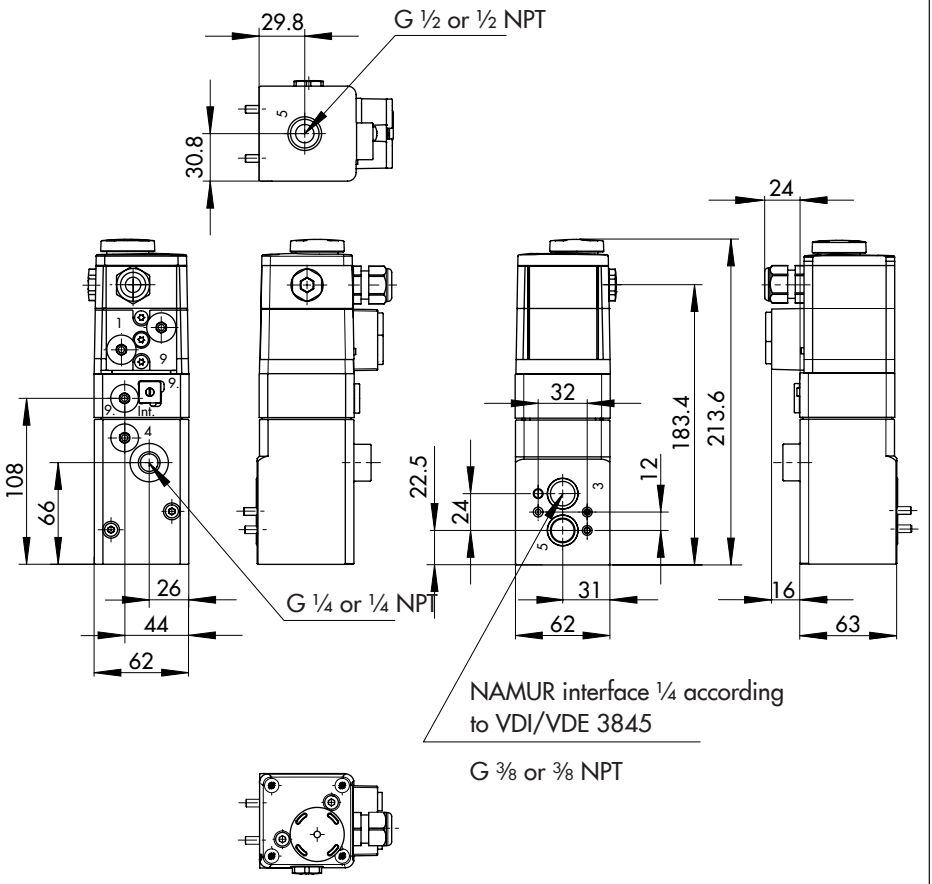
Version with adapter plate for linear actuators with NAMUR rib according to IEC 60534-6-1



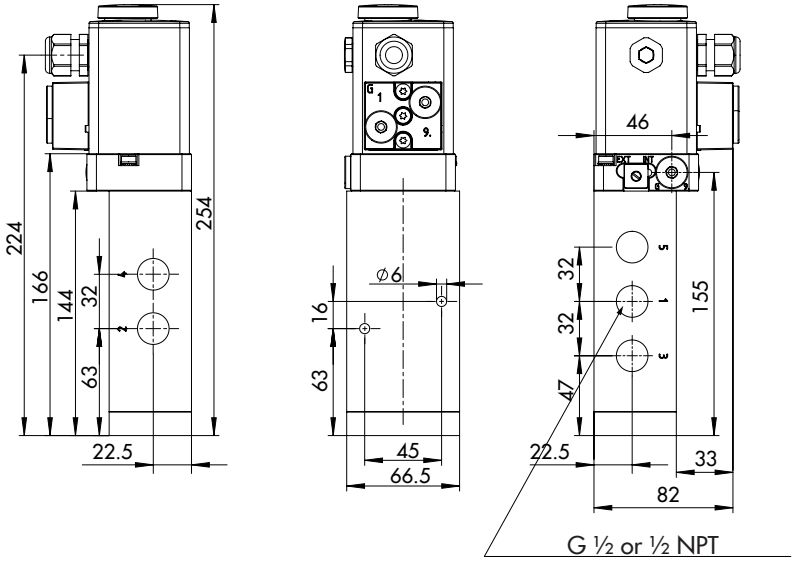
Version with NAMUR interface ¼ according to VDI/VDE 3845 (K_{VS} 1.4)



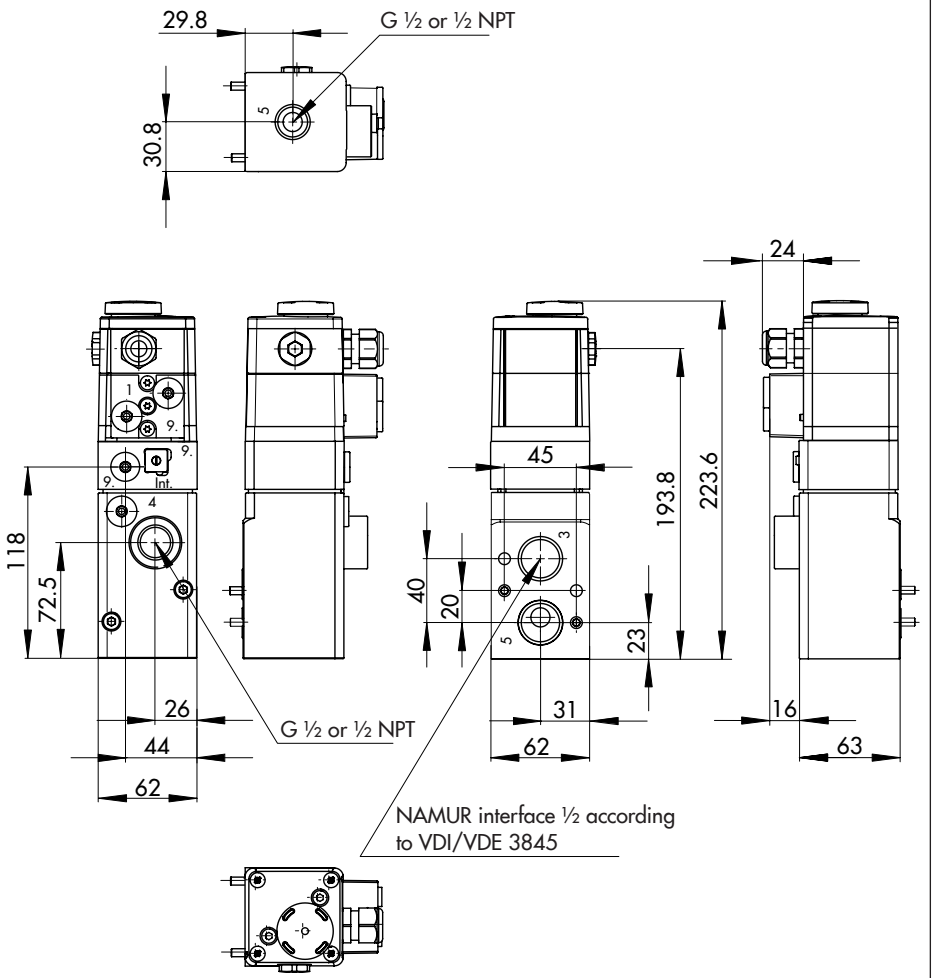
Version with NAMUR interface ¼ according to VDI/VDE 3845 (K_{VS} 2.0)



Version with NAMUR interface ½ according to VDI/VDE 3845 (K_{VS} 2.9)



Version with NAMUR interface ½ according to VDI/VDE 3845 (K_{VS} 4.3)



4 Measures for preparation

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Compare the shipment received with the delivery note.
2. Check the shipment for transportation damage. Report any damage to SAMSON and the forwarding agent (refer to delivery note).

4.1 Unpacking

NOTICE

Risk of solenoid valve damage due to foreign particles entering the valve.

➔ *Do not remove the packaging if the solenoid valve is to be transported to another location or kept in storage. Do not remove the protective film/protective caps until immediately before mounting the device on the valve.*

Before mounting the solenoid valve, proceed as follows:

1. Remove the packaging from the solenoid valve.
2. Dispose of the packaging in accordance with the valid regulations.

4.2 Transporting

➔ Pack the solenoid valve properly to comply with terms of transportation.

Transport instructions

– Protect the solenoid valve against external influences (e.g. impact).
– Protect the solenoid valve against moisture and dirt.
– Observe transport temperature depending on the permissible ambient temperature (see technical data in section 3.2).

4.3 Storage

NOTICE

Risk of solenoid valve damage due to improper storage.

➔ *Observe the storage instructions. Contact SAMSON, if need be.*

Storage instructions

– Protect the solenoid valve against external influences (e.g. impact, shocks, vibration).
– Do not damage the corrosion protection (coating).
– Protect the solenoid valve against moisture and dirt. In damp spaces, prevent condensation. If necessary, use a drying agent or heating.
– Observe storage temperature depending on the permissible ambient temperature (see technical data in section 3.2).
– Store solenoid valve with closed cover in airtight packaging.

5 Mounting and start-up

NOTICE

Risk of malfunction due to incorrectly performed start-up.

➔ *Perform start-up following the described sequence.*

The procedures to mount, install and start up the solenoid valve are described in the following. They must be performed in the prescribed sequence.

1. **Remove the protective caps from the pneumatic connections.**
2. **Mount the solenoid valve.**
   ➔ Section 5.1 onward
3. **Perform pneumatic installation.**
   ➔ Section 5.2 onward
4. **Perform electrical installation.**
   ➔ Section 5.3 onward

5.1 Mounting

WARNING

Risk of personal injury due to parts bursting or the process medium spurting out under high pressure.

➔ *Before installation, depressurize the relevant plant section.*

Any mounting position may be used. The following applies concerning the installation:

➔ Mount the solenoid valve in such a way that the M16x1.5 cable gland faces downward (in cases where this is not possible, mount it in the horizontal position).

➔ On mounting, make sure that 200 mm or more clearance is kept above the enclosure cover.

5.1.1 Mounting the restrictor plate

The solenoid valve version with K_{VS} 0.32 can be fitted with a **restrictor plate** to adjust the actuating time of the pneumatic actuator (see section 3.1).

The restrictor plate is mounted on rotary actuators with a NAMUR interface according to VDI/VDE 3845, on an adapter plate for linear actuators with NAMUR rib according to IEC 60534-6-1 or on a connection block for the Type 3277 Pneumatic Actuator.

➔ Fasten the restrictor plate using two slotted-head screws (1) and washers (2).

Make sure that the O-rings (4, 5 and 6) are seated properly.

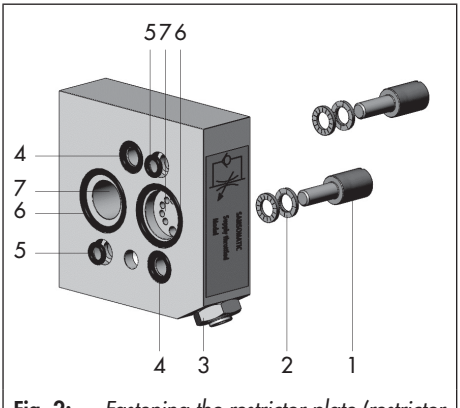


Fig. 2: *Fastening the restrictor plate (restrictor plate 100182988 shown)*

5.1.2 Direct attachment to Type 3277 Actuator

For Type 3277 Actuators with 175 to 750 cm² diaphragm areas or solenoid valve interfaces according to VDI/VDE 3847. Required mounting parts and accessories: see section 3.1 ('Direct attachment to Type 3277 Actuator').

1. Seal ports 1 and 9 at the device with stainless steel blanking plugs.
2. Remove the connecting plate and turn the turnable gasket so that its tag points to port 9. Remount the connecting plate.

If the solenoid valve is configured for direct attachment to the mounting block with positioner according to VDI/VDE 3847, steps 1 and 2 are not required.

3. Check the location of the molded seal and the coded screw on the NAMUR interface.
4. Use two cap screws to fasten the solenoid valve onto the mounting block.

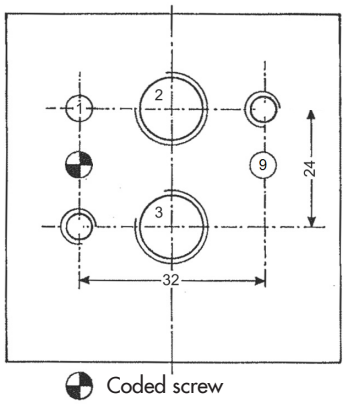


Fig. 3: *Connection diagram according to VDI/VDE 3847*

5.1.3 Attachment according to IEC 60534-6

Required mounting parts and accessories: see section 3.1 ('Attachment according to IEC 60534-6')

If the solenoid valve is configured for attachment according to IEC 60534-6, no additional mounting parts are required.

1. Check the location of the molded seal or O-rings on the NAMUR interface and that of the coded screw.
2. Use two cap screws to fasten the solenoid valve on to the adapter plate of the NAMUR rib.

If the solenoid valve is configured for attachment according to IEC 60534-6, steps 1 and 2 are not required.

3. Use a fillister head screw to fasten the solenoid valve to the yoke.

5.1.4 Rotary Actuators

Required mounting parts and accessories: see section 3.1 ('Attachment to rotary actuators').

If the solenoid valve is configured for attachment to rotary actuators according to VDI/VDE 3845, no additional mounting parts are required.

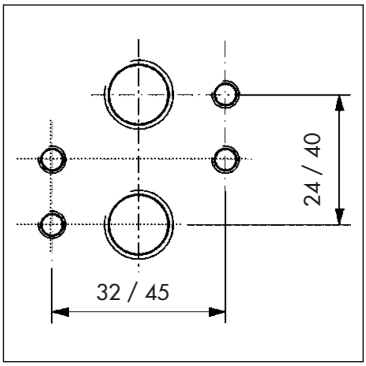


Fig. 4: *Connection diagram according to VDI/VDE 3845*

1. Check the location of the molded seal or O-rings on the NAMUR interface and that of the coded screw.
2. Use two cap screws to fasten the solenoid valve on to the rotary actuator.

5.2 Pneumatic connections

⚠ WARNING

Risk of injury due to high pressure inside device.

➔ *Prior to performing repair and maintenance work on the device, depressurize the connecting lines.*

The air connections are designed as threaded holes with G or NPT thread depending on the device version.

➔ Run and attach the connecting lines and screw joints according to good professional practice.

➔ Check the connecting lines and screw joints for leaks and damage at regular intervals and repair them, if necessary.

➔ The K_{VS} coefficient of an upstream pressure reducing valve must be at least 1.6 times larger than the K_{VS} coefficient of the solenoid valve.

5.2.1 Port labeling

K_{VS} 0.32

Inscription	Function
1	Supply air
9	External pilot supply
2	Output
3	Vent plug

K_{VS} 1.4 and K_{VS} 2.9

Inscription	Function
1	Supply air
9	External pilot supply
2/4	Output
3/5	Vent plug

K_{VS} 2.0 and K_{VS} 4.3

Note

The ports 1 and 9 in the black connecting plate of the solenoid valve are not required and must be sealed using stainless steel blanking plugs.

Inscription	Function
1	Supply air
9	External pilot supply
3	Output
5	Vent plug

5.2.2 Sizing of the connecting line

➔ Refer to the table below for the minimum required nominal size of the connecting line at the port **1** or **4** of the enclosure.

The specifications apply to a connecting line shorter than 2 m. Use a larger nominal size for lines longer than 2 m.

Port	9	1/4
Pipe [1]	6x1 mm	12x1 mm
Hose [2]	4x1 mm	9x3 mm

1) Outside diameter x Wall thickness
2) Inside diameter x Wall thickness

5.2.3 Compressed air quality

NOTICE

Risk of malfunction due to failure to comply with air quality requirements.

➔ *Only use supply air that is dry and free of oil and dust.*
➔ *Read the maintenance instructions for upstream pressure reducing stations.*
➔ *Blow through all air pipes and hoses thoroughly before connecting them.*

With internal pilot supply over port **1**:

Instrument air (free from corrosive substances), 1.4 to 10 bar operating pressure

With internal pilot supply over port **4**:

Instrument air (free from corrosive substances), 2.7 to 6 bar operating pressure

With external pilot supply over port **9**

Instrument air (free from corrosive substances), air containing oil or non-corrosive gases with 0 to 10 bar operating pressure

Compressed air quality according to ISO 8573-1		
Particle size and quantity	**Oil content**	**Pressure dew point**
Class 4	Class 3	Class 3
≤5 µm and 1000/m³	≤1 mg/m³	–20 °C/10 K below the lowest ambient temperature to be expected

5.2.4 Pilot supply

K_{VS} 0.32

In the delivered state, the pilot supply is fed internally over port **1**, if not configured otherwise.

Fig. 5: *Internal pilot supply*

On mounting the solenoid valve to rotary or linear actuators fitted with positioners, change the pilot supply to an external pilot supply over port **9**.

To change to an external supply over port **9**, proceed as follows:

1. Unscrew the fastening screws on the connecting plate.
2. Take the connecting plate off the enclosure.
3. Remove the turnable gasket from the groove and turn it so that the tag points to the right.
4. Refasten the connecting plate.

Fig. 6: *External pilot supply*

K_{VS} 1.4 and K_{VS} 2.9

The pilot supply in these solenoid valves is fed internally over port **1** or **3**, if not specified otherwise. To change to an external supply over port **9**, proceed as follows:

1. Undo the cap screw on the connection plate and remove plate and gasket.
2. Turn the gasket 180°. The tip of gasket must rest in the plate cut-out marked '9'.
3. Fasten the plate and gasket to the connection plate.

The changeover must be performed on both pilot valves for booster valves actuated on both sides.

K_{VS} 2.0 and K_{VS} 4.3

i ***Note***

When a booster valve is used (K_{VS} 2.0 and K_{VS} 4.3), the turnable gasket described for K_{VS} 0.32 must always positioned with its tag pointing to port 1.

In the delivered state, the pilot supply is fed internally over port **4**, if not configured otherwise.

➔ On mounting the solenoid valve on rotary or linear actuators fitted with positioners, the supply must be changed to an external pilot supply over port **9**.

To change to an external supply over port **9**, proceed as follows:

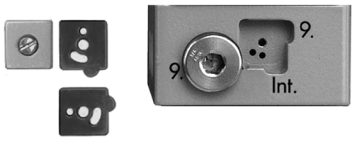


Fig. 7: *Turnable gasket of the booster valve*

1. Unscrew the fastening screw from the plate.
2. Remove the plate and turnable gasket from the groove.

3. Turn the turnable gasket by 90° and reinsert it together with the plate into the groove.
4. Tighten the fastening screw.

5.3 Electrical connections

⚠ DANGER

Risk of fatal injury due to electric shock.

➔ *For electrical installation, observe the relevant electrotechnical regulations and the accident prevention regulations that apply in the country of use.*
Valid regulations in Germany:
– VDE regulations
– Accident prevention regulations of the employers' liability insurance.

⚠ DANGER

Risk of fatal injury due to the ignition of an explosive atmosphere.

➔ *For installation in hazardous areas, observe the relevant standards that apply in the country of use.*
Valid standards in Germany:
– EN 60079-14: 2008 (VDE 0165, Part 1) Explosive Atmospheres – Electrical Installations Design, Selection and Erection.

⚠ WARNING

Incorrect electrical connection will render the explosion protection unsafe.

➔ *Adhere to the terminal assignment.*
➔ *Do not undo the enameled screws in or on the enclosure.*

⚠ WARNING

Intrinsic safety rendered ineffective in intrinsically safe devices.

➔ *Only connect intrinsically safe devices intended for use in intrinsically safe circuits to certified intrinsically safe input-connected units.*
➔ *Do not place intrinsically safe devices back into operation that were connected to intrinsically safe input-connected units without certification.*
➔ *Do not exceed the maximum permissible electric values specified in the EC type examination certificates when interconnecting intrinsically safe electrical equipment (U_i or U_0, I_i or I_0, P_i or P_0, C_i or C_0 and L_i or L_0).*

Selecting cables and wires

➔ **Observe clause 12 of EN 60079-14: 2008 (VDE 0165, Part 1) for installation of the intrinsically safe circuits.**

➔ Clause 12.2.2.7 applies when running multi-core cables and wires with more than one intrinsically safe circuit.

- ➔ **Radial thickness of the insulation** of a conductor for common insulating materials (e.g. polyethylene): **minimum 0.2 mm**.
- ➔ **Diameter of an individual wire** in a fine-stranded conductor: **minimum 0.1 mm.**
- ➔ Protect the conductor ends against splicing, e.g. by using wire-end ferrules.
- ➔ Seal cable entries left unused with screw plugs.
- ➔ For use in ambient temperatures **below –20 °C**: use metal cable gland.

5.3.1 Conditions concerning connection according to PTB 06 ATEX 2028 X

For type of protection Ex nA II, the input circuits may be connected, interrupted or switched while energized only during installation, maintenance or repair.

For type of protection Ex nL IIC, the input circuits may be switched under normal operating conditions.

If the Type 3967-8x Solenoid Valve is intended for use in explosive atmospheres with conductive dust according to EN 50281-1-1:1998, it must be installed in an enclosure which provides the degree of protection IP 54 according to IEC 60529:1989 at the minimum. The wiring must be connected in such a way that the connection is not subjected to pulling or twisting.

5.3.2 Switching amplifier according to EN 60079-25

For operation of the solenoid valve, switching amplifiers must be connected in the output circuit. They must comply with the limit values of the output circuits.

- ➔ Observe the relevant regulations for installation in hazardous areas.

Equipment for use in zone 2/zone 22

In equipment operated according to type of protection Ex nA II (non-sparking equipment) according to EN 60079-15: 2003:

- ➔ Circuits may be connected, interrupted or switched while energized only during installation, maintenance or repair.

Equipment connected to energy-limited circuits with type of protection Ex nL (energy-limited equipment) according to EN 60079-15: 2003:

- ➔ Equipment may be switched under normal operating conditions.

The maximum permissible values specified in the statement of conformity and its addenda apply when interconnecting the equipment with energy-limited circuits in type of protection Ex nL IIC.

5.3.3 Cable entry with cable gland

The enclosure of the solenoid valve has two M16x1.5 boreholes. They can be used for cable glands as required.

➔ The cable gland version depends on the ambient temperature range. See technical data in section 3.2.

➔ The screw terminals are designed for wire cross-sections of 0.2 to 2.5 mm². Tighten by at least 0.5 Nm.

➔ Connect **one** voltage source at the maximum.

In general, it is not necessary to connect the device to a bonding conductor.

5.3.4 Connecting the electrical supply

➔ Connect the electrical power (voltage) as shown in Fig. 8.

Fig. 8: *Terminal connection in the enclosure*

6 Start-up and operation

The solenoid valve is ready for use after mounting and start-up.

6.1 Adjusting the restrictor manually (only K_{VS} 0.32 version with restrictor plate)

Restrictor plates with lock nut

➔ Remove the cover protecting the lock nut on the beveled corner of the restrictor plate.

➔ Undo the lock nut.

➔ Adjust the actuating times:
- Turn the restrictor spindle clockwise to reduce the cross-sectional area of flow (slows the stroking speed).
- Turn the restrictor spindle counterclockwise to increase the cross-sectional area of flow (increases the stroking speed).

➔ Fasten the restriction setting in place with the lock nut.

➔ Attach the cover protecting the lock nut.

Restrictor plates with safety plate

➔ Loosen the two retaining screws on the safety plate (restrictor plate side) and push the plate to one side.

➔ Adjust the actuating times:
- Turn the adjustment screw clockwise to reduce the cross-sectional area of flow (slows the stroking speed).
- Turn the adjustment screw counterclockwise to increase the cross-sectional area of flow (increases the stroking speed).

➔ Push the safety plate back into its original position (concealing the adjustment screw). Fasten it in place with the two retaining screws.

i Note

The construction of the restrictor plates suitable for SIL applications ensures that the cross-sectional area of flow cannot be completely closed.

7 Servicing

i Note

The solenoid valve was checked by SAMSON before delivery.

- *The product warranty becomes void if service or repair work not described in these instructions is performed without prior agreement by SAMSON's After-sales Service.*
- *Only use original spare parts by SAMSON, which comply with the original specifications.*

Table 1: *Troubleshooting*

Malfunction	Possible reasons	Recommended action
The solenoid valve does not switch.	Incorrect terminal assignment.	Check electrical connection.
	Turn turnable gasket to external pilot supply.	Connect port 9 and supply it with compressed air. Alternatively, turn the turnable gasket to internal pilot supply.
The solenoid valve leaks to the atmosphere.	Gasket slipped.	Check that the molded seal and O-rings are correctly seated.
	Pilot pressure is insufficient and an intermediate position of the solenoid valve is reached (air is constantly vented)	Check the pressure line. Check the pressure line for leakage. Use a larger cross-section for the pressure line.

7.1 Preparation for return shipment

Defective solenoid valves can be returned to SAMSON for repair.

Proceed as follows to return devices to SAMSON:

1. Put the control valve out of operation. See associated valve documentation.
2. Remove the solenoid valve (see section 9).
3. Proceed as described on our website at www.samsongroup.com > Service & Support > After-sales Service > Returning goods.

8 Malfunctions

i Note

Contact SAMSON's After-sales Service for malfunctions not listed in Table 1 (see section 10.1).

8.1 Emergency action

The solenoid valve has a safety function. Upon failure of the supply voltage or air supply, it automatically closes (closed in the de-energized state).

Plant operators are responsible for emergency action to be taken in the plant.

9 Decommissioning and removal

⚠ DANGER

Risk of fatal injury due to electric shock.

➔ *Before performing any work on the device and before opening the device, disconnect the supply voltage and protect it against unintentional reconnection.*

➔ *Only use power interruption devices that are protected against unintentional reconnection of the power supply.*

⚠ DANGER

Risk of bursting in control valve components due to incorrect opening.

➔ *Before starting any work on the solenoid valve, depressurize all plant sections affected.*

➔ *Observe the warnings in the actuator and valve documentation.*

9.1 Decommissioning

To decommission the solenoid valve for disassembly, proceed as follows:

1. Close the shut-off valves upstream of the solenoid valve to stop the compressed air from flowing through the solenoid valve.
2. Relieve the pipelines completely of pressure.
3. Disconnect and lock the supply voltage.
4. Remove the solenoid valve from the pipeline

9.2 Disposal

SAMSON is a producer registered at the following European institution https://www.ewrn.org/national-registers/national-registers. WEEE reg. no.: DE 62194439/ FR 02566

➔ Observe local, national and international refuse regulations.

➔ Do not dispose of components, lubricants and hazardous substances together with your other household waste.

Tip

On request, we can appoint a service provider to dismantle and recycle the product.

10 Annex

10.1 After-sales service

Contact SAMSON's After-sales Service for support concerning service or repair work or when malfunctions or defects arise.

E-mail address

You can reach our after-sales service at aftersalesservice@samsongroup.com.

Addresses of SAMSON AG and its subsidiaries

The addresses of SAMSON AG, its subsidiaries, representatives and service facilities worldwide can be found on our website (www.samsongroup.com) or in all SAMSON product catalogs.

Required specifications

Please submit the following details:

- Order number and position number in the order
- Type designation and model number or configuration ID
- Other mounted valve accessories (positioner, supply pressure regulator etc.)
- Pressure
- Wire cross-section
- Actuator type and manufacturer

10.2 Certificates

The certificates valid at the time when these instructions were published are included on the next pages.

The latest certificates are available on the Internet at ▶ www.samsongroup.com > Product selector > 3967 > Downloads > Certificates.

SAMSON

EU Konformitätserklärung / EU Declaration of Conformity / Déclaration UE de conformité

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller/
This declaration of conformity is issued under the sole responsibility of the manufacturer/
La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.

Für das folgende Produkt / For the following product / Nous certifions que le produit

Magnetventil / Solenoid Valve / Electrovanne
Typ/Type/Type 3967

wird die Konformität mit den einschlägigen Harmonisierungsrechtsvorschriften der Union bestätigt /
the conformity with the relevant Union harmonisation legislation is declared with/
est conforme à la législation d'harmonisation de l'Union applicable selon les normes:

EMC 2014/30/EU	EN 61000-6-2:2005, EN 61000-6-3:2007 +A1:2011, EN 61326-1:2013
LVD 2014/35/EU	EN 60730-1:2016, EN 61010-1:2010
RoHS 2011/65/EU	EN 50581:2012

Hersteller / Manufacturer / Fabricant:

SAMSON AKTIENGESELLSCHAFT
Weismüllerstraße 3
D-60314 Frankfurt am Main
Deutschland/Germany/Allemagne

Frankfurt / Francfort, 2017-07-29
Im Namen des Herstellers/ On behalf of the Manufacturer/ Au nom du fabricant.

i v. H. Zager

Hanno Zager
Leiter Qualitätssicherung/Head of Quality Managment/
Responsable de l'assurance de la qualité

i.V. Dirk Hoffmann

Dirk Hoffmann
Zentralabteilungsleiter/Head of Department/Chef du département
Entwicklungsorganisation/Development Organization

SAMSON AKTIENGESELLSCHAFT
Weismüllerstraße 3 60314 Frankfurt am Main
Telefon: 069 4009-0 · Telefax: 069 4009-1507
E-Mail: samson@samson.de
Revison 07

ce_3967-0_de_en_fra_rev07.pdf

EU Konformitätserklärung / EU Declaration of Conformity / Déclaration UE de conformité

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This declaration of conformity is issued under the sole responsibility of the manufacturer/
La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.

Für das folgende Produkt / For the following product / Nous certifions que le produit

Magnetventil / Solenoid Valve / Electrovanne
Typ/Type/Type 3967-1...

entsprechend der EU-Baumusterprüfbescheingung PTB 06 ATEX 2027 ausgestellt von der/
according to the EU Type Examination PTB 06 ATEX 2027 issued by/
établi selon le certificat CE d'essais sur échantillons PTB 06 ATEX 2027 émis par:

Physikalisch Technische Bundesanstalt
Bundesallee 100
D-38116 Braunschweig
Benannte Stelle/Notified Body/Organisme notifié 0102

wird die Konformität mit den einschlägigen Harmonisierungsrechtsvorschriften der Union bestätigt /
the conformity with the relevant Union harmonisation legislation is declared with/
est conforme à la législation d'harmonisation de l'Union applicable selon les normes:

EMC 2014/30/EU	EN 61000-6-2:2019, EN 61000-6-3:2007 +A1:2011, EN 61326-1:2013
Explosion Protection 2014/34/EU	EN 60079-0:2012+A11:2013, EN 60079-11:2012
RoHS 2011/65/EU	EN 50581:2012

Hersteller / Manufacturer / Fabricant:

SAMSON AKTIENGESELLSCHAFT
Weismüllerstraße 3
D-60314 Frankfurt am Main
Deutschland/Germany/Allemagne

Frankfurt / Francfort, 2020-01-23
Im Namen des Herstellers/ On behalf of the Manufacturer/ Au nom du fabricant.

i.V. J. Bieger

Dipl.-Ing. Jens Bieger
Zentralabteilungsleiter/Head of Department/Chef du département
Entwicklung Ventilanbaugeräte und Messtechnik
Development Valve Attachments and Measurement Technologies

i.V. S. Schäfer

Dipl.-Ing. Silke Bianca Schäfer
Total Quality Management/
Management par la qualité totale

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EU Konformitätserklärung / EU Declaration of Conformity / Déclaration UE de conformité

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller/
This declaration of conformity is issued under the sole responsibility of the manufacturer/
La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.

Für das folgende Produkt / For the following product / Nous certifions que le produit

Magnetventil / Solenoid Valve / Electrovanne
Typ / Type / Type 3967-8...

entsprechend der EU-Baumusterprüfbescheingung PTB 06 ATEX 2028 X ausgestellt von der/
according to the EU Type Examination PTB 06 ATEX 2028 X issued by/
établi selon le certificat CE d'essais sur échantillons PTB 06 ATEX 2028 X émis par:

Physikalisch Technische Bundesanstalt
Bundesallee 100
D-38116 Braunschweig
Benannte Stelle/Notified Body/Organisme notifié 0102

wird die Konformität mit den einschlägigen Harmonisierungsrechtsvorschriften der Union bestätigt /
the conformity with the relevant Union harmonisation legislation is declared with/
est conforme à la législation d'harmonisation de l'Union applicable selon les normes:

EMC 2014/30/EU	EN 61000-6-2:2005, EN 61000-6-3:2007 +A1:2011, EN 61326-1:2013
Explosion Protection 94/9/EC (bis/to 2016-04-19) Explosion Protection 2014/34/EU (ab/from 2016-04-20)	EN 60079-0:2009, EN 60079-15:2010, EN 60079-31:2009
RoHS 2011/65/EU	EN 50581:2012

Hersteller / Manufacturer / Fabricant:

SAMSON AKTIENGESELLSCHAFT
Weismüllerstraße 3
D-60314 Frankfurt am Main
Deutschland/Germany/Allemagne

Frankfurt / Francfort, 2017-07-29

Im Namen des Herstellers/ On behalf of the Manufacturer/ Au nom du fabricant.

i v. H. Zager

Hanno Zager
Leiter Qualitätssicherung/Head of Quality Managment/
Responsable de l'assurance de la qualité

i.V. Dirk Hoffmann

Dirk Hoffmann
Zentralabteilungsleiter/Head of Department/Chef du département
Entwicklungsorganisation/Development Organization

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SAMSON REGULATION S.A.S.

DECLARATION UE DE CONFORMITE **DC008**
EU DECLARATION OF CONFORMITY **2019-11**
EU KONFORMITÄTSERKLÄRUNG

La présente déclaration de conformité est établie sous la seule responsabilité du fabricant.
This declaration of conformity is issued under the sole responsibility of the manufacturer.
Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Nous certifions pour les produits suivants en exécution standard :
For the following products in standard execution:
Für die folgenden Produkte in Standard-Ausführung:

Type / type / Typ : 2371, 3249, 3252, 3310, 3331, 3347, 3349, 3351, 3710, 3711, 3776, 3777, 3812, 3963, 3964, 3967, 4708, 4746, 5090, Samstation

sont conformes à la législation applicable harmonisée de l'Union :
the conformity with the relevant Union harmonization legislation is declared with:
wird die Konformität mit den einschlägigen Harmonisierungsrechtsvorschriften der Union bestätigt:

RoHS 2011/65/EU, 2015/863/EU **EN50581:2012-09**

Fabricant :
Manufacturer:
Hersteller:

SAMSON REGULATION S.A.S.
1, rue Jean Corona
69520 Vaulx-en-Velin
France

Vaulx-en-Velin, le 26/11/19

Au nom du fabricant,
On behalf of the Manufacturer,
Im Namen des Herstellers,

SAMSON REGULATION S.A.S.

Joséphine SIGNOLES-FONTAINE
Responsable QSE

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

(1) # EU-TYPE EXAMINATION CERTIFICATE

(Translation)

(2) Equipment or Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number:

PTB 06 ATEX 2027 **Issue: 2**

(4) Product: Magnetventil Typ 3967-110...

(5) Manufacturer: SAMSON AG Mess- und Regeltechnik

(6) Address: Weismüllerstraße 3, 60314 Frankfurt, Deutschland

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential Test Report PTB Ex 19-29076.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012+A11:2013 EN 60079-11:2012

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

II 2 G Ex ia IIC T6...T4 Gb and II 2 D Ex ia IIIC T80 °C Db

Konformitätsbewertungsstelle, Sektor Explosionsschutz Braunschweig, July 3, 2019
On behalf of PTB:

Dr.-Ing. D. Markus
Direktor und Professor

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sheet 1/3

(13) # SCHEDULE

(14) **EU-Type Examination Certificate Number PTB 06 ATEX 2027 , Issue: 2**

(15) Description of Product

The solenoid valve, type 3967-110..., transforms binary electric signals into pneumatic output signals; it is used for controlling pneumatic actuators.

The solenoid valve is electrically controlled with the e/p binary converter coil, type 1079-40.., which is a modified version of the type 1079-27.. binary converter coil certified with the PTB 00 ATEX 2157 U certificate. It is a passive two-terminal element that can be integrated into certified intrinsically safe circuits, provided the maximum values for U_i, I_i and P_i are not exceeded.

It is used in potentially explosive atmospheres.

For the relationship between temperature class and the permissible ambient temperatures, reference is made to the following table:

Temperature class	Ambient temperatures
T6	-45 °C to +60 °C
T5	-45 °C to +70 °C
T4	-45 °C to +80 °C

The range of the permissible ambient temperatures for dust group IIIC is -45 °C to +60 °C

Electrical data

Unlike the other versions, the version with a 6 V nominal signal has a defined maximum intrinsically safe input power P_i.

Signal circuit (terminals +, -) ..... In type of protection Intrinsic Safety Ex ia IIC/IIIC

Only for connection to a certified intrinsically safe circuit

Maximum values:

for variant of nominal signal 6 V
U_i = 32 V
I_i = 150 mA
P_i = 250 mW
L_i negligibly low
C_i negligibly low

for all other versions (nominal signal 12 V and 24 V)
U_i = 32 V
I_i = 150 mA
L_i negligibly low
C_i negligibly low

Modifications from earlier versions

The modifications concern the marking and the supplementation of the permissible ambient temperature range for Group IIIC.

(16) Test Report PTB Ex19-29076

(17) Specific conditions of use

None.

(18) Essential health and safety requirements

Met by compliance with the aforementioned standards.

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, July 3, 2019

Dr.-Ing. D. Markus
Direktor und Professor

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

PTB

TRANSLATION

(1) # Statement of Conformity

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres – **Directive 94/9/EC**

(3) EC Type Examination Certificate Number

PTB 06 ATEX 2028 X

(4) Equipment: Model 3967-8 Solenoid Valve

(5) Manufacturer: SAMSON AG Mess- und Regeltechnik

(6) Address: Weismüllerstr. 3, 60314 Frankfurt am Main, Germany

(7) The design of this equipment and the various approved versions thereof are specified in the schedule to this type examination certificate and the documents referred to therein.

(8) The Physikalisch-Technische Bundesanstalt certifies that according to the Council Directive 94/9/EC of 23 March 1994 this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres as specified in Annex II to the Directive.

The examination and test results are recorded in confidential report **PTB Ex 06-26109**

(9) The essential health and safety requirements are satisfied by compliance with

EN 60079-15: 2003 **EN 50281-1-1:1998**

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment it subject to special conditions for safe use as specified in the schedule to this certificate.

(11) This Statement of Conformity relates only to the design and construction of the subject equipment according to Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment and to placing it on the market.

Physikalisch-Technische Bundesanstalt., Bundesallee 100, D-38116 Braunschweig

(12) The marking of the equipment shall include the following:

II 3 G EEx nA II T 6, or II 3 G EEx nL II C T 6, or
II 3 D IP 54 T 80 °C, or II 3 D IP 65 T 80 °C

Zertifizierungsstelle Explosionsschutz

Braunschweig, 23 October 2006

By order
(Signature)

(Seal)

Dr. Ing. U. Gerlach
Oberregierungsrat

(13) # Schedule

(14) **Statement of Conformity PTB 06 ATEX 2028 X**

(15) **Description of Equipment**

The Model 3967-8.. Solenoid Valve converts electrical binary signals into pneumatic output signals and serves for controlling pneumatic actuators.

The solenoid valve is actuated electrically by the Model 1079-40 .. e/p Binary Converter Coil, a modified version of the Model 1079-27 .. e/p Binary Converter Coil certified under PTB 00 ATEX 2157 U. This is a passive two-pole network that is permitted to be connected to certified intrinsically safe circuits unless the admissible maximum valves of U_i, I_i and P_i are exceeded.

The equipment is intended for use in hazardous areas.

The Model 3967-8 ... also complies with the requirements of electrical equipment protected by the enclosure according to EN 50281-1-:1998.

Electrical data:

By connection of suitable series resistors the Model 1079-40 .. e/p Binary Converter Coil can be connected to nominal voltages of 6 V, 12 V and 24 V.

The correlation between version, temperature classification, permissible ambient temperature ranges and maximum power dissipation is shown in the table below.

Version	U_N	**6 V DC**	**12 V DC**	**24 V DC**
Temperature class	T6	- 45 °C		60 °C
	T5			70 °C
	T4			80 °C
Characteristic rectangular	P_i	250 mW	(#)	
Characteristic linear	P_i	(#)	(#)	

(#) No limitations

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

Schedule

Statement of Conformity PTB 06 ATEX 2028X

Electrical data

Input circuit .....

Type of protection EEx nA II
or EEx nL IIC

Maximum values:

Ui = 32 V
Ii = 132 mA

Ci negligible
Li negligible

(16) **Test report** **PTB Ex 06-26109**

(17) **Special conditions for safe use**

According to the requirements of type of protection EEx nA II the input circuits are permitted to be connected, disconnected or operated while live only during installation, maintenance and repair work.

According to the requirements of type of protection EEx nL IIC the input circuits are permitted to be connected while in operation.

If the Model 3967-8 ... Solenoid Valve is intended in to be used in hazardous areas containing conductive dusts according to EN 50281-1-1:1998 it shall be installed in an enclosure providing at least degree of protection IP 54 in compliance with the I EC publication 60529:1989. The cabling shall be connected in such a manner that the connecting wiring is free from tensile and tensional stress.

(18) **Essential health and safety requirements**

Satisfied by compliance with the standards specified above.

Zertifizierungsstelle Explosionsschutz

Braunschweig, 23 October 2006

By order
(Signature)

(Seal)

Dr. Ing. U. Gerlach

Physikalisch-Technische Bundesanstalt., Bundesallee 100, D-38116 Braunschweig

Ptb52Ex n.doc

[Translation of German original]

Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin

[PTB logo]

1st ADDENDUM
to Statement of Conformity PTB 06 ATEX 2028 X

Equipment:	Type 3967-8.. Solenoid Valve
Marking:	**II 3 G EEx nA II T6 / II 3 G EEx nL IIC T6** **II 3 D IP 54 T 80 °C / II 3 D IP 65 T 80 °C**
Manufacturer:	SAMSON AG, Mess- und Regeltechnik
Address:	Weismüllerstraße 3, 60314 Frankfurt, Germany

Description of additions and modifications

The Type 3967-8.. Solenoid Valve converts binary electric signals into pneumatic output signals and serves to control pneumatic actuators.

Amongst others, the modifications refer to the printed circuit board and the marking.
In the future, the marking will be as follows:

II 3 G Ex nA II T6 / II 3 G Ex nL IIC T6

II 3 D Ex tD A21 IP 65 T 80 °C

The electrical data, notes on manufacturing and operation and all other specifications also apply to this first addendum.

Applied standards

EN 60079-0:2006 **EN 60079-15:2005** **EN 61241-0:2006** **EN 61241-1:2004**

Test Report PTB Ex 07-27233

Certification Body for Explosion Protection
O/o

Braunschweig, 9 January 2008

[Signature Johannsmeyer, stamp: Physikalisch-Technische Bundesanstalt 56]

Dr.-Ing. U. Johannsmeyer
Director and Professor

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx PTB 08.0036	Issue No: 1	Certificate history: Issue No. 1 (2019-07-03) Issue No. 0 (2008-08-26)
Status:	**Current**	Page 1 of 5	
Date of Issue:	**2019-07-03**		

Applicant: **SAMSON AG Mess- und Regeltechnik**
Weismüllerstr. 3
60314 Frankfurt am Main
Germany

Equipment: **Solenoid Valve Type 3967-112...**
Optional accessory:

Type of Protection: **Intrinsic Safety "i"**

Marking:
Ex ia IIC T6...T4 Gb and
Ex ia IIIC T80 °C Db

Approved for issue on behalf of the IECEx Certification Body: Dr.-Ing. Detlev Markus

Position: Head of Department "Explosion Protection in Energy Technology"

Signature:
(for printed version)

Date: 03.07.19

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Physikalisch-Technische Bundesanstalt (PTB)
Bundesallee 100
38116 Braunschweig
Germany

PTB
Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin

IECEx Certificate of Conformity

Certificate No: IECEx PTB 08.0036 Issue No: 1

Date of Issue: **2019-07-03** Page 2 of 5

Manufacturer: **SAMSON AG Mess- und Regeltechnik**
Weismüllerstr. 3
60314 Frankfurt am Main
Germany

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

IEC 60079-11 : 2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

DE/PTB/ExTR08.0045/00 DE/PTB/ExTR08.0045/01

Quality Assessment Report:

DE/TUN/QAR06.0011/08

IECEx Certificate of Conformity

Certificate No: IECEx PTB 08.0036 Issue No: 1

Date of Issue: **2019-07-03** Page 3 of 5

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The solenoid valve, type 3967-112..., transforms binary electric signals into pneumatic output signals; it is used for controlling pneumatic actuators.

The solenoid valve is electrically controlled with the e/p binary converter coil, type 1079-40... It is a passive two-terminal element that can be integrated into certified intrinsically safe circuits, provided the maximum values for U_i, I_i and P_i are not exceeded.

It is used in potentially explosive atmospheres.

For the thermal and electrical values reference is made to the annex.

SPECIFIC CONDITIONS OF USE: NO

IECEx Certificate of Conformity

Certificate No: IECEx PTB 08.0036 Issue No: 1

Date of Issue: **2019-07-03** Page 4 of 5

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

The modifications concern the applied standards, the elimination of dust explosion protection by enclosure "t", the adding of dust explosion protection by Intrinsic Safety, the permissible ambient temperature range for group IIIC, the electrical data and the marking.
The product has not been subjected to any technical modifications.

IECEx Certificate of Conformity

Certificate No: IECEx PTB 08.0036 Issue No: 1

Date of Issue: **2019-07-03** Page 5 of 5

Additional information:

Annex:

Annex IECEx PTB 08.0036-01.pdf

Applicant:

SAMSON AG Mess- und Regeltechnik

Weismüllerstraße 3, 60019 Frankfurt, Germany

Electrical Apparatus:

Solenoid Valve, Type 3967-112...

Thermal and electrical data

Unlike the other versions, the version with a 6 V nominal signal has a defined maximum intrinsically safe input power P_i.

Signal circuit..... (terminals +, -)	Type of protection Intrinsic Safety Ex ia IIC / IIIC
	Only for connection to a certified intrinsically safe circuit
	Maximum values:
	for variant of nominal signal 6 V U_i = 32 V I_i = 150 mA P_i = 250 mW L_i negligibly low C_i negligibly low
	for all other versions (nominal signal 12 V and 24 V) U_i = 32 V I_i = 150 mA L_i negligibly low C_i negligibly low

Physikalisch-Technische Bundesanstalt (PTB)
Bundesallee 100, 38116 Braunschweig, Germany
Postfach 33 45, 38023 Braunschweig, Germany
Telephone +49 531 592-0, Telefax +49 531 592-3605

For the relationship between temperature class and the permissible ambient temperatures for gas group IIC, reference is made to the following table:

Temperature class	Ambient temperatures
T6	-45 °C to +60 °C
T5	-45 °C to +70 °C
T4	-45 °C to +80 °C

The range of the permissible ambient temperatures for dust group IIIC is -45 °C to +60 °C

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IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx PTB 08.0038X	issue No.:0	Certificate history:
Status:	Current		
Date of Issue:	2008-08-26	Page 1 of 3	

Applicant: **SAMSON AG Mess- und Regeltechnik**
Weismüllerstr. 3
60314 Frankfurt am Main
Germany

Electrical Apparatus: **Solenoid Valve Type 3967-8..**
Optional accessory:

Type of Protection: **Construction, test and marking of type of protection "n" electrical apparatus;**

Marking: **Ex nA II T6 / Ex nL IIC T6**
Ex tD A22 IP65 T 80 °C

Approved for issue on behalf of the IECEx Certification Body: Dr.-Ing. Ulrich Johannsmeyer

Position: Department Head "Intrinsic Safety and Safety of Systems"

Signature:
(for printed version)

Date: 2008-08-28

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Physikalisch-Technische Bundesanstalt (PTB)
Bundesallee 100
38116 Braunschweig
Germany

IECEx Certificate of Conformity

Certificate No.: IECEx PTB 08.0038X

Date of Issue: **2008-08-26** Issue No.: **0**

Manufacturer: **SAMSON AG Mess- und Regeltechnik**
Weismüllerstr. 3
60314 Frankfurt am Main
Germany

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2007-10 Edition: 5	Explosive atmospheres - Part 0:Equipment - General requirements
IEC 60079-15 : 2005-03 Edition: Ed 3	Electrical apparatus for explosive gas atmospheres Part 15: Contruction, test and Marking of Type of Protection "n" electrical apparatus
IEC 61241-0 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-1 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

DE/PTB/ExTR08.0046/00

Quality Assessment Report:
DE/TUN/QAR06.0011/00

IECEx Certificate of Conformity

Certificate No.: IECEx PTB 08.0038X

Date of Issue: **2008-08-26** Issue No.: **0**

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The Model 3967-8.. Solenoid Valve converts electrical binary input signals into pneumatic output signals and serves for controlling pneumatic actuators.
The device is intended for use inside of hazardous areas.
For further information see annex

CONDITIONS OF CERTIFICATION: YES as shown below:

Conditions for safe use

- When the Model 3967-8... Solenoid Valve is to be used in hazardous locations where conductive dusts according to IEC 61241-1 are present, it shall be mounted in an additional enclosure of steel or stainless steel resp. or of plastic. Evidence shall be furnished that the enclosure inclusive of its connection facilities and bushings comply with Degree of Protection IP65 according to IEC 60529.
- When the Solenoid Valve is to be mounted in a plastic enclosure, the enclosure made by Manufacturer Rittal certified under PTB 03 ATEX 1011 U shall be used.
- Under normal operating conditions the input circuits provided with type of protection Ex nA II are permitted to be connected, disconnected or switched on/off while live only during installation, maintenance and repair work.The input circuits provided with type of protection Ex nL IIC are permitted to be switched on/off in normal operation.

Annexe: 3967-8_Technical Data.pdf

EB 3967 EN

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