

MOUNTING AND OPERATING INSTRUCTIONS



EB 8368 EN (identical with the German original instructions EB 3776)

Translation of original instructions



Type 3776 Limit Switch

Edition August 2018

CE Ex
certified



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ID 066000000

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.

- 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 (aftersaleservice@samson.de).



The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at www.samson.de > **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

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1 General information

The device is to be mounted, started up or operated only by trained and experienced personnel familiar with the device. According to these mounting and operating instructions, trained personnel is referred to as individuals who are able to judge the work they are assigned to and recognize possible dangers 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.

Any hazards that could be caused in the valve by the process medium, the signal pressure or by moving parts are to be prevented by taking appropriate precautions.

If inadmissible motions or forces are produced in the pneumatic actuator as a result of the supply pressure, it must be restricted using a suitable supply pressure reducing station.

Proper shipping and storage are assumed.

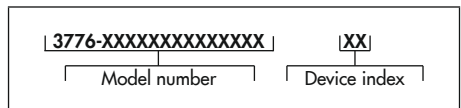
For technical data, ordering specifications, spare parts and accessories, see Data Sheet

► T 3776.

1.1 Markings on the device

1.1.1 Model number and device index

The model number and device index are specified on the nameplate.



General information

1.1.2 Article code

Limit switch	Type 3776-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Type of protection																	
No explosion protection	0																
II 2G Ex ia IIC T6, ATEX ¹⁾ (max. 60/70/80 °C in T6/T5/T4)	1																
Ex ia FM ²⁾ (max. 60°C in T6/T5)	3																
II 3G Ex nA II T6, ATEX ³⁾ (max. 60/70/80 °C in T6/T5/T4)	8																
Limit contact																	
Version																	
Inductive proximity switch SC3,5 N0, two-wire (-40 to +80 °C)	1																
Inductive proximity switch SJ3,5 SN, two-wire (-45 to +80 °C)	2																
Inductive double proximity switch SB3,5 E2, three-wire ³⁾ , without explosion protection and AS-i (-20 to +70 °C)	3																
Electric microswitch, three-wire ³⁾ , SPDT with silver contact without AS-i (-40 to +80 °C)	5																
Electric microswitch, three-wire ³⁾ , SPDT with gold contact without AS-i (-40 to +80 °C)	6																
Special version	9																
Quantity ⁴⁾																	
1 limit contact	1																
2 limit contacts	2																
3 limit contacts	3																
4 limit contacts	4																
6 limit contacts	6																
Opening angle																	
<100°, adjustable	0																
<180°, adjustable	1																
Special version	9																
Solenoid valve																	
Nominal signal																	
Without solenoid valve		0	0	0	0	0	0										
6 V DC		1															
12 V DC		2															

Limit switch	Type 3776-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
24 V DC	3																	
230 V AC (without explosion protection)	5																	
115 V AC (without explosion protection)	6																	
Manual override																		
Without, SIL	0																	
With pushbutton underneath the enclosure cover, SIL	1																	
Pushbutton/switch underneath the enclosure cover	2																	
Switching function																		
Without switching function (without integrated solenoid valve)	0																	
3/2-way function with spring-return mechanism, K_{VS} 0.2, SIL	1																	
5/2-way function with spring-return mechanism, K_{VS} 0.3	3	0																
5/2-way, detent mechanism, K_{VS} 0.3	4																	
5/3-way, 2 + 4 closed, K_{VS} 0.3	5																	
5/3-way, 2 + 4 vented, K_{VS} 0.3	6																	
Connection block with one solenoid pilot valve ⁵⁾	8	0																
Connection block with two solenoid pilot valves ^{4) 6)}	9	0																
Restrictors																		
Without, SIL	0																	
2 exhaust air restrictors, K_{VS} 0.01 to 0.18, adjustable (optional with 5/2-way or 5/3-way function)	1																	
1 supply air/1 exhaust air restrictor, K_{VS} 0.01 to 0.18, adjustable (optional with 3/2-way function)	2																	
Pneumatic connection																		
Without, (without integrated solenoid valve)	0																	
G ¼	1																	
¼ NPT	2																	
Electrical connection																		
12-pole terminal block, M20x1.5 threaded connection																		
1 black cable gland M20x1.5, made of polyamide, min. -20 °C	1	0																
2 black cable glands M20x1.5, made of polyamide, min. -20 °C	1	1																
1 blue cable gland M20x1.5, made of polyamide, min. -20 °C	1	2																
2 blue cable glands M20x1.5, made of polyamide, min. -20 °C	1	3																
1 adapter M20x1.5 to ½ NPT (aluminum), min. -45 °C	1	4																
2 adapters M20x1.5 to ½ NPT (aluminum), min. -45 °C	1	5																

General information

Limit switch	Type 3776-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1 black CEAG cable gland M20x1.5, made of polyamide, min. -20 °C	1	6														
2 black CEAG cable glands M20x1.5, made of polyamide, min. -20 °C	1	7														
1 cable gland M20x1.5, made of brass, min. -45 °C	1	8														
2 cable glands M20x1.5 (brass), min. -45 °C	1	9														
Connector																
1 Harting device connector, 8-pole, max. 50 V AC, made of aluminum, silver gray ⁷⁾ , min -40 °C	2	1														
2 Harting device connectors, 7+7-pole, max. 50 V AC, made of aluminum, silver gray ⁷⁾ , min -40 °C	2	2														
1 device connector, type A according to DIN EN 175301-803, 4-pole, black polyamide ⁷⁾ , min. -20 °C	2	5														
2 device connectors, type A according to DIN EN 175301-803, 4+4-pole, black polyamide ⁸⁾ , min. -20 °C	2	6														
1 Binder round connector, 7-pole, black polyamide ⁷⁾ , min. -20 °C	2	7														
2 Binder round connectors, 7+6-pole, black polyamide ⁸⁾ , min. -20 °C	2	8														
AS-Interface module with bus connection																
Cable adapter for AS-i flat-ribbon cable, two-wire, black polyamide, without explosion protection, -25 to +60 °C	5	2														
Round connector M12x1, 4-pole, brass, without explosion protection ⁷⁾ , -25 to +60 °C	5	3														
Degree of protection																
IP 54, polyethylene filter (min. -20 °C)		0														
IP 65, filter check valve made of polyamide (min. -20 °C)		1														
IP 65, filter check valve made of stainless steel 1.4305 (min. -45 °C)		2														
Ambient temperature																
The permissible ambient temperature of the limit switch depends on the permissible ambient temperature of the components, type of protection and temperature class.										x						
Safety approval																
Without															0	
SIL ⁹⁾															1	

Limit switch	Type 3776- x x x x x x x x x x x x x x x x												
Special version													
Inductive proximity switch SJ3,5 S1N, two-wire, NAMUR NO contact, with explosion protection and SIL capability (-25 to +80 °C)	0	0	4										
EAC 1Ex ia IIC T6...T4 Gb X	0	1	1										
EAC Ex on request	0	1	5										
STCC II 2G Ex ia IIC T6	0	1	6										
STCC II 3G Ex nA II T6	0	1	7										
Further special versions on request	x	x	x										

- 1) According to EC type examination certificate PTB 98 ATEX 2072
- 2) According to FM certificate of conformity 3026958
- 3) According to statement of conformity PTB 02 ATEX 2007 X (II 3G Ex nA II T6)
- 4) A maximum of two three-wire limit contacts can be used when a solenoid valve is actuated on both sides.
- 5) For pneumatic actuation on one side of an external 3/2-way or 5/2-way Type 3756 Booster Valve, G 1/4/1/4 NPT
- 6) For pneumatic actuation on both sides of an external 5/2-way or 5/3-way Type 3756 Booster Valve, G 1/4/1/4 NPT
- 7) The cable socket is not included in the scope of delivery.
- 8) The cable sockets are not included in the scope of delivery.
- 9) SIL according to IEC 61508 (certificate no. DE V 60.09/14 rev. 01)

1.1.3 Summary of explosion protection approvals

Type 3776	Certification		Type of protection
-1	ATEX	Number PTB 98 ATEX 2072 Date 2006-08-25	II 2G Ex ia IIC T6
		Number RU C-DE.HA65.B.00615/20 Date 2020-06-08 Valid until 2025-05-13	I Ex ia IIC T6...T4 Gb X
	STCC	Number ZETC/23/2018 Date 2018-04-27 Valid until 2021-04-26	II 2G Ex ia IIC T6 Gb
		Number A/P/HQ/MH/104/1794 Date 2016-11-12 Valid until 2021-11-11	Ex ia IIC T6
-3	FM	Number 3026958 Date 2006-10-16	Class I, Zone 0 AEx ia IIC Class I, Div. 1, Groups A, B, C, D. Class I, Div. 2, Groups A, B, C, D; Class I, Zone 2, IIC
-8		ATEX	Number PTB 02 ATEX 2007 X Date 2002-03-07
	EAC	On request	
	STCC	Number ZETC/23/2018 Date 2018-04-27 Valid until 2021-04-26	II 3G Ex nA IIC T6 Gc

2 Installation

⚠ WARNING

- Before installation, depressurize the relevant plant section.
- Due to the high surface resistance, installation and maintenance of the equipment within hazardous areas must be performed in such a way as to prevent electrostatic charging.

ⓘ NOTICE

The degree of protection IEC 60529 is only guaranteed when the enclosure cover is mounted, the exhaust air filters are installed and the connections have been properly mounted.

i Note

Devices with index 1 or lower have a black enclosure cover with polyamide window. Devices with device index 2 and higher have a transparent polycarbonate enclosure cover.

Do not loosen enameled screws in or on the housing.

The devices are mounted onto rotary actuators, linear actuators and control valves with mounting ribs using mounting kits. Observe the corresponding mounting instructions (see sections 2.1 to 2.7).

On mounting, make sure that at least 300 mm clearance is kept above the enclosure cover.

In cases where mechanical damage of the enclosure cannot be ruled out at the site of installation, mount additional protection to the enclosure in order to meet the requirements of Clause 6 of EN 61241-0:2006 (Electrical Apparatus for Use in the Presence of Combustible Dust).

Mounting position

Devices must not be mounted with the bottom facing upwards onto rotary actuators or control valves with mounting ribs in order to prevent water from entering the enclosure. The exhaust filter in the enclosure cover and the cable gland must face downward or, in cases where this is not possible, mount them in the horizontal position.

When mounted onto SAMSON Type 3277 Linear Actuators, any mounting position may be used.

2.1 Mounting on SAMSON Type 3278 Rotary Actuators

A mounting kit (see Fig. 1) is required for mounting on SAMSON Type 3278 Linear Actuators (see Data Sheet ► T 8321 as well as Mounting and Operating Instructions ► EB 8321).

Please note the following instructions when mounting the device:

– **Devices with Type 3776-XXXXXX10 3/2-way Booster Valve**

The output port on the bottom of the booster valve must be sealed by a threaded pin (delivered state).

– **Devices with Type 3776-XXXXXX10 or -XXXXXX12 3/2-way Booster Valve**

Implement the exhaust air feedback from the rotary actuator as follows:

- ➔ Connect the spring chamber of the rotary actuator using a connection line to port 4 of the booster valve.
- ➔ If no exhaust air feedback is used, seal port 4 of the booster valve with a blanking plug (12).

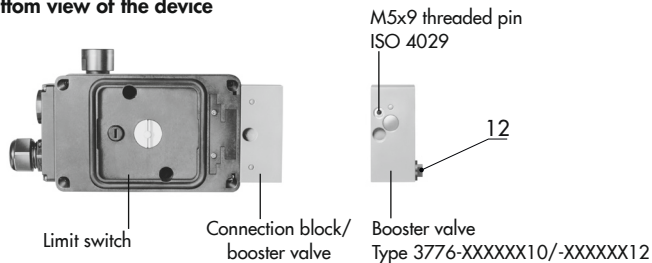
Mounting

1. Fasten the plate (8) to the flange of the rotary actuator using two hexagon socket screws (9).
2. Insert O-rings (4) into the grooves of the threaded bolts of the flange plate (5).
3. Fasten the flange plate (5) to the flange of the rotary actuator using four hexagon screws (6). Make sure the four hexa-

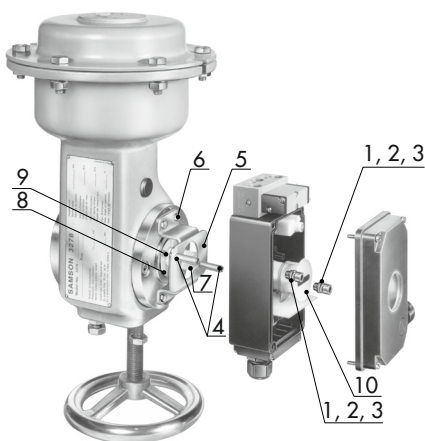
gon screws are only tightened slightly to allow the flange plate (5) to be aligned when attaching the enclosure.

4. Place the follower clamp (7) through the flange plate (5) into the slot of the plate (8) on the rotary actuator.
5. Unscrew enclosure cover off the device.
6. Place the enclosure on the stud bolts of the flange plate (5). Make sure that the shaft trunnion on the device is aligned so that it engages in the middle of the slot in the follower clamp (7).
7. Fasten the flange plate (5) to the flange of the rotary actuator by tightening the four hexagon screws (6) further.
8. Fasten the enclosure using two hexagon socket screws (1), two spring washers (2) and two washers (3).
9. Place the indicator cap (10) on the cam holder and turn it until it engages.
10. Fasten the enclosure cover on the device.

Bottom view of the device



Mounting kit for SAMSON rotary actuators	
Actuator area	Order no.
160 cm ²	1400-7216
320 cm ²	1400-7217



No.	Quantity	Description
1	2x	M6x12 hexagon socket screw ISO 4762
2	2x	Spring washer B6
3	2x	Washer ISO 7089, 6-6
4	2x	O-ring 7.5x1.5
5	1x	Flange plate
6	4x	M5x12 hexagon screw EN 24017
7	1x	Follower clamp
8	1x	Plate
9	2x	M4x10 hexagon socket screw ISO 4762
10	1x	Indicator cap
11	1x	Retaining ring (only with mounting kit 1400-7217)
12	1x	¼" blanking plug

Fig. 1: Mounting on SAMSON Type 3278 Rotary Actuators

2.2 Attachment to rotary actuators according to VDI/VDE 3845, fixing level 1

A mounting kit is required for mounting onto rotary actuators according to VDI/VDE 3845 (09-2004), fixing level 1 (see Fig. 2).

Please note the following instructions when mounting the device:

– **Devices with Type 3776-XXXXXX10 3/2-way Booster Valve**

The output port on the bottom of the booster valve must be sealed by a threaded pin (delivered state).

– **Devices with Type 3776-XXXXXX10 or -XXXXXX12 3/2-way Booster Valve**

Implement the exhaust air feedback from the rotary actuator as follows:

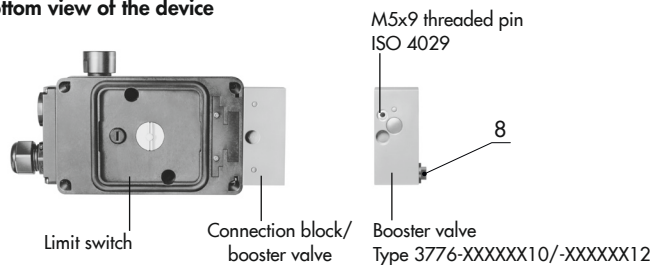
- Connect the spring chamber of the rotary actuator using a connection line to port 4 of the booster valve.
- If no exhaust air feedback is used, seal port 4 of the booster valve with a blanking plug (8).

Installation

1. Insert O-rings (4) into the grooves of the threaded bolts of the flange plate (5).
2. Fasten the flange plate (5) to the flange of the rotary actuator using four hexagon screws (6). Make sure the four hexagon screws are only tightened slightly to allow the flange plate (5) to be aligned when attaching the enclosure.

3. Unscrew enclosure cover off the device.
4. Place the enclosure on the threaded bolts of the flange plate (5). Make sure that the shaft trunnion on the device is aligned so that it engages in the middle of the slot on the shaft trunnion of the rotary actuator.
5. Fasten the flange plate (5) to the flange of the rotary actuator by tightening the four hexagon screws (6) further.
6. Fasten the enclosure using two hexagon socket screws (1), two spring washers (2) and two washers (3).
7. Place the indicator cap (7) on the cam holder and turn it until it engages.
8. Fasten the enclosure cover on the device.

Bottom view of the device



Mounting kit for rotary actuators (fixing level 1) - Order number			
1400-7043	1400-7186	1400-7212	1400-7210
Size 1	Size 2	Size 3	Size 4
Hole spacing A			
80 mm	80 mm	130 mm	130 mm
Shaft trunnion length B			
20 mm	30 mm	30 mm	50 mm

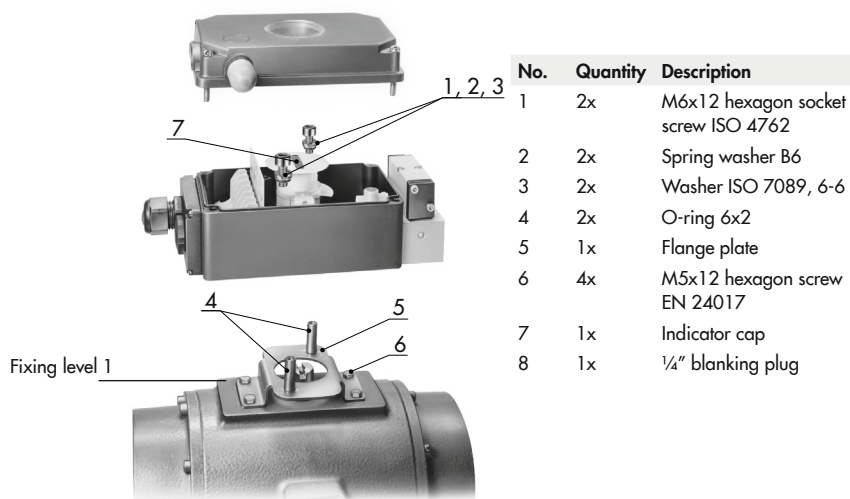


Fig. 2: Attachment to rotary actuators according to VDI/VDE 3845 (2004-09), fixing level 1

2.3 Attachment to rotary actuators according to VDI/VDE 3845, fixing level 2

A mounting kit is required for mounting onto rotary actuators according to VDI/VDE 3845 (09-2004), fixing level 2 (see Fig. 3).

Please note the following instructions when mounting the device:

– **Devices with Type 3776-XXXXXX10 3/2-way Booster Valve**

The output port on the bottom of the booster valve must be sealed by a threaded pin (delivered state).

– **Devices with Type 3776-XXXXXX10 or -XXXXXX12 3/2-way Booster Valve**

Implement the exhaust air feedback from the rotary actuator as follows:

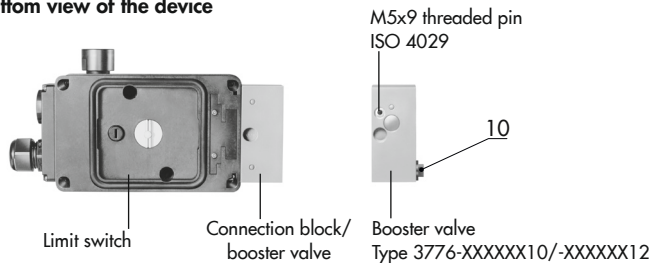
- Connect the spring chamber of the rotary actuator using a connection line to port 4 of the booster valve.
- If no exhaust air feedback is used, seal port 4 of the booster valve with a blanking plug (10).

Installation

1. Fasten the bracket supplied by the actuator manufacturer to the flange of the rotary actuator using four hexagon screws. Make sure the four hexagon screws are only tightened slightly to allow the bracket to be aligned when attaching the enclosure.

2. Insert O-rings (4) into the grooves of the threaded bolts of the flange plate (5).
3. Fasten the flange plate (5) to the bracket using two hexagon bolts (7) and two nuts (8).
4. Place the follower clamp (6) into the slot of the shaft trunnion on the rotary actuator.
5. Unscrew enclosure cover off the device.
6. Place the enclosure on the threaded bolts of the flange plate (5). Make sure that the shaft trunnion on the device is aligned so that it engages in the middle of the slot in the follower clamp (6).
7. Fasten the bracket to the flange of the rotary actuator by tightening the four hexagon screws further.
8. Fasten the enclosure using two hexagon socket screws (1), two spring washers (2) and two washers (3).
9. Place the indicator cap (9) on the cam holder and turn it until it engages.
10. Fasten the enclosure cover on the device.

Bottom view of the device



Mounting kit for rotary actuators (fixing level 2) - Order no.: 1400-7041

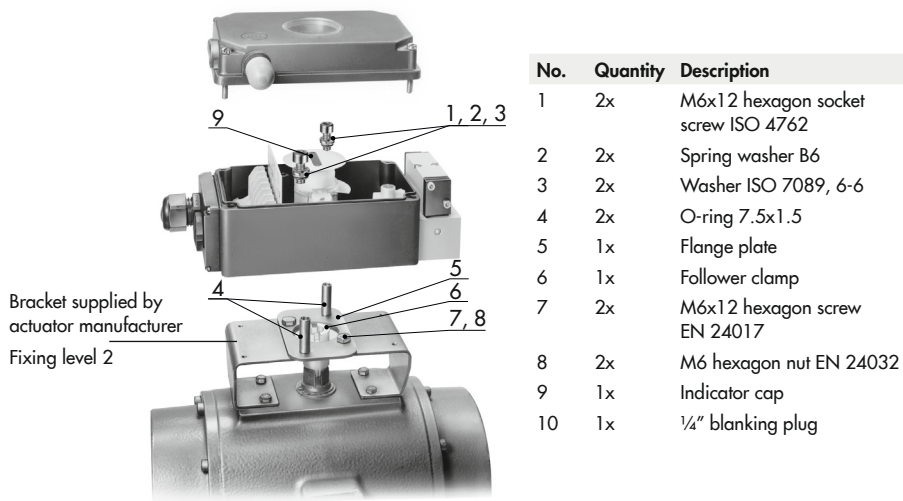


Fig. 3: Attachment to rotary actuators according to VDI/VDE 3845 (2004-09), fixing level 2

2.4 Mounting on SAMSON Type 3277 Linear Actuators

A mounting kit (see Fig. 4) is required for mounting on SAMSON Type 3277 Linear Actuators (see Data Sheet ► T 8310-1 as well as Mounting and Operating Instructions ► EB 8310-6).

A SAMSON Type 373X, Type 3725, Type 376X or Type 378X Positioner can be mounted as well.

Please note the following instructions when mounting the device:

– Devices with Type 3776-XXXXXX10 3/2-way Booster Valve

The output port on the bottom of the booster valve must be sealed by a threaded pin (delivered state).

→ Insert the O-ring (16) into the output port on the bottom of the booster valve.

– Devices with Type 3776-XXXXXX10 or -XXXXXX12 3/2-way Booster Valve

Implement the exhaust air feedback from the linear actuator as follows:

→ Connect the spring chamber of the linear actuator using a connection line to port 4 of the booster valve.

→ If no exhaust air feedback is used, seal port 4 of the booster valve with a blanking plug (15).

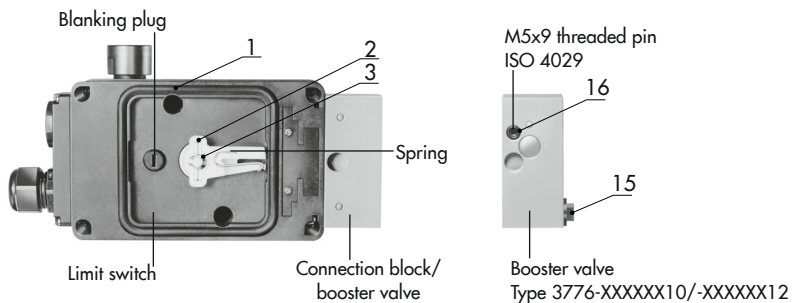
Installation

1. Use a screwdriver to turn and separate the blanking plug from the enclosure base.
2. Insert formed seal (1) in the groove of the enclosure base.
3. Place the follower clamp (2) with the spring facing outward onto the shaft trunnion and secure it with the circlip (3).
4. Fasten the flange plate (4) with stuck-on gasket (5) using two hex screws (6)

Mounting kit for Type 3277 Linear Actuator

No.	Quantity	Description	No.	Quantity	Description
1	1x	Formed seal	10	1x	Fastening screw with driving pin (for mounting with Type 373X and Type 3725 Positioners)
2	1x	Follower clamp	11	2x	M6x12 hexagon socket screw ISO 4762
3	1x	Circlip Ø5x0.8	12	2x	Spring washer B6
4	1x	Flange plate	13	2x	Washer ISO 7089, 6
5	1x	Gasket	14	1x	Cover
6	2x	M5x12 hexagon screw EN 24017	15	2x	¼" blanking plug
7	1x	Washer ISO 7089, 5	16	1x	O-ring 4x2
8	1x	O-ring 5x1.2			
9	1x	Clamp (for mounting without positioner/with Type 376X or Type 378X Positioner)			

Bottom view of the device



Mounting kit for Type 3277 Linear Actuator	
Actuator area	Order no.
175, 240, 350 cm ²	1400-7220
355, 700, 750 cm ²	1400-7221

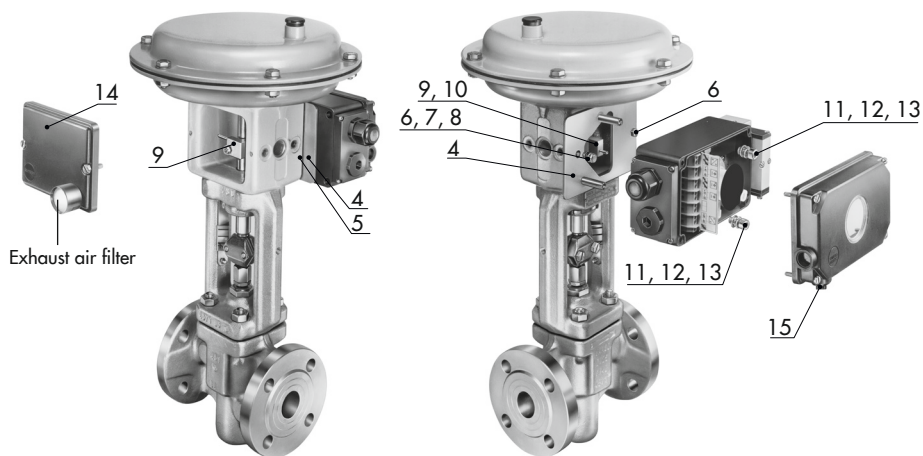


Fig. 4: Mounting on SAMSON Type 3277 Linear Actuators

Installation

aligned to the right on the actuator yoke. Place washer (7) and O-ring (8) under the left hex screw.

5. **Mounting without positioner/mounting with Type 376X or Type 378X Positioner:** fasten clamp (9) on the actuator stem.

Mounting with Type 373X and

Type 3725 Positioners: fasten the clamp out of the positioner mounting kit onto the actuator stem using the fastening screw with driving pin (10).

6. Unscrew enclosure cover off the device.
7. Place the enclosure on the stud bolts of the flange plate (4). Make sure that the shaft trunnion is aligned so that the driving pin on the clamp (9) or the fastening screw (10) engages exactly in the slot in the follower clamp (2).
8. Fasten the enclosure using two hexagon socket screws (11), two spring washers (12) and two washers (13).
9. Fasten the enclosure cover on the device.
10. **Mounting without positioner:** remove the exhaust air filter in the enclosure cover and replace it with the blanking plug (15) since the air is exchanged through the cover (14) on the linear actuator. Fasten the cover (14) on the other side of the actuator yoke and screw in the exhaust air filter.

Mounting with Type 373X, Type 3725, Type 376X or Type 378X Positioner:

mount the positioner on the other side of the actuator yoke as described in the mounting and operating instructions.

The cover (14) is not required in this case.

2.5 Mounting on SAMSON Type 3277-5 Linear Actuators (external signal pressure routing)

A mounting kit (see Fig. 5) is required for mounting on SAMSON Type 3277-5 Linear Actuators with external signal pressure routing (see Data Sheet ► T 8310-1 as well as Mounting and Operating Instructions ► EB 8310-1).

A SAMSON Type 373X, Type 3725, Type 376X or Type 378X Positioner can be mounted as well.

Please note the following instructions when mounting the device:

– Devices with Type 3776-XXXXXX10 3/2-way Booster Valve

The output port on the bottom of the booster valve must be sealed by a threaded pin (delivered state).

➔ Insert the O-ring (16) into the output port on the bottom of the booster valve.

– Devices with Type 3776-XXXXXX10 or -XXXXXX12 3/2-way Booster Valve

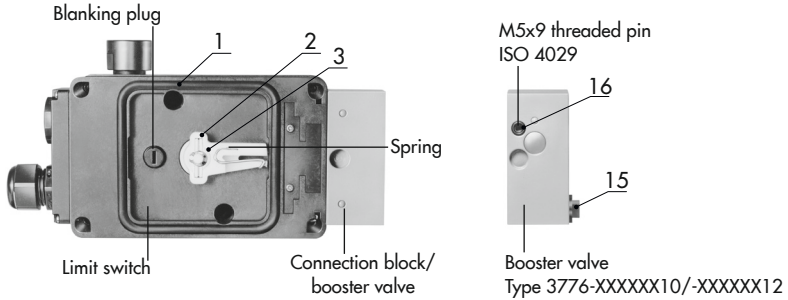
➔ Seal port 4 of the booster valve with a blanking plug (15).

Installation

1. Use a screwdriver to turn and separate the blanking plug from the enclosure base.
2. Insert formed seal (1) in the groove of the enclosure base.

3. Place the follower clamp (1) with the spring facing outward onto the shaft trunnion and secure it with the circlip (3).
4. Fasten the flange plate (4) with stuck-on gasket (5) using two hex screws (6) aligned to the right on the actuator yoke. Place washer (7) and O-ring (8) under the left hex screw.
5. **Mounting without positioner/mounting with Type 376X or Type 378X Positioner:** fasten clamp (9) on the actuator stem.
Mounting with Type 373X and Type 3725 Positioners: fasten the clamp out of the positioner mounting kit onto the actuator stem using the fastening screw with driving pin (10).
6. Unscrew enclosure cover off the device.
7. Place the enclosure on the stud bolts of the flange plate (4). Make sure that the shaft trunnion is aligned so that the driving pin on the clamp (9) or the fastening screw (10) engages exactly in the slot in the follower clamp (2).
8. Fasten the enclosure using two hexagon socket screws (11), two spring washers (12) and two washers (13).
9. Fasten the enclosure cover on the device.
10. **Mounting without positioner:** remove the exhaust air filter in the enclosure cover and replace it with the blanking plug (15) since the air is exchanged through the cover (14) on the linear actuator.
Fasten the cover (14) on the other side of the actuator yoke and screw in the exhaust air filter.

Bottom view of the device



Mounting kit for Type 3277-5, 120 cm² diaphragm area (external signal pressure routing)

Order no.: 1400-7219

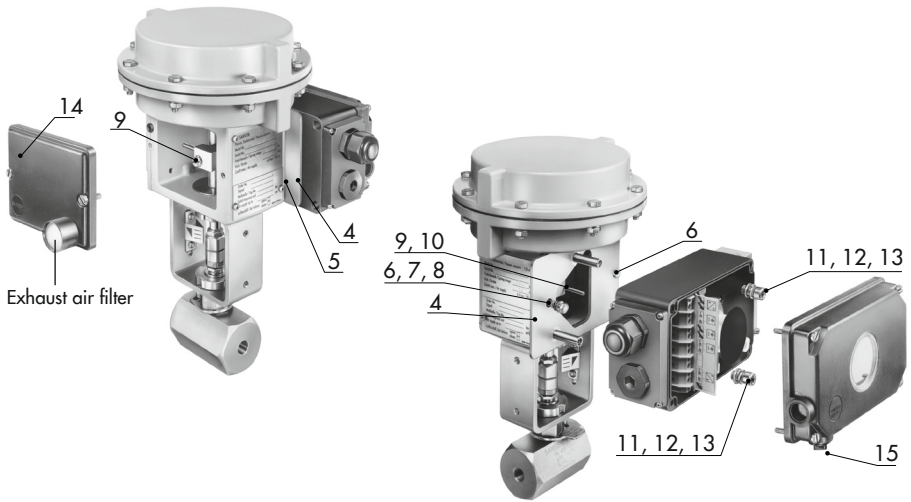


Fig. 5: Mounting on SAMSON Type 3277-5 Linear Actuators · External signal pressure routing

Mounting with Type 373X, Type 3725, Type 376X or Type 378X Positioner:
mount the positioner on the other side of the actuator yoke as described in the mounting and operating instructions.

The cover (14) is not required in this case.

Mounting kit for Type 3277-5, 120 cm² diaphragm area (external signal pressure routing)

No.	Quantity	Description	No.	Quantity	Description
1	1x	Formed seal	10	1x	Fastening screw with driving pin (for mounting with Type 373X and Type 3725 Positioners)
2	1x	Follower clamp			
3	1x	Circlip Ø5x0.8	11	2x	M6x12 hexagon socket screw ISO 4762
4	1x	Flange plate	12	2x	Spring washer B6
5	1x	Gasket	13	2x	Washer ISO 7089, 6
6	2x	M5x12 hexagon screw EN 24017	14	1x	Cover
7	1x	Washer ISO 7089, 5	15	2x	¼" blanking plug
8	1x	O-ring 5x1.2	16	1x	O-ring 4x2
9	1x	Clamp (for mounting without positioner/with Type 376X or Type 378X Positioner)			

2.6 Mounting on SAMSON Type 3277-5 Linear Actuators (internal signal pressure routing)

A mounting kit (see Fig. 6) is required for mounting on SAMSON Type 3277-5 Linear Actuators with internal signal pressure routing (see Data Sheet ▶ T 8310-1 as well as Mounting and Operating Instructions ▶ EB 8310-1).

A SAMSON Type 373X, Type 3725, Type 376X or Type 378X Positioner can be mounted as well.

Please note the following instructions when mounting the device:

Devices with Type 3776-XXXXXX10 3/2-way Booster Valve

Only these devices can be mounted on SAMSON Type 3277-5 Linear Actuators

with internal signal pressure routing. The signal pressure is routed through holes in the yoke and over a switchover plate either to the top or bottom diaphragm chamber.

- ➔ Unscrew the threaded pin out of the output port on the bottom of the booster valve.
- ➔ Seal port 2 of the booster valve with the screw plug (17) and O-ring (18).
- ➔ Seal port 4 of the booster valve with a blanking plug (15).

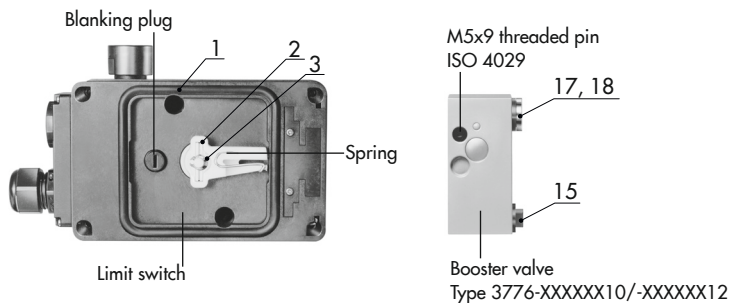
Installation

1. Use a screwdriver to turn and separate the blanking plug from the enclosure base.
2. Insert formed seal (1) in the groove of the enclosure base.
3. Place the follower clamp (2) with the spring facing outward onto the shaft trunnion and secure it with the circlip (3).

Mounting kit for Type 3277-5, 120 cm² diaphragm area (internal signal pressure routing)

No.	Quantity	Description	No.	Quantity	Description
1	1x	Formed seal	10	1x	Fastening screw with driving pin (for mounting with Type 373X and Type 3725 Positioners)
2	1x	Follower clamp	11	2x	M6x12 hexagon socket screw ISO 4762
3	1x	Circlip Ø5x0.8	12	2x	Spring washer B6
4	1x	Flange plate	13	2x	Washer ISO 7089, 6
5	1x	Gasket	14	1x	Cover
6	2x	M5x12 hexagon screw EN 24017	15	2x	¼" blanking plug
7	1x	Washer ISO 7089, 5	16	1x	13 mm seal
8	1x	O-ring 5x1.2	17	1x	Screw plug DIN 908, ¼"
9	1x	Clamp (for mounting without positioner/with Type 376X or Type 378X Positioner)	18	1x	O-ring 14x1 (for G ¼ only)

Bottom view of the device



Mounting kit for Type 3277-5, 120 cm ² diaphragm area (internal signal pressure routing)	
Connection	Order no.
G ¼	1400-7222
¼ NPT	1400-7223

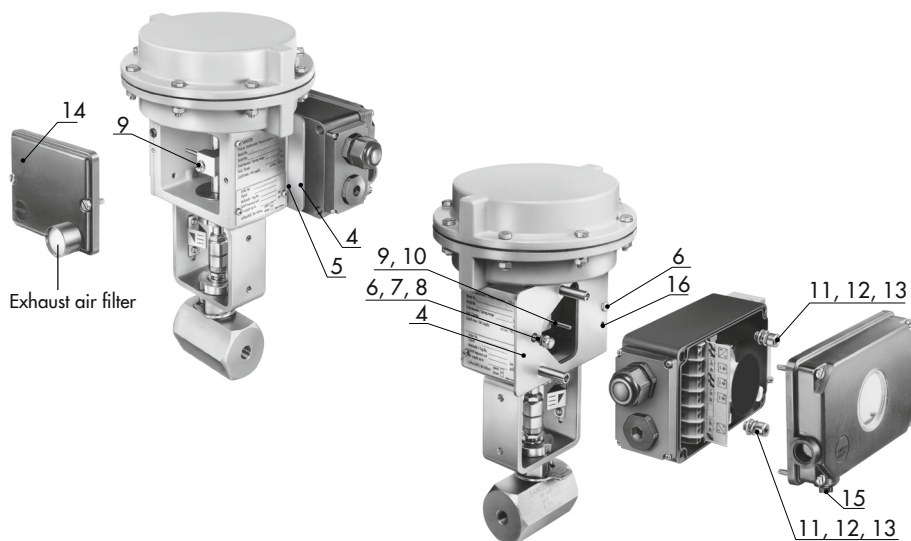


Fig. 6: Mounting on SAMSON Type 3277-5 Linear Actuators · Internal signal pressure routing

Installation

4. Fasten the flange plate (4) with stuck-on gasket (5) using two hex screws (6) aligned to the right on the actuator yoke. Place washer (7) and O-ring (8) under the left hex screw.
5. Insert seal (16) through the hole on the flange plate (4) into the signal pressure connection.
6. **Mounting without positioner/mounting with Type 376X or Type 378X Positioner:** fasten clamp (9) on the actuator stem.
7. **Mounting with Type 373X and Type 3725 Positioners:** fasten the clamp out of the positioner mounting kit onto the actuator stem using the fastening screw with driving pin (10).
8. Unscrew enclosure cover off the device.
9. Place the enclosure on the stud bolts of the flange plate (4). Make sure that the shaft trunnion is aligned so that the driving pin on the clamp (9) or the fastening screw (10) engages exactly in the slot in the follower clamp (2).
10. Fasten the enclosure using two hexagon socket screws (11), two spring washers (12) and two washers (13).
11. Fasten the enclosure cover on the device.
12. **Mounting without positioner:** remove the exhaust air filter in the enclosure cover and replace it with the blanking plug (15) since the air is exchanged through the cover (14) on the linear actuator.
Fasten the cover (14) on the other side of the actuator yoke and screw in the exhaust air filter.

Mounting with Type 373X, Type 3725, Type 376X or Type 378X Positioner: mount the positioner on the other side of the actuator yoke as described in the mounting and operating instructions.

The cover (14) is not required in this case.

2.7 Mounting on SAMSON Type 324X Valve with rib according to IEC 60534-6-1

A mounting kit (see Fig. 7) is required for mounting on SAMSON Type 324X Valves (see Data Sheet ► T 8015 as well as Mounting and Operating Instructions ► EB 8015).

i Note

The same mounting procedure applies to SAMSON Types 324X, 325X and 328X Valves larger than DN 100.

Correspondingly adapted mounting kits are required for mounting on valves with 35 mm travel and larger. Therefore, specify the valve model, size and travel when ordering.

Please note the following instructions when mounting the device:

– **Devices with Type 3776-XXXXXX10 3/2-way Booster Valve**

The output port on the bottom of the booster valve must be sealed by a threaded pin (delivered state).

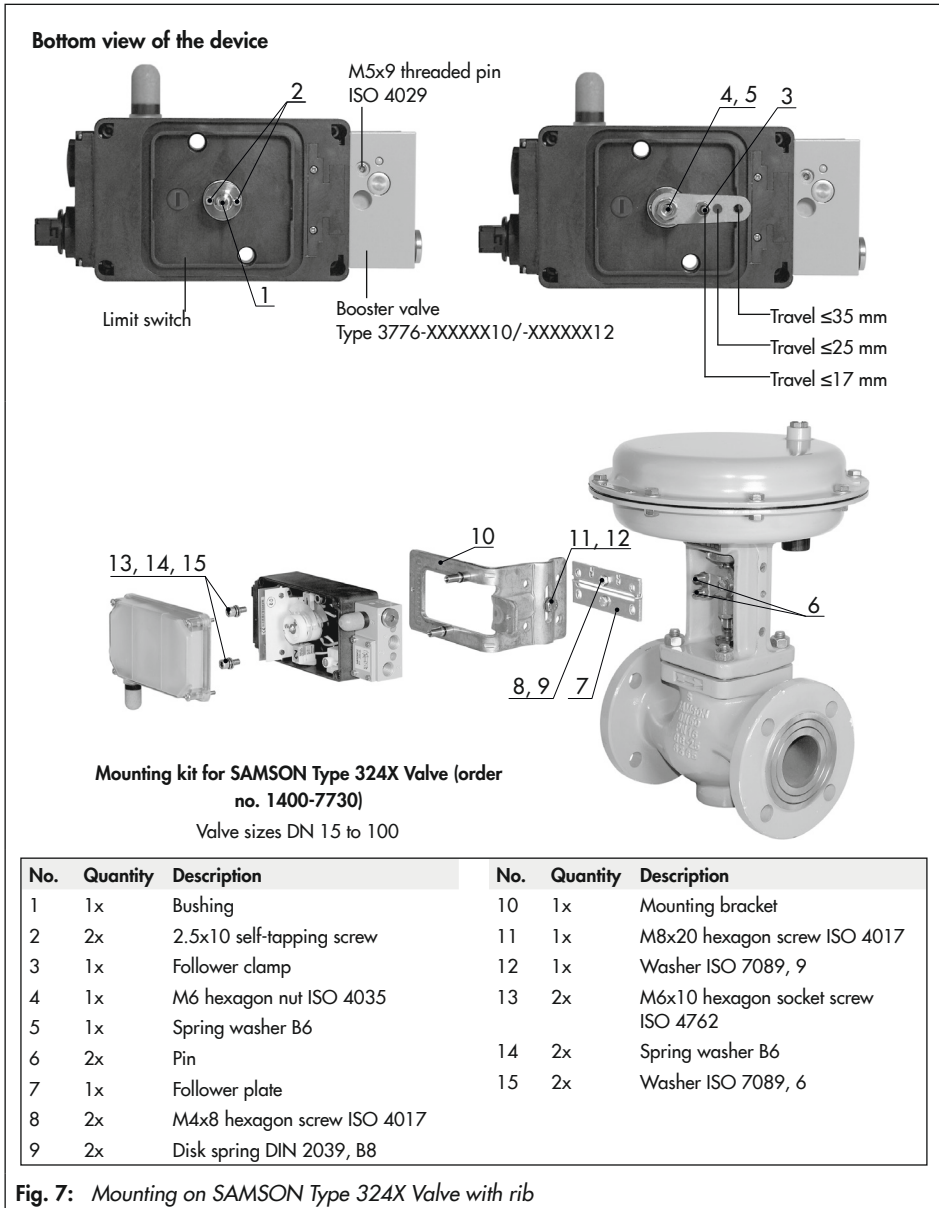
– **Devices with Type 3776-XXXXXX10 or -XXXXXX12 3/2-way Booster Valve**

Implement the exhaust air feedback from the linear actuator as follows:

- ➔ Connect the spring chamber of the linear actuator using a connection line to port 4 of the booster valve.
- ➔ If no exhaust air feedback is used, seal port 4 of the booster valve with a screw plug.

Installation

1. Screw two pins (6) into the stem connector between the actuator and plug stems.
2. Fasten the follower plate (7) to the pins (6) using two hex screws (8) and two disk springs (9).
3. Fasten the mounting bracket (10) to the valve rib using a hex screw (11) and washer (12). Make sure the mounting bracket (10) is aligned centrally to the 50 % mark on the travel indicator scale.
4. Unscrew enclosure cover off the device.
5. Place bushing (1) on the device's shaft trunnion and fasten using two self-tapping screws (2).
6. Insert the driving pin into the marked hole ($\leq 17 / \leq 25 / \leq 35$ mm) of the follower clamp (3) depending on the valve travel. Fasten it with a hex nut.
7. Insert the follower clamp (3) on the threaded stem of the bushing (1) and fasten it using a hex nut (4) and spring washer (5).
8. Align the follower clamp (3) in the horizontal position.
9. Place the enclosure on the stud bolts of the mounting bracket (10). Make sure the pin on the follower clamp (3) engages exactly into the slot of the follower plate (7). If this is not possible, loosen the hex screw (11) and align the mounting bracket (10) again.
10. Fasten the enclosure using two hexagon socket screws (13), two spring washers (14) and two washers (15).
11. Fasten the enclosure cover on the device.



3 Pneumatic connection

- For devices with pilot valve: 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.
- Before starting any repair work, depressurize any connecting lines that must be opened.
- Observe the maximum permissible pilot supply pressure.
- Connect the pilot supply at the G ¼ (¼ NPT) tapped holes on the connection block or booster valve.
- To connect it to the actuator, preferably use angular screw fittings for a 6x1 pipe (outer diameter x wall thickness) or a 4x1 hose (inside diameter x wall thickness).
- For connecting lengths longer than 2 m, use larger valve sizes.
- Protect the exhaust air connection by installing a filter or taking other appropriate precautions to prevent water or dirt from entering it.

- Ensure that the K_{VS} coefficient of an upstream supply pressure regulator is at least 1.6 times larger than the device's K_{VS} coefficient.

3.1 Pilot supply

Medium

Instrument air free from corrosive substances or nitrogen

WARNING

Note when used with nitrogen: when the devices are to be mounted in closed, unventilated rooms, the exhaust air of pilot valves or booster valves must be discharged over a common pipe to the atmosphere.

Pressure

2.2 to 6.0 bar

Compressed air quality

- According to ISO 8573-1
- Refer to Table 1

Table 1: Compressed air quality

Particle size and quantity	Oil content	Pressure dew point
Class 4	Class 3	Class 3
$\leq 5 \mu\text{m}$ and $1000/\text{m}^3$	$\leq 1 \text{ mg}/\text{m}^3$	$-20 \text{ }^\circ\text{C}$ or at least 10 K below the lowest ambient temperature to be expected

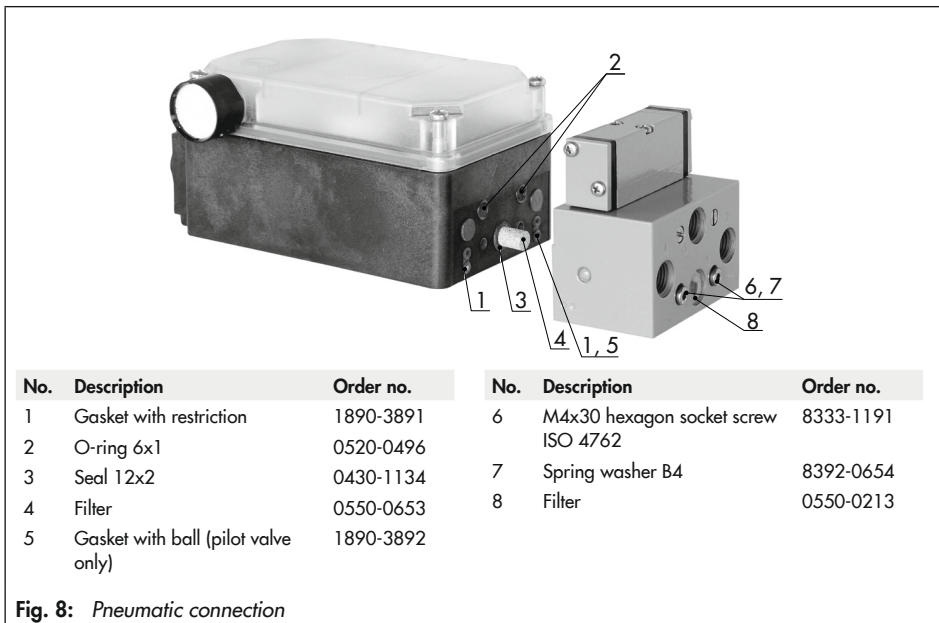
3.2 Filter elements for the pilot supply

To prevent dirt particles entering the pilot valve, a strainer with mesh size 30 µm and a filter with pore size 100 µm are installed in pilot supply port 9.

The filter elements must be cleaned or replaced when they are blocked (see Fig. 8).

Cleaning and replacing the filter elements

1. Unscrew the strainer (8) with a screwdriver (7 to 9 mm blade) out of the pilot supply port 9.
2. Clean the strainer (8) or replace it and screw it into the pilot supply port 9.
3. Unscrew the two hexagon socket screws (6) and two spring washers (7) and remove the connection block/booster valve from the enclosure.
4. Pull the filter (4) out of the connection hole.
5. Clean the filter (4) or replace it and insert it into the connection hole. Make sure that the seal (3) is seated properly.
6. Fasten the connection block/booster valve with the two hexagon socket screws (6) and two spring washers (7) onto the enclosure. Make sure that the gasket (1 or 5) and two O-rings (2) are seated properly.



No.	Description	Order no.	No.	Description	Order no.
1	Gasket with restriction	1890-3891	6	M4x30 hexagon socket screw ISO 4762	8333-1191
2	O-ring 6x1	0520-0496	7	Spring washer B4	8392-0654
3	Seal 12x2	0430-1134	8	Filter	0550-0213
4	Filter	0550-0653			
5	Gasket with ball (pilot valve only)	1890-3892			

Fig. 8: Pneumatic connection

3.3 Exhaust air filter and degree of protection

The devices are fitted with a filter (IP 54) in the enclosure cover or a filter check valve (IP 65).

Devices with Type 3776 Booster Valve

- XXXXXX10/-XXXXXX12
- XXXXXX30/-XXXXXX31
- XXXXXX40/-XXXXXX41
- XXXXXX50/-XXXXXX51
- XXXXXX60/-XXXXXX61
- XXXXXX70/-XXXXXX71

The booster valve in these devices must be protected against water or dirt entering it, e.g. by installing a filter (IP 54) or taking other appropriate precautions.

3.4 Restrictors

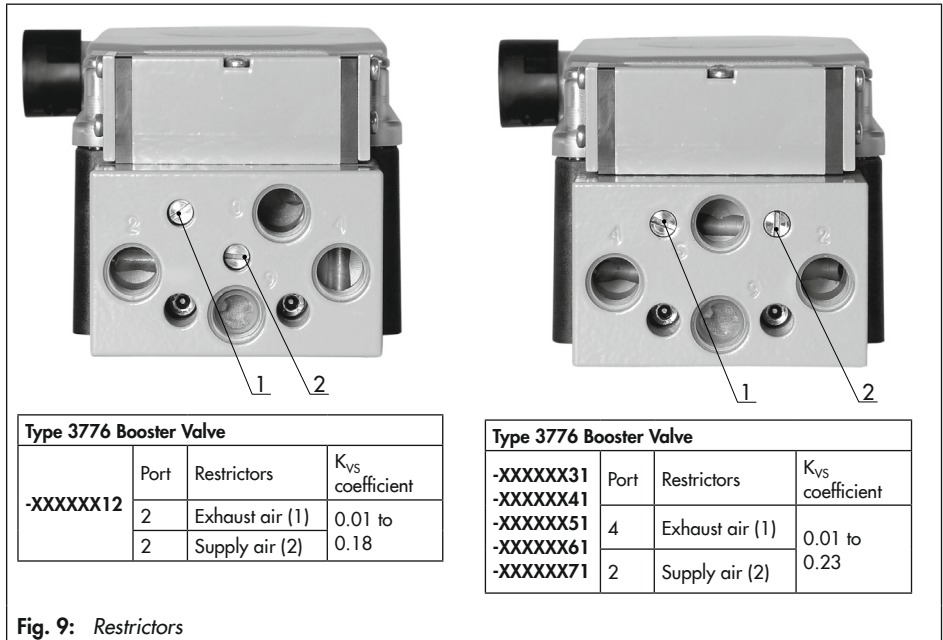
Devices with Type 3776 Booster Valve

- XXXXXX12/-XXXXXX31
- XXXXXX41/-XXXXXX51
- XXXXXX61/-XXXXXX71

These devices are fitted with supply air/exhaust air restrictors (see Fig. 9).

Use a screwdriver to turn the restriction screws (1) and (2) clockwise (close) or counterclockwise (open) to adjust the closing and opening times (e.g. in a ratio of 1:1.5 for rotary actuators).

A minimum amount of air still flows when the restriction screws are tightened.



4 Electrical connection

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

The following regulations apply to installation in hazardous areas: EN 60079-14:2008 (VDE 0165-1) Explosive Atmospheres – Electrical Installations Design, Selection and Erection.

The specifications in the EC type examination certificate PTB 98 ATEX 2072 for zone 1 and the statement of conformity PTB 02 ATEX 2007 X for zone 2 (see section 8).

DANGER

It is absolutely necessary to adhere to the terminal assignment. Switching the assignment of the electrical terminals may cause the explosion protection to become ineffective.

Do not loosen enameled screws in or on the housing.

The maximum permissible values specified in the EC type examination certificates apply 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).

4.1 Connecting cables

Cable glands M20x1.5 on a terminal block in the enclosure or plug connectors are used for electrical connection (see section 4.3).

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.

Preferably use connecting lines with minimum 0.5 mm² conductor cross-section and 6 to 9 mm outside diameter. The radial thickness of the insulation of a conductor for common insulating materials (e.g. polyethylene) must not be smaller than 0.2 mm. The diameter of an individual wire in a fine-stranded conductor must not be smaller than 0.1 mm. Protect the conductor ends against splicing, e.g. by using wire-end ferrules.

When two separate cables are used for connection, an additional cable gland can be installed. Seal cable entries left unused with plugs. Fit equipment used in ambient temperatures below -20 °C with metal cable glands.

4.2 Equipment for use in zone 2

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.

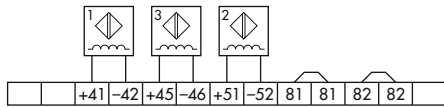
The maximum permissible values specified in the statement of conformity or its addenda (see section 8) apply when interconnecting the equipment with energy-limited circuits in type of protection Ex nL IIC.

4.3 Wiring plans

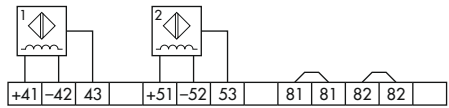
The following wiring plans are included on the next pages:

- Wiring plans for terminal block (Fig. 10)
- Wiring plans for plug connectors according to EN 175301-803 (Fig. 11)
- Wiring plans for Harting plug connectors (Fig. 12)
- Wiring plans for Binder round connectors (Fig. 13)

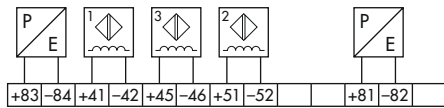
Wiring plans for terminal block



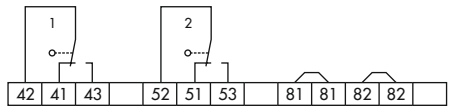
Three inductive limit contacts (two-wire)



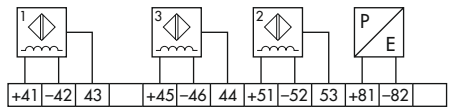
Two inductive limit contacts (three-wire)



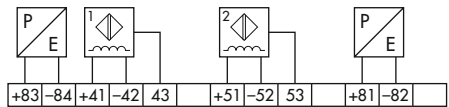
Two pilot valves
Three inductive limit contacts (two-wire)



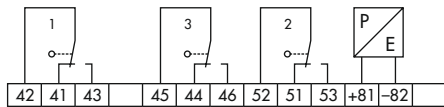
Two electric limit contacts (changeover contact)



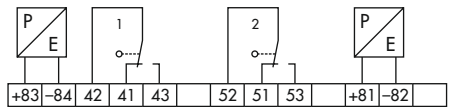
One pilot valve
Three inductive limit contacts (three-wire)



Two pilot valves
Two inductive limit contacts (three-wire)



One pilot valve
Three electric limit contacts (changeover contact)



Two pilot valves
Two electric limit contacts (changeover contact)

Fig. 10: Wiring plans for maximum equipping options

Wiring plans for plug connectors according to EN 175301-803

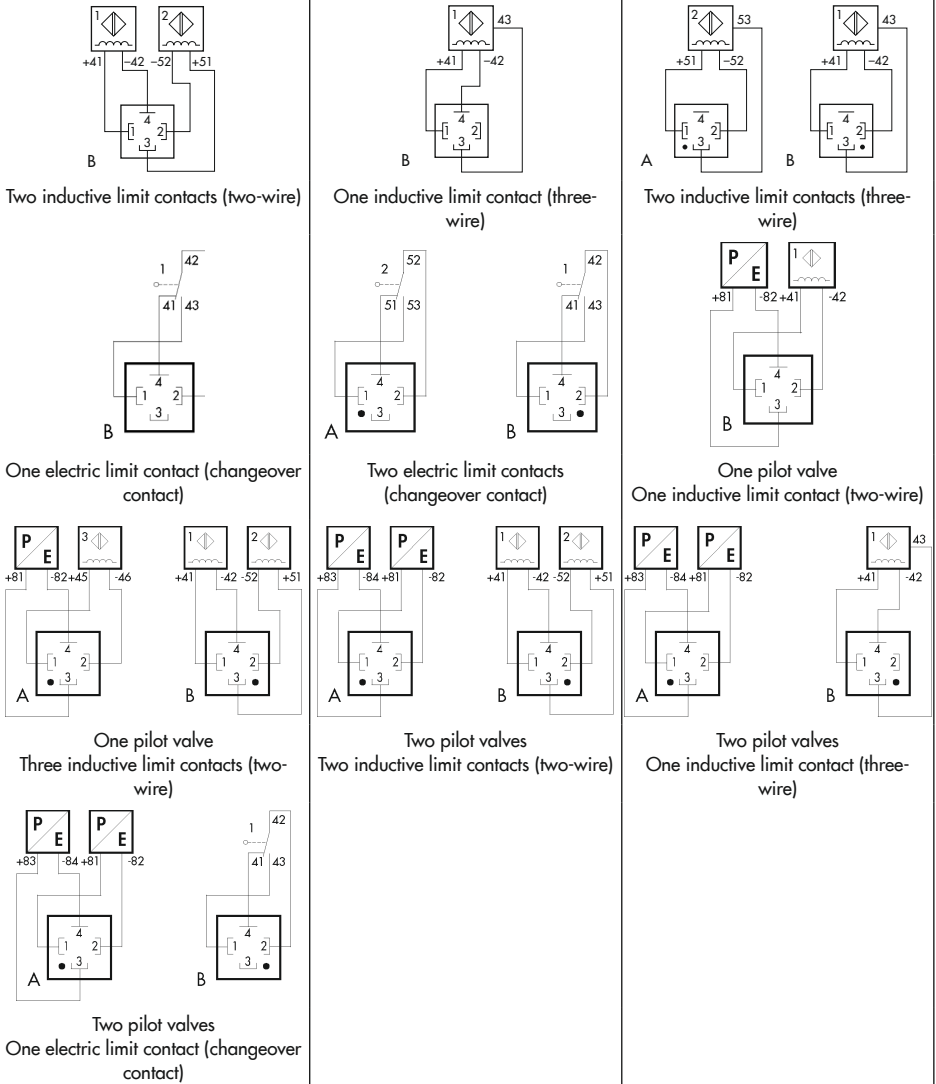


Fig. 11: Wiring plans for maximum equipping options
 • = Hole for coded screw (only when two connectors are used)

Wiring plans for Harting plug connectors

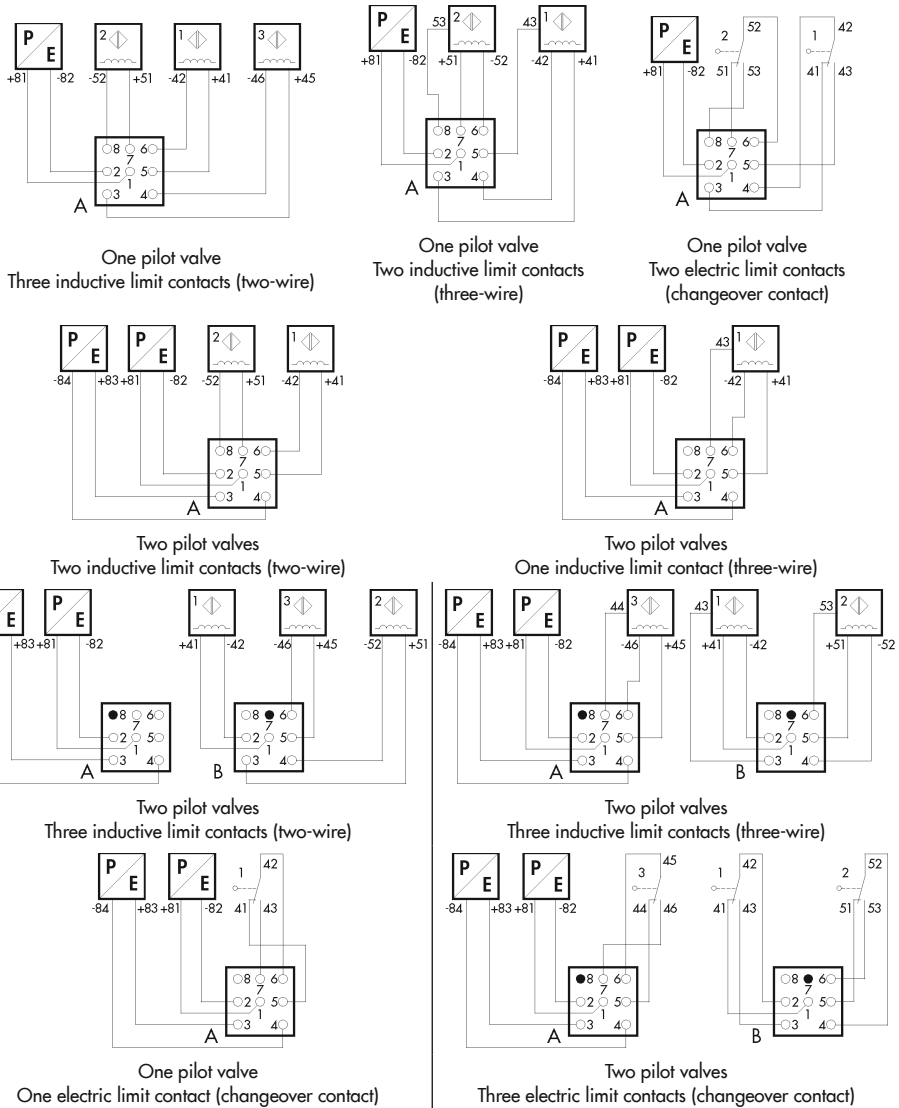
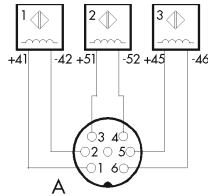
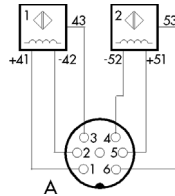


Fig. 12: Wiring plans for maximum equipping options
 • = Hole for coded screw (only when two connectors are used)

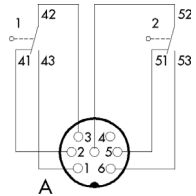
Wiring plans for Binder round connectors



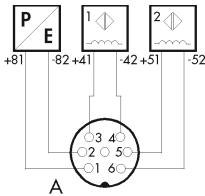
Three inductive limit contacts (two-wire)



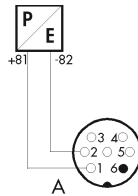
Two inductive limit contacts (three-wire)



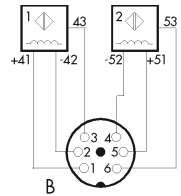
Two electric limit contacts (changeover contact)



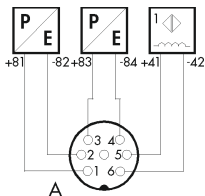
One pilot valve
Two inductive limit contacts (two-wire)



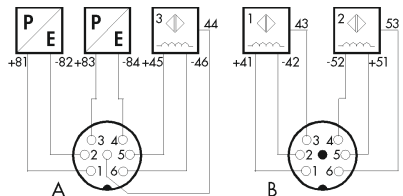
One pilot valve
Two inductive limit contacts (three-wire)



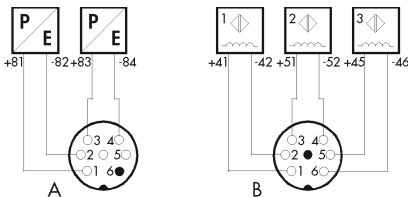
B



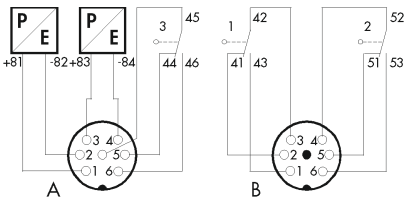
Two pilot valves
One inductive limit contact (three-wire)



Two pilot valves
Three inductive limit contacts (three-wire)



Two pilot valves
Three inductive limit contacts (two-wire)



Two pilot valves
Three electric limit contacts (changeover contact)

Fig. 13: Wiring plans for maximum equipping options

• = Hole for coded screw (only when two connectors are used)

4.4 AS-Interface module (specification 2.1)

Type 3776-0XXXXXXXX52 and
Type 3776-0XXXXXXXX53

The AS-Interface module is installed on a printed circuit board in the enclosure and is connected ready for use (see Fig. 14).

i Note

The AS-Interface module is programmed for the slave address A 2 in the delivered state.

Slave type

A/B slave

Data bit

Table 2: Bit assignment

Bit	Input	Output
00	–	OUT 1
01	–	–
02	IN 1	–
03	IN 2	–

LED status indication

Three LEDs are located on the printed circuit board: one LED to indicate the status of the AS-Interface module and two LEDs for the inputs IN 1 and IN 2 (see Table 3).

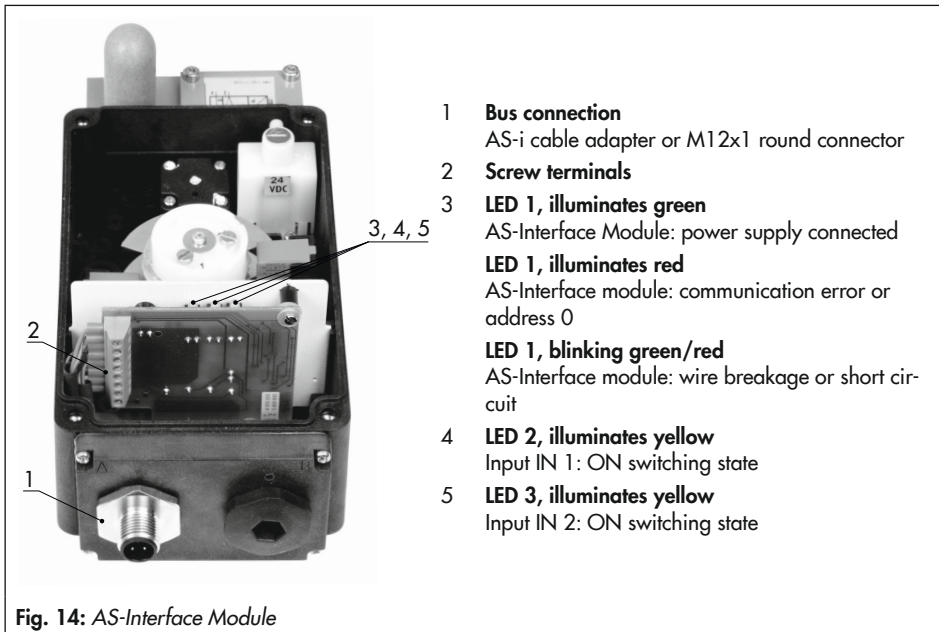


Fig. 14: AS-Interface Module

Table 3: LED status indication

LED	Function	Status
1	Green	AS-Interface Module Auxiliary power connected
	Red	AS-Interface Module Communication error or address 0
	Blinking green/red	AS-Interface Module Wire breakage or short circuit
2	Yellow	Input IN 1 ON switching state
3	Yellow	Input IN 2 ON switching state

Wire breakage or short-circuit monitoring

Configure the wire breakage or short-circuit monitoring using a programming device at the AS-i master.

LED 1 blinks green/red to indicate a wire breakage or short circuit.

When the wire breakage or short-circuit monitoring is active, the proximity switch is attenuated when a wire breakage is detected and unattenuated when there is a short circuit (LED 2 or LED 3 illuminated yellow).

Bus connection

An AS-i flat-ribbon cable with line adapter or a connecting cable with M12x1 round connector is used for bus connection at the threaded hole A in the flange plate (see Fig. 15).

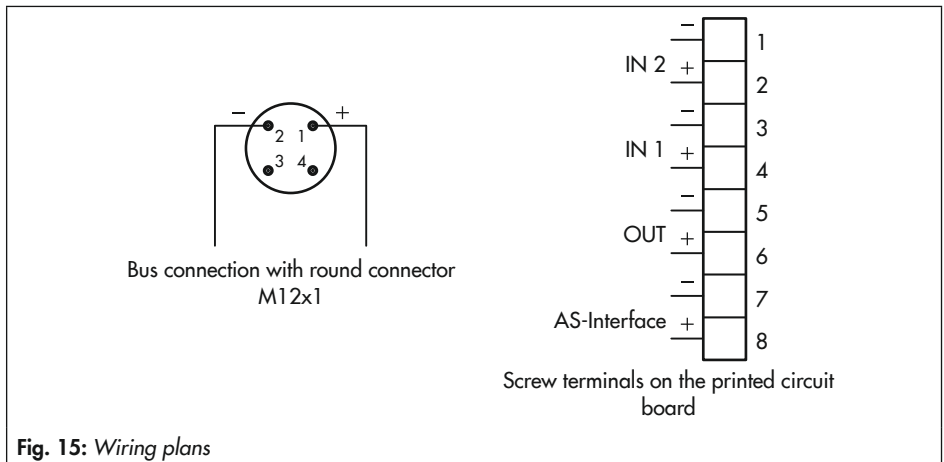


Fig. 15: Wiring plans

4.5 Pilot valve/manual override

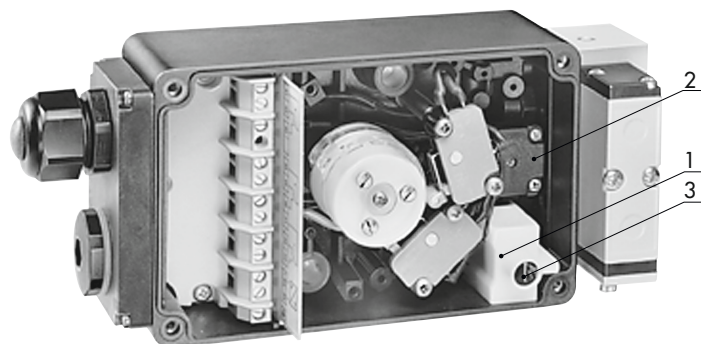
⚠ WARNING

Pilot valves without manual override must be used for safety-instrumented systems.

Devices with pilot valve

The pilot valve, consisting of an electropneumatic binary converter (1) and pressure reducer (2), can optionally be fitted with a manual override (3) (see Fig. 16).

When a nominal signal is not connected, the pilot valve can be actuated at the pushbutton or pushbutton/switch using a screwdriver (4.5 mm blade).



- 1 Electropneumatic binary converter
- 2 Pressure reducing valve
- 3 Manual override

Fig. 16: Pilot valve/manual override

5 Limit contacts

The devices are equipped with a maximum of either three inductive proximity switches, one inductive double proximity switch or three electric microswitches (see sections 5.2 to 5.4).

For most applications, the limit contacts are adjusted to issue a signal when the actuator has reached one of its end positions. The switching point can be adjusted to any position within the opening angle or travel range to signalize intermediate positions.

5.1 Switching point shift due to temperature changes

The limit contacts and their operating elements react to temperature changes.

To ensure reliable switching, the switching hysteresis between the actuator's switching position and the limit contact's switching point must be larger than the switching point shift caused by the temperature change.

For this reason, the switching point shift must be compensated for by x turns of the adjustment screw on adjusting the limit contact.

Table 4: *Adjustment data*

Switching point shift $\Delta T = 50 \text{ K}$	
Opening angle	Travel
$\leq 2^\circ$	$\leq 0.8 \text{ mm}$
Turns of the adjustment screw	
$x = 1/16$	$x = 1/16$

5.2 Inductive proximity switches

The shaft (1) of devices with inductive proximity switches (3) has a maximum of three adjustable metal tags (2) (see Fig. 17).

When the tag is inside the magnetic field of the proximity switch, the proximity switch is attenuated and the output has a high impedance.

Switching functions:

- SC3,5-N0: NC contact/LED off
- SJ3,5-SN: NC contact
- SB3,5-E2: NO contact/LED on

When the tag leaves the magnetic field, the proximity switch is unattenuated and the output has a low impedance.

Switching functions:

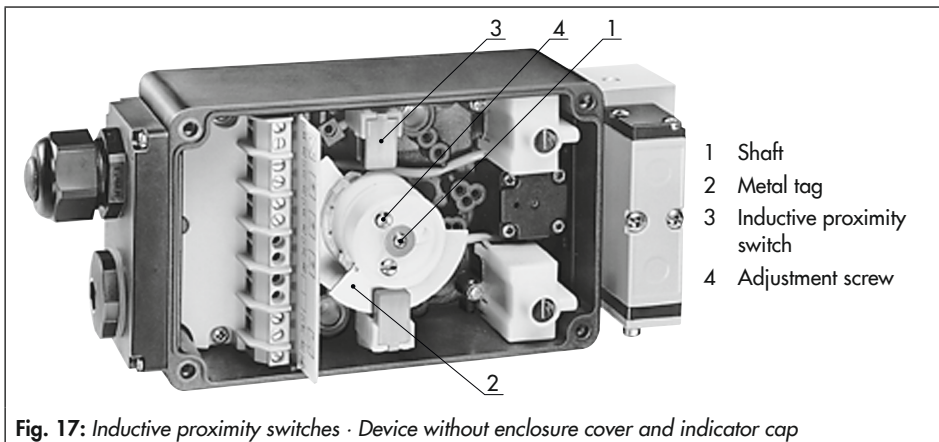
- SC3,5-N0: NO contact/LED on
- SJ3,5-SN: NO contact
- SB3,5-E2: NC contact/LED off

i Note

When devices are delivered in the mounted state, the metal tags are adjusted so that the proximity switches are unattenuated in the actuator's switching positions.

Adjusting the switching points

1. Unscrew enclosure cover off the device.
2. Pull the indicator cap off the cam holder (for rotary actuators only).
3. Move the valve to the position at which the switching point is to be activated.
4. Turn the adjustment screw (4) with a screwdriver until the metal tag (2) moves out of the magnetic field of the proximity



sensor (3) and the output signal changes from 0 to 1 or from 1 to 0.

5. Turn the adjustment screw (4) in the opposite direction by x turns to compensate for the switching point shift due to temperature changes (see Table 4).
6. Move the valve away from the switching position and check whether the output signal changes from 1 to 0 or from 0 to 1.
7. Move the valve back to the switching position and check the switching point.
8. Place the indicator cap on the cam holder and turn it until it engages (for rotary actuators only).
9. Fasten the enclosure cover on the device.

5.3 Inductive double proximity switch

The shaft (1) of devices with an inductive double proximity switch (3) has an adjustable metal tag (2) with 70° or 90° opening angle (see Fig. 18).

i Note

These devices can only be used with rotary actuators.

When the tag is inside the magnetic field of the proximity switch, the proximity switch is attenuated and the output has a high impedance.

Switching function: Contact open/LED off

When the tag leaves the magnetic field, the proximity switch is unattenuated and the output has a low impedance.

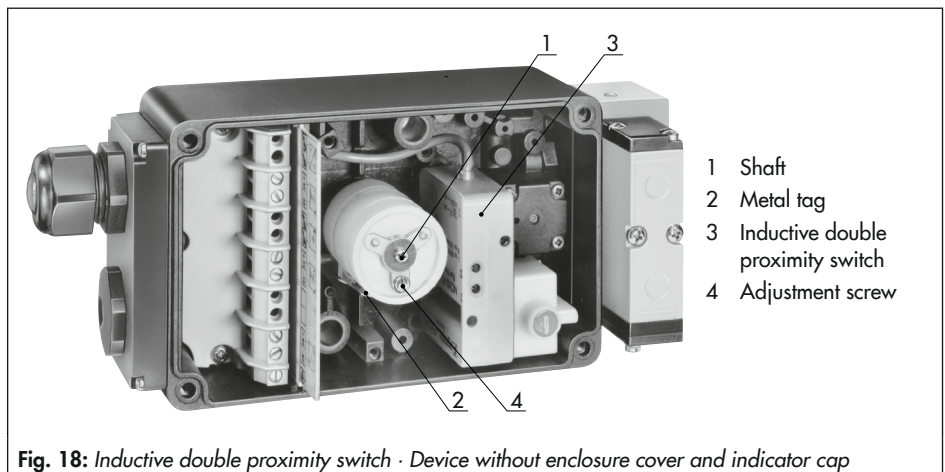


Fig. 18: Inductive double proximity switch · Device without enclosure cover and indicator cap

Switching function: Contact closed/LED on

i Note

The metal tag is designed so that the proximity switches are unattenuated in the actuator's switching positions. If the device is mounted turned by 90°, the connecting lines of the proximity switches must be exchanged to indicate the OPEN and CLOSED switching positions correctly.

Adjusting the switching points

1. Unscrew enclosure cover off the device.
2. Pull the indicator cap off the cam holder.
3. Move the rotary actuator to the CLOSED switching position.
4. Turn the adjustment screw (4) with a screwdriver until the metal tag (2) moves out of the magnetic field of the CLOSED proximity sensor and the output signal changes from 0 to 1.
5. Turn the adjustment screw (4) in the opposite direction by x turns to compensate for the switching point shift due to temperature changes (see Table 4).
6. Move the rotary actuator to the OPEN switching position and check whether the output signal of the OPEN proximity switch changes from 0 to 1.
7. Move the rotary actuator back to the CLOSED switching position and check the switching point.
8. Place the indicator cap on the cam holder and turn it until it engages.
9. Fasten the enclosure cover on the device.

5.4 Electric microswitches

The shaft (1) of devices with electric microswitches has a maximum of three adjustable cam disks (2). Each cam disk activates an electric microswitch (3) over the roller on the switch lever (4) (see Fig. 19).

The double-throw contact of the electric microswitches can be used as a make-contact or break-contact.

Adjusting the switching points

1. Unscrew enclosure cover off the device.
2. Pull the indicator cap off the cam holder (for rotary actuators only).
3. Move the valve to the position at which the switching point is to be activated.
4. Turn the adjustment screw (5) with a screwdriver until the cam disk (2) activates the electric microswitch (3) and the output signal changes.
5. Turn the adjustment screw (5) in the opposite direction by x turns to compensate for the switching point shift due to temperature changes (see Table 4).
6. Move the valve away from the switching position and check whether the output signal changes.
7. Move the valve back to the switching position and check the switching point.
8. Place the indicator cap on the cam holder and turn it until it engages (for rotary actuators only).
9. Fasten the enclosure cover on the device.

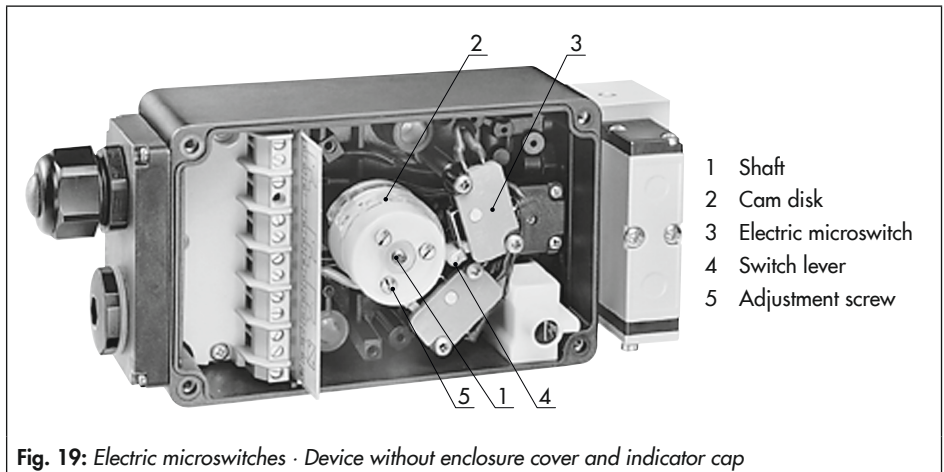


Fig. 19: *Electric microswitches · Device without enclosure cover and indicator cap*

6 Servicing explosion-protected devices

If a part of the device on which the explosion protection is based needs to be serviced, the device must not be put back into operation until a qualified inspector has assessed it 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 performs 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.

7 Maintenance, calibration and work on equipment

Interconnection with intrinsically safe circuits to check or calibrate the equipment inside or outside hazardous areas is to be performed only with intrinsically safe current/voltage calibrators and measuring instruments to rule out any damage to components relevant to explosion protection.

→ Observe the maximum permissible values specified in the certificates for intrinsically safe circuits (see section 8).

8 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 025665

- ➔ Observe local, national and international refuse regulations.
- ➔ Do not dispose of components, lubricants and hazardous substances together with your other household waste.

i Note

We can provide you with a recycling passport according to PAS 1049 on request. Simply e-mail us at offersaleservice@samsongroup.com giving details of your company address.

💡 Tip

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

9 Certificates

The EC type examination certificates are provided on the next pages.



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

Grenzsinalgeber / Limit Switch / Relais à seuil Typ/Type/Type 3776

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.

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

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

es_3776-0_de_en_fr_07_1607.pdf



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

Grenzsignalgeber / Limit Switch / Relais à seuil Typ/Type/Type 3776-1...

entsprechend der EU-Baumusterprüfbescheinigung PTB 98 ATEX 2072 ausgestellt von der/
according to the EU Type Examination PTB 98 ATEX 2072 issued by/
établi selon le certificat CE d'essais sur échantillons PTB 98 ATEX 2072 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 60079-11:2012
RoHS 2011/65/EU	EN 50581:2012

Hersteller / Manufacturer / Fabricant:

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

Frankfurt / Francfort, 2017-07-29

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

H. Zager

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

D. Hoffmann

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

ce_3776-1_de_en_fr_07_rev07.pdf



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

Grenzsignalgeber / Limit Switch / Relais à seuil Typ/Type/Type 3776-8...

entsprechend der EU-Baumusterprüfbescheinigung PTB 02 ATEX 2007 X ausgestellt von der/
according to the EU Type Examination PTB 02 ATEX 2007 X issued by/
établi selon le certificat CE d'essais sur échantillons PTB 02 ATEX 2007 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

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.

H. Zager

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

D. Hoffmann

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

[federal eagle logo]

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



- (3) EC type examination certificate number

PTB 98 ATEX 2072

- (4) Equipment: Type 3776-1 Limit Switch
- (5) Manufacturer: SAMSON AG
- (6) Address: Weismüllerstraße 3, 60314 Frankfurt am Main, Germany
- (7) The design of this equipment and its different permissible versions are specified in the schedule to this certificate.
- (8) Physikalisch-Technische Bundesanstalt, notified body no. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that 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, given in Annex II to the directive.
- The examination and test results are recorded in the confidential Test Report PTB Ex 98-28049.
- (9) Compliance with the essential health and safety requirements is ensured by compliance with **EN 50014:1997** **EN 50020:1994**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EC type examination certificate relates only to the design and construction of the specified equipment or protective system in accordance with Directive 94/9/EC. Further requirements of this directive apply to the manufacture and playing on the market of this equipment.
- (12) The marking of the equipment must include the following specifications:

 **II 2 G EEx ia IIC T6**

Certification Sector for Explosion Protection
O/o

Braunschweig, 7 July 1998

[signature Johannsmeyer, round stamp with federal eagle logo
and Physikalisch-Technische Bundesanstalt 56 lettering]

Dr.-Ing. U. Johannsmeyer
Director

(13)

Schedule

(14)

EC Type Examination Certificate PTB 98 ATEX 2072

(15) Description of the equipment

The Type 3776-1... Limit Switches are suitable for attachment to rotary actuators according to VDE/DIN 3845 and for integral attachment to Type 3277 Linear Actuators with concealed linkage. Depending on their version, the limit switches are fitted with limit contacts in different designs and low-power solenoid valves.

The Type 3776-1... Limit Switches are passive dipoles that may be connected to all certified intrinsically safe current circuits, provided the permissible maximum values for U_i , I_i , and P_i are not exceeded.

The electrical connection is made using connectors or cable entries.

The relation between temperature class and the maximum permissible ambient temperature range is shown in the following table:

T6	-20 °C to +60 °C
T5	-20 °C to +70 °C
T4	-20 °C to +80 °C

The relation between temperature class and the maximum permissible ambient temperature range shown in the following table applies to the Type 3779-17. Limit Switches:

T6	-20 °C to +55 °C
T5	-20 °C to +70 °C
T4	-20 °C to +80 °C

Electric data

Contact current circuits..... in type of protection Intrinsic Safety EEx ia IIC
 For connection to a certified intrinsically safe current circuit only

Max. values:

Type 3776-11., Type 3776-12., Type 3776-14. with inductive two-wire sensor:
 (terminals 41/42, 45/46, and 51/52)

$$U_i = 16 \text{ V}$$

$$I_i = 52 \text{ mA}$$

$$P_i = 169 \text{ mW}$$

$$\text{Effective inner capacitance } C_i = 80 \text{ nF}$$

$$\text{Effective inner inductivity } L_i = 500 \text{ } \mu\text{H}$$

Schedule to EC Type Examination Certificate PTB 98 ATEX 2072

Type 3776-17. with inductive double proximity switch:
(terminals 41/42 and 51/52)

$U_i = 15 \text{ V}$
 $I_i = 52 \text{ mA}$
 $P_i = 169 \text{ mW}$
Effective inner capacitance $C_i = 100 \text{ nF}$
Effective inner inductivity $L_i = 100 \text{ }\mu\text{H}$

Type 3776-15., Type 3776-16. with electric microswitch:
(terminals 41/42/43, 44/45/46, and 51/52/53)

$U_i = 45 \text{ V}$
 $P_i = 2 \text{ W}$
The effective inner capacitances and inductivities are negligibly small.

Type 3776-1...1, Type 3776-1...2, Type 3776-1...3 with solenoid valve:

Input current circuit..... in type of protection Intrinsic Safety EEx ia IIC
(terminals 81/82 und 83/84) For connection to a certified intrinsically safe current circuit only

Max. values:

U_i	25 V	27 V	28 V	30 V	32 V
I_i	150 mA	125 mA	115 mA	100 mA	90 mA

The effective inner capacitances and inductivities are negligibly small.

- (16) Test report PTB Ex 98-28049
- (17) Special conditions
Not applicable
- (18) Essential health and safety requirements
Covered by the standards mentioned above.

Certification Sector for Explosion Protection
O/o


Braunschweig, 7 July 1998

[signature Johannsmeyer, round stamp with federal eagle logo
and Physikalisch-Technische Bundesanstalt 56 lettering]

Dr.-Ing. U. Johannsmeyer
Director

1st ADDENDUM
 according to Directive 94/9/EC, Annex III, item 6
to EC Type Examination Certificate PTB 98 ATEX 2072

Equipment: Type 3776-1 Limit Switch

Marking:  II 2 G EEx ia IIC T6

Manufacturer: SAMSON AG Mess- und Regeltechnik

Address: Weismüllerstraße 3, 60314 Frankfurt am Main, Germany

Description of additions and modifications

In the future, the Type 3776-1 Limit Switch may be manufactured according to the test documents listed in the test report. The modifications are made with respect to Directive 94/9/EC, article 14.

The modifications apply to the internal and external design.

The electric data are changed as follows:

The relation between the device types, temperature classes, permissible ambient temperature ranges, and maximum short-circuit currents is shown in the following table:

Type 3776-11., Type 3776-12., and Type 3776-14.

Temperature class	Permissible ambient temperature range	Max. short-circuit current
T6	to 45 °C	52 mA
T5	-45 °C to 60 °C	
T4	to 80 °C	
T6	to 65 °C	25 mA
T5	-45 °C to 80 °C	
T4	to 100 °C	

1st Addendum to EC Type Examination Certificate PTB 98 ATEX 2072

Type 3776-17.

Temperature class	Permissible ambient temperature range	Max. short-circuit current
T6 T5 T4	-45 °C to 55 °C to 70 °C to 85 °C	52 mA
T6 T5 T4	-45 °C to 70 °C to 80 °C to 100 °C	25 mA

Electric data

Contact current circuits in type of protection Intrinsic Safety EEx ia IIC
 For connection to a certified intrinsically safe current circuit only

Type 3776-11., Type 3776-12., Type 3776-14. with inductive two-wire sensor:
 (terminals 41/42, 45/46, and 51/52) Max. values:

$$\begin{aligned}
 U_i &= 16 \text{ V} \\
 I_i &= 52 \text{ mA} \\
 P_i &= 169 \text{ mW} \\
 C_i &= 50 \text{ nF} \\
 L_i &= 250 \text{ } \mu\text{H}
 \end{aligned}$$

Type 3776-17. with inductive double proximity switch:
 (terminals 41/42 and 51/52) Max. values:

$$\begin{aligned}
 U_i &= 15 \text{ V} \\
 I_i &= 52 \text{ mA} \\
 P_i &= 169 \text{ mW} \\
 C_i &= 100 \text{ nF} \\
 L_i &= 100 \text{ } \mu\text{H}
 \end{aligned}$$

Type 3776-1...1, Type 3776-1...2, Type 3776-1...3 with solenoid valve:
 Input current circuit in type of protection Intrinsic Safety EEx ia IIC
 (terminals 81/82 und 83/84)

1st Addendum to EC Type Examination Certificate PTB 98 ATEX 2072

The relation between the version, temperature class, permissible ambient temperature range, and maximum power dissipation is shown in the following table:

Version	U_N	6 V	12 V	24 V
Temperature class	T6		60 °C	
	T5	-45 °C to		70 °C
	T4		80 °C	
Linear or rectangular characteristic	P_i	*	**	

C_i negligibly small

L_i negligibly small

* The maximum permissible power dissipation P_i of the 6 V version is 250 mW.

** The maximum values for connection to a certified intrinsically safe current circuit are shown in the following table:

U_i	25 V	27 V	28 V	30 V	32 V
I_i	150 mA	125 mA	115 mA	100 mA	85 mA
P_i	No restriction				

All other specifications remain valid also for this 1st addendum.

Test report: PTB Ex 01-21202

Certification Sector for Explosion Protection
O/o

Braunschweig, 9 August 2001

[signature Johannsmeyer, round stamp with federal eagle logo
and Physikalisch-Technische Bundesanstalt 56 lettering]

Dr.-Ing. U. Johannsmeyer
Director

2nd ADDENDUM
according to Directive 94/9/EC, Annex III, item 6
to EC Type Examination Certificate PTB 98 ATEX 2072

Equipment: Type 3776-1 Limit Switch

Marking:  II 2 G EEx ia IIC T6

Manufacturer: SAMSON AG Mess- und Regeltechnik

Address: Weismüllerstraße 3, 60314 Frankfurt am Main, Germany

Description of additions and modifications

In the future, the Type 3776-1 Limit Switch may also be manufactured and operated according to the test documents listed in the test report.

The modifications apply to the internal and external design.

The relation between the device types, temperature classes, permissible ambient temperature ranges, and electric data is shown in the following table:

Type 3776-11., Type 3776-12., and Type 3776-14.

Temperature class	Permissible ambient temperature range	U_i	I_i	P_i
T6 T5 T4	-45 °C to 45 °C to 60 °C to 80 °C	16 V	52 mA	169 mW
T6 T5 T4	-45 °C to 65 °C to 80 °C to 100 °C	16 V	25 mA	64 mW

2nd Addendum to EC Type Examination Certificate PTB 98 ATEX 2072
Type 3776-17.

Temperature class	Permissible ambient temperature range	U_i	I_i	P_i
T6 T5 T4	-45 °C to 55 °C to 70 °C to 85 °C	15 V/16 V	52 mA	169 mW
T6 T5 T4	-45 °C to 70 °C to 80 °C to 100 °C	15 V/16 V	25 mA	64 mW

The electric data are changed as follows:

Electric data

Contact current circuits in type of protection Intrinsic Safety EEx ia IIC
 For connection to a certified intrinsically safe current circuit only

Max. values:

Type 3776-11., Type 3776-12., Type 3776-14.

a) with inductive two-wire sensor:

(terminals 41/42,
45/46, and 51/52)

$U_i = 16 \text{ V}$
 $I_i = 52 \text{ mA}/25 \text{ mA}$
 $P_i = 169 \text{ mW}/64 \text{ mW}$

The relation between the sensor type and the maximum permissible reactance is shown in the following table:

Sensor type	SC3.5...-NO...	SJ3.5-SN...	SJ3.5-...-N...
C_i	150 nF	30 nF	50 nF
L_i	150 μH	100 μH	250 μH

b) with inductive proximity switch:

(terminals 41/42,
45/46, and 51/52)

$U_i = 16 \text{ V}$
 $I_i = 52 \text{ mA}/25 \text{ mA}$
 $P_i = 169 \text{ mW}/64 \text{ mW}$

The relation between the sensor type and the maximum permissible reactance is shown in the following table:

Sensor type	NJ2-V3-N...	NCN3-F24.-N4...
C_i	40 nF	100 nF
L_i	50 μH	100 μH

[translation of German original]

Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin

[PTB lettering]

2nd Addendum to EC Type Examination Certificate PTB 98 ATEX 2072

All other specifications remain valid also for this 2nd addendum.

Test report: PTB Ex 04-23528


Certification Sector for Explosion Protection
O/o

Braunschweig, 1 March 2004

[signature Johannsmeyer, round stamp with federal eagle logo
and Physikalisch-Technische Bundesanstalt 56 lettering]

Dr.-Ing. U. Johannsmeyer
Director

3rd ADDENDUM
according to Directive 94/9/EC, Annex III, item 6
to EC Type Examination Certificate PTB 98 ATEX 2072

Equipment: Type 3776-1 Limit Switch
Marking:  II 2 G EEx ia IIC T6
Manufacturer: SAMSON AG Mess- und Regeltechnik
Address: Weismüllerstraße 3, 60314 Frankfurt am Main, Germany

Description of additions and modifications

With this addendum, the temperature classes for the Type 3776-15. and Type 3776-16. Limit Switches are defined and the electric data are added for organizational reasons. No further changes were made.

Type 3776-15., Type 3776-16. with electric microswitch

The relation between the temperature class and permissible ambient temperature range is shown in the following table:

Temperature class	Permissible ambient temperature range
T6	to 60 °C
T5	-45 °C to 70 °C
T4	to 80 °C

Electric data

(terminals 41/42/43, 44/45/46, and 51/52/53)

Max. values:

$$U_i = 45 \text{ V}$$

$$P_i = 2 \text{ W}$$

C_i negligibly small

L_i negligibly small

[translation of German original]

Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin

[PTB lettering]

3rd Addendum to EC Type Examination Certificate PTB 98 ATEX 2072

All other specifications mentioned in the EC type examination certificate remain valid also for this 3rd addendum.

Test report: PTB Ex 06-26195

Certification Sector for Explosion Protection
O/o

Braunschweig, 25 August 2006

[signature Johannsmeyer, round stamp with federal eagle logo
and Physikalisch-Technische Bundesanstalt 56 lettering]

Dr.-Ing. U. Johannsmeyer
Director and Professor



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 02 ATEX 2007 X

- (4) Equipment: Model 3776-8 Limit Switch
- (5) Manufacturer: SAMSON AG Mess- und Regeltechnik
- (6) Address: Weismüllerstr. 3, D-60314 Frankfurt, Germany
- (7) This equipment and any acceptable variation therefore are specified in the schedule to this certificate and the documents referred to therein.
- (8) The Physikalisch-Technische Bundesanstalt, notified body number 0102 in according to Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that 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 given in Annex II to the Directive.

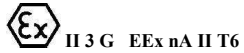
The examination and test results are recorded in confidential report: **PTB Ex 02-21203**.

- (9) The Essential Health and Safety Requirements are satisfied by compliance with
- EN 50021: 1999**
- (10) If the sign “X” is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) In compliance with the Directive 94/9/EC this Statement of Conformity relates only to the design and construction of the equipment specified. Further requirements of this Directive apply to manufacture and marketing of this equipment.

Statements of conformity without signature and seal are invalid.
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(12) The marking of the equipment shall include the following:



Zertifizierungsstelle Explosionsschutz
By order

Braunschweig, 07. März 2002

(Signature)

(Seal)

Dr. Ing. U. Johannmeyer
Regierungsdirektor

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(13) **S c h e d u l e**

(14) **Statement of Conformity PTB 02 ATEX 2007 X**

(15) **Description of Equipment**

The Model 3776-8... Limit Switches are suitable for attachment to rotary actuators complying with VDE/DIN 3845 and for integral attachment to Model 3277 Linear Actuators with covered lever system. Dependent on the version, they are equipped with limit contacts of different design and with low-power solenoid valves.

The electrical connection is made by plug connectors or cable entries..

The correlation between temperature classification and permissible ambient temperature range is shown in the table below:

Version U _N	6V	12 V	24 V
Temperature class T6	60°C		
T5	-45°C . . . 70°C		
T4	80°C		

Electrical data

Versions:

- a.) With dual inductive proximity switch:
 Contact circuit
 (terminals 41/42, 51/52) Type of protection EEx nA II
- b.) With inductive limit switch:
 Contact circuit
 (terminals 41/42, 45/46 and 51/52) Type of protection EEx nA II
- c.) With electrical limit switch:
 Contact circuit
 (terminals 41/42/43, 44/45/46 and 51/52/53) Type of protection EEx nA II
- d.) With solenoid valve module:
 Contact circuit
 (terminals 81/82, 83/84) Type of protection EEx nA II

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Schedule of the Statement of Conformity PTB 02 ATEX 2007 X

(16) **Test report** PTB Ex 02-21203

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

The Model 3776-8 . . . Limit Switch shall be installed in an enclosure providing at least Degree of Protection IP 54 in compliance with the IEC Publication 60529:1989

The wiring shall be connected in such a manner that the connection facilities are not subjected to tensile and/or torsional stress.

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

Are satisfied by compliance with the standard specified.

Zertifizierungsstelle Explosionsschutz
By order

Braunschweig, 07 März 2002

(Signature) (seal)

Dr. Ing. U. Johannsmeyer

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