MOUNTING AND OPERATING INSTRUCTIONS

EB 8384-1 EN (1300-1610)

Translation of original instructions



Old design



New design

Type 3730-1 Electropneumatic Positioner

Firmware version 2.2x

CE Ex certified

Edition February 2018

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 (aftersalesservice@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

1 Safety instructions and measures 6
1.1 Notes on possible severe personal injury 9
1.2 Notes on possible personal injury 9
1.3 Notes on possible property damage 10
2 Markings on the device 11
2.1 Nameplate 11
2.2 Article code 12
2.3 Firmware versions 13
3 Design and principle of operation 14
3.1 Mounting versions 16
3.2 Device overview and operating controls 16
3.3 Accessories 17
3.4 Travel tables 21
3.5 Technical data 22
3.6 Dimensions in mm 26
3.7 Fixing levels according to VDI/VDE 3845 (September 2010) 30
4 Measures for preparation 31
4.1 Unpacking 31
4.2 Transporting 31
4.3 Storage 31
5 Mounting and start-up 32
5.1 Mounting position 32
5.2 Lever and pin position 32
5.3 Direct attachment 34
5.3.1 Type 3277-5 Actuator 34
5.3.2 Type 3277 Actuator 36
5.4 Attachment according to IEC 60534-6 38
5.5 Attachment according to VDI/VDE 3847-1 40
5.6 Attachment according to VDI/VDE 3847-2 47
5.6.1 Version for single-acting actuator 48
5.6.2 Version for double-acting actuator 50
5.7 Attachment to Type 3510 Micro-flow Valve 54
5.8 Attachment to rotary actuators 54
5.8.1 Heavy-duty version 56
5.9 Reversing amplifier for double-acting actuators 60
5.9.1 Reversing amplifier (1079-1118 or 1079-1119) 60
5.10 Attaching positioners with stainless steel housings 62

5.11 Air purging function for single-acting actuators 62
5.12 Pneumatic connections 64
5.13 Connecting the supply air 65
5.13.1 Signal pressure connection 65
5.13.2 Signal pressure gauges 65
5.13.3 Supply pressure 65
5.13.4 Signal pressure (output) 66
5.14 Electrical connections 66
5.14.1 Connecting the electrical power 69
5.14.2 Switching amplifier according to EN 60947-5-6 69

6 Operation 70
6.1 Rotary pushbutton 70
6.2 Volume restriction Q 71
6.3 Display 71

7 Operating the positioner 71
7.1 Adjusting the volume restriction Q 72
7.2 Adapting the display direction 72
7.3 Determining the fail-safe position 73
7.4 Setting other parameters 73
7.5 Initializing the positioner 75
7.6 Zero calibration 76
7.7 Resetting to default settings 76
7.8 Manual mode 77

8 Servicing 78
8.1 Preparation for return shipment 78

9 Malfunctions 79
9.1 Emergency action 79

10 Decommissioning and removal 80
10.1 Decommissioning 80
10.2 Removing the positioner 80
10.3 Disposal 80

11 Appendix 81
11.1 After-sales service 81
11.2 Certificates 81
11.3 Code list 82
11.3.1 Error codes 85

i ***Note***

*These Mounting and Operating Instructions **EB 8384-1** are valid for actuators with firmware versions **2.20** to **2.29**. The latest edition of these instructions, detailing the firmware version and modifications compared to the previous version, is available on our website.*

1 Safety instructions and measures

Intended use

SAMSON's Type 3730-1 Positioner is mounted on pneumatic control valves and is used to assign the valve position to the control signal. The device is designed to operate under exactly defined conditions (e.g. operating pressure, temperature). Therefore, operators must ensure that the positioner is only used in applications where the operating conditions correspond to the technical data. In case operators intend to use the positioner in other applications or conditions than 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 for limits and fields of application as well as possible uses.

Reasonably foreseeable misuse

The Type 3730-1 Positioner 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 specified by SAMSON

Qualifications of operating personnel

The positioner is to be mounted, started up or operated only by trained and experienced personnel familiar with the product. 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 are to 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

No personal protective equipment is required for the direct handling of the positioner. Work on the control valve may be necessary when mounting or removing the device.

➔ 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.

Safety features

Upon failure of the air supply or electric signal, the positioner vents the actuator, causing the valve to move to the fail-safe position determined by the actuator.

Warning against residual hazards

The positioner has direct influence on the control valve. 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. They must observe all hazard statements, warning and caution notes in these mounting and operating instructions, especially for installation, start-up and service work.

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

Explosion protection

– Explosive dust atmospheres of zone 21 or zone 22
  The following applies to type of protection Ex i in combustible dust atmospheres:
  If intrinsic safety is impaired by the influence of dust, an enclosure complying with Clause 6.1.3 of EN 60079-11 with at least in degree of protection IP 5X must be used. The requirements according to Clause 6.1.3 apply to the cable glands accordingly. The degree of ingress protection is verified by a test according to IEC 60529 and EN 60079-0 (e.g. performed by VDE).
  For use in the presence of combustible dust in compliance with type of protection Ex tb IIIC (protection by enclosure), observe Clause 5.6.3 of EN 60079-14.

– 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 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 used 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.
  EN 60079-17 applies to servicing explosion-protected devices.
– Maintenance, calibration and work on equipment
  To ensure that components relevant to explosion protection are not damaged, observe the maximum permissible values specified in the certificates for intrinsically safe circuit.

Responsibilities of the operator

The operator is responsible for proper operation and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions to the operating personnel and to instruct them in proper operation. Furthermore, the operator must ensure that operating personnel or third persons 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 specified hazard statements, warning and caution notes. Furthermore, the operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.

Referenced standards and regulations

The device with a CE marking fulfills the requirements of the Directives 2014/30/EU and 2011/65/EU as well as 2014/34/EU depending on the version. The declarations of conformity are included at the end of these instructions.

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 positioner is mounted (valve, actuator, valve accessories, etc.).

1.1 Notes on possible severe personal injury

⚠ DANGER

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

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

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

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

1.2 Notes on possible personal injury

⚠ WARNING

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

During initialization of the positioner and during operation, the actuator stem moves through its entire travel range. Injury to hands or fingers is possible if they are inserted into the valve.

➔ During initialization and operation, do not insert hands or fingers into the valve yoke and do not touch any moving valve parts.

1.3 Notes on possible property damage

NOTICE

Risk of damage to the positioner due to incorrect mounting position.

➔ Do not mount the positioner with the back of the device facing upward.

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

Risk of malfunction due to incorrect sequence during start-up.

The positioner can only work properly if the mounting and start-up are performed in the prescribed sequence.

➔ Perform mounting and start-up as described in section 5 in page 32.

An incorrect electric signal will damage the positioner.

A current source must be used to provide the electrical power for the positioner.

➔ Only use a current source and never a voltage source.

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

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

➔ Connect the electrical wiring to the positioner according to the prescribed terminal assignment.

Malfunction due to initialization not yet completed.

The initialization causes the positioner to be adapted to the mounting situation. After initialization is completed, the positioner is ready to use.

➔ Initialize the positioner on the first start-up.

➔ Re-initialize positioner after changing the mounting position.

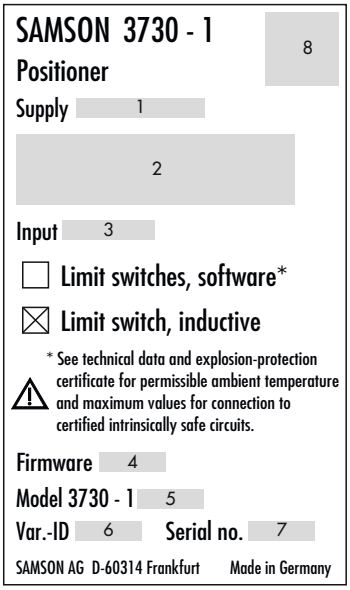
Risk of positioner damage due to incorrect grounding of the electric welding equipment.

➔ Do not ground electric welding equipment near to the positioner.

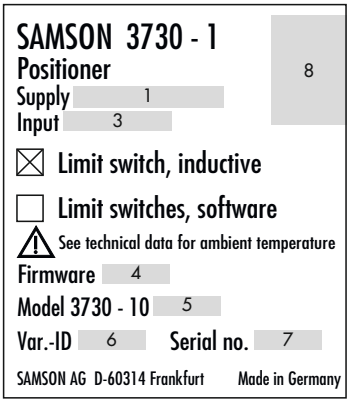
2 Markings on the device

2.1 Nameplate

Explosion-protected version



Version without explosion protection



1 Supply pressure
2 Type of protection for explosion-protected devices
3 Signal range
4 Firmware version
5 Model no.
6 Configuration ID
7 Serial number
8 Compliance

2.2 Article code

Positioner	**Type 3730-1**	x	x	0	0	0	0	0	0	0	x	0	0	x	0	0	0
With LCD and autotune, 4 to 20 mA set point, two software limit contacts																	
Explosion protection																	
Without	0																
ATEX: II 2G Ex ia IIC T6..T4 Gb; II 2D Ex ia IIIC T80°C Db	1																
FM/CSA: Class I, Zone 0 AEx ia IIC; Class I, II, III, Div.1, Groups A–G; Class I, Div.2, Groups A–D; Class II, Div.2, Groups F, G/ Ex ia IIC T6; Class I, Zone 0; Class II, Groups E–G; Ex nA II T6; Class I, Zone 2; Class I, Div.2, Groups A–D; Class II, Div.2, Groups E–G	3																
ATEX: II 2D Ex tb IIIC T80°C Db	5																
ATEX: II 3G Ex nA II T6 Gc; II 3D Ex tc IIIC T80°Dc	8																
Option: Inductive limit contact																	
Without		0															
With SJ2-SN proximity switch (NC contact)		1															
Housing material																	
Aluminum (standard)											0						
Stainless steel 1.4408											1						
Special applications																	
Without														0			
Device compatible with paint (lowest permissible ambient temperature –20 °C)														1			
Exhaust air port with ¼ NPT thread, back of housing sealed														2			
Special version																	
Without																0	0 0

2.3 Firmware versions

These Mounting and Operating Instructions are valid for firmware versions 2.20 to 2.29. The revisions listed in the table apply to firmware version 2.02 and higher.

Table 1: *Firmware revisions*

2.02 (old)	**2.10** (new)
	New Reset function in Code P0. See section 11.3.
	New Manual mode function in Code P14. See section 11.3.
2.10 (old)	**2.11** (new)
	Internal revisions
2.11 (old)	**2.12** (new)
	Internal revisions
2.12 (old)	**2.20** (new)
	• Parameter change: Nominal range (P4) • New assignment of parameter codes: Manual mode (P17) and Reset (P18) • New parameter codes: Firmware version (P20) and Control mode (to include integral-action component, P21). See code list on page 82 onwards. • New assignment of error codes E8 to E15. See error codes on page 85 onwards.
2.20 (old)	**2.21** (new)
	Optimized detection of zero and initialization routine
2.21 (old)	**2.22** (new)
	• P12 (limit A1) and P13 (limit A2) parameters: adjustment ranges extended to 0-100 % (same behavior as in firmware 2.20). See section 11.3. • P4 parameter (nominal range): adjustment ranges extended. See code list in section 11.3.

3 Design and principle of operation

➔ Refer to Fig. 1

The electropneumatic positioner is mounted on pneumatic control valves and is used to assign the valve position (controlled variable x) to the control signal (set point w). The positioner compares the electric control signal of a control system to the travel or opening angle of the control valve and issues a signal pressure (output variable y) for the pneumatic actuator.

The positioner is designed depending on which accessories are selected either for direct attachment to SAMSON Type 3277 Actuators or for attachment to actuators according to NAMUR (IEC 60534-6). Additionally, a coupling wheel included in the accessories is required to transfer the rotary motion for rotary actuators according to VDI/VDE 3845.
Springless rotary actuators require a reversing amplifier included in the accessories to permit the powered operation in either direction.

The positioner consists of a travel sensor system proportional to resistance, an analog i/p converter with a downstream air capacity booster and the electronics with microcontroller. The positioner is fitted with two adjustable software limit contacts as standard to indicate the valve's end positions.

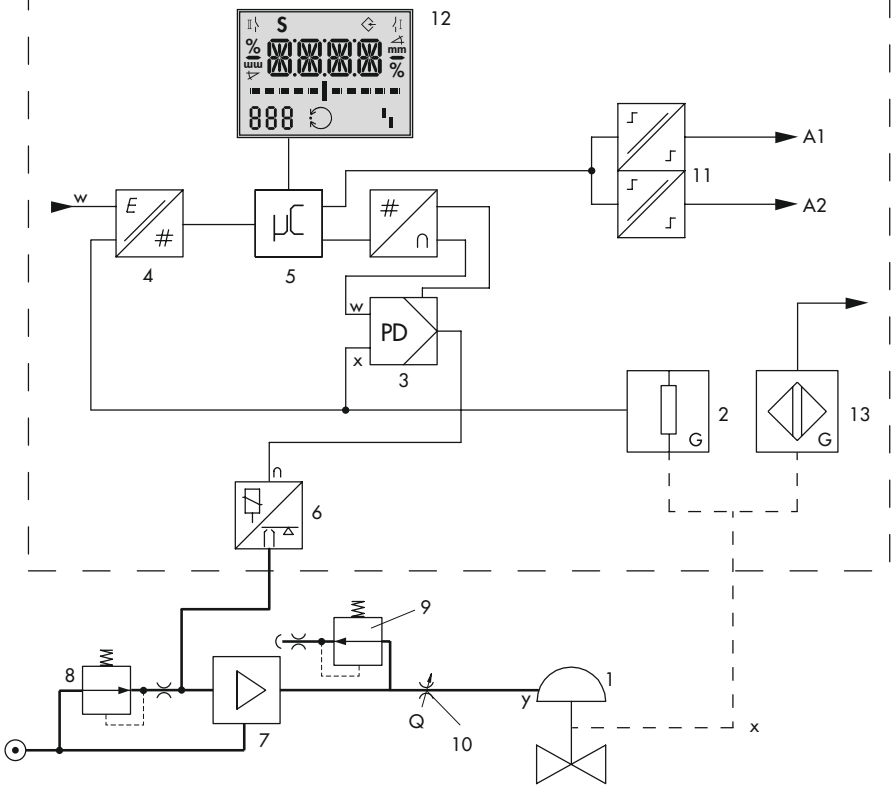
The position of the valve stem is transmitted as a either an angle of rotation or travel over the pick-up lever to the travel sensor (2) and supplied to an analog PD controller (3). An A/D converter (4) transmits the position of the valve to the microcontroller (5).

The PD controller (3) compares this actual position to the 4 to 20 mA DC control signal (reference variable) after it has been converted by the A/D converter (4).
In case of a system deviation, the activation of the i/p module (6) is changed so that the actuator of the control valve (1) is pressurized or vented accordingly over the downstream booster (7). This causes the valve plug to move to the position determined by the set point.
The supply air is supplied to the booster and the pressure regulator (8). An intermediate flow regulator (9) with fixed settings is used to purge the positioner and, at the same time, guarantees trouble-free operation of the booster.
The output signal pressure supplied by the booster can be limited to 2.4 bar by activating the P9 parameter.

The volume restriction (10) is used to optimize the positioner by adapting it to the actuator size.

Tight-closing function:

The pneumatic actuator is completely filled with air or vented as soon as the set point falls below 1 % or exceeds 99 % (see set point cutoff function in P10 and P11 parameters).



1 Control valve
2 Travel sensor
3 PD controller
4 A/D converter
5 Microcontroller
6 i/p converter
7 Air capacity booster
8 Pressure regulator
9 Flow regulator
10 Volume restriction
11 Limit contacts
12 Display
13 Inductive limit contact (optional)

Fig. 1: *Functional diagram*

3.1 Mounting versions

The Type 3730-1 Positioner is suitable for the following types of attachment using the corresponding accessories (see section 3.3):

– Direct attachment to Type 3277 Actuator (see section 5.3): The positioner is mounted on the yoke. The signal pressure is connected to the actuator over a connection block: internally over a hole in the valve yoke for "actuator stem extends" fail-safe action and through an external signal pressure line for "actuator stem retracts" fail-safe action.
– Attachment to actuators according to IEC 60534-6 (see section 5.4): The positioner is mounted to the control valve using a NAMUR bracket.
– Attachment according to VDI/VDE 3847-1/-2 (see section 5.5/section 5.6): Attachment according to VDI/VDE 3847-1/-2 using the corresponding accessories allows the positioner to be replaced quickly while the process is running.
– Attachment to Type 3510 Micro-flow Valve (see section 5.7): The positioner is attached to the valve yoke using a bracket.
– Attachment to rotary actuators according to VDI/VDE 3845 (see section 5.8): The positioner is mounted to the rotary actuator using the corresponding accessories.

3.2 Device overview and operating controls

See section 6 on page 70.

3.3 Accessories

Table 2: *General accessories*

Designation		Order no.
Reversing amplifier for double-acting actuators		Type 3710
Cable gland M20x1.5	Black plastic (6 to 12 mm clamping range)	8808-1011
	Blue plastic (6 to 12 mm clamping range)	8808-1012
	Nickel-plated brass (6 to 12 mm clamping range)	1890-4875
	Nickel-plated brass (10 to 14 mm clamping range)	1992-8395
	Stainless steel 1.4305 (8 to 14.5 mm clamping range)	8808-0160
Adapter M20x1.5 to ½ NPT	Powder-coated aluminum	0310-2149
	Stainless steel	1400-7114
Lever	S	0510-0522
	M	0510-0510
	L	0510-0511
	XL	0510-0512
	XXL	0510-0525
Retrofit kit for inductive limit switch 1 x SJ2-SN		1402-1771

Table 3: *Direct attachment to Type 3277-5 (see section 5.3.1)*

Designation			Order no.
Mounting parts	Standard version for actuators 120 cm² or smaller		1400-7452
	Version compatible with paint for actuators 120 cm² or smaller		1402-0940
Accessories for actuator	Old switchover plate for Type 3277-5xxxxxx.**00** Actuator (old)		1400-6819
	New switchover plate for Type 3277-5xxxxxx.**01** Actuator (new) [1]		1400-6822
	New connecting plate for Type 3277-5xxxxxx.**01** Actuator (new) [1], G ⅛ and ⅛ NPT		1400-6823
	Old connecting plate for Type 3277-5xxxxxx.**00** Actuator (old): G ⅛		1400-6820
	Old connecting plate for Type 3277-5xxxxxx.**00** (old): ⅛ NPT		1400-6821
Accessories for positioner	Connecting plate (6)	G ¼	1400-7461
		¼ NPT	1400-7462
	Pressure gauge bracket (7)	G ¼	1400-7458
		¼ NPT	1400-7459
	Pressure gauge mounting kit (8) up to max. 6 bar (output/supply)	Stainless steel/brass	1402-0938
		Stainless steel/stainless steel	1402-0939

[1] Only new switchover and connecting plates can be used with new actuators (Index 01). Old and new plates are not interchangeable.

Table 4: *Direct attachment to Type 3277 (see section 5.3.2)*

Mounting parts/accessories		Order no.
Standard version for actuators 175, 240, 350, 355, 700, 750 cm²		1400-7453
Version compatible with paint for actuators 175, 240, 350, 355, 700, 750 cm²		1402-0941
Connection block with seals and screw	G ¼	1400-8819
	¼ NPT	1400-8820
Pressure gauge mounting kit up to max. 6 bar (output/supply)	Stainless steel/brass	1402-0938
	Stainless steel/stainless steel	1402-0939
Piping with screw fittings [1]		**Order no.**
Actuator (175 cm²), steel	G ¼/G ⅜	1402-0970
	¼ NPT/⅜ NPT	1402-0976
Actuator (175 cm²), stainless steel	G ¼/G ⅜	1402-0971
	¼ NPT/⅜ NPT	1402-0978
Actuator (240 cm²), steel	G ¼/G ⅜	1400-6444
	¼ NPT/⅜ NPT	1402-0911
Actuator (240 cm²), stainless steel	G ¼/G ⅜	1400-6445
	¼ NPT/⅜ NPT	1402-0912
Actuator (350 cm²), steel	G ¼/G ⅜	1400-6446
	¼ NPT/⅜ NPT	1402-0913
Actuator (350 cm²), stainless steel	G ¼/G ⅜	1400-6447
	¼ NPT/⅜ NPT	1402-0914
Actuator (355 cm²), steel	G ¼/G ⅜	1402-0972
	¼ NPT/⅜ NPT	1402-0979
Actuator (355 cm²), stainless steel	G ¼/G ⅜	1402-0973
	¼ NPT/⅜ NPT	1402-0980
Actuator (700 cm²), steel	G ¼/G ⅜	1400-6448
	¼ NPT/⅜ NPT	1402-0915
Actuator (700 cm²), stainless steel	G ¼/G ⅜	1400-6449
	¼ NPT/⅜ NPT	1402-0916
Actuator (750 cm²), steel	G ¼/G ⅜	1402-0974
	¼ NPT/⅜ NPT	1402-0981
Actuator (750 cm²), stainless steel	G ¼/G ⅜	1402-0975
	¼ NPT/⅜ NPT	1402-0982

[1] For "actuator stem retracts" direction of action;
with air purging of the top diaphragm chamber;
air purging of the diaphragm chamber for "actuator stem extends" direction of action

Table 5: *Attachment to NAMUR rib or attachment to rod-type yokes[1] according to IEC 60534-6 (section 5.4)*

Travel in mm	Lever	For actuator	Order no.
7.5	S	Type 3271-5 with 60/120 cm² on Type 3510 Micro-flow Valve	1402-0478
5 to 50	M [2]	Actuators from other manufacturers and Type 3271 with 120 to 750 cm² effective areas	1400-7454
14 to 100	L	Actuators from other manufacturers and Type 3271 with 1000 and 1400-60 cm²	1400-7455
30 or 60	L	Type 3271, 1400-120 and 2800 cm² versions with 30/60 mm travel [3]	1400-7466
		Mounting brackets for Emerson and Masoneilan linear actuators (in addition, a mounting kit according to IEC 60534-6 is required depending on the travel). See rows above.	1400-6771
		Valtek Type 25/50	1400-9554
40 to 200	XL	Actuators from other manufacturers and Type 3271 with 1400-120 and 2800 cm² and with 120 mm travel	1400-7456

Accessories		Order no.
Connecting plate	G ¼	1400-7461
	¼ NPT	1400-7462
Pressure gauge bracket	G ¼	1400-7458
	¼ NPT	1400-7459
Pressure gauge mounting kit up to max. 6 bar (output/supply)	Stainless steel/brass	1402-0938
	Stainless steel/stainless steel	1402-0939

1) 20 to 35 mm rod diameter
2) M lever is mounted on basic device (included in the scope of delivery)
3) In conjunction with Type 3273 Side-mounted Handwheel with 120 mm rated travel, additionally one bracket (0300-1162) and two countersunk screws (8330-0919) are required.

Table 6: *Attachment according to VDI/VDE 3847-1 (see section 5.5)*

Mounting parts			Order no.
VDI/VDE 3847 interface adapter			1402-0257
Connecting plate, including connection for air purging of actuator spring chamber	Aluminum	ISO 228/1-G ¼	1402-0268
		¼-18 NPT	1402-0269
	Stainless steel	ISO 228/1-G ¼	1402-0270
		¼-18 NPT	1402-0271
Mounting kit for attachment to SAMSON Type 3277 Actuator with 175 to 750 cm²			1402-0868
Mounting kit for attachment to SAMSON Type 3271 Actuator or non-SAMSON actuators			1402-0869
Travel pick-off for valve travel up to 100 mm			1402-0177
Travel pick-off for 100 to 200 mm valve travel (SAMSON Type 3271 Actuator only)			1402-0178

Table 7: *Attachment according to VDI/VDE 3847-2 (see section 5.6)*

Designation		Order no.
Mounting parts	Mounting block for Type 31a (edition 2020+) with dummy plate for solenoid valve interface	1402-1645
	Dummy plate for solenoid valve interface (sold individually)	1402-1290
	Adapter bracket for Type 3730 (VDI/VDE 3847)	1402-0257
	Adapter bracket for Type 3730 and Type 3710 (DAP/PST)	1402-1590
Accessories for actuator	Shaft adapter AA1	1402-1617
	Shaft adapter AA2	1402-1616
	Shaft adapter AA4	1402-1888

Table 8: *Attachment to rotary actuators (see section 5.8)*

Mounting parts/accessories			Order no.
Attachment according to VDI/VDE 3845 (September 2010), actuator surface corresponds to fixing level 1			
	Size AA1 to AA4, version with CrNiMo steel bracket		1400-7448
	Size AA1 to AA4, heavy-duty version		1400-9244
	Size AA5, heavy-duty version (e.g. Air Torque 10 000)		1400-9542
	Bracket surface corresponds to fixing level 2, heavy-duty version		1400-9526
	Attachment for rotary actuators with max. 180° opening angle, fixing level 2		1400-8815 and 1400-9837
Attachment to SAMSON Type 3278 with 160/320 cm², CrNiMo steel bracket			1400-7614
Attachment to SAMSON Type 3278 with 160 cm² and to VETEC Type S160, Type R and Type M, heavy-duty version			1400-9245
Attachment to SAMSON Type 3278 with 320 cm² and to VETEC Type S320, heavy-duty version			1400-5891 and 1400-9526
Attachment to Camflex II			1400-9120
Accessories	Connecting plate	G ¼	1400-7461
		¼ NPT	1400-7462
	Pressure gauge bracket	G ¼	1400-7458
		¼ NPT	1400-7459
	Pressure gauge mounting kit up to max. 6 bar (output/supply)	Stainless steel/brass	1402-0938
		Stainless steel/stainless steel	1402-0939

3.4 Travel tables

i ***Note***

*The **M** lever is included in the scope of delivery.*
***S, L, XL** levers for attachment according to IEC 60534-6 (NAMUR) are available as accessories (see Table 5 on page 19). The XXL lever is available on request.*

Table 9: *Direct attachment to Type 3277-5 and Type 3277 Actuator*

Actuator size [cm²]	Rated travel [mm]	Adjustment range at positioner Travel [mm]	Required lever	Assigned pin position
120	7.5	5.0 to 16.0	M	25
120/175/240/350	15	7.0 to 22.0	M	35
355/700/750	30	10.0 to 32.0	M	50

Table 10: *Attachment according to IEC 60534-6 (NAMUR)*

SAMSON valves with Type 3271 Actuator		Other valves/actuators			
Actuator area [cm²]	Rated travel [mm]	Min. travel [mm]	Max. travel [mm]	Required lever	Assigned pin position
60 and 120 with Type 3510 Valve	7.5	3.5	11.0	S	17
120	7.5	5.0	16.0	M	25
120/175/240/350	15	7.0	22.0	M	35
355/700/750	7.5				
355/700/750	15 and 30	10.0	32.0	M	50
1000/1400/2800	30	14.0	44.0	L	70
	60	20.0	64.0	L	100
1400/2800	120	40.0	128.0	XL	200
See manufacturer's specifications	200	See manufacturer's specifications			300

Table 11: *Attachment to rotary actuators*

Opening angle	Required lever	Assigned pin position
20 to 100°	M	90°

3.5 Technical data

Table 12: *Type 3730-1 Electropneumatic Positioner*

Type 3730-1 Positioner **The technical data for the explosion-protected devices may be restricted by the limits specified in the test certificates.**	
Rated travel Adjustable	Direct attachment to Type 3277: 3.6 to 30 mm Attachment according to IEC 60534-6: 3.6 to 200 mm Attachment to rotary actuators: 24 to 100° opening angle
Travel range	Adjustable within the initialized travel/angle of rotation Travel can be restricted to 1/5 at the maximum
Set point w	Signal range 4 to 20 mA · Two-wire device with reverse polarity protection Split-range operation 4 to 11.9 mA and 12.1 to 20 mA, static destruction limit 100 mA
Minimum current	3.7 mA
Load impedance	≤ 6 V (corresponding to 300 Ω at 20 mA)
Supply air Air quality acc. to ISO 8573-1	1.4 to 7 bar (20 to 105 psi) 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
Signal pressure (output)	0 bar up to the supply pressure · Can be limited to approx. 2.4 bar by software
Characteristic Adjustable	Linear/equal percentage/reverse equal percentage Butterfly valve, rotary plug valve and segmented ball valve: Linear/equal percentage
Hysteresis	≤1 %
Sensitivity	≤0.1 %
Direction of action	w/x reversible
Air consumption, steady state	Independent from supply pressure approx. 110 l_n/h
Air output capacity To fill actuator with air To vent actuator	 At Δp = 6 bar: 8.5 m_n^3/h · At Δp = 1.4 bar: 3.0 m_n^3/h · $K_{Vmax\ (20\ °C)}$ = 0.09 At Δp = 6 bar: 14.0 m_n^3/h · At Δp = 1.4 bar: 4.5 m_n^3/h · $K_{Vmax\ (20\ °C)}$ = 0.15
Permissible ambient temperature	–20 to +80 °C for all versions –45 to +80 °C with metal cable gland **The temperature limits for the explosion-protected devices may be restricted by the limits specified in the test certificates.**
Influences	Temperature: ≤0.15 %/10 K Supply air: None Effect of vibration: ≤0.25 % of 15 to 1500 Hz and 4 g according to IEC 770

Type 3730-1 Positioner **The technical data for the explosion-protected devices may be restricted by the limits specified in the test certificates.**		
Electromagnetic compatibility	Complying with EN 61000-6-2, EN 61000-6-3, EN 61326-1 and NAMUR Recommendation NE 21	
Electrical connections	One M20x1.5 cable gland for 6 to 12 mm clamping range Second M20x1.5 threaded connection additionally available Screw terminals for 0.2 to 2.5 mm² wire cross-section	
Explosion protection	Refer to Table 13	
Degree of protection	IP 66/NEMA 4X	
Use in safety-instrumented systems (SIL)	Observing the requirements of IEC 61508, the systematic capability of the pilot valve for emergency venting as a component in safety-instrumented systems is given.	
	Use is possible on observing the requirements of IEC 61511 and the required hardware fault tolerance in safety-instrumented systems up to SIL 2 (single device/ HFT = 0) and SIL 3 (redundant configuration/HFT = 1).	
Weight	Approx. 1 kg · Special version in stainless steel: 2.2 kg	
Compliance	CE · EAC	
Materials		
Housing	Die-cast aluminum EN AC-AlSi12(Fe) (EN AC-44300) acc. to DIN EN 1706 · Chromated and powder paint coated · Special version: stainless steel 1.4408	
External parts	Stainless steel 1.4404/316L	
Cable gland	M20x1.5, black polyamide	
Binary contacts	2 software limit contacts with configurable limits (0.5 % steps), reverse polarity protection, floating	
Signal state	**Without explosion protection**	**Ex**
No response:	Conducting (R = 348 Ω)	≥ 2.2 mA
Response	Non-conducting	≤1.0 mA
Operating voltage	For connection to the binary input of the PLC acc. to IEC 61131-2, P_{max} = 400 mW or for connection to NAMUR switching amplifier acc. to EN 60947-5-6	For connection to NAMUR switching amplifier acc. to EN 60947-5-6
Option: inductive limit contact by Pepperl+Fuchs	For connection to switching amplifier according to EN 60947-5-6. Can be used in combination with a software limit contact	
Proximity switch SJ2-SN	Measuring plate not detected: ≥3 mA · Measuring plate detected: ≤1 mA	

Table 13: *Explosion protection certificates*

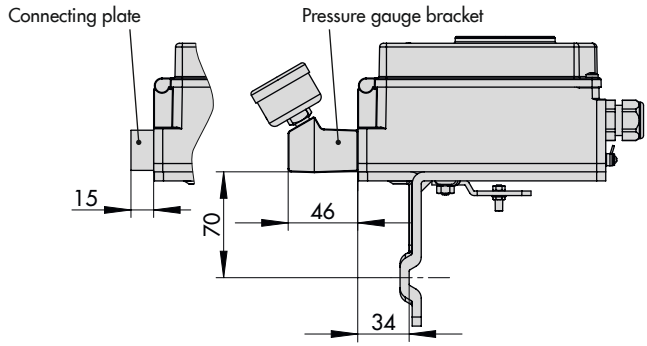
Type	Certification			Type of protection/comments
-1	**STCC**	Number Date Valid until	ZETC/14/2018 2018-04-27 2021-04-26	0Ex ia IIC T6X 2Ex s II T6 X
-11	 1)	Number Date	PTB 04 ATEX 2033 2017-01-24	II 2G Ex ia IIC T6..T4 Gb; II 2D Ex ia IIIC T80°C Db
	CCoE	Number Date Valid until	A/P/HQ/ MH/144/6238 2014-07-01 2019-12-31	Ex ia IIC T6
		Number Date Valid until	RU C-DE.AA87.B.01278 2018-11-30 2023-11-29	1 Ex ia IIC T6/T5/T4 Gb X Ex tb IIIC T80°C Db X
	IECEx	Number Date	IECEx PTB 06.0055X 2017-01-26	Ex ia IIC T6...T4 Gb; Ex ia IIIC T80°C Db
	NEPSI	On request		
-13	**CSA**	Number Date	1675820 2017-05-18	Ex ia IIC T6; Class I, Zone 0; Class II, Groups E, F, G; Ex nA II T6; Class I, Zone 2 Class I, Div.2, Groups A, B, C, D Class II, Div.2, Groups E, F, G Class III: Type 4 Enclosure
	FM	Number Date	3023478 2008-11-03	Class I, Zone 0 AEx ia IIC Class I, II, III, Div.1, Groups A, B, C, D, E, F, G Class I, Div.2, Groups A, B, C, D Class II, Div.2, Groups F, G NEMA Type 4X
-15	 1)	Number Date	PTB 04 ATEX 2033 2017-01-24	II 2D Ex tb IIIC T80°C Db
	IECEx	Number Date	IECEx PTB 06.0055X 2017-01-26	Ex tb IIIC T80°C Db

Type	Certification			Type of protection/comments
3730 -18	 2)	Number Date	PTB 04 ATEX 2114 X 2017-01-26	II 3G Ex nA II T6 Gc; II 3D Ex tc IIIC T80°Dc
		Number Date Valid until	RU C DE.08.B.00113 2018-11-30 2023-11-30	2 Ex nA IIC T6/T5/T4 Gc X 2 Ex ic IIC T6/T5/T4 Gc X Ex tc IIIC T80°C Dc X
	IECEx	Number Date	IECEx PTB 06.0055X 2017-01-26	Ex nA IIC T6...T4 Gc; Ex tc IIIC T80°C Dc
	NEPSI	Number Date Valid until	GYJ14.1110X 2014-05-08 2019-05-07	Ex ic IIC T4~T6 Gc; Ex nA IIC T4~T6 Gc

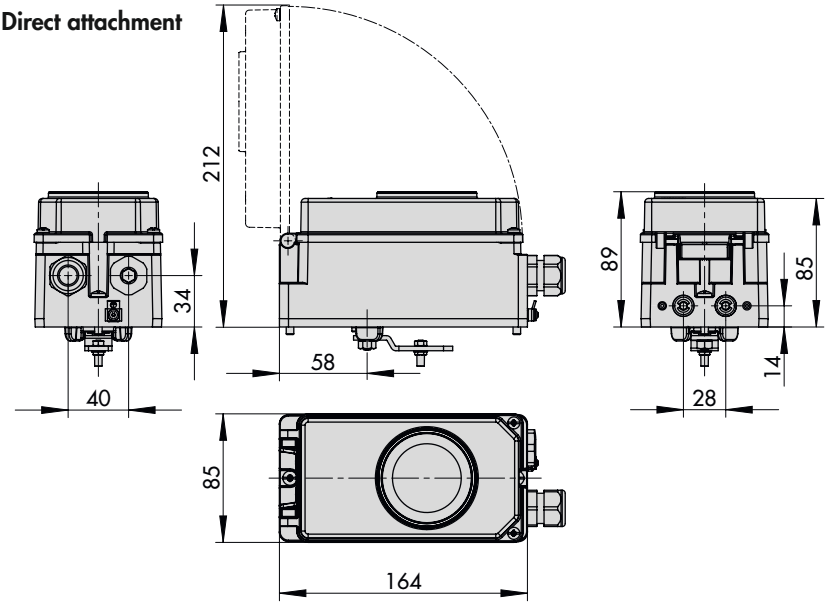
1) EC type examination certificate
2) Statement of conformity

3.6 Dimensions in mm

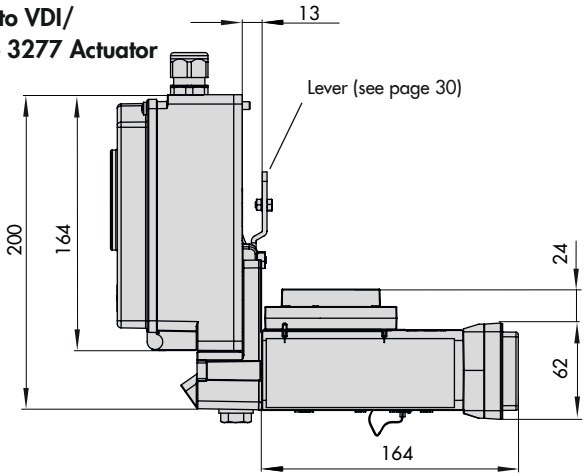
Attachment according to IEC 60534-6



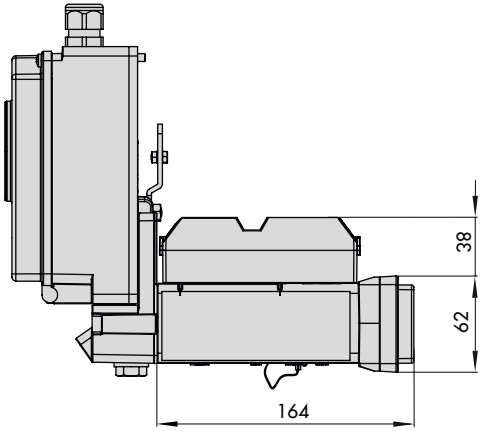
Direct attachment



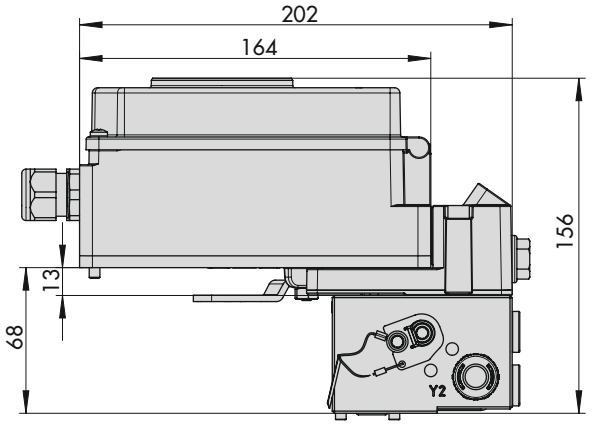
Attachment according to VDI/ VDE 3847-1 onto Type 3277 Actuator



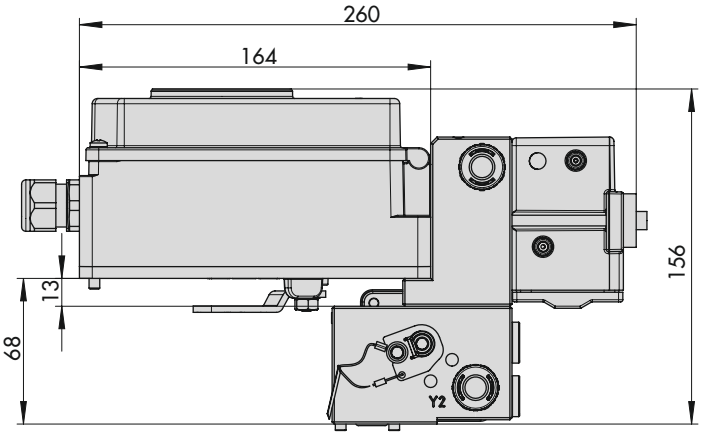
Attachment according to VDI/ VDE 3847 to a NAMUR rib



Attachment according to VDI/VDE 3847-2 with single-acting actuator



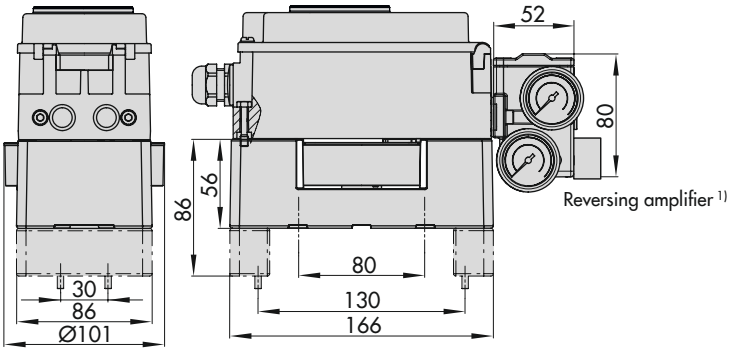
Attachment according to VDI/VDE 3847-2 with double-acting actuator



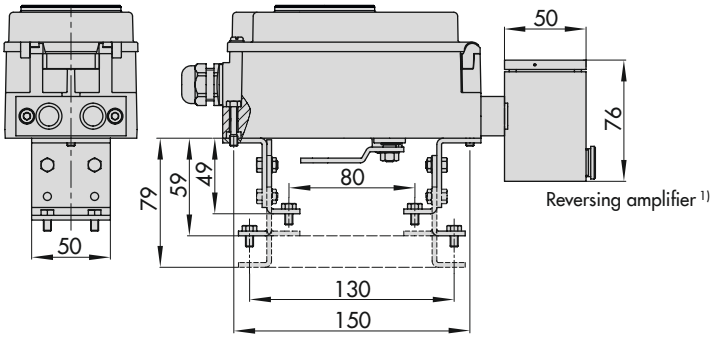
1) For attachment using intermediate plate

Attachment to rotary actuators according to VDI/VDE 3845

Heavy-duty version

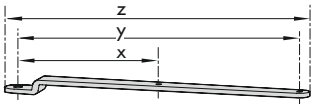


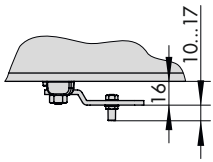
Light version



1) Reversing amplifier
– Type 3710 (see drawing of heavy-duty version for dimensions)
– 1079-1118/1079-1119, no longer available
(see drawing of light version for dimensions)

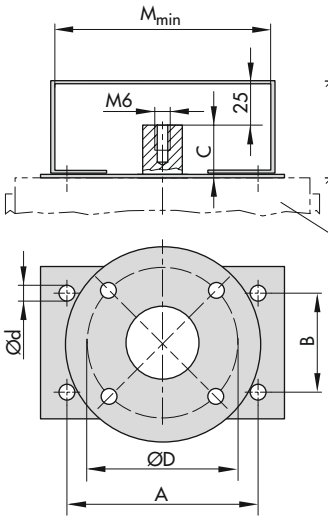
Lever





Lever	x	y	z
S	17 mm	25 mm	33 mm
M	25 mm	50 mm	66 mm
L	70 mm	100 mm	116 mm
XL	100 mm	200 mm	216 mm
XXL	200 mm	300 mm	316 mm

3.7 Fixing levels according to VDI/VDE 3845 (September 2010)



Dimensions in mm						
Size	A	B	C	Ød	M_{min}	D[1)]
AA0	50	25	15	5.5 for M5	66	50
AA1	80	30	20	5.5 for M5	96	50
AA2	80	30	30	5.5 for M5	96	50
AA3	130	30	30	5.5 for M5	146	50
AA4	130	30	50	5.5 for M5	146	50
AA5	200	50	80	6.5 for M6	220	50

1) Flange type F05 acc. to DIN EN ISO 5211

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 transportation damage.

4.1 Unpacking

NOTICE

Risk of positioner damage due to foreign particles entering it.
Do not remove the packaging and protective film/protective caps until immediately before mounting and start-up.

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

4.2 Transporting

– Protect the positioner against external influences (e.g. impact).
– Protect the positioner against moisture and dirt.
– Observe transport temperature depending on the permissible ambient temperature (see technical data in section 3.5).

4.3 Storage

NOTICE

Risk of positioner damage due to improper storage.
– Observe storage instructions.
– Contact SAMSON in case of different storage conditions or long storage periods.

Storage instructions

– Protect the positioner against external influences (e.g. impact, shocks, vibration).
– Do not damage the corrosion protection (coating).
– Protect the positioner 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 3.5).
– Store positioner with closed cover.
– Seal the pneumatic and electrical connections.

5 Mounting and start-up

NOTICE

Risk of malfunction due to incorrect sequence of mounting, installation and start-up. Observe the prescribed sequence.

➔ Sequence:

1. **Remove the protective caps from the pneumatic connections.**
2. **Mount the positioner on the valve.**
➔ Section 5.3 onward
3. **Perform pneumatic installation.**
➔ Section 5.12 onward
4. **Perform electrical installation.**
➔ Section 5.14 onward
5. **Perform settings.**
➔ Section 6 onward

5.1 Mounting position

NOTICE

Risk of damage to the positioner due to incorrect mounting position.
– *Do not mount the positioner with the back of the device facing upward.*
– *Do not seal or restrict the vent opening when the device is installed on site.*

➔ Observe mounting position (see Fig. 3).

5.2 Lever and pin position

The positioner is adapted to the actuator and to the rated travel by the lever on the back of the positioner and the pin inserted into the lever.

The travel tables on page 21 show the maximum adjustment range at the positioner. The travel that can be implemented at the valve is additionally restricted by the selected fail-safe position and the required compression of the actuator springs.

The positioner is equipped with the M lever (pin position 35) as standard (see Fig. 4).

Note

*The **M** lever is included in the scope of delivery.*
***S, L, XL** levers are available as accessories (see Table 5 on page 19). The **XXL** lever is available on request.*

If a pin position other than position **35** with the standard **M** lever is required or an **L** or **XL** lever size is required, proceed as follows (see Fig. 5):

1. Fasten the follower pin (2) in the assigned lever hole (pin position as specified in the travel tables on page 21). Only use the longer follower pin included in the mounting kit.
2. Place the lever (1) on the shaft of the positioner and fasten it tight using the disk spring (1.2) and nut (1.1).

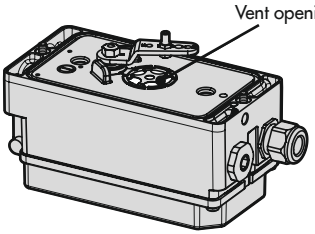


Fig. 2: *Vent opening (back of the positioner)*

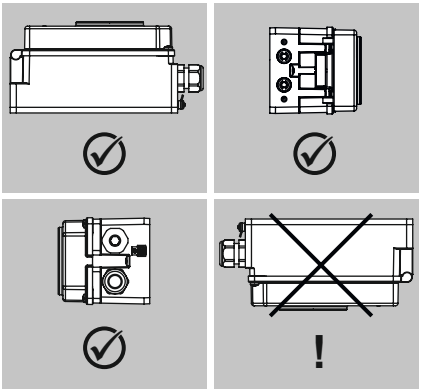


Fig. 3: *Permissible mounting positions*

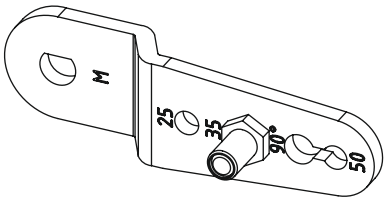
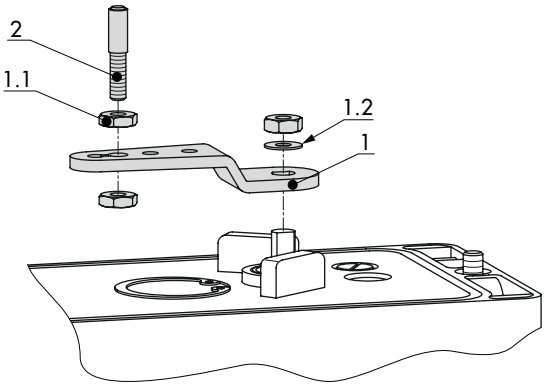


Fig. 4: *M lever with pin position 35*



1 Lever
1.1 Nut
1.2 Disk spring
2 Follower pin

Fig. 5: *Mounting the lever and follower pin*

5.3 Direct attachment

5.3.1 Type 3277-5 Actuator

➔ Required mounting parts and accessories: Table 3 on page 17.

➔ Observe travel tables on page 21.

Actuator with 120 cm² (see Fig. 6)

Depending on the type of positioner attachment, the signal pressure is routed either left or right of the yoke through a hole to the actuator diaphragm. Depending on the failsafe action of the actuator "actuator stem extends" or "actuator stem retracts" (valve closes or opens upon supply air failure), the switchover plate (9) must first be attached to the actuator yoke. Align the switchover plate with the corresponding symbol for left or right attachment according to the marking (view looking onto the switchover plate).

3. Mount connecting plate (6) or pressure gauge bracket (7) with pressure gauges on the positioner, making sure the two seals (6.1) are seated properly.
4. Remove screw plug (4) on the back of the positioner and seal the signal pressure output (38) on the connecting plate (6) or on the pressure gauge bracket (7) with the stopper (5) included in the accessories.
5. Place follower clamp (3) on the actuator stem, align it and screw tight so that the mounting screw is located in the groove of the actuator stem.
6. Mount cover plate (10) with narrow side of the cut-out (Fig. 6, on the left) pointing towards the signal pressure connection. Make sure that the gasket (14) points towards the actuator yoke.
7. **15 mm travel:** Keep the follower pin (2) on the **M** lever (1) on the back of the positioner in the pin position **35** (delivered state).
   7.5 mm travel: Remove the follower pin (2) from the pin position **35**, reposition it in the hole for pin position **25** and screw tight.
8. Insert formed seal (15) into the groove of the positioner housing and insert the seal (10.1) on the back of the housing.
9. Place positioner on the cover plate (10) in such a manner that the follower pin (2) rests on the top of the follower clamp (3). Adjust the lever (1) correspondingly and open the positioner cover to hold the positioner shaft in position at the cap or switch (Fig. 27). The lever (1) must rest on the follower clamp with spring force. Mount the positioner on the cover plate (10) using the two fixing screws.

i ***Note***

The following applies to all types of attachment except for direct attachment to Type 3277-5: the signal pressure output at the back must be sealed by the screw plug (4, order no. 0180-1436) and the associated O-ring (order no. 0520-0412) (delivered state, parts included in the scope of delivery).

10. Mount cover (11) on the other side. Make sure that the vent plug is located at

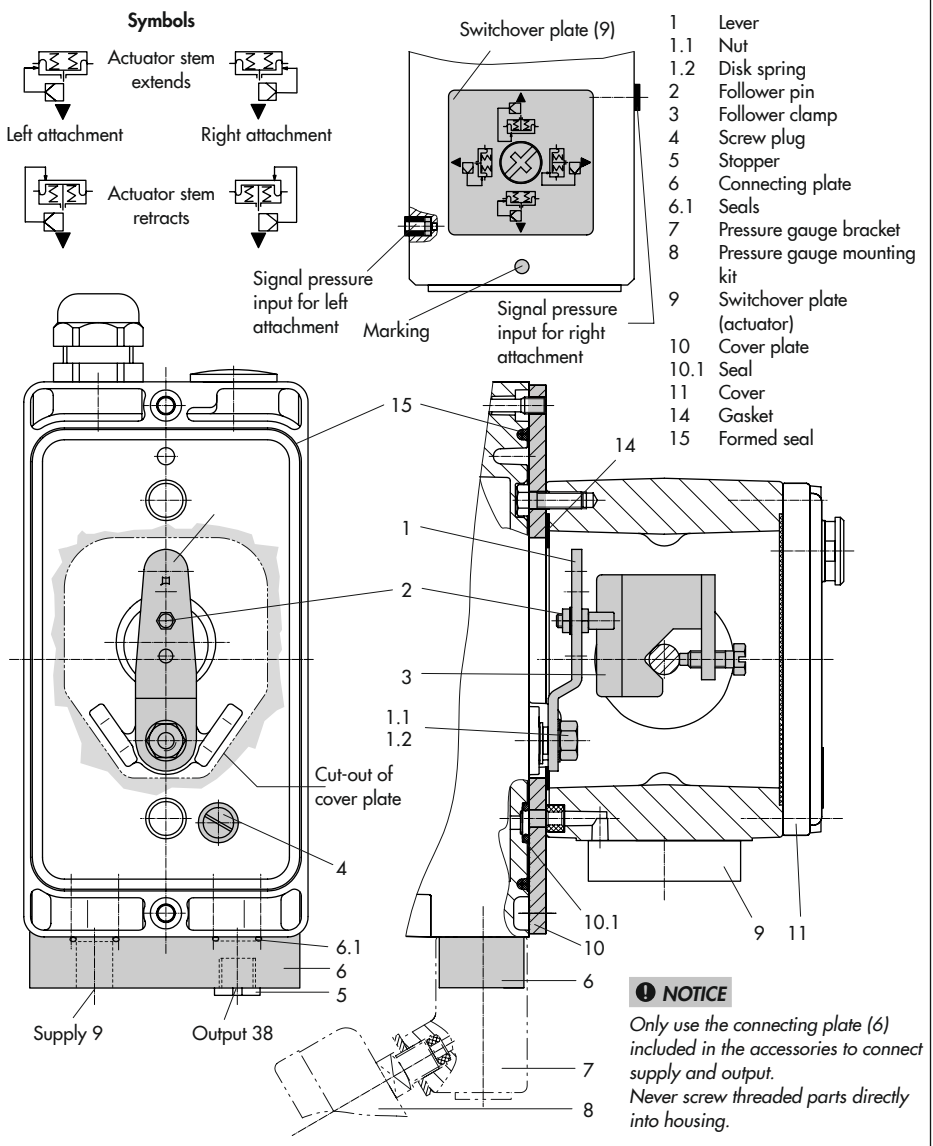


Fig. 6: *Direct attachment – Signal pressure connection for Type 3277-5 Actuator with 120 cm²*

the bottom when the control valve is installed to allow any condensed water that collects to drain off.

5.3.2 Type 3277 Actuator

➔ Required mounting parts and accessories: Table 4 on page 18.

➔ Observe travel tables on page 21.

Actuators with 175 to 750 cm² effective areas (see Fig. 7)

Mount the positioner on the yoke. The signal pressure is routed to the actuator over the connection block (12), for actuators with fail-safe action "actuator stem extends" internally through a hole in the valve yoke and for "actuator stem retracts" through an external pipe.

1. Place follower clamp (3) on the actuator stem, align it and screw tight so that the mounting screw is located in the groove of the actuator stem.
2. Mount cover plate (10) with narrow side of the cut-out (Fig. 7, on the left) pointing towards the signal pressure connection. Make sure that the gasket (14) points towards the actuator yoke.
3. For actuators with 355, 700 or 750 cm², remove the follower pin (2) on the **M** lever (1) on the back of the positioner from pin position **35**, reposition it in the hole for pin position **50** and screw tight.
   For actuators 175, 240 and 350 cm² with 15 mm travel, keep the follower pin (2) in pin position **35**.
4. Insert formed seal (15) into the groove of the positioner housing.
5. Place positioner on the cover plate in such a manner that the follower pin (2) rests on the top of the follower clamp (3). Adjust the lever (1) correspondingly and open the positioner cover to hold the positioner shaft in position at the cap or switch (Fig. 27). The lever (1) must rest on the follower clamp with spring force. Mount the positioner on the cover plate (10) using the two fixing screws.
6. Make sure that the tip of the gasket (16) projecting from the side of the connection block is positioned to match the actuator symbol for the actuator's fail-safe action "actuator stem extends" or "actuator stem retracts". If this is not the case, unscrew the three fastening screws and lift off the cover. Turn the gasket (16) by 180° and re-insert it.
   The old connection block version (Fig. 7, bottom) requires the switch plate (13) to be turned to align the actuator symbol with the arrow marking.
7. Place the connection block (12) with the associated seals against the positioner and the actuator yoke and fasten using the screw (12.1). For actuators with fail-safe action "actuator stem retracts", additionally remove the stopper (12.2) and mount the external signal pressure pipe.
8. Mount cover (11) on the other side. Make sure that the vent plug is located at the bottom when the control valve is installed to allow any condensed water that collects to drain off.

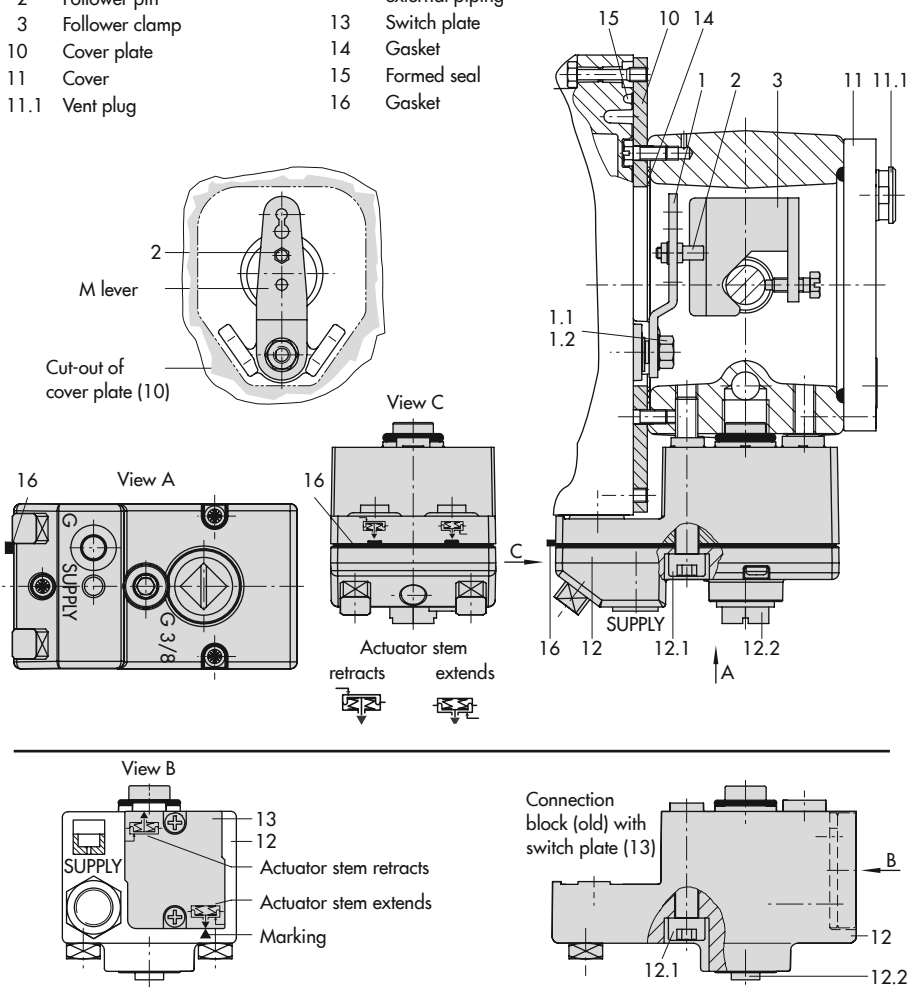


Fig. 7: *Direct attachment – Signal pressure connection for Type 3277 Actuator with 175 to 750 cm²*

5.4 Attachment according to IEC 60534-6

➔ Required mounting parts and accessories: Table 5 on page 19.

➔ Observe travel tables on page 21.

➔ Refer to Fig. 8

The positioner is attached to the control valve using a NAMUR bracket (10).

1. Screw the two bolts (14) to the bracket (9.1) of the stem connector (9), place the follower plate (3) on top and use the screws (14.1) for fastening.

   2800 and 1400 cm² with 120 mm travel:

   – For a travel of 60 mm or smaller, screw the longer follower plate (3.1) directly to the stem connector (9).
   – For a travel exceeding 60 mm, mount the bracket (16) first and then the follower plate (3) to the bracket together with the bolts (14) and screws (14.1).

2. Mount NAMUR bracket (10) to the control valve as follows:
   – For **attachment to the NAMUR rib**, use an M8 screw (11) and toothed lock washer directly in the yoke hole.
   – For attachment to **valves with rod-type yokes**, use two U-bolts (15) around the yoke. Align the NAMUR bracket (10) according to the embossed scale so that the follower plate (3) is shifted by half the angle range to the NAMUR bracket (the slot of the follower plate is centrally aligned with the NAMUR bracket at mid valve travel).

3. Mount connecting plate (6) or pressure gauge bracket (7) with pressure gauges on the positioner, making sure the two seals (6.1) are seated properly.

4. Select required lever size (1) M, L or XL and pin position according to the actuator size and valve travel listed in the travel table on page 21.

Should a pin position other than position **35** with the standard **M** lever be required or an **L** or **XL** lever size be required, proceed as follows:

5. Fasten the follower pin (2) in the assigned lever hole (pin position as specified in the travel table). Only use the longer follower pin (2) included in the mounting kit.

6. Place the lever (1) on the shaft of the positioner and fasten it tight using the disk spring (1.2) and nut (1.1).
   Move lever once all the way as far as it will go in both directions.

7. Place positioner on the NAMUR bracket in such a manner that the follower pin (2) rests in the slot of the follower plate (3, 3.1). Adjust the lever (1) correspondingly.
   Screw the positioner to the NAMUR bracket using its two fastening screws.

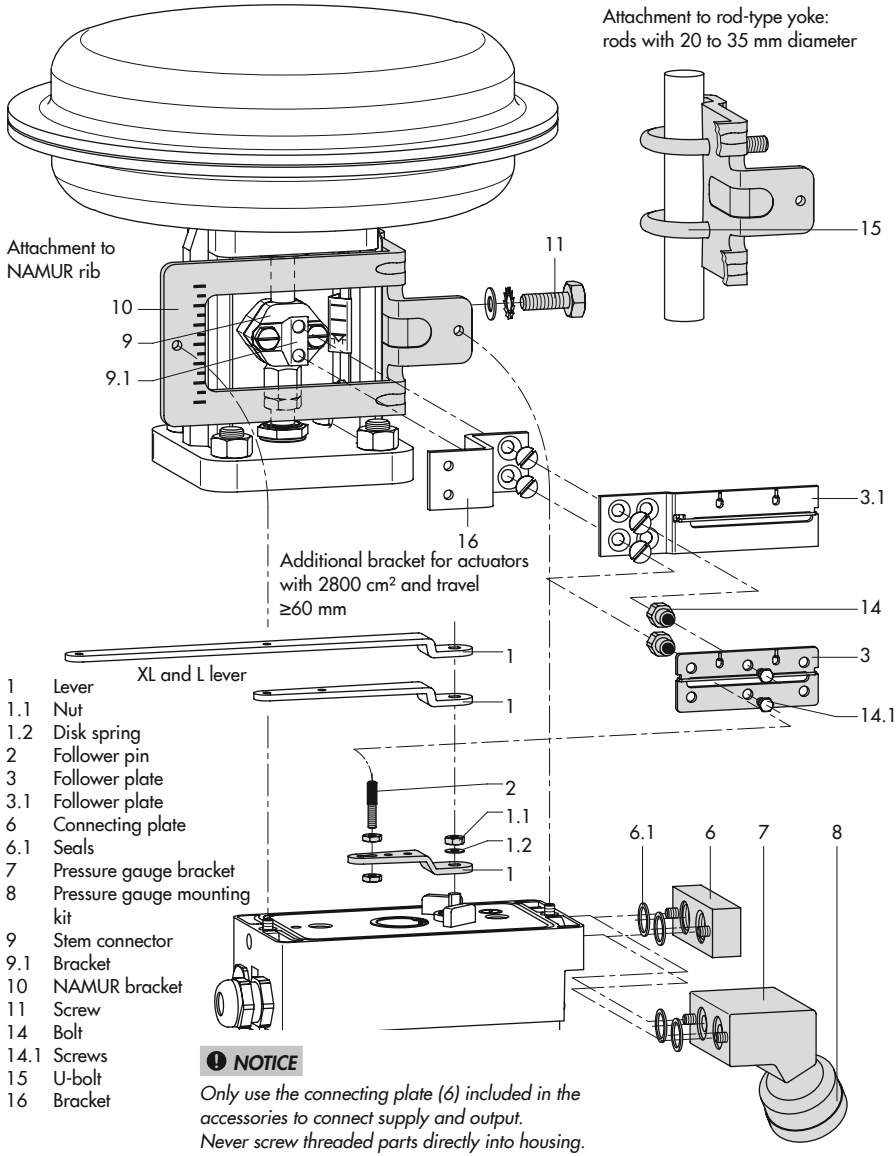


Fig. 8: *Attachment according to IEC 60534-6 (NAMUR)*

5.5 Attachment according to VDI/VDE 3847-1

➔ Refer to Fig. 9

The following positioners with air purging of the actuator's spring chamber can be attached according to VDI/VDE 3847:

– Type 3730-1xx0000000x00**6**000
– Type 3730-1xx0000000x00**7**000

Type 3730-1xx0000000x00**0**000 Positioner without air purging of the actuator's spring chamber can be attached according to VDI/VDE 3847.

This type of attachment allows the positioner to be replaced quickly while the process is running by blocking the air in the actuator.

The signal pressure can be blocked in the actuator by unscrewing the red retaining screw (20) and turning the air blocker (19) on the bottom of the adapter block.

Attachment to Type 3277 Actuator (see Fig. 9)

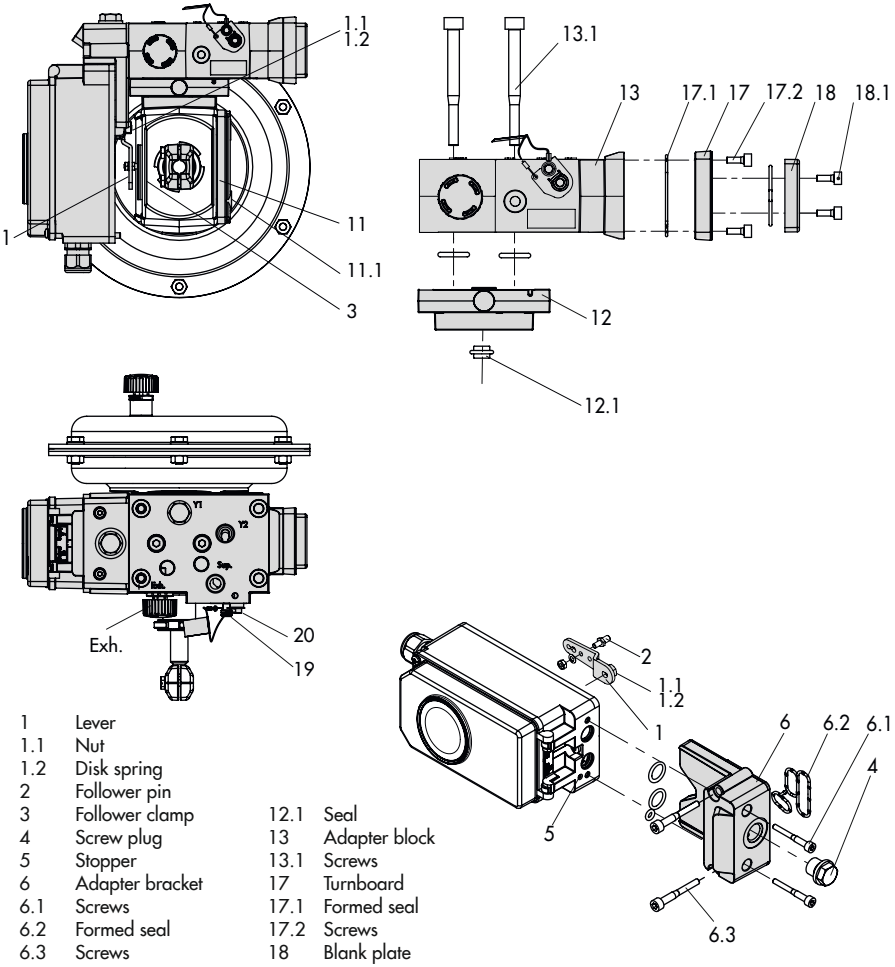
➔ Required mounting parts and accessories: Table 6 on page 19

Mount the positioner on the yoke as shown in Fig. 9. The signal pressure is routed to the actuator over the connecting plate (12), for actuators with fail-safe action "actuator stem extends" internally through a bore in the valve yoke and for "actuator stem retracts" through external piping.

Only the Y1 port is required for positioner attachment. The Y2 port can be used for air purging of the spring chamber.

1. Place follower clamp (3) on the actuator stem, align it and screw tight so that the mounting screw is located in the groove of the actuator stem.
2. Place the adapter bracket (6) on the positioner and mount using the screws (6.1). Make sure that the seals are correctly seated. For positioners **with air purging**, remove the stopper (5) before mounting the positioner. For positioners **without air purging**, replace the screw plug (4) with a vent plug.
3. For actuators with 355, 700 or 750 cm², remove the follower pin (2) on the M lever (1) on the back of the positioner from pin position 35, reposition it in the hole for pin position 50 and screw tight.

   For actuators 175, 240 and 350 cm² with 15 mm travel, keep the follower pin (2) in pin position 35.
4. Insert the formed seal (6.2) in the groove of the adapter bracket (6).
5. Insert the formed seal (17.1) into the turnboard (17) and mount the turnboard to the adapter block (13) using the screws (17.2).
6. Mount the blank plate (18) to the turnboard (17) using the screws (18.1). Make sure that the seals are correctly seated.



1	Lever	12.1	Seal
1.1	Nut	13	Adapter block
1.2	Disk spring	13.1	Screws
2	Follower pin	17	Turnboard
3	Follower clamp	17.1	Formed seal
4	Screw plug	17.2	Screws
5	Stopper	18	Blank plate
6	Adapter bracket	18.1	Screws
6.1	Screws	19	Air blocker
6.2	Formed seal	20	Retaining screw
6.3	Screws		
11	Cover		
11.1	Vent plug		
12	Connecting plate		

Fig. 9: *Attachment according to VDI/VDE 3847 onto Type 3277 Actuator*

i ***Note***

A solenoid valve can also be mounted in place of the blank plate (18). The orientation of the turnboard (17) determines the mounting position of the solenoid valve. Alternatively, a restrictor plate can be mounted (▶ AB 11).

7. Insert the screws (13.1) through the middle holes of the adapter block (13).
8. Place the connecting plate (12) together with the seal (12.1) onto the screws (13.1) corresponding to the fail-safe action "actuator stem extends" or "actuator stem retracts". The fail-safe action that applies is determined by aligning the groove of the adapter block (13) with the groove of the connecting plate (12) (Fig. 10).
9. Mount the adapter block (13) together with the connecting plate (12) to the actuator using the screws (13.1).

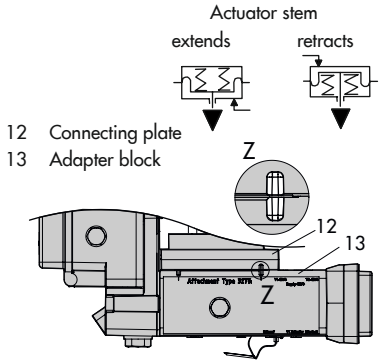


Fig. 10: *Fail-safe action*

10. Insert the vent plug (11.1) into the **Exh.** connection.
11. For fail-safe action "actuator stem extends", seal the Y1 port with a blanking plug.

    For fail-safe action "actuator stem retracts", connect the Y1 port to the signal pressure connection of the actuator.

    Place positioner on the adapter block (13) in such a manner that the follower pin (2) rests on the top of the follower clamp (3). Adjust the lever (1) correspondingly and open the positioner cover to hold the positioner shaft in position at the cap or rotary pushbutton.

    The lever (1) must rest on the follower clamp with spring force.

    Fasten the positioner to the adapter block (13) using the two fastening screws (6.3). Make sure the formed seal (6.2) is properly seated.
12. Mount cover (11) on the other side to the yoke. Make sure that the vent plug is located at the bottom when the control valve is installed to allow any condensed water that collects to drain off.

Attachment to NAMUR rib (see Fig. 11)

➔ Required mounting parts and accessories: Table 6 on page 19

➔ Observe travel tables on page 21.

1. **Series 240 Valves, actuator size up to 1400-60 cm²:** Screw the two bolts (14) to the bracket of the stem connector or directly to the stem connector (depending on the version), place the follower plate (3) on top and use the screws (14.1) to fasten it.

   Type 3251 Valve, 350 to 2800 cm²: Screw the longer follower plate (3.1) to the bracket of the stem connector or directly to the stem connector (depending on the version).

   Type 3254 Valve, 1400-120 to 2800 cm²: Screw the two bolts (14) to the bracket (16). Fasten the bracket (16) onto the stem connector, place the follower plate (3) on top and use the screws (14.1) to fasten it.

   Mount the positioner on the NAMUR rib as shown in Fig. 11.

2. For **attachment to the NAMUR rib**, fasten the NAMUR connection block (10) directly into the existing yoke bore using the screw and toothed lock washer (11). Align the marking on the NAMUR valve connection (on the side marked '1') to 50 % travel.

   For attachment to **valves with rod-type yokes** using the formed plate (15), which is placed around the yoke: screw the four studs into the NAMUR connection block (10). Place the NAMUR connection block on the rod and position the formed plate (15) on the opposite side. Use the nuts and toothed lock washers to fasten the formed plate onto the studs. Align the marking on the NAMUR valve connection (on the side marked '1') to 50 % travel.

3. Place the adapter bracket (6) on the positioner and mount using the screws (6.1). Make sure that the seals are correctly seated. For positioners **with air purging**, remove the stopper (5) before mounting the positioner. For positioners **without air purging**, replace the screw plug (4) with a vent plug.

4. Select required lever size (1) M, L or XL and pin position according to the actuator size and valve travel listed in the travel table on page 21.

Should a pin position other than position 35 with the standard M lever be required or an L or XL lever size be required, proceed as follows:

– Fasten the follower pin (2) in the assigned lever hole (pin position as specified in the travel table). Only use the longer follower pin (2) included in the mounting kit.

– Place the lever (1) on the shaft of the positioner and fasten it tight using the disk spring (1.2) and nut (1.1).

– Move lever once all the way as far as it will go in both directions.

5. Insert the formed seal (6.2) in the groove of the adapter bracket.

6. Insert the formed seal (17.1) into the turnboard (17) and mount the turnboard to the adapter block (13) using the screws (17.2).
7. Mount the blank plate (18) to the turnboard using the screws (18.1). Make sure that the seals are correctly seated.

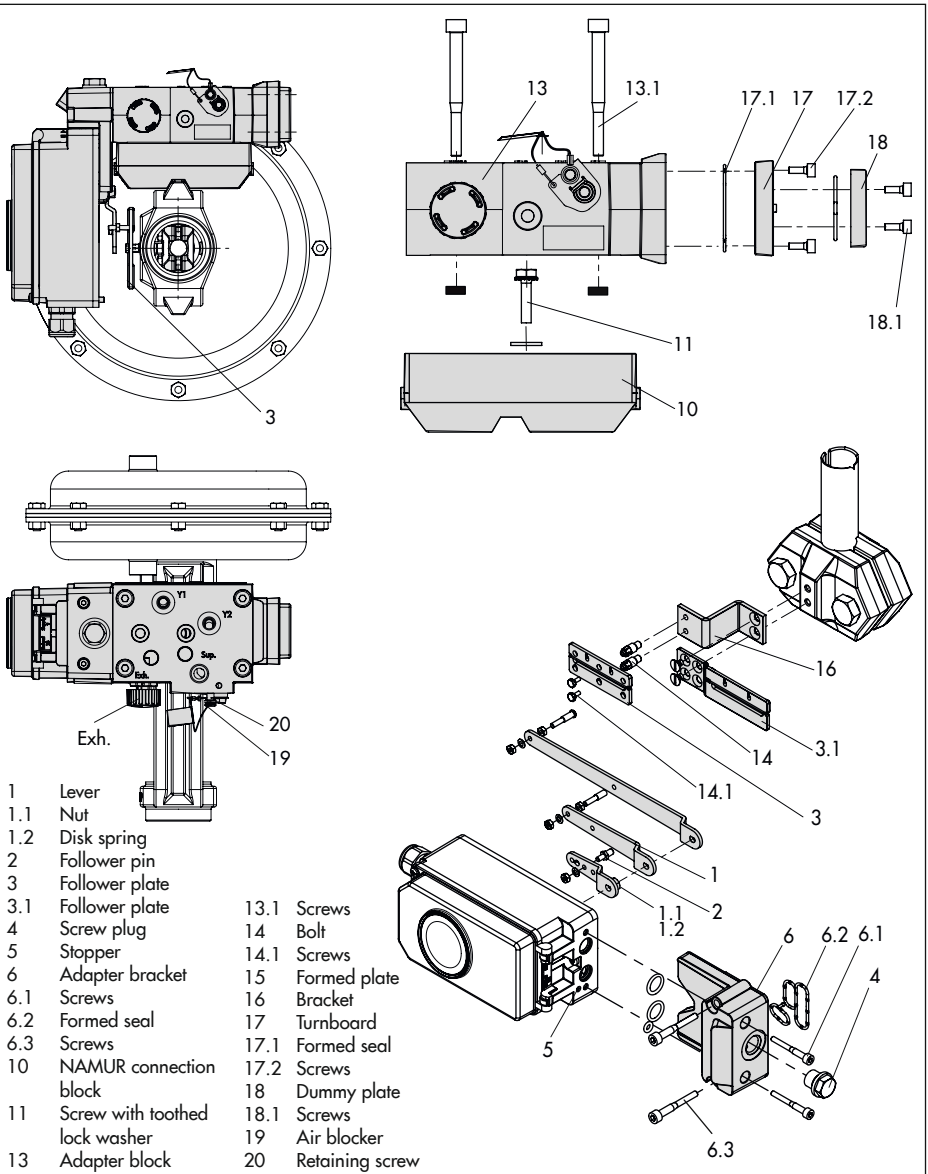
i ***Note***

A solenoid valve can also be mounted in place of the blank plate (18). The orientation of the turnboard (17) determines the mounting position of the solenoid valve. Alternatively, a restrictor plate can be mounted (▶ AB 11).

8. Fasten the adapter block (13) to the NAMUR connection block using the screws (13.1).
9. Insert the vent plug into the Exh. connection.
10. Place the positioner on the adapter block (13) in such a manner that the follower pin (2) rests on the top of the follower plate (3, 3.1). Adjust the lever (1) correspondingly.

    Fasten the positioner to the adapter block (13) using the two fastening screws (6.3). Make sure the formed seal (6.2) is properly seated.
11. For **single-acting actuators without air purging**, connect the Y1 port of the adapter block to the signal pressure connection of the actuator. Seal the Y2 port with a blanking plug.

    For **double-acting actuators and actuators with air purging**, connect the Y2 port of the adapter block to the signal pressure connection of the second actuator chamber or spring chamber of the actuator.



1	Lever	13.1	Screws
1.1	Nut	14	Bolt
1.2	Disk spring	14.1	Screws
2	Follower pin	15	Formed plate
3	Follower plate	16	Bracket
3.1	Follower plate	17	Turnboard
4	Screw plug	17.1	Formed seal
5	Stopper	17.2	Screws
6	Adapter bracket	18	Dummy plate
6.1	Screws	18.1	Screws
6.2	Formed seal	19	Air blocker
6.3	Screws	20	Retaining screw
10	NAMUR connection block		
11	Screw with toothed lock washer		
13	Adapter block		

Fig. 11: *Attachment according to VDI/VDE 3847-1 to a NAMUR rib*

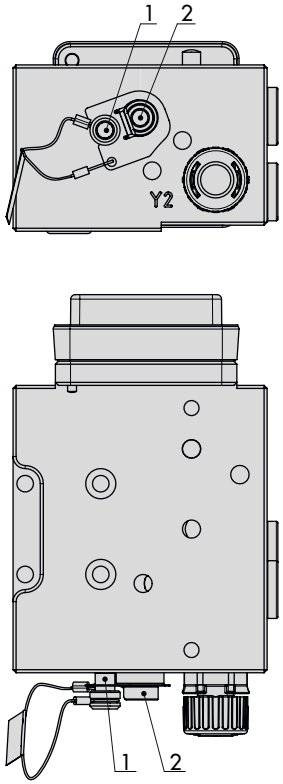
5.6 Attachment according to VDI/VDE 3847-2

Attachment according to VDI/VDE 3847-2 for PFEIFFER SRP (single-acting) and DAP (double-acting) rotary actuators in sizes 60 to 1200 with NAMUR interface and air purging of the actuator's spring chamber allows the direct attachment of the positioner without additional piping.

Additionally, the positioner can be replaced quickly while the process is running by blocking the air in single-acting actuators.

Procedure to block the actuator in place (see Fig. 12):

1. Unscrew the red retaining screw (1).
2. Turn the air blocker (2) on the bottom of the adapter block according to the inscription.



1 Retaining screw
2 Air blocker

Fig. 12: *Adapter block for attachment according to VDI/VDE 3847-2*

5.6.1 Version for single-acting actuator

Mounting onto a PFEIFFER Type 31a (edition 2020+) SRP Rotary Actuator

➔ Refer to Fig. 14.

1. Fasten the adapter block (1) to the actuator's NAMUR interface using the four fastening screws (2).

➔ Make sure that the seals are correctly seated.

2. Mount the follower wheel (3) onto the actuator shaft. Use the matching shaft adapter (see Table 7 on page 20).
3. Place the adapter bracket (4) onto the adapter block (1) and fasten it using the fastening screws (5).

➔ Make sure that the seals are correctly seated.

4. Insert and fasten the follower pin in the 90° position on the positioner's lever (see Fig. 13). Only use the longer follower pin included in the mounting kit.
5. Align the positioner on the adapter bracket (1) in such a way that the follower pin engages into the actuator's follower wheel (3).
6. Fasten the positioner onto the adapter bracket (4) using the fastening screws (6).

➔ Make sure that the seals are correctly seated.

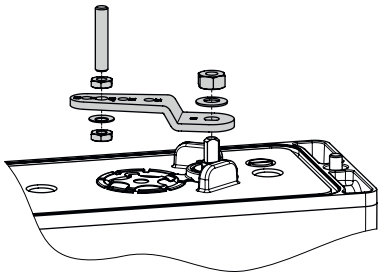


Fig. 13: *Follower pin in 90° position*

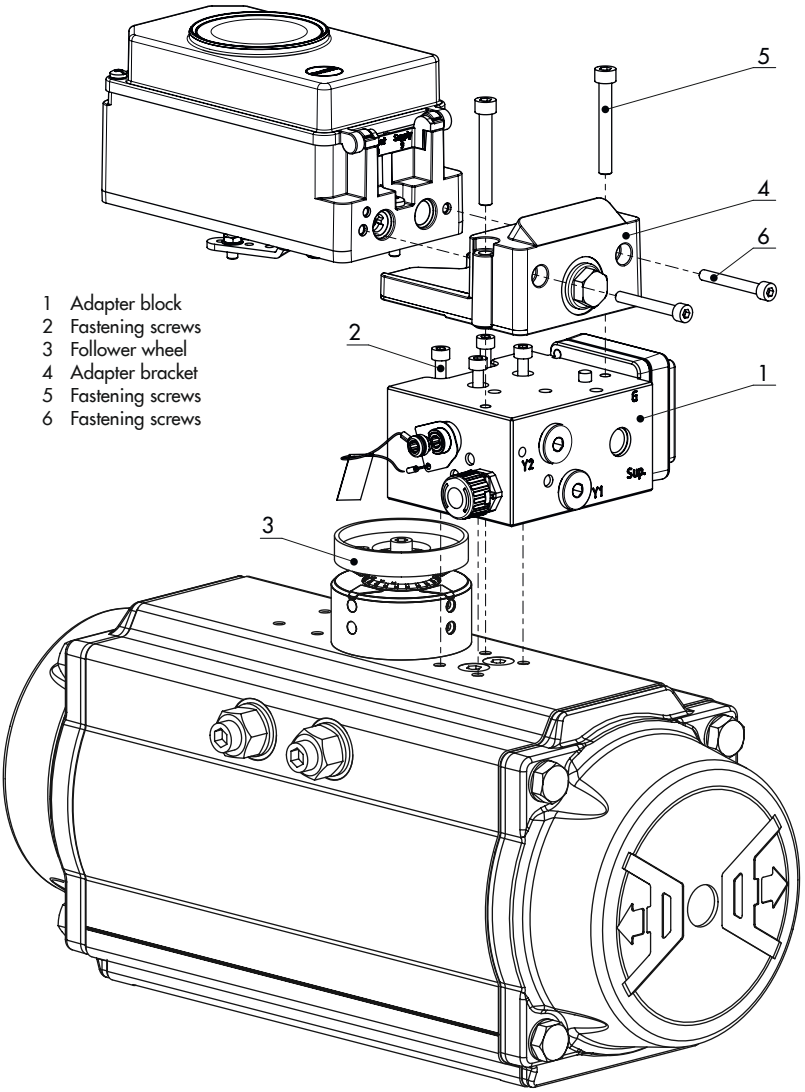


Fig. 14: *Mounting on a single-acting actuator*

5.6.2 Version for double-acting actuator

A reversing amplifier must be additionally mounted for applications with double-acting (DAP) actuators or applications with single-acting (SAP) actuators that include partial stroke testing.

In this case, a special adapter bracket (4) is required for mounting.

➔ Refer to Fig. 16.

1. Fasten the adapter block (1) to the actuator's NAMUR interface using the four fastening screws (2).

➔ Make sure that the seals are correctly seated.

2. Mount the follower wheel (3) onto the actuator shaft. Use the matching adapter (see Table 7 on page 20).
3. Place the adapter bracket (4) onto the adapter block (1) and fasten it using the fastening screws (5).

➔ Make sure that the seals are correctly seated.

4. Insert and fasten the follower pin into the 90° position on the positioner's lever (see Fig. 13 on page 48).
5. Align the positioner on the adapter bracket (1) in such a way that the follower pin engages into the actuator's follower wheel (3).
6. Fasten the positioner onto the adapter bracket (4) using the fastening screws (6).
7. Mount the Type 3710 Reversing Amplifier (7) together with the two guide bushings (8) and terminal plate (9) onto the adapter bracket using the associated fastening screws (10).

➔ Make sure that the seals are correctly seated.

8. Remove the vent plug at the adapter block and seal the opening with the G ¼ screw plug.
9. Mount the turnboard marked '***Doppel***' for double-acting actuators or the turnboard marked '***PST***' for single-acting actuators with partial stroke testing. See Fig. 15.

➔ Make sure that the seals are correctly seated.

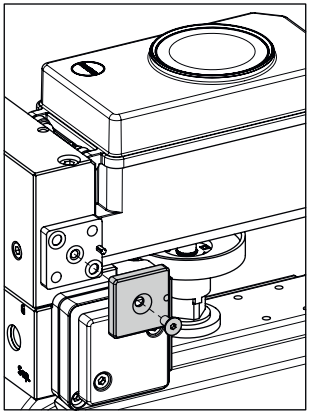


Fig. 15: *Mounting the turnboard*

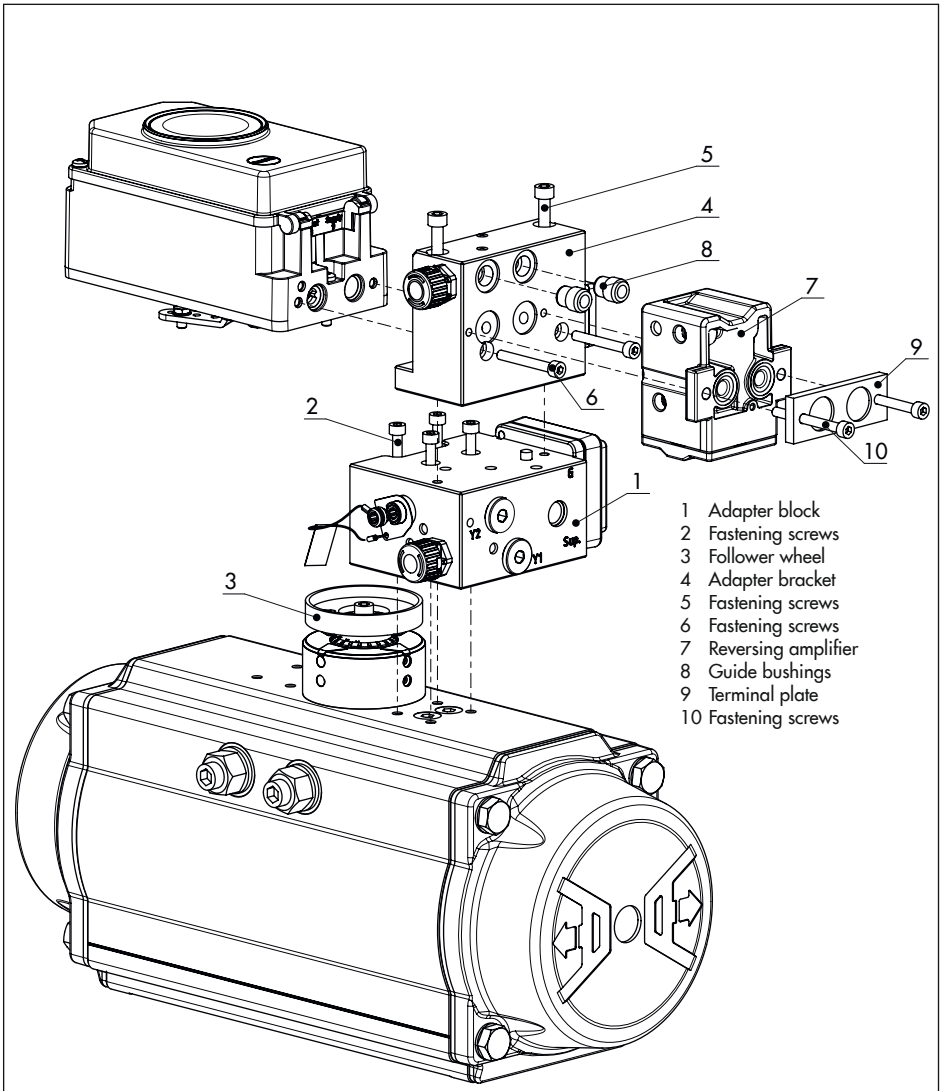


Fig. 16: *Mounting on a double-acting actuator or single-acting actuator with partial stroke testing*

Intermediate plate for AA4 interface

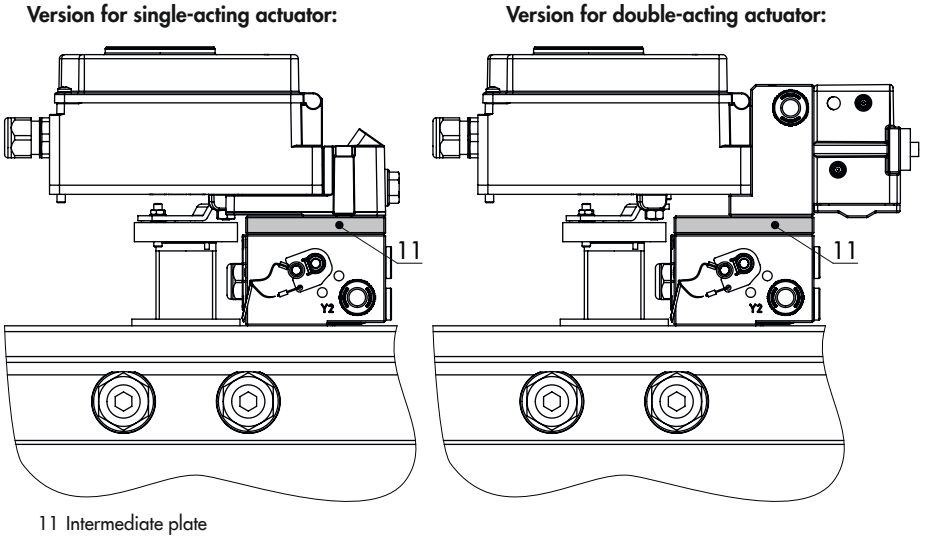
➔ Refer to Fig. 17.

An intermediate plate (1) must be mounted between the adapter block and adapter bracket for PFEIFFER SRP and DAP rotary actuators in sizes 900 and 1200 with AA4 interface. This plate is included in the accessories for the shaft adapter AA4 (see Table 7 on page 20).

Mounting a solenoid valve

➔ Refer to Fig. 18.

A solenoid valve can also be mounted in place of the blank plate (18). The orientation of the turnboard (17) determines the mounting position of the solenoid valve. Alternatively, a restrictor plate can be mounted. Further information can be found in the document ▶ AB 11.



11 Intermediate plate

Fig. 17: *Intermediate plate for actuators in sizes 900 and 1200 for AA4 interface*

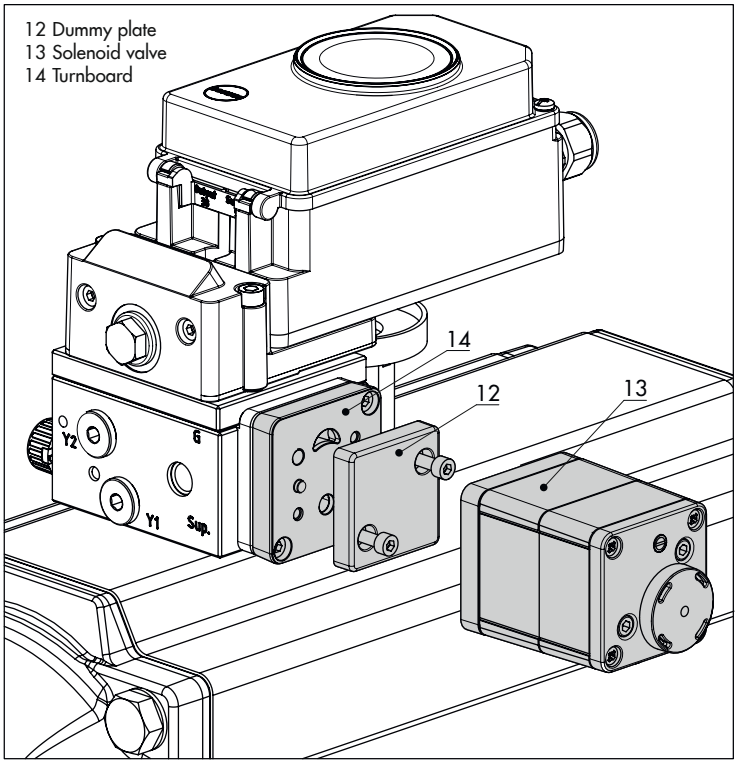


Fig. 18: *Mounting a solenoid valve*

5.7 Attachment to Type 3510 Micro-flow Valve

➔ Refer to Fig. 19

➔ Required mounting parts and accessories: Table 5 on page 19.

➔ Observe travel tables on page 21.

The positioner is attached to the valve yoke using a bracket.

1. Fasten the bracket (9.1) to the stem connector.
2. Screw the two bolts (9.2) to the bracket (9.1) of the stem connector (9), place the follower plate (3) on top and use the screws (9.3) for fastening.
3. Mount the travel indication scale (accessories) to the outer side of the yoke using the hex screws (12.1), ensuring that the scale is aligned with the stem connector.
4. Fasten the hex bar (11) onto the outer side of yoke by screwing the M8 screws (11.1) directly into the holes on the yoke.
5. Fasten the bracket (10) to the hex bar (11) using the hex screw (10.1), washer and tooth lock washer.
6. Mount connecting plate (6) or pressure gauge bracket (7) with pressure gauges on the positioner, making sure the two seals are seated properly.
7. Unscrew the standard M lever (1) including follower pin (2) from the positioner shaft.
8. Take the S lever (1) and screw the follower pin (2) in the hole for pin position 17.
9. Place the S lever on the positioner shaft and screw tight using the disk spring (1.2) and nut (1.1).
   Move lever once all the way as far as it will go in both directions.
10. Place positioner on the bracket (10) in such a manner that the follower pin slides into the groove of the follower pin (3). Adjust the lever (1) correspondingly. Screw the positioner to the bracket (10) using both its screws.

5.8 Attachment to rotary actuators

➔ Refer to Fig. 21

➔ Required mounting parts and accessories: Table 7 on page 20.

➔ Observe travel tables on page 21.

The positioner is mounted to the rotary actuator using two pairs of brackets.

Prior to attaching the positioner to the SAMSON Type 3278 Rotary Actuator, mount the associated adapter (5) to the free end of the rotary actuator shaft.

i ***Note***

On attaching the positioner as described below, it is imperative that the actuator's direction of rotation is observed.

1. Place follower clamp (3) on the slotted actuator shaft or adapter (5).
2. Place coupling wheel (4) with flat side facing the actuator on the follower clamp (3). Refer to Fig. 21 to align slot so that it

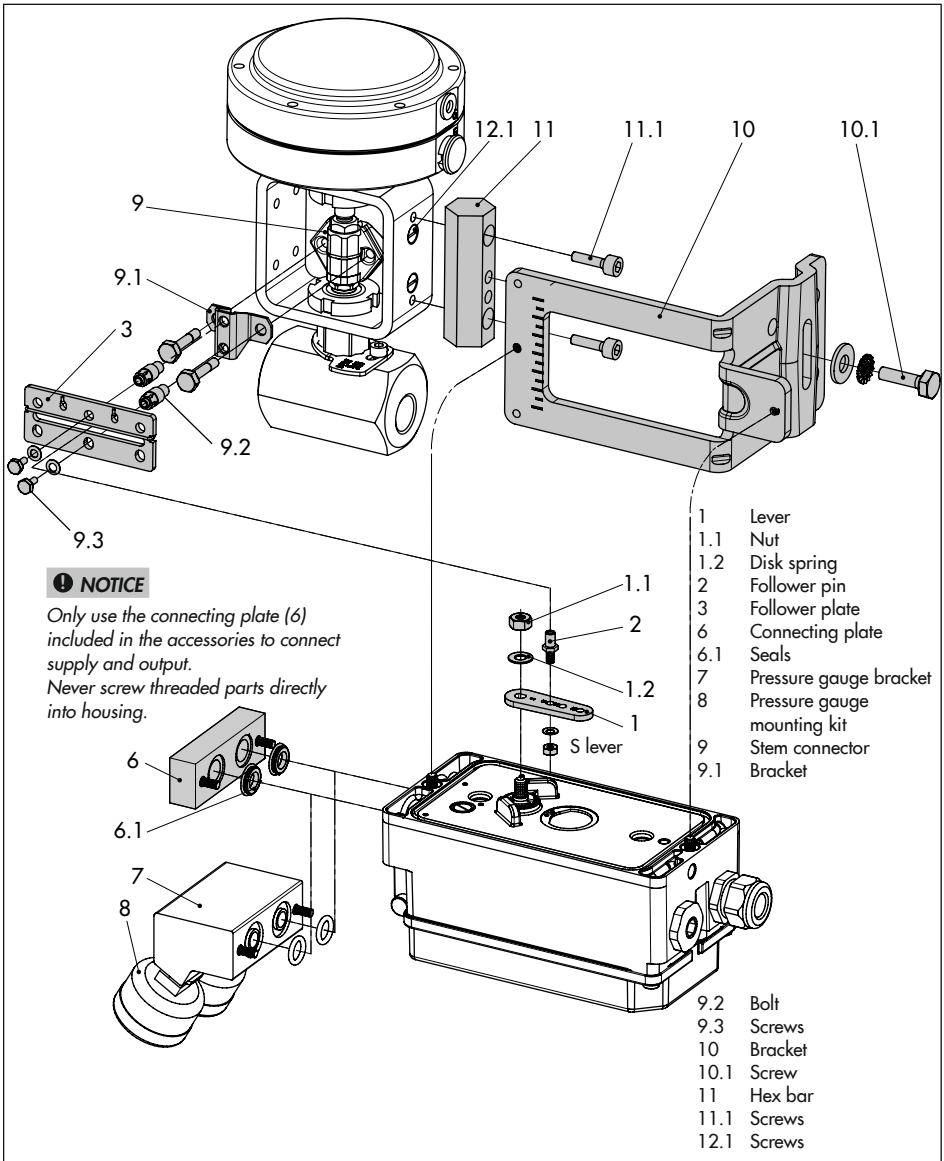


Fig. 19: *Attachment to Type 3510 Micro-flow Valve*

matches the direction of rotation when the valve is in its closed position.

3. Fasten the coupling wheel (4) and follower clamp (3) tightly onto the actuator shaft using screw (4.1) and disk spring (4.2).
4. Fasten the bottom pair of brackets (10.1) with the bends pointing either facing to the inside or to the outside (depending on the actuator size) onto the actuator housing. Position the top pair of brackets (10) and fasten.
5. Mount connecting plate (6) or pressure gauge bracket (7) with pressure gauges on the positioner, making sure the two seals are seated properly. Double-acting springless rotary actuators require the use of a reversing amplifier on the connection side of the positioner housing (see section 5.9).

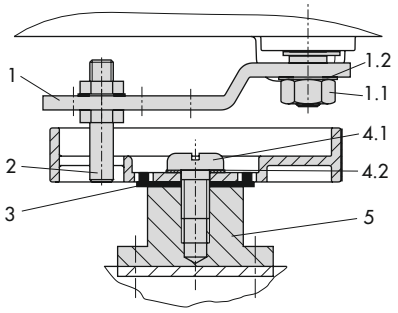


Fig. 20: *Mounting the coupling wheel on Type 3278*

6. Unscrew the standard follower pin (2) from the positioner's **M** lever (1). Use the metal follower pin (Ø 5 mm) included in the mounting kit and screw tight into the hole for pin position **90°**.
7. Place positioner on the top bracket (10) and fasten tight. Taking the actuator's direction of rotation into account, adjust lever (1) so that it engages in the slot of the coupling wheel (4) with its follower pin (Fig. 21). It must be guaranteed that the lever (1) is parallel to the long side of the positioner when the actuator is at half its angle of rotation.
8. Stick the scale plate (4.3) on the coupling wheel so that the arrow tip indicates the closed position and it can be easily read when the valve is installed.

5.8.1 Heavy-duty version

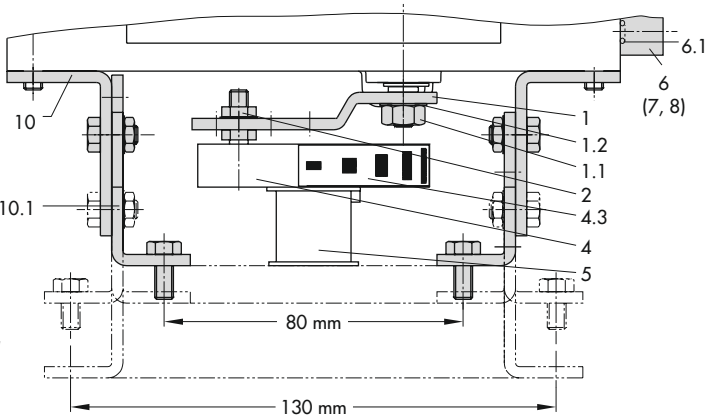
➔ Refer to Fig. 23

➔ Required mounting parts and accessories: Table 7 on page 20.

Both mounting kits contain all the necessary mounting parts. The parts for the actuator size used must be selected from the mounting kit.

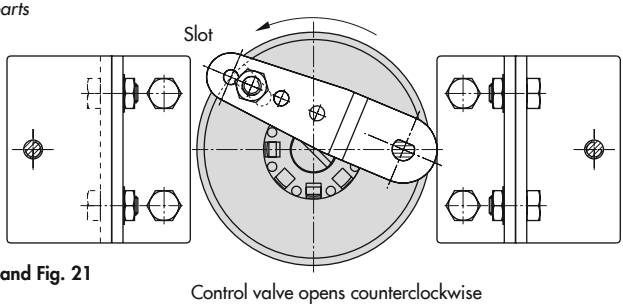
Prepare actuator and mount possibly required adapter supplied by the actuator manufacturer.

1. Mount the housing (10) onto the rotary actuator. In case of VDI/VDE attachment, place spacers (11) underneath, if necessary.



NOTICE

Only use the connecting plate (6) included in the accessories to connect supply and output. Never screw threaded parts directly into housing.



Legend for Fig. 20 and Fig. 21

1	Lever
1.1	Nut
1.2	Disk spring
2	Follower pin
3	Follower clamp
4	Coupling wheel
4.1	Screw
4.2	Disk spring
4.3	Scale plate
5	Actuator shaft Adapter for Type 3278
6	Connecting plate
6.1	Seals
7	Pressure gauge bracket
8	Pressure gauge mounting kit
10	Top pair of brackets
10.1	Bottom pair of brackets

Fig. 21: *Attachment to rotary actuators*

2. For **SAMSON Type 3278 and VETEC S160** Rotary Actuators, screw the adapter (5) onto the free end of the shaft or place adapter (5.1) onto the shaft of the **VETEC R Actuator**. Place adapter (3) onto **Type 3278, VETEC S160 and VETEC R** Actuators. For **VDI/VDE version**, this step depends on the actuator size.
3. Stick adhesive label (4.3) onto the coupling in such a manner that the yellow part of the sticker is visible in the window of the housing when the valve is OPEN. Adhesive labels with explanatory symbols are enclosed and can be stuck on the enclosure, if required.
4. Fasten coupling wheel (4) on the slotted actuator shaft or adapter (3) using screw (4.1) and disk spring (4.2).

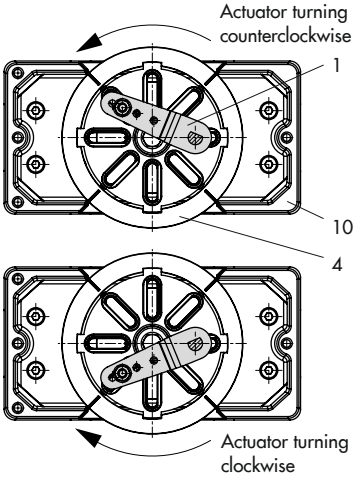


Fig. 22: *Direction of rotation*

5. Unscrew the standard follower pin (2) from the positioner's M lever (1). Attach the follower pin (Ø5 mm) included in the mounting kit to pin position 90°.
6. Mount connecting plate (6) for required G ¼ connecting thread or pressure gauge bracket (7) with pressure gauges on the positioner, making sure the two seals (6.1) are seated properly. Double-acting springless rotary actuators require the use of a reversing amplifier on the connection side of the positioner housing (see section 5.9).
7. For actuators with a volume of less than 300 cm³, fit the restriction (order no. 1400-6964) into the signal pressure output of the positioner (or the output of the pressure gauge bracket or connecting plate).
8. Place positioner on housing (10) and screw it tight. Taking the actuator's direction of rotation into account, adjust lever (1) so that it engages in the correct slot with its follower pin (Fig. 22).

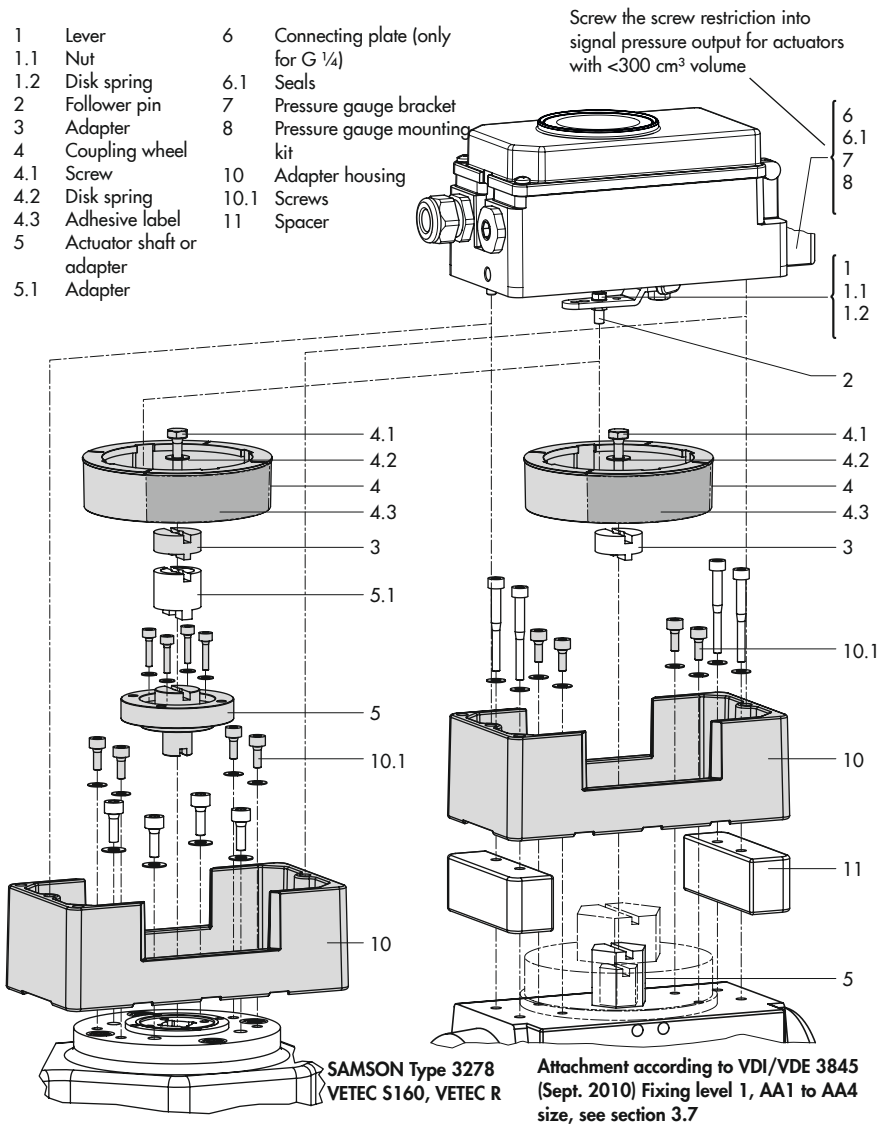


Fig. 23: *Attachment to rotary actuators (heavy-duty version)*

5.9 Reversing amplifier for double-acting actuators

For the use with double-acting actuators, the positioner must be fitted with a reversing amplifier:

➔ SAMSON Type 3710 Reversing Amplifier ▶ EB 8392

➔ If a different reversing amplifier (item no. 1079-1118 or 1079-1119) is used, mount it as described in section 5.9.1.

The following applies to all reversing amplifiers:

The signal pressure of the positioner is supplied at the output 1 of the reversing amplifier. An opposing pressure, which equals the required supply pressure (Z) when added to the pressure at output 1, is applied at output 2.
The following relationship applies:
output 1 + output 2 = Supply pressure (Z).

Connect output 1 to the signal pressure connection on the actuator that causes the valve to open when the pressure rises.

Connect output 2 to the signal pressure connection on the actuator that causes the valve to close when the pressure rises.

i ***Note***

How the outputs are marked depends on the reversing amplifier used:
*– **Type 3710:** Output 1/2 = Y_1/Y_2*
*– **1079-1118 and 1079-1119:***
Output 1/2 = A_1/A_2

5.9.1 Reversing amplifier (1079-1118 or 1079-1119)

➔ Refer to Fig. 24.

1. Mount the connecting plate (6) from the accessories in Table 11 to the positioner. Make sure that both O-rings (6.1) are seated correctly.
2. Thread the special nuts (1.3) from the accessories of the reversing amplifier into the boreholes of the connecting plate.
3. Insert the gasket (1.2) into the recess of the reversing amplifier and slide both the hollowed special screws (1.1) into the connecting boreholes $\mathbf{A_1}$ and **Z**.
4. Place the reversing amplifier onto the connecting plate (6) and screw tight using both the special screws (1.1).
5. Use a screwdriver (8 mm wide) to screw the enclosed filters (1.6) into the connection boreholes $\mathbf{A_1}$ and **Z**.

! ***NOTICE***

Air can escape uncontrolled from the signal pressure connection.
Do not unscrew the sealing plug (1.5) out of the reversing amplifier.

i ***Note***

The rubber seal (1.4) is not required and can be removed when the sealing plug is used.

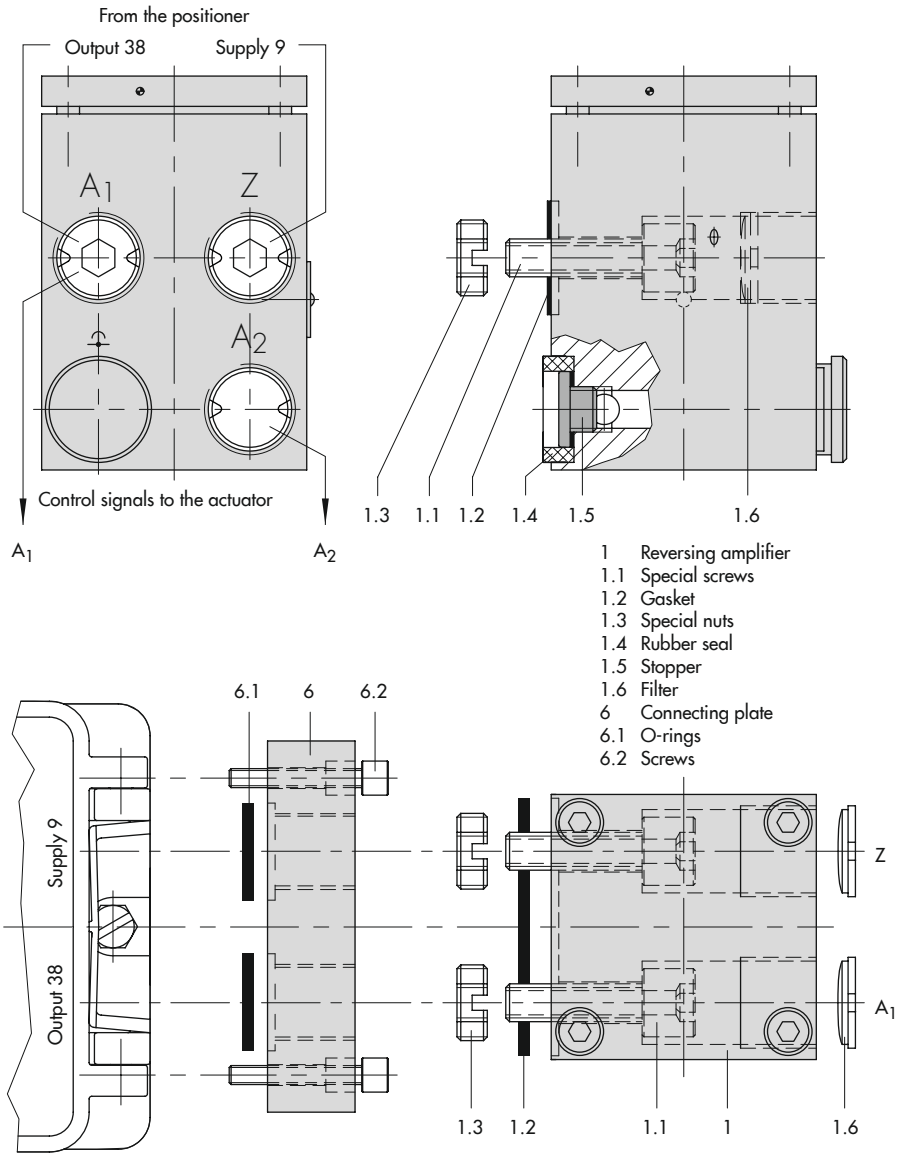


Fig. 24: *Mounting a reversing amplifier (1079-1118 or 1079-1119)*

Pressure gauge attachment

The mounting sequence shown in Fig. 24 remains unchanged. Screw a pressure gauge bracket onto the connections $\mathbf{A_1}$ and **Z**.

Pressure gauge bracket	G ¼	1400-7106
	¼ NPT	1400-7107

Pressure gauges for supply air Z and output A_1 as listed in Table 3 to Table 8.

5.10 Attaching positioners with stainless steel housings

Positioners with stainless steel housings require mounting parts that are completely made of stainless steel or free of aluminum.

i ***Note***

The pneumatic connecting plate and pressure gauge bracket are available in stainless steel (order numbers listed below). The Type 3710 Pneumatic Reversing Amplifier is also available in stainless steel.

Connecting plate (stainless steel)	G ¼	1400-7476
	¼ NPT	1400-7477
Pressure gauge bracket (stainless steel)	G ¼	1402-0265
	¼ NPT	1400-7108

Table 2 to Table 8 apply for attaching positioners with stainless steel housings with the following restrictions:

Direct attachment

All mounting kits from Table 3 and Table 4 can be used. The connection block is not required. The stainless steel version of the pneumatic connecting plate routes the air internally to the actuator.

Attachment according to IEC 60534-6 (NAMUR rib or attachment to rod-type yokes)

All mounting kits from Table 5 can be used. Connecting plate in stainless steel.

Attachment to rotary actuators

All mounting kits from Table 8 can be used except for the heavy-duty version. Connecting plate in stainless steel.

5.11 Air purging function for single-acting actuators

The instrument air leaving the positioner is diverted to the actuator spring chamber to provide corrosion protection inside the actuator. The following must be observed:

Direct attachment to Type 3277-5 (stem extends FA/stem retracts FE)

The air purging function is automatically provided.

Direct attachment to Type 3277, 175 to 750 cm²

FA: Remove the stopper (12.2, Fig. 7) at the connection block and make a pneumatic connection to the spring chamber on the vented side.

NOTICE

Mounting possibly incorrect when old powder-paint-coated aluminum connection blocks are used.
Mount old powder-paint-coated aluminum connection blocks as described in sections on Attachment according to IEC 60534-6 (NAMUR rib or attachment to rod-type yokes) and Attachment to rotary actuators.

FE: The air purging function is automatically provided.

Attachment according to IEC 60534-6 (NAMUR rib or attachment to rod-type yokes) and to rotary actuators

The positioner requires an additional port for the exhaust air that can be connected over piping. An adapter available as an accessory is used for this purpose:

Threaded bushing (M20x1.5)	G ¼	0310-2619
	¼ NPT	0310-2550

Note

*The adapter uses one of the M20x1.5 connections in the housing which means **only one** cable gland can be installed.*

Should other valve accessories be used which vent the actuator (e.g. solenoid valve, volume booster, quick exhaust valve), this exhaust air must also be included in the purging function. The connection over the adapter at the positioner must be protected with a check valve (e.g. check valve G ¼, order no. 8502-0597) mounted in the piping. Otherwise the pressure in the positioner housing would rise above the ambient pressure and damage the positioner when the exhausting components respond suddenly.

5.12 Pneumatic connections

⚠ WARNING

Risk of injury by possible movement of exposed parts (positioner, actuator or valve) after connecting the signal pressure.
Do not touch or block exposed moving parts.

NOTICE

Incorrect connection of the supply air will damage the positioner and will lead to malfunction.
Screw the screw fittings into the connecting plate, pressure gauge mounting block or connection block from the accessories.

The pneumatic ports are located on the back of the positioner (see Fig. 25).

NOTICE

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

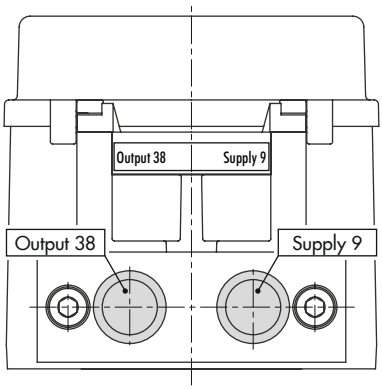


Fig. 25: *Pneumatic connections*

5.13 Connecting the supply air

NOTICE

Risk of malfunction due to incorrect sequence of mounting, installation and start-up.
Keep the following sequence.

1. *Remove the protective caps from the pneumatic connections.*
2. *Mount the positioner on the valve.*
3. *Connect the supply air.*
4. *Connect the electrical power.*
5. *Perform settings.*

The pneumatic connections in the connecting plate, pressure gauge mounting block and connection block are optionally designed as a bore with ¼ NPT or G ¼ thread. Customary fittings for metal or copper tubing or plastic hoses can be used.

➔ Read instructions in section 5.12.

5.13.1 Signal pressure connection

The signal pressure connection depends on how the positioner is mounted onto the actuator:

Type 3277 Actuator

➔ The signal pressure connection is fixed.

Attachment according to IEC 60534-6 (NAMUR)

➔ For "actuator stem retracts" fail-safe action: connect the signal pressure to the connection on top of the actuator.

➔ For "actuator stem extends" fail-safe action: connect the signal pressure to the connection on the bottom of the actuator.

Rotary actuators (heavy-duty version)

➔ For rotary actuators, the manufacturer's specifications for connection apply.

5.13.2 Signal pressure gauges

Tip

To monitor the supply air and signal pressure, we recommend mounting pressure gauges (see accessories in section 3.3).

Mounting the pressure gauges:

➔ See section 5.4 and section Fig. 8

5.13.3 Supply pressure

The required supply air pressure depends on the bench range and the actuator's direction of action (fail-safe action).

The bench range is written on the nameplate either as the bench range or signal pressure range depending on the actuator. The direction of action is marked FA or FE or by a symbol.

Actuator stem extends FA (AIR TO OPEN)

Fail-close (for globe and angle valves):

➔ Required supply pressure = Upper bench range value + 0.2 bar, at least 1.4 bar.

Actuator stem retracts FE (AIR TO CLOSE)

Fail-open (for globe and angle valves):

For tight-closing valves, the maximum signal pressure pst_{max} is roughly estimated as follows:

$$pst_{max} = F + \frac{d^2 \cdot \pi \cdot \Delta p}{4 \cdot A} \text{ [bar]}$$

d = Seat diameter [cm]
Δp = Differential pressure across the valve [bar]
A = Actuator area [cm²]
F = Upper bench range value of the actuator [bar]

If there are no specifications, calculate as follows:

➔ Required supply pressure = Upper bench range value + 1 bar

5.13.4 Signal pressure (output)

The signal pressure at the output (38) of the positioner can be restricted to approx. 2.4 bar by setting P9 parameter code to ON.

5.14 Electrical connections

For electrical installation, observe the relevant electrotechnical regulations and the accident prevention regulations that apply in the country of use. In Germany, these are the VDE regulations and the accident prevention regulations of the employers' liability insurance.

⚠ DANGER

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

The following regulations apply to installation in hazardous areas: EN 60079-14 (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 housing.
– Do not exceed the maximum permissible 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).

The ambient temperature ranges of the tables in the EC type examination certificate apply for the assignment between the permissible ambient temperature, temperature class, maximum short-circuit currents and maximum power P_i and P_0.

The following applies additionally: For positioners in type of protection Ex tb (Type 3730-15) and type of protection Ex nA (Type 3730-18), the cable glands and blanking plugs must be certified according to EN 60079-7 (Ex e).

Selecting cables and wires

Observe **Clause 12 of EN 60079-14** for installation of the intrinsically safe circuits.

Clause 12.2.2.7 applies when running multicore cables or wires with more than one intrinsically safe circuit.

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 or wires 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 entries.

Equipment for use in zone 2/zone 22

In equipment operated according to type of protection Ex nA (non-sparking equipment) according to EN 60079-15, circuits may be connected, interrupted or switched while energized only during installation, maintenance or repair.
The special conditions of use mentioned in the statement of conformity are to be observed for the rated values and the installation of the series-connected fuse for interconnection of Ex nA circuits.

For Ex nA equipment (non-sparking equipment), circuits may be connected, interrupted or switched while energized only during installation, maintenance or repair.

– Positioners with type of protection Ex nA or Ex tc can be used with a closed cover (no window) or or with a cover with window.
– The Types 3730-11, 3730-15 and 3730-18 Positioners are 100 % identical in design, except for the marking and the housing cover.
– The signal current circuit must be connected in series with a fuse according to IEC 60127-2/VI, 250 V T with a fuse rating of I_N ≤63 mA.

The fuses must be installed outside the hazardous area.

Cable entry

Cable entry with M20x1.5 cable gland, 6 to 12 mm clamping range.
There is a second M20x1.5 threaded hole in the housing that can be used for additional connection, when required. The screw terminals are designed for wire cross-sections of 0.2 to 2.5 mm². Tighten the screws by 0.5 to 0.6 Nm.
The wires for the set point must be connected to the terminals 11 and 12 located in the housing. Only use a **current source**!

NOTICE

An incorrect electric signal will damage the positioner.

Do not connect the positioner to a voltage source. The incorrect connection of a voltage source of just around 7 V (or around 2 V when connected to the wrong pole) by mistake can damage the positioner.

Do not interrupt the minimum current 3.7 mA for longer than two minutes!

In general, it is not necessary to connect the positioner to a bonding conductor. Should this be required, however, this conductor can be connected inside the device.

For operation of the limit contacts in Type 3730-11/-13/-18 Positioners, switching amplifiers which comply with EN 60947-5-6 must be connected to terminals 41/42 and 51/52 in the output circuit.

➔ Observe the relevant regulations for installation in hazardous areas.

NOTICE

Malfunctioning of the positioner!
The set point must not fall below 3.7 mA while the positioner is running.

Accessories

Cable glands M20x1.5	Order no.
Black plastic (6 to 12 mm clamping range)	8808-1011
Blue plastic (6 to 12 mm clamping range)	8808-1012
Nickel-plated brass (6 to 12 mm clamping range)	1890-4875
Nickel-plated brass (10 to 14 mm clamping range)	1922-8395
Stainless steel 1.4305 (8 to 14.5 mm clamping range)	8808-0160
Adapter M20x1.5 to ½ NPT	
Powder-coated aluminum	0310-2149
Stainless steel	1400-7114

5.14.1 Connecting the electrical power

NOTICE

Risk of malfunction due to incorrect sequence of mounting, installation and start-up.
Keep the following sequence.

1. *Remove the protective caps from the pneumatic connections.*
2. *Mount the positioner on the valve.*
3. *Connect the supply air.*
4. *Connect the electrical power.*
5. *Perform settings.*

➔ Connect the electrical power (mA signal) as shown in Fig. 26.

5.14.2 Switching amplifier according to EN 60947-5-6

For operation of the limit contacts, switching amplifiers must be connected in the output circuit. They must comply with the limit values of the output circuits conforming to EN 60947-5-6.

➔ Observe the relevant regulations for installation in hazardous areas.

For applications in safe areas (non-hazardous areas), limit contacts can be directly interconnected to the binary input of the PLC in accordance with IEC 61131. This applies to the standard operating range for digital inputs according to Clause 5.2.1.2 of IEC 61131-2 with the rated voltage of 24 V DC.

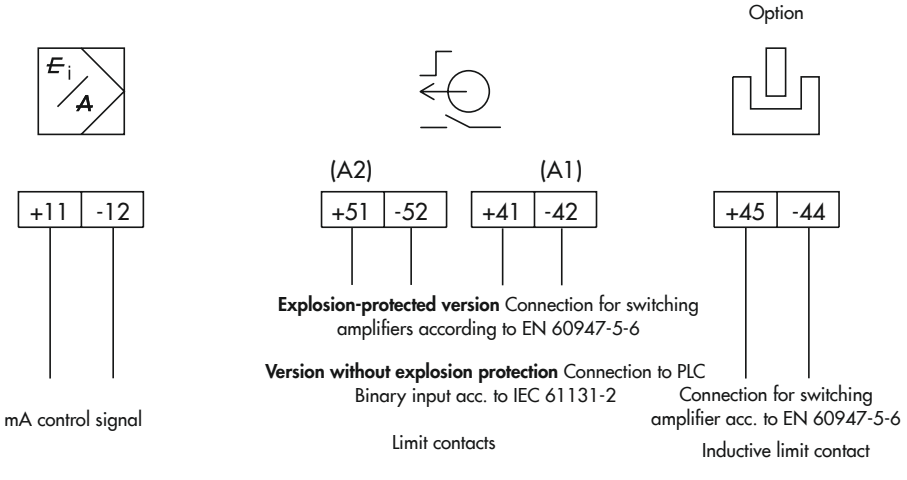


Fig. 26: *Connecting the mA control signal*

6 Operation

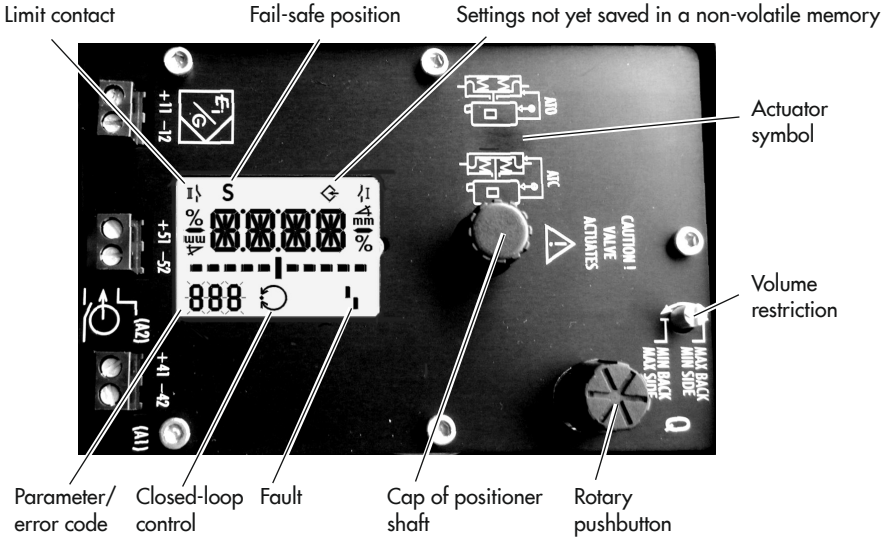


Fig. 27: *Operating controls of Type 3730-1 Positioner*

The rotary pushbutton is mainly used to operate the positioner.

To adapt the air capacity, the volume restriction must be adjusted.

6.1 Rotary pushbutton

Turn ⊛ to select a parameter code (P0 to P21) and then press it to confirm the parameter code selected.

If you want to change a parameter value, turn ⊛ to select the required value. Then press ⊛ to confirm the value.

Parameter values that have been changed are first saved in the EEPROM (protected against power failure) when the display returns to the status indication mode. Turn ⊛ to Code P0 or wait three minutes until the display returns automatically. The parameter code is not saved permanently as long as the ⇨ icon appears at the top of the display.

i ***Note***

After changing settings in P2, P3, P4 and P8 parameter codes, the positioner must be re-initialized.

6.2 Volume restriction Q

The volume restriction serves to adapt the air output capacity to the size of the actuator. Depending on the air passage at the actuator, two fixed settings are available (see section 7.1).

6.3 Display

Icons assigned to certain codes and functions are indicated on the display. The bar elements indicate the system deviation that depends on the sign (+/–) and the value. One bar element appears per 1 % system deviation.

If the positioner has not yet been initialized, the lever position in degrees in relation to the mid-axis is indicated instead of the system deviation. One bar element corresponds to approximately a 5° angle of rotation.

If the fault indication icon ! is displayed, turn ⊛ until *ERR* is displayed to view the E0 to E15 error code(s) (see section 11.3.1).

7 Operating the positioner

NOTICE

Risk of malfunction due to incorrect sequence of mounting, installation and start-up.
Keep the following sequence.

1. *Remove the protective caps from the pneumatic connections.*
2. *Mount the positioner on the valve.*
3. *Connect the supply air.*
4. *Connect the electrical power.*
5. *Perform settings.*

The positioner is ready for operation with its default settings for most applications, provided it has been mounted properly.

The positioner just needs to be initialized after the volume restriction has been set and the fail-safe position has been determined.

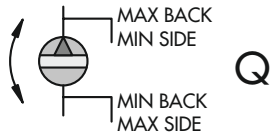
WARNING

Risk of injury due to the actuator stem extending or retracting.
Do not touch or block the actuator stem.

Note

The positioner has a function to monitor the working range. If the lever moves too close to the mechanical stops (risk of mechanical damage), the positioner vents the actuator and the valve moves to its fail-safe position (S displayed together with E8 error code). In this case, check the positioner attachment. Reset the displayed error code by selecting RST (see section 7.7).

7.1 Adjusting the volume restriction Q



Signal pressure \ Transit time	<1 s	≥1 s
Connection at the side	MIN SIDE	MAX SIDE
Connection at the back	MIN BACK	MAX BACK

* Intermediate settings are not permitted.

Fig. 28: *Volume restriction Q*

The volume restriction Q serves to adapt the air output capacity to the size of the actuator:

– Actuators with a **transit time < 1 s**, e.g. linear actuators with an effective area smaller than 240 cm², require a restricted air flow rate (MIN).
– Actuators with a **transit time ≥ 1 s** do not require the air flow rate to be restricted (MAX).

The position of volume restriction Q also depends on how the signal pressure is routed at the actuator in **SAMSON actuators**:

'SIDE' inscription

– For actuators with a signal pressure connection at the side, e.g. Type 3271-5
– For actuators from other manufacturers

'BACK' inscription

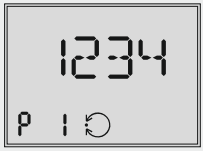
– For actuators with a signal pressure connection at the back, e.g. Type 3277-5

NOTICE

Malfunction due to changed start-up settings. Initialize an initialized positioner again after the position of the volume restriction has been changed.

7.2 Adapting the display direction

To adapt the reading on the display to the mounting situation of the actuator, the display contents can be turned by 180°.



Reading direction for right attachment of pneumatic connections

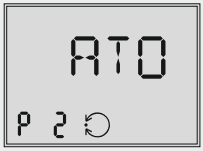
1. Turn ⊛ until Code P1 appears.
2. Press ⊛, the code P1 blinks.
3. Turn ⊛ and select the required reading direction.
4. Press ⊛ to confirm.

7.3 Determining the fail-safe position

– AIR TO OPEN (ATO) applies to a valve opening as the signal pressure increases.
– AIR TO CLOSE (ATC) applies to a valve closing as the signal pressure increases.

The signal pressure is the pneumatic pressure at the output of the positioner applied to the actuator.

AIR TO OPEN (ATO) always applies to positioners with a mounted reversing amplifier for double-acting rotary actuators (connections according to section 5.9).



Default: ATO

1. Turn ⊛ until Code P2 appears.
2. Press ⊛, the code P2 blinks.
3. Turn ⊛ and select the required fail-safe position (ATO or ATC).
4. Press ⊛ to confirm.

7.4 Setting other parameters

Table 14 lists all the parameter codes and their default settings. If you want to change the default setting of a parameter, proceed as described previously.

More details concerning the parameter codes can be found in section 11.3.

Table 14: *Parameter codes*

Codes marked by an asterisk (*) indicate that the positioner needs to be re-initialized afterwards [...] Default settings			
P0	Status reading	**P11**	Set point cutoff increase [OFF]
P1	Reading direction	**P12**	Limit value A1 switching threshold [2 %]
P2*	Fail-safe position [ATO]/ATC	**P13**	Limit value A2 switching threshold [98 %]
P3*	Pin position [35]	**P14**	Reading of set point w
P4*	Nominal range [MAX]	**P15**	Start initialization
P5	Characteristic [0]	**P16**	Start zero calibration
P6	Set point [4 to 20 mA]	**P17**	Start manual mode
P7	w/x direction of action [>>]	**P18**	Load default settings
P8*	Gain K_P [50]	**P19**	free
P9	Pressure limit 2.4 bar [OFF]	**P20**	Firmware version
P10	Set point cutoff decrease [ON]	**P21**	Control mode [PD]/PID

7.5 Initializing the positioner

⚠ WARNING

Risk of injury by exposed moving parts on the positioner, actuator or valve.
Do not touch or block exposed moving parts.

NOTICE

The process is disturbed by the movement of the actuator or valve.
Do not perform the initialization while the process is running. First isolate the plant by closing the shut-off valves.

➔ Check the max. permissible signal pressure of the valve before starting initialization. During initialization, the positioner issues an output signal pressure up to the maximum supply pressure supplied. If necessary, limit the signal pressure by connecting an upstream pressure reducing valve.

i Note

Reset positioner to its default settings (see section 7.7) before mounting it on a different actuator or changing its mounting position.

During initialization the positioner adapts itself optimally to the friction conditions and the signal pressure required by the control valve.

The type and extent of self-adaptation depends on the preset parameters.

MAX is the default setting for the nominal range (Code P4). During the initialization process, the positioner determines the travel/rotational angle of the closing element from the CLOSED position as far as it will go in the other direction.

Tip

For normal operation, simply start initialization over Code P15 after mounting the positioner on the valve, setting the volume restriction and setting the fail-safe position (P2). The positioner only works with its default settings.

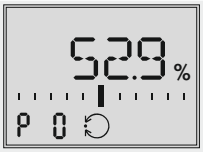
Start initialization by activating Code P15 as follows:



1. Turn ⊛ until Code P15 appears.
2. Press ⊛ and hold for six seconds.
   Reading: ***6-5-4-3-2-1-***
   Initialization starts. The display blinks.

i Note

The time required for the initialization procedure depends on the actuator transit time and can take a few minutes.



Initialization successfully completed, positioner runs in closed-loop operation

After a successful initialization, the positioner runs in closed-loop operation indicated by the ↻ closed-loop operation icon and control position in % predetermined by the set point on the display.

A malfunction leads to the process being interrupted. The ! fault indication icon is displayed. See section 9.

Canceling initialization

The initialization can be canceled by pressing ⊛.

Press ⊛, blinking display: ***ESC***

Press ⊛ to confirm cancellation.

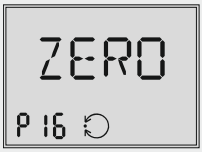
Example 1: A positioner that has not yet been initialized goes to the fail-safe position after the initialization process has been canceled.

Example 2: The initialized positioner goes to AUTO mode after the re-initialization process has been canceled. The settings of the previous initialization are used.

7.6 Zero calibration

In case of inconsistencies in the fail-safe position of the valve, e.g. with soft-seated plugs, it might be necessary to recalibrate zero.

Start the zero calibration by activating Code P16 as follows:



1. Turn ⊛ until Code P16 appears.
2. Press ⊛ and hold for six seconds. Reading: ***6-5-4-3-2-1-***

   Zero calibration starts, the display blinks.

The positioner moves the control valve to the CLOSED position and recalibrates the internal electric zero point.

When the zero calibration has been successfully completed, the positioner returns to closed-loop operation (display with status indication).

Canceling zero calibration

The zero calibration can be canceled by pressing ⊛. The positioner returns the AUTO mode. ***ESC*** blinks on the display and must be confirmed.

A new zero calibration can be started directly afterwards.

7.7 Resetting to default settings

The positioner is in closed-loop operation after the initialization has been successfully completed.

A reset causes an initialization to be undone and all parameters settings are reset to the default settings (see code list in section 11.3).

In Code ***P18***

1. Turn ⊛ until Code P18 appears.
2. Press ⊛ and hold for six seconds.
   Reading: ***6-5-4-3-2-1-***

7.8 Manual mode

The valve position can be moved as follows using the Manual mode function:

1. Turn ⊛ until Code P17 appears.
2. Press ⊛ and hold for six seconds.
   Reading: ***6-5-4-3-2-1-***
   The manual set point (w man) is indicated on the display of an **initialized positioner**.

   The lever position in degrees in relation to the mid-axis is indicated on the display of a positioner that **has not been initialized**.
3. Turn ⊛.
   Initialized positioner: the manual set point is adjusted in steps of 0.1 %. You can move the valve controlled within its range.

   Positioner that has not been initialized: the valve is only moved in one direction uncontrolled by adjusting the manual set point.
4. Press ⊛ to deactivate the manual mode function.

i ***Note***

*The Manual mode function can only be exited as described. The positioner does **not** automatically exit this function after three minutes and return to the display showing the status indication.*

8 Servicing

Note

The positioner was checked by SAMSON before it left the factory.

- *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 department.*
- *Only use original spare parts by SAMSON, which comply with the original specifications.*

The positioner does not require any maintenance.

Housing cover

Occasionally, the window in the cover may need to be cleaned.

NOTICE

Incorrect cleaning will damage the window. The window is made of Makrolon® (new design) and will be damaged when cleaned with abrasive cleaning agents or agents containing solvents.

- *Do not rub the window dry.*
- *Do not use any cleaning agents containing chlorine or alcohol or abrasive cleaning agents.*
- *Use a non-abrasive, soft cloth for cleaning.*

Filters

There are filters with a 100 µm mesh size in the pneumatic connections for supply and output which can be removed and cleaned, if required.

Supply air pressure reducing stations

The maintenance instructions of any upstream supply air pressure reducing stations must be observed.

8.1 Preparation for return shipment

Defective positioners 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 positioner (see section 10).
3. Send the positioner to your nearest SAMSON subsidiary. SAMSON subsidiaries are listed on our website at ▶ www.samson.de > Contact.

9 Malfunctions

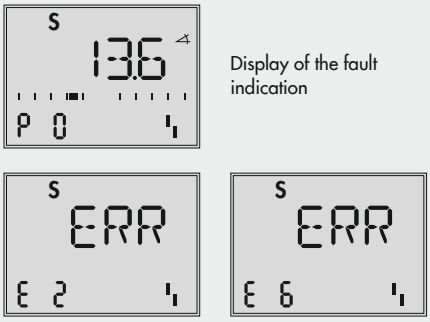
In case of a fault, the fault indication icon appears at the bottom of the display.

Turn past Code ***P0*** or ***P21.*** The respective error code ***E0*** to ***E15*** together with ***ERR*** appear on the display.

Refer to the error codes (section 11.3.1) for the cause of the errors and the recommended action.

Example:

If, for instance, a travel has been entered in Code P4 (nominal range) which is larger than the maximum valve travel possible, the initialization process would be interrupted (E2 error code) because the rated travel would not have been reached (E6 error code). The valve moves to the fail-safe position (*S* indicated on the display).



Display of the fault indication

The nominal range (Code P4) must be changed and the positioner re-initialized to remedy this problem.

Reset error codes

The E0 and E8 error codes can be reset as follows:



1. Turn to select the error code.
2. Press , display: *ESC*
3. Turn until RST appears.
4. Press to reset the error.

The reset procedure can be canceled by pressing when *ESC* appears.

9.1 Emergency action

Upon failure of the air supply or electric signal, the positioner vents the actuator, causing the valve to move to the fail-safe position determined by the actuator.

Tip

Emergency action in the event of valve or actuator failure is described in the associated valve and actuator documentation.

➔ The plant operator is responsible for emergency action to be taken in the plant.

10 Decommissioning and removal

⚠ DANGER

Risk of fatal injury due to ineffective explosion protection.

The explosion protection becomes ineffective when the positioner cover is opened.
The following regulations apply to installation in hazardous areas: EN 60079-14 (VDE 0165, Part 1).

NOTICE

The process is disturbed by interrupting closed-loop control.
Do not mount or service the positioner while the process is running and only after isolating the plant by closing the shut-off valves.

10.1 Decommissioning

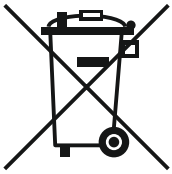
To decommission the positioner before removing it, proceed as follows:

1. Disconnect and lock the air supply and signal pressure.
2. Open the positioner cover and disconnect the wires for the control signal.

10.2 Removing the positioner

1. Disconnect the wires for the control signal from the positioner.
2. Disconnect the lines for supply air and signal pressure (not required for direct attachment using a connection block).
3. To remove the positioner, loosen the three fastening screws on the positioner.

10.3 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.

Note

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

Tip

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

11 Appendix

11.1 After-sales service

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

E-mail

You can reach the After-sales Service Department at aftersalesservice@samson.

Addresses of SAMSON AG and its subsidiaries

The addresses of SAMSON AG, its subsidiaries, representatives and service facilities worldwide can be found on the SAMSON website or in all SAMSON product catalogs.

Required specifications

Please submit the following details:

- Order number and position number in the order
- Type, serial number, firmware version, device version

11.2 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.samson.de > Product selector > Valve accessories > Type 3730-1 > Downloads > Certificates

11.3 Code list

i ***Note***

– Values in square brackets [ ] are default settings.
– Codes marked by an asterisk (*) indicate that the positioner needs to be re-initialized afterwards

Code	Reading/values	Description
P0	**Status reading with basic information**	The reading indicates the valve position or angle of rotation in % when the positioner is initialized. Press ⊛ to show the position of the lever in relation to the mid-axis.
P1	**Reading direction**	The reading direction of the display is turned by 180°.
P2*	**ATO/ATC** [ATO]	Parameter to adapt the positioner to how the control valve functions: ATO: Air to open (valve CLOSED in fail-safe position) ATC: Air to close (valve OPEN in fail-safe position)
P3*	**Pin position** 17/25/[35]/50/70/100/200/90°	The follower pin must be inserted in the proper position depending on the valve travel/opening angle (see page 21).
P4*	**Nominal range [MAX]**	The possible adjustment range can be selected in steps of 0.5 mm depending on the selected pin position: ***17*** From 3.5 to 17.5 mm, alternatively ***MAX*** ***25*** From 5.0 to 25.0 mm, alternatively ***MAX*** ***35*** From 7.0 to 35.0 mm, alternatively ***MAX*** ***50*** From 10.0 to 50.0 mm, alternatively ***MAX*** ***70*** From 14.0 to 70.0 mm, alternatively ***MAX*** ***100*** From 20.0 to 100.0 mm, alternatively ***MAX*** ***200*** From 40.0 to 166.0 mm, alternatively ***MAX*** For ***90°*** Maximum range only, if ***P3 = 90°*** (***MAX*** = Maximum possible travel)

Code	Reading/values	Description
P5	**Characteristic** 0 to 8 [0]	Characteristic selection: 0, 1, 2 for globe valves, 0 to 8 with rotary actuators (P3 = 90°) 0 Linear 1 Equal percentage 2 Reverse equal percentage 3 SAMSON butterfly valve, linear 4 SAMSON butterfly valve, equal percentage 5 VETEC rotary plug valve, linear 6 VETEC rotary plug valve, equal percentage 7 Segmented ball valve, linear 8 Segmented ball valve, equal percentage
P6	**Set point** [4 to 20 mA] SRLO/SRHI	For split-range operation: **SRLO**: low range 4 to 11.9 mA **SRHI**: high range 12.1 to 20 mA
P7	**w/x** [>>]/<>	Direction of action of the set point w to the valve position x (increasing/increasing or increasing/decreasing)
P8*	**Gain K_p** 30/[50]	On initializing the positioner, the gain is set to the selected value. If the positioner hunts, the K_p value can be reduced.
P9	**Pressure limitation** ON/[OFF]	The signal pressure can take on the same pressure as the supply air at the maximum [**OFF**] or, in the case that the maximum actuator force can damage the valve, the pressure is limited to approx. 2.4 bar.
P10	**Set point cutoff decrease** [ON]/OFF	Lower tight-closing function: If ***w*** reaches up to 1 % towards the final value that causes the valve to close, the actuator is immediately completely vented (with **ATO** - air to open) or filled with air (with **ATC** - air to close).
P11	**Set point cutoff increase** ON/[OFF]	Upper tight-closing function: If ***w*** reaches up to 99 % towards the final value that causes the valve to open, the actuator is immediately completely filled with air (with **ATO** - air to open) or vented (with **ATC** - air to close).
P12	**Limit A1** 0 to 100 % [2 %]	Software limit value A1 is displayed or can be changed in relation to the operating range (steps of 0.5 %).
P13	**Limit A2** 0 to 100 % [98 %]	Software limit value A2 is displayed or can be changed in relation to the operating range (steps of 0.5 %).

Code	Reading/values	Description
P14	**Info w** Initialized	Indicates the internally adjusted set point in the positioner (adjusted set point in 0 to 100 % according to the settings in ***P6*** and ***P7***). Press ⊛ to display external set point (applied set point in 0 to 100 % according to the 4-20 mA signal).
	Not initialized	Displays external set point in 0 to 100 % according to the 4-20 mA signal.
P15	**Start initialization**	Press ⊛ to cancel the initialization process. As a result, the valve moves to the fail-safe position. After a power supply failure during initialization, the positioner starts with the values of the last initialization (if available).
P16	**Start zero calibration**	The zero calibration process can be interrupted by pressing ⊛. The control valve returns to closed-loop operation. **i** ***Note*** *A zero calibration cannot be started when **E1** error code exists.* After a power supply failure during zero calibration, the positioner starts with the settings from the last zero calibration.
P17	**Manual mode**	Turn ⊛ to enter the set point.
P18	**Reset**	Parameters are reset to their default setting. The positioner can only return to closed-loop operation after it has been re-initialized.
P19	Unassigned	
P20	**Firmware version**	Installed firmware version is displayed. Press ⊛ to display the last four digits of the serial number.
P21	**Control mode** [PD]/ PID	Allows an integral-action component to be included in the control parameters

11.3.1 Error codes

Error codes		
E0	**Zero error**	Only with tight-closing function P10 (set point cutoff decrease set to ON). The zero point has shifted by more than 5 % compared to initialization. Error can occur when the positioner's attachment position is shifted or when the valve trim is worn, particularly with soft-sealed plugs.
	Recommended action	Check valve and attachment of the positioner. If OK, perform a zero calibration over Code P16 (see section 7.6) or select error code and reset (RST).
E1	**Displayed and INIT values are not identical**	Parameter code settings were changed after the initialization.
	Recommended action	Select error code and reset (RST).
E2	**Positioner not initialized**	
	Recommended action	Set parameters and initialize the positioner over Code P15.
E3	**K_P setting**	Positioner hunts. Volume restriction set incorrectly, too much gain.
	Recommended action	Check the volume restriction setting as described in section 7.1. Limit gain K_P in Code P8. Re-initialize the positioner.
E4	**Transit time too fast**	The transit times of the actuator determined during initialization are so short (below 0.5 second) that optimal positioner tuning is not possible.
	Recommended action	Check the volume restriction setting as described in section 7.1. Re-initialize the positioner.
E5	**Standstill detection is not possible**	Supply pressure is too low or varies. Mounting incorrect.
	Recommended action	Check supply air and positioner mounting. Re-initialize the positioner.

Error codes		
E6	**Travel is not achieved during initialization**	Supply pressure is too low, actuator leaks, incorrect travel adjusted or pressure limit function activated.
	Recommended action	Check supply air, positioner mounting and setting. Re-initialize the positioner.
E7	**Actuator does not move**	No supply air, mounting blocked. No input signal or input signal below 3.7 mA
	Recommended action	Check supply air, positioner mounting and mA input signal. Re-initialize the positioner.
E8	**Travel signal at lower/ upper limit**	Wrong pin position, wrong lever, wrong attachment direction when NAMUR attachment is used.
	Recommended action	Check positioner mounting and re-initialize the positioner.
E9	**Internal error**	Switch off positioner and wait ten seconds before switching it on again. If the error reappears, return positioner to SAMSON AG for repair.
E10 to **E13**	**Device error (internal)**	Return positioner to SAMSON AG for repair.
E14	**Data error**	Reset positioner (P18). Reconfigure and re-initialize the positioner. If the error reappears, return positioner to SAMSON AG for repair.
E15	**Device error (internal)**	Return positioner to SAMSON AG for repair.

VDE
VDE Prüf und Zertifizierungsinstitut

TRANSLATION

Offenbach, 2005-11-21

Your ref.	Your letter	Our ref.	Contact
P. Opl	2005-11-08	479000-9010-0001/67325 FG33/bhl-wah	H. Biehl Tel. (069) 8306-249 Fax (069) 8306-716 gerhard.biehl@vde.com

Test report for Information of the Applicant

Testing of the Degree of Protection on enclosures of Type 3730 and Type 3731 Positioners

This test report contains the result of a single investigation carried out on the product submitted. A sample of this product was tested to found the accordance with the thereafter listed standards resp. parts of standards.

The test report does not entitle to use a VDE Certification mark and the *"GS = geprüfte Sicherheit (test safety)"* and does not refer to all VDE specifications applicable to the tested product.

This report may only be passed to a third party in its complete wording including this preamble and the date of issue.

Any publication or reproduction requires the prior written approval of the VDE Testing and Certification Institute.

1 Assignment

The samples described in 2 below were tested for compliance with the IP 66 degree of protection.

2 Samples

2.1 Type 3730 Positioner

2.2 Type 3731 Positioner

3 Basis of assessment

DIN EN 60529/VDE 0470 Part 1/2000-09
Degree of protection provided by enclosures (IP Code)
German version EN 60529:1999+A1:2000

4 Execution of the tests

The dust test had already been carried out on the Type 3730 Positioner under the reference number: 479000-9010-0001/32752 and on the Type 3731 Positioner under the reference number: 479000-9010-0001/58985 with suction as per category 1 at the connecting enclosures of the positioners and solenoid valves. The under pressure was 2 kPa and the test lasted 8 hours.

5 Test results

The testing of the samples described in 2 above yielded the following results:

Protecting against access to hazardous parts and against ingress of solid foreign objects according to DIN EN 60529/VDE 0470 Part 1:2000-09	**IP6X satisfied**
Protecting against ingress of water according to DIN EN 60529/VDE 0470 Part 1:2000-09	**IPX6 satisfied**

The positioner enclosures in the versions submitted meet the requirements of IP 66 degree of protection.

There was no ingress of either dust or water.

VDE- Prüf- und Zertifizierungsinstitut
Fachgebiet FG33

(Signature)

(Signature)

Gerhard Biehl

VDE VERBAND DER ELEKTROTECHNIK
ELEKTRONIK INFORMATIONSTECHNIK e.V

Testing and Certification Institute
Merianstrasse 28
D-63069 Offenbach

Prüfbericht VDE u. EN 60529 IP-Schutzart.doc 2 *e-mail: vde-institut@vde.com*

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 04 ATEX 2033 **Issue: 01**

(4) Product: e/p-positioner type 3730-11... and 3730-15
3730-15...

(5) Manufacturer: SAMSON AG Mess- und Regeltechnik

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

(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 16-25127.

(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 EN 60079-31:2014

(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:

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

ZSEx001e c

Konformitätsbewertungsstelle, Sektor Explosionsschutz Braunschweig, January 24, 2017
On behalf of PTB:

Dr.-Ing. F. Lienesch
Regierungsdirektor

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

(13) # SCHEDULE

(14) **EU-Type Examination Certificate Number PTB 04 ATEX 2033 , Issue: 01**

(15) Description of Product

The e/p-positioner, type 3730-11... and 3730-15... is a single- or double-acting positioner intended for installation onto lift drives and pivot drives. It serves for assignment of a valve position to an actuating signal. Non-flammable media are used as pneumatic auxiliary energy. The equipment is intended for the application inside or outside of hazardous areas.

In the future the e/p-positioner type 3730-11... and 3730-15... may also be manufactured and operated according to the test documents listed in the test report.

Thermal and electrical maximum values:

Typ 3730-11...:

The permissible range of the ambient temperature for dust group IIIC is between -40 °C ... 80 °C.

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

Gas group	Temperature class	Permissible range of the ambient temperature
IIC	T6	-40 °C ... 55 °C
	T5	-40 °C ... 70 °C
	T4	-40 °C ... 80 °C

For the relationship between temperature class, permissible ambient temperature range and maximum short-circuit current if analyzing units are connected to the inductive limit contact (terminals 44/45), reference is made to the following table.

Temperature class	Permissible range of the ambient temperature	Maximum short-circuit current I_o
T6	-40 °C ... 45 °C	52 mA
T5	-40 °C ... 60 °C	
T4	-40 °C ... 75 °C	

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

T6	-40 °C ... 60 °C	25 mA
T5	-40 °C ... 80 °C	
T4	-40 °C ... 80 °C	

Depending on the variant of the positioner type 3730-11... the different connection possibilities lead to the following electrical values.

Signal circuit ..... type of protection Intrinsic Safety Ex ia IIC/IIIC
(terminals 11/12) only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 28 V
I_i = 115 mA
P_i = 1 W

C_i = 6 nF
L_i negligibly low

Software-limit contact ..... type of protection Intrinsic Safety Ex ia IIC/IIIC
(terminals 41/42 & 51/52) only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 20 V
I_i = 60 mA
P_i = 250 mW

C_i = 16 nF
L_i negligibly low

resp.

Induktive limit contact ..... type of protection Intrinsic Safety Ex ia IIC/IIIC
(terminals 44/45) only for connection to a certified intrinsically safe circuit

Maximum values:

U_i = 16 V
I_i = 52 mA
P_i = 169 mA

C_i = 60 nF
L_i = 100 µH

resp.

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

U_i = 16 V
I_i = 25 mA
P_i = 64 mA

C_i = 60 nF
L_i = 100 µH

Typ 3730-15:

The permissible range of the ambient temperature for dust group IIIC is between -40 °C ... 80 °C.

Depending on the variant of the positioner type 3730-15... the different connection possibilities lead to the following electrical values.

Signal circuit	Rated Voltage:	28 V
(Terminals 11/12)	Nominal signal:	4 ... 20 mA
Limit contact, inductive	Rated Voltage:	16 V
(Terminals 44/45)	Nominal signal:	8 V DC, 8 mA
Limit contacts, software	Rated Voltage:	20 V
(Terminals 41/42)	Nominal signal:	8 V DC, 8 mA

Changes against previous issue:
The changes against EC-Type Examination Certificate PTB 04 ATEX 2033 (3. Supplement) concern the electrical data, the update of the applied standards, the addition of type notation 3730-15 for the version using type of protection dust ignition protection by enclosure, the implementation of durst ignition protection by Intrinsic Safety and the application of alternative gasket material of the enclosure. Except the application of alternative enclosures, no other technical changes were made to the equipment.

(16) Test Report PTB Ex16-25127

(17) Specific conditions of use

none

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 04 ATEX 2033 , Issue: 01

(18) Essential health and safety requirements

Met by compliance with the aforementioned standards under item (9).

According to Article 41 of Directive 2014/34/EU, EC-type examination certificates which have been issued according to Directive 94/9/EC prior to the date of coming into force of Directive 2014/34/EU (April 20, 2016) may be considered as if they were issued already in compliance with Directive 2014/34/EU. By permission of the European Commission supplements to such EC-type examination certificates and new issues of such certificates may continue to hold the original certificate number issued before April 20, 2016.

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, January 24, 2017

Dr.-Ing. F. Lienesch
Regierungsdirektor

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin
Nationales Metrologieinstitut

(1) # CONFORMITY STATEMENT

(Translation)

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

(3) Test Certificate Number:

PTB 04 ATEX 2114 X **Issue: 01**

(4) Product: e/p-positioner type 3730-18...

(5) Manufacturer: SAMSON AG Mess- und Regeltechnik

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

(7) This product and any acceptable variation thereto are 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 17-25128.

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

EN 60079-0:2012/A11:2013 EN 60079-15:2010 EN 60079-31:2014

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

(11) This Conformity Statement relates only to the design and construction of the specified product in accordance with Directive 2014/34/EU. Further requirements of this Directive apply to the manufacture and supply of this product.

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

II 3 G Ex nA IIC T6 Gc and II 3 D Ex tc IIIC T80 °C Dc

Konformitätsbewertungsstelle, Sektor Explosionsschutz Braunschweig, January 26, 2017
On behalf of PTB:

Dr.-Ing. F. Lienesch
Regierungsdirektor

Sheet 1/3

Conformity Statements without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

(13) # SCHEDULE

(14) ## CONFORMITY STATEMENT PTB 04 ATEX 2114 X, Ausgabe: 01

(15) Description of the product

The e/p-positioner type 3730-18... is a single- or double-acting positioner for the attachment to all common lift or slewing-motion actuators. It serves for assignment of a valve position to an actuating signal. Non-flammable media are used as pneumatic auxiliary energy. The equipment is intended for the application inside hazardous areas.

In the future the e/p-positioner, type 3730-18.. may also be manufactured according to the test documents listed in the test report.

Thermal and electrical maximum values:

The permissible range of the ambient temperature for dust group IIIC is between -40 °C ... 80 °C.

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

Gas group	Temperature class	Permissible range of the ambient temperature
IIC	T6	-40 °C ... 55 °C
	T5	-40 °C ... 70 °C
	T4	-40 °C ... 80 °C

Depending on the variant of the positioner type 3730-18... the different connection possibilities lead to the following electrical values.

Signal circuit	Rated Voltage:	28 V
(Terminals 11/12)	Nominal signal:	4 ... 20 mA
Limit contact, inductive	Rated Voltage:	16 V
(Terminals 44/45)	Nominal signal:	8 V DC, 8 mA
Limit contacts, software	Rated Voltage:	20 V
(Terminals 41/42)	Nominal signal:	8 V DC, 8 mA

Conformity Statements without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 04 ATEX 2114 X, Issue: 01

Changes against previous issue:

The changes against the Conformity Statement PTB 04 ATEX 2114X (2nd Supplement) concern the electrical data, the update of the applied standards, the cancelation of type of protection "nL", the application of alternative gasket material of the enclosure and the extension of an enclosure version with sight glass.
No other technical changes were made to the equipment.

(16) Test report PTB Ex 17-25128

(17) Specific conditions of use

For operation with type of protection "nA":

If the signal circuit is connected to a circuit of type of protection "nA", a fuse according to IEC 60127-2/VI 250 V T with a nominal maximum fuse current of $I_N \leq 40$ mA shall be connected in series. This fuse shall be arranged outside of the hazardous area.
Connecting, disconnecting as well as switching of energized circuits is only permitted during installation, maintenance or repair work.

(18) Essential health and safety requirements

Met by compliance with the aforementioned standards.

According to Article 41 of Directive 2014/34/EU, Conformity Statements which have been issued according to Directive 94/9/EC prior to the date of coming into force of Directive 2014/34/EU (April 20, 2016) may be considered as if they were issued already in compliance with Directive 2014/34/EU. By permission of the European Commission supplements to such Conformity Statements and new issues of such certificates may continue to hold the original certificate number issued before April 20, 2016.

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Dr.-Ing. F. Lienesch
Regierungsdirektor

Braunschweig, January 26, 2017

Conformity Statements without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt.
In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

Installation Manual for apparatus certified by CSA for use in hazardous locations.

Electrical rating of intrinsically safe apparatus and apparatus for installation in hazardous locations.

Table 1: Maximum values

	Control signal	Limit switches software	Inductive limit switch type SJ2-SN.
Circuit No.	1	2 and 3	4
Terminal No.	11 / 12	41 / 42 and 51 / 52	44 / 45
U_i or V_{max}	28V	20V	16V
I_i or I_{max}	115mA	60mA	25 / 52mA
P_i or P_{max}	1W	250mW	64 / 169mW
C_i	6nF	16nF	30nF
L_i	0µH	0µH	100µH

Notes: Entity parameters shall meet the following requirements:

$U_0 \leq U_i$ or V_{max} / $I_0 \leq I_i$ or I_{max} / P_0 or $P_{max} \leq P_i$ or P_{max}
$C_a \geq C_i + C_{cable}$ and $L_a \geq L_i + L_{cable}$

Table 2: CSA – certified barrier parameters of circuit 1

Barrier	Supply barrier		Evaluation barrier	
	V_{OC}	R_{min}	V_{OC}	R_{min}
circuit 1	≤28V	≥300Ω	≤28V	Diode

Table 3: The correlation between temperature classification and permissible ambient temperature ranges is shown in the table below:

Temperature class	Permissible ambient temperature range
T6	- 40℃ ... 55℃
T5	- 40℃ ... 70℃
T4	- 40℃ ... 80℃

Table 4: The correlation between temperature classification and permissible ambient temperature ranges and short-circuit current for the inductive limit switch:

Temperature class	Permissible ambient temperature range for type SJ2-SN. limit switch	
	@ I_{sc} (I_0) = 25 mA	@ I_{sc} (I_0) = 52 mA
T6	- 40℃ ... 65℃	- 40℃ ... 45℃
T5	- 40℃ ... 80℃	- 40℃ ... 60℃
T4	- 40℃ ... 80℃	- 40℃ ... 75℃

Intrinsically safe if installed as specified in manufacturer's installation manual.
CSA- certified for hazardous locations

Ex ia IIC T6; Class I, Zone 0
Class I; Groups A, B, C, D
Class II; Groups E, F + G; Class III. **Type 4 Enclosure / IP 66**

Notes:

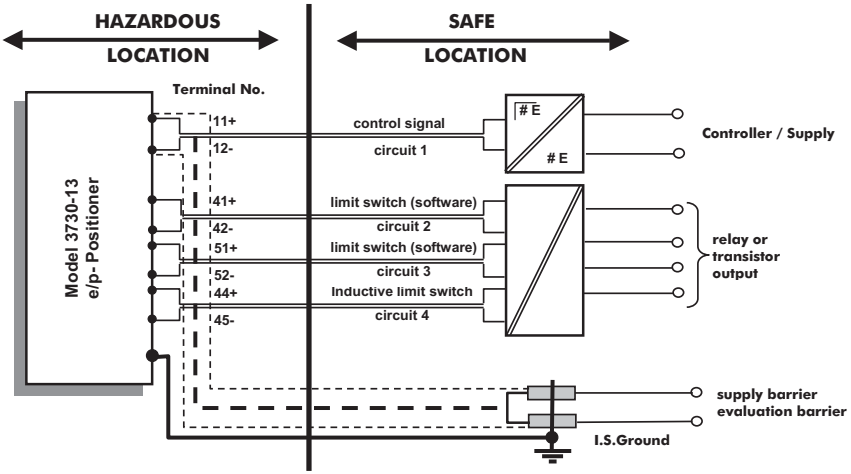
1.) The apparatus may be installed in intrinsically safe circuits only when used in conjunction with CSA certified apparatus. For maximum values of V_{max}; I_{max}; P_{max} ; C_i and L_i of the various apparatus see Table 1 on page 1.

2.) For barrier selection see Table 2 on page 1.

3.) The installation must be in accordance with the C.E.C. Part 1.

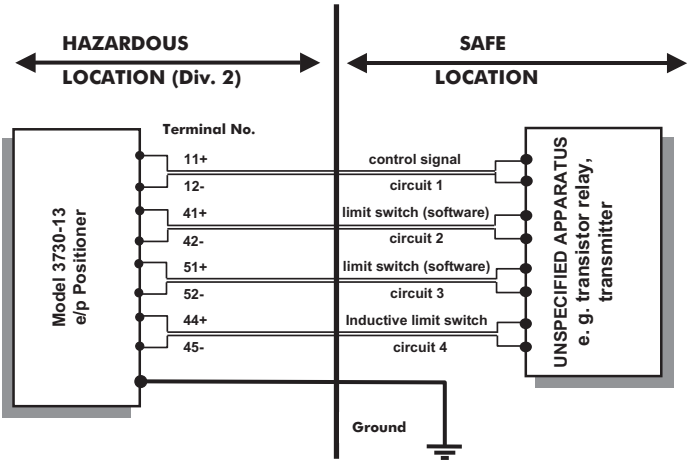
4.) Use only supply wires suitable for 5°C above surrounding temperature.

5.) For CSA Certification, Safety Barrier must be CSA Certified and installed in accordance with C.E.C. Part. 1. Each pair of I.S. wires must be protected by a shield that is grounded at the I.S. Ground. The shield must extend as close to the terminals as possible.



CSA- certified for hazardous locations

Ex nA II T6; Class I, Zone 2
Class II, Div. 2 Groups A, B, C, D
Class II, Div. 2 Groups E, F+G; Class III. **Type 4 Enclosure / IP 66**



Notes:

1.) The installation must be in accordance with the Canadian Electrical Code, Part 1

2.) For the maximum values for the individual circuits see Table 1 and 2.

3.) The cables shall be protected by conduits.

4.) Cable entry only rigid metal conduit according to drawing
No. 1050-0539 T and 1050-0540 T

Installation Manual for apparatus approved by FM for use in hazardous locations.

Electrical rating of intrinsically safe apparatus and apparatus for installation in hazardous locations.

Table 1: Maximum Entity and Non Incendive Field Wiring values

	Control signal	Limit switches software	Inductive limit switch type SJ2-SN.
Circuit No.	1	2 and 3	4
Terminal No.	11 / 12	41 / 42 and 51 / 52	44 / 45
U_i or V_{max}	28V	20V	16V
I_i or I_{max}	115mA	60mA	25 / 52mA
P_i or P_{max}	1W	250mW	64 / 169mW
C_i	6nF	16nF	30nF
L_i	0µH	0µH	100µH

Notes: Entity parameters shall meet the following requirements:

$U_0 \leq U_i$ or V_{max} / $I_0 \leq I_i$ or I_{max} / P_0 or $P_{max} \leq P_i$ or P_{max}
$C_a \geq C_i + C_{cable}$ and $L_a \geq L_i + L_{cable}$

Table 2: FM – approved barrier parameters of circuit 1

Barrier	Supply barrier				Evaluation barrier		
	V_{OC}	R_{min}	I_{SC}	P_{max}	V_{OC}	R_{min}	I_{SC}
circuit 1	≤28V	≥280Ω	≤115mA	≤1W	≤28V	#	0mA

Table 3: The correlation between temperature classification and permissible ambient temperature ranges is shown in the table below:

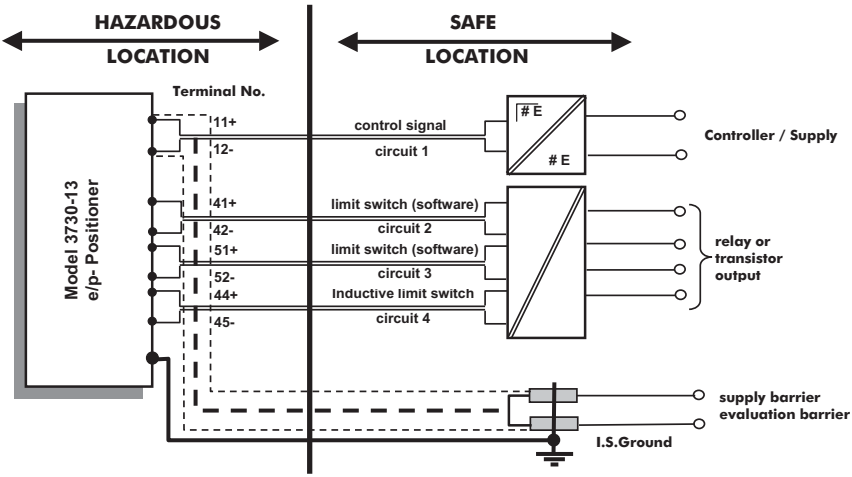
Temperature class	Permissible ambient temperature range
T6	- 40℃ ... 55℃
T5	- 40℃ ... 70℃
T4	- 40℃ ... 80℃

Table 4: The correlation between temperature classification and permissible ambient temperature ranges and short-circuit current for the inductive limit switch:

Temperature class	Permissible ambient temperature range for type SJ2-SN. limit switch	
	@ I_{sc} (I_0) = 25 mA	@ I_{sc} (I_0) = 52 mA
T6	- 40℃ ... 65℃	- 40℃ ... 45℃
T5	- 40℃ ... 80℃	- 40℃ ... 60℃
T4	- 40℃ ... 80℃	- 40℃ ... 75℃

FM- approved for hazardous locations

Class I, Zone 0 AEx ia IIC T6
Class I, II, III, Div. 1, Groups A, B, C, D, E, F + G **NEMA 4X / IP66**



Notes:

1.) The apparatus may be installed in intrinsically safe circuits only in conjunction with FM-approved associated intrinsically safe apparatus with entity parameters. For the maximum input values see Table 1.

2.) For the interconnection of intrinsically safe apparatus and associated intrinsically safe apparatus not specifically examined in combination as a system, the entity parameters must meet the following requirements:

V_{OC} or U_0	≤	U_i or V_{max}
I_{SC} or I_0	≤	I_i or I_{max}
P_0	≤	P_i or P_{max}
C_a or C_0	≥	$C_i + C_{Cable}$,
L_a or L_0	≥	$L_i + L_{Cable}$

3.) For barrier selection see Table 2.

4.) The installation must be in accordance with the National Electrical Code ANSI/NFPA 70 and ANSI/ISA RP 12.06.01.

5.) Use only supply wires suitable for 5°C above surrounding temperature.

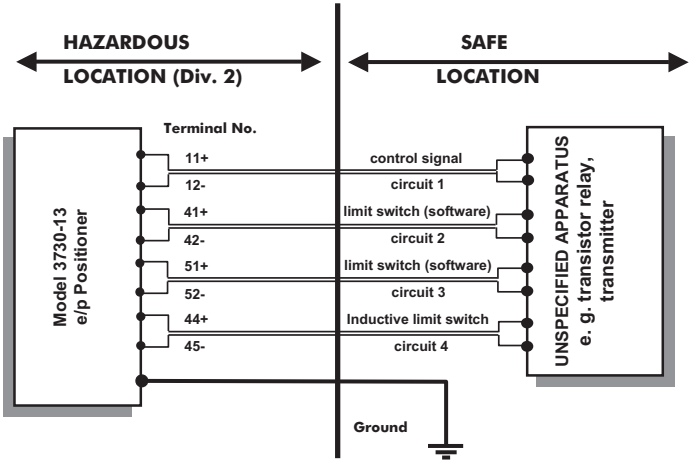
6.) For the permissible maximum values for the intrinsically safe circuits 1 - 4 see Table 1.

7.) For the permissible barrier parameters for circuit 1 see Table 2.

8.) Cable entry M 20 x 1.5 or metal conduit according to drawing No. 1050 – 0539 T or 1050 – 0540 T.

FM- approved for hazardous locations

Class I, Zone 2 AEx nA II
Class I, Division 2, Groups A, B, C, D
Class II, Division 2 Groups F + G **NEMA 4X / IP66**



Notes:

1.) The installation must be in accordance with the National Electrical Code ANSI/NFPA 70.

2.) For the maximum values for the individual circuits see Table 1.
Cable entry only rigid metal conduit.

Nonincendive Field Wiring:

1.) The apparatus may be installed in nonincendive field wiring circuits only in conjunction with FM-approved associated nonincendive field wiring apparatus or FM-approved associated intrinsically safe apparatus with entity parameters. For the maximum input values of the nonincendive field wiring apparatus see Table 1.

2.) For the interconnection of nonincendive field wiring apparatus and associated nonincendive field wiring apparatus not specifically examined in combination as a system, the nonincendive field wiring parameters must meet the following requirements:

V_{OC} or U_0	$\leq$	U_i or V_{max}
I_{SC} or I_0	$\leq$	I_i or I_{max}
P_0	$\leq$	P_i or P_{max}
C_a or C_0	$\geq$	$C_i + C_{Cable}$
L_a or L_0	$\geq$	$L_i + L_{Cable}$

3.) Installation must be in accordance with the National Electrical Code ANSI/NFPA 70 and ANSI/ISA 12.12.01.

SMART IN FLOW CONTROL.

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

Elektropneumatischer Stellungsregler / Electropneumatic Positioner / Positionneur électropneumatique
Typ / Type / Type 3730-1...

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
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

ce_3730-1_de_en_fra_rev07.pdf

SMART IN FLOW CONTROL.

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

Elektropneumatischer Stellungsregler / Electropneumatic Positioner / Positionneur électropneumatique
Typ/Type/Type 3730-11..

entsprechend der EU-Baumusterprüfbescheingung PTB 04 ATEX 2033 ausgestellt von der/
according to the EU Type Examination PTB 04 ATEX 2033 issued by/
établi selon le certificat CE d'essais sur échantillons PTB 04 ATEX 2033 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 60079-0:2012/A11:2013, EN 60079-11:2012, EN 60079-31:2014
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

ce_3730-11_de_en_fro_rev07.pdf

SMART IN FLOW CONTROL.

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

Elektropneumatischer Stellungsregler / Electropneumatic Positioner / Positionneur électropneumatique
Typ / Type / Type 3730-15..

entsprechend der EU-Baumusterprüfbescheingung PTB 04 ATEX 2033 ausgestellt von der/
according to the EU Type Examination PTB 04 ATEX 2033 issued by/
établi selon le certificat CE d'essais sur échantillons PTB 04 ATEX 2033 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 60079-0:2012/A11:2013, EN 60079-11:2012, EN 60079-31:2014
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

ce_3730-15_de_en_fra_rev07.pdf

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

Elektropneumatischer Stellungsregler / Electropneumatic Positioner / Positionneur électropneumatique
Typ/Type/Type 3730-18..

entsprechend der EU-Baumusterprüfbescheingung PTB 04 ATEX 2114 X ausgestellt von der/
according to the EU Type Examination PTB 04 ATEX 2114 X issued by/
établi selon le certificat CE d'essais sur échantillons PTB 04 ATEX 2114 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 60079-0:2012/A11:2013, EN 60079-11:2012, EN 60079-31:2014
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

ce_3730-18_de_en_fru_rev07.pdf

EB 8384-1 EN

SAMSON AKTIENGESELLSCHAFT
Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
samson@samson.de · www.samson.de

2022-12-19 · English