



## Type 3725 Electropneumatic Positioner



### Application

Single-acting positioner for attachment to pneumatic globe and rotary valves. Self-calibrating, automatic adaptation to valve and actuator.

Reference variable	4 to 20 mA
Travel	5 to 50 mm
Opening angle	24 to 100°



**Fig. 1:** Type 3725 Electropneumatic Positioner (hardware version 1.00.00)



**Fig. 2:** Type 3725 Electropneumatic Positioner (hardware version G1:00)

The positioner ensures a predetermined assignment of the valve position (controlled variable  $x$ ) to the input signal (reference variable  $w$ ). It compares the input signal received from a control system to the travel or rotational angle of the valve and issues a corresponding output signal pressure (output variable  $y$ ).

### Special features

- Simple direct attachment to SAMSON Type 3277 Actuator (120 to 750 cm<sup>2</sup>)
- Attachment according to IEC 60534-6-1 (NAMUR)
- Attachment to rotary actuators according to VDI/VDE 3845
- Attachment to Type 3372 Actuator for Series V2001 Valves
- Easy operation with intuitive navigation menu using three capacitive keys
- LCD easy to read in any mounting position thanks to selectable reading direction
- Variable, automatic start-up
- Preset parameters (only values deviating from the standard need to be adjusted)
- All parameters saved in non-volatile EEPROM
- Tight-closing function can be activated
- Continuous zero monitoring
- Non-contact position sensing
- Unaffected by environmental effects and steam hammering

### Principle of operation

The Type 3725 Electropneumatic Positioner is mounted on pneumatic control valves and used to

assign the valve position (controlled variable  $x$ ) to the control signal (reference variable  $w$ ). 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 mainly consists of the following components:

- Magneto-resistive sensor (2)
- Analog i/p converter (6) with a downstream air capacity booster (7)
- Electronics unit with microcontroller (4)

The travel or opening angle is measured by the pick-up lever, non-contact magneto-resistive sensor and downstream electronics.

The pick-up lever is connected to a magnet inside the device. The motion of the pick-up lever causes the direction of the magnetic field to change. This change is sensed by the sensor (2). The electronics unit determines the current position of the actuator stem or opening angle from this information.

The position of the actuator stem or opening angle is transmitted to the microcontroller (3) over the A/D converter (4). The PD control algorithm in the microprocessor (4) compares this actual position to the 4 to 20 mA control signal after it has been converted by the A/D converter. In case of a system deviation, the activation of the i/p converter (6) is changed so that the actuator of the valve (1) is pressurized or vented accordingly over the downstream air capacity booster (7). The supply air is supplied to the air capacity booster (7) and the pressure regulator (8).

## Operation

A user-friendly, intuitive concept using three capacitive keys and an LCD has been developed: Users select parameters by touching the arrow keys and confirm the settings with the confirmation key. In the menu, all parameters are listed in one level, meaning there is no need to search through sub-menus. All parameter settings can be read and changed on site.

The menu is structured with all parameters listed one after the other on the same level. This allows users to read and change parameters at the device.

All values are displayed on the LCD. The reading direction of the LCD can be rotated by 180°.

## Attachment

The Type 3725 Electropneumatic Positioner can be attached directly to the Type 3277 Actuator over a connection block. When attached to the Type 3277-5 Actuator (120 cm<sup>2</sup>), the signal pressure

is routed over an internal bore in the actuator yoke to the actuator.

In actuators with "actuator stem retracts" fail-safe action and in actuators with effective diaphragm areas of 175 cm<sup>2</sup> or larger, the signal pressure is routed to the actuator over ready-made external piping.

## Ordering text

Type 3725 Positioner

Attachment

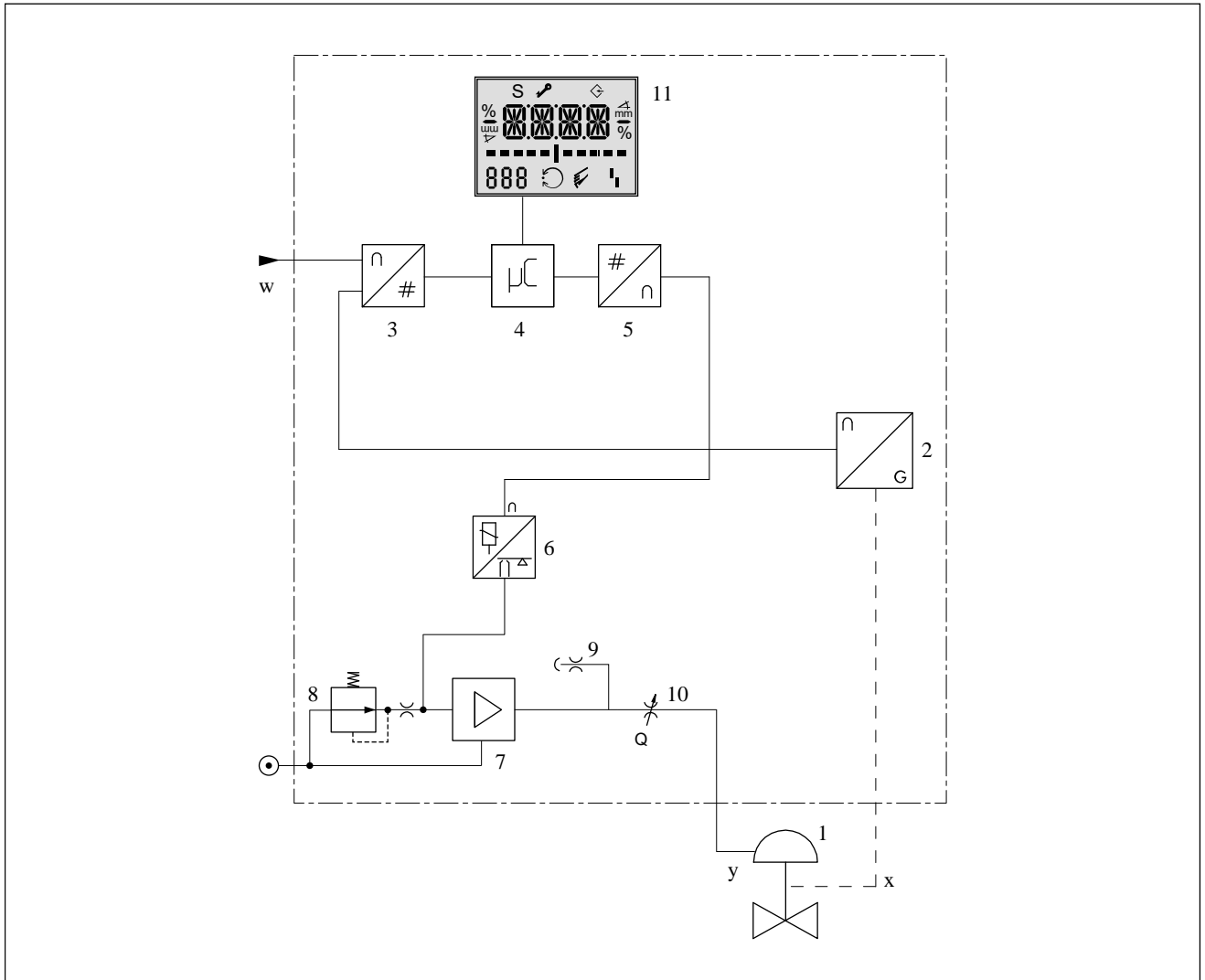
- Direct attachment to Type 3277 (without pneumatic connecting rail)
- Direct attachment to Type 3277 Actuator (120 to 750 cm<sup>2</sup>)
- Attachment according to IEC 60534-6-1 (NAMUR)
- Attachment to rotary actuators according to VDI/VDE 3845
- Attachment to Type 3278 Rotary Actuator (160/320 cm<sup>2</sup>)

Pneumatic connecting rail

- G ¼
- ¼ NPT

Pressure gauge (max. 6 bar)

- With
- Without




**Fig. 3:** Functional diagram of Type 3725 Electropneumatic Positioner

- |                   |                        |                       |
|-------------------|------------------------|-----------------------|
| 1 Valve           | 5 D/A converter        | 9 Fixed restriction   |
| 2 Sensor          | 6 i/p converter        | 10 Volume restriction |
| 3 A/D converter   | 7 Air capacity booster | 11 Display            |
| 4 Microcontroller | 8 Pressure regulator   |                       |

## Technical data

**Table 1:** Technical data for Type 3725 Positioner

Travel (adjustable)	Direct attachment to Type 3277	5 to 30 mm
	Direct attachment to Type 2780-2	6/12/15 mm
	Attachment to Type 3372 Actuator	15/30 mm
	Attachment according to IEC 60534-6 (NAMUR)	5 to 50 mm
	Attachment to rotary actuators	24 to 100°
Reference variable w (reverse polarity protection)	Signal range 4 to 20 mA · 2-wire unit Split-range operation 4 to 11.9 mA and 12.1 to 20 mA	
Static destruction limit	±33 V	
Minimum current	3.8 mA	
Load impedance	Max. 6.3 V (corresponding to 315 Ω at 20 mA)	
Supply	Supply air: 1.4 to 7 bar (20 to 105 psi)	
Air quality acc. to ISO 8573-1	Max. particle size and density: Class 4; oil content: Class 3; pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Signal pressure (output)	0 bar up to the supply pressure · Can be limited to approx. 2.3 bar by software	
Characteristic	3 characteristics for globe valves · 9 characteristics for rotary valves	
Hysteresis	≤0.3 %	
Sensitivity	≤0.1 %	
Transit time	Only for actuators with initialization time >0.5 s <sup>1)</sup>	
Direction of action	w/x reversible	
Air consumption	≤100 I <sub>n</sub> /h with a supply pressure up to 6 bar and a signal pressure of 0.6 bar	
Air output capacity	Actuator (supply): at Δp = 6 bar: 8.5 m <sub>n</sub> <sup>3</sup> /h, at Δp = 1.4 bar: 3.0 m <sub>n</sub> <sup>3</sup> /h K <sub>Vmax(20 °C)</sub> = 0.09 · Air output at the signal pressure output (38) can be restricted with the volume restriction Q to K <sub>Vmin(20 °C)</sub> ≈ 1/3 K <sub>Vmax(20 °C)</sub>	
	Actuator (exhaust): at Δp = 6 bar: 14.0 m <sub>n</sub> <sup>3</sup> /h, at Δp = 1.4 bar: 4.5 m <sub>n</sub> <sup>3</sup> /h K <sub>Vmax(20 °C)</sub> = 0.15 · Air output at the signal pressure output (38) can be restricted with the volume restriction Q to K <sub>Vmin(20 °C)</sub> ≈ 1/3 K <sub>Vmax(20 °C)</sub>	
Permissible ambient temperature	-20 to +80 °C -25 to +80 °C with metal cable gland The limits in the test certificates additionally apply for explosion-protected versions	
Influences	Temperature	≤0.15 %/10 K
	Effect of vibration	≤0.25 % up to 2000 Hz and 4 g according to IEC 770
	Supply	None
Explosion protection	See Table 2 for details on explosion protection certificates.	
Degree of protection	IP66	
Conformity		
<b>Materials</b>		
Housing	Polyphthalamide (PPA)	
Cover	GI:00 · Cover with integrated square window made of polycarbonate (PC) HV 01.00.00 · Cover made of polyphthalamide (PPA) with round window made of polycarbonate (PC)	
External parts	Stainless steel 1.4571 and 1.4301	
Cable gland	Black polyamide (PA), M20x1.5	

Vent plug	High-density polyethylene (PE-HD)
<b>Weight</b>	Approx. 0.5 kg

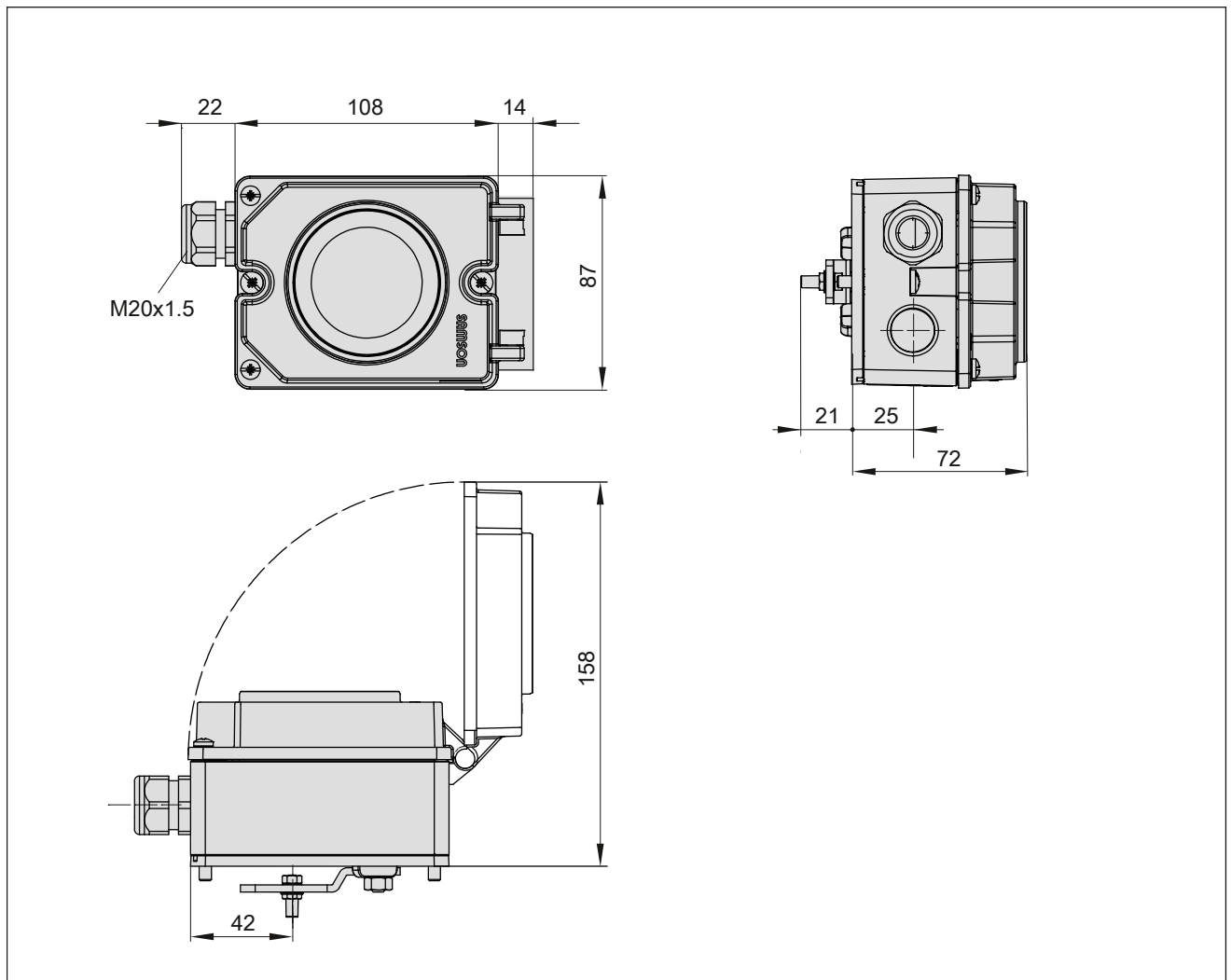
<sup>1)</sup> For faster actuators, a volume restriction must be used. Otherwise, the initialization cannot be performed successfully.

**Table 2:** Summary of explosion protection certificates for Type 3725

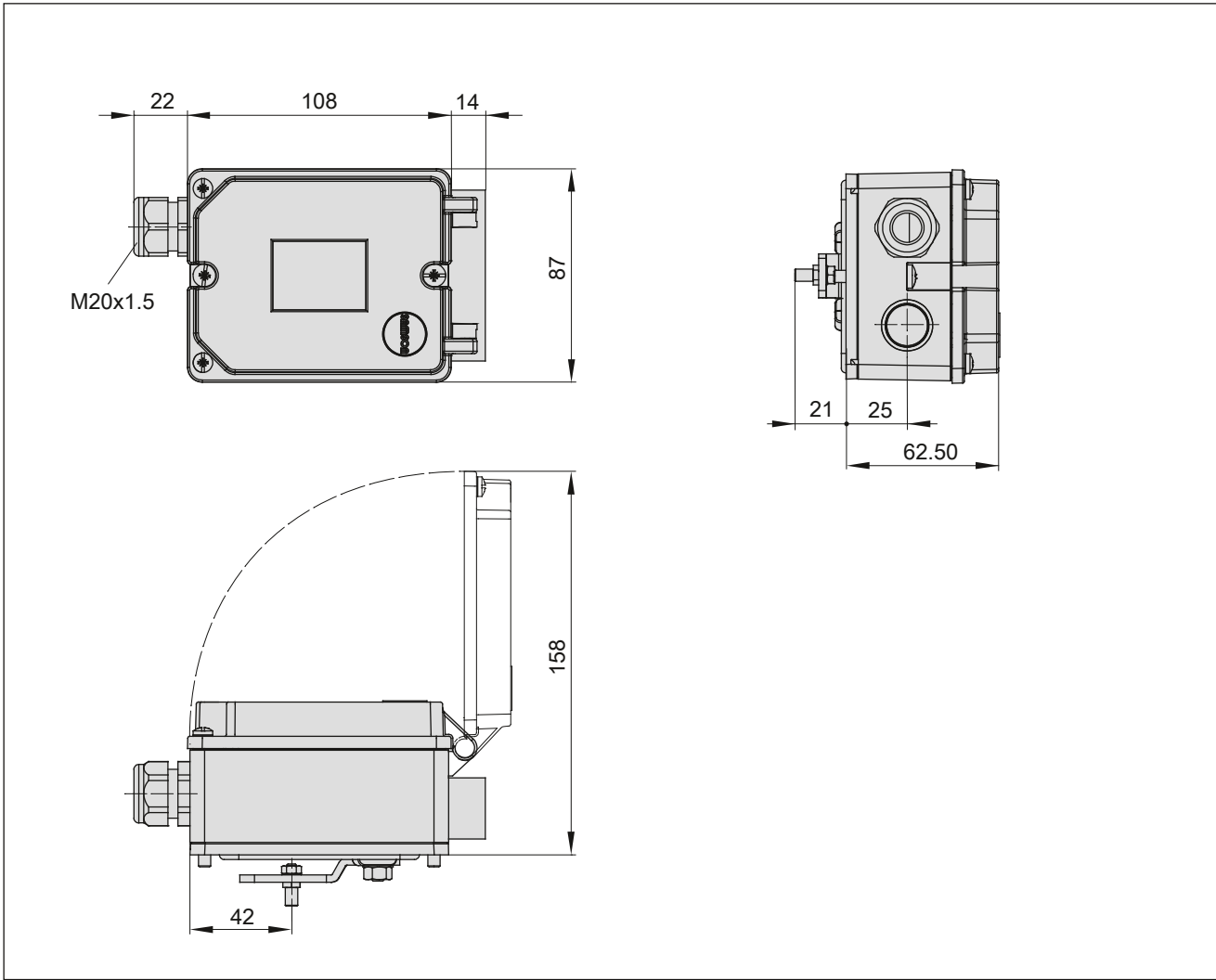
Type	Certificate	Number	Start	End	Type of protection
<b>3725-1000</b>	<b>ATEX</b>	PTB 11 ATEX 2020 X	2019-02-25	-	II 2 G Ex ia IIC T4 Gb
<b>3725-112</b>	<b>CCC Ex</b>	2021322307003871	2023-04-29	2026-04-04	Ex ia II T4 Gb
<b>3725-130</b>	<b>CSA c/us</b>	2703735 X	2014-06-03	-	Ex ia IIC T4 Class I, Zone 0 AEx ia IIC T4; Class I Div. 1, Groups A, B, C & D

**Table 3:** Summary of ship classification certificates for Type 3725

Certificate	Number	Start	End
<b>BV Type Approval Certificate</b>	46564/B0 BV	2022-01-11	2027-01-11



**Fig. 4:** Dimensions (mm) of Type 3725 Electropneumatic Positioner (hardware version 1.00.00)



**Fig. 5:** Dimensions (mm) of Type 3725 Electropneumatic Positioner (hardware version GI:00)

**Table 4:** Article code for Type 3725 Positioner

Positioner	Type 3725-	x	x	x	0	0	0	0	x	0	0	x	x	x	x
With LCD and autotune, 4 to 20 mA reference variable															
Explosion protection															
Without		0	0	0											
ATEX II 2 G Ex ia IIC T4 Gb		1	1	0								9	8		
CCC Ex Ex ia II T4 Gb		1	1	2								9	8		
CSA c/us Ex ia IIC T4; Class I, Zone 0, AEx ia IIC T4; Class I, Div. 1, Groups A, B, C & D		1	3	0								9	8		
Ship classification certification															
Without								0							
Bureau Veritas Certification								1				9	8		
Hardware version															
GI:00												9	8		
01.00.00												9	7		
Firmware version															
1.12														9	3