

Application

Analog position transmitter for attachment to control valves as well as Type 4763 Electropneumatic Positioner or Type 4765 Pneumatic Positioner to convert the valve travel into a continuous output signal between 4 to 20 mA

Valve travels from 7 to 120 mm



The position transmitter picks up the travel of pneumatic or electric control valves and converts it into a continuous output signal between 4 and 20 mA. If this signal is, for example, supplied to an indicating unit, the current valve stem position can be monitored.

Attachment to actuators with cast yokes (NAMUR) or rod-type yokes according to IEC 60534 as well as Type 4763 Electropneumatic Positioner or Type 4765 Pneumatic Positioners.

Special features

- Extensive travel range
- Reversible operating direction
- Any mounting position possible
- Extremely insensitive to vibrations
- Small hysteresis
- Two-wire circuit connection

Versions in type of protection "Intrinsic safety" EEx ia IIC T6 are also available for hazardous areas.

Versions and article code

Position Transmitter	Type 4748-	x	0	x
Explosion protection				
Without		0		0
Ex II 2 G EEx ia IIC T6 acc. to ATEX		1		
Ex II 3 G EEx nA II T6 for Zone 2 acc. to ATEX		8		0
Electrical connections				
M20 x 1.5 cable gland, black (plastic)				0
M20 x 1.5 cable gland, blue (plastic)				1

Accessories

Adapter 1/2 NPT for electrical connections



Fig. 1 · Type 4748 Position Transmitter

Principle of operation (Fig. 2)

The travel of the control valve is either transmitted directly to the pin (1.1) and the lever (1) over the plate (20) or, when attached to the positioner, via a coupling pin. The lever (1) moves in a rotary motion which is transmitted to the solenoid system (2). This causes a change in the magnetic field as well as the voltage in the sensor (2.1) operating according to the Hall effect. The connected electronics unit converts the voltage into a load-independent 4 to 20 mA DC current signal.

Depending on the travel range of the control valve, two different levers (1) are provided for the position transmitter:

Lever I for a travel between 7 and 60 mm

Lever II for a travel between 60 and 103 mm

A special lever is always used to attach the transmitter to a positioner, regardless of the travel.

Adjusting the position transmitter (Fig. 3)

The **operating direction** of the output signal is selected depending on the location of a 7-pole connector. The symbols direct action >> or reverse action <> indicate the operating direction.

With direct operating direction (>>), the travel corresponds to zero at a signal of 4 mA and corresponds to the rated travel at 20 mA. Whereas, with the reverse operating direction (<>), the travel corresponds to zero at a signal of 20 mA and to the rated travel at 4 mA.

ZERO is set with switches 3 and 4, and can be finely adjusted using the ZERO potentiometer. It is always based on the 4 mA signal.

SPAN and the upper range value are set with switches 1 and 2, and are finely adjusted using the SPAN potentiometer. This setting is always based on the 20 mA signal.

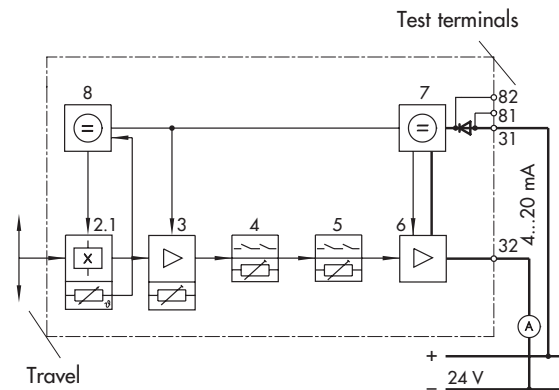


Fig. 2 · Functional diagram

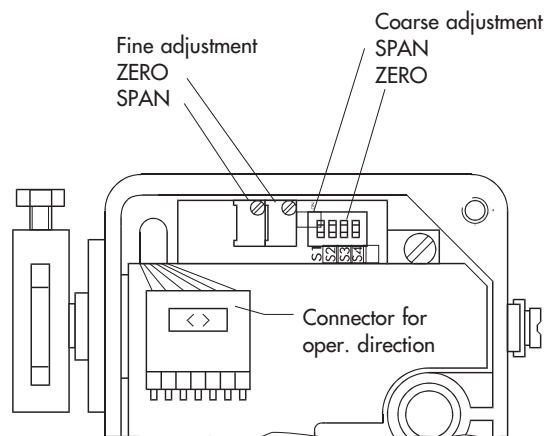


Fig. 3 · Adjusters

Legend for Fig. 2

- 1 Lever for valve travel
- 1.1 Coupling pin
- 2 Solenoid system
- 2.1 Sensor with temperature resistor
- 3 Measuring amplifier
- 4 Switches and potentiometer for coarse and fine ZERO adjustment
- 5 Switches and potentiometer for coarse and fine SPAN adjustment
- 6 Output stage
- 7 Constant-voltage source
- 8 Constant-current source
- 20 Plate for attachment to actuator or to plug stem of valve

Table 1 · Technical data

Type	4748-0	4748-1
Output	Two-wire circuit 4 to 20 mA	
Permissible load	$R_B = \frac{U_s - 12\text{ V}}{20\text{ mA}}$	
Output circuit	–	Intrinsically safe
Auxiliary power	Two-wire network 24 V Voltage range 12 to 45 V	
	For connection to intrinsically safe circuits with maximum values $U_o = 25\text{ V}$, $I_K = 100\text{ mA}$, $P = 0.8\text{ W}$ (effective internal inductance and capacitance are negligibly small) ¹⁾	
Characteristic	Characteristic: Output linear to input Deviation from terminal-based conformity: $\leq 1\%$ ²⁾	
Hysteresis	$\leq 0.6\%$ ³⁾	
Response	$\leq 0.1\%$	
Influence on auxiliary power	$\leq 0.1\%$ on span changes within the specified limits	
HF effect	$\leq 1\%$, $f = 150\text{ MHz}$, 1 Watt transmission power, 0.5 m distance	
Effect of vibration	No effect between 10 and 150 Hz and 4 g	
Load influence	$\leq 0.1\%$	
Permissible ambient temperature	–20 to +70 °C · The limits specified in the EC Type Examination Certificate additionally apply for explosion-protected devices.	
Effect of ambient temperature	$\leq 0.3\%/10\text{ K}$ on lower measuring range value and span ²⁾	
Ripple of the output signal	$\leq 0.3\%$	
Travel ranges min./max.	1 Attachment to Type 4763/4765 Positioners: 7 ... 60 mm 2 Lever I: 7 ... 60 mm Lever II: > 60 ... 103 mm (up to 120 mm on request)	
Materials	Housing: Die-cast aluminum, plastic coated External parts: 1.4571, black anodized aluminum	
Weight	Approx.	0.7 kg
Degree of protection	With direct attachment: IP 65 When attached to a positioner: IP 54 (IP 65 on request), refer to EB 8363 EN	

¹⁾ e.g. SAMSOMATIC Type 994-0103-KFD2-STC4-Ex1 Loop Isolator

²⁾ At max. travel 100 % = 32° lever angle

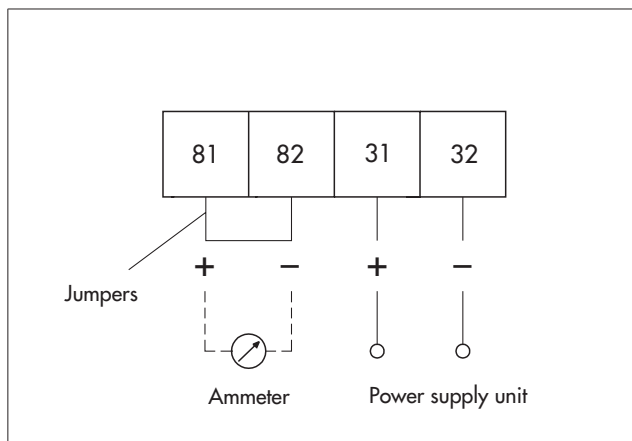
³⁾ At max. travel 100 % = 8° lever angle

Summary of explosion-protection approvals

The test certificates are included in the Mounting and Operating Instructions or are available on request

Type of approval	Certificate number	Date	Comments
EC Type Examination Certificate	PTB 03 ATEX 2046	2003-06-02	⊕ II 2 G EEx ia IIC T6; Type 4748-1
Statement of Conformity	PTB 03 ATEX 2047 X	2003-06-02	⊕ II 3 G EEx nA II T6, Zone 2; Type 4748-8

Electrical connection



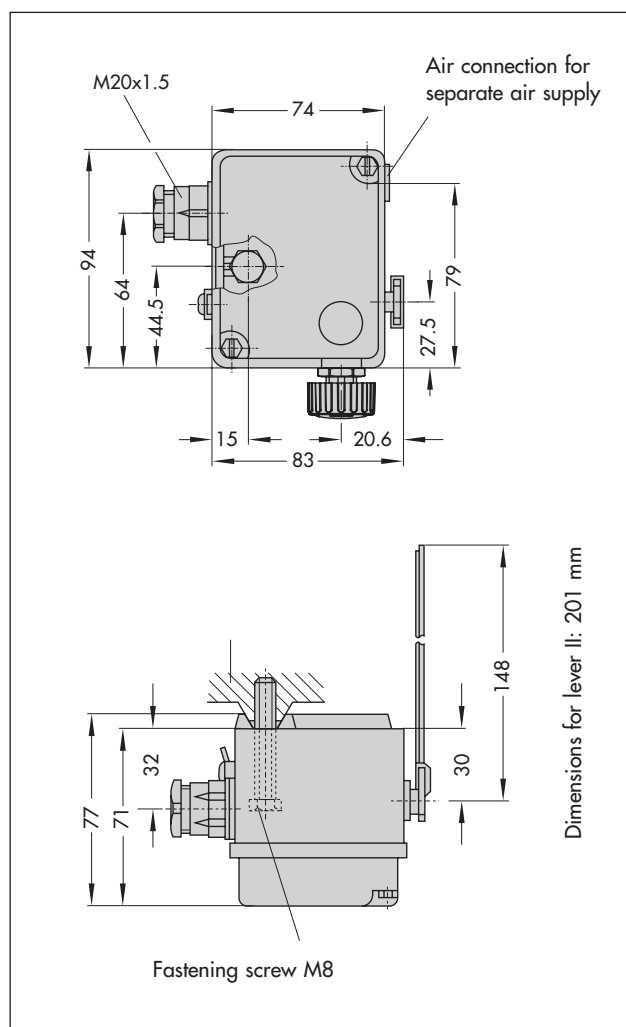
Test connection at terminals 81 and 82:
After removing the jumpers, an ammeter can be connected.

Ordering text

Position Transmitter Type 4748-x 0 x

- Without explosion protection, intrinsically safe or non-sparking for Zone 2 (see article code)
- Not attached
For attachment acc. to IEC 60534-6 (NAMUR)
- With lever I (148 mm) or lever II (201 mm)
- For attachment to positioner
- Optionally, special version/accessories

Dimensions in mm



Specifications subject to change without notice



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