

Pneumatic Transmitters for Pressure

Type 3804-1 with Pressure Seal



Application

Pressure transmitter with pressure seal for liquids, gases and vapors · Operating pressures from 0 to 190 bar · Measuring spans from 1.0 to 100 bar

The pressure transmitters are used to measure a pressure and convert the measured value into a standardized pneumatic signal between 0.2 and 1.0 bar. The application of transmitters with pressure seals is beneficial or necessary if the process medium cannot be routed to the measuring element through a tube. Such process media and applications include:

- Fluids which readily crystallize, accrete or precipitate, easily segregate or contain suspended particles
- Particularly corrosive or highly viscous fluids
- Food and beverages or pharmaceuticals which do not allow the use of a connecting tube for hygienic reasons

The device consists of a Type 3804-1 Transmitter (refer to Data Sheet T 7540 EN for more details) and a pressure seal system with a separating diaphragm, which is coupled with the pressure measuring element of the transmitter over a barrier liquid (silicone oil). Thus, the measured pressure acting on the separating diaphragm is transmitted to the measuring element and converted into a proportional output by the transmitter. The deflection of the force-balanced transmitter is extremely small. Therefore the spring characteristics and the hysteresis of the separating diaphragm hardly influence the measuring characteristics of the instrument.

Special features

- The process medium only comes into contact with the connecting parts of the pressure seal and the separating diaphragm connected to the upper part.
- Can be used in hazardous areas (Zones 1 and 2) without restrictions or without special measures



Fig. 1: Type 3804-1 with Pressure Seal

Versions

Type 3804-1 with Pressure Seal

Standard version with lower range value $p_e = 0$ bar · An approx. 2-m-long tube connects the transmitter with the pressure seal, its measuring connection optionally being a G ½ tapped hole, an open flange in DN 50 or a hygienic coupling in DN 50.

Special version with positive adjustable lower range value

Note

All pressures p_e are specified in bar (gauge) unless specified otherwise.

Table 1: Technical data · All pressure stated as gauge pressure p_e in bar unless specified otherwise

The pressures for the measuring span, overloading and ultimate strength are limited by the nominal pressure range of the pressure seal.

Type 3804-1		
Span	1 to 20 bar	16 to 100 bar
Measuring limit	38 bar	120 bar
Overloading	Ten times the adjusted span, however not exceeding 50 bar	
Ultimate strength up to	100 bar	250 bar
Pressure measuring element	Metal bellows	
Supply air	1.4 ± 0.1 bar (20 ± 1.5 psi) · Air quality according to ISO 8573-1 · Max. particle size and density: Class 4 · Oil content: Class 3 · Pressure dew point: Class 3 or at least 10 K below the lowest ambient temperature to be expected	
Output pressure	0.2 to 1 bar (3 to 15 psi)	
Air consumption in steady state	< 0.15 m _n ³ /h	
Max. air output capacity	1 m _n ³ /h	
Load characteristic	0.3 m _n ³ /h per 3 % output signal change	
Characteristic	Linear	
Deviation from linearity	< 0.5 % with terminal-based conformity	
Hysteresis	< 0.2 %	
Dead band	< 0.05 %	
Overload influence	Overload up to permissible value < 1 %	
Permissible ambient temperature for transmitter	-20 to +70 °C	
Degree of protection	IP 54	
Transmitter with adjustable lower range value		
Lower range value adjustable from	0 to 18 bar	0 to 90 bar
Additional temperature influence	< 0.2 %/10 K	

Refer to Data Sheet T 7540 EN for further technical data.

Pressure seal	
Process fluid connection	
Tapped hole G ½	PN 100, 250
DIN flange, DN 50	PN 40, 63, 100, 160 or 250
Hygienic coupling DIN 11851, DN 50	PN 10
Upper part welded to separating diaphragm and capillary tube	
Permissible temperature at the separating diaphragm	-40 to +150 °C · DIN flange, DN 50: on request up to +300 °C

Table 2: Materials · Material numbers according to DIN EN

Type 3804-1	
Process fluid connection	1.4571 On request: Steel, Hastelloy B or C, Monel, nickel, tantalum lining or PTFE lining (up to 220 °C and PN 40)
Separating diaphragm	1.4571 On request: Steel, Hastelloy B or C, Monel, nickel, tantalum lining or PTFE lining (up to 220 °C and 40 bar)
Upper part	1.4571
Clamping flange, nuts, bolts	Steel (zinc-coated) · Special version: 1.4571
Hygienic coupling DIN 11851, DN 50	PN 10, 1.4300

Installation

The usual mounting position, i.e. with the base in horizontal position and process fluid connection pointing downwards, is shown in the dimensional drawings.

A different mounting position, i.e. with the base in vertical position and process fluid connection in horizontal position, is possible. In this case, the air connections must be located above the process fluid connection. Zero must be corrected if this mounting position is used.

The supplied mounting parts allow the following types of mounting (see Fig. 2):

- **Pipe mounting** with clamp to horizontal or vertical 2" pipe.
- **Wall mounting** with mounting plate attached to the wall.

Note

In devices with measuring spans up to 6 bar, the height difference between the pressure seal and the transmitter influences the lower range value and must therefore be taken into account during calibration.

Ordering text

Type 3804-1 Pneumatic Transmitter with Pressure Seal

Span ... to ... bar/adjusted from ... to ... bar

Output 0.2 bar to 1 bar/up to 15 psi

Process fluid connection ...; optionally, special version/accessories

Dimensions in mm

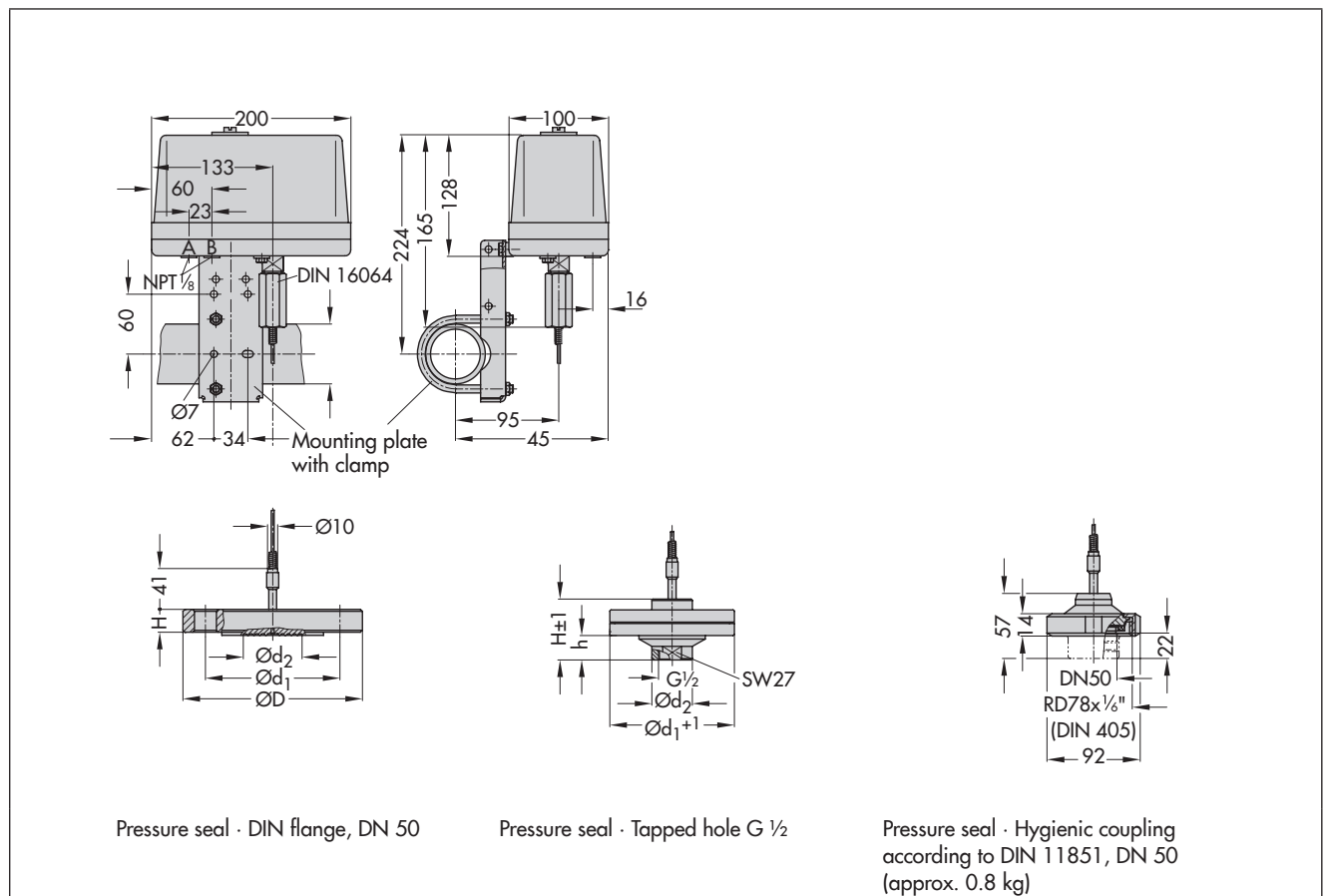


Table of dimensions

Process fluid connection	PN	mm					Weight, approx. kg
		D	d ₁	d ₂	h	H	
Tapped hole G 1/2	100	–	90	30	8.5	56	4.6
	250	–	108	30	2.5	56	6.2
DIN flange, DN 50	40	165	125	59	–	20	6.5
	63	180	135	59	–	26	8.3
	100	195	145	59	–	28	9.7
	160	195	145	59	–	30	10.2
	250	200	150	59	–	38	12.5

Fig. 2: Dimensional drawings

Specifications subject to change without notice



SAMSON AG · MESS- UND REGELTECHNIK
Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
Internet: <http://www.samson.de>

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