

T 7550 EN

Type 3804-1 Pneumatic Transmitter for Pressure with Diaphragm Seal

Application

Pressure transmitter with diaphragm seal for liquids, gases and vapors · Operating pressures from 0 to 20 bar
Measuring spans from 1.0 to 20 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 diaphragm seals is beneficial or necessary if the process medium cannot be routed to the measuring element through a tube. Such process media 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 (details in Data Sheet ▶ T 7540) and a diaphragm seal with a separating diaphragm, which is coupled with the pressure measuring element of the transmitter over a filler liquid (silicone oil). This allows the measured pressure acting on the separating diaphragm to be 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 diaphragm 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

Versions

Type 3804-1 with diaphragm seal

Standard version with lower range value $p_e = 0$ bar. An approx. 2-m-long tube connects the transmitter with the diaphragm seal.



Fig. 1: Type 3804-1 with diaphragm seal

Other version


Flange DN 50 or DN 80 mounted directly to the transmitter

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 diaphragm seal.

Type 3804-1		
Measuring span (continuously adjustable)	1 to 6 bar	1 to 20 bar
Overloading	Ten times the adjusted span, however not exceeding	
	25 bar	50 bar
Ultimate strength up to	60 bar	100 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	
Compliance		

For further technical data, see Data Sheet ► T 7540

Diaphragm seal	
Process fluid connection	DIN flange
Upper part welded to separating diaphragm and capillary tube	
Permissible temperature at the separating diaphragm	-40 to +150 °C

Table 2: Diaphragm seal configurations

Diaphragm seal attached	Measuring span up to	Flange size	Nominal pressure
With 2 m capillary tube	20 bar	DN 50	PN 40
			PN 63
Direct	6 bar	DN 50	PN 40
		DN 80	PN 40
	20 bar	DN 50	PN 40

Table 3: Materials · Material numbers according to DIN EN

Type 3804-1	
Wetted parts	1.4404/1.4435 (316L)

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 also 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 diaphragm 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 Diaphragm Seal

Span ... bar

Output 0.2 to 1 bar/up to 15 psi

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

Measuring range adjusted to: ... to ... bar

Dimensions in mm

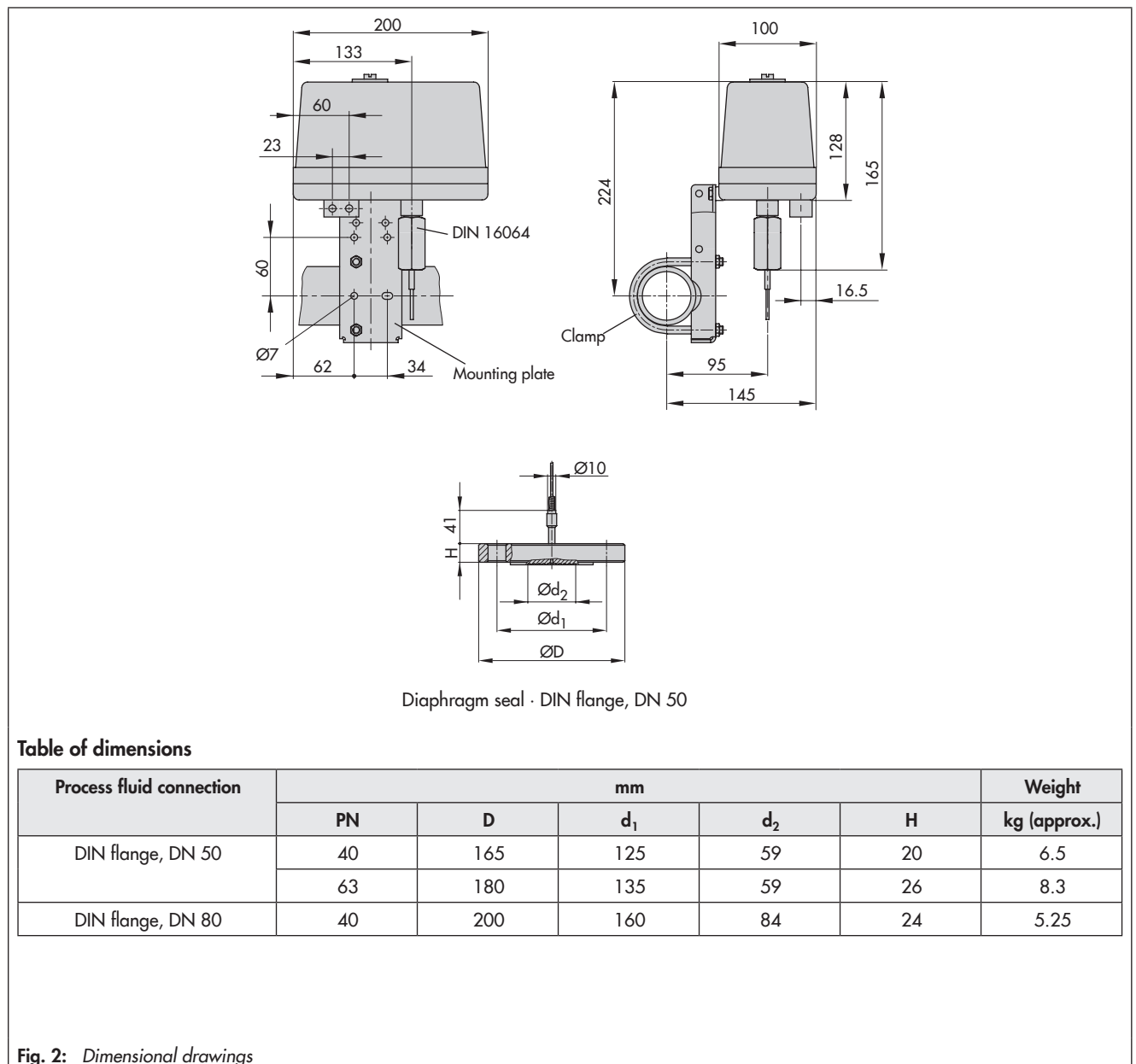


Table of dimensions

Process fluid connection	mm					Weight
	PN	D	d ₁	d ₂	H	kg (approx.)
DIN flange, DN 50	40	165	125	59	20	6.5
	63	180	135	59	26	8.3
DIN flange, DN 80	40	200	160	84	24	5.25

Fig. 2: Dimensional drawings

Article code

Pneumatic transmitter for pressure	Type 3804- 1 0 0 x x 0 4 0 4 x x 0 x x 0 0															
Pneumatic transmitter for pressure, process fluid connection diaphragm seal with DIN flange, pneumatic connections 1/8"-27 NPT, at the side																
Measuring range																
1 to 20 bar with diaphragm seal and capillary tube					1	1						0	5/6		1	1
1 to 6 bar with diaphragm seal directly attached					3	1						1	4/5		7	2
1 to 20 bar with diaphragm seal directly attached					3	2						1	4		7	2
Diaphragm seal																
Flange DN 50, PN 40												0	5			
Flange DN 50, PN 63												0	6			
Flange DN 50, PN 40												1	4			
Flange DN 80, PN 40												1	5			