

# Pneumatic Transmitter for Temperature



**Type 812-1** · With fixed sensor or sensor with capillary tube

## Application

Temperature transmitter for use in pneumatic control systems with temperatures from  $-40\text{ °C}$  to  $+300\text{ °C}$ .

Instruments for measuring temperatures and converting the measured value into a pneumatic standardized signal of 0.2 to 1.0 bar or 3 to 15 psi · Suitable for measuring liquids, gases and vapors.

## Special features:

- Wide variety of applications as the nitrogen ( $\text{N}_2$ )-filled bulb of the sensor can be used for various media
- Measuring span of 50, 100 or 200 °C
- The lower range value can be adjusted within broad limits
- Sensor made of CrNiMo steel (1.4571)

## Versions

**Type 812-1** · Pneumatic transmitter for temperature with bulb or spiral sensor · Measuring span 50, 100 or 200 °C · Measuring limits  $-40$  to  $+300\text{ °C}$  · Measuring range  $-20$  to  $+30\text{ °C}$ ,  $0$  to  $+100\text{ °C}$ ,  $+50$  to  $+150\text{ °C}$ ,  $0$  to  $+200\text{ °C}$

Version with fixed temperature sensor (Fig. 1) or with temperature sensor connected to the measuring system via a capillary tube (Fig. 2).

**On option** · Air temperature sensor (outside diameter 20 mm) or temperature sensor for installation in T-unions acc. to DIN 11 857 (for milk and other food and beverages).

**Special version** · Connection pipe with protective metal hose · Supply air connection  $G\ \frac{1}{8}$  instead of  $\frac{1}{8}$  NPT · Special measuring range



Fig. 1 · Type 812-1 with fixed sensor (standard version)



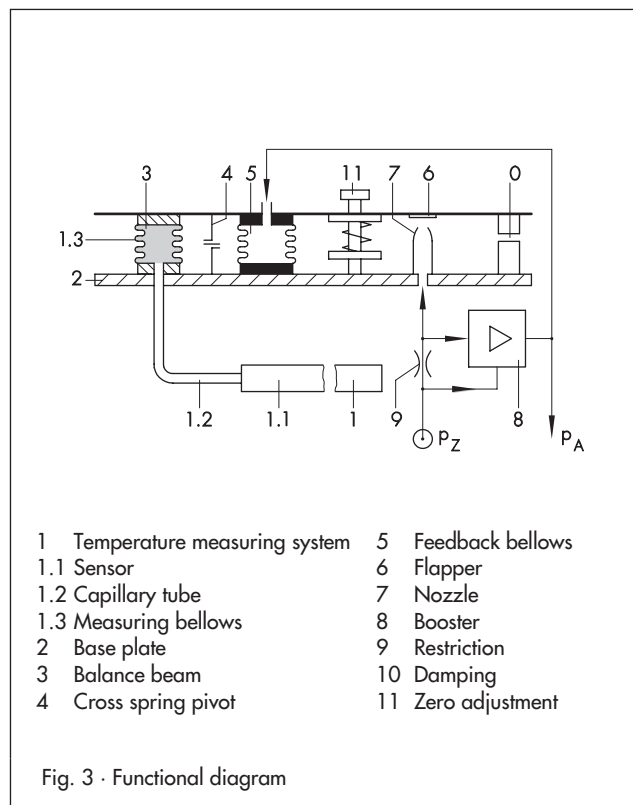
Fig. 2 · Type 812-1, sensor with capillary tube

### Principle of operation (Fig. 3)

The temperature of the process medium produces in the gas-filled sensor (1) a pressure proportional to the temperature. This pressure acts on the measuring bellows (1.3) creating a force which is measured at the balance beam (3) and converted into a pneumatic signal ( $p_A$ ).

The supply air  $p_z$  flows through the booster (8) passes on to the restriction (9) and the nozzle (7) and finally hits the flapper (6). Increasing temperature causes the flapper to come closer to the nozzle. As a result, the output pressure  $p_A$  supplied to the bellows (5) rises as long as equilibrium is reached again, i.e. until the output signal reaches a value proportional to the temperature.

Adjustment of zero via the adjustment screw (11).



### Ordering text

Type 812-1 Pneumatic Transmitter

With fixed sensor/capillary tube 3 m/ capillary tube 6 m

Sensor smooth/for T-union/for air

Measuring range ... C

On option, accessories ..., special version

### Ordering code

- Complete order number as required -

Version	3812-	...	...	...	...
<b>Sensor type</b>					
Bulb sensor	1				
Air sensor	2				
Sensor for food processing	3				
<b>Sensor version</b>					
Capillary tube, 3 m	1				
Capillary tube, protected, 3 m	2				
Capillary tube, 6 m	3				
Capillary tube, protected, 6 m	4				
Bulb sensor, fixed	5				
<b>Measuring span</b>					
50 °C	2				
100 °C	3				
200 °C	4				
<b>Connection/output</b>					
1/8 NPT / 0.2 to 1 bar	0				
1/8 NPT / 3 to 15 psi	1				
G 1/8 / 0.2 to 1 bar	2				
G 1/8 / 3 to 15 psi	3				

**Table 1 · Technical data** · All pressure stated as gauge pressure  $p_g$  in bar

Measuring span	50 °C	100 °C	200 °C
Measuring limits	-40 to +300 °C		
Overload limits	350 °C	350 °C	500 °C
Supply air	Supply air 1.4 ±0.1 bar (20 ±1.5 psi)		
Output	0.2 to 1.0 bar (3 to 15 psi)		
Air supply	Max. 2 m <sub>n</sub> <sup>3</sup> /h		
Consumption	0.1 m <sub>n</sub> <sup>3</sup> /h in steady-state conditions		
Load characteristic	0.8 m <sub>n</sub> <sup>3</sup> /h, reversing error < 0.3 %		
Deviation in characteristic	0.6 % with terminal-based conformity		
Hysteresis	< 0.2 %		
Influence	Supply air: < 0.12 %/0.1 bar		
Pressure at the sensor	< 0.4 %/10 bar	< 0.2 %/10 bar	< 0.1 %/10 bar
Ambient temperature	< 0.06 %/°C		
Perm. ambient temperature	-40 to +90 °C		
Length of capillary tube	3 m or 5 m		

### Installation

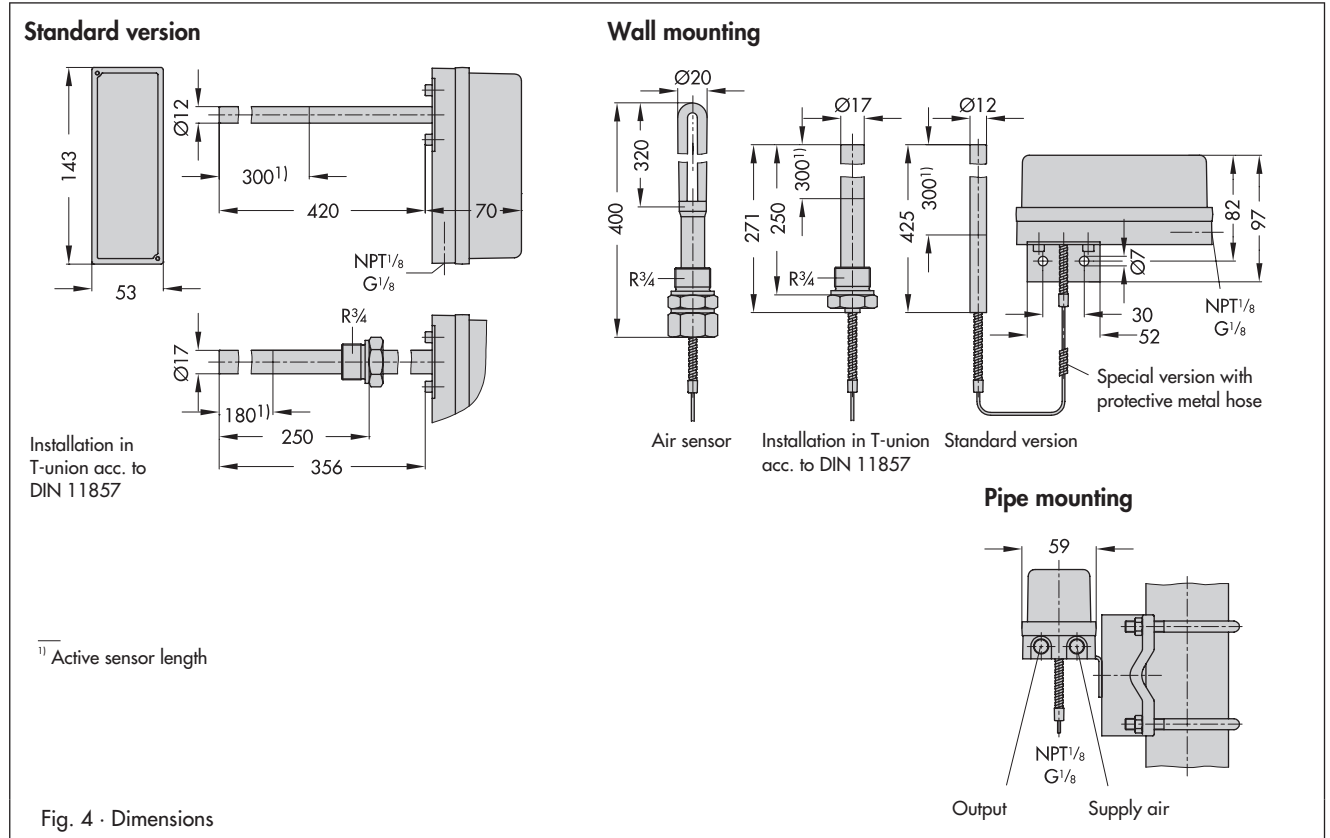
All the dimensional diagrams show the standard mounting position. Other mounting positions may require the correction of the lower range value.

For versions with capillary tube, the temperature sensor can be mounted in any position. This version comes supplied with brackets for wall mounting. Pipe mounting needs special mounting brackets (order no. 1.089-0101).

To ensure accurate measurements, the active bulb length of the sensor must be entirely immersed in the fluid to be measured.

**Air connections:** Two tapped holes  $\frac{1}{8}$  NPT (optionally, two tapped holes ISO 228 G  $\frac{1}{8}$ ).

### Dimensions in mm



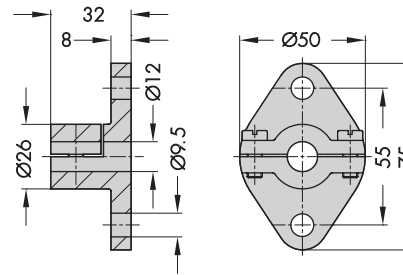
## Accessories (see Fig. 5)

Accessories are not included in the scope of transmitter delivery. They need to be ordered separately. Select accessories as necessary for the operating conditions at the site of installation.

### Clamping flange

Clamping flange for wall mounting, e.g. on pressureless vessels, ducts, etc.

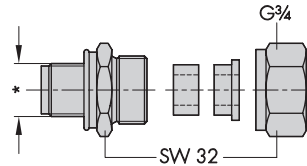
Order no.: 1090-9547



### Screw gland (PN 10) for pressures up to 10 bar

\*) G 1/2: Order no.: 1080-4881

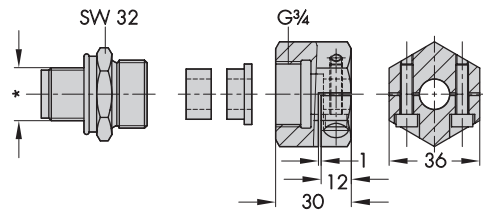
G 3/4: Order no.: 1080-4882



### Screw gland (PN 40) for pressures up to 40 bar

\*) G 1/2: Order no.: 1080-4884

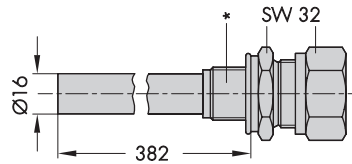
G 3/4: Order no.: 1080-4885



### Thermowell with thread (PN 63) for pressures up to 63 bar

\*) G 1/2: Order no.: 1080-4888

G 3/4: Order no.: 1080-4889



### Thermowell for welding (PN 63) for pressures up to 63 bar

#### Thermowell with flange DN 25 for PN 40 or PN 100

Details on request

Order no.: 1080-4890

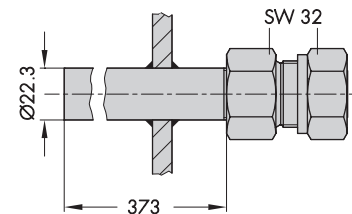


Fig. 5 · Accessories

Specifications subject to change without notice.



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