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## Indoor, outdoor and duct resistance thermometers

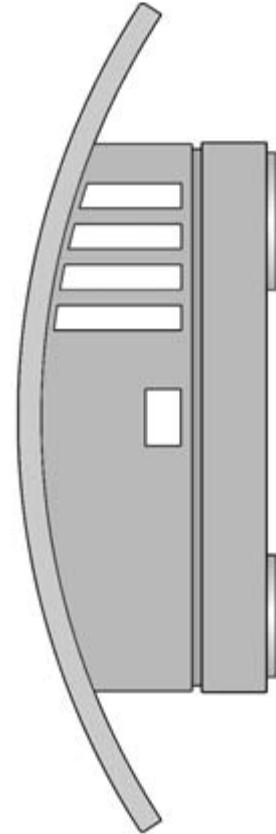
- for temperatures from -30 to +80°C (200°C)
- for use in HVAC
- IP20 to IP65 protection
- for 2-wire, 3-wire or 4-wire connections
- fitted transmitter option 4 – 20mA / 0 – 10V

Indoor, outdoor and duct resistance thermometers for HVAC applications are mainly used for temperature measurement in rooms, air ducts and outdoors.

Different instrument versions with plastic housings for different protection ratings are available to suit the particular measurement task.

The measuring insert is normally fitted with a Pt100 temperature sensor to EN 60 751, Class B, in 2-wire circuit. Versions with Pt500, Pt1000 or Ni 1000 can also be supplied. An extension in 3- or 4-wire circuit, starting from the terminals, is possible.

A transmitter can optionally be integrated.



## Technical data

### Terminal box

plastic PC housing (material PP on Type 902523/11), IP20 to IP65,  
Type 902523/25: IP54 and IP65 protection

### Protection tube

stainless steel 1.4571; 5.4mm and 6mm dia.

### Measuring insert

Pt100 temperature sensor, EN 60 751, Class B, 2-wire circuit

### Transmitter

analog transmitter, output signal 4 – 20mA or 0 – 10V

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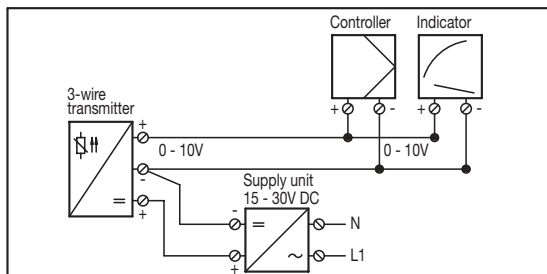
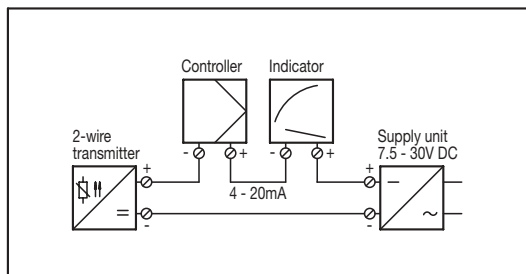


Transmitter	Output 4 – 20mA		Output 0 – 10V	
	<b>Input</b>			
Measurement input	Pt100 (EN 60 751)			
Sensor current	≤ 0.5mA			
Sampling rate	continuous measurement because of analog signal path			
<b>Measurement circuit monitoring</b>				
Underrange	falling to ≤ 3.6mA		0V	
Overrange	rising to ≥ 22mA to < 28mA (24mA typical)		rising to ≥ 11V to < 14V (12V typical)	
Probe short circuit	≤ 3.6mA		0V	
Probe and lead break	≥ 22mA to < 28mA (24mA typical)		≥ 11V to < 14V (12V typical)	
<b>Output</b>				
Output signal	proportional DC current 4 – 20mA		DC voltage 0 – 10V	
Transfer characteristic	linear with temperature			
Transfer accuracy	≤ ±0.1 %		≤ ±0.2 %	
Damping of ripple on 24V supply voltage, amplitude 10V/50Hz, burden 470Ω/load 10MΩ	37dB		40dB	
Burden (R <sub>b</sub> )	R <sub>b</sub> = (U <sub>b</sub> - 7.5V) / 22mA		-	
Burden error	≤ ±0.02 % / 100Ω <sup>1</sup>		-	
Load/load error	-		≥ 10kΩ / ≤ ±0.1 %	
Settling time on temperature change	≤ 10msec			
Calibration conditions	24V DC / approx. 22°C			
Calibration accuracy	≤ ±0.2 % <sup>1,2</sup> or ≤ ±0.2 °C			
Overall accuracy: sensor/calibration	±0.4 °C (typical) at 20°C / 24V supply voltage			
<b>Supply</b>				
Supply voltage (U <sub>b</sub> )	7.5 – 30V DC		15 – 30V DC	
Reverse polarity protection	yes			
Supply voltage error	≤ ±0.01 % per V deviation from 24V <sup>1</sup>			
<b>Ambient conditions</b>				
Operating temperature range	-40 to +85°C			
Storage temperature range	-40 to +100°C			
Temperature error	≤ ±0.01 % per °C deviation from 22°C <sup>1</sup>			
Climatic conditions similar to EN 60 654, Class C1	relative humidity ≤ 95 % annual mean, no condensation			
EMC interference emission/immunity	EN 61 326, Class B / to industrial requirements			

1. All data refer to the end-of-range value 20mA.

2. The larger value applies.

**Connection example with supply unit, 4 – 20mA output**      **Connection example with supply unit, 0 – 10V output**



**Connection diagram**

**Output 4 - 20mA**

Connection for	Terminal	Terminal
Supply voltage 7.5 - 30V DC	+ 81	81 82
Current output 4 - 20mA	- 82	+ -

$$R_B = \frac{U_b - 7.5V}{22mA}$$

R<sub>B</sub> = burden resistance  
U<sub>b</sub> = supply voltage

**Output 0 - 10V**

Connection for	Terminal	Terminal
Supply voltage 15 - 30V DC	+ 81	81 82 83
Voltage output 0 - 10V	- 82	+ - +

Load ≥ 10kΩ