

Temperature sensor with Pt100 or 4 to 20mA output

# Easytemp TMR31



**R 1147.-**  
11-35 pcs.

- PC programmable transmitter with 4 to 20 mA output or Pt100 sensor
- Fast response times without reduced tip
- Selectable sensor length

## **i** Specs at a glance:

- **Temperature range:**  
-50 to +200 °C (-58 to 392 °F)
- **Accuracy:**  
<0.08 %, Pt100 class A
- **Immersion length (diameter):**  
40 to 600 mm (∅ 6 mm)  
(1.6 to 23.6" (∅ 0.24))
- **Sensor response time:**  
<1.0 s (T<sub>50</sub>), <2.0 s (T<sub>90</sub>)

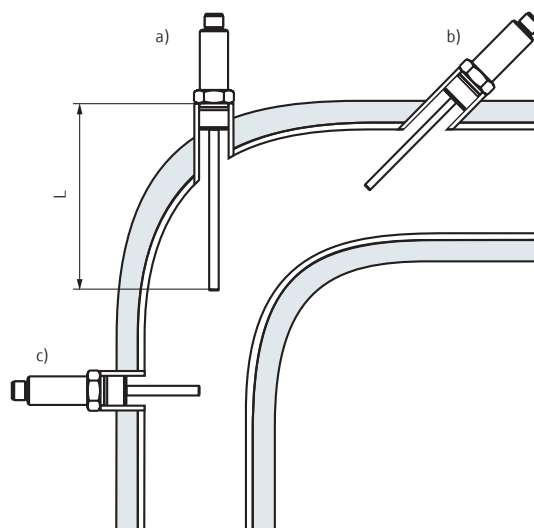
**Application** The Easytemp TMR31 is a compact cost-effective thermometer that has been designed for use in all general applications across the process industries.

**Function** The compact thermometer consists of a Pt100 class A sensor, (optional) transducer and housing with process connection. The TMR31 is available without a process connection so that it can be combined with a TW251 thermowell (with compression fitting) for insertion into a process. The built-in electronics can be programmed using a PC and TXU10-BA configuration kit to convert the Pt100 input signal into a temperature linear 4 to 20 mA signal.



Complete product information:  
[www.e-direct.endress.com/tmr31](http://www.e-direct.endress.com/tmr31)

## Installation instructions



Pipe installation

- At angle sections, against the direction of flow
- In smaller pipes, turned against the direction of flow
- Perpendicular to the direction of flow

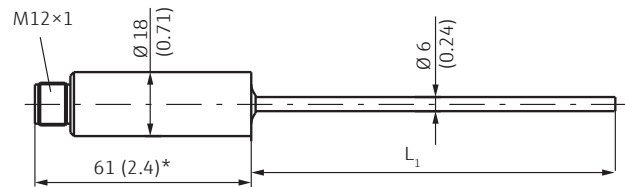
L = Insertion length

## Technical data

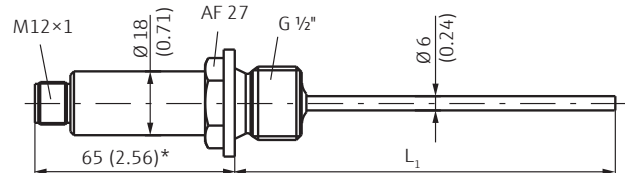
Sensor	
Sensing element	1 × Pt100
Tolerance	Class A to IEC 751
Process temperature	-50 to +150 °C (-58 to 302 °F) (200 °C (392 °F) extension neck)
Material	
Material	316L
Diameter	6 mm (Ø 0.24")
Length	40 to 600 mm (1.6 to 23.6") selectable (please specify)
Response time	$T_{50} = <1.0$ s; $T_{90} = <2.0$ s
Max. pressure	100 bar / 1500 psi (at 100 mm / 3.94" and 20 °C / 68 °F, depending on process conn.)
Process connection	
Version	G½", 316L; without (flange welding boss or compression fitting needed)
Transmitter housing	
Degree of protection	IP 66/67
Electrical connection	M12×1-plug-in connector
Material	304
Output characteristics	
Output signal	With electronics 4 to 20 mA, 20 to 4 mA without electronics Pt100
Signal on alarm	Under measuring range: linear decrease to 3.8 mA Over measuring range: linear increase to 20.5 mA Sensor break; Sensor short-circuit: ≤3.6 mA or 21.0 mA
Load	Max. ( $U_{\text{power supply}} - 10$ V) / 0.023 A
Induced current requirement	≤3.5 mA
Current limitation	≤23 mA
Switch-on delay	2 s
Power supply	
Supply voltage	$U_b = 10$ to 35 V DC
Residual ripple	Permitted residual ripple $U_{ss} \leq 3$ V at $U_b \geq 13$ V, $f_{\text{max}} = 1$ kHz
Accuracy	
Transmitter response time	1 s
Reference operating conditions	0 °C (32 °F) (ice bath)
Measuring error	0.1 K (0.18 °F) or 0.08 %
Influence of supply voltage	≤ ±0.01 %/V deviation from 24 V
Influence of ambient temperature (temperature drift)	$T_d = \pm(15 \text{ ppm/K} \times (\text{full scale value of measuring range} + 200) + 50 \text{ ppm/K} \times \text{set measuring range}) \times \Delta\theta$ $\Delta\theta =$ deviation of ambient temperature from the reference operating condition
Long term stability	≤0.1 K/year or 0.05 %/year
Influence of load	≤ ±0.02 %/100 Ω
Operating conditions	
Ambient temperature	-40 to +85 °C (-40 to 185 °F)
Storage temperature	-40 to +85 °C (-40 to 185 °F)
Climate class	As per EN 60 654-1, Class C
Condensation	Permitted
Shock resistance	4 g/2 to 150 Hz as per IEC 60068-2-6
EMC	According to IEC 61326 Series and NAMUR NE21
Approvals	
Approvals	DNV GL

## Dimensions in mm (inches)

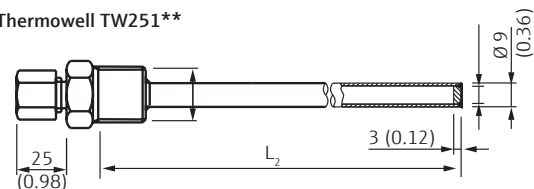
### Without process connection



### With G ½" process connection



### Thermowell TW251\*\*



$L_1 =$  selectable length from 40 to 600 mm (1.6" to 23.6")

$L_2 = 50 / 100 / 150 / 200$  mm (1.97" / 3.94" / 5.9" / 7.87")

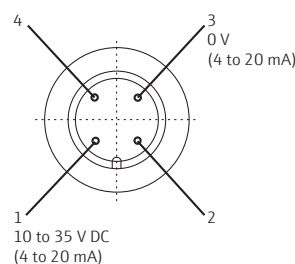
\* Version with extension neck add 35 mm (1.38")

\*\* The TMR31 has to be at least 50 mm (1.97") longer than  $L_2$

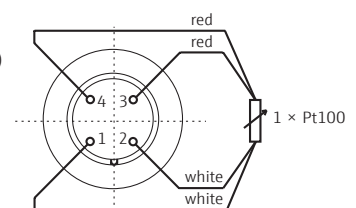
Installation according to instruction manual.

## Electrical connection

### 4 to 20 mA



### 1 × Pt100



## Price table

### Neck

Code	Neck
A	W/o
B	35 mm (1.38")

Easytemp TMR31			Order no.	Price/pcs. in R		
Output	Process Connection	Length*		1 to 3	4 to 10	11 to 35
4 to 20 mA max.150°	Without	<input type="text"/> mm	TMR31-A1X <input type="text"/> AAAX1AAA	2131.-	1982.-	1876.-
	G½"	<input type="text"/> mm	TMR31-A1X <input type="text"/> BBAX1AAA	2257.-	2099.-	1986.-
4 to 20 mA max 200	Without	<input type="text"/> mm	TMR31-A1XBAAAX1AAA	2131.-	1982.-	1876.-
	G½"	<input type="text"/> mm	TMR31-A1XBBBAX1AAA	2257.-	2099.-	1986.-
Pt100. DIN class A. 4-wire	Without	<input type="text"/> mm	TMR31-A11 <input type="text"/> AAAX1AAA	1303.-	1212.-	1147.-
	G½"	<input type="text"/> mm	TMR31-A11 <input type="text"/> BBAX1AAA	1428.-	1328.-	1257.-

\* Please specify sensor length (40 to 300 mm)!

\*\* Please add code for measuring range.

Accessories	Order no.	Price/pcs. in R
Flange welding boss for TMR31 without process connection	51004751	792.92
Flange welding boss for TMR31 with process connection G½"	51004752	418.67
Compression Fitting TA50 6mm; G1/2"; PTFE	TA50-HP	966.26
Configuration kit with USB-connection	TXU10-BA	2148.96
5 m cable with M12×1 plug	51005148	163.66

Prices are applicable for South Africa until 30/06/2020, in Rand (R) per unit, net excluding value added tax (VAT), cost of packing and dispatch. Endress+Hauser retains the right to change or modify pricing at any time. The terms of sales and delivery of Endress+Hauser are applicable. Current prices and delivery times can be verified prior to ordering on [www.e-direct.endress.com](http://www.e-direct.endress.com).

Complete product information:  
[www.e-direct.endress.com/tmr31](http://www.e-direct.endress.com/tmr31)

More products to complete  
your measuring point ...



Pressure sensor  
Cerabar PMC21



Process meters  
RIA45



Process transmitter  
RMA42