

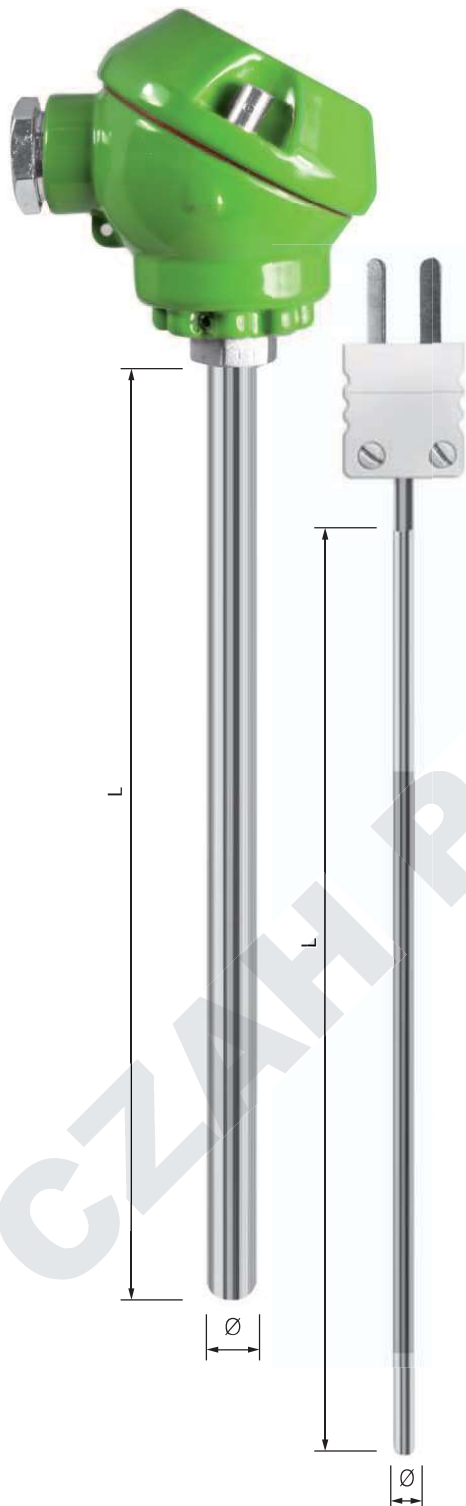
03

# MINERAL INSULATED RESISTANCE THERMOMETERS

Mineral insulated resistance thermometers are intended to measure the temperature in difficult environments. Can be supplied as simplex or duplex. Operating range is -50 to + 600 °C. Sensors are characterised by a short response time and high insulation resistance. The mineral insulated construction allows sensor to be bent. Sensors available in 2,3 and 4-wire configuration.

General Information:

- Sensor type: Pt100; Pt500; Pt1000 or their multiple
- Sheath material: steel 316 (other materials possible after agreement)
- Sensor termination options: table 4
- Connection cables: according to a customer's requirements
- Minimum length of a sensor: because of measuring reasons the length should be no less than 60 mm.



03	sensor type	accuracy	sheath diameter	wiring configuration	measuring part length	termination type	cable length	cable type	compression fitting	temperature transmitter	max operating temperature
	Pt100 2xPt100 Pt500 Pt1000 2xPt500 2xPt1000										
	Give accuracy class (table 1)										
	Give sheath diameter Ø ; table 2										
	Give wiring configuration; table 3 (refers to one measuring element)										
	Give measuring part length L [mm]										
	Give construction type; table 4										
	Cable length [mm] (for a cable ended with a connector, please specify connector type; table 4)										
	Give cable type; table 5										
	Give compression fitting type (skip if not requested)										
	Give transmitter details (for sensors with terminal head); table 7										
	Give max operating temperature of measuring part										

## TAB. ORDERING CODE:

03	Pt100	A	3,0	4	500	T3H	3000	RT402	UG101 D3S	—	300 °C
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### 03 – Pt100 – A – 3,0 – 4 – 500 – T3H – 3000 – RT402 – UGS103 – 300 °C

Temperature sensor model 03 (resistance mineral insulated) Type Pt100, simplex, class A, diameter 3,0 mm, 4-wire design, length 50 mm (measured from a pot seal). Sensors ended with a pot seal T3H (spring loaded pot seal protected with resin for temperature of 220 °C). Cable 3000 mm long, Teflon insulated with stainless steel overbraid RT402, with a moveable ss fitting with thread M10x1 (UG101D3S). Operating range of the measuring part is up to a maximum of 300 °C.

**TAB. 1 RESISTOR TOLERANCE CLASS AND OPERATING TEMP. RANGE \*)**

TOLERANCE CLASS	FOR WIRE WOUND RESISTORS	FOR THIN FILM RESISTORS	TOLERANCE VALUE **)
<b>AA</b>	-50 ÷ +250	0 ÷ +150	± (0.1+0.0017 t )
<b>A</b>	-100 ÷ +450	-30 ÷ +300	± (0.15+0.002 t )
<b>B</b>	-196 ÷ +660	-50 ÷ +500	± (0.3+0.005 t )
<b>C</b>	-196 ÷ +660	-50 ÷ +600	± (0.6+0.01 t )

\*) to PN-EN60751:2009

\*\*)|t| = temperature in °C no matter what unit (absolute value)

**TAB. 2 AVAILABLE CONSTRUCTIONS ( DEPENDING ON THE DIAMETER \*\*)**

NUMBER OF RESISTORS	WIRE NUMBER (FOR ONE RESISTOR)	TEMPERATURE SENSOR DIAMETER [mm] **)		
		Ø 3,0	Ø 4,5	Ø 6,0
<b>1</b>	2	X	X	X
	3	X	X	X
	4	X	X	X
<b>2*</b>	2		X	X
	3		X	X
	4			X

\*) in case of 2 resistors the number of wires is double \*\*) different diameters on request, eg. Ø 1,5 mm and Ø 2,0 mm

**TAB. 3 WIRING CONFIGURATION AND COLOUR MARKING**

SINGLE (ONE RESISTOR)			
2-WIRE DESIGN	3-WIRE DESIGN	4-WIRE DESIGN	
DOUBLE (2 RESISTORS)			
2-WIRE DESIGN	3-WIRE DESIGN	4-WIRE DESIGN	

**TAB. 4**    **SENSOR CONSTRUCTION**

TYPE	POT SEAL WITH A CABLE *) **)	TYPE	CONNECTOR *)
<b>T1</b> to 120 °C  <b>T1H</b> to 220 °C	For diameters from 0.5 mm to 4.5 mm. Operating temperature for connector: 120 °C, T1H version to 220 °C 	<b>SW1</b> to 220 °C 2-pin  <b>SW2</b> to 220 °C 3-pin  <b>SW3</b> to 220 °C 4-pin	    
<b>T2</b> to 120 °C  <b>T2H</b> to 220 °C	For diameter 6.0 mm. Operating temperature for connector: 120 °C, T2H version to 220 °C 	<b>MW1</b> to 220 °C 2-pin  <b>MW2</b> to 220 °C 3-pin  <b>MW3</b> to 220 °C 4-pin	    
<b>T3</b> to 120 °C  <b>T3H</b> to 220 °C	For diameter 6.0 mm. Operating temperature for connector: 120 °C, T3H version to 220 °C. Additional seal protects a cable against breaking during bending. 		

\*) in case of higher operating temperature, please contact the sales department  
 \*\*) different types of pot seals available on request











\*) different LEMO types available on request

TERMINAL BLOCK OR MI CABLE WITH BARE ENDS *)	
<b>TYPE</b>  <p>Fixing screws M4 (33 mm distance)</p>	<b>WK2 *)**</b>  

\*) different length available on request \*\*) diameter of thermo-electrodes depends on a diameter of MI cable

COMPRESSION FITTING *)	
<b>TYPE</b>  <b>KR12 with thread G1/2"</b>  	<b>KR24 with thread M24x1.5</b>  

\*) different thread dimensions available on request

TERMINAL HEAD *) **) **)					
TYPE	B	NA	MA	G1	G2
					
TYPE	DA	TL	TS	SEG (stal 316)	KNN (plastic)
					

\*) different terminal heads available on request

\*\*) for technical data see table A, page 50

## TAB. 5 CABLE TYPES

The sensors can be supplied complete with cables of various design. The following insulation types are available: PCV, PTFE, fiberglass, Kapton or combination of the mentioned materials. Standards cable sections are 0.22mm<sup>2</sup> (7/0.2 mm). To choose the right cable, please see table D, page 54.

The most common cables:

RS301 - 3x0,22 mm<sup>2</sup> – Silicone insulated / 3 wires

RS401 - 4x0,22 mm<sup>2</sup> – Silicone insulated / 4 wired

RW301 - 3x0,22 mm<sup>2</sup> – fiberglass insulated / steel overbraid, 3 wires

RW401 - 4x0,22 mm<sup>2</sup> – fiberglass insulated / steel overbraid, 4 wires

## TAB. 6 COMPRESSION FITTINGS

Additional element used to assemble a thermocouple at measuring location. We offer a wide range of types. To choose the appropriate fitting, see table F, page 61. Other types available on request.

## TAB. 7 TEMPERATURE TRANSMITTER

If the in-head transmitter is requested eg. for signal 4...20 mA, please give all the necessary details, such as: transmitter type, temperature range. List of transmitters is available in the table E, page 60.