PRESSURE RESISTANT TEMPERATURE PROBE FOR SENSOR CONTROL MODULE

4 016138 304381

Ordering No. 15 65 04

Characteristic features

- **Temperature sensor in stainless steel housing**
- **Pressure resistant up to 20 bar**
- **M10 x 1.5 screw threads**
- **Inserted BUNA-N sealing gasket**

Typical areas of application

- **Heating and solar systems**
- **Building instrumentation**
- **Compressed air systems and Hydraulics**

Range of applications

Universal, pressure resistant temperature sensor for general applications e.g. heating and solar systems or industrial applications. The sensor housing of stainless steel grade 1.4305 is mechanically robust and resistant to most of the chemicals. With the M10x1.5 ISO-screw threads, direct mounting of the sensor on pipelines is possible, and this ensures a good thermal contact to the medium. The gasket ring provided on the threaded flange tightly seals over flat surfaces.

This temperature sensor together with the universal sensor control module 156503/17/30 works as a thermostat for universal applications.

Resistance tables

The precision grade NTC-sensor is suitable for many applications where high accuracy temperature measurements are needed. Since the sensor element used (NTC resistor) is of very close tolerance, it is interchangeable without re-calibration in most cases. The resistance value of the sensor is directly dependent on temperature. The high slope of impedance curve enables its implementation through simple evaluation circuits. With an integrated parallel resistor, the resistance pattern is pre-linearised to a S-form shape. The curve has a mamixum slope in the range of 20°C.

The following table gives further details on the dependency of sensor resistance with respect to temperature. The tolerance in resistance value is ±2%. The detailed characteristics with intermediate values can be obtained from us on request (EXCEL-file).

Temperature	Resistance
-40° C	96.4 kOhm
0° C	72.9 kOhm
10° C	62.2 kOhm
20° C	50.9 kOhm
30° C	40.1 kOhm
40° C	30.6 kOhm
60° C	17.0 kOhm
80° C	9.29 kOhm
100° C	5.17 kOhm

Technical Data

Temperature measurement	
Measuring range	-40..80°C (100° C short time)
Sensorelement	NTC SEMI 833
Resistance range	5..96 kΩ (47.54kΩ at 23.0°C)
Tolerance	± 2% of the resistance value
Linearisation	with integrated parallel resistor (100k)
General	
Dimensions of sensor tube	∅ 7 x 20 mm
Pressure withstanding capacity	20 bar
Mounting threads	ISO M10 x 1.5 L=7 mm
Sensing unit material	Stainless steel 1.4305
Cable material	Polyurethane, oil resistant
Gasket ring material	BUNA-N
Connection	RJ12-Plug, 6-pin
Cable gland	M16
Cable length	1 m
Guarantee	24 Months
Scope of supply	Temperature sensor with documentation

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HYGROSENS INSTRUMENTS GmbH Postfach 1054 D-79839 Löffingen Tel: +49 7654 808969-0 Fax: +49 7654 808969-9

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CE

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Application notes

The continuous operating temperature should not exceed 80°C, otherwise the plastic connection cable gets deformed and hence the insulation properties may deteriorate. However, the temperature sensor works for a short time at 100°C. The cable should not be subjected to cold conditions below -15°C otherwise cold breakages may occur due to brittleness.

For special applications or critical operational requirements, the suitability of materials (housing, cable and gasket), used in the sensing unit, should be checked by the user before introducing into the application.

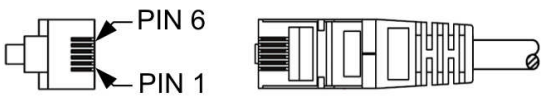
After assembly in the pipelines, the tightness of sealing should be checked to avoid any leakages.

In applications with conducting materials or unfavourable material combinations, electrolytic corrosion effects are possible. A cold welding of stainless steel threads can be avoided through anti- seizure compounds.

The sensor housing is electrically connected to the working base. Earth return current or balancing currents are not allowed for EMI reasons.

RJ12-Plug connector configuration

The sensor housing is connected to pin 6. The sensor is connected to pin 5 & 4 and is potential free. In universal sensor control module, pin 5 is connected to the device body and pin 4 is the input to instrument amplifiers. pin 1, 2 and 3 are unoccupied by the sensor.



View of contacts in the plug connector

Pin	Function	Description
1,2,3		Unoccupied
4	SENS	NTC Sensor connection 2 (Input)
5	GND	NTC Sensor connection 1 (GND)
6	SHLD	Shielding and sensor housing

Connection to the Universal Sensor control module (156503,-17, -30)

The relevant safety regulations should be duly followed. Connection and assembly should be carried out by only trained personnel and after switching off the voltage supply.

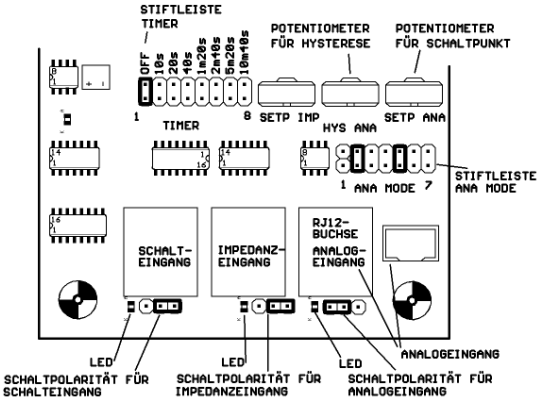
The RJ12-plug is configured for direct connection to the sensor control module. The plug connector is brought out from the hole in housing and fitted through the gland. The plug connector of the sensors is inserted into the right RJ12 socket "ANALOG INPUT" (see sketch).

Configuration of the jumpers

The operating mode for the temperature sensor is adjusted as per pin configuration “ANA MODE“. The jumpers are placed at position 2 and 5 of the pin group.

The switching mode of the device is decided by the position of jumper plug in the analog input socket: In the right position, the relay is switched ON when temperature exceeds the set switching point. In the left position shown in the sketch, the switching mode is reversed, that means the relay switches ON if the temperature measured by the sensor falls below the set switching point. The switched mode of the device can be seen on the LED. In active condition (= Relay closed) the LED glows.

Since the three inputs to the module are configured with OR-logic, the jumper plugs "Switch polarity" of the other two idle inputs must be inserted in the inactive position (see sketch). The related LEDs of the input sockets may not glow. If this is not ensured, the relay will always be in closed position!



Setting the switching point

The switching point setting for analog input "SETP ANA" is done by the preset potentiometer at the right edge of the PCB. The setting is done by comparative measurement at the desired switching point.

The range of setting is right from around –40° C (left limit on the potentiometer, i.e. counter clockwise direction) to about 100° C (right limit). The middle point of the potentiometer is at approx. 25°C.

The switching hysteresis (difference between ON and OFF switching point) can be adjusted by the preset potentiometer “HYS ANA“. The setting is to be done with a suitable screw driver.

Time delay Setting

Finally, adjustment of time delay setting is done by placing the jumper plug in the desired position on the contact strip “TIMER”. With this, the configuration is complete and the device is ready for use.

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