



Turbine thermal resistance sensor with cable outlet and high mechanical resistance

Type 112 67

INSTRUCTION MANUAL

APPLICATION

- For remote measuring of turbine bearing temperature and for other similar applications, where the sensor is installed in the bore hole of the device being measured (the collet chuck has no caulking ring)
- Up to overpressure of 100 kPa
- For the environment where the seismic resistance is required of 1 Hz up to 33 Hz, acceleration 3g, protocol of ČKD Blansko

The sensors are not the products of "justified concern" as they are specified in Act. No. 22/1997 Coll.

DESCRIPTION

The measuring resistor with the inner wiring is inserted into the stem tube with a screw fitting with a collet chuck and nut and it is electrically insulated from the stem tube housing. The outlet cable is buried with insulation substance. The screw fitting with collet chuck enables to change the change of submersion. The sensor cannot be disassembled.

To measure the temperature we use the defined change of sensor resistance in dependence of change of temperature in the environment being measures.

TECHNICAL DATA

The sensor is performed in accordance to ČSN EN 61140 ed.2 as the electrical device of protection class III for the utilization in the supply mains of installation overvoltage category II and a contamination degree 2 in accordance to ČSN EN 61010-1. The downstream device (evaluating) must conform to Art. 6.3 of this standard.

Measuring range: -70 up to 180 °C

Electrical capacity to stand in accordance to ČSN EN 61010-1 art. 6.8.4: 500 V eff

Electrical insulation resistance in accordance to ČSN IEC 751, art. 4.2.1:
min. 100 MΩ, by 15 up to 35°C, max. 80 % relative humidity

Protection in accordance to ČSN EN 60529:
IP 65

Working position: random

Sensor weight:
For L = 45 up to 80 approx. 0, 50 kg
For L = 80 up to 140 approx 0, 75 kg

Type of operation: permanent

Material used:
Stem tube of measuring element steel 1.4541
Cable outlet Cu veins with silicone insulation, outside insulation – silicon

OPERATION CONDITIONS

Environment defined by the group of parameters and their degree of severity IE 36 in accordance to ČSN EN 60721-3-3 and the operation conditions as follows:

Temperature at the outlet of cable from sensor:
Permanently -55 up to 180 °C

Relative humidity of external environment:
10 up to 100 % with condensation, with the upper limit of water content 29 g H₂O/kg of dry air

Atmospheric pressure: 70 up to 106 kPa

Vibrations:
Frequency range 10 up to 55 Hz
Deflection amplitude 0, 35 mm
Acceleration amplitude 49, 0 ms⁻²

METROLOGICAL DATA

Sensor: measuring resistor Pt 100 single or double in the connection in accordance to connection diagram and table of versions $\alpha = 0, 00385 [K^{-1}]$, toleration class B or A (only for 4-wire in accordance to ČSN IEC 751).

Inner conduction resistance at 20 °C

2 x 0, 75 mm² 0,056 Ω/m

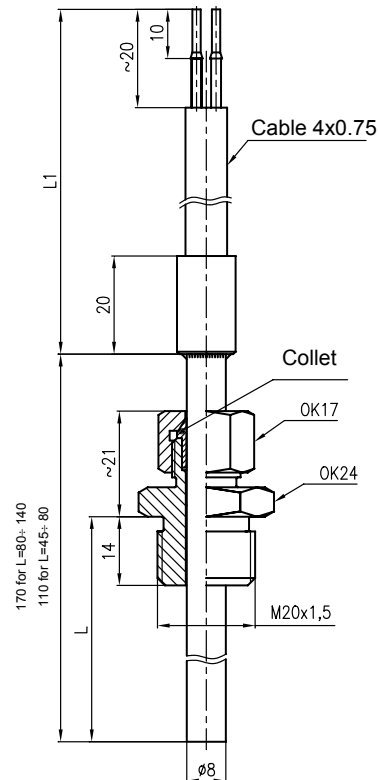
Maximum current loading of measuring resistor: 5 mA

Measuring current recommended: 1 mA

Submersion calibration depth: 100 mm

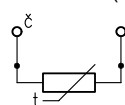
Temperature time response in accordance to ČSN IEC 751 in water whirl (typical value):

$\tau_{0,5}$ 13 s
 $\tau_{0,9}$ 33 s

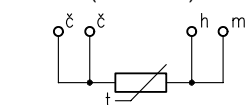


Connection diagram

Double measuring resistor
Twin wire connection
(2x Pt 100/B/2)



Single measuring resistor
Four wire connection
(Pt 100/ I4)



LABELING

Data on sensor screw fitting

- Manufacturer trade marks
- Type of resistance, nominal value R_0 / toleration class / configuration of wires if the inner wiring
- Product order number
- Protection
- Production time code
- Maximum operation temperature

DELIVERY

Each delivery shall contain if it's not otherwise agreed with the customer:

- Delivery note
- The sensor according to the order, outlet cable is twisted into a bundle and is ensured against the unrolling.
- Original technical documentation in Czech language:
 - o Certificate of quality and completeness of the product which simultaneously is a letter of guarantee

- o Letter of calibration (for the version which is calibrated)
- o Instruction manual

If it is stipulated in the purchase contract or it is not otherwise agreed the product can be delivered with the additional documentation:

- o Copy of inspection certificate 3.1 for the stem tube material with number of melting

VERSIONS OF THERMAL SENSORS

| SPECIFICATION | | | | ORDER NUMBER | | | | |
|--|-------------------|-------------------------------|--------------|--------------|---|---|---|---|
| | | | | 112 67 | 5 | x | x | x |
| Measuring resistor accordance to ČSN IEC 751 | | Pt 100/ I4 *) | | | | 6 | | |
| Toleration class B or A **) | | 2x Pt 100/B/2 | | | | 8 | | |
| Measuring resistor | | different *) | | | | 9 | | |
| Nominal length L [mm] | from 45 up to 80 | Length of cable outlet L1 [m] | 4 | | | | 1 | 4 |
| | | | different *) | | | | 1 | 9 |
| | 6,3 | | | | | 2 | 5 | |
| | different *) | | | | | 2 | 9 | |
| | from 80 up to 140 | | | | | | | |

*) only as a special option after it's agreed with the manufacturer

**) measuring resistor in toleration class A only in 4-wires connection

ORDERS

The order should mention:

- name
- order number of the product
- if calibration is requested and in which temperature points
- other (special) requirements
- number of pieces

MASTER ORDER

Standard version

Turbine thermal resistant sensor with cable outlet, with high mechanical resistance
112 675 814 - 15 pieces

Special requirement:

Turbine thermal resistant sensor with cable outlet, with high mechanical resistance
112 675 629
4-wires connection, cable length 8 m - 6 pieces

PACKAGING

Both sensors and its accessories are delivered in the package which ensures the resistance against thermal and mechanical effects according to the control packaging regulations.

TRANSPORT

It is possible to carry the sensors under conditions corresponding to the combination of classes IE 21 according to ČSN EN 60721-3-2, (i.e. by plans and trucks in the space ventilated and protected against metrological effects.).

STORING

The sensors can be stored under conditions corresponding to the combination of classes IE 11/1K3 in accordance to ČSN EN 60721-3-1 (i.e. in the space with temperature between -5 and 45 °C and humidity between 5 and 95%, without extra danger of biological factors attack and with not very significant vibrations and laying not close to dust and sand sources.).

CALIBRATION

It's carried out in accordance to TPM 3342-94 and in accordance to ČSN IEC 751, usually in three temperature points evenly distributed in the sensor operation range or in the points requested by the customer. Letter of calibration is issued with the data measured.

ASSAMBLY AND CONNECTING

Fix the sensors by screwing the screw fitting into the bore hole of turbine bearing or the lug of technological equipment in case of other applications. Working position of sensors is random; don't situate the outlet cable in the direction upwards and reduce the load of it. Submersion of sensor can be set up in range of 45 - 80 mm and 80-140 mm.

Fix the collet chuck by setting the nut up on it. Electrical connection can be performed by the staff capable at least in accordance to § 5 regulation 50/1978 Coll.



NOTICE

Cable of sensor must be protected against the effect of oil products and organic solvents!

PUTTING INTO OPERATION

After the sensor is assembled and the down stream (evaluating) device is connected to the feeding power, the appliance is ready to operate.

MANIPULATION AND MAINTENANCE

The sensor doesn't require any special manipulation or maintenance.

SPARE PARTS

Design of sensor doesn't require spare parts deliveries.

GUARANTEE

The manufacturer guarantees in accordance of § 429 of the Commercial Code and provisions of § 620, par. 2, of Civic Code for the technical and operation parameters of the product given in the instruction manual. Guarantee period is valid for 24 months from product acceptance by the customer, if it is not otherwise stipulated by the contract. Claims of defects must be filed in writing at the producer in the guarantee period. The claimant shall mention the name of product, order and production number, date of issue and number of delivery note, an appt description of the defect and what he/she is claiming. If the claimant is asked to send the device for repair he/she has to do so in the original package or in another package suitable to ensure the safe transport. Guarantee is not applied to the defects caused by the incompetent intervention, by its mechanical damage or by failure to respect the operational conditions of the product and the instruction manual.

REPAIRS

It is impossible to disassemble the sensor and therefore it is not being repaired.

PUTTING OUT OF OPERATION AND SCRAPPING

It is carried out in accordance to the Waste Act no.106/2005 Coll.

The products and their packages don't content any parts that might influence the environment.

The products put out of operation including their packages (apart of the products specified as electrical devices for purpose of return take over and separated collection of the electrical waste) can be stored either into the sorted or unsorted waste in accordance to the type of waste.

The manufacturer carries out return take over of specified electrical devices free of charge (from 13. 8. 200) from the consumer and he warns of the danger related to its illegal scrapping.

The packing of sensor is fully recyclable. The metal parts of the product are being recycled; plastics and electrical waste which cannot be recycled are scrapped in accordance to the above mentioned Act.

**NOVÁ PAKA**

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