



NOVÁ PAKA

Resistance temperature sensor with cable outlet for plastic applications, with high mechanical resistance Type 112 66

PRODUCT MANUAL

APPLICATION

- for remote measurement of temperature, especially for measurement of temperature of plasticizing cylinders of machines for processing plastic materials and for other similar applications, where the sensor is installed in the bore of the measured equipment
- For the environment, where mechanical resistance is required pursuant to EN 60068-2-6 (class AH2) and seismic capability of the electrical equipment of the safety system of the nuclear power stations pursuant to IEC 980 (MVZ level SL-2)

DESCRIPTION

A measuring resistor with internal wiring is inserted into a stem tube, which is ended with a case with a screw-joint and a spring. The measuring resistor with internal wiring is isolated from the jacket of the stem tube and output wires are sealed with insulation material. Output wires are protected with a metal hose. The stem tube of the sensor is spring-loaded. The sensor cannot be dismantled.

To measure temperature, a defined change of sensor resistance in dependence on the change of temperature of the measured environment is used.

TECHNICAL DATA

The sensor is designed pursuant to EN 61140 as an electrical equipment of protection class III for the application in networks with the category of overvoltage in the installation II and pollution grade 2 pursuant to EN 61010-1, the follow-up (evaluation) device shall comply with Article 6.3 thereof.

Measuring range: 0 to 350 °C

Electric strength pursuant to EN 61010-1, Article 6.8.3:
500 V eff

Electric insulation resistance pursuant to EN 60751
min. 100 MΩ, at 15 to 35°C, max. 80 % relative humidity,
min 100 V DC

Ingress protection pursuant to EN 60529: IP 65

Operation position: discretionary

Sensor weight without wire:

for L = 63	approx. 0.08 kg
for L = 80	approx. 0.10 kg
for L = 100	approx. 0.12 kg
for L = 120	approx. 0.14 kg
pair of wires incl. hose	approx. 0.1 kg/m

Type of operation: continuous

Applied materials:

Stem tube of measuring insert	steel 1.4541
Case with screw-joint	steel class 11, galvanic zinc coating
Internal wiring	Cu
Output wires	Cu cores with isolation silicone isolation
Protective hose	brass

OPERATION CONDITIONS

The environment is defined by the group of parameters and their severity grades IE 36 pursuant to EN 60721-3-3 and the following operation conditions.

Temperature of sensor case and output wires:
continually max. 180 °C

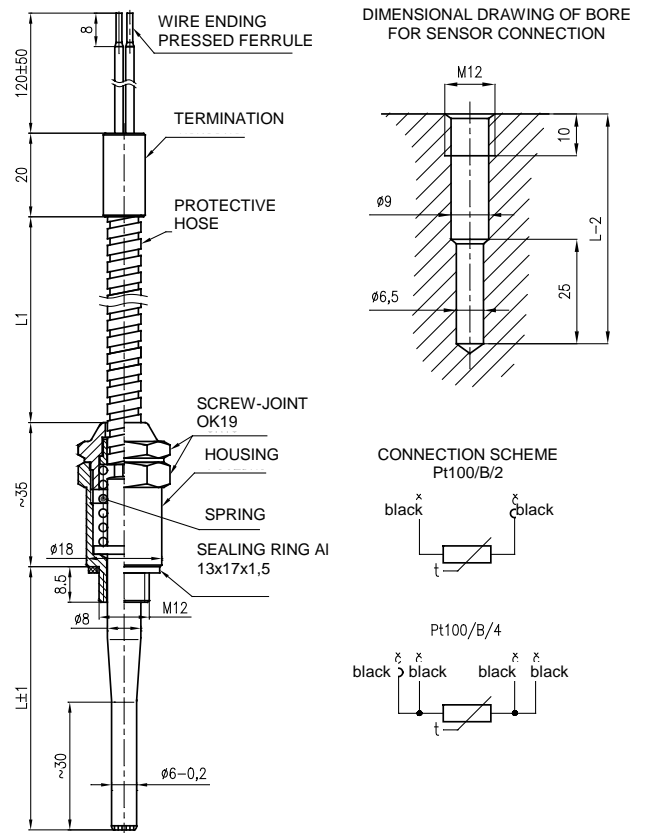
Relative ambient humidity:
10 to 100 % with condensation, with upper limit of water content 29 g H₂O/kg of dry air

Atmospheric pressure: 70 to 106 kPa

Vibrations:

Frequency range	10 to 150 Hz
Drift amplitude	0.2 mm
Acceleration amplitude	29.4 ms ⁻²

FIGURE 1- DIMENSIONAL DRAWING



METROLOGICAL DATA

Sensing unit: measuring resistor Pt 100 single in the connection pursuant to the scheme and table of designs, $\alpha = 0.00385 [K^{-1}]$, tolerance class B or A (only for 4-wire) pursuant to EN 60751

Internal wiring resistance of both cores at 20 °C: 0.07 Ω/m

Maximum current load of measuring resistor: 5 mA

Recommended measuring current: 1 mA

Calibration depth of immersion: 100 mm

Temperature response time pursuant to EN 60751 in whirling water (characteristic value): $\tau_{0,5}$ 5 s, $\tau_{0,9}$ 12 s

DESIGNATION

Data on sensor housing

- Trademark of the manufacturer
- Type of resistance sensor, nominal value R_0 / tolerance class / configuration of wires of internal wiring
- Product ordering number
- Ingress protection
- Time code (Serial number for calibrated design, design with tolerance class A, design with converter)
- Maximum operation temperature

DELIVERY

Unless agreed otherwise with the customer, each delivery includes:

- Delivery note
- Sensor pursuant to the purchase order, output wires with protective hose are wound in a bundle and secured against unreeling
- Sealing ring Al 13x17x1.5 (ČSN 02 9310.3)
- Accompanying technical documentation in Czech:
 - o Product manual
 - o Product quality and completeness certificate, which also serves as the warranty certificate
 - o Calibration sheet (for calibrated design)

If it is established in the purchase contract or agreed otherwise, the following documentation can be also delivered with the product:

- o Copy of the Inspection Certificate 3.1 for the stem tube material with the heat number
- o Declaration of Conformity with purchase order 2.1 acc. to EN 10204
- o Test report about the seismic and the vibration qualification

RELIABILITY

Indicators of reliability in operation conditions and ambient conditions specified herein

- Medium time of operation between failures 96 000 hours (inf. value)
- Expected service life 10 years

CALIBRATION

It is realized pursuant to TPM 3342-94 and in compliance with EN 60751, usually in three temperature points evenly distributed within the operation range of the sensor or in the points according to the requirement of the customer. Calibration sheets with measured data are issued for calibrated sensors.

ORDERING

The purchase order shall specify:

- Name
- Product ordering number
- If calibration is required and in what temperature points
- Other (special) requirements
- Number of pieces

PURCHASE ORDER EXAMPLE

Standard design

Resistance temperature sensor for plastic applications with cable outlet, with high mechanical resistance
112 665 713
15 pcs

Special requirement:

Resistance temperature sensor for plastic applications with cable outlet, with high mechanical resistance
112 665 699
four-wire connection, nominal length L = 160 mm, length of output wires L₁ = 10 m
6 pcs

PACKING

Both sensors and accessories are delivered in a packing ensuring resistance to the impact of thermal effects and mechanical effects pursuant to controlled packing regulations.

TRANSPORT

The sensors may be transported on conditions corresponding to the set of combinations of classes IE 21 pursuant to EN 60721-3-2 (i.e. by airplanes and trucks, in premises that are ventilated and protected against atmospheric conditions).

STORAGE

The sensors may be stored on conditions corresponding to the set of combinations of classes IE 11/1K3 pursuant to EN 60721-3-1 (i.e. in places with continuous temperature regulation from - 5 to 45 °C and humidity from 5 to 95%, without a special threat of an attack with biological agents, with vibrations of small significance and not situated close to sources of dust and sand)

TABLE 1 - DESIGN OF TEMPERATURE SENSORS

SPECIFICATION		ORDERING NUMBER				
		112 66	5	x	x	x
Measuring resistor pursuant to EN 60 751 tolerance class B or A **)	Pt 100/ /4 *)			6		
	Pt 100/B/2			7		
Measuring resistor	Other *)			9		
Nominal length L [mm]	63				1	
	80				2	
	100				3	
	120				4	
	Other *)				9	
Length of output wires L ₁ (protective hose) [m]	2.5					3
	4					4
	6.3					5
	Other *)					9

*) Only as a special request after an agreement with the manufacturer

**) Measuring resistor in tolerance class A only in four-wire connection

TABLE 2 – ADDITIONAL REQUIREMENT FOR DESIGN OF TEMPERATURE SENSORS, TYPE 112 66

REQUIREMENT FOR OTHER DOCUMENTATION	CODE
Copy of the Inspection Certificate 3.1 acc to EN 10204 for material of tube with the heat number	/3.1
Declaration of Conformity with purchase order 2.1 pursuant to EN 10204	/2.1

TABLE 3 –OVERVIEW OF SEALING RINGS TYPE 991 SUPPLIED TO TEMPERATURE SENSORS

EXTERNAL FIXING THREAD OF TEMPERATURE SENSORS	SEALING RING			
	DIMENSION [mm] Ød x ØD x t	MATERIAL	NUMBER	ORDERING NUMBER
M10 x 1,5	13x17x1,5	Aluminium EN AW-1050A-H111	1 Pcs	991 TK 13

The sealing ring is supplied to each sensor by default. The sealing ring can also be ordered separately using ordering number

INSTALLATION AND CONNECTION

The sensors are installed by screwing into the bore pursuant to Figure 1.

Operation position of the sensors is discretionary; the outlet shall not be situated upwards.

Support output wires with the protective hose. The smallest radius of hose bent is 30 mm.

The electrical connection may be only realized by qualified workers pursuant.

COMMISSIONING

After the installation of the sensor and connection of the follow-up (evaluation) device to the supply voltage, the equipment is prepared for operation

OPERATION AND MAINTENANCE

The sensor does not require any operation and maintenance.

SPARE PARTS

The sensor design does not require any delivery of spare parts.

WARRANTY

The warranty period is 24 months from the receiving of the product by the customer, unless established otherwise in the contract. Rejection of defects shall be enforced in writing at the manufacturer within the warranty period. The rejecting side shall identify the product name, ordering and manufacturing numbers, date of issue and number of the delivery note, clear description of the occurring defect and the subject of the claim. If the rejecting side is invited to send the device for repair, it shall do so in the original package of the manufacturer and/or in another package ensuring safe transport.

The warranty shall not apply to defects caused by unauthorized intervention into the device, its forced mechanical damage or failure to comply with operation conditions of the product and the product manual.

REPAIRS

The sensor cannot be dismantled and, therefore, it is not repaired.

DISABLING AND LIQUIDATION

The product and its package do not include any parts that could impact the environment.

Products that are withdrawn from operation, including their packages (with the exception of products marked as electrical equipment for the purposes of return withdrawal and separate salvage of electrical waste), may be disposed of to sorted or unsorted waste pursuant to the type of waste.

The manufacturer realizes free return withdrawal of marked electrical equipment (from 13.8.2005) from the consumer and points out the danger connected with their illegal disposal.

The package of the sensor can be recycled completely. Metal parts of the products are recycled, non-recyclable plastic materials and electrical waste shall be disposed of in accordance with applicable legislation.

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