EX TF . . . 100 Ks

Temperature sensor

Characteristics

- Full protection due to encapsulation
- Aluminium cabinet
- Easy installation
- Protected supply cable (optionally)
- Long sensor tip (230 mm)
- Also usable as Ex-i-sensor

The temperature sensor Ex TF...100 Ks is a sensor that features an optimization betweeen fast setting time, vibration resistance, mechanical strength for the ex-protection and for relatively high evaluation current at minimal distortion of measured values. In addition the interference immunity at measurements in external areas at long supply lines is ensured, due to its increased test voltage for the insulation value. The temperature sensor Ex TF...100 Ks is mounted in a sleeve made of stainless steel at the end of a mineral isolated cable. For the acquisition of fast temperature measurings in the Ex-area. The mineral isolated cable has an aluminium cabinet as junction on a hose, at which an exterior PE-connection is possible. The measured value is recorded by a resistor according to EN 60751 (Pt100), or DIN 43760 (Ni100) or IEC 751.

Range of application

The temperature sensor Ex TF...100 Ks is destined for the acquisition of temperature changes in potentially explosive atmospheres of zone 1 and higher. Its high test voltage guarantees operating safety also for long leads. The sensor can also be used as Ex-i sensor, as no effective inductivities and outputs are measurable. The temperature sensor serves for the temperature measurement of surfaces and roomtemperatures in protective cabinets. Depending on the used thermal element, different maximum measurable temperature ranges reveal.

WARMING OF THE SENSOR TIP

Depending on the conditioning instrument in the case of failure, caused by the conditioning instrumenta maximum admissible capacity of 0,8 watt can be converted inside the sensing element. How large this capacity and the corresponding temperature rise really can be in the case of application, also depends on the type of installation. In the worst case a temeprature rise of 35 K. For ususal errors a temperature rise of ≤ 12 K can be expected..

TYPE CODE

Connecting length 1,2 m is standard. Excess lengths more than 5 m must be requested separately, as for this purpose a special teflon coated shielded cable must be ordered. Delivery times must be requested when ordering.

Ex TF [–] 1 100 Ks [–] 2 [–] 3

1	Pt	Standard
2	-	Standard
	s	with protective hose (The protective hose is a corrugated hose made of stainless steel and fixed with a special screw.)
3	-	Standard (1,2 m length)
	. . .	Value, e.g. 4 for 4 m length
	s	Special length 5 m

Example: Device Pt 100, with protective hose and standard length of 1,2 m

Ex TF Pt 100 Ks 1 2 3

GENERAL TECHNICAL DATA

Nominal voltage	2,3 V
Nominal measured value current	1 - 10 mA
Insulation leve voltage U_o	24 V
Nominal resistance	100 Ω
Test voltage resistor	1100 V ~
Protection degree	IP65
Design cabinet (B x H x T)	74 X 22 x 22 mm
Sensor tip	5 x 50 mm
Mi - cable	2 x 230 mm
Connection lead	5-6 mm ∅, length 1,2 m (Standard)
Mounting dimensions	63 x 14,5 mm
Measuring ranges	-40°C to +400°C
Ambient temperature range	-40°C to +180°C
EU-type examination certificate	PTZ 16 ATEX 0025X
Ignition protection type (gas)	II 2 G Ex eb mb IIC T1-T6 (see table 1)
Identification	CE 0344 ⟨Ex⟩ II 2 G Ex eb mb IIC T1-T6

Table 1

	Temperature class					
	T6	T5	T4	T3	T2	T1
Max. admissible ambient temperature	+70°C	+85°C	+120°C	+180°C	+180°C	+180°C
Max. admissible sensor temperature	+70°C	+85°C	+120°C	+180°C	+280°C	+400°C

Erich Ott GmbH & Co. KG
Partner für den Ex-Bereich

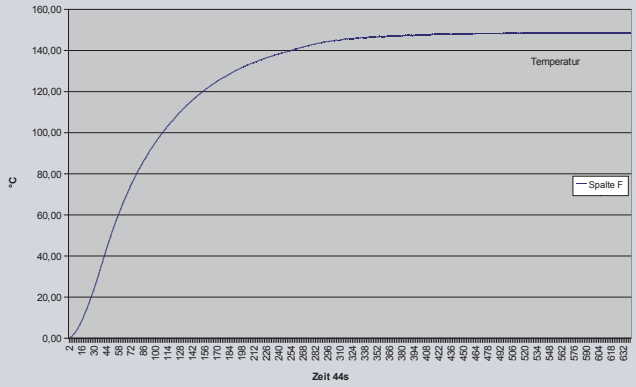
D-65189 Wiesbaden
Rüdigerstrasse 15

Telephone +49 (0)611 - 761 393
Telefax +49 (0)611 - 711 462

mail info@erich-ott.de
web www.erich-ott.de

RESPONSE TIME

Temperature rise of about 5°C/s in oil. For an exact reslt the average value must be generated and the reaction time will become slower. It is barely possible to state an exact value with this, but roughly speaking woulb be about 100 s for 150°C for oil.



Generally:
The responding behaviour is significantly co-determined by the heat transfer. In other media with a different heat conductance value, the values are accordingly different. Media with low thermal conductivity (e.g. air) lead to inert properties, therefore less °C/s. For media with higher thermal conductivity this leads to more °C/s. Here must be considered for the installation, that the heat transfer is optimal to achieve high temperature increase rates, for example by using alu adhesive tape for surface measurements.

ELECTRICAL ACCURACY PT100

Exclusively sensors of class B are used:
Error limits o classes in °C: class B: dT = ± (0,30 °C + 0,005 · T)

NAMEPLATE

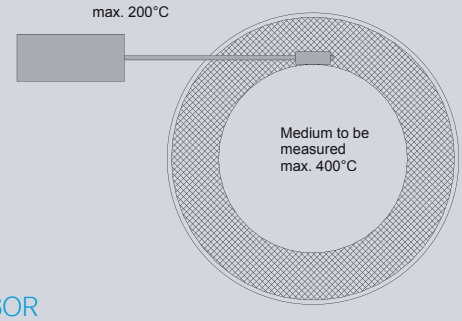
1-	Supervising agency	5-	Nominal voltage
2-	Ex- labelling	6-	Measuring current
3-	Type of ignition protection	7-	Inspecting authority / EU-type examination certificate
4-	Type code	8-	Production number

PROJECTION

For the accuracy of the temperature measurement must be considered that the thermal capacity of the sensor as well as the relation of heat supply and heat dissipation influence the measurement result. Very fast changes can accordingly be collected only with very small temperature sensors. Response curves of the sensor can be sent on request. As the sensor has a surface that applies the surface of the object to be measured only slightly without special provisions, an intermediate value of ambient temperature and surface temperature of the object to be measured is scaled. With appropriate measures, such as insulation and suchlike, the difference between those two temperatures can be kept as small as possible. The dynamic error results from the heat accumulation capacity and the relation heat accumulation capacity sensor to the object to be measured, whereas the mass of the object to be measured only has an influence on this relation in an immediate proximity of 2 bis 3 cm. The measurement error due to the connection cable of the device, whether 2-, 3- or 4-wire switch, is, compared to the previous influence possibilities, generally negligible. For the error calculation the connection point in the terminal box can be regarded as end of line error and thus the complete circuit can be constructed as if the sensor would be placed right there. The usual measuring error, in consequence of a measuring current of 10 mA, is less than 0,25 K at 20°C.

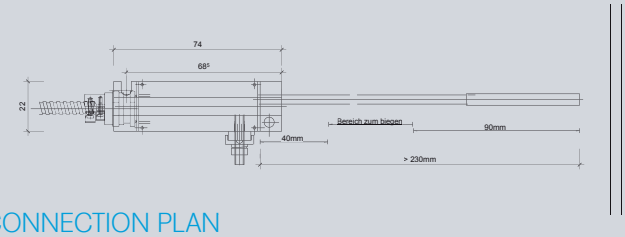
MOUNTING METHOD

The fixation on pipelines takes place by use of a metal tensioning strap combined with a tension lock over the terminal enclosure. The surface pressure must be chosen so high, that the sensor can not be moved anymore from the installation site. For installation on a mounting plate two holes are provided, with which the temperature sensor can be fastened on the mounting plate by using two M3 schrews. Alternatively also sheet-metal screws can be used

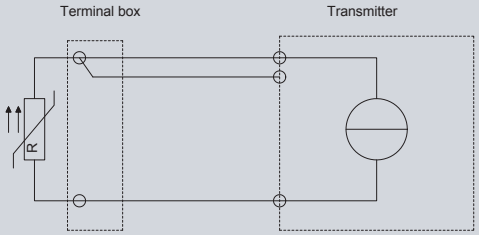


SENSOR

The Mi-cable of the temperature sensor my only be bent with a radius of 40 mm within the range, as shown in the picture.



CONNECTION PLAN



CABLES AND LEADS

For supply cables longer than 5 m the exterior network must be earthed with PE at the feeding point. The max. resistivity of the supply line and its consistency depends on the presettings at the evaluation device. The inductivity of the device is negligible, the capacity of the sensor is ≤ 1000 pF. The supply line must generally be installed safely according to the standards of the EN 60079-14 and the engineering rules. The connection end must be led into an appropriate terminal box. Attention should be paid to the fact that the screw joint, through which the cable is led into the terminal box, can lute a cable with a diameter of 5 mm. The cold flow behaviour drops about approximately one decimal power per 10 K warming. A bending radius of 5 x D (D = cable diameter) must be adhered to. The PTFE connection cable must be installed non-spinning, without tensile load (≤ 1 kg) and with a bending radius of 10 x D (≥ 60mm), for permanent temperatures of more than 80°C.

Please take further information from the operating manual.
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