



Manual

Temperature sensor *EM24/38 LT24/38Ex m*

1. Manufacturer and distributor

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2. Labeling

EPHY-MESS GmbH AB-Nr.-Pos.Nr 65205 Wiesbaden-Delkenheim Features acc. 8.	 0102	PTB 00 ATEX 2127X II 2G Ex mb II T3-T6 $T_{min} [^{\circ}C] \leq T_A \leq T_{max} [^{\circ}C] \quad I_m \leq I [mA]$	mm/yy Sn.-Nr. xxxx
			

3. General functions

Temperature sensors of type EM24/38 or LT24/38 detect the temperature with the help of a passive resistance sensor. The sensor resistance R increases with rising temperature T (positive temperature coefficient).

Each resistance value is related to a certain temperature. From this R-T relation the temperature can be detected by measuring the resistance. The temperature measurement with the EM24/38 or LT24/38 happens almost punctual at the tip of the sensor (TEL . 2 mm).

4. Assembly of the temperature sensor EM24/38 OR LT24/38

The EM24/38 or LT24/38 version with resistance sensor is equipped either with a thin film-, glass- or ceramic resistance, all insulated with double shrinking hose. The resistance is assembled into the sensor protection pipe which is partly filled with heat-conductive paste for better thermal contact. The remaining volume of the protection pipe is filled with a ceramic filling to increase the shock resistance.

In the completely sealed angular cable exit occurs the transition from the measuring wire to the supply line. The fix connected supply line comes radially out of the cable exit via a screw fitting. The sensors of type EM24/38 or LT24/38 are produced without brass lid.



5. Assembly

- Temperature sensors of type EM24/38 or LT24/38 are especially designed for the installation into blind hole drillings in electrical motors (generators) or other electrical machinery.
- The angular cable exit enables an installation of the temperature sensor very close to the machine housing and a tensile free cable installation on the housing surface.
- The EM24/38 or LT24/38-sensor installation / mounting must happen with a special moveable fitting with Teflon, brass or steel clamp/cutting ring. For insulated protection pipes only fittings with Teflon clamp rings are allowed to be used.
- The forementioned restrictions for the moveable fitting installation are not valid for sensor versions with rigid (nonmoveable) fittings.
- By using moveable fittings the installation angle (cable exit) can be adapted exactly to the local requirements.
- During installation of the thermometer one has to consider that no damage of cable and insulation occurs.
- High bending loads (flexing) as well as mechanical point loads on the temperature sensor (protection pipe and cable exit) during installation and operation must be avoided.
- The supply lines (connecting wires) have to be installed strain-relieved.
- The equipment doesn't need to be grounded.
- The installation of the component must be defined in the EC-Type Examination Certificate for the particular electrical device.

6. Connecting wires

- The connecting wires of the EM24/38 or LT24/38-sensors are color-coded according to the color code and type of circuit related to the used resistance sensor (see 7.3 *circuit and labeling of connecting wires*).
- The connector ends have to be attached to suitable clamps only.
- The sensor supply lines (connecting wires) may only be connected to power supply units suitable and approved for passive resistance sensors according to the standards belonging to the special sensor.
- The power supply must have a connection adequate to the thermometer's type of circuit (2-, 3- or 4-wire-circuit).
- The electrical performance data have to be observed (6. technical data).
- The sensor signal of the resistance sensor version has no polarity.
- It is not allowed to connect, install or apply the sensor in another way than described under item 4 and 5.



7. Technical data

7.1 Technical data of insulated measuring resistance / insulated thermocouple

Description	measuring resistance in stainless steel protection pipe with fix connected supply lines, drawing no 000519M7, 000519M8, 000522M3, 000522M4, 000725M2, 000725M3, 000725M5 und 000725M6, 010222M1	
Construction	insulated measuring resistance, installed shock resistant into stainless steel protection pipe with fix connected hose line and sealed angular cable exit, active length for measuring appr. 2 mm	
Approval	PTB 00 ATEX 2127X	
Type of protection	II 2 G Ex mb T3-T6	
Ambient temperature temperature at cable exit	RTD	-50°C... +195°C
	TE	-50°C....+195°C
	KTY	-40°C.....+175°C (KTY83) 195°C (195°C)
	PTC	-25°C....+195°C
Ambient temperature temperature at cable exit	-50° C...+100° C	
Sensors	resistance element	
	assembly:	thin film sensor, glass sensor or coiled ceramic sensor
	measuring circuit:	1 or 2
	material:	Platin (Pt) / Nickel (Ni)
	resistance value :	100Ω, 500Ω oder 1000Ω bei [0°C]
	tolerance:	according to norm
	mode of connection	2-, 3- and 4-wire circuit
	measuring current	0,3...10 mA
	max. operating voltage:	60V
	max. current:	10mA
	max. power :	17,6mW
	max. operating temperature	195°C
	Thermocouple	
	measuring circuit:	1 or 2
	tolerance	according to norm
	measuring current:	≤ 100mA
	max. Operating voltage:	30V
	max. power	0,9W
	max. operating temperature	195°C

**KTY-sensor**

model	KTY83	KTY84
measuring circuit:	1	1
nominal resistance:	1000Ω at 25°C	1000Ω at 100°C
measuring current:	1mA	2mA
max. operating voltage:	5V	5V
max. power :	6,7mW	
max. operating temperature	KTY83 175°C	KTY 84 195°C

PTC sensor

measuring circuit:	1 or 2
NTT ³⁾ :	60...180°C
measuring current:	2mA
max. Operating voltage:	2,5V
power:	4,7mW
max. operating temperature	195°C

Dimensions

protection pipe:	Ø5 ... Ø12mm x L (L ≥ 50 mm)
cable exit:	Ø24 ^{±0,2} x 29 ^{±0,2} mm Ø38 ^{±0,2} x 33 ^{±0,2} mm

Protection pipe

stainless steel, bare or insulated with shrinking hose²⁾

Cable exit

brass, bare or nickel plated, completely sealed, with M16x1,5-insert, alternatively with PG16-insert

Installation fitting

moveable:	stainless steel with thread M10x1, G1/4", G1/2" and others
accessories	conical PTFE-, brass or stainless steel clamp ring
fixed:	G3/8"

Dielectric strength

supply line	2,5 kV / 1 min.
armature	2,5 kV / 1 min.

Insulation resistance

R_{iso}(500 V) > 200 MΩ

Supply line

construction	PTFE or Silicone-insulated, hose line
color code acc. to DIN resp. customers request	
cross section	AWG 16-30

Shock resistance

vibration-resistant

- 1) 3- and 4-wire mode for double sensors only for type EM 38 possible
- 2) measuring range for mod. elastomer insulation: -50...+150°C
measuring range for PTFE insulation: -50...+195°C
- 3) Nominal Threshold Temperature



9. Temperature classes

The maximum temperature for EM24/38 depends on the temperature class

Temp. class	max. measuring temperature for gases[°C]	max. ambient temperature for gases[°C]	Protection pipe insulation	Sensor type
T3	193	100	without / PTFE	PTC
T3	193	100	without / PTFE	KTY84
T3	178	100	without / PTFE	2 x resistance
T3	186	100	without / PTFE	1 x resistance
T3	178	100	without / PTFE	thermocouple
T3	173	100	without / PTFE	KTY83
T3	148	100	Elastomer	PTC
T3	148	100	Elastomer	KTY84
T3	133	100	Elastomer	2 x resistance
T3	141	100	Elastomer	1 x resistance
T3	133	100	Elastomer	thermocouple
T3	148	100	Elastomer	KTY83
T4	128	100	Elastomer / without / PTFE	PTC
T4	128	100	Elastomer / without / PTFE	KTY 83/84
T4	113	100	Elastomer / without / PTFE	2 x resistance
T4	121	100	Elastomer / without / PTFE	1 x resistance
T4	113	100	Elastomer / without / PTFE	thermocouple
T5	93	95	Elastomer / without / PTFE	PTC
T5	93	95	Elastomer / without / PTFE	KTY 83/84
T5	78	95	Elastomer / without / PTFE	2 x resistance
T5	86	95	Elastomer / without / PTFE	1 x resistance
T5	78	95	Elastomer / without / PTFE	thermocouple
T6	78	80	Elastomer / without / PTFE	PTC
T6	78	80	Elastomer / without / PTFE	KTY 83/84
T6	63	80	Elastomer / without / PTFE	2 x resistance
T6	71	80	Elastomer / without / PTFE	1 x resistance
T6	63	80	Elastomer / without / PTFE	thermocouple

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Baden-Delkenheim

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EPHX MESS-GmbH

652 Wiesbaden-D

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Serien-Nr.: 0007

