Temperature meter

EMT-102

Operating manual

Version 22.12

1 Safety rules

- read these instructions before use

- before turning on the power, make sure that the wires are connected correctly

- ensure operating conditions (power supply, humidity, temperature) according to specifications

2 Characteristics of the device

EMT-102 is a microprocessor-based temperature meter designed to work with thermoresistive sensors (RTD) **Pt100** according to PN-EN 60751, **Ni100** according to PN-83/M53852, thermoelectric (TC) **B, J, K, N, R, S, T** according to PN-EN 60584-1 or semiconductor DS18B20.

It is designed to be installed on a board or control panel.

It is characterized by high accuracy, low power consumption and immunity to interference in industrial environment. It has a digital readout with a display resolution of 0.1°C or 1°C

3 Technical data

General:

Execution	type of senson	indication range (°C)
EMT-102-Pt100	Pt100	-199 ... 850
EMT-102-Ni100	Ni100	-60 ... 180
EMT-102-J	Fe-CuNi	-199 ... 1200
EMT-102-K	NiCr-NiAl	-199 ... 1370
EMT-102-N	NiCrSi-NiSi	-199 ... 1300
EMT-102-T	Cu-CuNi	-199 ... 300
EMT-102-S	PtRh10-Pt	0 ... 1700
EMT-102-R	PtRh13-P	0 ... 1700
EMT-102-B	PtRh30-PtRh6	400 ... 1800
EMT-102-DS	DS18B20	-55 ... 125

- lead resistance for RTD (Pt100/Ni100) .... < 10 per wire

- Electronic temperature compensation for cold ends of thermocouples

LED digital readout (4 digits):

- display range .... -999 - 9999

- height of digits .... 20 mm

- LED color .... Red

Accuracy (for ambient temperature of 23°C±5°C):

- RTD sensors (Pt100/Ni100)................................... 0.15% of the indication range ± 1 digit

- TC thermoelectric sensors .... 0.15% of indication range ± 1 digit

additional error of compensation of cold ends .... ± 0,4°C

- DS semiconductor sensors .... ± 0.5°C for the range -10 ... 85°C

$$± 2°C \text{ for range} < -10 \text{ and} > 85°C$$

Display resolution (automatically switchable):

- for range -99.9 ... 999,9 .... 0,1°C

- for range < -100°C and >1000°C .... 1°C

Signaling (message on the display):

- power on .... Init for 5 sec.

- sensor range exceeded bottom .... ErLo

- sensor range exceeded top .... ErHi

Board enclosure .... 96 x 48 x 80 mm (260g)

- recessed window .... 92 x 45.2 mm

- mounting .... with mounts on the side

- front panel material .... Polycarbonate

- body material .... self-extinguishing Noryl

Degree of protection of the housing:

- front side Ip61

- from connector side Ip30

Power supply:

- main .... 230V AC (+10% - 15%), 50Hz, 3VA

- LV low-voltage (optional) .... 10-30V DC, 2W

Operating temperature: .... -25°C...+50°C

Relative humidity: .... 0 - 90% RH non-condensing

EMC compatibility: .... industrial environment

-Immunity .... according to PN-EN 61000-6-2:2002(U)

-emissivity .... according to PN-EN 61000-6-4:2002(U)4

Installation recommendations

General notes:

- mount in the board with mounting brackets

- do not power the device from the same lines as high power devices without

appropriate filters

- avoid running sensor cables in the immediate vicinity and parallel to power lines

- avoid the proximity of devices generating high impulse interference

- include a delay-free 1A fuse in the power supply circuit

Connection of thermoresistive sensors (RTD) Pt100 / Ni100:

- copper connection wires should have equal length and cross section

- it is recommended to connect sensors using the 3-wire method

- if the distance between the meter and the sensor is not large (2-3m), it is acceptable

2-wire connection

- 2-wire method introduces an error of 1°C for each 0.4 of cable resistance

### Connection of thermoelectric sensors (TC) B, J, K, N, R, S, T:

- the thermoelectric sensor must be connected with a suitable wire   compensation

- connecting the sensor with copper wires will introduce a significant measurement error

Connection of 1-wire semiconductor sensors (DS18B20):

- the sensor should be connected using a 3-wire cable with the smallest possible

capacitance between wires

- The sensor must be connected according to the following drawing, incorrect
connection risks damage to the sensor
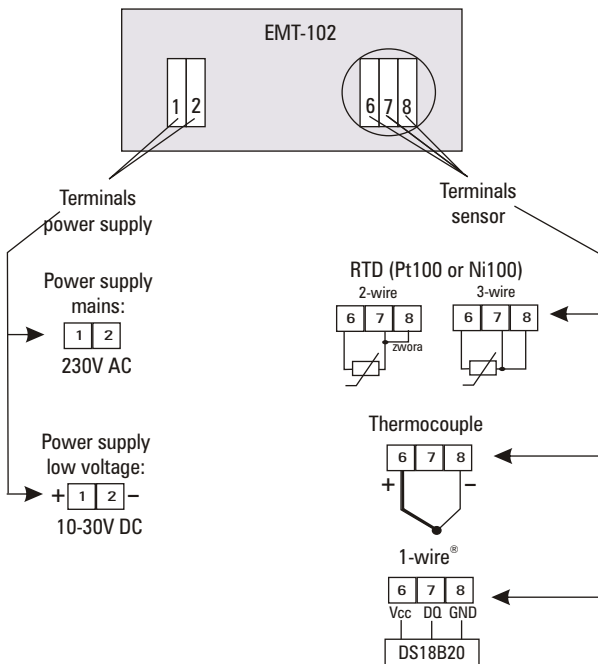
How to connect the power supply and sensor to the EMT-102

5. Meter operation

- after succesful installation the meter is ready for operation

- the meter does not require periodic maintenance

Control of the meter working with RTD (Pt100 / Ni100):

- connect a test resistor in place of the sensor (to terminals 6-7-8), the meter should show the temperature corresponding to the resistance of the resistor (the meter is supplied   with a control resistor 70...80°C for Pt100 or 45...55°C for Ni100).

Check of the meter working with TC thermocouples:

- short circuit the input terminals of the sensor (terminals 6-8), the meter should show the ambient temperature.