

KT-LED-24-PT100-24VDC

Operation Manual



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Note :

The fields with a grey background contain the factory-set default values.



1 Short description

This digital display is an easy-to-use, microprocessor-controlled device for the display (and the acquisition) of measured temperature values. The temperatures are measured by means of Pt100 or Ni100 resistance thermometers. They can display either the current measured value, the maximum value or the minimum value. In case of power switch-off, the maximum and minimum values are stored in an EEPROM. The values are restored as soon as the display is powered again. The Latch input is isolated electrically from the signal input by means of an optocoupler. It allows storing the current measured value. The supply voltage (10 .. 30 V DC) is isolated electrically from the signal input by means of a DC/DC converter.



2 Safety instructions and warnings

Only use this display



- in a way according to its intended purpose
- if its technical condition is perfect
- adhering to the operating instructions and the general safety instructions.

1. Before carrying out any installation or maintenance work, make sure that the power supply of the digital display is switched off.
2. Only use this digital display in a way according to its intended purpose.
3. If its technical condition is perfect.
4. Adhering to the operating instructions and the general safety instructions.
5. Adhere to country or user specific regulations.
6. The digital display is not intended for use in areas with risks of explosion and in the branches excluded by the standard EN 61010 Part 1.
7. The digital display shall only operate if it has been correctly mounted in a panel, in accordance with the chapter "Main technical features".

2.1 Use according to the intended purpose

The digital display only may be used as a panel-mounted device. Applications of this product may be found in industrial processes and controls, in the branch of the manufacturing lines for the metal, wood, plastics, paper, glass, textile, etc., processing industries.

Overvoltages at the terminals of the digital display must be limited to the values of overvoltage category II.

If the digital display is used to monitor machines or processes in which, in case of a failure of the device or an error made by the operator, there might be risks of damaging the machine or causing accidents to the operators, it is up to you to take appropriate safety measures.

3 Mounting

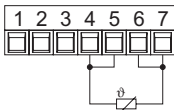
3.1 Installation

1. The digital display shall not be installed near to contactors or motor starters.
2. We recommend the use of wire end ferrules in order to avoid short-circuits between adjacent terminals.
3. In order to keep the interferences at the measuring input as low as possible, the signal and power supply wires must be routed separately.
4. Use shielded cables for all signal/probe wirings and

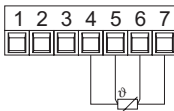
3.2 Electrical connection

3.2.1 Pt100/Ni100 resistance thermometers

2-wire resistance thermometer



4-wire resistance thermometer

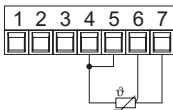


avoid routing the signal/probe wirings parallel to each other. The shield shall only be grounded at one point in order to avoid ground loops.

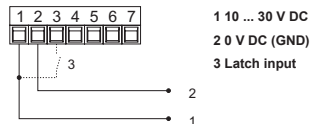
Important note:

Before carrying out any installation or maintenance work, make sure that the power supply of the digital display is switched off.

3-wire resistance thermometer



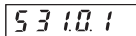
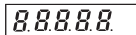
3.2.2 Supply voltage and Latch input connection



4. Start-up

After switching on the supply voltage:

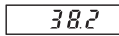
1. a display test is carried out (Duration: 2 seconds)
2. Device type and software version are displayed (Duration: 2 seconds)



3. the selected probe is displayed (Duration: 2 seconds).



4. the display is ready to operate and the measured value is displayed.



5. Programming

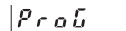
5.1 Switching to programming

To switch to the programming mode:

1. switch the power supply of the device off, press simultaneously both keys on the front side, and then switch the power supply on again.



2. The display shows the following message.



3. release both keys. The first parameter to be set appears on the display. The display switches every second between the following messages



4. press the left key to stop the display from switching. The last programmed parameter setting is displayed.

5.2 Changing the parameter setting

1. press the right-hand/grey key to change the parameter setting by one value at a time



2. to input numerical values, select first the decade with the left-hand/red key



3. the decade blinks

5.3 Saving the parameter setting and switching to the following parameter

1. keep the left/red key pressed



5.4 Programming the adjustable parameters

5.4.1 Input signal type

r R n G E Range

Selection in the menu

Pt 100 Pt100 probe

n i 100 Ni100 probe

4. set now the numerical value using the right-hand/ grey key



5. to reach the following decade, press the left-hand/red key



6. if negative numerical values are required, set the left decade to "-" or "-1".

2. and press simultaneously the right/grey key.



Note:

The fields with a grey background contain the **factory-set** default values.

Pt 100

5.4.2 Measuring method

Measuring method

Selection in the menu

2 wires; **please note**
See point 5.4.2.1 opposite!

3 wires

4 wires

5.4.3 Decimal point

Decimal point

Selection in the menu

Resolution 0,1 °C/0,1 °F

Resolution 1 °C/1 °F

5.4.5 Correction value

Inputting a correction value allows acting upon the displayed result. These correction values may be

Setting the correction value

Selection in the menu

Correction value in 0,1 °C/0,1 °F,
depending on the unit selected

5.4.6 Maximum value acquisition

The maximum value may be saved and consulted during operation (see 6.1)

Selection in the menu

Maximum value acquisition on

Maximum value acquisition off

5.4.2.1 Line resistivity

If you selected the 2-wire measuring method in 5.4.2, the display shows

line resistivity

Input here the line resistivity of your 2-wire probe for **long connection cables**. If the resistivity value input here is wrong, the displayed result will not be correct.

5.4.4 Temperature unit

Unit

Selection in the menu

Display in °C

Display in °F

positive or negative. The input is always made with one decimal place.

5.4.6.1 Resetting the maximum value

This allows defining whether the maximum value can be reset during operation or not. However, the maximum value can only be reset if the maximum value display is the active function (see 6.1). If the maximum value is reset, the current measured value becomes the new maximum value.

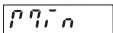
Selection in the menu

The maximum value can be reset
using the red key

The maximum value cannot be reset

5.4.7 Minimum value acquisition

The minimum value may be saved and consulted during operation (see 6.1)

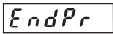


Selection in the menu

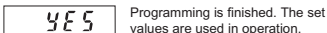
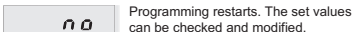


5.5 End of programming

When programming is finished, end the programming routine as follows:

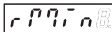


Selection in the menu

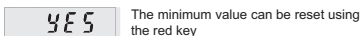


5.4.7.1 Resetting the minimum value

This allows defining whether the minimum value can be reset during operation or not. However, the minimum value can only be reset if the minimum value display is the active function (see 6.1). If the minimum value is reset, the current measured value becomes the new minimum value.



Selection in the menu



6. Operation

6.1 Switching the display during operation

Press the right-hand/grey key to select among the following functions:

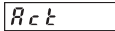
- current measured value
- minimum value
- maximum value.

Press the key once to display the designation of the active display function for 2 seconds. If, during this time, the right-hand grey key is pressed a second time, the display switches to the following display function. This is confirmed by a 2-second display of the designation of the new function. After these 2 seconds, the display shows, depending on the selection, the maximum value, the minimum value or the current measured value.

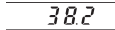
1. Current measured value, press once the right-hand/grey key



for 2 s:



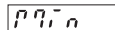
after 2 s:



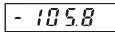
2. Minimum value (when active), press once the right-hand/grey key



for 2 s:



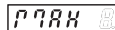
after 2 s:



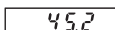
3. Maximum value (when active), press once the right-hand/grey key



for 2 s:



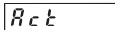
after 2 s:



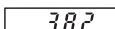
4. Current measured value, press once the right-hand/grey key



for 2 s:



after 2 s:



6.2 Saving the momentary value (Display-Latch)

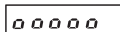
In case of a High Signal at the Latch input, the current measured value is frozen on the display. The minimum and maximum value acquisition continues operating in the background.

7 Troubleshooting and alarm messages

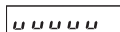
7.1 Display does not light up

If the **display does not light up**, check the supply voltage or the power supply cables. Do not open the housing by force.

7.2 Measuring rang overflow or underflow

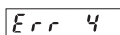


Measuring range overflow
Ranges see 8.1



Measuring range underflow
Ranges see 8.1

7.3 Input problems



Probe broken or input signal exceeds the allowable range

8 Main technical features

Operation: by means of two front panel keys

Display: 5-digit display, red 7-segment LED's, Height of the figures 8 mm

Display range: (see temperature range), with leading zeros suppression Measuring range overflow, indicated by 00000 on the display.
Measuring range underflow, indicated by uuuuu on the display.

8.1 Electrical features

Input: PT100 resistance thermometer
Ni100 resistance thermometer

Supply current:
1 mA

Circuit type: 2-wire, 3-wire and 4-wire connection technique, programmable with probe breakage monitoring

Temperature ranges:
Pt100 acc. to DIN IEC 751:
-199.9°C .. +850.0°C (-327.8°F .. 1562.0°F)
Ni100 acc. to DIN 43760:
-60.0°C .. +250.0°C (-76.0°F .. 482.0°F)

Resolution: 0,1°C (0,1°F) or 1°C (1°F), programmable

Linearity error PT100:
< 0,1 % for the whole measuring range at an ambient temperature of 20°C

Linearity error Ni100:
< 0,2 % for the whole measuring range at an ambient temperature of 20°C

Temperature drift:
0,1 K/Kambient

Measuring rate:
5 measurements/second, fixed

Display refresh:
1 ... 2 times per second

Display Latch input:
Display stop for the current measured value, active for log. 1
Switching log. 0: 0 ... 2 VDC
level log. 1: 4 ... 30 VDC

Supply voltage:
10 ... 30 V DC, electrically separated, with Verpolschutz

Current consumption:
max. 40 mA

Test voltage: 500 Veff; 50/60 Hz; 1 min

Data backup: EEPROM

8.2 Mechanical features

Housing: Housing for control panel 48 x 24 mm according to DIN 43 700, RAL 7021

Dimensions: (W x H x D):
48 x 24 x 66 mm

Panel cut-out: (W x H):
45+0,6 x 22,2+0,3 mm

Mounting depth:
approximately 59 mm

Weight: approximately 50 g

Protection level:
IP65 (on the front side)

Connection: Screw terminal, RM 5.08, 7 poles

Connection diameter:
single-wire 0,14 .. 1,5 mm²
thin wire 0,14 .. 1,5 mm²
wire dimensions AWG 26-18

8.3 Environmental conditions

EMC:


Interference immunity:

with shielded signal and control lines
not intended for local DC electricity
supply network(s) /battery connecting
cable ≥ 30 m

Device Safety

Protection Class:

Protection Class 2 (front side)

 Only the front side is classified as
accessible for the operator

Application area:

Pollution level 2 over-voltage Category II

Insulation:

Front: double insulation,
Rear side: basic insulation

Signal inputs and und sensor power supply: SELV

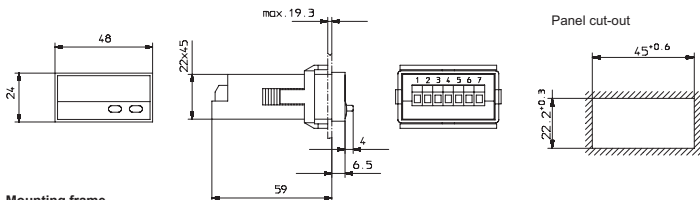
Operating temperature:

-20 °C ... +65 °C, relative humidity < 85%

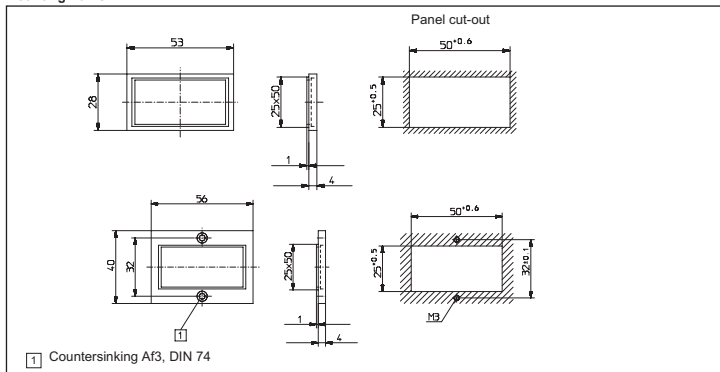
Storage temperature:

-25 °C ... +70 °C

11 Digital display dimensions



Mounting frame



9 Scope of delivery

Digital display

Clamp

Front panel for clamp mounting,

Panel cut-out 50 x 25 mm

Front panel for screw mounting,

Panel cut-out 50 x 25 mm

Seal

Multilingual operating instructions

1 set of self-adhesive symbols

10 Order code

KT-LED-24-PT100-24VDC

Connections

1. 10 ... 30 V DC Supply voltage
2. 0 V DC GND
3. Latch - Input
4. Pt100/Ni100
5. Pt100/Ni100 (Sensor-input)
6. Pt100/Ni100 see page 14)
7. Pt100/Ni100

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Explosion Protection

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- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
- Electrical Ex Equipment
- Purge and Pressurization
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- Mobile Computing and Communications
- HART Interface Solutions
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- Wireless Solutions
- Level Measurement

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
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