Codix 532

Kübler

Digitalanzeige
für Thermoelement-Sensoren
J, K und N

Digital display
for Thermoelectric couple sensors
J, K and N

Afficheur digital
pur Sondes à thermocouple
J, K et N

Visualizador digital
para Sondas con termopar
J,K y N

Visualizzatore digitale
per Sonde a termocoppia
J,K e N

deutsch

english

français

italiano

español

■■■ *wir geben Impulse*

Summary

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 J, K and N thermoelectric couple sensors. 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.
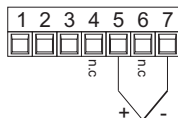
english

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 shieded cables for all signal/probe wirings and 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.

3.2 Electrical connection

3.2.1 Thermoelectric couple sensor

3.2.2 Supply voltage and Latch input connection

3 Latch input
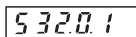
2 0 V DC (GND)

1 10 ... 30 V DC

4. Start-up
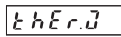
After switching on the supply voltage:

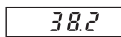1. a display test is carried out (Duration: 2 seconds)
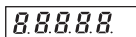
2. Device type and software version are displayed (Duration: 2 seconds)

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

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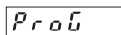

5. Programming

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
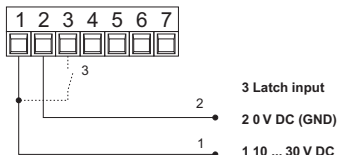
 1 s

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
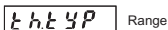

3. the decade blinks

5.3 Parametereinstellung übernehmen und auf den nächsten Parameter weiterschalten

1. Linke/rote Taste gedrückt halten

5.4 Programmng the adjustable parameters

5.4.1 Input signal type

 Range

Selection in the menu

 Thermoelectric couple J

 Thermoelectric couple K

 Thermoelectric couple N

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.

5.4.2 Reference point compensation

A thermoelectric temperature measurement measures a (thermoelectric) voltage generated by a thermoelectric couple. The value of the thermoelectric voltage depends on the temperture difference between the measured point and the reference point.

In order to define accurately the temperature at the measured point, the temperature of the reference point must be constant and/or known. To do so, the internal and external reference points are differentiated.

For the internal reference point compensation, the device is fitted with an internal temperature sensor that measures the current temperature of the terminal. This temperature is used to compensate the measured thermoelectric voltage. This measuring method requires to connect the sensor with the terminal of the display by means of appropriate compensation lines. These terminals are the internal compensation point.
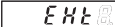
When using the external reference point compensation, the temperature of the reference point is maintained at a constant and known value by means of appropriate measures. The temperature sensor ist connected with the device, which is set to the constant temperature of the reference point, by means of a simple copper wire.

5.4.2 Reference point compensation (Continued)

| `rEFJu` | Reference point compensation |

Selection in the menu

| `int` | Internal reference point compensation |

| `EHt` | External reference point compensation Adhere to point 5.4.2.1 |

5.4.2.1 External reference point temperature

| `t.Junc` | External reference point temperature |

Selection in the menu

| `- 9999 ... 0000.0 ... 09999` |

Input of the known value of the external reference point temperature in 0,1 °C/0,1 °F, according to the temperature unit set

5.4.3 Decimal point

| `dP` | Decimal point |

Selection in the menu

| `0.0` | Resolution 0,1 °C/0,1 °F |

| `0` | Resolution 1 °C/1 °F |

5.4.4 Temperature unit

| `Unit` | Unit |

Selection in the menu

| `°C` | Display in °C |

| `°F` | Display in °F |

5.4.5 Correction value
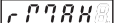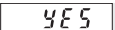
Inputting a correction value allows acting upon the displayed result. These correction values may be positive or negative. The input is always made with one decimal place.

| `AdJSt` | Setting the correction value |

Selection in the menu

| `-9999 ... 0000.0 ... 99999` | Correction value in 0,1 °C/0,1 °F, depending on the unit selected |

5.4.6 Maximum value acquisition

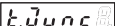The maximum value may be saved and consulted during operation (see 6.1)

| `PMAH` |

Selection in the menu

| `YES` | Maximum value acquisition on |

| `no` | Maximum value acquisition off |

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.
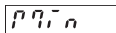
| `rPMAH` |

Selection in the menu

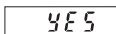| `YES` | The maximum value can be reset using the red key |

| `no` | The maximum value cannot be reset |

5.4.7 Minimum value acquisition

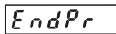The minimum value may be saved and consulted during operation (see 6.1)

$$P\bar{\Pi}i\,n$$

Selection in the menu
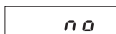
| $\gamma E 5$ | Minimum value acquisition on |

| $n\,o$ | Minimum value acquisition off |

5.5 End of programming

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

$$E\,n\,d P\,r$$

Selection in the menu

| $n\,o$ | Programming restarts. The set values can be checked and modified. |

| $\gamma E 5$ | Programming is finished. The set values are used in operation. |
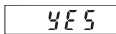
5.4.7.1 Resetting the minimum value

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.

$$r\,P\,\bar{\Pi}i\,n$$
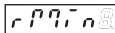
Selection in the menu
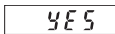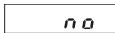
| $\gamma E 5$ | The minimum value can be reset using the red key |

| $n\,o$ | The minimum value cannot be reset |

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..
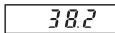
1. Current measured value, press once the right-hand/grey key
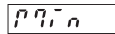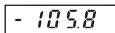
for 2 s: $\qquad$ $R\,c\,t$
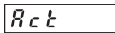
after 2 s: $\qquad$ 38.2

2. Minimum value (when active), press once the right-hand/grey key
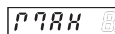
for 2 s: $\qquad$ $P\,\bar{\Pi}i\,n$

after 2 s: $\qquad$ $-\,105.8$

3. Maximum value (when active), press once the right-hand/grey key 1x drücken

for 2 s: $\qquad$ $P\,\bar{\Pi}R\,X$

after 2 s: $\qquad$ 45.2
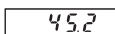
4. Current measured value, press once the right-hand/grey key

for 2 s: $\qquad$ $R\,c\,t$

after 2 s: $\qquad$ 38.2

english
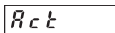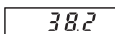
### 6.2 Saving the momentary value (Display-Latch)

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.
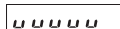
7 Troubleshooting and alarm messages

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.

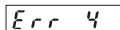### 7.2 Measuring rang overflow or underflow
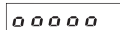
$o\ o\ o\ o\ o$	**Measuring range overflow** **Ranges see 8.1**

$u\ u\ u\ u\ u$	**Measuring range underflow** **Ranges see 8.1**

7.3 Input problems

$E\ r\ r\ \ \ 4$	**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 ooooo on the display. Measuring range underflow, indicated by uuuuu on the display.

8.1 Electrical features

Input: Thermoelement-sensor
J (Fe-CuNi)
K (Ni-CrNi)
N (NiCrSi-NiSi)

Temperature ranges:
after DIN IEC 548

J (Fe-CuNi)	-210,0 °C ...	+1200,0 °C
	-346,0 °F ...	+2192,0 °F
K (Ni-CrNi)	-200,0 °C ...	+1372,0 °C
	-328,0 °F ...	+2501,6 °F
N (NiCrSi-NiSi)	-200,0 °C ...	+1372,0 °C
	-328,0 °F ...	+2372,0 °F

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

Reference point compensation:
internal or external (programmable)

Reference point error:
+/–1,0 °C typ.
+/–3,0 °C max.

Linearity error:
< 0,4 % 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:
IP 65 (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 dimensionsAWG 26-16

8.3 Environment conditions

EMC:

Interference emissions	EN 55011 Class B
Interference resistance	EN 61000-6-2

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

Storage temperature:
-25 °C ... +70 °C

9 Scope of delivery

Digital display
Clamp
Front panel for clamp mounting,
Panel cut-out 50 x 25 mm
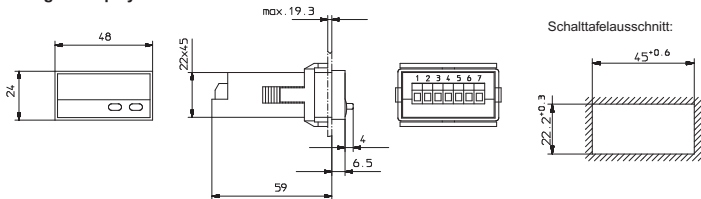Front panel for screw mounting,
Panel cut-out 50 x 25 mm
Seal
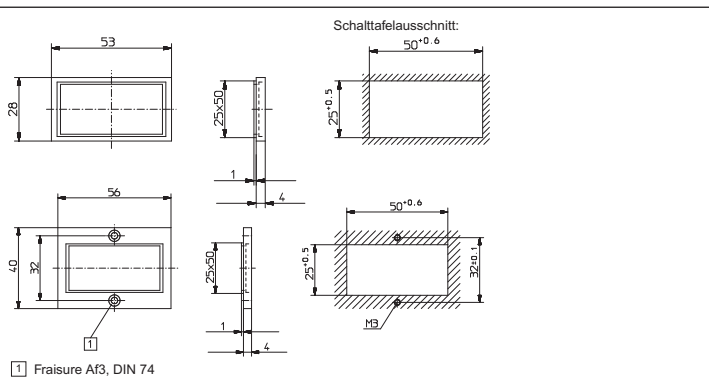Multilingual operating instructions
1 set of self-adhesive symbols

10 Order code

6.532.012.300

11 Digital display dimensions

Mounting frame

1 Fraisure Af3, DIN 74

Kübler