Panel indicators with 1,44" TFT display MD22-TFT

Pt-100 Thermometer

User Manual

no: IO-W_MD22-TFT-T (eng)

Spółdzielnia Niewidomych PROMET 41-200 Sosnowiec, ul. Lipowa 11

Centrala: tel +48 22 269 81 00, Sekretariat: tel. +48 32 269 81 02, Dział Obsługi Klienta: tel. +48 32 269 81 81,

Strona | 1

1. Characteristics of the MD22-TFT series

The MD22-TFT indicators are an exemplary development of the MD22 series so far containing only signal lamps, LED indicators and buzzers.

Main characteristics of all MD22-TFT indicators:
- visualization of the input size or signal on the 1,44" TFT
- assembly in a standard Ø 22 hole
- supply voltage – 24V DC (10÷32 V) or 24V AC (±10%)

This manual contains instructions for the standardized signals indicator 0-10V / 4-20mA MD22-TFT- IU. General appearance for all types of indicators don't differ. Aside from markings of the terminal and functions of the control buttons.

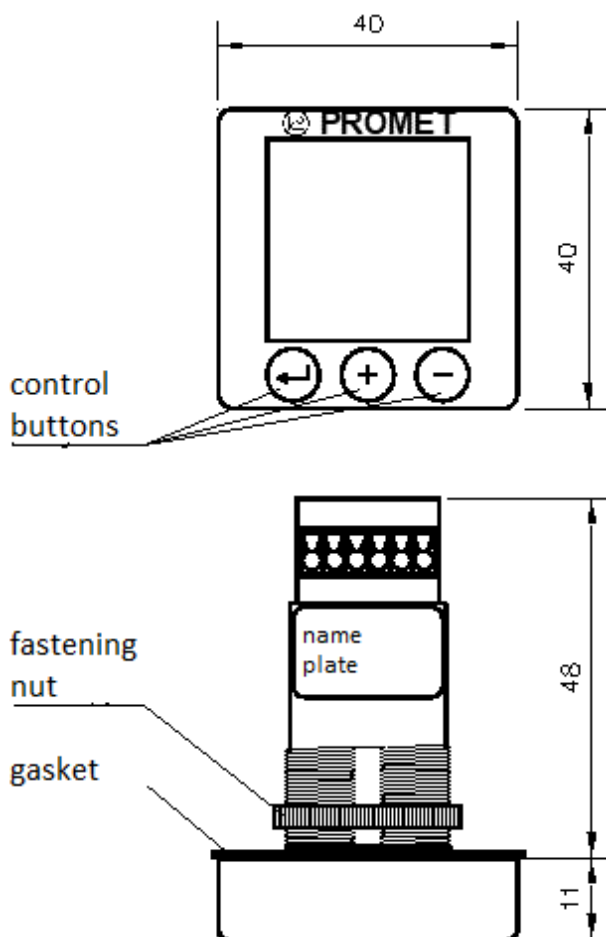Appearance and dimensions of the MD22-TFT are presented on Fig. 1.

Fig. 1. Appearance and dimensions

1.1. Characteristics of MD22-TFT-T digital thermometer.

The indicator in the MD22-TFT-T version is a digital temperature meter cooperating with the PT100 sensor (not included) intended mainly for monitoring the temperature of industrial equipment, temperature in switchgear cabinets, etc. The range of measured resistance corresponds to the temperature range -200 ÷ 800 ° C . The actual temperature range depends on the construction of the

Spółdzielnia Niewidomych PROMET 41-200 Sosnowiec, ul. Lipowa 11

Centrala: tel +48 22 269 81 00, Sekretariat: tel. +48 32 269 81 02, Dział Obsługi Klienta: tel. +48 32 269 81 81,

Strona | 2

Pt100 sensor used. Basic error of measurement ± 2 ° C for the entire temperature range measured -200 ÷ 800 ºC, (does not take into account the error of the sensor).

PT100 sensor connection can be done by two- or three-wire depending on the design of the sensor. The display is three-digit without a decimal point (accuracy to full degrees). In addition, a bar graph is displayed on the screen (in the form of a horizontal beam of variable length) giving rough information about the measured temperature, but readable from a larger distance than a digital reading. The thermometer has upper and lower alarm outputs..

2. Basic requirements and safety of use.

Meaning of symbols:

⚠ – it is particularly important to read before connecting the indicator. Failure to comply with the remarks marked with this symbol may cause damage to the indicator or the occurrence of hazards.

⚠? – means relevant parts of the description regarding the specific characteristics of the indicator. In terms of operational safety, the indicator meets the requirements of the PN-EN 61010-1 standard.

2.1. Security considerations:

– The installation and connection of the indicator should be carried out by qualified personnel, ⚠
– All available protection requirements should be taken into account,
– Before switching on the power supply, check the correctness of electrical connections,
– Before disassembling the indicator from the board, it should be disconnected from the power supply.

3. Installation

3.1. Mechanical fastening

The indicator is designed for mounting in a standard ⌀22.5mm hole with a positioning cut-out at the top. Mounting the indicator to the board boils down to inserting the body into the prepared hole and screwing it from the rear with the fixing nut.

3.2. Electrical connections

The meter is equipped with six screw terminals. The maximum cross-sectionof wires - 0.5mm2. ⚠ It is recommended to solder or use cable ends with solder ends.

Terminal designations and electrical connections are shown in Fig.2.

The Pt100 temperature sensor can be connected in a three-wire connection as shown in figure 2 or a two-wire connection. In the case of a two-wire connection, the Pt100 sensor must be connected between the "In" and "GND" terminals. The "In1" terminal can be left free or (better) connected to "GND".

For the three-wire connection, equal resistances of the wires connected to the "In" and "GND" terminals, supplying the current to the Pt100 sensor are assumed. The wire connected to the "In1" input can be treated as a current less one (the resistance does not have a significant effect on the measurement result).

Spółdzielnia Niewidomych PROMET 41-200 Sosnowiec, ul. Lipowa 11

Centrala: tel +48 22 269 81 00, Sekretariat: tel. +48 32 269 81 02, Dział Obsługi Klienta: tel. +48 32 269 81 81,

Strona | 3

The alarm outputs Al L and Al H are of the open NPN collector type.
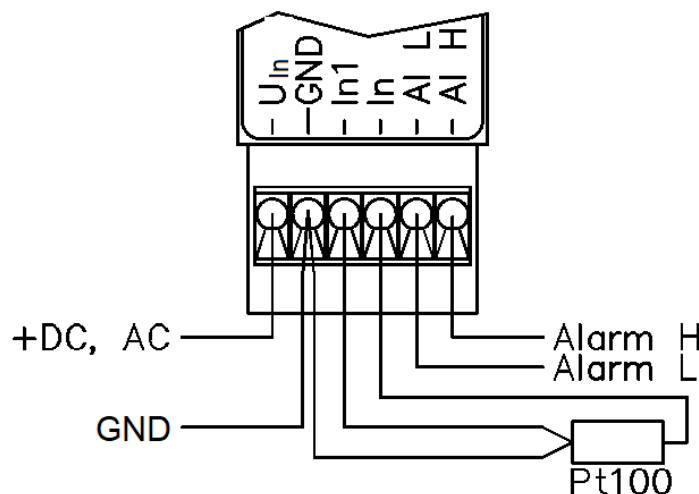Output transistors: Umax = 100V Imax = 800mA.

Fig. 2 Connections

4. Operation

After the power is turned on, a text message is displayed containing a summary of all current settings, namely:

- MD22-TFT-T   *(mark)*
- In   (type of entry)   factory-set. 2-wire
- Max   (max of range)   factory-set. 100 ºC
- Min   *(min* of range for *barg.)*   factory-set. 000 ºC
- Al H   (overflow alarm - upper)   factory-set. 80 ºC   (ON)
- Al L   (overflow alarm - lower)   factory-set. 10 ºC   (ON)

After approx. 4 seconds, the device switches to normal operation mode, with the settings in accordance with the list. The list can be recalled from the normal mode by pressing (shortly) the "-"or "+".

4.1. Screen view during normal operation.

Figure 3 shows a view of the screen.

Fig. 3 normal view
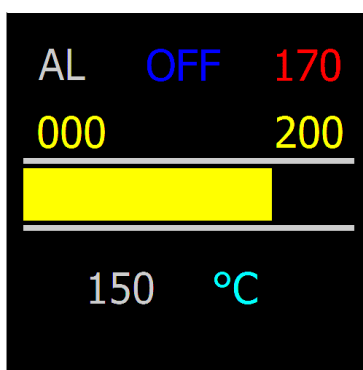
The following elements are visible on the screen:

Spółdzielnia Niewidomych PROMET 41-200 Sosnowiec, ul. Lipowa 11

Centrala: tel +48 22 269 81 00, Sekretariat: tel. +48 32 269 81 02, Dział Obsługi Klienta: tel. +48 32 269 81 81,

Strona | 4

– At the top of the screen, in the first line of text, the lower alarm (blue) and upper (red) alarms are displayed. If any of the alarms has been programmed as disabled - instead of the value, the symbol "OFF" is displayed (for example in Fig. 3 for the lower alarm).

– Below, directly above the bargraph strip, the temperature values entered during programming are displayed in yellow, equal to the minimum and maximum range for the bargraph.

– A bargraph is displayed in the middle of the screen in the form of a yellow horizontal bar. Zero strip length - measured temperature less than or equal to the minimum range for the bargraph introduced during programming. The maximum length of the bar (the entire width of the screen) - a temperature higher or equal to the maximum of the range.

note:
Bar graph is only rough information about the measured temperature, but it is readable from a greater distance than the digital display.

– Below the bar graph, the measured temperature is displayed in digital form (white colour) with units (ºC, cyan colour). Activation of alarms is signalled by the change in the colour temperature display from white to blue (temperature below the lower threshold) or to the red one (temperature above the upper threshold).

5. Settings up - programming of the MD22-TFT-T indicator.

Reprogramming is carried out by means of three buttons of the membrane keyboard on the front panel, marked as ↵, +, -.

Entering the programming mode follows by pressing and holding the "↵" button for approx. 5s. Immediately after pressing the "↵" button, the screen backlight goes off, after about 5s the first setting screen appears with the SET 1 header.
If the button is released earlier - the indicator returns to normal operation.

The programming process is quite intuitive. The parameter found to change is highlighted by displaying black characters on a white background. The function of the "+" and "-" buttons is displayed on each of the setting screens in the magenta colour at the bottom of the screen.
Pressing the "↵" button takes you to the next parameter settings or to the next settings screen.

5.1. Notes on setting numerical values.

The method of setting individual digits was adopted (incrementing with the "+" button). The digit to be changed is displayed in the yellow box, the selection is made with the "-" button. All set numerical values should be in the range -200 ÷ 0800. The oldest item can be "0" or "-". The program does not allow setting values outside the range -200 ÷ 800.

Spółdzielnia Niewidomych PROMET 41-200 Sosnowiec, ul. Lipowa 11

Centrala: tel +48 22 269 81 00, Sekretariat: tel. +48 32 269 81 02, Dział Obsługi Klienta: tel. +48 32 269 81 81,

Strona | 5

5.2. A brief description of each setting.

5.2.1.   Screen "SET 1"
➢ Input type - Selection of the Pt100 sensor connection method (2-wire lub 3-wire)
   [↵]

5.2.2.   Screen "SET 2"
➢ Setting Barg. Range Min – the value of the minimum range for the bargraph
   [↵]

5.2.3.   Screen "SET 3"
➢ Setting Barg. Range Max – the value of the maximum range for the bargraph
   [↵]

5.2.4.   Screen "SET 4"
➢ Alarm L ON/OFF – lower alarm on / off
   [↵]

5.2.5.   Screen "SET 4a" (will be omitted when previously set to OFF)
➢ Alarm L settings – setting the lower alarm value. The Al L output will be activated when the measured temperature falls below the set level.
   [↵]

5.2.6.   Screen "SET 5"
➢ Alarm H ON/OFF – upper alarm on / off
   [↵]

5.2.7.   Screen "SET 5a" (will be omitted when previously set to OFF)
➢ Alarm H settings – setting the upper alarm value. The Al H output will be activated when the measured (scaled) value rises above the set level.
   [↵]

5.2.8.   Final screen (without the header row)
Indicates three possibilities of termination, namely:
➢ [↵] – Exit with save - exit with saving of new parameters, return to normal operation
➢ [+] – Exit without save - output without writing changes, restoration of old parameters, return to normal
➢ [-] – Again - return to the beginning of the settings (screen SET 1, p.5.2.1)

Before returning to normal operation, a summary list of settings is displayed for a few seconds, described in point 4. New settings are displayed if "↵" or current if "+" was pressed.

6. Maintenance

The indicator does not require any maintenance.

Spółdzielnia Niewidomych PROMET 41-200 Sosnowiec, ul. Lipowa 11

Centrala: tel +48 22 269 81 00, Sekretariat: tel. +48 32 269 81 02, Dział Obsługi Klienta: tel. +48 32 269 81 81,

Strona | 6

7. Disposal of indicators after use

Worn out indicators, as electronic devices, should be disposed of in accordance with the regulations in force in the area on used electrical and electronic equipment. They should not be burned or disposed of in containers with other waste.

8. Important technical data

Basic application	device temperature monitoring
Reading field	TFT display with 1.44 "screen size
Supply voltage	24V DC (10 ÷ 36V) or 24V ± 10% AC, unseparated
Power consumption	max 0.5W
Range of measurement	depending on the sensor construction, max. -200 ÷ 800 ºC
Basic error	± 2 ºC for measured temperatures -200 ÷ 800 ºC
Level of security	IP 67 (front), IP 20 (back)
Enclosure type	panel, installation in a Ø 22.5 hole
Operating temperature	-20÷50°C (does not apply to the probe PT100)
Relative humidity	max 93%, without condensation
Height	up to 2000 m a.s.l.
Max. cross-section of connection cables	0.14-0.5 mm^2 for Dy cable 0.14-0.5 mm^2 for Ly cable
Security requirements	by PN-EN 61010-1
Degree of pollution	2
Input	Pt-100 sensor
Output	2x open collector type NPN, Umax = 100V, Imax = 800mA

Spółdzielnia Niewidomych PROMET 41-200 Sosnowiec, ul. Lipowa 11

Centrala: tel +48 22 269 81 00, Sekretariat: tel. +48 32 269 81 02, Dział Obsługi Klienta: tel. +48 32 269 81 81,

Strona | 7