

COMMETER C0311

Single channel thermometer for thermocouples J,K,S

Instruction manual

Manual for use of thermometer for thermocouples J, K, S COMMETER C0311

Instrument is designed for measurement of temperature from thermocouples of types J, K, S. Measured value is displayed on an LCD display. Instrument compares measured value of temperature with two adjustable levels. Breaking the level is indicated by blinking the proper value on display and by audio indication (switchable). Instrument is equipped with minimum and maximum memory and Hold function. Minimum and maximum values and Hold value are possible to display on the LCD anytime.

Technical parameters:

Parameters of measurement:

Range of measurement (with the limitation of connected probe parameters):

thermocouple J (Fe-Co)	-200 to +750°C
thermocouple K (NiCr-Ni)	-200 to +1300°C
thermocouple S (Pt10%Rh-Pt)	-50 to +1700°C

Resolution:

thermocouples J and K	0.1°C from -99.9 to +999.9°C, otherwise 1°C
thermocouple S	0.4°C from -50.0 to +999.9°C, otherwise 1°C

Accuracy of inputs without probes:

thermocouples J and K	$\pm(0.1\% + 0.4^\circ\text{C})$ from reading
thermocouple S	$\pm(0.1\% + 0.85^\circ\text{C})$ from reading

Compatible temperature probes: J,K,S thermocouple with subminiature male thermocouple connector

Compensation of thermocouple cold junction temperature: automatic from -10 to +60°C

Measuring interval and display reading refresh: approximately 0.7 s in FAST mode
0.7 to 5 s in dynamic mode

Power: battery 9V or ac/dc adapter 12V with NiCd accumulator 9V

Average current consumption: 0.3 to 1.3 mA (depending on operation mode)

Protection: IP20

Operation conditions:

Ambient temperature range: -10 to +60 °C

Ambient relative humidity range: 5 to 95 % RH, non condensing

Outer characteristics in accordance with EN 33-2000-3: normal environment with characteristics AD1, AE1, AF1, AG1, AH1, AK1, AL1, AN1, AP1, AQ1, AR1, AS1, BA1, BE1

Storing conditions: temperature -10 to +60 °C relative humidity 5 to 95 % RH

Dimensions: 141 x 71 x 27 mm

Weight including battery: approximately 150 g

Battery life depends on selected display refresh mode (see below). In FAST mode display is refreshed in shortest possible interval with highest current consumption. In dynamic mode display is refreshed in interval up to 5 s in case measured values remain stable. Refresh interval is shortened to approximately 0.7 s only if measured values change. Current consumption in this mode in usual operation is lower, battery life is up to 4 times longer. The FAST mode is recommend to use only in cases, when slower display response is not acceptable.

Battery voltage drop below 7 V is indicated with blinking of "BAT" in default display mode

(displaying of actual values) and FAST mode is automatically cancelled to save the battery. At the same time audio indication of alarms is automatically switched OFF.

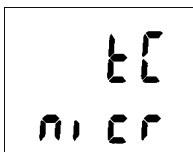
If instrument is supplied from external ac/dc adapter, internal 9V battery should be replaced with rechargeable NiCd accumulator. In usual operation from adapter accumulator is charged only with small current. If accumulator is totally discharged, its full charging in instrument takes approximately 100 hours. Instrument with accumulator is not recommended for permanent operation without ac/dc adapter plugged. Accumulator works only as a standby source in case of power mains failure.

Switching ON and OFF the instrument



Connect the external probe to the connector before switching ON the instrument. Switch ON the instrument by pressing ON/OFF key. After switching ON the instrument all symbols on the LCD are displayed. If the ON/OFF key is being held pressed, all LCD symbols are displayed till the key is released.

In usual operation instrument then starts the measurement mode and actual measured values are displayed. If instrument is ON, do not disconnect or connect the probe to prevent storing of incorrect value to minimum and maximum memory.



Actual selected thermocouple type is then displayed shortly. Symbols J or n i c r (thermocouple K) or S indicate actual thermocouple type. If selected thermocouple does not match the probe type connected to the instruments, temperature readings will not be correct and new selection of thermocouple type is necessary (see below).

In usual operation instrument then starts the measurement mode and actual measured values are displayed. If instrument is ON, do not disconnect or connect the probes to prevent storing of incorrect value to minimum and maximum memory.

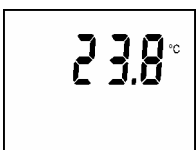
Press MENU key to switch instrument to actual measurement mode.

It is possible to switch OFF the instrument anytime, all instrument setting is kept saved. If 9V battery is disconnected for more than 1 minute all settings will be lost.

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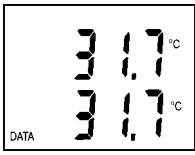
Display of actual measured temperature

In this mode is instrument anytime after switching ON. It is possible to enter this mode from other modes by pressing or by repeating pressing of MENU key. If the external probe is not connected properly or probe is out of measuring range, reading -- is displayed on the upper LCD line.

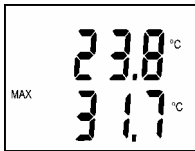


Temperature in °C is displayed on the upper LCD.

Function HOLD (storing of actual measured temperature) and minimum a maximum memory



Press HOLD key in the default mode (displaying of actual measured temperature) to store actual measured value to internal memory (indicated by short beep). Anytime it is possible to display stored value from MENU (see below). Each pressing of the HOLD key in the default mode causes value stored in HOLD memory is replaced with actual temperature.



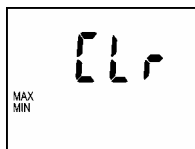
Switched ON instrument permanently updates minimum and maximum memory of temperature. Press MIN key (resp. MAX key) in the default mode to display minimum (resp. maximum) reading. These minimum and maximum readings are indicated by MIN (MAX) symbols on the LCD. Pressing MIN (MAX) or MENU key again to return to default mode. Minimum and maximum memory is cleared from menu after confirmation selection CLR (see below). Values in HOLD, MIN and MAX memories remain stored even after instrument is switched OFF.

Functions and settings available from menu

Press MENU key to enter mode of viewing menu items one by one. Press arrow keys up and down to list all menu items. Press MENU key again to return to default mode (displaying of actual measured values).



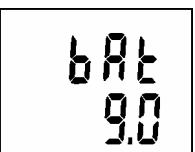
This item indicates if audio signaling of alarm indication is switched on (On) or switched off (OFF). Press ENTER key to change actual setting. Notice: if the battery voltage is low, audio indication is out of operation to reduce current consumption independently on this selection.



Clearing of minimum and maximum memory of temperature. Memory is cleared after pressing ENTER key. Clearing is confirmed by reading YES on the LCD lower display.



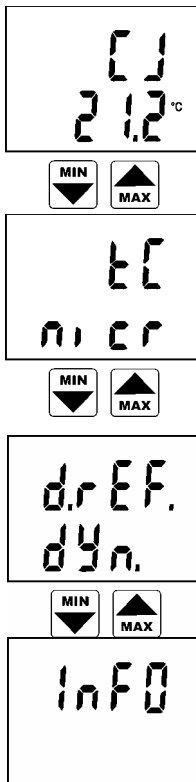
Press ENTER key to display value stored in the HOLD memory. Press MENU key to leave this mode.



Battery voltage of partially loaded battery is displayed. This value illustrates battery condition.



Temperature of thermocouple cold junction is indicated. Temperature is being sensed at the location of probe connector. This temperature is used for automatic compensation of thermocouple cold junction temperature.

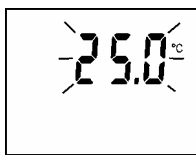


Type of actual selected thermocouple is indicated - symbols **J** or **nicr** (K thermocouple) or **S**. Press ENTER key to enter the thermocouple selection mode (procedure is described below). If the selection is not correct, temperature readings are incorrect.

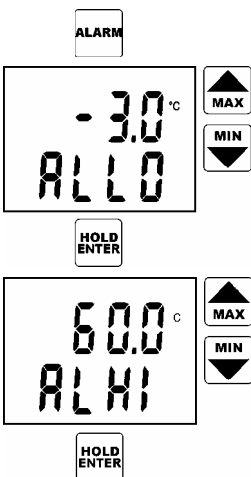
Display refresh mode is indicated. In the FAST mode refreshment is fastest with regular interval approximately 0.7 s. In the dynamic refresh mode (DYN.) each 15 s refresh interval of display is doubled to maximum 5 s if measured values are stable. If measured values change, refresh interval decreases to approximately 0.7 s. This dynamic mode prolongs battery life significantly. Select the desired mode by ENTER key. Notice: if battery voltage is low, the FAST mode is out of operation to reduce current consumption independently on this selection.

Pressing of ENTER key causes displaying service information on software version (upper LCD line) together with instrument configuration on the LCD lower line.

Alarm indication and setting



It is possible to set lower and upper limit for measured temperature. Breaking of the limit is indicated by blinking of the value on the display. Alarm activation can be disabled by setting lower alarm limit up to its maximum. This is indicated by OFF reading at the position of numeric value. Value of upper limit of the same alarm is indifferent.



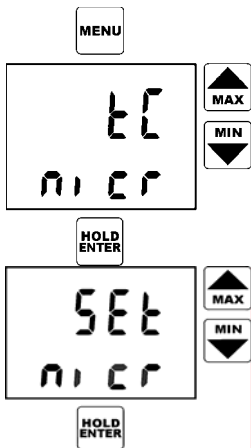
To set alarms press ALARM key.

Reading ALLO indicates adjusted lower alarm limit. Set the desired value by means of the arrow keys. Press and hold the arrow key UP to make value increase fast. Press and hold the arrow key DOWN to make value decrease fast. Release the arrow key and press ENTER to confirm new limit.

Reading ALHI indicates adjusted upper limit. Set the desired value in the same way as in above lower limit. If needed it is possible to get back to lower limit setting of the same alarm by pressing DISPLAY key. Press ENTER key to confirm new upper limit.

It is possible to leave the alarm setting mode by pressing MENU key. New adjusted limits up to pressing MENU key are stored in memory.

Selection of thermocouple type



Select menu item tC to select thermocouple type. Confirm the desired thermocouple type by pressing ENTER.

Reading SET indicates the mode of selection of thermocouple type. Use the arrow keys to select the desired thermocouple type - symbols J or nicr (K thermocouple) or S at the lower LCD line. Confirm by pressing ENTER.

Anytime it is possible to leave the thermocouple type setting mode by pressing MENU key without any change of thermocouple type.

Battery replacement

Low battery voltage is indicated on the display with blinking reading "BAT". It is necessary to replace it with new one as soon as possible. Battery is located under small cover on the instrument lower side. It is absolutely necessary to replace battery with instrument switched OFF, otherwise AUDI (from menu selections) and data in memory HOLD, MIN and MAX will be lost. For the same reason do not disconnect the battery for longer than 1 minute even if instrument is switched OFF. If it happens (or if battery is totally discharged), it is necessary in appropriate menu selection to set again LCD refreshment mode (d.REF.), alarm audio indication (AUDI) and clear the minimum and maximum memory (CLR). If the instrument does not work after replacement of totally discharged battery (LCD does not indicate any symbol), remove the battery and leave the instruments without any battery for 30 minutes. Then contact the new battery and set the above menu items.

Commeter instruments passed the following electromagnetic compatibility (EMC) tests:

radiation: EN 55022	class B
immunity: EN 61000-4-2	(levels 4/8 kV, class A)
EN 61000-4-3	(intensity of electromagnetic field 3 V/m, class B)
EN 61000-4-4	(levels 1/0,5 kV, class A)
EN 61000-4-6	(intensity of electromagnetic field 3 V/m, class B)
EN 61000-4-11	(class A)
EN 61000-4-5	(class A)