ENGLISH

User manual

Release EN 1.00 - 14/09/2017

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1. SAFETY PRECAUTIONS AND PROCEDURES

This instrument conforms to safety guidelines relating to electronic measuring instruments. For your own safety and that of the apparatus, you must follow the procedures described in this instruction manual and specially read all the notes preceded by the symbol ⚠ carefully. Strictly keep to the following instructions before and during measurements:

- Do not perform measurements in environments with explosive gas, fuels or dust.
- Do not perform any measurement in case of unusual conditions of the instrument such as deformation, breakage, leakage of substances, absence of display reading etc.

The following symbols are used on the instrument and in this manual:

Caution: refer to the instructions reported on this manual; improper use may damage the apparatus or its components.

Ground reference

1.1. PRELIMINARY INSTRUCTIONS

- Use the instrument only as specified in this manual otherwise, the protection provided by the instrument may be impaired.
- Only the accessories supplied with the instrument guarantee compliance with the safety standards. They must be in good conditions and must be replaced, if necessary, with identical models.
- Do not effect measurements beyond the limits specified in this manual.
- Check that batteries have been placed correctly.

1.2. DURING USE

Carefully read the following recommendations and instructions:

CAUTION

No compliance with the Warnings and/or Instructions may damage the apparatus and/or its components or injure the operator.

- Use the instrument and the probes only within the ranges specified in this manual and in the probes' ones.
- Do not perform any measurement on materials under voltage. This could damage the instrument.
- If during a measurement the read value or sign never changes, please verify if the HOLD function is active.

1.3. AFTER USE

- When the measurements are completed switch off the instrument.
- Remove batteries when the apparatus remains unused for long periods.

2. GENERAL DESCRIPTION

The instrument can performs the following measurements:

- Temperature measurement in °C/°F/°K by means of K, J and T type probes
- Maximum, minimum values measurements
- Data HOLD
- Offset adjustment for compensation of external probes
- Backlight
- Auto Power OFF

Each function could be selected via the relative key. The selected quantity appears on a high-contrast display with indication of measurement unit and of the active functions. There are also the function keys, for their use please see § 4.2.

3. PREPARATION FOR USE

3.1. INITIAL

The instrument has been checked from every point of view before shipment. Every care has been taken to make sure that the instrument reaches you in perfect conditions. However, it's advisable to make a rapid check in order to detect eventual damages, which may have occurred in transit. Should this be the case, enter immediately the usual claims with the carrier. Make sure that all the accessories listed in § 7.3 are contained in the package. In case of discrepancies contact the dealer. In case of returning of the tester, please keep to the instructions given in § 8.

3.2. POWER SUPPLY

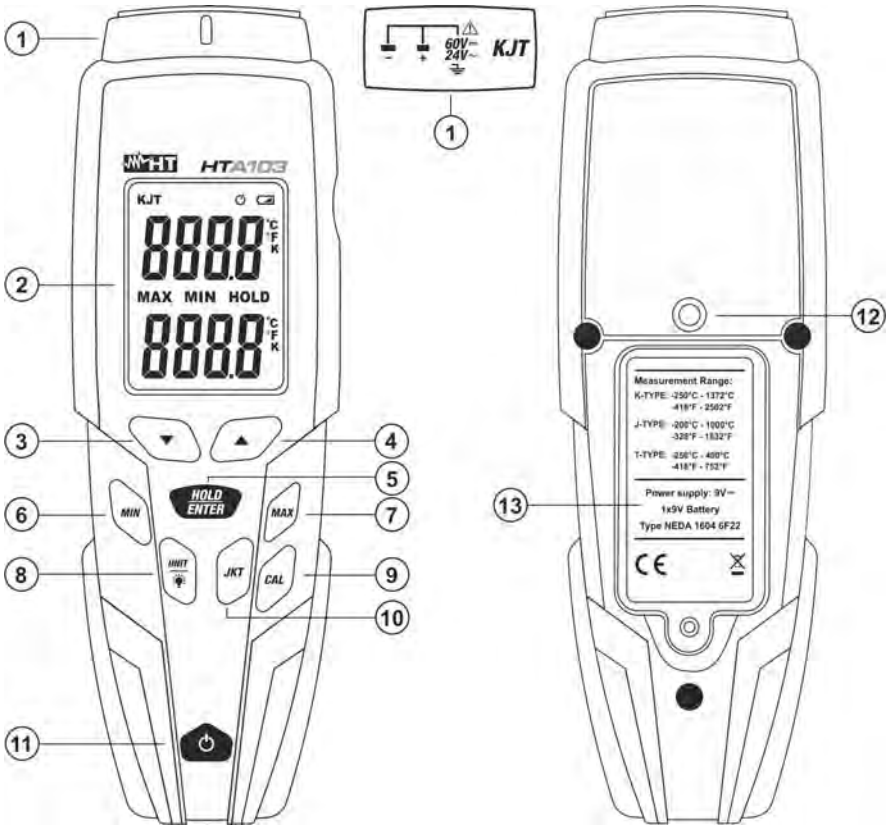
The instrument is supplied by 1x9V alkaline battery type IEC 6F22 included in the package. Battery life: about 200 hours. When battery is low, the symbol "  " appears on the display. Replace it immediately, following the instructions given in § 6.2.

3.3. STORAGE

In order to guarantee the accuracy of the measurements, after a period of storage in extreme environmental condition, wait for the necessary time so that the instrument returns to normal measuring conditions (see § 7.2.1).

4. NOMENCLATURE

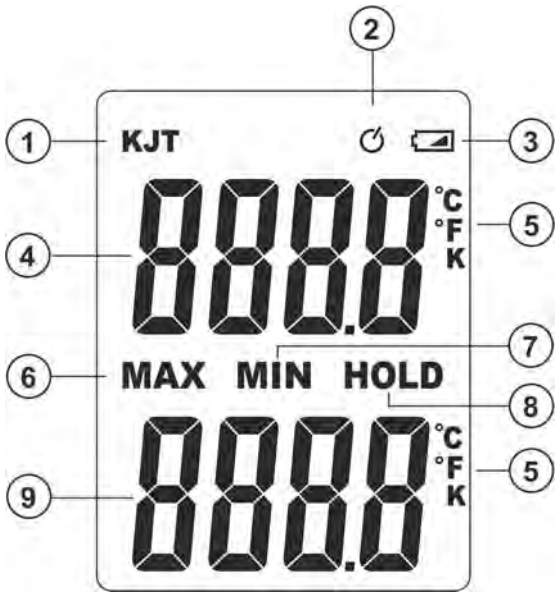
4.1. INSTRUMENT DESCRIPTION



CAPTION:
1. Input terminal for JKT probes
2. LCD display
3. Arrow key ▼
4. Arrow key ▲
5. **HOLD/ENTER** key
6. **MIN** key
7. **MAX** key
8. **UNIT/☀** key
9. **CAL** key
10. **JKT** key
11. **ON/OFF** key
12. Tripod hole
13. Battery cover

Fig. 1: Instrument description

4.2. DESCRIPTION OF DISPLAY



CAPTION:
1. Probe type indication
2. Auto Power OFF (APO) symbol
3. Low battery indication
4. Main display
5. Measurement unit
6. MAX function active
7. MIN function active
8. HOLD function active
9. Secondary display

Fig. 2: Display description

4.3. FUNCTION KEY DESCRIPTION

4.3.1. ON/OFF key

By pushing **ON/OFF** key permits to turn on and off the instrument. After turn on, the backlight is active and it automatically disabled after approx. 20s.

4.3.2. UNIT/☼ key

By pushing **UNIT/☼** key permits the temperature measurement unit selection among the option: "**°C**" (Celsius), "**°F**" (Fahrenheit) and "**K**" (Kelvin). The **UNIT/☼** key is disabled if the function "HOLD" is activated..

The formulas that links Celsius and Fahrenheit degrees are:

$T\,[°C] = \frac{T\,[°F] - 32}{1.8}$ or $T\,[°F] = T\,[°C] * 1.8 + 32$

so: 0°C are equal to 32°F, 100°C are equal to 212°F

By pushing long (>2s) of **UNIT/☼** key permits to activate/disable the backlight.

4.3.3. JKT key

By pushing **JKT** key permits to set the type of external probe (K, J or T) to be connected to the instrument. Cyclically the K, J or T settings are displayed.

4.3.4. MAX and MIN key

By pushing **MAX** or **MIN** key permits to detect the Maximum or Minimum values of measured temperature. The secondary display (see Fig. 2 – part 9) shows the symbol linked to the selected function: The symbol "MAX" for maximum value and "MIN" for minimum value. The MAX or MIN values are dynamically updated while the real time value of temperature is displayed on the main display (see Fig. 2 – part 4)

4.3.5. HOLD/ENTER key

By pushing **HOLD/ENTER** key the instrument's measured value is frozen on the display and the symbol "HOLD" appears on it. The HOLD function does not influence the secondary display.

4.3.6. ▲ and ▼ keys

Use the ▼ and ▲ arrow keys to set the offset values during the calibration operation of the probe fitted in the terminal input of the instrument (see § 4.3.7).

4.3.7. CAL key

The **CAL** key permits to perform compensation on the temperature measurement due to a possible error of the input probe. Follow the below steps:

1. By pushing long (>3s) **CAL** key to enter in the calibration section. The below screen is shown at display:

Fig. 3: Compensation of temperature probe

2. On the main display the real time value of the temperature is displayed while the measurement offset value is displayed on the secondary display. The default value is "0.0". **Do not modify this default value if any compensation is needed**
3. Push the ▲ or ▼arrow keys respectively to increase or decrease the offset value. The maximum set values are: **±5°C** or **±9°F** with a **0.1°C** / **0.1°F** resolution
4. By pushing long (>3s) again **CAL** key to save the settings and quit this mode. The instrument keeps the set value after each shutdown

4.3.8. Disabling Auto Power OFF

The instrument is provided with Auto Power OFF (APO) feature which automatically permits to switch it off after 15 minutes of idleness in order to preserve the internal battery. To disable this feature follows the below steps:

1. With instrument on, push and keep the **HOLD/ENTER** key
2. By pushing long (>1s) the **ON/OFF** key. The "APO OFF" message is shown at display for a while (see Fig. 4 – left part) and the "⏲" symbol disappears from display
3. Repeat the same operation of the point 1 and 2 for enable again the function with "APO ON" message shown at display (see Fig. 4 – right part) or the feature is automatically restored after each shutdown

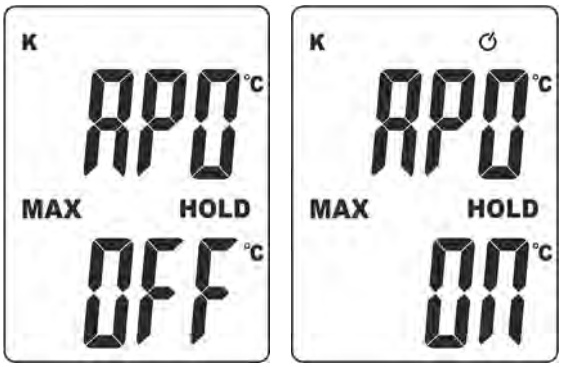


Fig. 4: Disable/enable Auto Power OFF

5. OPERATING INSTRUCTIONS

5.1. TEMPERATURE MEASUREMENT

CAUTION

Maximum input voltage is 24V AC or 60V DC. Do not attempt to apply any voltage that exceeds the limits indicates in this manual to avoid electrical shock hazard or damage the instrument.

1. Turn on the instrument by pushing the **ON/OFF** key. If no probe is connected to the instrument, the "- - - -" symbol is shown at two displays
2. Select the type of probe (see § 4.3.3) and the measurement unit (see § 4.3.2)
3. Insert the connectors of the probe on input terminal respecting the polarity (+) and (-) (see Fig. 1 – part 1) shown on the instrument and on the probe connector
4. The real time value of the temperature is shown on the main display (see Fig. 5)

Fig. 5: Use of the instrument for temperature measurement

5. Press **HOLD/ENTER** key to freeze result at display (see § 4.3.5)
6. Press the **MAX** or **MIN** keys to read the Maximum or Minimum values on secondary display
7. Switch off the instrument after measurement

6. MAINTENANCE

6.1. GENERAL

1. Whether in use or in storage, please do not exceed the specification requirements to avoid any possible damage or danger during use
2. Do not place this instrument in high temperature or expose to direct sunlight
3. Be sure to turn the instrument off after use. For long time storage, remove the battery to avoid leakage of battery liquid that would damage the interior parts

6.2. BATTERY REPLACEMENT

When the symbol "  " is displayed replace battery.

CAUTION

Only expert and trained technicians must perform this operation. Remove all the probes from the devices under test before replacing the battery.

1. Switch off the instrument
2. Remove the temperature probe
3. Remove the battery cover (see Fig. 1 – part 13)
4. Remove the battery from the battery fastener
5. Set the new battery into battery fastener, and return it to the battery case
6. Replace the battery cover
7. Use the appropriate battery disposal methods for Your area

6.3. CLEANING

For cleaning the instrument use a soft dry cloth. Never use a wet cloth, solvents or water, etc.

6.4. END OF LIFE

CAUTION: this symbol indicates that equipment, its accessories and battery shall be subject to a separate collection and proper disposal.

7. TECHNICAL SPECIFICATIONS

7.1. CHARACTERISTICS

Accuracy is calculated as [%rdg + degrees] at 23°C ± 5°C <70%HR

Temperature measurement with K probe

Range	Resolution	Accuracy	Overload protection
-250°C ÷ 1372°C	0.1 °C	±(1%rdg+ 1°C) (T<-99.9°C) ±(1%rdg+0.5°C) (T≥ -99.9°C)	60V DC 24V AC rms
-418°F ÷ 2502°F	0.1 °F	±(1%rdg+ 1.8°F) (T<-148°F) ±(1%rdg+0.9°F) (T≥ -148°F)	

Temperature measurement with J probe

Range	Resolution	Accuracy	Overload protection
-200°C ÷ 1000°C	0.1 °C	±(1%rdg+ 1°C) (T<-99.9°C) ±(1%rdg+0.5°C) (T≥ -99.9°C)	60V DC 24V AC rms
-328°F ÷ 1832°F	0.1 °F	±(1%rdg+ 1.8°F) (T<-148°F) ±(1%rdg+0.9°F) (T≥ -148°F)	

Temperature measurement with T probe

Range	Resolution	Accuracy	Overload protection
-250°C ÷ 400°C	0.1 °C	±(1%rdg+ 1°C) (T<-99.9°C) ±(1%rdg+0.5°C) (T≥ -99.9°C)	60V DC 24V AC rms
-418°F ÷ 752°F	0.1 °F	±(1%rdg+ 1.8°F) (T<-148°F) ±(1%rdg+0.9°F) (T≥ -148°F)	

7.1.1. General data

Mechanical characteristics

Dimensions (Lx W x H): 190 x 65 x 45mm; (7 x 3 x 2in)
Weight (including battery): 235g (8 ounces)
Mechanical protection: IP40

Supply

Battery type: 1x9V alkaline NEDA 1604 IEC 6F22 JIS 006P
Low battery indication: "  " symbol is displayed
Battery life: ca 50h (backlight ON), ca 210h (backlight OFF)
Auto Power Off: after 15 minutes of idleness (disabled)

Display

Characteristics: double 4 LCD, sign, decimal point and backlight
Sample rate: 3times/s

7.2. ENVIRONMENTAL CONDITIONS

7.2.1. Climatic conditions

Reference temperature: 25°C ; (77°F)
Operating temperature: 0°C ÷ 50 °C ; (32°F ÷ 122°F)
Operating humidity: <70%RH
Storage temperature: -10°C ÷ 60°C ; (14°F ÷ 140°F)
Storage humidity: <70%RH
Max height of use: 2000m (6562ft)

This instrument satisfies the requirements of EMC Directive 2014/30/EU
This instrument satisfies the requirements of European Directive 2011/65/EU (RoHS) and 2012/19/EU (WEEE)

7.3. ACCESSORIES

7.3.1. Accessories provided

- K-type wire probe (Code: TK101)
- Battery
- Carrying bag
- User manual

7.3.2. Optional accessories

- Type K probe for air and gas — Cod. TK107
- Type K probe for semi solid substances — Cod. TK108
- Type K probe for liquid — Cod. TK109
- Type K probe for surfaces — Cod. TK110
- Type K probe for surfaces with a 90° lead — Cod. TK111

8. SERVICE

8.1. WARRANTY CONDITIONS

This equipment is guaranteed against material faults or production defects, in accordance with the general sales conditions. During the warranty period (one year), faulty parts may be replaced. The manufacturer reserves the right to decide either to repair or replace the product. In case of returning of the instrument, all transport charges must be paid by the customer. The instrument must be accompanied by a delivery note indicating the faults or reasons of returning. The returned tester must be packed in its original box. Any damage occurred in transit because of lack of original packaging will be debited to the customer. The manufacturer is not responsible for any damage against persons or things. Accessories and batteries are not covered by warranty.

The warranty won't be applied to the following cases:

- Faults due to improper use of the equipment.
- Faults due to combination of the tester with incompatible equipment.
- Faults due to improper packaging.
- Faults due to servicing carried out by a person not approved by the company.
- Faults due to modifications made without explicit authorization of our technical department.
- Faults due to adaptation to a particular application not provided for by the definition of the equipment or by the instruction manual.

8.2. SERVICE

If the equipment doesn't work properly, before contacting the SERVICE, test the batteries, the probes and change them if necessary. If the equipment still doesn't work, make sure that your operating procedure complies with the one described in this manual. In case of returning of the instrument, all transport charges must be paid by the customer. The instrument must be accompanied by a delivery note indicating the faults or reasons of returning. The returned tester must be packed in its original box. Any damage occurred in transit because of lack of original packaging will be debited to the customer.