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HT INSTRUMENTS HT10 Two Pole Voltage Tester

Product Information

Specifications

- Model: HT10
- Release: 4.00 – 02/12/2024
- Languages: Italiano, English, Deutsch

PRECAUTIONS AND SAFETY MEASURES

This instrument complies with IEC/EN61010-1. For your own safety and to avoid damaging the instrument, you're recommended to keep to the instructions contained in this manual and read carefully all the notes preceded by the symbol ⚠

CAUTION

- Depending on the internal impedance of the voltage detector there will be a different capability of indicating the presence or absence of operating voltage in case interference voltage is present
- A voltage detector of relatively low internal impedance, compared to the reference value of 100k , will not indicate all interference voltages having an original voltage

value above the ELV level. When in contact with the parts to be tested, the voltage detector may temporarily discharge the interference voltage to a level below ELV, but voltage will be back to the original value when the voltage detector is removed

- When the indication “voltage present” does not appear, it is highly recommended installing earthing equipment before proceeding
- A voltage detector of relatively high internal impedance, compared to the reference value of 100k , may not permit to clearly indicate the absence of operating voltage in case interference voltage is present
- When the indication “voltage present” appears on a part that is expected to be disconnected from the installation, it is highly recommended confirming by other means (e.g. use of another voltage detector, visual check of the disconnected parts of the electric circuit to be tested, etc.) that there is no operating voltage on the part to be tested and to conclude that the voltage indicated by the voltage detector is an interference voltage
- A voltage detector declaring two values of internal impedance has passed a performance test of detecting interference voltages and is (within technical limits) able to distinguish operating voltage from interference voltage and has a means to directly or indirectly indicate which type of voltage is present
- This instrument has been designed for use in environments with pollution degree 2.
- It can be used for DC and AC VOLTAGE measurements on installations of CAT IV 600V or CAT III 1000V

The following symbols are used on the instrument:

 CAUTION – refer to the instruction manual – an improper use may damage the instrument or its components

 Double insulated

 DC Voltage

 AC Voltage

 Instrument suitable for carrying out measurements under voltage

The instrument complies with the regulation of the TUV Association for Electrical, Electronic & Information Technologies and with the rules of “Geprüfte Sicherheit

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

DURING USE

Always keep to the instructions contained in this manual:

- When using the instrument always respect the usual safety regulations aimed at protecting you against dangerous electric currents as well as the instrument against incorrect operation
- Do not test nor connect to any circuit exceeding the specified overload protection
- Do not take measurements under environmental conditions exceeding the limits indicated in § 7.2
- Check the state of the internal batteries before use and replace them if necessary
- Prior to usage ensure perfect instrument function (e.g. on a known voltage source)
- The functionality of the instrument must be quickly checked before and after use by using the test probes. If the indication of one or more steps fails or if no functionality is verified, the instrument is no longer to be used
- The different signals indicated by the instrument (including the ELV limit indication) must not be used for measuring purposes
- Before using the instrument with audible indicator at locations with a high background noise level please evaluate if the audible signal is perceptible
- Position the instrument in order to avoid hiding of visual indication or covering of sound transmitter
- Check the state of the voltage source before to use the instrument

AFTER USE

If you expect not to use the instrument for a long period remove batteries

CAUTION

Noncompliance with the CAUTIONs and/or the instructions may damage the tester and/or its components or injure the operator

MEASURING CATEGORIES DEFINITIONS

The norm IEC/EN61010-1: Safety requirements for electrical equipment for measurement, control and laboratory use, Part 1: General requirements, defines what measuring category, usually called overvoltage category, is. On § 6.7.4: Measuring circuits, it says: (OMISSIS)

Circuits are divided into the following measurement categories:

- Measurement category IV is for measurements performed at the source of the low voltage installation
- Examples are electricity meters and measurements on primary overcurrent protection devices and ripple control units
- Measurement category III is for measurements performed in the building installation
- Examples are measurements on distribution boards, circuit breakers, wiring, including cables, busbars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industrial use and some other equipment, for example, stationary motors with permanent connection to fixed installation.
- Measurement category II is for measurements performed on circuits directly connected to the low voltage installation Examples are measurements on household appliances, portable tools and similar equipment.
- Measurement category I is for measurements performed on circuits not directly connected to MAINS
- Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS-derived circuits. In the latter case, transient stresses are variable; for that reason, the norm requires that the transient withstand capability of the equipment is made known to the user

GENERAL DESCRIPTION

The instrument performs the below measurements:

- DC Voltage with 2-wire method
- AC Voltage with 2-wire method
- AC Voltage with 1-wire method (polarity detection)
- AC Voltage measurement with low impedance value
- Phase sequence indication

- Resistance measurement
- Continuity test with buzzer

The measurement result is displayed with indication of the measuring unit both in numerical mode and on the LCD display. A white pointer LED is also available in order to correctly perform the tests even in poorly lit environments

PREPARATION FOR USE

INITIAL CHECKS

The instrument has been checked from a mechanical and electrical 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 to detect any damage 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 § 7.3.1 are contained in the package. In case of discrepancies contact Your dealer. In case of returning of the tester please keep to the instructions given in § 8

POWER SUPPLY

The instrument is powered by 2×1.5V alkaline batteries type AAA LR03. When batteries are low, a low battery indication “  ” is displayed. To replace batteries please follow the instructions of § 6.2

STORAGE

After a period of storage under extreme environmental conditions exceeding the limits mentioned in § 7.2 let the instrument come back to normal measuring conditions before using it.

NOMENCLATURE

INTRUMENT DESCRIPTION

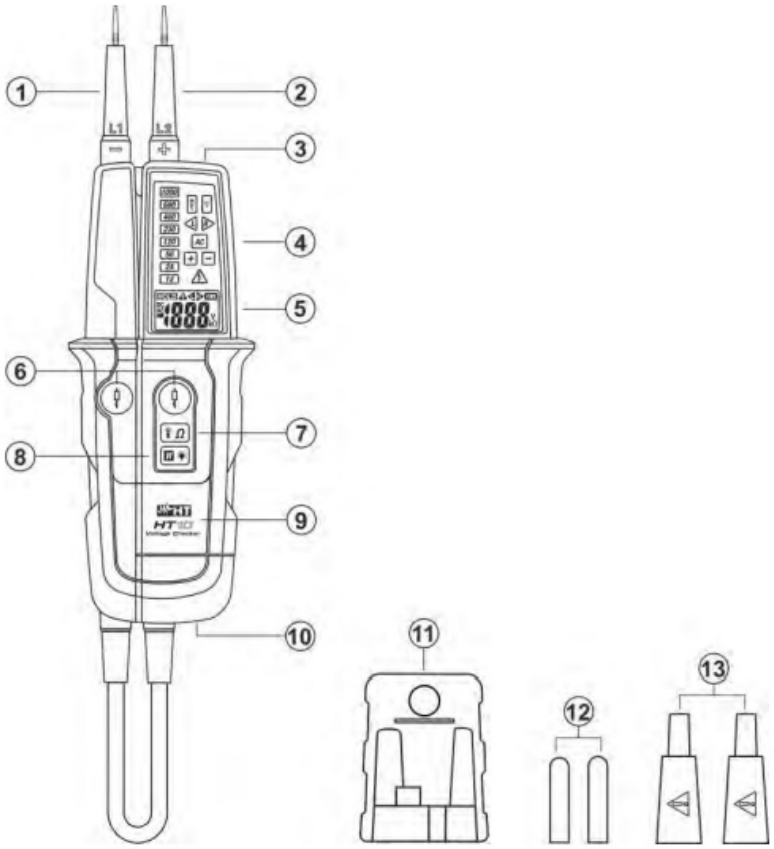


Fig. 1: Instruments description

1. L1 dynamic probe
2. L2 fixed probe
3. White LED pointer
4. Warning LEDs
5. LCD Display
6. Low impedance test switches
7.  key
8.  key
9. Battery compartment
10. Screw of battery cover
11. Probe tip protection cap
12. 4mm metal sleeves with internal thread
13. Probe tip protection covers

DESCRIPTION OF WARNING LEDS

1. LEDs for voltage test
2. LED for low impedance test

3. LED for continuity test
4. LEDs for phase sequence test
5. LED for AC voltage
6. LED for DC voltage sign
7. LED for warning voltage
8. LCD Display

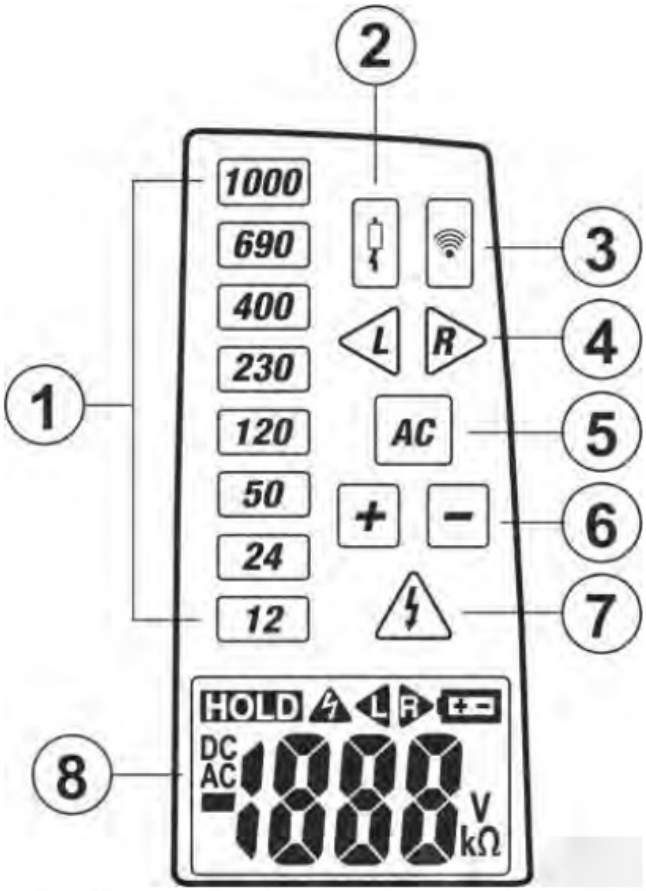


Fig. 2: Description of warning LEDs

DESCRIPTION OF DISPLAY

1. Data HOLD function activated
2. voltage over 50VAC/120VDC
3. Phase sequence symbols
4. Low battery indication
5. LCD display
6. Voltage and Resistance units
7. DC/AC Voltage measures and polarity

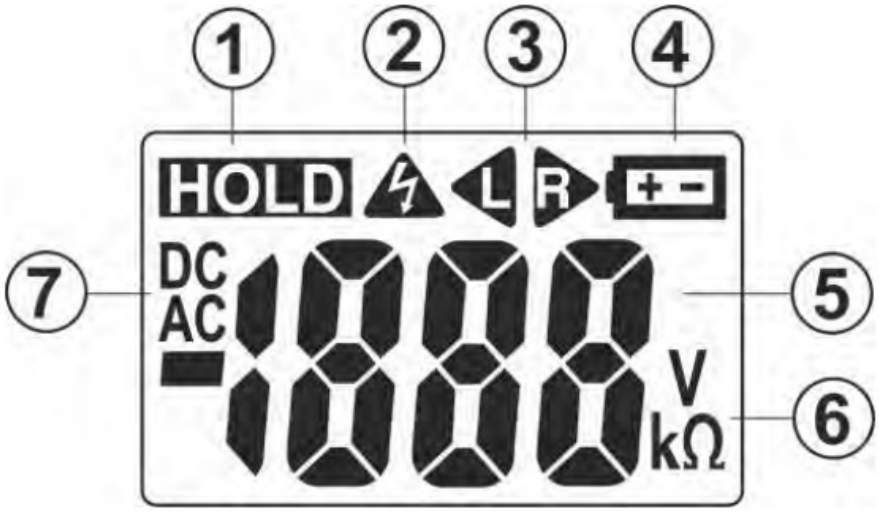


Fig. 3: Description of display

OPERATING INSTRUCTIONS

INITIAL AUTOTEST

Before starting any measurement perform the following checks

CAUTION

- Use the instrument on a known voltage source
- The " " LED switches on when a voltage above 50VAC/120VDC is applied, even if the battery is low or has been removed
- Before and after the use of instrument short the L1 and L2 probes for approx. 4-6s. The below actions must be noted:
  - All the LEDs except low impedance test switch on
  - The audible signal will sound
  - All segments of display and backlight switch on

DC VOLTAGE MEASUREMENT

CAUTION

- The maximum input for DC Voltage is 1000V. Do not measure higher voltages to avoid risks of electrical shocks or serious damages to the instrument
- Warning LED turns ON and the buzzer sound for voltage between probes over 120V

1. Perform the preliminary Autotest function (see § 5.1)
2. Connect the L1 and L2 probes to the object under test (see Fig. 4). The measurement is performed only with contact of probes directly on metal parts of conductors
3. The instrument switches on automatically for voltage >6V and the DC voltage value is displayed both through red LEDs switching on and on the display. DC symbol is displayed and “+” LED switches on
4. Should symbol “-” be displayed it means that the detected voltage has an opposite direction compared to the connection shown in Fig. 4
5. The instrument turns automatically OFF as soon as probes are disconnected from the object under test
6. Press the H/ key to activate/deactivate the function HOLD at display. Press and hold the H/ key in order to activate/deactivate the display backlight
7. Press the /Ω key to activate/deactivate the white LED torch

AC VOLTAGE MEASUREMENT

CAUTION

- The maximum input for AC Voltage is 1000V. Do not measure higher voltages to avoid risks of electrical shocks or serious damages to the instrument
- Warning LED turns ON and the buzzer sound for voltage between probes over 50V

1. Perform the preliminary Autotest function (see § 5.1)
2. Connect the L1 and L2 probes to the object under test (see Fig. 5). The measurement is performed only with contact of probes directly on metal parts of conductors
3. The instrument switches on automatically on for voltage >6V and the AC voltage value is displayed both through red LEDs switching on and on the display. AC symbol is displayed
4. The LED and the “AC” indication switch on, the AC voltage measurement is displayed, and an acoustic signal is emitted
5. The instrument turns automatically OFF as soon as probes are disconnected from the object under test

6. For measurements in single-phase plants the LEDs R or L can turn on This is not a device problem
7. Press the H/ key to enable the HOLD function at display. Press and hold the H/ key in order to activate/deactivate the display backlight
8. Press the /Ω key to activate/deactivate the white LED torch

AC VOLTAGE WITH LOW IMPEDANCE VALUE

CAUTION

- The maximum input for AC Voltage is 1000V. Do not measure higher voltages to avoid risks of electrical shocks or serious damages to the instrument
- Warning LED turns ON and the buzzer sound for voltage between probes over 50V
- This function is particularly useful for testing installations. Due to the lowered internal impedance, capacitive voltage effects are suppressed. The reading shows the actual voltage applied. Similarly, measuring phase (L1) on earth wire (PE) may trigger fault-current circuit breakers (RCD)

1. Perform the preliminary Autotest function (see § 5.1)
2. Connect the L1 and L2 probes to the object under test (see Fig. 6). The measurement is performed only with contact of probes directly on metal parts of conductors
3. The LED and the “AC“indication switch on, the AC voltage measurement is displayed and an acoustic signal is emitted
4. Press the two switches (see Fig. 1 – part 6) simultaneously. The applied voltage is displayed both through red LEDs switching on and on the display. AC symbol is displayed. The LED for low impedance test (see Fig. 2 – part 2) switches on
5. The instrument turns automatically OFF as soon as probes are disconnected from the object under test
6. For measurements in single-phase plants the LEDs R or L can turn on. This is not a device problem

7. Press the H/ key to activate/deactivate the HOLD function at display. Press and hold the H/ key in order to activate/deactivate the display backlight
8. Press the /Ω key to activate/deactivate the white LED torch

1-WIRE AC VOLTAGE DETECTION (POLARITY)

CAUTION

- The maximum input for AC voltage is 1000V. Do not try to measure higher voltages to avoid risk of electrical shocks or serious damages to the instrument
- The 1-wire AC voltage mode should be used as a quick test in order to detect the presence of voltage only without displaying any result. The pole test is not suitable to determine voltage. For this purpose, the two-pole voltage testing is always mandatory
- When using single-pole phase tests to determine external conductors the display function may be impaired under certain conditions (e.g. for insulating body, protective equipment on insulation locations, etc..
- Warning LED turns ON and the buzzer sound for voltage between probes over 100V

1. Perform the preliminary Autotest function (see § 5.1)
2. Connect the L2 probes to the object under test (see Fig. 7). The measurement is performed only with contact of probe directly on the metal part of conductor
3. The LED and the “- – -“indication switch on, and an acoustic signal is emitted for voltage present >100V AC
4. The instrument turns automatically OFF as soon as probes are disconnected from the object under test
5. Press the H/ key to activate/deactivate the HOLD function at display. Press and hold the H/ key in order to activate/deactivate the display backlight
6. Press the /Ω key to activate/deactivate the white LED torch

PHASE SEQUENCE INDICATION

CAUTION

- The maximum input for AC voltage is 1000V. Do not try to measure higher voltages to avoid risk of electrical shocks or serious damages to the instrument
- Warning LED turns ON and the buzzer sound for voltage between probes over 50V

1. Perform the preliminary Autotest function (see § 5.1)
2. Connect L1 probe on L1 phase and L2 probe on L2 phase of the three-phase system under test (see Fig. 8). The measurement is performed only with contact of probes directly on metal parts of conductors
3. The LED and the “AC“indication switch on, the AC voltage measurement is displayed and an acoustic signal is emitted
4. The R symbol (clockwise) is displayed in case of correct phase sequence indication. The L symbol (anticlockwise) is displayed in case of incorrect phase sequence indication
5. Connect L1 probe on L2 phase and L2 probe on L3 phase of the three-phase system under test. The R symbol (clockwise) is displayed in case of correct phase sequence indication. The symbol L (anticlockwise) is displayed in case of incorrect phase sequence indication
6. Connect L1 probe on L3 phase and L2 probe on L1 phase of three-phase system under test. The symbol R (clockwise) is displayed in case of correct phase sequence indication. The symbol L (anticlockwise) is displayed in case of incorrect phase sequence indication
7. Press the H/ key to activate/deactivate the HOLD function at display. Press and hold the H/ key in order to activate/deactivate the display backlight
8. Press the /Ω key to activate/deactivate the white LED torch

CONTINUITY TEST

CAUTION

Before performing the continuity test, remove power from the circuit under test and discharge all capacitors

1. Perform the preliminary Autotest function (see § 5.1)
2. Connect the L1 and L2 probes to the object under test (see Fig. 9)
3. Continuity test is active for resistance <400kΩ. The meter turns automatically on with LED “ ”, the “Con” message is displayed and the buzzer sounds continuously indicating a positive test
4. The meter automatically turns on when the two probes are separated from the measured object
5. Press the key to activate/deactivate the white LED torch

RESISTANCE MEASUREMENT

CAUTION

Before taking any in circuit resistance measurement, remove power from the circuit to be tested and discharge all the capacitors

1. Perform the preliminary Autotest function (see § 5.1)
2. Press and hold the key to switch on the instrument The “OL” and “Ω” symbols are displayed
3. Connect the L1 and L2 probes to the object under test (see Fig. 10). The resistance value is shown at display
4. Press the key to activate/deactivate the function HOLD at display. Press and hold the key in order to activate/deactivate the display backlight
5. Press the key to activate/deactivate the white LED torch
6. Press and hold the key to switch off the instrument

MAINTENANCE

GENERAL INFORMATIONS

1. To guarantee the instrument's performance make sure to use it or keep it stored under suitable environmental conditions
2. Do not expose it to high temperatures or humidity or direct sunlight. Please make sure to turn it off after use.
3. If you expect not to use the instrument for a long time remove batteries to avoid leakage of battery liquid which could damage its inner components
4. Only authorized persons are allowed to disassemble the instrument

BATTERY REPLACEMENT

When the symbol "  " is shown on the display replace the battery.

CAUTION

Only skilled technicians can open the instrument and replace batteries. Before removing batteries disconnect the test leads from any energized circuits to avoid electrical shock

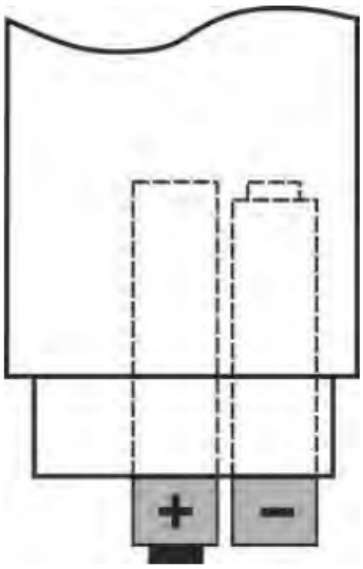


Fig. 11: Battery replacement

1. Loosen the screw on the bottom part of instrument (see Fig. 1 –part 10) and remove the battery cover
2. Remove batteries from the battery compartment
3. Insert new batteries of the same type (see § 7.2) respecting the indicated polarity (see Fig. 11)
4. Restore the battery cover and tighten the screw again

5. Do not throw used batteries into the environment after use. Use the appropriate battery disposal methods available in your area

CLEANING

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

TECHNICAL SPECIFICATIONS

TECHNICAL CHARACTERISTICS

Accuracy calculated as ±[%rdg + (dgt * resolution)] at 23°C±5°C, < 70%RH

AC/DC Voltage (LED indications)		
Range	**Resolution**	**Accuracy**
12V ¸ 1000V	±12, 24, 50, 120, 230, 400, 690, 1000V	Complies with IEC/EN61243-3:2014

- Frequency range: 0/40Hz ÷ 400Hz
- Response time: 1s
- Auto Power ON: ≥12V AC/DC
- Duration time: after 30s of continue measurements, the instrument needs a recovery time of 240s before it can start a new measurement

AC/DC Voltage (LCD indications) – Autorange			
Range	**Resolution**	**Accuracy**	**Overload protection**
6V ÷ 1000V	1V	±(3.0%rdg+5dgt)	1000VAC/DC

- Frequency range: 0/40Hz ÷ 400Hz
- Response time: ≤1s
- Auto Power ON: ≥ 6V AC/DC

- Measuring range selection: automatic
- Load impedance: 350kΩ / Is<3.5mA (no RCD tripping)
- Peak current: max 3.5mA @1000V
- Duration time: 30s
- Recovery time: 240s

AC Voltage with low impedance value			
Range	**Resolution**	**Frequency range**	**Overload protection**
6V ÷ 1000V	1V	0/40Hz ÷ 400Hz	1000VAC/DC

- Input impedance: ca 7kΩ
- Max output current: Is (load) = 150mA
- RCD tripping: ca 30mA @230V

1–wire AC voltage detection (polarity)			
Range	**Resolution**	**Frequency range**	**Overload protection**
100V ¸ 1000V	1V	50Hz ÷ 400Hz	1000VAC/DC

Continuity test			
Function	**Buzzer**	**Test current**	**Overload protection**
	<400kΩ	<5µA	1000V AC/DC

Resistance measurement			
Range	**Resolution**	**Accuracy**	**Overload protection**
0Ω ÷ 1999W	1Ω	±(5.0%rdg+10dgt)	1000V AC/DC
Test current:	<30µA		

Phase sequence indication		
Voltage range	**Frequency range**	**Overload protection**
100V ¸ 1000V	50Hz ÷ 60Hz	1000VAC/DC

Measurement method: 2-wire with contact on metal live parts

GENERAL CHARACTERISTICS

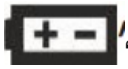
Reference guidelines

- Safety: IEC/EN61010-1, IEC/EN61243-3:2014
- EMC: IEC/EN61326-1
- Insulation: double insulation
- Pollution degree: 2
- Measurement category: CAT III 1000V, CAT IV 600V

Display

- Characteristics: 3½ LCD (1999 counts), decimal point unit symbol, backlight
- Over range indication: symbol **"OL"** on the display
- Conversion mode: Mean value

Power supply

- Battery type: 2×1.5V batteries type AAA LR03
- Low battery indication: symbol "  "on the display
- Auto Power OFF: after 1 minute of idleness (R measure)

Mechanical characteristics

- Dimensions (L x W x H): 270 x 70 x 30mm (11 x 3 x 1in)
- Weight (including battery): 290g (10ounces)
- Mechanical protection: IP64

Environmental conditions

- Reference temperature: 23°C ± 5°C (73°F ± 41°F)
- Operating temperature: -10°C ÷ 55°C (14°F ÷ 131°F)
- Operating humidity: <85%RH
- Storage temperature: -10°C ÷ 60°C (14°F ÷ 140°F)
- Storage humidity: <85%RH
- Max height of use: 2000m (6.562ft)

This instrument satisfies the requirements of Low Voltage Directive 2014/35/EU (LVD) and of EMC Directive 2014/30/EU
This instrument satisfies the requirements of European Directive 2011/65/EU (RoHS) and 2012/19/EU (WEEE)

ACCESSORIES

Standard accessories

- Plastic protection of metal probes
- 4mm metal sleeves adapter + tip protection, 2px Cod. KITHT10
- Batteries (not fitted)
- Carrying case
- User manual

SERVICE

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 authorized by the company.
- Faults due to modifications made without explicit authorisation 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.

SERVICE

If the equipment doesn’t work properly, before contacting the service, test the batteries, the test leads, etc., 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

FIGURE INTERNE

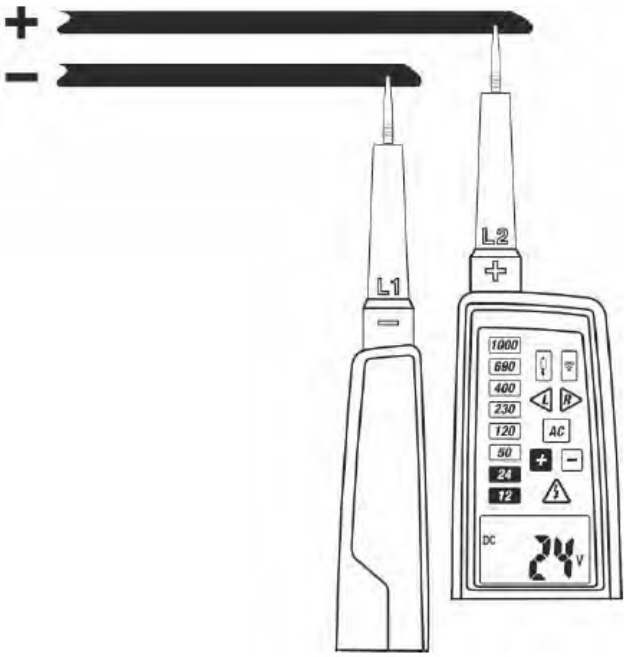


Fig. 4 DC voltage measurements

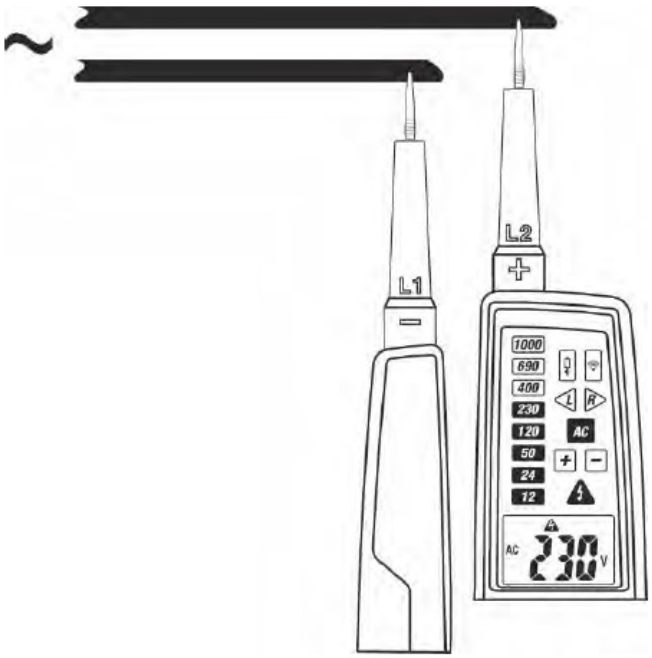


Fig. 5 AC voltage measurements

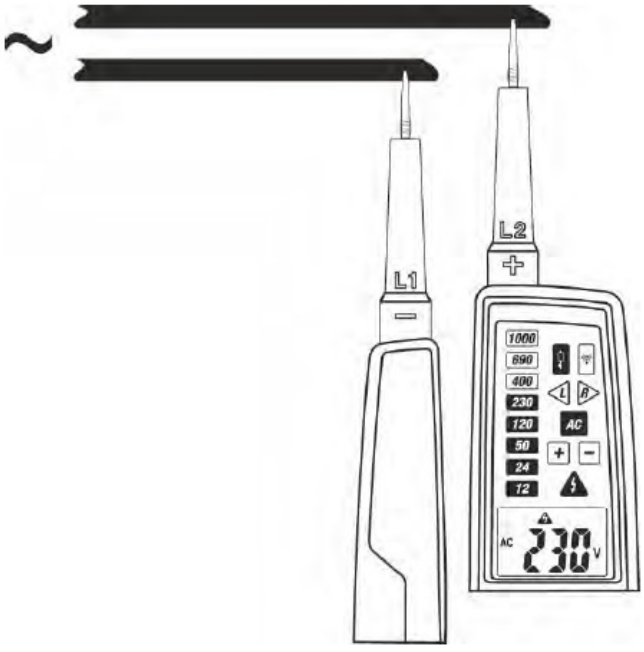


Fig. 6 AC Voltage with low impedance value

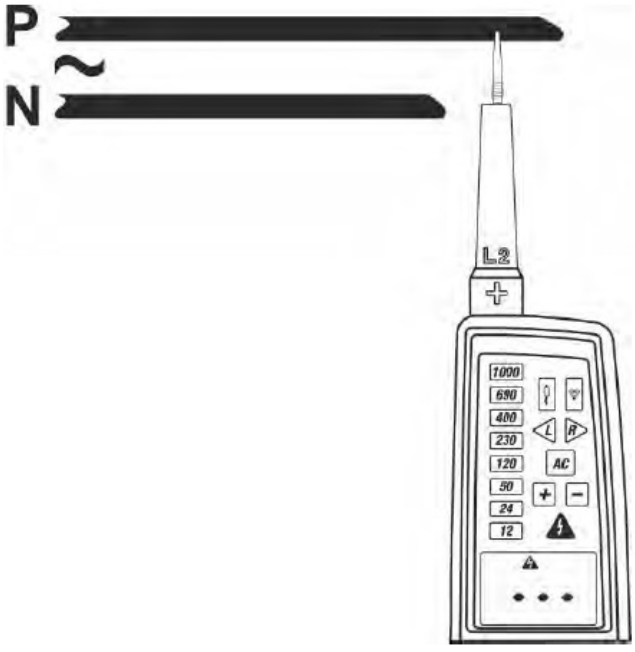


Fig. 7 1-wire AC Voltage detection

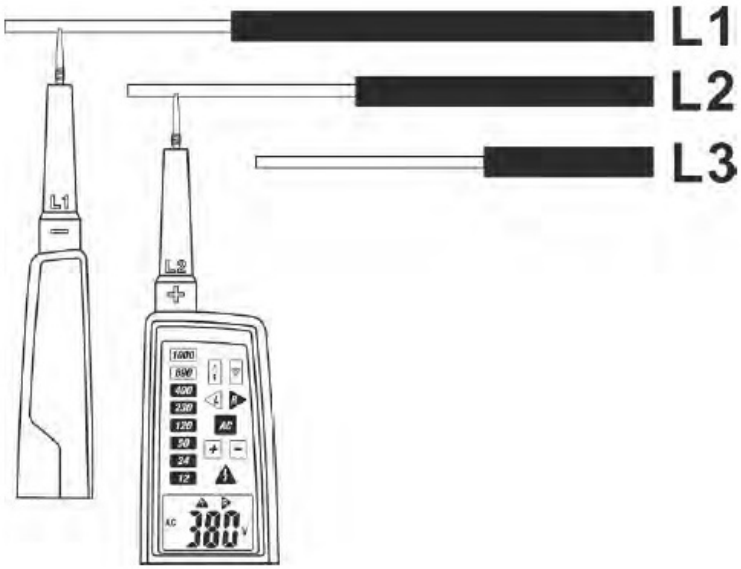


Fig. 8 Phase sequence test

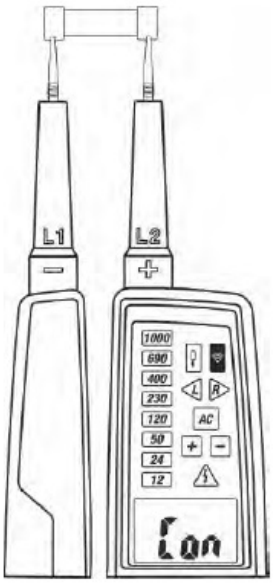


Fig. 9 Continuity test

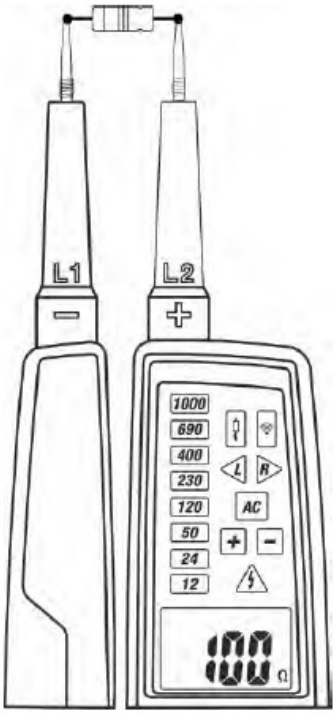


Fig. 10 Resistance measurement

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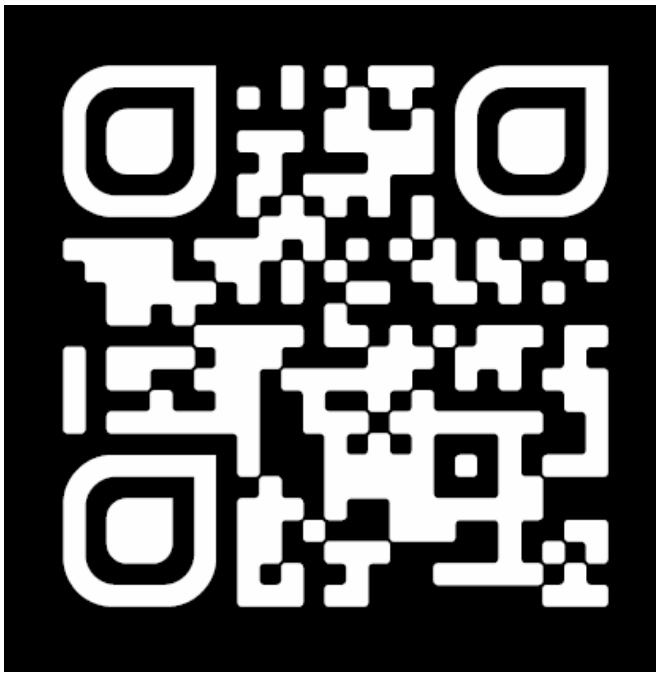
WHERE WE ARE



Frequently Asked Questions

- **Q: What should I do if the tool shows a low battery warning?**
  A: If the battery is low, consider replacing it to ensure proper functionality of the tool.
- **Q: Can this tool measure both AC and DC voltages?**
  A: Yes, the tool is designed to measure both AC and DC voltages. Refer to the LED indicators and LCD display for readings.

Documents / Resources

	HT INSTRUMENTS HT10 Two Pole Voltage Tester [pdf] User Manual HT10, HT10 Two Pole Voltage Tester, Two Pole Voltage Tester, Voltage Tester, Tester

References

- User Manual

HT INSTRUMENTS

HT INSTRUMENTS, HT10, HT10 Two Pole Voltage Tester, Tester, Two Pole Voltage Tester, Voltage Tester

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