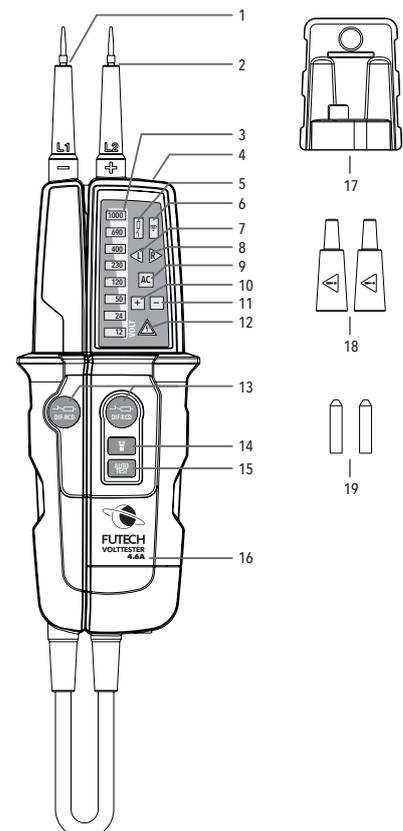




DESCRIPTION

1. Handle test probe – (L1)
2. Instrument test probe + (L2)
3. LEDs for voltage display
4. Measurement point illumination (LED Flashlight)
5. LED for low impedance test
6. LED or continuity
7. LED for left rotary field
8. LED for right rotary field
9. LED for AC voltage
10. LED for positive voltage
11. LED for negative voltage
12. LED for warning voltage
13. LOW impedance switches
14. Button for measuring point illumination (LED flashlight)
15. AUTOTEST (self check test)
16. Battery case
17. Probe tip Protective cap
(with storage compartments for probe tip cover and probe tip extension)
18. Probe tip cover
19. Probe tip extension (Ø 4mm, screw on)



SAFETY AND WARNINGS

Do not exceed the maximum allowable input range of any function. Insulated personnel body protective equipment up to 1000V. The unauthorized persons are not allowed to disassemble the voltage detector.

In order to avoid electrical shock, the valid safety and VDE regulations regarding excessive contact voltages must receive utmost attention, when working with voltages exceeding 120V (60V) DC or 50V (25V) rms AC. The values in brackets are valid for limited ranges (as for example medicine and agriculture).

Prior to measurement ensure that the test leads and the test instrument are in perfect condition. The safety can no longer be insured if the instrument shows obvious damage, does not carry out the desired measurements, has been stored for too long under unfavorable conditions or has been subjected to mechanical stress during transport. All relevant statutory regulations must be adhered to when using this instrument.

When using the instrument, only the handles of the probes may be touched. Do not touch the probe tips.

This instrument may only be used within the ranges specified and within low voltage systems up to 1000V.

Prior to usage ensure perfect instrument function. (e.g. on known voltage source).

The device is not to be used if the battery box is open and have to be kept dry and clean. Do not use this instrument in damp conditions. Perfect display is only guaranteed within a temperature range of -10°C up to +55°C, at relative humidity question <85%.

The voltage tester may no longer be used if one of several functions fail or if no functionality is indicated. If the operator's safety cannot be guaranteed, the instrument must be removed from service and protected against use.

Please read the complete safety instructions in the booklet delivered with this device.

SAFETY ADVICES

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 of the presence of interference voltage.

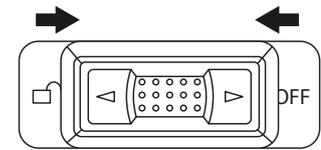
A voltage detector of relatively low impedance, compared to the reference value of 100k Ω , will not indicate all interference voltages having an original voltage value above the ELV level. When in contact with the parts to be tested, the voltage detector may discharge temporarily the interference voltage to a level below the ELV, but it 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 work.

A voltage detector of relatively high internal impedance, compared to the reference value of 100k Ω , may not permit to clearly indicate the absence of operating voltage in case of presence of interference voltage.

When the indication "voltage present" appears on a part that expected to be disconnected of the installation, it is highly recommended confirming by another (e.g. use of an adequate voltage detector, visual check of the disconnecting point of the electric circuit, 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 passes a performance test of managing 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.



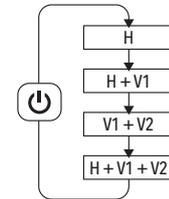
■ APPROPRIATE USAGE

The instrument may only be used under those conditions and for those purposes for which it was conceived. For this reason, in particular the safety references, the technical data including environmental conditions and the usage in dry environments must be followed.

When modifying or changing the instrument, the operational safety is no longer ensured.

The instrument may only be opened by an authorized service technician.

The voltage detectors are designed to be used by skilled persons and in accordance with safe methods of work.



■ OPERATION

■ PREPARING THE TEST

Prior to every test, please ensure that the instrument is in perfect condition. For example, keep an eye out for a broken housing or leaking batteries.

Always carry out a function test before using the voltage tester. See next point.

Check that the instrument is functioning properly (for example at a known voltage source) before and after every test.

If safety of the user can not be guaranteed, switch off the instrument and secure it to prevent unintentional usage.

■ CARRYING OUT A FUNCTION TEST

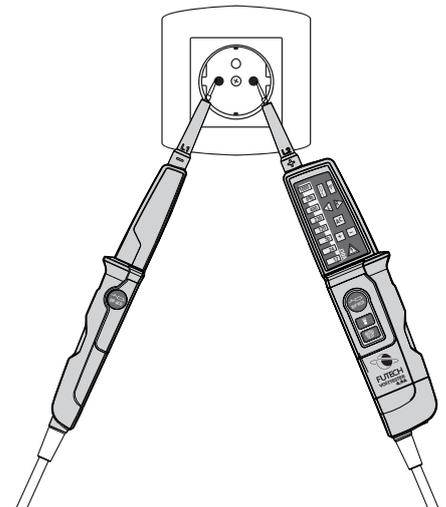
When press "AUTOTEST", with the exception of the LED for low impedance test, all LEDs should light up. If the battery voltage is too low, all LEDs will blink, please replace the battery.

■ VOLTAGE TEST

- Connect both test probes with the power source.
- As from a voltage of >6V the voltage tester switches on automatically.
- The voltage is displayed via LEDs. The different indicating signals of the voltage detector (including the ELV limit indication) are not to be used for measuring purposes.
- For AC voltage, the "AC" is illuminated;
- for positive voltage, the "+" is illuminated;
- for negative voltage, the "-" is illuminated.
- In the case of DC voltage, the polarity of the indicated voltage relates to the voltage tester probe tip.
- Once the safety extra-low voltage (50V AC / 120V DC) is reached or exceeded, the LED "warning for voltage" [12] is illuminated, in the event of no battery power or main circuit failure, and an acoustic signal is emitted.

■ SIGNAL-POLE PHASE TEST

- The single-pole phase test is only possible when batteries are installed and in good condition.
- The single-pole phase test starts at an AC voltage of approx. 100V (pole >100V AC).
- 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).
- The single-pole phase testing is not appropriate to determine whether a line is live or not. For this purpose, the double-pole voltage test is always required.
- Connect both test probes with power source.
- A signal sound indicates the phase.
- The LED "warning for voltage" [12] is illuminated in the display.



■ CONTINUITY TEST

The continuity test is only possible when batteries are installed and in good condition. A signal sound is audible for continuity and the LED for continuity LED [6] is illuminated.

■ VOLTAGE TEST WITH SWITCHED LOAD, RCD TRIP TEST

- During voltage tests, you can decrease the interference voltages from inductive or capacitive coupling by loading the UUT with a lower impedance than the tester has in normal mode. In systems with RCD circuit breakers, you can trip an RCD switch with the same low impedance as when you measure voltage between L and PE*.
- To do an RCD trip test during voltage measurement, push the two low impedance buttons [13] at the same time. If you have 10mA or 30mA RCDs between L and PE* in a 230V system, it will trip.
- During load current, the low impedance LED is the indication for the flowing load current. This indication is not to be used for voltage test of measurement.
- If the two pushbuttons are not used, the RCDs will not trip, even in measurements between L and PE*

(* Protective earth: grounding)

■ ROTARY FIELD INDICATION

The voltage testers are equipped with a double-pole rotary field indicator. The rotary phase indication is always active. The symbols "R" or "L" are always displayed. However, the rotary direction can only be determined within a three-phase system. Here, the instrument indicates the voltage between two external conductors.

Connect the instrument test probe with the supposed phase L2 and the handle test probe with the supposed phase L1. The voltage and the rotary field direction are displayed.

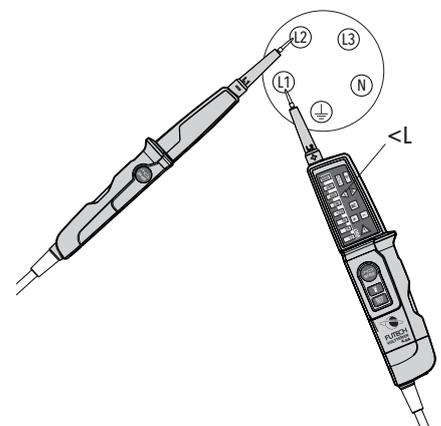
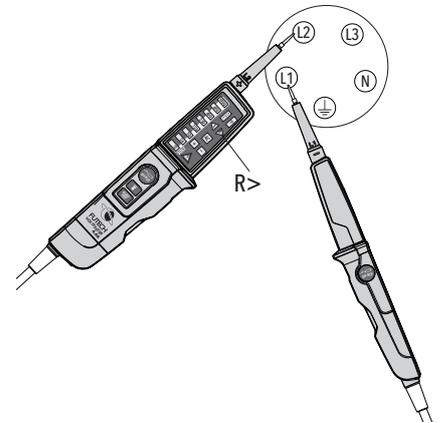
- "R" signifies that the supposed phase L1 is the actual phase L1 and the supposed phase L2 is the actual phase L2.

"L" signifies that the supposed phase L1 is the actual phase L2 and the supposed phase L2 is the actual phase L1.

When re-testing with exchanged test probes the opposite symbol has to be illuminated.

■ MEASUREMENT POINT ILLUMINATION

This voltage tester are equipped with a measurement point illumination feature. Thus, working under bad lighting conditions (e.g. division switch cabinets) is made easier. Press the button for measurement point illumination [14] to activate the LED flashlight.



■ **MAINTENANCE**

When using the voltage tester in compliance with the instruction manual, no particular maintenance is required. If functional errors occur during normal operating, please contact our service center.

■ **CLEANING**

Prior to cleaning, remove the voltage tester from all measurement circuits. If the instrument is dirty after daily usage, it is advisable to clean it by using a damp cloth and a mild household detergent. Never use acid detergents or dissolvents for cleaning. After cleaning, do not use the voltage tester for approx. 5 hours.

■ **BATTERY REPLACEMENT**

If no signal sound is audible when short-circuiting the test probes, or the auto test shows that the battery voltage is too low, proceed with the battery replacement.

- Completely disconnect voltage tester from the measurement circuit
- Remove discharged screw, battery cover and batteries.
- Replace by 2 new AAA batteries, respecting the polarity.
- Close the battery cover and re-screw the screw.

■ **SPECIFICATIONS**

LEDS

· LED voltage range	12V to 1000V AC/DC
· LED resolution	± 12,24,50,120,230,400,690,1000V AC/DC
· Tolerances	Complies with EN 61243-3:2014
· Frequency range	0/40Hz to 400Hz
· Response time	≤1 sec.
· Auto power on	≥12V AC/DC
Voltage detection	Automatic
Polarity detection	Full range
Range detection	Automatic
Internal Basic load impedance Peak current	max. 3.5mA at 1000V 350kΩ / Is <3.5 mA (no RCD tripping)
Operation Time	Duration Time = 30 seconds
Recovery time	Recovery Time = 240 seconds
Continuity Test	0 to 400 kΩ
Accuracy	nominal resistance +50%
Test current	≤5 μA

Futech is a registered brand of Laseto NV, Belgium.

Futech declares that the Volttester 4.6A is in conformity with the following standards:

- EN 61326-1:2013
- EN 61326-2-2:2013

following the provisions of Directive:

- Electromagnetic Compatibility Directive 2014/30/EU

Tested by Bureau Veritas Shenzhen Co., Ltd - Guangdong 523942, China
Certificate number 1788AB0911N009001 - CE170911N009

