



FUTECH 421.46D Voltage Tests User Manual

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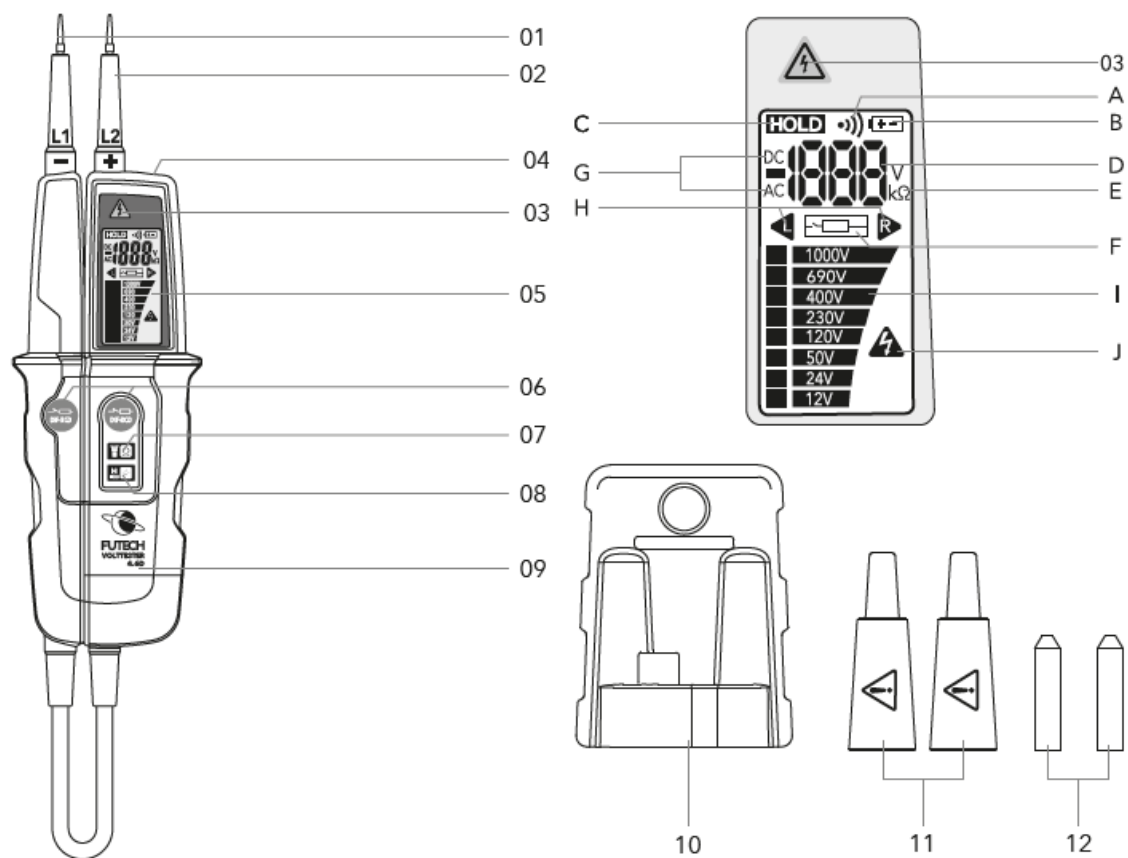
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FUTECH 421.46D Voltage Tests



OVERVIEW



HOUSING

1. Handle test probe – (L1)
2. Instrument test probe + (L2)
3. Warning LED for voltage

4. LED flashlight
5. 2000 counts LCD Display
6. LOW impedance buttons
7. LED flashlight button / Resistance test button
8. Hold button / LCD Display backlight button
9. Battery cover
10. Probe tip protective cap
11. Probe tip cover
12. Probe tip extension (Ø 4mm, screw on)

LCD DISPLAY

- A Continuity symbol
- B Battery indicator
- C Hold symbol
- D Measured value
- E Measurement unit (Volt / Ohm)
- F Low impedance symbol
- G DC & AC symbol
- H Left & right rotary field
- I Voltage scale
- J Warning voltage symbol

SAFETY

Please read the safety instructions provided as separate booklet with the device.

FIRST TIME USAGE

Remove all protection foils.

Place the provided 2 x AAA batteries in the battery cover [09].

FUNCTION TEST

Before usage, carry out a function test by connecting the Handle test probe [01] and instrument test probe [02] during 4 to 10 seconds, then disconnect.

All segments of the LCD Display [05] and the LED for voltage warning [03] should light.

OPERATION

VOLTAGE TEST

- Connect both test probe tips [01][02] with a power source
- As from a voltage of >6V the voltage tester switches on automatically.
- The voltage is shown on the LCD Display [05] In case you measure DC voltage, the LCD display [05] shows "DC" [G] and the indicated polarity relates to the voltage tester probe tip.
- In case you measure AC voltage, the LCD display [05] shows "AC" [G].

Once the safety extra-low voltage is reached or exceeded the warning voltage [A] will light up. The warning LED for voltage [03] will light in the event the safety extra-low voltage (50V AC / 120V DC) is reached or exceeded; in the event of no battery power or main circuit failure, you will also hear an acoustic signal. In case you are measuring in a position where you have no direct view on the LCD Display [05], press the HOLD button [08]. The

device will freeze the measured value [D] on the LCD display [05] and stop measuring continuously. After reading the measured value, press the HOLD Button [08] again. The device will start measuring again and shows the actual measured voltage on the display.

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 warning LED for voltage" [03] is illuminated.

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 continuity symbol [A] and CON is shown on the LCD Display [05].

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 protective earth (grounding).

To do an RCD trip test during voltage measurement, push the two low impedance buttons [06] at the same time. If you have 10mA or 30mA RCDs between L and protective earth (grounding) in a 230V system, it will trip.

During load current, the low impedance symbol [F] is the indication for the flowing load current. This indication is not to be used for voltage test of measurement.

If the two low impedance buttons [06] are not used, the RCDs will not trip, even in measurements between L and protective earth (grounding).

RESISTANCE TEST

This device can measure low ohm resistances between 1 Ohm and 1999 Ohm at a resolution of 1 Ohm To do a resistance test:

- Do a Voltage test to make sure the unit under test is not live. Tension must be 0 Volt.
- Hold the LED flashlight button / resistance test button [07] for 2 seconds.
- Connect the two test probes with the unit under test and read the resistance value on the LCD display [05].
- Hold the LED flashlight button / resistance test button [07] for 2 seconds to turn off the resistance test.

To save battery power the function will switch off automatically.

ROTARY FIELD INDICATION

This voltage tester is 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 [02] with the supposed phase L2 and the handle test probe [01] with the supposed phase L1. The voltage and the rotary field direction are shown on the LCD Display [05].

"R" signifies that the supposed phase L1 is the actual phase L1 and the supposed phase L2 is the actual phase L2. (fig.1)

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

(fig.2)

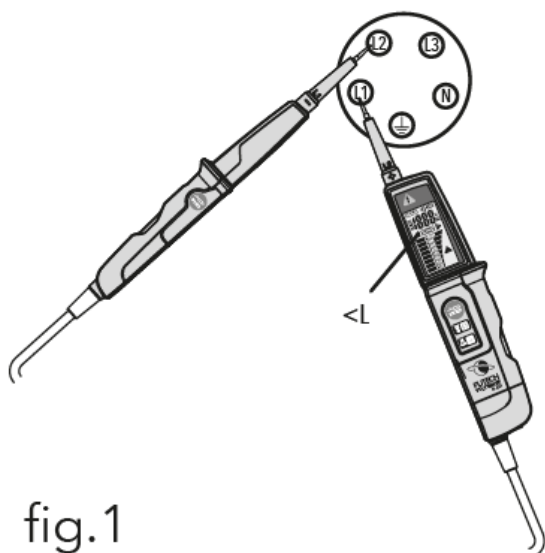


fig.1

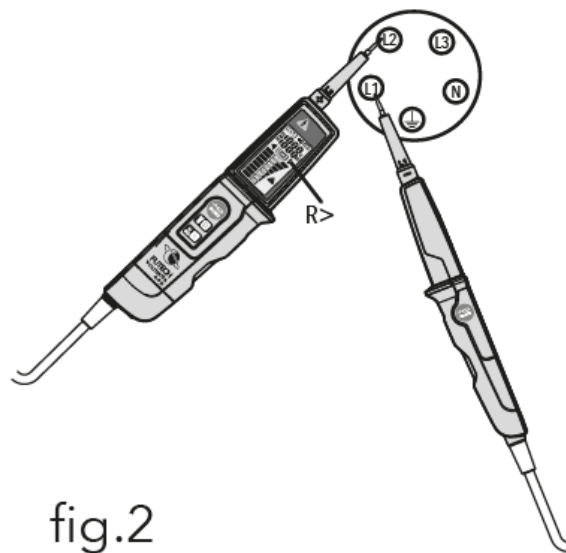


fig.2

When re-testing with exchanged test probes the opposite symbol has to be shown on the LCD display [05].

MEASUREMENT POINT ILLUMINATION

This voltage tester is equipped with a LED flash-light [04] to illuminate the measured point. This makes measuring under bad lighting conditions (e.g. division switch cabinets) easier. Press the button for LED flashlight / resistance test [07] to switch the LED flashlight [04] ON / OFF.

MAINTENANCE

When using the voltage tester in compliance with this user manual and all safety instructions, no 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 [B] is too low, proceed with the battery replacement. Completely disconnect voltage tester from all electrical circuits or machines. Open the battery cover [09] with an appropriate screw driver. Replace by 2 new AAA batteries, respecting the polarity. Close the battery cover [09] with an appropriate screw driver.

	421.46D VOLTTESTER 4.6D
LCD display	2000 counts (3 1/2 digit) LCD display
Voltage range	6V – 1000V AC / DC
Resolution	1V AC / DC
Tolerances	±3,0% of reading ±5 digit
Frequentie range	0/40Hz – 400Hz
Response time	≤ 1 second
Auto power on	≥ 6V AC / DC
Range detection	Automatic
Polarity detection	Full range
Internal basic load impedance peak current	Max 3.5mA at 1000V 350kΩ / Is < 3.5mA (no RCD tripping)
Operation time	Duration time = 30 seconds
Recovery time	240 seconds



DECLARATION OF CONFORMITY

Futech (Belgium) declares under its own responsibility that these device, 421.46D VOLTTESTER 4.6 Digital is in conformity with the standards EN 61326-1:2013, EN 61326-2-2:2013 following the provisions of Directive(s) 2014/30/EU

Lier, Belgium, DECEMBER 20, 2023

Patrick Waûters

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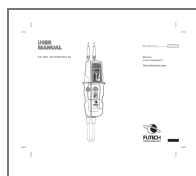
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References

-  **[FUTECH Professional measuring tools for construction](#)**
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