



## testo 750 · Voltage tester

Instruction manual



## 1 Contents

|                                                                                        |           |
|----------------------------------------------------------------------------------------|-----------|
| <b>1 Contents .....</b>                                                                | <b>2</b>  |
| <b>2 Observe prior to use!.....</b>                                                    | <b>4</b>  |
| <b>3 Safety instructions.....</b>                                                      | <b>4</b>  |
| <b>4 Intended use .....</b>                                                            | <b>5</b>  |
| <b>5 Technical data .....</b>                                                          | <b>6</b>  |
| 5.1. Voltage testing .....                                                             | 6         |
| 5.2. Single-pole phase testing .....                                                   | 6         |
| 5.3. Rotary field direction detection .....                                            | 7         |
| 5.4. Continuity testing .....                                                          | 7         |
| 5.5. General technical data .....                                                      | 7         |
| <b>6 Overview .....</b>                                                                | <b>8</b>  |
| 6.1. Display and control elements.....                                                 | 8         |
| 6.2. Explanation of icons .....                                                        | 9         |
| <b>7 Operating the instrument.....</b>                                                 | <b>10</b> |
| 7.1. Switching the instrument on .....                                                 | 10        |
| 7.2. Switching the measuring point<br>illumination on/off (only testo 750-2 / -3) .... | 10        |
| <b>8 Carrying out a test.....</b>                                                      | <b>10</b> |
| 8.1. Preparing the test.....                                                           | 10        |
| 8.2. Voltage testing .....                                                             | 11        |
| 8.3. Voltage testing with RCD/FI trip test<br>(only testo 750-2 / -3) .....            | 11        |
| 8.4. Single-pole phase testing .....                                                   | 11        |
| 8.5. Continuity testing .....                                                          | 12        |
| 8.6. Determining the rotary field direction ...                                        | 12        |

|                                           |           |
|-------------------------------------------|-----------|
| <b>9 Service and maintenance .....</b>    | <b>12</b> |
| 9.1. Replacing the batteries.....         | 12        |
| 9.2. Maintenance .....                    | 12        |
| 9.3. Storage .....                        | 13        |
| 9.4. Cleaning.....                        | 13        |
| <b>10 Protecting the environment.....</b> | <b>13</b> |

### 3 Safety instructions

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## 2 Observe prior to use!

- The instruction manual contains information and instructions which are necessary for operating and using the instrument safely. Before using the instrument, read the instruction manual carefully and comply with all aspects of it. Keep this document to hand so that you can refer to it when necessary. Forward this documentation to any subsequent users of the instrument.
- If the manual, the warnings and instructions are not followed, there is a risk of life-threatening injuries to the user and damage to the instrument.

## 3 Safety instructions

- The instrument may only be used by trained personnel. During all operations, please observe the Employers' Liability Insurance Association provisions for health and safety at work.
- In order to prevent electric shock, take safety precautions when working with voltages greater than 120 V (60 V) DC or 50 V (25 V) rms. AC. These values are the limit for contact voltages in accordance with DIN VDE (values in brackets apply to restricted areas, for example agricultural sectors).
- The instrument may only be touched at the designated grip areas, the display elements must not be covered.
- Maintenance work that is not described in this documentation must only be carried out by trained service technicians.
- If the instrument is modified in any way, operational safety can no longer be guaranteed.
- Batteries must be checked before use and changed if necessary.
- Storage areas must be dry.
- If there is any battery leakage, the instrument must no longer be used until it has been checked by our Customer Service.
- The battery acid (electrolyte) is highly alkaline and electrically conductive. Risk of acid burn! If the battery acid comes into contact with your skin or clothing, thoroughly rinse the areas affected immediately with plenty of water. If battery acid gets into your eyes, rinse them immediately with plenty of water and seek medical advice.
- Depending on the internal impedance of the voltage tester, there are different ways of displaying "operating voltage present" or "operating voltage not present" when interference voltage is present.
- A voltage tester with relatively low internal impedance does not display all interference voltages with an initial value above ELV, compared to the reference value of 100 kOhm. Upon contact with the parts to be tested, the voltage tester may temporarily reduce the interference voltage by discharging to a level below ELV; however, after removing the voltage tester, the interference voltage will assume its original value once again.
- If the notification "voltage present" does not appear, we strongly recommend that you insert the earthing device before starting work.

## 4

## 4 Intended use

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- A voltage tester with relatively high internal impedance will not clearly display “operating voltage not present” in the event of existing interference voltage, compared to the reference value of 100 kOhm.
- If “voltage present” appears on a part which is considered disconnected from the system, we strongly recommend that you determine the status “operating voltage not present” of the part to be tested via additional measures (e.g. using a suitable voltage tester, visual inspection of the disconnection point in the electrical network, etc.) and make sure that the voltage indicated by the voltage tester is an interference voltage.
- A voltage tester indicating two values for the internal impedance has passed the test for differentiating between interference and operating voltage and can display the voltage type directly or indirectly.

## 4 Intended use

The instrument may only be used under the conditions and for the purpose for which it was designed:

- Voltage testing, rotary field detection, single-pole phase testing and continuity testing
- Only variants testo 750-2 and -3: voltage testing with RCD/FI trip test
- The instrument may only be used within the specified measuring ranges and in low-voltage installations of up to 690 V (measuring range category CAT III 690)

The instrument must not be used for the following:

- In potentially explosive atmospheres: the instrument is not explosion-proof!
- When it rains: risk of electric shock!

## 5 Technical data

## 5 Technical data

### 5.1. Voltage testing

| Feature                                               | Values                                           |
|-------------------------------------------------------|--------------------------------------------------|
| LED display: voltage range                            | 12 - 690 V AC/DC                                 |
| LED display: voltage values                           | 12V, 24V, 50V, 120V, 230V, 400V, 690V            |
| LED display: tolerances                               | According to EN 61243-3:2014                     |
| LCD display (only variant testo 750-3): voltage range | 10 - 690 V AC/DC                                 |
| LCD display (only variant testo 750-3): Resolution    | 1 V                                              |
| LCD display (only variant testo 750-3): Tolerance     | ± (3 % of the display value + 5 digits)          |
| Frequency range                                       | DC voltage, 14Hz – 400Hz                         |
| Acoustic signalling                                   | ≥ 50 V AC, ≥ 120 V DC                            |
| Voltage detection                                     | Automatic                                        |
| Internal load                                         | Approx. 2.4 W at 690V (load buttons not pressed) |
| Current                                               | Is < 3.5 mA at 690V (load buttons not pressed)   |
| Connectible load (only testo 750-2 and -3)            | Approx. 140 W at 690 V (load buttons pressed)    |
| Connectible test load (only testo 750-2 and -3)       | < 200mA (load buttons pressed)                   |
| Operating time                                        | 30 s                                             |
| Recovery time                                         | 240 s                                            |
| Automatic power on                                    | > 10 V                                           |
| Reading memory (HOLD) (only testo 750-3)              | 10 - 690 V AC/DC                                 |
| Overload indicator (only testo 750-3)                 | ≥ 720V AC/DC, LCD display shows <b>OL</b>        |

### 5.2. Single-pole phase testing

| Feature             | Values                          |
|---------------------|---------------------------------|
| Voltage range       | 100 - 690 V AC voltage to earth |
| Frequency range     | 50/60 Hz                        |
| Acoustic signalling | Yes                             |
| LED display         | Red LED                         |

### 5.3. Rotary field direction detection

| Feature         | Values                     |
|-----------------|----------------------------|
| Voltage range   | 170 - 690 V phase-to-phase |
| Frequency range | 50/60 Hz                   |
| LED display     | Green LED                  |

### 5.4. Continuity testing

| Feature                | Values       |
|------------------------|--------------|
| Area                   | 0 - 500 kΩ   |
| Tolerances             | 0 % to +50 % |
| Test current           | < 5 μA       |
| Acoustic signalling    | Yes          |
| LED display            | Red LED      |
| Overvoltage protection | 690 V AC/DC  |
| Automatic power on     | < 500 kΩ     |

### 5.5. General technical data

| Feature                       | Values                                                                          |
|-------------------------------|---------------------------------------------------------------------------------|
| Operating ambient temperature | -10°C to 50°C                                                                   |
| Storage ambient temperature   | -15°C to 60°C                                                                   |
| Humidity                      | Max. 95 % RH                                                                    |
| Operating altitude            | Up to 2000 m                                                                    |
| Measurement category          | CAT IV 600V, CAT III 690V                                                       |
| Level of contamination        | 2                                                                               |
| Protection class              | IP 64                                                                           |
| Power supply                  | 2 x 1.5V (AAA / IEC LR03)                                                       |
| Power consumption             | Approximately 60 mA                                                             |
| Battery life                  | More than 10,000 measurements (< 5 s per measurement)                           |
| Dimensions (H x W x D)        | testo 750-1: 270 x 65 x 35 mm<br>testo 750-2/-3: 270 x 72 x 35 mm               |
| Weight incl. battery          | testo 750-1: 235 g<br>testo 750-2/-3: 295 g                                     |
| Safety standards              | EN 61243-3:2014, DIN VDE 0682-401:2011,<br>EN 61326-1:2013, DIN EN 61010-1:2011 |
| Authorizations                | CE, TÜV GS, CSA                                                                 |

## 6 Overview

### 6.1. Display and control elements

Product variant shown: testo 750-3



- 1 Probe tip - (L1)
- 2 Probe tip + (L2)
- 3 Measuring point illumination, white LED (only testo 750-2 and -3)
- 4 LED display

| Display     | Meaning                                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC          | Voltage testing: AC voltage is applied                                                                                                                                                     |
| + -         | Voltage testing: DC voltage is applied                                                                                                                                                     |
| L R         | Voltage testing AC: rotary field direction left or right                                                                                                                                   |
| Rx          | Continuity testing: continuity detected                                                                                                                                                    |
|             | <ul style="list-style-type: none"><li>Safety extra-low voltage exceeded (&gt; 50 V AC / &gt; 120 V DC)</li><li>Single-pole phase testing (only testo 750-2 / -3): Phase detected</li></ul> |
| 12, 24 etc. | Applied voltage value in V                                                                                                                                                                 |

- 5 LCD display (only testo 750-3)

6 Control keys:

| Key                                                                                                          | Function                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  2x (only testo 750-2 / -3) | Carry out RCD/FI trip test                                                                                                                                                 |
| <b>HOLD</b> (only testo 750-3)                                                                               | Record reading                                                                                                                                                             |
|  (only testo 750-2 / -3)    | <ul style="list-style-type: none"> <li>Switch measuring point illumination on/off</li> <li>Switch LCD display background illumination on/off (only testo 750-3)</li> </ul> |

7 Grip area

8 Battery compartment

9 Probe tip protective cap (with storage compartments for probe tip cover and probe tip extension)

10 GS38 probe tip cover

11 Probe tip extension (diameter 4 mm, screw-on)

## 6.2. Explanation of icons

| Icon                                                                                | Meaning                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | <b>Caution!</b> Warning about a danger spot, refer to instruction manual                                                                                                                    |
|  | <b>Caution!</b> Dangerous voltage, risk of electric shock                                                                                                                                   |
|  | Continuous double or reinforced insulation in accordance with Category II DIN EN 61140                                                                                                      |
|  | Suitable for work on live parts                                                                                                                                                             |
|  | Conformity mark, verifies compliance with the valid EU Directives: EMC Directive (2014/30/EU) with the standard EN 61326-1, Low-Voltage Directive (2014/35/EU) with the standard EN 61010-1 |
|  | Fulfills applicable Australian provisions.                                                                                                                                                  |
|  | The instrument complies with the WEEE Directive (2012/19/EU)                                                                                                                                |

## 7 Operating the instrument

### 7.1. Switching the instrument on

- > Connect both probe tips or press any button.
- The instrument switches on.  
On the testo 750-3, the LCD display is switched on and shows ---.

### 7.2. Switching the measuring point illumination on/off (only testo 750-2 / -3)

- > To switch on/off: briefly press the  button.
- The measuring point illumination switches off automatically after 2 minutes.  
Only testo 750-3: the background illumination of the LCD display is switched on/off at the same time as the measuring point illumination.

## 8 Carrying out a test

### 8.1. 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 below.
- Check that the instrument is functioning properly (for example at a known voltage source) before and after every test.
- If the safety of the user cannot be guaranteed, switch off the instrument and secure it to prevent unintentional usage.

#### Carrying out a function test

- > Connect the voltage tester probe tips for 4 seconds and then disconnect.
- All LEDs should light up. All segments are illuminated on the LCD display (only testo 750-3).

#### Removing/installing the probe tip protector/extension

The probe tip protector and extension can be removed/installed as required. To store these when not in use, we recommend the storage compartments on the probe tip protective cap.

Attention: Use of the probe tip protector may be required depending on the national regulations or provisions!

- > Probe tip protector: push onto probe tips or pull off.
- > Probe tip extension: screw onto probe tips or unscrew.

### 8.2. Voltage testing

- > Connect both probe tips to the test object.
- The voltage tester switches on automatically at a voltage of approximately 10 V or above.
- The voltage is indicated by LEDs (12 V, 24 V, 50 V, 120 V, 230 V, 400 V and 690 V).  
On the testo 750-3, the voltage is also shown on the LCD display.
- 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 (50 V AC / 120 V DC) is reached or exceeded, an acoustic signal is emitted.

#### Recording readings (only testo 750-3)

- > Once voltage is applied to the measuring instrument, press the **HOLD** button.
- A short acoustic signal is emitted and the LCD display shows the recorded reading.
- > To delete the recorded value, press the **HOLD** button once again.
- A short acoustic signal is emitted.

The recorded value will automatically be deleted after approx. 10 seconds once voltage is no longer being applied to the probe tips. This is indicated by a short acoustic signal.

Once the recorded value has been deleted, the LCD display once again indicates the voltage currently being applied to the probe tips.

The LED voltage display always indicates the voltage currently being applied in the electrical circuit.

Voltages below approx. 10 V AC/DC cannot be recorded, --- is shown on the LCD display.

### 8.3. Voltage testing with RCD/FI trip test (only testo 750-2 / -3)

For voltage tests in systems with RCD/FI residual current circuit breakers, these can be tested with a 10 mA or 30 mA nominal current by connecting a load:

- > Test the voltage between L and PE and press both  buttons at the same time.
- The RCD/FI should trip.

### 8.4. Single-pole phase testing

Single-pole phase testing is possible from AC voltages of approx. 100 V.

During the single-pole phase testing to determine external conductors, the display function may be impaired, for example due to insulating personal protective equipment or other insulators.

The single-pole phase testing is not suitable for testing for absence of voltage.

Two-pole voltage testing is required for this.

- > Connect the voltage tester probe tip + (L2) to the test object.

## 9 Service and maintenance

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-  is illuminated to signify the phase testing.

### 8.5. Continuity testing

- ✓ Disconnect the test circuit/object from the power supply.
- ✓ Conduct a two-pole voltage test on the test object to confirm the absence of voltage.
- > Connect both probe tips to the test object.
- For continuity up to approx. 500 kΩ, **Rx** is illuminated and an acoustic signal is emitted.
- The continuity test switches off automatically after 10 seconds if no continuity is detected. As soon as continuity is detected, the instrument switches back on automatically.

### 8.6. Determining the rotary field direction

The rotary field direction detector is always active, **L** or **R** may be constantly illuminated, however the rotary field direction can only be determined in a three-phase system between the external conductors.

The tester displays the voltage between two external conductors.

1. Connect the probe tip L1 (-) to the presumed phase L1 and the probe tip L2 (+) to the presumed phase L2.
  2. Completely cover the grip area with your hands!
- If **R** is constantly illuminated: "right" rotary field.
  - If **L** is constantly illuminated: "left" rotary field.

Cross-check:

- > Repeat the process with switched probe tips.
- The opposite result must be indicated.

## 9 Service and maintenance

### 9.1. Replacing the batteries

The batteries need to be replaced if, when connecting the probe tips, **Rx** does not light up or the battery icon is illuminated on the LCD display (only testo 750-3).

1. Disconnect the voltage tester completely from the measurement object.
2. Using a screwdriver, unscrew the two metal screws on the battery compartment until the battery compartment cover can be removed. Do not unscrew the screws completely.
3. Remove the spent batteries.
4. Insert new batteries, type AAA / IEC LR03 (1.5 V), ensuring correct polarity.
5. Put the battery compartment cover back on and screw down.

### 9.2. Maintenance

When operated in accordance with the instruction manual, the instrument does not require any particular maintenance.

### 9.3. Storage

- > If the instrument is not in use for a significant period of time: remove the batteries in order to prevent any danger or damage due to any potential leaking of the batteries.

### 9.4. Cleaning

Prior to cleaning, the instrument must be disconnected from all measuring circuits.

- > Wipe the instrument with a damp cloth and a small amount of mild household detergent.

Never use any harsh cleaning agents or solvents to clean the instrument! After being cleaned, the instrument must not be used until it has completely dried.

## 10 Protecting the environment

- > Dispose of faulty rechargeable batteries/spent batteries in accordance with the valid legal specifications.
- > At the end of its useful life, send the product to the separate collection for electric and electronic devices (observe local regulations) or return the product to Testo for disposal.