testo 770 - Clamp meter

Instruction manual

1 Contents

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 is not followed, or if you fail to observe the warnings and instructions, there is a risk of fatal injury 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 measuring instrument may only be used with a maximum voltage of 600 V.
- Measurements that are dangerously close to electrical installations must only be carried out under the direction of a qualified electrician, not by oneself.
- The instrument may only be touched at the designated grip areas, the display elements must not be covered.
- If the safety of the operator can no longer be guaranteed, you must decommission the instrument and ensure that it cannot be used inadvertently. This applies if the instrument:
  - has obvious indications of damage
  - cracks on the housing
  - defective test leads
  - leaking batteries
  - will no longer carry out the required measurements
  - was stored for too long in unfavourable conditions
  - was exposed to mechanical stresses during transport.
- Prevent the instrument from being heated due to exposure to direct sunlight. This is the only way to ensure that the instrument functions perfectly and has a long service life.
- If the instrument needs to be opened, this should only be carried out by an expert. Before being opened, the instrument must be switched off and isolated from all electrical circuits.
- 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.
- Modifications or alterations to the instrument will result in the complete invalidation of any warranty or guarantee claims against the manufacturer.
- It is not permitted to use the instrument in an explosive environment.
- Before and after use, always check that the instrument is in peak working order. To do this, test the instrument at a known current source.

- High-frequency electromagnetic fields (HF) can influence the measurement result and result in the wrong information being displayed. This influence is temporary and will not damage the measuring instrument in any way. As soon as the measuring instrument is removed from the influencing HF field, its original accuracy will be re-established. Known sources of these high-frequency electromagnetic fields are radio or mobile telephony equipment, for example. If this type of equipment should influence the measuring instrument, switch it off or increase the distance between the equipment and the measuring instrument.
- The instrument must not be used while its battery compartment is open.
- 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.

4 Intended use

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

- The instrument conforms to measurement category CAT IV with a rated voltage of 600V to earth.
  Measurement category CAT IV is for use at the source of voltage installations, e.g. building connection, main fuse, meter.

The instrument may only be used in the fields of application described in the instruction manual. Any other application is considered improper and untested usage, and can result in accidents or damage to the instrument. Any misuse will result in the complete invalidation of any warranty or guarantee claims against Testo.

The manufacturer is not responsible for any damage to property or personal injury resulting from the following:

- Failure to observe the instruction manual
- Instrument modifications not approved by the manufacturer
- The use of spare parts not approved by the manufacturer
- Use under the influence of alcohol, drugs or medication

The instrument must not be used for the following circumstances:

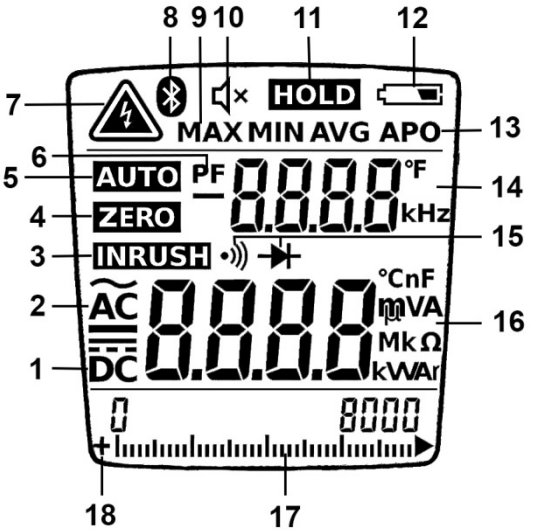
- In potentially explosive atmospheres: the instrument is not explosion-proof!
- When there is rain or other precipitation: risk of electric shock!

5 Overview

5.1. Display and control elements

1 Control keys
2 LC display
3 Clamp trigger
4 Clamp/hook
5 HOLD key
6 Rotary switch
7 Grip area
8 On the rear: Battery compartment
9 Input jack for voltage, resistance, continuity, capacitance, diode, frequency and μA measurements
10. Ground/COM jack for all measurements from point 9

5.2. LC display



1 Direct current/voltage
2 Alternating current/voltage
3 Inrush current measurement
4 Zeroing enabled in DC current measuring mode
5 **AUTO** mode is the default setting in all measuring modes
6 Power factor
7 Dangerous voltage, AC ≥ 33 V, DC ≥ 70 V
8 Bluetooth® enabled (testo 770-3 only)
9 Maximum, minimum, average measurement
10 Alarm off
11 **Hold** is activated, LC display holds the current reading
12 Battery capacity display

Display	Feature
No Symbol	Battery capacity 100 – 30%
	Battery capacity 30 - 15%
	Battery capacity 15 - 2%
flashes and acoustic signal emitted	Battery capacity 2 – 0%, instrument switches off automatically

13 Automatic power-off function is activated
14 Measuring units
15 Diode test and continuity
16 Measuring units

17 Analog display (testo 770-3 only)
18 Indication of polarity in bar chart (testo 770-3 only)

5.3. Control key functions

The clamp meter features a rotary switch, as well as 6 control keys, which respond to a brief or a long keypress.
In the default setting, the instrument is in **AUTO** mode when voltage, current, RCDC (resistance, capacitance and diode with continuity) is being measured.

Key	Brief keypress **function** (<1 s)	Long keypress **function** (>2 s)
ZERO Zero adjustment	Zeroing when measuring DC current	Exit zero adjustment
SELECT Select	Switches between the manual sub-modes of the selected measurement.	Back to **AUTO** mode
MIN/MAX Min/Max	Switches between MAX, MIN and AVG functions	Switch off recording mode
INRUSH Inrush	If position **A** is selected, the instrument switches to inrush mode. Reset the inrush measurement if a measurement is already shown on the LC display.	Switches back to the mode most recently activated before **INRUSH** was selected.
Illumination	Background illumination on/off	
(testo 770-3) Illumination/ Bluetooth	Background illumination on/off	Bluetooth on/off

5.4. Rotary switch functions

Selection	**Function**
OFF Switch off	Switch the instrument off.
Current	Activates automatic mode for current, choose between AC/DC. Manual selection of AC/DC with [SELECT].
Voltage	Activates automatic mode for voltage between AC and DC measurement via the test leads and jacks. Manual selection of AC/DC with [SELECT].

Selection	Function
RCDC control	Automatic mode for resistance, continuity, capacitance and diode test. Manual selection of AC/DC with [SELECT].
W testo 770-3 only	Activates the mode for power measurement. Manual selection of active, reactive and apparent power, as well as power measurement for direct current/voltage with [SELECT].
µA testo 770-2/-3 only	Automatic mode for µA measurement. Manual selection of AC/DC with [SELECT].

5.5. Further functions

Bluetooth® (testo 770-3 only)

> Enable Bluetooth®: press and hold down [ ] and turn the rotary switch from **[OFF]** to a function. Then release [ ].

> Disable Bluetooth®: turn rotary switch to **[OFF]**.

HOLD

> Activate function: press **[HOLD]** <1 s.

- the current reading is recorded and **HOLD** is shown on the LC display.

> Exit function: press **[HOLD]** <1 s.

- the current measurement is displayed.

The Hold function can be used from all measuring modes.

MAX/MIN/AVG

[MIN/MAX] allows for switching between maximum, minimum and the periodic display of AVG values.
This function is disabled in the default setting.

> Activate function: press [MIN/MAX] <1 s.

- Max value is displayed.

> Display min value and periodic display of AVG values: press [MIN/MAX] <1 s each time.

> Exit function: press [MIN/MAX] >2 s or **[HOLD]**.

This function can be activated in all measuring modes (this function is not available at capacitance measurement with testo 770-1 and testo 770-2).

When pressing [MIN/MAX] in **AUTO AC/DC** voltage mode or **AUTO AC/DC** current measurement mode, the instrument retains the last-selected AC/DC setting. In all other operating states, you can select what you need by briefly pressing the [SELECT] key or via the rotary switch itself:

- Voltage measurement and measurement with a thermocouple adapter: select V

- Current measurement: select Ã
- Resistance, continuity, diode and capacitance measurement: select
- µA measurement: select µA (testo 770-3 only).
- Power measurement: select W (testo 770-3 only).

5.6. Explanation of icons

Icon	Meaning
	Attention! Warning about a danger spot, refer to instruction manual
	Caution! Dangerous voltage, risk of electric shock
	Application around and removal from HAZARDOUS LIVE conductors is permitted.
	Continuous double or reinforced insulation complies with category II DIN EN 61140 / IEC 536
C US	The product is certified for the US and Canadian markets, in accordance with the applicable American and Canadian standards.
	Tested for safety (tested by TÜV Rheinland)
	Compliance mark for ACMA (Australian Communications and Media Authority) guidelines.
	This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements.
	Bluetooth testo 770-3 only
	Conformity mark, verifies compliance with the valid EU Directives: EMC Directive (2014/30/EU) with the EN 61326-1 standard, Low-Voltage Directive (2014/35/EU) with the EN 61010-1 standard
	The instrument complies with the WEEE Directive (2012/16/EU)

6 Operating the instrument

Different measuring modes can be selected via the rotary switch. When the instrument is in voltage mode [V], it automatically detects the range and the type of measurement, AC or DC. When the instrument is in current mode [Ã], it automatically switches between AC and DC accordingly. When the rotary switch is at the [] position, the instrument automatically detects the appropriate measurement. If the instrument is switched to

power mode [W], it measures active, reactive and apparent power together with the power factor (for sinusoidal signals).

All the available measuring modes can also be selected manually.

6.1. Switching the instrument on

> Switch on: turn the rotary switch to the required measuring mode.
- The instrument switches on.

6.2. Switching the background illumination on/off

> To switch on/off: briefly press the [ ] key.

The background illumination switches off automatically within 1 minute.

It is possible to switch the background illumination on/off in all measuring modes.

6.3. Switching the instrument off (automatically/manually)

Automatically

The automatic power-off function (APO) is always enabled as a default setting and is shown on the LC display as **APO**. If no control key is pressed within 15 min, the instrument switches off automatically. If necessary, the automatic power-off function (APO) can be turned off.

> Disable power-off function: press the **[HOLD]** key and turn the rotary switch from the OFF position to a different position.

Once the instrument has switched off, the power-off function is reset to the default setting.

Manually

> Switch off: turn the rotary switch to the **[OFF]** position.

6.4. Using testo 770-3 with testo Smart Probes App

6.4.1. Establishing Bluetooth® connection (770-3)

You need a tablet or smartphone with the testo Smart Probes App already installed on it to be able to establish a Bluetooth connection.

You can get the App for iOS instruments in the App Store or for Android instruments in the Play Store.

Compatibility:

- requires iOS 8.3 or newer / Android 4.3 or newer
- requires Bluetooth 4.0
- tested with the following smartphones / tablets: www.testo.com/smartprobesmanuals.html

✓ The testo Smart Probes App is installed on your mobile terminal device and ready for use.

> Enable Bluetooth®: press and hold down [ ] and turn the rotary switch from **[OFF]** to a function. Then release [ ].

- **CONN** appears in the display. If the Bluetooth® connection is established, appears in the display and the instrument changes to the set measuring mode.

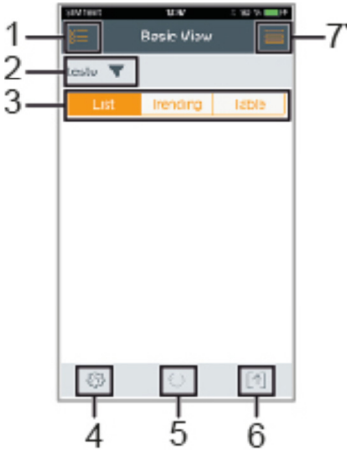
> Disable Bluetooth®: Turn rotary switch to **[OFF]**.

6.4.2. Transmitting readings

✓ testo 770-3 is switched on and connected to your mobile terminal device via Bluetooth.

- The current readings are automatically displayed in the App.

6.4.3. Overview of the App operating controls



1 Choice of applications.
2 Display of connected instruments.
3 Switch between views (list, graphic, table)
4 Settings for measurement. (The menu adjusts depending on the instrument connected and the application selected)
5 Restarts the measuring value recording in graph and table format.
6 Export of the readings
7 Menu options

7 Carrying out a measurement

7.1. Preparing for measurement

Prior to every measurement, please ensure that the instrument is in perfect condition:

- For example, keep an eye out for broken housing or leaking batteries.
- Always carry out a function test before using the instrument, see below.

- Check that the instrument is functioning perfectly (for example at a known voltage source) before and after every test.
- If the safety of the user cannot be guaranteed, the instrument must be switched off and secured to prevent unintentional usage.

When connecting the test leads to the test object, always connect the common test lead (**COM**) to the test object first of all. When disconnecting the test leads, always disconnect the +/- phase test lead first of all.

7.2. Current measurement

WARNING

Serious risk of injury to the user and/or destruction of the instrument while measuring current.

> Measuring circuit must be de-energized.

The measuring instrument may only be used in circuits up to a maximum voltage of 600V. The nominal cross-section of the connection cable must be taken into account in order to ensure safe connection (e.g. via crocodile clips).

Strong RFinterference and / or open leadswhen measuring A AC may result in unstable display readings.

7.2.1. Measuring A AC or A DC

Automatic measuring mode

1. Switch instrument on: set rotary switch to .
- The instrument switches on.
- The instrument is in **AUTO A** mode.
2. Enclose the live conductor and centre it in the jaws.
- The instrument automatically detects the **A AC** or **A DC** mode.
- The measured value is shown on the LC display.

For measurements below 3.0 A AC, the automatic AC/DC detection might not work. If that happens, set AC/DC manually.

Manual measuring mode

✓ Instrument is in automatic measuring mode **AUTO A**

1. Exit **AUTO A** measuring mode: press [SELECT] <1 s.
2. Switch between **A AC** and **A DC**: press [SELECT] <1 s.
- The measured value is shown on the LC display.

Switch to automatic measuring mode: press [SELECT] >1 s.

- The instrument is in automatic measuring mode when **AUTO** is illuminated on the LC display.

7.2.2. Measuring µA AC or µA DC (testo 770/-2/-3 only)

Automatic measuring mode

1. Switch instrument on: set rotary switch to .
- The instrument switches on.

- The instrument is in **AUTO µA** mode.
2. Connect test leads: black test lead to black jack, red test lead to red jack. Then connect test leads to the test object.
- The instrument automatically detects the **µA AC** or **µA DC** mode.
- The measured value is shown on the LC display.

Manual measuring mode

✓ Instrument is in automatic measuring mode **AUTO µA**.

1. Exit **AUTO µA** measuring mode: press [SELECT] <1 s.
2. Switch between **µA AC** and **µA DC**: press [SELECT] <1 s.
- The measured value is shown on the LC display.

Switch to automatic measuring mode: press [SELECT] >1 s.
- The instrument is in automatic measuring mode when **AUTO** is illuminated on the LC display.

7.3. Voltage measurement

When measuring AC voltage, the frequency is measured at the same time and shown in the relevant row on the LC display.

Automatic measuring mode

1. Switch instrument on: set rotary switch to Ṽ.
- The instrument switches on.
- The instrument is in **AUTO V** mode.
2. Connect test leads: black test lead to black jack, red test lead to red jack. Then connect test leads to the test object.

The instrument features a built-in zero crossing detector. When the measured signal (voltage or current) indicates zero crossings, the instrument automatically switches to AC measuring mode. If continuity is indicated, the instrument switches to DC measuring mode.

- The measured value is shown on the LC display.

Manual measuring mode

✓ Instrument is in automatic measuring mode **AUTO V**.

1. Exit **AUTO V** measuring mode: press [SELECT] <1 s.
2. Switch between **V AC** and **V DC**: press [SELECT] <1 s.
- The measured value is shown on the LC display.
3. Switch to automatic measuring mode: press [SELECT] >1 s.
- The instrument is in automatic measuring mode when **AUTO** is illuminated on the LC display.

7.4. Measuring resistance, capacitance, continuity and diode test

WARNING

Serious risk of injury to the user and/or destruction of the instrument during resistance testing.

> Test object must be de-energized.

External voltages will distort the measurement result.

7.4.1. testo 770-1/-2

Manual measuring mode

1. Switch instrument on: set rotary switch to .
- The instrument is switched on.
2. Connect test leads: black test lead to black jack, red test lead to red jack. Then connect test leads to the test object.
- The instrument is in **Ω** measuring mode.
3. Switch between resistance, capacitance, continuity and diode test:

   press [SELECT] <1 s.
- The measured value is shown on the LC display.

7.4.2. testo 770-3

Automatic measuring mode

Automatic detection for resistance/capacitance in the following range:

- 0.0 ohms to 6.000 mohms
- 0.500 nF to 600.0 µF

Change to manual measuring mode for the remaining measuring range.

1. Switch instrument on: set rotary switch to .
- The instrument is switched on.
2. Connect test leads: black test lead to black jack, red test lead to red jack. Then connect test leads to the test object.
- The instrument is in **AUTO RCDC** measuring mode.
- The instrument detects resistance, continuity, diode and capacitance and automatically adjusts the measuring range.
- The measured value is shown on the LC display.

Manual measuring mode

3. Disable **AUTO RCDC** measuring mode: press [SELECT] <1 s.
4. Switch between resistance, capacitance, continuity and diode test:

   press [SELECT] <1 s.
- The measured value is shown on the LC display.

> Switch back to **AUTO** mode: press [SELECT] >2 s.

7.5. Power measurement (testo 770-3 only)

For the power measurement, two measurements are carried out at the same time. The voltage of the measurement object is measured via the **COM** jack, **V** input jack and using two test leads. The current of the measurement object must be measured using the clamp meter. From these two factors, the instrument automatically calculates the different types of power, as well as the power factor.

1. Switch instrument on: set rotary switch to W.
- The instrument switches on.
- The instrument is in the mode for power measurement with alternating current/voltage
2. Enclose the live conductor and centre it in the jaws.
3. Connect test leads: black test lead to black jack, red test lead to red jack. Then connect test leads to the test object.
4. The instrument displays the active power in w(atts) and the power factor (PF).

> The instrument requires approx. 5 s for the reading to be displayed. An updated reading is displayed after approx. 5 s.

5. Switch between active power, apparent power, reactive power and power measurement for direct current/voltage: press [SELECT] <1 s.

7.6. Frequency measurement

The frequency is displayed automatically during an A AC or V AC measurement.

> The following minimum values are necessary for correct display of
> frequency with voltage and/or current measurement:
> Voltage: 200 mV
> Current: 1.5% of the measuring range

7.7. Temperature measurement (optional) (testo 770-2/-3 only)

A thermocouple adapter (0590 0021) is optionally available for measuring temperature. Before using the thermocouple adapter, please carefully read through the relevant section relating to the thermocouple adapter in the documentation. Familiarize yourself with the product before using it. Pay particular attention to the safety instructions and warning advice in order to prevent injuries and damage to the product.
In this section, it is assumed that you are familiar with the contents of the documentation relating to the thermocouple adapter.

Carrying out temperature measurement

✓ A thermocouple is attached to the thermocouple adapter.

1. Switch instrument on: set rotary switch to V.
- The instrument switches on.
- The instrument is in **AUTO V** mode
2. Connect the thermocouple adapter to the instrument: plug the adapter into the jack. Ensure correct polarity!

- The thermocouple adapter switches on automatically.

3. Activate temperature measurement: press [ZERO] >2 s.
- The measured values are shown on the LC display in °C and °F.

7.8. Inrush current (INRUSH)

The inrush function is an approximation function. This means that
readings can differ from one another.

1. Switch instrument on: set rotary switch to [Ã].
- The instrument switches on.
- The instrument is in **AUTO A** mode.
2. Enclose the live conductor and centre it in the jaws.
3. Activate inrush current calculation: press [INRUSH] <1 s.
- The measured value is shown on the LC display.
4. Restart inrush current calculation: press [INRUSH] <1 s.
- The measured value is shown on the LC display.
5. Exit inrush current calculation and switch back to **AUTO** mode: press [INRUSH] >2 s.

8 Service and maintenance

8.1. Replacing the batteries

The batteries need to be replaced when the battery icon appears on the LC display.

✓ The instrument is switched off.

1. Disconnect the instrument from the test leads and make sure that the instrument is not enclosing any live cable.

2. Using a screwdriver, unscrew the two metal screws (1, 2) 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.

8.2. Maintenance

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

If a malfunction occurs during operation, the ongoing measurement should be stopped immediately. Send the instrument to Testo Service for checking.

8.3. Calibration

In order to maintain the specified accuracy of the measurement results, Testo recommends calibrating the instrument once a year. Send the instrument to Testo Service for calibration.

8.4. Storage

- Store the instrument in dry, closed rooms.

> 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.

8.5. Cleaning

Before cleaning, the instrument must be switched off and disconnected from external voltages or from other connected instruments (test specimen, control units, etc.).

> 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.

9 Technical data

9.1. General technical data

Feature	Values
Ambient operating temperature	0 °C to 50 °C
Ambient storage temperature	-10 °C to 60 °C
Humidity	0 to 80% RH
Operating altitude	Up to 2000 m
Measurement category	CAT IV / 600 V
Level of contamination	2
Protection class	IP 40
Power supply	3 x 1.5 V (AAA / IEC LR03)
Battery status display	Batt. icon appears from <3.9 V
Display	3 3/4 digit, LC display
Display range	testo 770-1/-2: 4000 digits testo 770-3: 6000 digits
Polarity indicator	automatic
Overload protection for µA current measurement	high-impedance (testo 770-2/-3 only)
Dimensions (H x W x D)	Approx. 250 x 95 x 40 mm
Weight	Approx. 450 g
Safety standards	WEEE 2012/16/EU, EMC 2014/30/EU, EN 61326-1, Low-Voltage Directive 2014/35/EU with the standard EN 61010-2-032, insulation complies with category II IEC 536 / DIN EN 61140
Warranty	Duration: 2 years

9.2. More technical data

9.2.1. testo 770-1/-2

Feature	Measuring range[1]	Resolution	Accuracy
DC voltage	4.000 V 40.00 V 400.0 V 600 V	1 mV 10 mV 100 mV 1 V	± (0.8% of meas. val. + 3 digits)
AC voltage[2,3,4]	4.000 V 40.00 V 400.0 V 600 V	1 mV 10 mV 100 mV 1 V	± (1.0% of meas. val. + 3 digits)
DC current - jaws [A] - jack [µA] (testo 770-2)	 400 A 400 µA	 0.1 A 0.1 µA	 ± (2.0% of meas. val. + 5 digits) ± (1.5% of meas. val. + 5 digits)
AC current[3] - jaws [A][5] - jack [µA] (testo 770-2)[2,4]	 400 A 400 µA	 0.1 A 0.1 µA	 ± (2.0% of meas. val. + 5 digits) ± (1.5% of meas. val. + 5 digits)
Resistance	400.0 Ohm 4.000 kOhm 40.00 kOhm 400.0 kOhm 4.000 MOhm 40.00 MOhm	0.1 Ohm 1 Ohm 10 Ohm 100 Ohm 1 kOhm 10 kOhm	± (1.5% of meas. val. + 3 digits)
Continuity alarm	<0 to 30 Ohm		
Diode test	yes (0 to 2.5 V)		
Capacity	51.20 nF[6]	0.01 nF	± 10% typically

[1] The lower measuring ranges are only specified from 5% (does not apply to DC current / AC current measurements with the current probe)

[2] Signal bandwidth 40 Hz to 1 kHz

[3] In the case of a mixed signal (AC + DC), only the purely AC component is taken into account

[4] As the frequency increases (over 400 Hz), the accuracy deteriorates +/- (1.5% of m.v. + 3 digits) for 400Hz to 750Hz / +/- (2.0% of m.v. + 3digits) for 750Hz to 1kHz

[5] Frequency of AC current up to 400 Hz

[6] Specification is valid for capacitances > 10 nF

Feature	Measuring range[1]	Resolution	Accuracy
	512.0 nF	0.01 nF	± (1.5% of meas. val. + 5 digits)
	5.120 µF	0.001 µF	± (1.5% of meas. val. + 5 digits)
	51.20 µF	0.01 µF	± 10% typically
	100.0 µF (15 s)[7]	0.1 µF	± 10% typically
Temperature with adapter (testo 770-2)[8]	-20 to 500 °C	0.2 °C	-20 to 0 °C: +/- 2 °C 0 °C to 100 °C: +/- 1 °C 100 °C to 250 °C: +/- 1.5% >250 °C: +/-2%

Figures correspond to +23 °C ± 5 °C at <80% rel. humidity. Temperature coefficient: 0.15 x specified accuracy per 1 °C (<18 °C and >28 °C)

9.2.2. testo 770-3

Feature	Measuring range[9]	Resolution	Accuracy
DC voltage	600 mV 6.000 V 60.00 V 600.0 V	0.1 mV 1 mV 10 mV 100 mV	± (0.8% of meas. val. + 3 digits)
AC voltage[10],[11],[12]	600 mV 6.000 V 60.00 V 600.0 V	0.1 mV 1 mV 10 mV 100 mV	± (1.0% of meas. val. + 3 digits)
DC current - jaws [A] - jack [µA]	 600 A 600 µA	 0.1 A 1 µA	 ± (2.0% of meas. val. + 5 digits) ± (1.5% of meas. val. + 5 digits)

[7] Maximum measurement duration is 15 s

[8] Does not include the measurement error of the temperature probe. The specified accuracy is the sum total of the measurement errors of the thermocouple adapter and the testo 770.

[9] The lower measuring ranges are only specified from 5% (does not apply to DC current / AC current measurements with the current probe)

[10] Signal bandwidth 40 Hz to 1 kHz

[11] In the case of a mixed signal (AC + DC), only the purely AC component is taken into account

[12] As the frequency increases (over 400 Hz), the accuracy deteriorates +/- (1.5% of m.v. + 3 digits) for 400Hz to 750Hz / +/- (2.0% of m.v. + 3digits) for 750Hz to 1kHz

Feature	Measuring range[9]	Resolution	Accuracy
AC current[11] - jaws [A][13] - jack [µA][10],[12]	 600 A 600 µA	 0.1 A 0.1 µA	 ± (2.0% of meas. val. + 5 digits) ± (1.5% of meas. val. + 5 digits)
Resistance	60.00 Ohm 600.0 Ohm 6.000 kOhm 60.00 kOhm 600.0 kOhm 6.000 MOhm 60.00 MOhm	0.01 Ohm 0.1 Ohm 1 Ohm 10 Ohm 100 Ohm 1 kOhm 10 kOhm	± (1.5% of meas. val. + 3 digits)
Continuity alarm	0 to 30 Ohm		
Diode test	yes (0 to 2.5 V)		
Power measurement	Power factor: ±5% ±5 digits, for current strength > 10 A ±10% ±5 digits typical, for current strength between > 2 A and < 10 A Power: ±10% current strength > 10 A ±15% typical, for current strength < 10 A		
Capacitance measurement	6.000 nF[14]	0.001 nF	± (10% of meas. val. + 25 digits)
	60.00 nF	0.01 nF	± (2% of meas. val. + 10 digits)
	600.0 nF	0.1 nF	± (1.5% of meas. val. + 5 digits)
	6.000 µF	0.001 µF	± (1.5% of meas. val. + 5 digits)
	60.00 µF	0.01 µF	± (1.5% of meas. val. + 5 digits)
	600.0 µF	0.1 µF	± (2% of meas. val. + 10 digits)
	6.000 mF	1.0 µF	± 10% typically
	60.00 mF[15]	10.0 µF	± 10% typically

[13] Frequency of AC currents up to 400 Hz

[14] Accuracy valid for capacitance values >2 nF

[15] Maximum measurement duration is 13.2 s

Feature	Measuring range[9]	Resolution	Accuracy
Frequency with voltage/current[16]	9.999 Hz 99.99 Hz 999.9 Hz 9.999 kHz	0.001 Hz 0.01 Hz 0.1 Hz 1 Hz	± (0.1% + 1 digits)
Temperature with adapter[17]	-20 to 500 °C	0.2 °C	-20 to 0 °C ± 2 °C 0 to 99.99 °C ± 1 °C 100 to 249.99 °C ± 1.5% >250 °C ± 2%

Figures correspond to +23 °C ± 5 °C at <80% rel. humidity. Temperature coefficient: 0.15 x specified accuracy per 1 °C (<18 °C and >28 °C)

9.3. Bluetooth module (testo 770-3 only)

Feature	Values
Bluetooth	Range <20 m (free field)
Bluetooth type	LSD Science & Technology Co., Ltd L Series BLE module (08 May 2013) based on TI CC254X chip
Qualified Design ID	B016552
Bluetooth radio class	Class 3
Bluetooth company	10274

testo 770-3 only

The use of the wireless module is subject to the regulations and stipulations of the respective country of use, and the module may only be used in each case in countries for which a country certification has been granted.

The user and every owner undertake to adhere to these regulations and prerequisites for use, and acknowledge that the re-sale, export, import, etc. in particular in, to or from countries without wireless permits, is their responsibility.

[16] Frequency measurement is not specified for alternating currents or voltages below 3% of the smallest respective measuring range

[17] Does not include the measurement error of the temperature probe. The specified accuracy is the sum total of the measurement errors of the thermocouple adapter and the testo 770

10 Tips and assistance

10.1. Questions and answers

Question	Possible causes/solution
OL	The reading exceeds the measuring range upper limit > Check input value and change if necessary.
dISC (testo 770-3 only)	The capacitor to be tested still contains charge. > Discharge capacitor properly and carry out the test again.
OPEn	No connection to the probe tips during the RCDC measuring mode. > Establish a connection to the measurement object.

If we have not been able to answer your question, please contact your dealer or Testo Customer Service.

10.2. Accessories and spare parts

Probe and other assemblies are appropriately rated for measurement category III or IV and have a suitable voltage rating for the circuit to be measured.

11 Authorizations (testo 770-3 only)

Please note the following country-specific information for the product authorization.

European Certification

Belgium (BE), Bulgaria (BG), Denmark (DK), Germany (DE), Estonia (EE), Finland (FI), France (FR), Greece (GR), Ireland (IE), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Rumania (RO), Sweden (SE), Slowakia (SK), Slowenia (SI), Spain (ES), Czech Republic (CZ), Hungary (HU), United Kingdom (GB), Republic of Cypres (CY).

EFTA countries

Iceland, Liechtenstein, Norway and Switzerland.

Other countries

USA, Canada, Australia, Turkey

USA

FCC ID: WAF-2016T770-3

Information from the FCC (Federal Communications Commission)

For your own safety

Shielded cables should be used for a composite interface. This is to ensure continued protection against radio frequency interference.

FCC warning statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate

radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Shielded interface cable must be used in order to comply with the emission limits.

Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Canada

Product IC ID: 6127B-2016T7703

This instrument complies with Part 15C of the FCC Rules and Industry Canada RSS-210 (revision 8). Commissioning is subject to the following two conditions:

(1) This instrument must not cause any harmful interference and

(2) this instrument must be able to cope with interference, even if this has undesirable effects on operation.

Cet appareil satisfait à la partie 15C des directives FCC et au standard Industrie Canada RSS-210 (révision 8). Sa mise en service est soumise aux deux conditions
suivantes :

(1) cet appareil ne doit causer aucune interférence dangereuse et

(2) cet appareil doit supporter toute interférence, y compris des interférences qui provoquerait des opérations indésirables.

Australia

E 1561

Turkey

Authorized.

11.1. Certifications

Tested for safety (tested by TÜV Rheinland)

The product is certified for the US and Canadian markets, in accordance with the applicable American and Canadian safety standards.

11.2. Declaration of Conformity

CE

Declaration No.
0008 / 2016

Wir messen es. testo

EG-Konformitätserklärung
EC declaration of conformity

Für die nachfolgend bezeichneten Produkte:
We confirm that the following products:

testo 770-3 Best. Nr.: / Order No.: 0590 7703

wird bestätigt, daß sie den wesentlichen Schutzanforderungen entsprechen und bei bestimmungsmäßiger Verwendung den grundlegenden Anforderungen folgender Richtlinie entsprechen:

corresponds with the main protection requirements and, if used according to their intended purpose, comply with the essential requirements of the directive:

Richtlinien / directives	
☒ R&TTE 1999/5/EG	☒ RoHS 2011/65/EU
☒ NSR / LVD 2006/95/EC	

Zur Beurteilung der Erzeugnisse wurden folgende Normen herangezogen:
For assessment of the product following standards have been called upon:

Normen / standards		
☒ EN 301 489-1 V1.9.2: 2011	☒ DIN EN 61326-1:2013	☒ EN 60529:1992+A1+A2
☒ EN 301 489-17 V2.2.1: 2012	☒ DIN EN 61326-2-2:2013	☒ IEC 62321:2008
☒ EN 300 328 V1.9.1:2015	☒ DIN EN 61010-1:2010	☒ IEC 62321-3-1:2013
☒ EN 62479:2010	☒ DIN EN 61010-2-032:2012	☒ IEC 62321-5:2013
	☒ DIN EN 61010-2-033:2012	

Diese Erklärung wird für: / *This declaration is given in responsibility for:*
Testo AG
Postfach / *P.O. Box* 1140
79849 Lenzkirch / Germany
www.testo.com

abgegeben durch / *by:*

Dr. Rolf Merte
(Name / *name*)

CTO
(Stellung im Betrieb des Herstellers)
(Position in the company of the manufacturer)

Lenzkirch, 08.04.2016
(Ort, Datum / *place, date*)

ppa.
(Rechtsgültige Unterschrift)
(*Legally valid signature*)

Wolfgang Schwörer
(Name / *name*)

Head of Firmware & Electronics
(Stellung im Betrieb des Herstellers)
(Position in the company of the manufacturer)

i.V.
(Rechtsgültige Unterschrift)
(*Legally valid signature*)

12 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.

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