ELMA 2200X

Voltage Tester

Elma 2200X

GB Manual

elma instruments

Content

References marked on tester or in instruction manual:

⚠ Warning of a potential danger, comply with instruction manual.

☞ Reference. Please pay utmost attention.

⚠ Caution! Dangerous voltage. Danger of electrical shock.

Equipment for working under live voltage

Continuous double or reinforced insulation complies with category II DIN EN 61140.

CE Conformity symbol, the instrument complies with the valid directives. It complies with the **EMC Directive (2014/30/EU)**. Standard EN 61326-1 is fulfilled. It also complies with the Low Voltage Directive (2014/35/EU), Standard **EN61243-3:2014** is fulfilled.

Tester complies with the standard (2012/19/EU) WEEE

⚠ The instruction manual contains information and references, necessary for safe operation and maintenance of the tester.
Prior to using the tester (commissioning/ assembly) the user is kindly requested to thoroughly read the instruction manual and comply with it in all sections.

⚠ Failure to read the tester manual or to comply with the warnings and references contained herein can result in serious bodily injury or tester damag.
The respective accident prevention regulations established by the professional associations are to be strictly enforced at all times

1. Introduction / Product Package

The voltage tester 2200X is universally applicable tester for voltage testing, continuity testing, rotary field testing and trip test of RCD.

The tester is constructed according to the latest safety regulations and guarantee safe and reliable working.

The voltage tester 2200X is characterized by the following features:

- Designed to meet international safety standards. EN61243-3:2014 and IEC61010-1
- Measurement Category (CAT.) IV 600V, III 1000V
- AC and DC voltage test up to 1000Vac and 1500Vdc with LCD
- Polarity indication
- Single-pole phase test
- Phase rotation test
- Trip Test of RCD
- Continuity test
- Resistance test
- Auto-power ON / OFF
- Torch light
- IP64 (IEC60529)

After unpacking, check that the instrument is undamaged.
The product package comprises:

1 pc Tester 2200X
2 pcs 4mm test tip adapters
2 pcs CAT III/ 1000V test tip cover
2 pcs batteries 1.5V, IEC LR03
1 pc instruction Manual

2. Safety Measures

⚠ The testers have been constructed and tested in accordance with the safety regulations for voltage testers and have left the factory in a safe and perfect condition.

⚠ The operating instructions contain information and References required for safe operation and use of the tester. Before using the tester, read the operating instructions carefully and follow them in all respects.

3. Danger of electric shock and other dangers

⚠ To avoid an electric shock, observe the precautions when working with voltages exceeding 120 V (60 V) DC or 50 V (25 V) eff AC. In accordance with DIN VDE these values represent the threshold contact voltages (values in brackets refer to limited ranges, e.g. in agricultural areas).

⚠ The tester must not be used with the battery compartment open

⚠ Before using the tester, ensure that the test lead and device are in perfect working order. Look out e.g. for broken cables or leaking batteries.

⚠ Hold the tester and accessories by the designated grip areas only, the display elements must not be covered. Never touch the test probes.

⚠ The tester may be used only within the specified measurement ranges and in low-voltage installations up to 1000 Vac/1500Vdc.

⚠ The tester may be used only in the measuring circuit category it has been designed for.

⚠ Before and after use, always check that the tester is in perfect working order (e.g. on a known voltage source).

⚠ The tester must no longer be used if one or more functions fail or if no functionality is indicated.

⚠ It is not permitted to use the tester during rain or precipitation.

⚠ A perfect display is guaranteed only within a temperature range of -5°C to +40°C at relative air humidity less than 85%.

⚠ If the safety of the user cannot be guaranteed, the tester must be switched off and secured against unintentional use.

⚠ Safety is no longer guaranteed e.g. in the following cases:
- obvious damage
- broken housing, cracks in housing
- if the tester can no longer perform the required measurements/ tests
- stored for too long in unfavorable conditions
- damaged during transport
- leaking batteries

⚠ The tester complies with all EMC regulations. Nevertheless it can happen in rare cases that electric devices are disturbed by the electrical field of the tester or the tester is disturbed by electrical devices.

⚠ Never use the tester in explosive environment

⚠ Tester must be operated by trained users only

⚠ Operational safety is no longer guaranteed if the tester is modified or altered.

⚠ The tester may be opened by an authorized service technician only.

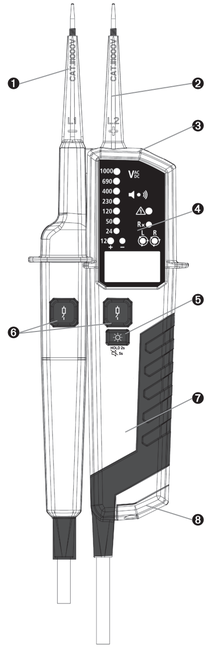
⚠ If the indication “voltage present” appears although the checked part is considered as disconnected, it is recommended to verify additional measures if the measured voltage is an interference voltage or not.

4. Intended Use

The tester may be used only under the conditions and for the purposes for which it was designed. Therefore, observe in particular the safety instructions, the technical data including environmental conditions.

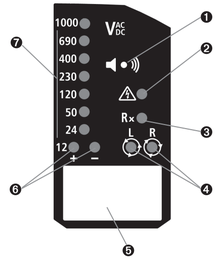
5. Tester Information

1. Test Probe, L1
2. Test Tip, L2
3. Torch Light
4. Display
5. Torch Light Button / Activation R-measurement
6. Trip TEST RCD Pushbuttons
7. Main body
8. Battery door



Control elements

1. Buzzer hole for acoustic indication
2. Single Pole Test ELV Warning
3. Continuity Test
4. Rotary field
5. LCD Display indication voltage, polarity and low battery
6. LED’s indicating 12V and polarity
7. Voltage Indication



Accessory

1. 4 mm test Tips,
2. Plug on cover (GS38)
3. Protective cover

6. Preparation for tests

6.1 Auto-power-on/ switching on

- The tester switches on when it detects continuity, an AC or DC voltage above approx. 6V or a live phase on L2 (single pole test).
- It can be switched on with the torch light button.

6.2 Auto-power off

- Tester is automatically powered off after 30 sec when there is no signal contacted to the probes.
- The torch light switches off after approx. 30 sec.

6.3 Self-Test

- When voltage tester is off short both probes L1 and L2, hold probes shorted.
- All LEDs, all symbols on LCD and buzzer will be on for a 2s.
- Self-test will start automatically when replacing batteries.

⚠ If some of LEDs is not ON, or some LCD symbols are not ON or Buzzer or Torch light is not ON, the device is not safe for use. Replace the battery and start Self-Test again. If some of these indications are not ON again, the device is not safe for use and must NOT be used.

⚠ Do not use tester while Self-Test procedure is activated.

7. Conducting Tests

7.1 Voltage test

- Connect both probes to the object under test.
- The voltage is indicated by LEDs and LCD
- Buzzer sounds when a threshold voltage of 50VAC or approx. 120 VDC is exceeded.
- Voltage polarity is indicated in following manner.

↘ AC: + and – 12V LED are on

↘ +DC: +12V LED is on

↘ -DC: -12V LED is on (and “-” is shown on LCD)

☞ When the L2 probe + is the positive (negative) potential, the Polarity indication LED indicates “+DC” (“-DC”).

☞ During voltage test, L or R LED may light up.

☞ In case of empty batteries, the ELV LED lights up >50VAC, >120VDC

7.2 Single-pole phase test

☞ Function of this test may not be fully achieved if the insulation condition/ grounding conditions of user or of the equipment under test aren’t good enough. Verification of live-circuit shouldn’t be dependent on this Single-pole phase test only, but on the voltage test.

- Hold the tester well in your hand. Connect the “L2 +” probe to the object under test.
  Single pole LED lights up and buzzer sounds when a voltage of approx. 100V AC or more exists in the object under test. (Pol≥100VAC).

7.3 Phase rotation test

- L LED and R LED for Phase rotation test may operate on various wiring systems, but effective testing result can be obtained only on three-phase 4-wire system.
- Hold the tester good in your hand and connect both probes to the object under the test.
- Phase-to-phase voltage is indicated by Voltage LEDs.
- R LED lights up for Right rotary field.
- L LED lights up for Left rotary field.
- Measurement principle: The instrument detects the phase rising order regarding the user as earth.

☞ Function of this test may not be fully achieved if the insulation condition/ grounding conditions of user or of the equipment under test is not good enough.

7.4 Trip Test of RCD

☞ For voltage tests in systems with RCD (earth leakage circuit breakers) an RCD can be tripped with a 10mA or 30mA nominal leakage current on single phase AC 230V power system.
- Connect probes “L1” and “L2” between L and PE of RCD protected system.
- Press simultaneously both of Trip TEST RCD Pushbuttons.
- The RCD should trip.

7.5 Continuity test (Rx) / Diode test

⚠ The test circuit/object shall be de-energized before measurement.
- Check for the absence of voltage by conducting a two pole voltage test on the test object.
- Connect both test probes together or press the Torch Light Pushbutton to switch ON the tester.
- Connect both test probes to the test object. For continuity (up to approx. 500kΩ) the Continuity Test LED – Rx is on and the buzzer is active.
- Continuity test automatically switches OFF after approx. 30 seconds if no continuity is detected. When tester is OFF, If continuity is detected it will be automatically switched on again.

7.6. Resistance test

⚠ Make sure that object test isn’t live.
- Switch into resistance measurement by short press of torch light. Connect both test probes to the object under test. Resistance up to 2k show on LCD display. For resistance less than 30 Ohm buzzer sounds continuously to indicate low continuity.
- Second short press switches into voltage measurement

7.7 Torch light

- Pressing the torch light button will turn on the light and after approx. 30s it will turn itself off.
- When torch light is on, pressing the torch light button for more than 6s will turn off the torch.

7.8 Data Hold

⚠ Under data hold mode, The LCD screen will only show the last saved measured voltage value. No auto refresh of LCD screen reading under Data Hold mode whether the voltage tester is connected to energized or non-energized circuit. The LED voltage indicators will always show the actual voltage of the circuit under measurement.
- After pressing the Torch Light push button for more than 2 seconds, the data hold function is activated and replies with a short sound. The LCD screen shows “the last measured value” and symbol “HOLD”. The hold function can be deactivated manually by pressing the Torch Light push button again. Function deactivation will be announced with a short sound.

7.9 Buzzer HOLD 2s 1.5s

Press the „torchlight“ button for 5s to switch the buzzer off or on. The display indicates with “b_O” (buzzer off) and with “b_I” (buzzer on) the status of the buzzer for 2s on LCD.
By default the buzzer is on (as well after battery replacement).

8. Battery Replacement

⚠ Remove the probes from any testing point, when opening the Battery case. Batteries are empty when the continuity test with both test probes connected cannot be done anymore. A battery symbol in the LCD indicates low battery.

Follow the procedure below and replace batteries with new ones (type IEC LR03 1.5V).

- Unscrew the battery door using Philips type screwdriver.
- Pull out the Battery door and replace the batteries. Insert new batteries according to the engraving on the Battery door.
- Re-assemble battery door.

⚠ Confirm that the Battery door case is properly locked prior to measurements.

9. Technical data

- Voltage range: 6…1000V AC (40…400Hz), 6…1500V DC(±)
- LED Nominal voltage: 12/24/50/120/230/400/690/1000V, AC (40…400Hz), DC(±)
- LED tolerances according to EN61243-3
- ELV indication LED >50VAC, >120VDC
- Response time: < 1s at 100% of each nominal voltage
- LCD Range: 6…1000VAC, 1500VDC(±)
- LCD Resolution: 1V
- LCD Accuracy : ±3%±3dgt (6…1000Vac/1500Vdc)
- LCD Overrange indication: “OL”
- Peak current: Is<3.5mA (at 1000V)
- Measurement Duty: 30s ON (operation time), 240s OFF (recovery time)
- Internal battery consumption: Approx. 80mA
- Single-pole phase test voltage range: 100…1000V AC (50/60Hz)
- Phase rotation test: 170…1000V phase-to-phase, AC 50/60Hz
- Continuity test: Detection range 0…500kΩ + 50%
- Resistancemeasurement: 0-1999Ω ±(5% + 10dgt); Resolution: 1Ω
- Battery: 3V (IEC LR03 1.5V x 2)
- Temperature: -5…40°C operation; -20…70°C storage, No condensation
- Humidity: Max 85% RH
- Altitude up to 2000m
- Overvoltage CAT. III 1000V/ CAT. IV 600V
- Standard EN61243-3:2014 and IEC61010-1
- Pollution degree 2
- Protection: IP 64

10. Cleaning and storage

⚠ Tester does not need any special maintenance if used according to user manual.

⚠ Remove tester from all test points before cleaning.

⚠ Use a lightly damp cloth with neutral detergent for cleaning the instrument. Do not use abrasives or solvents.

⚠ Do not expose the instrument to direct sun light, high temperature and humidity or dewfall.

⚠ Remove batteries when the instrument will not be in use for a long period.

11. 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 internal impedance, compared to the reference value of 100 kΩ, 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 100 kΩ, may not per¬mit 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 is expected to be disconnected of the installation, it is highly recommended confirming by another means (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 passed 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.

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