



SEFRAM 70 Voltage Tester User Manual

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Sefram

SEFRAM 70 Voltage Tester



Safety Information

Understand and follow operating instructions carefully.

WARNING



- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Always use proper terminals, switch positions, and range for measurements.
- To reduce the risk of fire or electric shock, do not use this product around explosive gas or in damp locations.
- Verify the Meter operation by measuring a known voltage. If in doubt, have the Meter serviced.
- Do not apply more than the rated voltage, as marked on the Meter, between terminals or between any terminal and earth ground.
- Avoid working alone so assistance can be rendered.
- Do not use the Tester if the Tester is not operating properly or if it is wet.
- Individual protective devices must be used if hazardous live parts in the installation where the measurement is to be carried out could be accessible.
- Use caution with voltages above 30 Vac rms, 42 Vac peak, or 60 Vdc. These voltages pose a shock hazard.
- DO NOT USE the test leads when the internal white insulation layer is exposed.
- DO NOT USE the test leads above the maximum ratings of CAT. environment, voltage and current, that are indicated on the probe and the probe tip guard cap.
- DO NOT USE the test leads without the probe tip guard cap in CAT III and CAT IV environments.
- Probe assemblies to be used for MAINS measurements shall be RATED as appropriate for MEASUREMENT CATEGORY III or IV according to IEC 61010-031 and shall have a voltage RATING of at least the voltage of the circuit to be measured.

- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, and continuity.

SAFETY ADVICE

- Depending on the internal impedance of this meter there will be a different capability of indicating the presence or absence of operating voltage in case of the presence of interference voltage.
- When in contact with the parts to be tested, this meter may discharge temporarily the interference voltage to a level below the ELV, but it will be back to the original value when this meter is removed.
- When the indication “voltage present” does not appear, it is highly recommended to install earthing equipment before work.
- When the indication “voltage present” appears on a part that is expected to be disconnected of the installation, it is highly recommended to confirm 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 this meter is an interference voltage.

Symbols as marked on the Meter and Instruction manual

	Risk of electric shock
#	See instruction manual
⌚	DC measurement
%	AC measurement
H	Both direct and alternating current
1	Equipment protected by double or reinforced insulation
<	Battery
)	Earth
6	Conforms to EU directives
E	Application around and removal from hazardous live conductors is permitted
	Do not discard this product or throw away.

Maintenance

- Do not attempt to repair this Meter. It contains no user-serviceable parts.
- Repair or servicing should only be performed by qualified personnel.

Cleaning

- Periodically wipe the case with a dry cloth and detergent.
- Do not use abrasives or solvents.

Making Basic Measurements

Preparation and Caution Before Measurement

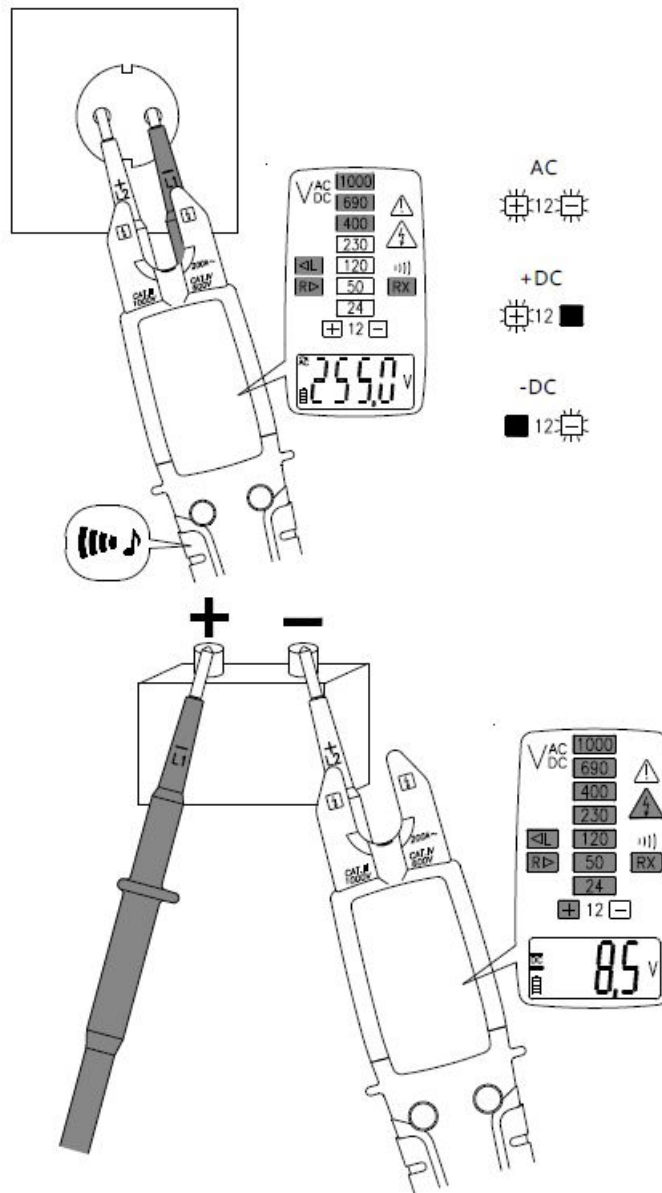
- Observe the rules of
- Warnings and
- Cautions.


CAUTION

- When connecting the test leads to the DUT (Device Under Test) connect the common test leads before connecting the live test leads; when removing the test leads, remove the live test leads before removing the common test leads.
- Make sure that the buzzer sound is perceptible before using it in a high background noise environment.

Voltage/Continuity/Single Pole Mode

Voltage Measurement



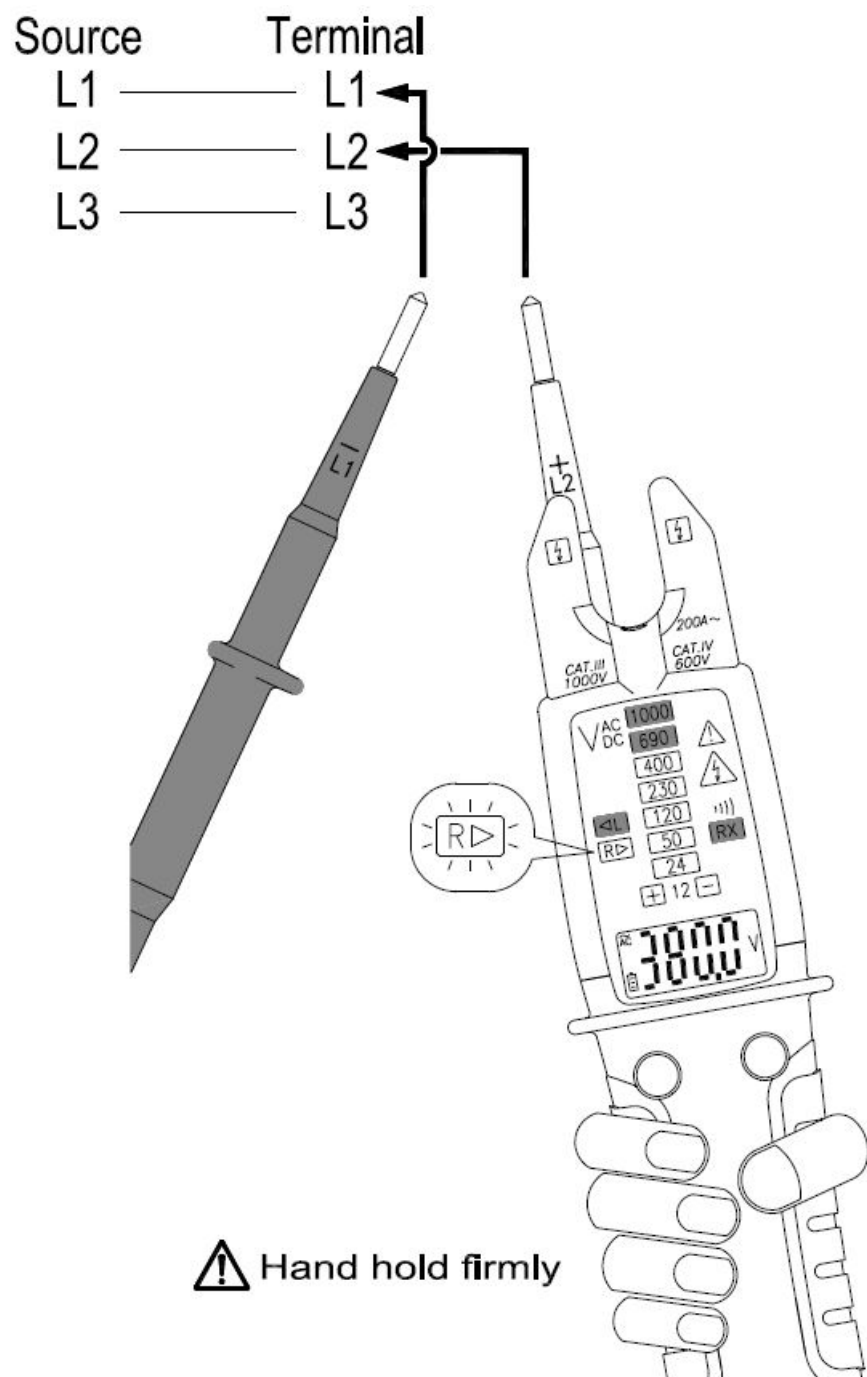
LED  indicates the measured voltage is high than the ELV limit (50VAC and/or 120VDC).

Warning

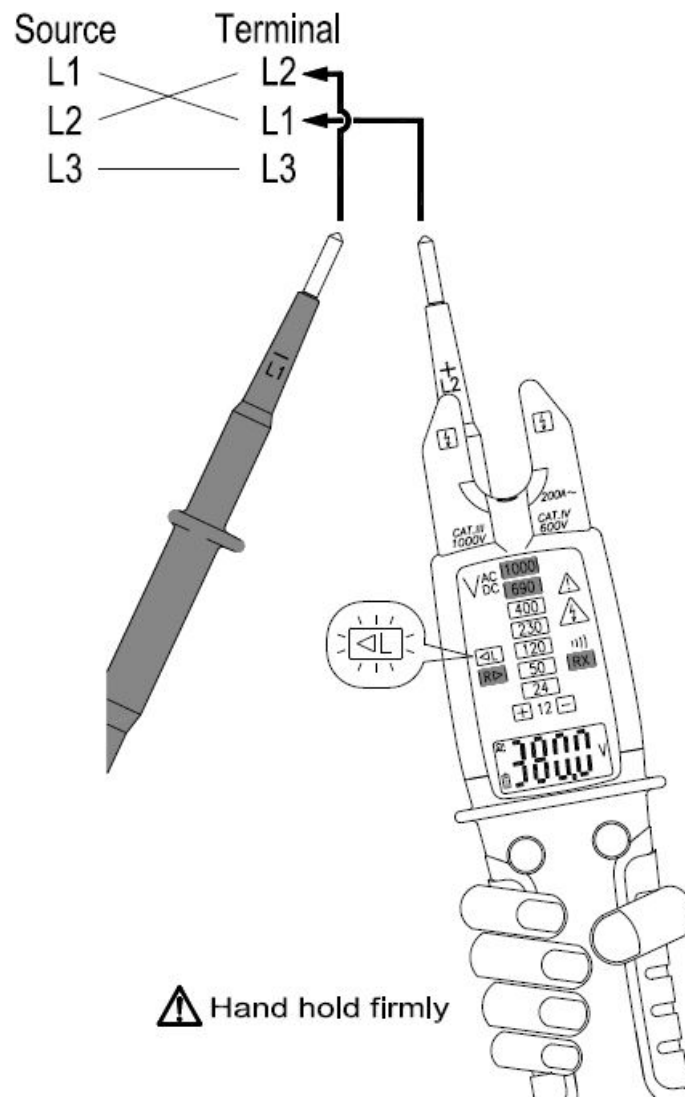
- When batteries are not fitted or are exhausted, the tester still work when measuring > 45VAC and/or >35VDC.
- Timing Rating (tr): 30 seconds, Recovery Time (rt): 240 seconds, when measuring >300V, recovery time is necessary.
- L/R LED may light up when measuring AC voltage.
- Due to the high internal resistance, capacitive and inductive Voltage (ghost voltage) may be indicated.

Phase Rotation Test

- Clockwise Phase Sequence L1-L2-L3(Right)



- Counterclockwise Phase Sequence L1-L3-L2(Left)



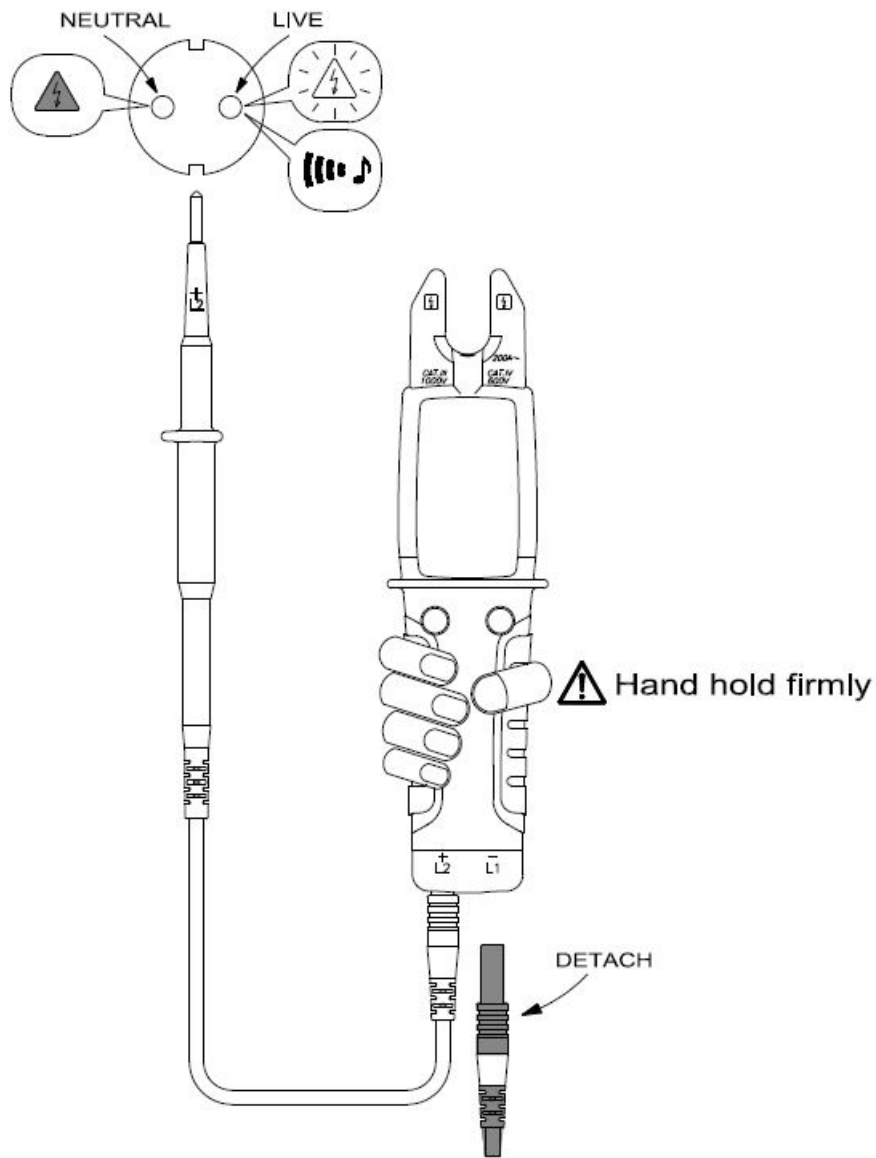
Warning

- Phase Rotation Test works only on 3 phase 4 wire system.
- The result is unreliable on other systems.

Note

- It is necessary to check the result by test with reverse sequence.

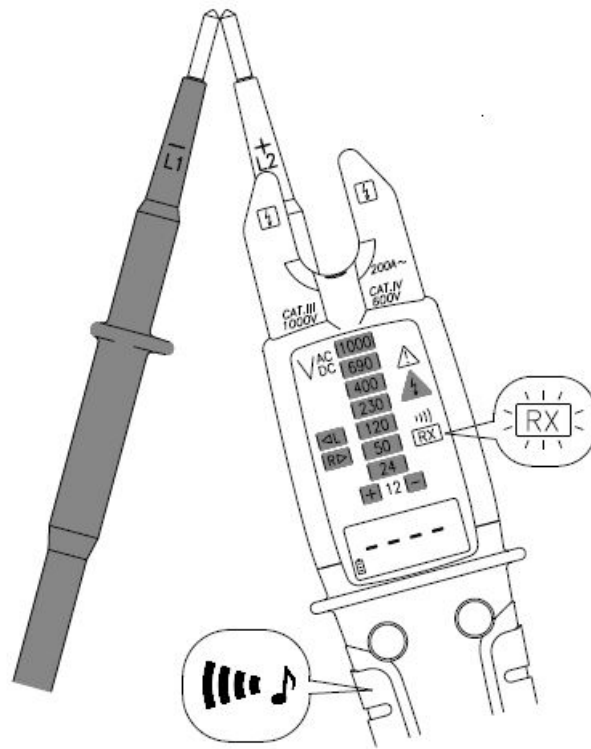
Single Pole Phase Check



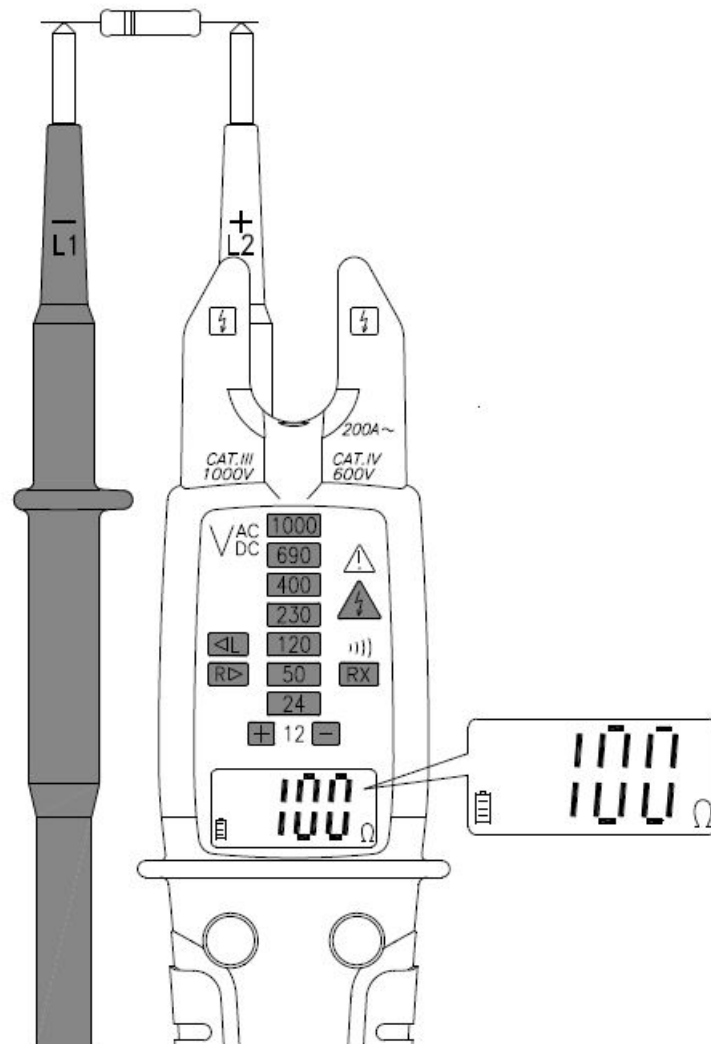
Warning

- Single Pole Check is available for both test leads.
- Remove one of test leads before performing check.
- Do not check if voltage appears by Single Pole Phase Check.
- Measure voltage with two pole to get a reliable result.

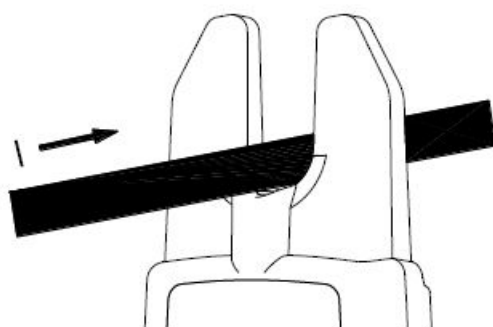
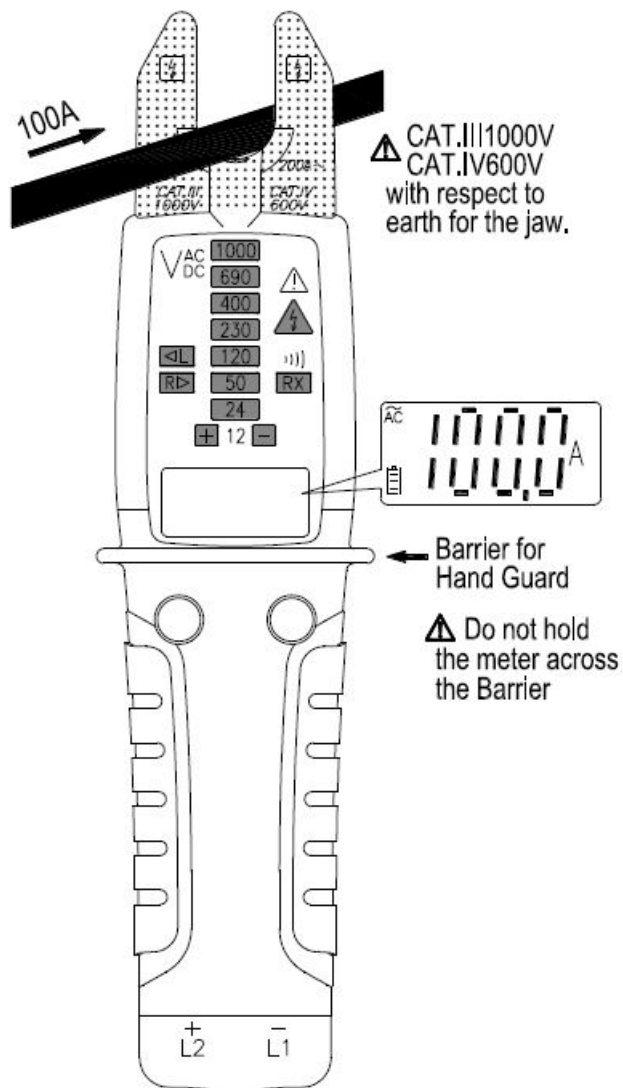
Continuity Check



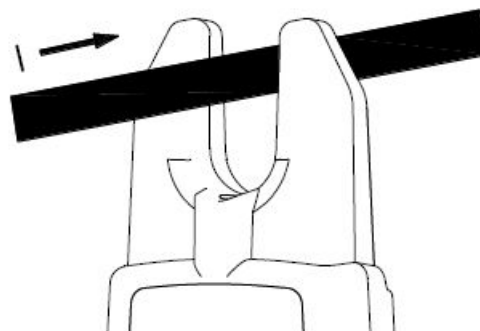
Resistor Mode



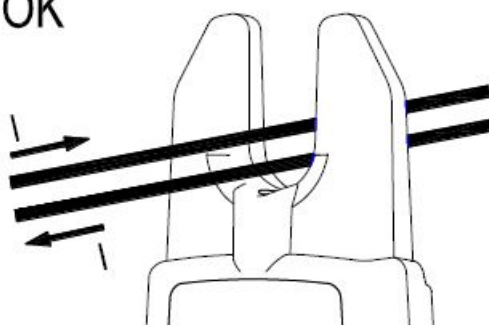
Ampere Mode



OK



OK



OK

$$I + (-I) = 0$$

Warning

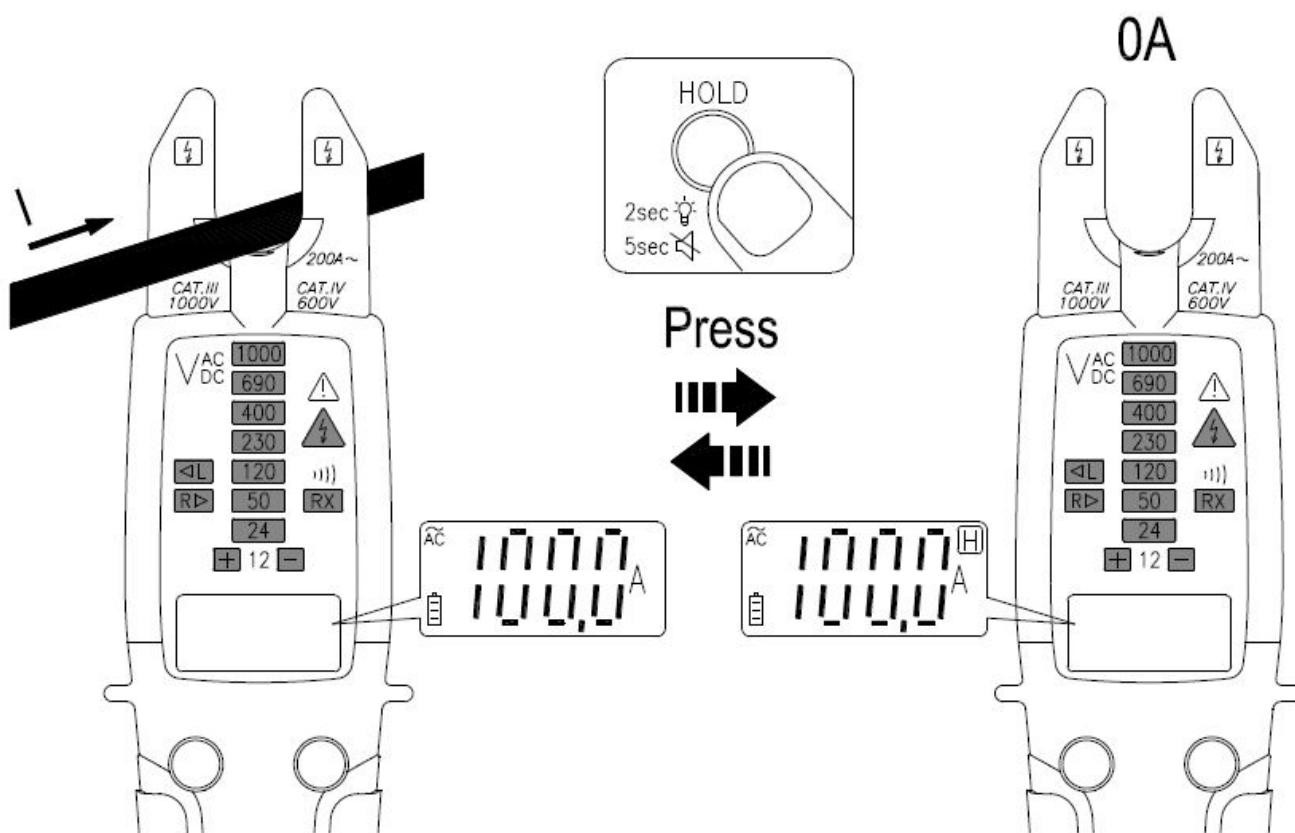
- The barrier on the body is indicating the limit of safe access of the hand-held part, do not hold over the barrier when in normal use.

Warning

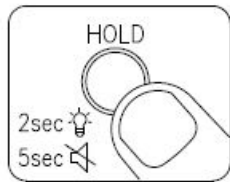
- Do not assemble test lead at the back of the meter while measuring current.

Using the Function

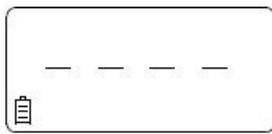
HOLD



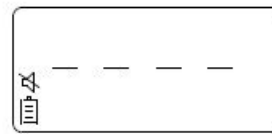
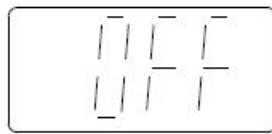
Enable/Disable ELV Warning Voice



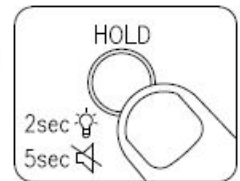
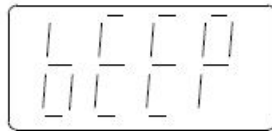
Press >5sec.



Voltage/Continuity/Single Pole Mode



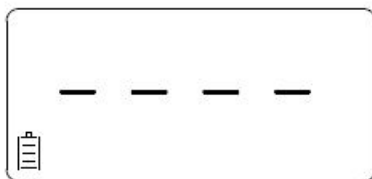
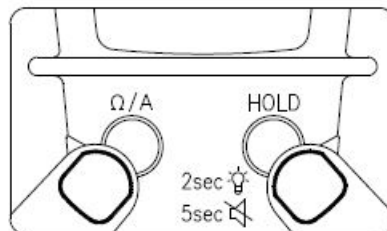
Voltage/Continuity/Single Pole Mode



Press >5sec.

Turn the meter OFF

- Press the Ω/A button and the "HOLD" button at the same time.

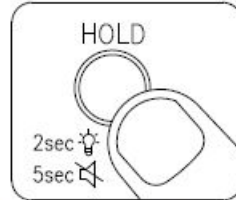
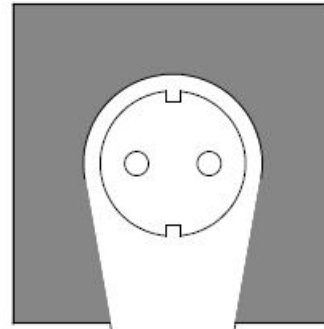
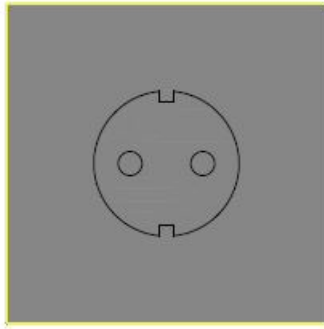


Powering ON

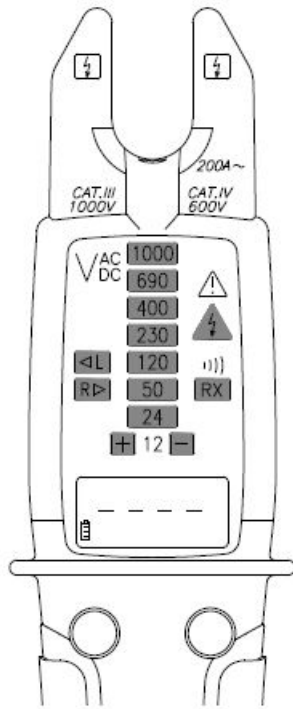


OFF

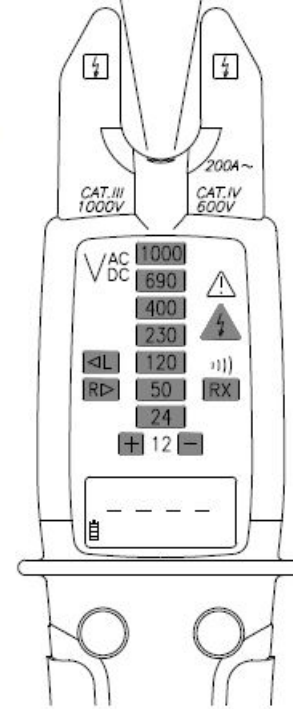
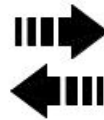
Torch



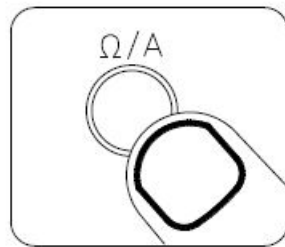
Press >2sec.



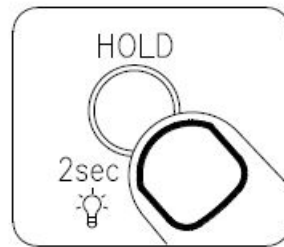
Powering ON



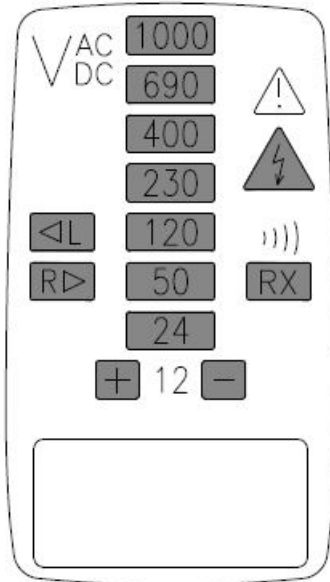
Self-Diagnostic Test



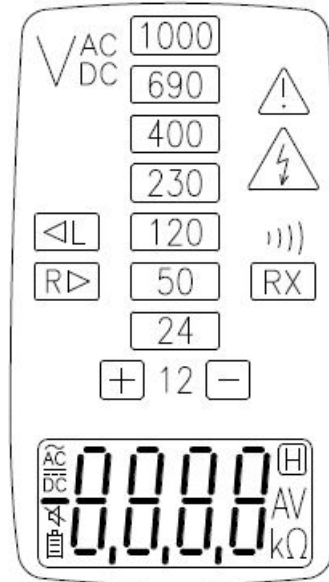
or



Press



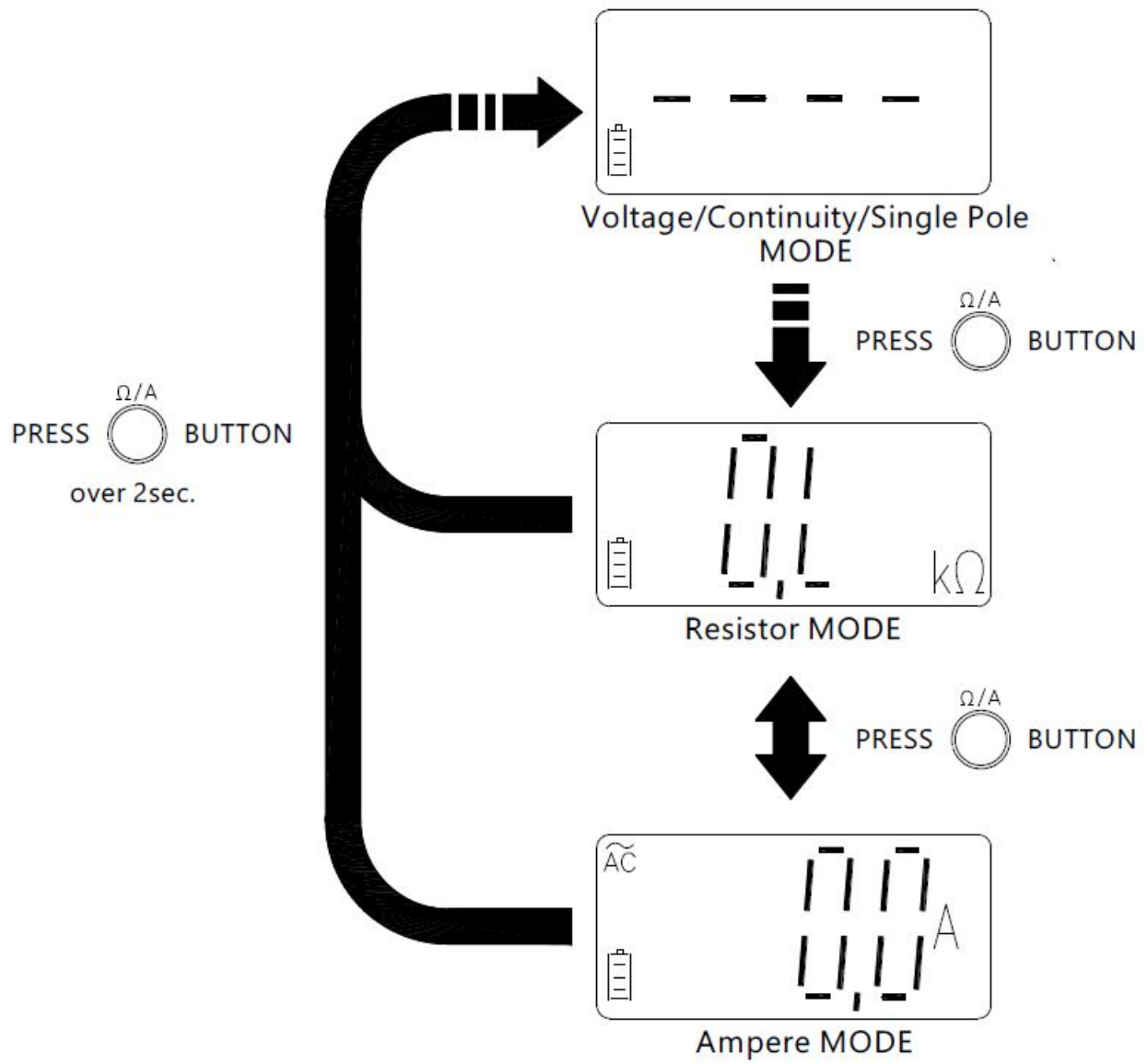
OFF



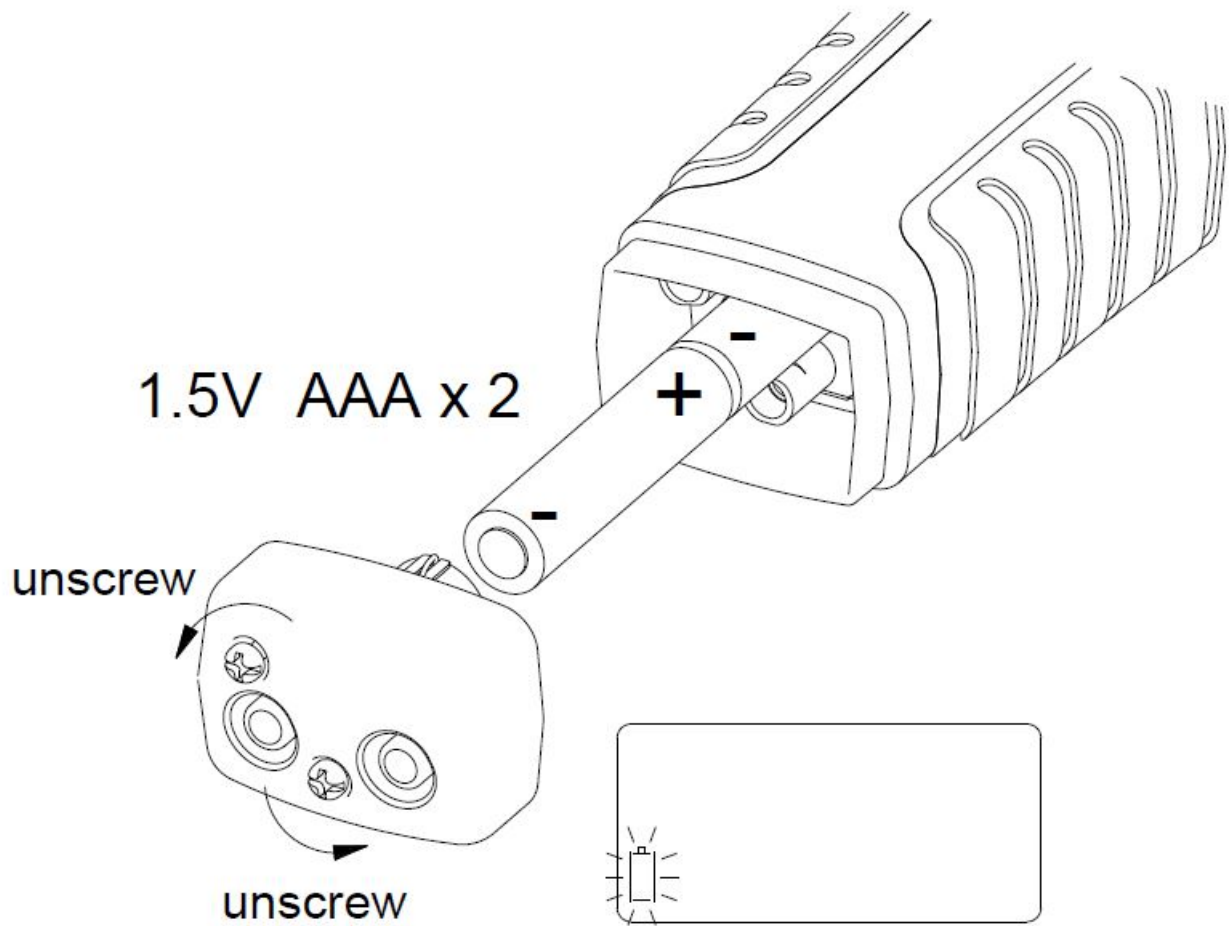
Warning

- Do not use the tester when an abnormality is found in self-diagnostic
- Test. When the presence or absence of operating voltage needs to be checked, it is mandatory to make a self-diagnostic test before and after each measurement.
- If the self-diagnostic is not correct, do not use the meter.

Function Button



Battery Replacement

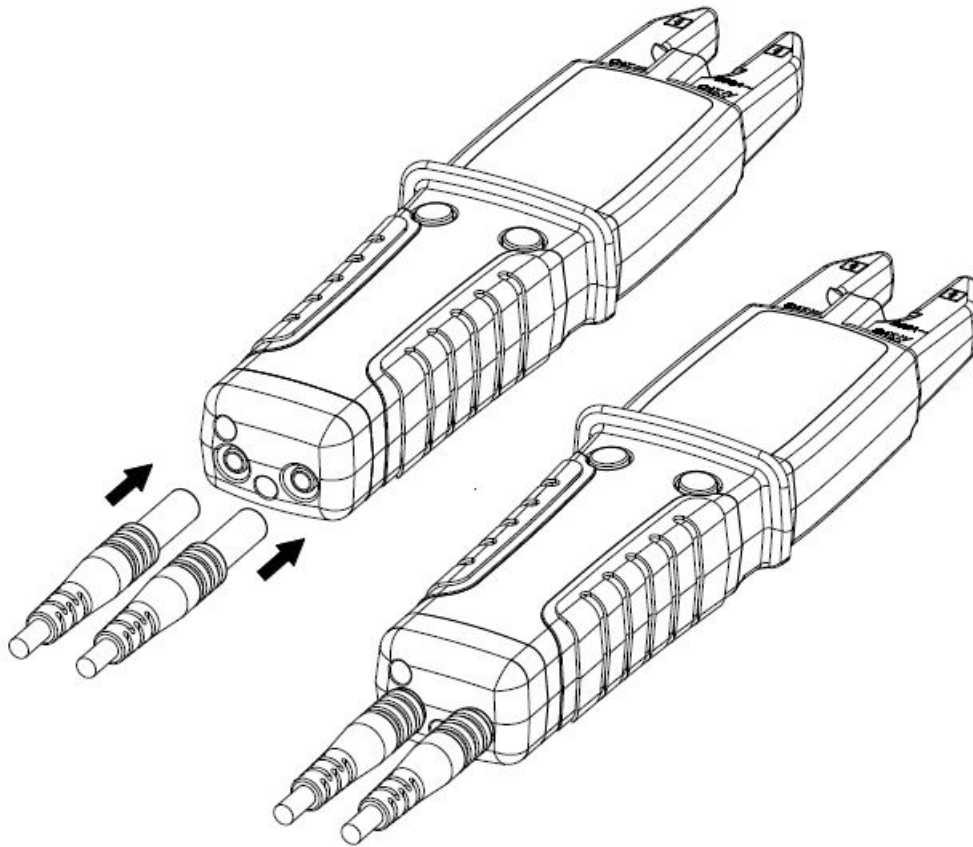


Warning

- To avoid false readings that can lead to electric shock and injury, replace the battery as soon as low battery indicator blinks.
- Remove test lead from the Meter before opening the battery door or Meter case.

IP2X test leads

It is mandatory to use the IP2X test leads supplied by the manufacturer to be compliant with EN61243-3 and UTE 18-510. If other test leads are connected to the meter, the safety of the user can be impaired and a non-voltage check is not possible according to standard.

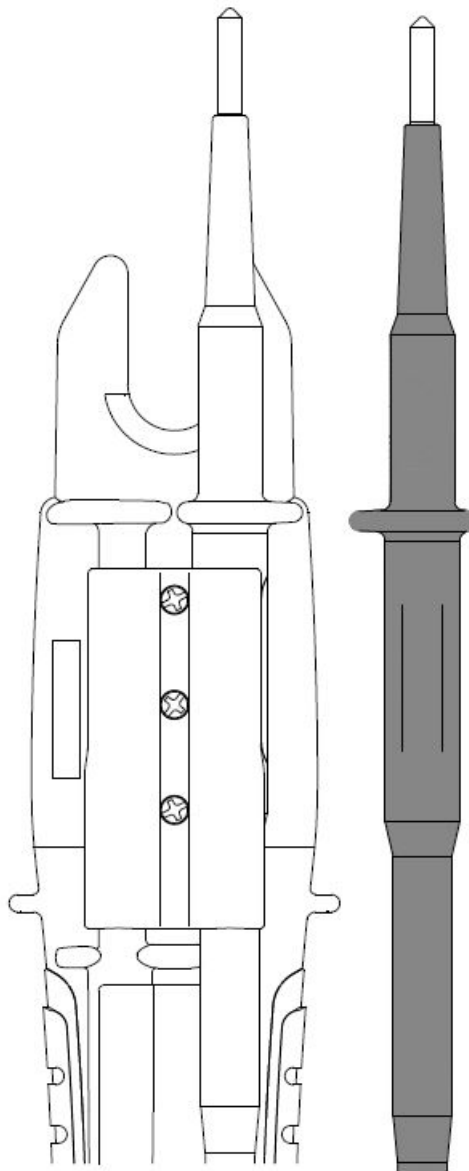


Warning

- For CAT III or CAT IV environments, use the IP2X test leads or the optional non-IP2X test leads with the probe tip guard cap fixed firmly. Without the probe tip guard cap, the test leads can be used in a CAT II environment ONLY.
- Make sure test leads are firmly connected to the instrument and other accessories.

Using the test leads

- The instrument is equipped with a test leads holder, designed to hold the test leads after having used the meter.
- When measuring current, be sure to remove the test leads from the holder, otherwise, the current measurement can be wrong.
- Use only the test leads provided by the manufacturer in order to keep the safety level and compliance to standards.
- It is possible to measure (except current) with one test lead in the holder and the second one in hand.



Specifications

General Specifications

- **Display Count:** 10000 counts.
- **Overrange Display:** "OL" or "-OL"
- **Conversion Rate :** 3 times/second
- **Dimensions (W x H x D) :** 57 x 220 x 35 mm
- **Weight:** 200g
- **Power Requirements :**
 - AAA Size Batteryx2(R03, LR03, 24D, 24A)
 - **Battery Life:** About 1000 operations. (based on Alkaline batteries, 30 sec. ON, 240 sec. OFF)
- **Maximum Conductor Size:** 16mm
- **Safety Standard Compliance :**
 - IEC / EN 61010-1, IEC / EN 61010-2-032, IEC / EN 61010-2-033,
 - IEC / EN 61010-031 for CAT IV 600V, CATIII 1000V
 - IEC / EN 61326-1 IEC / EN 61243-3

CAT Application field

II	The circuits are directly connected to Low-voltage installation.
III	The building installation.
IV	The source of the Low-voltage installation.

Environmental Conditions

- Indoor / Outdoor Use
- Pollution Degree: 2
- Maximum Operating Altitude: 2000m (6562ft)
- Operating Temperature & Relative Humidity :
 - -15°C ~ 30°C, ≤80%RH
 - 30°C ~ 40°C, ≤75%RH
 - 40°C ~ 55°C, ≤45%RH
- Storage Temperature: -20 to +60°C, 0 to 80% RH (no batteries)
- Temperature Coefficient : $0.2 \times (\text{Specified accuracy}) / ^\circ\text{C}$, $< 18^\circ\text{C}$, $> 28^\circ\text{C}$
- IP Rating: IP65
- Vibration: Random Vibration per MIL-PRF-28800F Class 2
- Drop Protection: 4 feet drop to the hardwood on the concrete floor

Electrical Specifications

- Accuracy is given as \pm (% of reading + counts of least significant digit) at $23^\circ\text{C} \pm 5^\circ\text{C}$, with relative humidity Less than 80% R.H., and is specified for 1 year after calibration.
- Condition of Auto Power On :
- With batteries fitted :
 - $> 3.0\text{V}$ or $< -8.0\text{V}$ between L2 and L1
 - Detect AC signal by Single Pole
 - Continuity
- Without batteries : $> | \pm 35.0\text{V DC} |$ or $> 45.0\text{V AC}$ between L2 and L1
- Auto Power Off :
- The Meter automatically turns off if one of the following conditions are met for about 10 seconds
 - The Auto Power On condition is not met.
 - Both buttons are not pressed.
 - The Meter automatically turns off if one of the following conditions are met for about 30 seconds
 - The resistance is OL when the Meter is in Resistor mode.
 - The current is $< 1.0\text{A}$ when the Meter is in Ampere mode

- For > 300V, Time rating (tr): 30 seconds; Recovery time (rt): 240 seconds
- AC Function
 - ACV and ACA specifications are ac coupled, true RMS.
 - For non-sinusoidal waveforms, Additional Accuracy by
 - Crest Factor (C.F.) :
 - Add 1.0% for C.F. 1.0 ~ 2.0
 - Add 2.5% for C.F. 2.0 ~ 2.5
 - Add 4.0% for C.F. 2.5 ~ 3.0
 - Max. Crest Factor of Input Signal:
 - 3.0 @ 5000 counts
 - 1.5 @ 10000 counts

DC Voltage

	Range	Resolution	Accuracy
With batteries	7.0V to 999.9V	0.1V	$\pm(1.0\% + 2D)$
Without batteries	35V to 999.9V	0.1V	

- Max. Input Current : < 3.5mA @ 1000V
- Overload Protection : AC/DC 1000V

AC Voltage

	Range	Resolution	Accuracy
With batteries	6.0V(1) to 999.9V	0.1V	$\pm(1.5\% + 5D)$
Without batteries	45V to 999.9V	0.1V	

- (1) For > 65Hz, the minimum range is 8.0V.
- Frequency Response : 45Hz to 400Hz
- Max. Input Current : < 3.5mA @ 1000V
- Overload Protection : AC/DC 1000V

Resistor

Range	Resolution	Accuracy
9999 Ω	1 Ω	$\pm(1.5\% + 5D)$
50.00k Ω	0.01k Ω	

- Output Voltage : about 0.5V
- Overload Protection : AC/DC 1000V

Continuity

- Continuity : The built-in buzzer sounds in the case of measuring resistance less than 1.8kΩ.
- Continuity Indicator : 3kHz Tone Buzzer and RX LED
- Response Time of Buzzer : < 100 msec.
- Output Voltage : about 0.5V
- Overload Protection : AC/DC 1000V

AC Ampere

Range	Resolution	Accuracy
200.0A	0.1A	±(3.0% + 5D)

- Frequency Response : 45Hz to 65Hz
- Overload Protection : AC/DC 200A

Rotary Field Indication

- For 3 phase 4 wire system only
- Sensitivity : 90V to 1000V (Phase-to-ground)
- Frequency Range : 45Hz to 65Hz
- “L” LED is on when the signal of L2 probe lead the signal of
- L1 probe; “R” LED is on when the signal of L1 probe lead the signal L2 probe.

Single-Pole Phase Check

- Sensitivity : 90V to 1000V (Phase-to-ground)
- Frequency Range : 45Hz to 65Hz
- Indicator : 3kHz Tone Buzzer and ELV LED

SEFRAM

- 32, rue E. Martel
- F42100 – Saint-Etienne
- France
- Tel : 04.77.59.01.01
- Fax : 04.77.57.23.23
- Web : www.sefram.fr.
- e-mail : sales@sefram.fr.

	<p>Sefram SEFRAM 70 Voltage Tester [pdf] User Manual SEFRAM 70 Voltage Tester, SEFRAM 70, Voltage Tester, Tester</p>
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