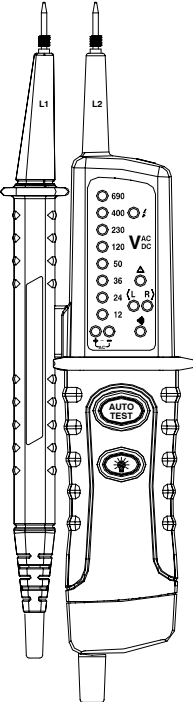


OPERATING INSTRUCTION

VOLTAGE TESTER



Safety

International Safety Symbols



Warning of a potential danger, comply with instruction manual.



Caution! Dangerous voltage. Danger of electrical shock.



Double insulation.

SAFETY NOTES

- Reference. Please use utmost attention.
- Do not exceed the maximum allowable input range of any function
- Insulated personnel body protective equipment up to 690V.

WARNINGS



In order to avoid electrical shock, the valid safety and VDE regulations regarding excessive contact voltages must receive utmost attention, when working with voltages exceeding 120V (60V) DC or 50V (25V) rms AC. The values in brackets are valid for limited ranges (as for example medicine and agriculture).



Prior to measurement ensure that the test leads and the test instrument are in perfect condition.



When using this instrument only the handles of the probes may be touched – do not touch the probe tips.



This instrument may only be used within the ranges specified and within low voltage systems up to 690V.



Prior to usage ensure perfect instrument function (e.g. on known voltage source).



The voltage testers may no longer be used if one or several functions fail or if no functionality is indicated.



Do not use this instrument under damp conditions.



Perfect display is only guaranteed within a temperature range of -10°C up to +55°C, at relative humidity <85%.



If the operator's safety cannot be guaranteed, the instrument must be removed from service and protected against use.

The safety can no longer be insured if the instrument

- Shows obvious damage
- Does not carry out the desired measurements
- Has been stored for too long under unfavorable conditions
- Has been subjected to mechanical stress during transport.

All relevant statutory regulations must be adhered to when using this instrument.

Appropriate Usage

The instrument may only be used under those conditions and for those purposes for which it was conceived. For this reason, in particular the safety references, the technical data including environmental conditions and the usage in dry environments must be followed.

When modifying or changing the instrument, the operational safety is no longer ensured.

The instrument may only be opened by an authorized service technician, e.g. for fuse replacement.

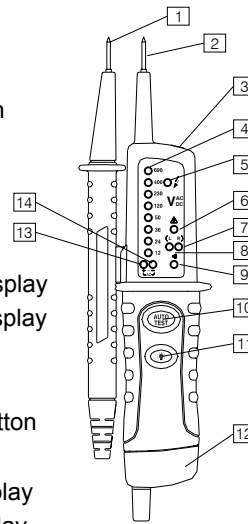
Specifications

LED voltage range	12,24,36,50,120,230, 400,690VDC
	12,24,36,50,120,230, 400,690VAC
LED resolution	±12,24,36,50,120,230, 400,690VDC
	12,24,36,50,120,230, 400,690VAC
Tolerances	-30% to 0% of reading
Voltage detection	automatic
Polarity detection	full range
Range detection	automatic
Response time	< 0.1s LED
ACV Frequency range	50/60Hz
Internal basic load	approx. 2.1 W at 600V
Peak current	1s <0.2A / 1s (5s) < 3.5mA
Operation time	ED =30s
Recovery time	10 min
LED on	About 8V AC/DC
Single-pole Phase Test	
Voltage range	100...690V AC
ACV Frequency range	50/60Hz
Continuity Test	
Resistance range	<300kΩ
Test current	5μA
Overvoltage protection	690VAC/DC

Rotary Field Indication	
Voltage range (LEDs)	100...400V
Frequency range	50/60Hz
Measurement principle	double-pole and contact electrode
Self-check Test	Autotest
Power supply	2x1.5V "AAA" Batteries
Power consumption	max.30mA / approx. 250mW
Temperature range	-10°C up to +55°C
Humidity	max.85% relative humidity
Overvoltage class	CATIII - 1000V









Voltage Tester Description

1. Handle test probe –
 2. Instrument test probe +
 3. measurement point illumination
 4. LEDs for voltage display
 5. LED for single-pole phase test
 6. LED for “!” warning voltage mode display
 7. LED for + DC voltage mode display
 8. LED for – DC voltage mode display
 9. LED for continuity
 10. Self-test switch(Autotest)
 11. Measurement point lighting Button
 12. Battery case
 13. LED for +DC voltage mode display
 14. LED for -DC voltage mode display
- (“13” LED add “14”LED for AC voltage mode display)



Explanations of Symbols

The voltage tester shows the following symbols:

	DC voltage
	AC voltage
	Phase display from 100 to 600V ~ 50/60Hz when used as a „single-pole“ phase tester.
	Continuity test symbol
	Negative DC voltage display
	Positive DC voltage display
	Device for work to be performed with voltage present
	Battery replacement symbol

Operation

1. Function test / Self test

- Test the voltage tester on a known source.
- The “!” LED will light on when there is a voltage over 50V, even if the battery is low or if the battery has been removed.
- Warning: To avoid electric shock, disconnect the test leads from any source of voltage before turn on the self-check test function.
- When press “Autotest” button, all voltage LEDs (4) will must be light on, and The continuity test’s LED (9) will light on, buzzer sound. This shows the tester self-test was done.

2.Voltage Test

- Connect both test probes with power source.
- As from a voltage of >12V the voltage tester switches on automatically.
- The voltage is displayed via LEDs.
- For AC voltages the "AC" LED is illuminated .
- For DC voltages the "-DC or +DC" LED is illuminated.
- The instruments are equipped with an LED row comprising: $\pm 12, 24, 36, 50, 120, 400, 690$ For DC voltage; 12, 24, 36, 50, 120, 400 for AC voltage. the polarity of the voltage displayed refers to the instrument test probe (+).
- Due to technical reasons the instrument cannot effectuate an automatic switch-on for DC voltages within the range of approx. 0V to $-/+8V$.

3. Single-pole phase Test

- The single-pole phase test is only possible when batteries are installed and in good condition.
- The single-pole phase test starts at an AC voltage of approx. 100V (pole >100V AC).
- When using single-pole phase tests to determine external conductors the display function may be impaired under certain conditions (e.g. for insulating body protective equipment on insulation locations).
- The single-pole phase testing is not appropriate to determine whether a line is live or not. For this purpose, the double-pole voltage test is always required.
- Connect both test probes with power source.
- The LED (5) is illuminated in the display.

4. Continuity Test

The continuity test is only possible when batteries are installed and in good condition. A signal sound is audible for continuity and the LED for continuity LED (9) is illuminated.

5. Rotary Field Indication

The voltage testers are equipped with a double-pole rotary field indicator.

The safety measures as mentioned in paragraph 2.0 have to be met.

The rotary phase indication is always active. The symbols R or L are always displayed. However, the rotary direction can only be determined within a three-phase system. Here, the instrument indicates the voltage between two external conductors.

Connect the instrument test probe with the supposed phase L2 and the handle test probe with the supposed phase L1.

The voltage and the rotary field direction are displayed.

R signifies that the supposed phase L1 is the actual phase L1 and the supposed phase L2 is the actual phase L2.

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

When re-testing with exchanged test probes the opposite symbol has to be illuminated.

6. Measurement Point Illumination

Voltage testers are equipped with a measurement point illumination feature. Thus, working under bad lighting conditions (e.g. division switch cabinets) is made easier.

Press button for measurement point illumination (11) on instrument.

7. Maintenance

When using voltage testers in compliance with the instruction manual, no particular maintenance is required. If functional errors occur during normal operating, our service department will check your instrument without delay.

8. Cleaning

Prior to cleaning, remove voltage test from all measurement circuits. If the instruments are dirty after daily usage, it is advisable clean them by using a damp cloth and a mild household detergent. Never use acid detergents or dissolvents for cleaning.

After cleaning, do not use the voltage tester for a period of approx. 5 hours.

9. Calibration Interval

the voltage testers must be calibrated periodically and checked by our service department at regular intervals to ensure the specified accuracy of measurement results. We recommend a calibration interval of one year.

10. Battery Replacement

If no signal sound is audible when short-circuiting the test probes, proceed with the battery replacement.

- Completely disconnect voltage tester from the measurement circuit.
- Remove discharged screw, battery cover and batteries.
- Replace by new batteries, two type "AAA" (UM4 R03) by respecting correct polarity.
- Close the battery cover and re-screw the screw.



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