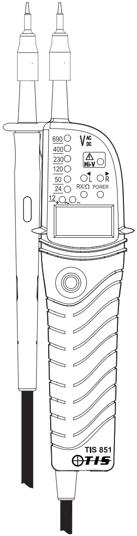
VOLTAGE TESTER



INSTRUCTION MANUAL

TIS 851

1. Features

- Self-Proving Test: Confirm the voltage indication function by all LEDs light up.
- AC and DC voltage tests up to 690V for Europe with LED and LCD(TIS 851)
- Polarity indication
- High voltage indication
- Phase rotation test
- Continuity test
- Auto-power ON/OFF
- Pen light for illuminating measurement points
- Probe clip for adjustable spacing between probes.
- IP64
- Compact design (Light weight and portable)
- Use thick wire H07RNF for Europe

2. Safety Warnings

This instruction manual contains warnings and safety rules which have to be noticed by the user to ensure safe operation of the instrument and to maintain it in safe condition. Therefore, read through these operating instructions before using the instrument .

⚠ **WARNING** is reserved for conditions and actions that are likely to cause serious or fatal injury.

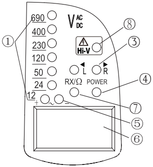
⚠ **CAUTION** is reserved for conditions and actions that can cause injury or instrument damage.

It is essential that the above instructions are adhered. Failure to follow the above instructions may cause injury,instrument damage and /or damage to equipment under testing.

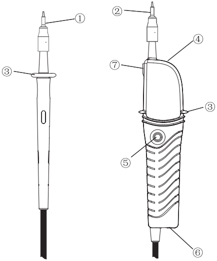
⚠WARNING

- Afert measuring AC/DC voltage source for 3 minutes, the tester must take a rest for 1 minute, Never make measurements on a circuit in which the electrical potential exceeds 690V. (When the measured voltage exceeds 690V, all the voltage display LEDS light up)
- Do not attempt to make measurement in the presence of flammable gasses, as the use of the instrument may cause sparking, which could lead to an explosion.
- Never attempt to use the instrutment if its surface or your hands are wet. (Do not use in rainfall.)
- Keep your hands and fingers behind the barriers during measurements.
- Never unlock and open the Battery case during measurements.
- Verify proper operation on a known source before taking action as a result of the indication.
- Never attempt to make any measurement in any abnormal conditions,such as a broken case or exposed metal parts are present on the instrument or test probes.
- Do not make any modification to the instru- ment.
- Extreme caution when *Live circuit* LED flashes or lights on.
- Correct indication of LEDs is only guaranteed within a temperature range of -10ºC up to 55ºC (<85% RH).

3. Instrument Layout



①.*12/24/50/120/230/400/690V LEDs* for European voltage indication
③. *L/R LEDs* for phase rotation test
④. *Power LED*
⑤. *Polarity indication LEDs* for voltage
⑥. LCD (only TIS 851)
⑦.Continuity test **/Live circuit LED**
⑧. Hight voltage indication ≥ 50V, ⚠ LED will light up

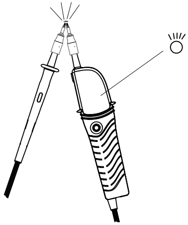


①. L1 probe -
②. L2 probe + (Instrument probe)
③. Barrier
④. Pen light
⑤. Pen light switch
⑥. Battery case
⑦. Probe clip

4. Preparation for Measurement

4.1 Self-Proving Test

- Please touch the two probes together and press the torch button (5); all LEDs shall light up, except the “HI-V” LED.
- Please do the “Self-Proving Test” before and after the measurements, which proves the instrument’s LED indication is function properly.
- All LEDs shall light up when battery is normal, except “HI-V” LED.
- LEDs will flash or go off when the battery voltage is below 2.4±0.1V.
- Following the description of Clause 7 to replace the battery.



⚠ WARNING

- Do not use the instrument when abnormal is found at Self-Proving Test.
- Instrument may turn on due to the influence of static charge.

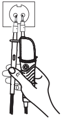
4.2 Trouble shooting

If any of the following problems occur, take off the “Battery Case” according to clause 7 in this manual; then lock it back after 5 seconds. Do the Self-Proving Test again (Clause 4.1).

- Self-Proving Test cannot be performed before or after the measurement.
- The instrument doesn’t turn off automatically after the Self-Proving Test or the measurement.

5. Single handed use

With the L1 probe on the probe clip, the user can change the spacing between probes with one hand.

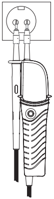


6. Measurement

> ### ⚠ WARNING
> - Carefully check Clause 2 as well.
> - Self-proving test should be done prior to measurements and confirm LED and buzzer works properly.
> - Before using a voltage detector with audible indicator at locations with a high background noise level, it has determined whether the audible signal is perceptible.
> - Verify proper operation on a known source before and after use.
> - Keep your hand and fingers behind the barriers on the probes during measurements.

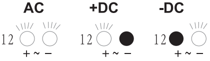
6.1 Voltage test (Double-pole test)

- ▶ Connect both probes to the object under test.
- ▶ The voltage is indicated by LEDs and LCD(only TIS 851).



Live circuit LED lights up:
⩾7V

- ▶ Voltage polarity is indicated in following manner.

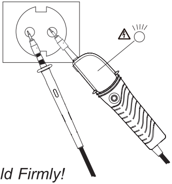


NOTE

- When the L2 probe + is the positive (negative) potential, the *Polarity indication LED* indicates "+DC" ("-DC").

6.2 High voltage indication

- ▶ Hold the instrument firmly and connect both probes to the object under test.
- ▶ Live circuit LED ⚠ lights up when a voltage of approx. 50V AC or more exists in the object under test.(Pol≥ 50V AC)

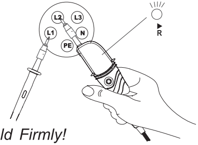


Hold Firmly!

6.3 Phase rotation test

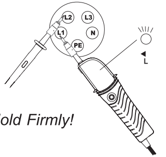
L LED and *R LED* for Phase roation test may operate on various wiring systems,but an effective testing result can be obtained only on Three phase system.

- ▶ Hold the instrument firmly and connect both probes to the object under test.(hold method shown as below fig)
- ▶ Phase-to-phase voltage is indicated by each Voltage LED.
- ▶ R LED indicates that the field is rotating towards the right direction of the "probe -". With this connection, the motor will go positive rotation.



Hold Firmly!

- ▶ L LED indicates that the field is rotating towards the left direction of the "probe -". With this connection, the motor will go negative rotation.



Hold Firmly!

The principle of measurement

The instrument detects the phase rising order in relation to the user to EARTH.

NOTE

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

6.4 Continuity test

> ### ⚠ WARNING
> **Make sure the object under test isn't live.**

The instrument operates as follows when measuring continuity.

- ▶ LED RX/Ω should be lighted,and the buzzer should sound continuously.

NOTE

In continuity mode the instrument works in the same way as the self-diagnostic test.

6.5 Pen light function

(Illuminating the Measurement Point)
Pen light illuminates the measurement point in dimly lit areas.

- ▶ Pressing the Pen light switch turns on the light.

NOTE

- The light is available while the instrument is powered off.
- Using the Pen light shortens the battery life.

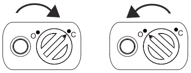
7. Battery Replacement

⚠ WARNING

- **Remove the probes from any testing point when opening the Battery case.**
- **Please use new battery.**
- **Mark sure there is no damage on the battery skin before inserting it into the tester.**

Batteries are dead when Power LED flashes or goes off at Self-diagnostic test defined in point 4.1.Follow the procedure below and replace batteries with new ones (type AAA 1.5 x 2pcs).

▶ Unlock the Battery case with a coin-shaped object.



Close Open

▶ Pull out the Battery case and replace the batteries.Insert new batteries according to the engraving on the Battery case.

▶ Insert the Battery case into the instrument and firmly lock the case again.

⚠ WARNING

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

8. Specification

Voltage Test	
Voltage Range	12~690V AC/DC
LED (TIS 851)	
Nominal Voltage	Europe: 12/24/50/120/230/400/690V
Tolerance (Threshold Voltage)	Light on at more than : 7±5V (12V LED) : 18±5V (24V LED) : 37.5±5V (50V LED) : 75%±5% of nominal voltage (120/230/400/690V LED)
Response Time	<0.5s at 100% of each nominal voltage
LCD	
Range/Resolution (Auto-range)	7~690V/1V
Accuracy(23±5℃)	±(3%+3) or 5V
Overrange indication	All voltage LED light up
Response Time	<1s at 90% of each voltage
Peak Current Is	<3.5mA (at 690V)
Internal Battery Consumption	Approx. 33mA (battery 3V, measuring 690V AC)
High voltage indication	
Voltage Range	50~690V AC
Phase rotation test	
System	Three phase system AC 50/60Hz
Phase Range	120±5 degree
Continuity test	
Detection Range	0~550kΩ
Test Current	Approx. 1.5μA (battery 3V, 0Ω)
Internal Battery Consumption	Approx. 30mA (battery 3V, 0Ω)
Reference condition	
Battery	3V(AAA 1.5V x 2pcs)
Temperature	-10~55ºC operation -20~60ºC storage No condensation
Humidity	max 85% RH
Used location	Altitude up to 2000m
Safety	
Standard category	EN 61243-3/ IEC 61243-3 EN 61010-1/ IEC 61010-1 CATIII 690V / CAT IV 600V
Pollution degree	2
IP code	IP64

9. Cleaning and Storage

⚠ CAUTION

- 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, high temperature and humidity or dewfall.
- Put the Probe protection cover on the Tips while not in use. Otherwise it may cause an injury.
- Remove batteries when the instrument will not be in use for a long period.
- Do not install the Battery Case without batteries.
- Please operate this unit strictly according to the manual instruction.

10. Safety Symbol

⚠ Always check proper operation of the device on a known working circuit before using.

Suitable for live working.

⚠ Caution, risk of electric shock. Under normal use, hazardous voltages may be present.

~ Alternating current.

≂ Both direct and altemating current.

11. Measurement Category

Category IV is for measurements performed at the source of the low-voltage installation.

Category III is for measurements performed in the building installation.

Category II is for measurements performed on circuits directly connected to the low voltage installation

12. Environment

- Do not dispose electrical appliances as unsorted municipal waste, use separate collection facilities.
- Contact your local government for information regarding the collection systems available.
- If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.
- When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposal at least for free of charge.

13. Ingress Protection (IP) Ratings

Ingress protection numbers are used to specirfy the environmental protection - electrical enclosure - of electrical equipment.

The IP rating normally has two numbers:
1. The first number - Protection against solid objects.
2. The second number - Protection against liquids.

IP64:

The instrument is totally protected against dust and against water sprayed from all directions.