

# **TIS 1830 Digital Insulation & Continuity Tester Instructions**

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## **1. Overview:**

TIS 1830 is a digital insulation test instrument which features a brand new design, combining a mass integrated circuit and digital circuit, parameter measurement of insulation resistance, low resistance and AC voltage is included. The instrument has functions which include higher accuracy, stable performance, and simple and reliable operation. It is designed to allow testing to BS7671 IEE 17<sup>th</sup> Edition Regulations & EN 61557-1-2-4-10. Conforming to EN 61010-1 3<sup>rd</sup> Edition, Category 111 600v, IP40 to EN60529, EN 61010-2-031 and EMC EN 61326-1.

## **2. Safety Warning**






Design, Manufacture & Operation of the instrument meets IEC61010 safety standard. This manual contains safety use and status of the instrument as well as warning and safety regulations which user must observe.

### **Warning: Read before using your Tester**

- To avoid possible electrical shock or personal injury, follow these instructions and use the unit only as specified in this manual.
- Do not use the unit or test leads if they appear damaged, or if the unit is not operating properly. If in doubt, have the unit looked at.
- Always use the proper function and range for measurements. When carrying out any test on insulation or continuity ensure there is no voltage present. This could cause injury or damage to your unit, which will not be covered by your warranty.

- Connect the test leads to the correct terminals when testing.
- Before rotating the function range selection switch, disconnect test probe from circuit under test.
- Verify the Tester's operation by measuring on a known voltage source for voltage measurement.
- Verify the Tester's operation by measuring on a known resistance source for resistance measurement. Or propriety Checkbox
- Do not apply more than the rated voltage, as marked on the Tester, between the test probe or between any test probe and earth ground.
- Do not use in distribution systems with voltages higher than 660V AC.
- Use the Tester with caution for voltages above 30 Vac rms, 42 Vac peak, or 60 Vdc. These voltages pose electrical shock hazards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing insulation resistance and continuity.
- Do not use the Tester around explosive gas or vapour
- When using the test probes, keep your fingers behind the finger guards.
- Do not touch the circuit under Test
- Before and after testing, verify there is no presence of hazardous voltage at the terminals
- Remove test leads from the Tester before opening the Tester's case or battery door.

### 3. Symbols

-  Caution ! Risk of electric shock.
- Caution ! Refer to the explanation in this Manual.
-  The equipment is protected by double insulation or reinforced insulation.
-  Do not use in distribution systems with voltages higher than 660 V.
-  Earth (Ground).
-  Battery
- Complies with European Directives.
- Do not dispose of this product as unsorted municipal waste. Contact a qualified recycler.

### 4. Technical Specifications

Accuracy;  $\pm$ (% of reading + LSD)

Maximum Display; 1999 count

Ambient Temperature;  $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$  ;

Operating Altitude;  $\leq 2000\text{M}$

Working Temperature;  $0^{\circ}\text{C} - + 35^{\circ}\text{C}$ ;

Relative Humidity;  $\leq 70\%$

Storage Temperature Range;  $0^{\circ}\text{C} - + 60^{\circ}\text{C}$

Battery; Alkaline, 6 x 1.5v, AA

Dimensions; (LxWxH) 161x102x70

Weight; 502g

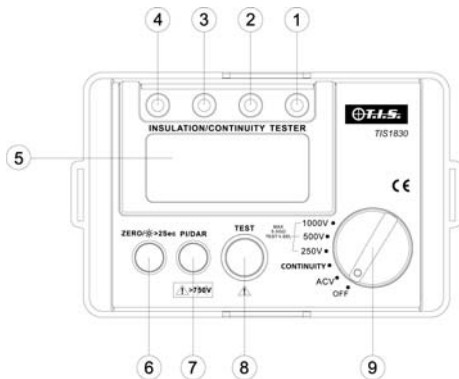
# TIS 1830 SPECIFICATION

Function	Range	Resolution	Accuracy	Tolerance	
Open-circuit voltage	250V	1V	0%~10%	250V	Instrument itself can generate the voltage
	500V	1V			
	1000V	1V			
Rated measurement current	1mA		0%~10%	250V	250V: Under 250K $\Omega$ 500: Under 500K $\Omega$ 1000V: Under 1M $\Omega$
	1mA				
	1mA				
Short-circuit current	about 2mA		For reference		LINE AND EARTH end of the high voltage output is short
Insulation Measurement	250	0.01M $\Omega$	0.00 M $\Omega$ ~99.9 M $\Omega$ : 3%+5 100 M $\Omega$ ~5.5G $\Omega$ : 5%+5	250V	<ol style="list-style-type: none"> <li>short-circuit current: about 2mA</li> <li>Less than 4M<math>\Omega</math>, buzzer alarm sound.</li> <li>The measuring range is as follows: 250V: 0.00 M<math>\Omega</math>-5.5G<math>\Omega</math></li> </ol>
		0.1 M $\Omega$			
		1 M $\Omega$			
	500V	0.01M $\Omega$			
		0.1 M $\Omega$			
		1 M $\Omega$			
	1000V	0.01M $\Omega$			
		0.1 M $\Omega$			
		1 M $\Omega$			

					500V: 0.00 M $\Omega$ -5.5G $\Omega$ 1000V: 0.00 M $\Omega$ -5.5G $\Omega$
Low $\Omega$ Measurement	200 $\Omega$	0.01 $\Omega$	$\pm(2\%+3)$	10V AC and 10V DC	short-circuit current: $\geq 200\text{mA}$
Voltage measurement Vac	750V AC	1V	$\pm(2\%+3)$	750V AC	1. input resistance: 10M $\Omega$ 2. min Voltage measureme nt: 30V 3. frequency: 50Hz/50Hz
DAR (DAR measurement)	1min insulation resistance/30s insulation resistance				
DAR (DAR measurement)	1min insulation resistance/15s insulation resistance				
PI (Polarization index measurement)	10min insulation resistance/1min insulation resistance				
Self-checking runction	Internal 10M $\Omega$ resistor				
Battery level indicator	When Battery voltage $\leq 7\text{V}$ the low voltage symbol display;				
Test lamp	When testing the insulation the test lamp is on.				
Backlight	Yes				

## **5. Front View of Instrument (See Front View of Instrument)**

- 1 Earth; Terminal for insulation measurement
- 2 G; negative jack for voltage measurement
- 3 V; positive jack for voltage measurement
- 4 Line; high voltage output for insulation resistance measurement
- 5 Lcd Display
- 6 Zero/ backlight
- 7 Conversion switch for absorption ratio and P.I. measurement
- 8 Test Button
- 9 Rotary Control Switch



Front View of Instrument






TIS 1830 LCD Display

## 6. Key and Rotary Switch Function (Cutter)

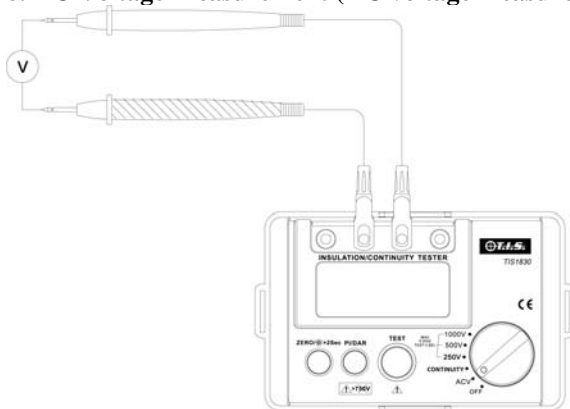
1. PI/DAR Polarization index measurement/ absorption ratio measurement
2. ZERO/LIGHT, open or turn off backlight, low resistance is zero;
3. TEST open or turn off insulation, low resistance measurement;
4. AC voltage measurement is carried out when cutter points to ACV;
5. Low resistance measurement is carried out when cutter points to CONTINUITY;
6. Insulation resistance measurement is carried out when cutter points to 250V/500V/1000V respectively  
(select the required output voltage);

## 7. Preparations before Measurement

After turning the instrument on, the LCD display indicates on the left side, the condition of the battery if the display indicates low voltages ( see symbol below) the battery must be replaced. Please replace with Alkaline 1.5v AA

Low voltage symbol	Battery voltage
	7V or even less

## 8. AC Voltage Measurement (AC voltage measurement figure)



## **Carrying out ACV Measurement**

- Use the proper function and range for measurements.
  - To avoid possible electrical shock, personal injury or damage to the tester, disconnect circuit power and discharge all high-voltage capacitors before testing resistance, diode capacitance and temperature.
  - Always connect the test leads to the correct terminals when testing.
  - Before rotating the function range selection switch, disconnect test probe from circuit under test.
  - Always test on a known circuit before carrying out any testing.
  - Do not use in distribution systems with voltages higher than 660V AC.
  - Use the Tester with caution for voltages above 30Vac, 42Vac peak, or 60Vdc.
- These voltages produce the risk of electrical shock, which may cause other risks, such as falling from a ladder etc.

## **Measurement of AC Voltage:**

1. Turn the rotary knob to AC V position
2. Use the V and G terminals for this test with the appropriate test leads.
3. The display will show the measurement of AC voltage.

## **Measurement of Continuity**

- Disconnect circuit power and de-energize the circuit before test.

- Do not measure continuity at live voltage circuit.
- Warning buzzer will sound when the tester detects a voltage of greater than 10Vac or dc. The display shows “Uext” and “warning symbol” Remove the test leads and isolate the voltage.

## **9. To carry out measurement of continuity:**

1. Turn the rotary knob to continuity position.
2. Use EARTH and G terminals for this test with test leads.
3. Before making a continuity measurement, use ZERO function to zero the test lead resistance.

## **To carry out test lead zeroing:**

- A: Connect the test leads to EARTH and G terminals and short-circuit the test leads using crocodiles and or probes.
- B: Press the TEST button (continuous measurement). The display will show the Resistance reading of your set of leads, including crocodile and or probes.
- C: Press the ZERO and hold the TEST button. Zeroing of your leads is complete when the display shows  $0.00\Omega$ , ZERO appears on display.

Note:

- The ZERO function can subtract up to  $10\Omega$  of lead resistance. Audio sound for lead resistance

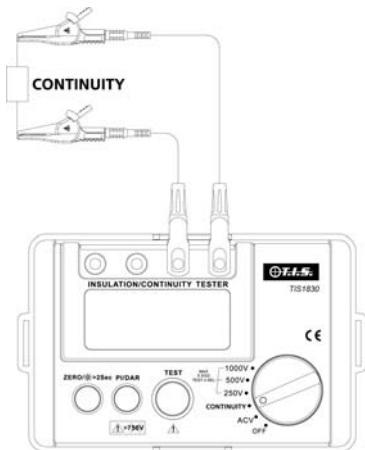
- Zeroing of your leads is advised to be repeated whenever you switch to the continuity function. Please re-check whenever you turn off or switch to another function.
- Zeroing of test leads with a resistance  $>10 \Omega$  is not possible.
- There is a buzzer warning sound
- Display retains measured test lead resistance, the ZERO annunciator will not appear on the display.

#### 4. Press TEST button (continuous measurement)

The primary display shows the continuity resistance.

The secondary display, smaller digits on the right hand side, will show the actual output of DC voltage.

The buzzer threshold is  $\leq 20$  ohms with the (audio) displayed on the screen



Low resistance measurement chart

## Safety warnings prior to carrying out Insulation Measurements

- Disconnect power to the circuit under test and de-energize the circuit before test.(Capacitors etc.)

- Do not measure insulation on a live voltage circuit.
- When measuring insulation resistance, make sure the two test leads are separated and are not crossed together.
- Do not short circuit the two test leads during output of DC, the voltage is presents at the output terminals
- Do not attempt to touch the circuit under measurement. Warning symbol on the display will indicate a hazardous output voltage is present at the terminals.
- When the measurement is completed, do not touch the circuit as the circuit may store energy, which may cause an electric shock. Allow time for the circuit to discharge or discharge the circuit (capacitors) after the measurement.

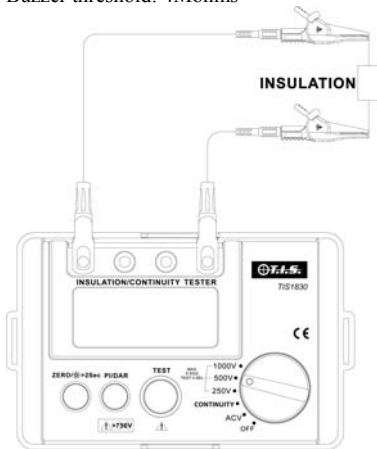
### **How to measure insulation resistance:**

1. Turn the rotary switch to 250V or 500V or 1000V position as required.
2. Use LINE and EARTH terminals for the test with test probes or crocodile clips connected to the circuit under test
3. Press TEST button to begin insulation resistance test. TEST button will hold for continuous measurement. Red warning light on TEST button indicates the presence of hazardous voltages at the terminals.

The primary display shows the insulation resistance reading

The secondary (smaller digits on the right side) display indicates the actual output DC

voltage that was present during the actual test.  
Buzzer threshold: 4Mohms



Insulation Resistance Measurement Chart





self-checking

### ● Polarization index measurement

In insulation measurement mode, select polarization index measurement by PI/DAR key, press this key once means selecting polarization index measurement, screen display Time1(1min)/Time2 (10min), press TEST key means insulated polarization index measurement.

## ●Absorption ratio measurement

In insulation measurement mode, select absorption ratio measurement by PI/DAR key, press this key twice means selecting absorption ratio measurement, screen display Time1 (30s)/Time2 (1min), press TEST key means insulated absorption ratio (1) measurement model; press this key three times means selecting polarization index measurement, screen display Time1 (15s)/ Time2 (1min), press TEST insulation absorption ratio (2) mode measurement.


## 11. Battery Replacement (See Below)

Danger

To avoid possible electric shock, remove all test leads from the instrument, before replacing the battery.



Caution When replacing the batteries

- \* Do not mix old and new batteries, replace all old batteries with new batteries
- \* Please note battery polarity when install new batteries.
- \* When you insert the new batteries, roll the batteries using your hand to ensure contact
- \* Do not make any measurement when the battery compartment is open.
- \* When the symbol “” appears on the LCD, it means that the batteries must be replaced. Please follow the steps below:

(1) Turn off the power (move rotary knob to OFF), and re move all test leads that are connected to the tester.

(2) Loosen screw on battery box, move the cover, and replace all of the batteries.

(3) After replacing the batteries, make sure the screw is secured.

## **12. Maintenance and Repairing**

Clean the surface with clean water and soft cloth or sponge.

To avoid damage to test instrument, do not put it in water.

If the instrument is wet, dry it before storage.

Other than replacing the batteries, all other remedial work must be carried out by an Authorised Repair Center or returned to an Authorised Distributor. Any repair or remedial work carried out by any “other person or persons” will void your guarantee

### **13. Limited Guarantee and Limitation of Liability**

Your Unit will be guaranteed free from defects in material and workmanship for 1 year from the date of purchase, unless local laws require otherwise. You can extend your guarantee period to 2 years,

for free, providing the unit is calibrated by Test Instrument Calibrations at the end of the 1st year

This guarantee does not cover fuses, batteries, test leads or damage from accident, neglect, misuse, alteration, contamination, or

other conditions of operation or handling. Our distributors are not authorised to extend any

guarantee on our behalf. To obtain service during the guarantee period, return the product with proof of purchase to your distributor. this guarantee is your only remedy.

all other guarantee - whether express, implied or statutory - including implied guarantees of fitness for a particular purpose or merchantability, are hereby disclaimed. manufacturer shall not be liable for any special, indirect, incidental or consequential damages or losses, arising from any cause.

### **Repair**

All units that are returned for guarantee or non-guarantee repair or for calibration should be

Returned to your local distributor with the following: your name, company's name, address, telephone number, and

proof of purchase. Additionally, please include a brief description of the problem or the

service

that you need and include the test leads with the unit. For units out of guarantee you may be required

to pay for the repair before the work will be carried out.

Under Guarantee Repairs and Replacement

Please read the guarantee statement and check your battery and fuses before requesting repair. During the

guarantee period any defective unit can be returned to your distributor.

Printing errors are accepted

P/N:110401104084