Electrical Safety Tester

Intelligent Electrical Safety Comprehensive Tester
TES-9900 & TES-9800 Series

Product description:

TES-9900/9800 series is a new generation of electrical safety performance comprehensive analysis/tester series instruments launched by TESSIO Technology. The products have the following features high speed, high accuracy and informatization, suitable for intelligent production line with fast-pace, hybrid, automation and informatiozation system.

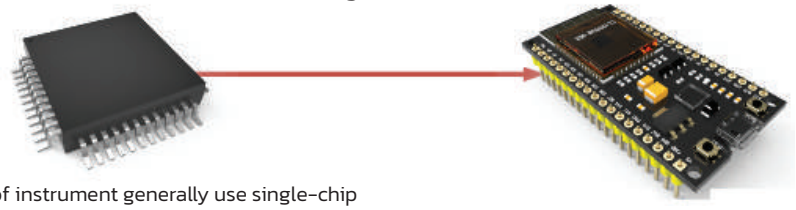
Features

- TES-9900/9800 series is a new generation of electrical safety comprehensive tester have characteristics AC and DC withstand voltage, insulation resistance, ground conduction resistance, resistance value, leakage current, operating power, low voltage start, arc detection, open circuit detection, etc.
- There are multiple specifications such as single & three-phase, multi-channel and built-in power supply, applied to different industries such as communication, computer, consumer electronics, medical treatment, photovoltaic, new energy vehicles, power batteries, household appliances, commercial air conditioning, commercial kitchenware, lamp lighting, switching power supply, power electronics, motor marta, rail transit, aerospace, quality supervision and measurement, testing and certification, etc.
- Regulatory compliance: Designed in accordance with the specific provisions of the electrical safety test in GB/IEC/UL and other relevant regulations, relying on the team's years of industry experience, simple /practical.
- Powerful performance: high precision, 1% basic accuracy; touch color screen + mechanical key dual operating system, ARM processor, main frequency 480MHz, fast speed, large capacity, high resolution and rich interfaces.

Provide the most professinal test solutions

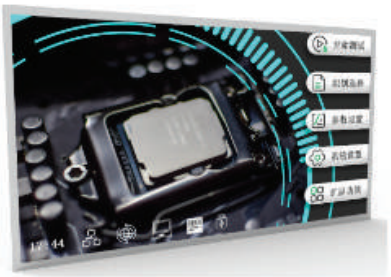
Innovation make testing easier

Compared with the previous generation of safety testers and other traditional instruments, based on the principle of being smaller, lighter, more fashionable, and more in line with customer needs, TES-9900/9800 series is completed in terms of high density, small size, high performance, strong experience and long life. A series of innovations make testing easier.



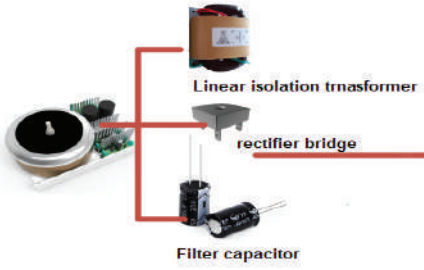
The previous generation of instrument generally use single-chip microcomputers or low-end ARM chip, mian frequency <200MHz. In-chip resource are scarce, slow speed few peripherals

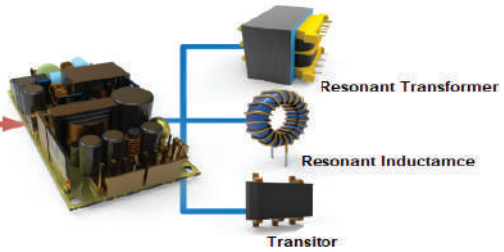
The TES-9900/9800 series adpots the new Cortex-M7 Industrial ARM Processor, Main frequency upto 480MHz, stroage space nearly a hundred times larger, rich in resources and strong perfermance



The previous generation of ssafety comprehensive testers generally is low scores. The LCD screen is small size with a single color and a small wiewing angle, which brings inconvenience to use.

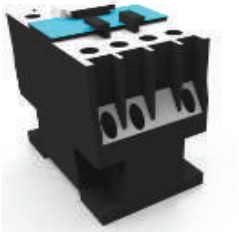
TES-9900/9800 series adpots and a new 7-inch capacitive touch screen, high-definition full colour, easy to learn and use.





Traditional safety gauges use linear power supply isolation and pressure regulation, low efficiency, large volume, serious fever.

TES-9900/9800 series adpots high-frequency resonant tranformer to achieve isolation voltage change, no switching noise, small volume

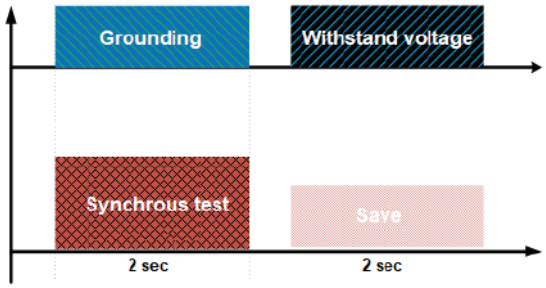


Traditional safety gauges use AC contracts as switching devices, which do not meet the voltage level requirement of high voltage tests. The mechanical life is limited, the noise is high and the maintenance cost is high.

TES-9000 series adpots a new switching original abandoning the AC contactor, which is smaller in size and noise.

Synchronous test of withstand voltage and ground resistance

TES-9900/9800 series built-in bi-amp technology outputs high voltage and high current synchronously, realizing the simultaneous test of ground on-resistance and AC/DC withstand voltage. As shown in the figure on the right, it can effectively save test time and solve the speed bottleneck.

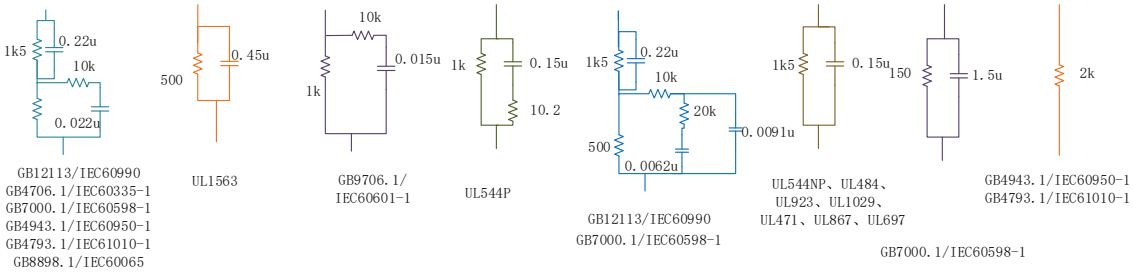


Open and short circuit protection function

TES-9900/9800 series uses low-voltage, high-frequency and non-destructive technology to increase the output voltage frequency while reducing the voltage level. It detects the cross-sectional capacitance of the measured object. It can complete the open circuit and short-circuit judgment of the output terminal within 0.1s, effectively solving the actual situation of the measured object The leakage current is relatively small and the short-circuit state is not suitable for high-voltage destructive testing.

Multi-network contact leakage current test

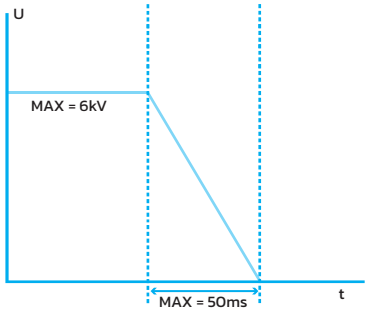
TES-9000 series can have up to 8 built-in simulated human networks, which meet the regulatory requirements shown in the figure below.



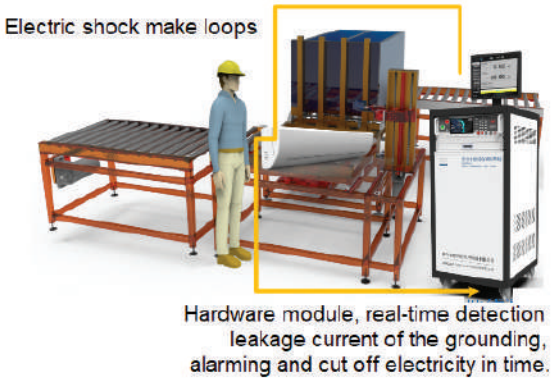
DC Withstand voltage rapid discharge function

To ensure the safety of testers, TES-9900/9800 series has a built-in residual voltage discharge function, which can complete the rapid discharge of the measured object, especially the capacitive component, within 50 milliseconds. At the same time, in order to solve the problems of sparking arcing and discharge life that are prone to occur during the discharge process.

TES-9900/9800 series has a built-in arc extinguishing device and a precision timing frequency conversion discharge module to ensure the safety of testers while ensuring the life of the instrument.



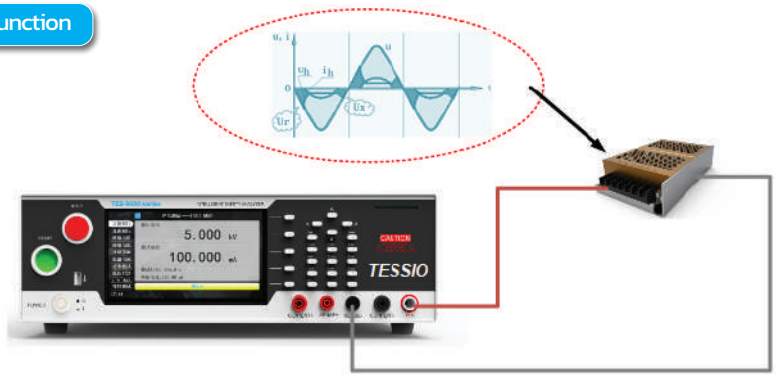
Leakage fast power-off protection



The high voltage test is dangerous to the operator. TES-9900/9800 series has a built-in leakage protection mechanism. When the user gets an electric shock, the leakage current detection will be completed within millisecond and the voltage output will be cut off immediately to ensure safety.

The instrument adopts hardware detection, fast speed, high stability and optional function chec module.

Arc detection function



Arc is a self-sustained discharge phenomenon caused by high voltage inside or on the insulating material. TES-9000 series can not only judge the discharge according to the arc level, but also record the discharge waveform under a certain frequency band.

Information interface function

Support USB barcode gun, realize the functions of scanning code start, data storage, barcode binding, information upload and so on. After the scan code is started, the test data will be automatically matched with the current bar code, and the currently required test program can be queried according to the identification field set by the user, automatically retrieved and completed the test and data storage.

Built-in spot check calibration module (Optional)

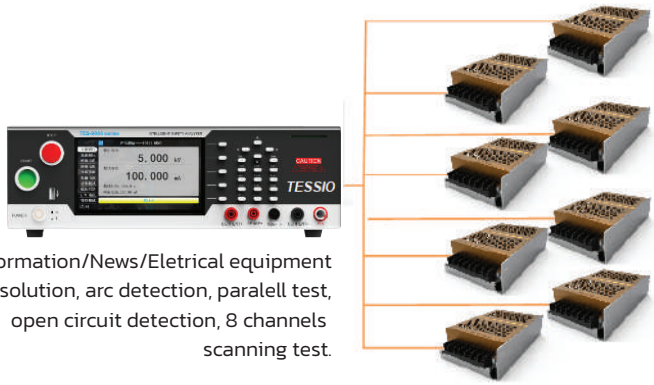
Many companies require that the use of equipment be checked every day when it is turned on. However, the general inspection device and the record sheet are separate from the test instrument, and multiple wiring and handwritten records need to be completed when used. TES-9000 has a built-in inspection module, which can complete the accuracy inspection of the measurement level, complete the self-inspection diagnosis of the equipment status and accuracy status and store the inspection data internally. Users can complete data export through LAN port or U disk

Serial number	Check item	Description
1	Function self-test	Complete the self-check on the functional integrity of the internal modules of the instrument, such as the main control circuit, power amplifier circuit, high voltage circuit, switching circuit, etc., and the function of the output circuit module is qualified/failed
2	Precision check	Complete the self-check of the output accuracy of the test function of the instrument, such as withstand voltage current accuracy, insulation resistance accuracy, ground conduction resistance accuracy, etc., output the check value of the corresponding test function, and store it in the internal unit, which can be retrieved by date later.

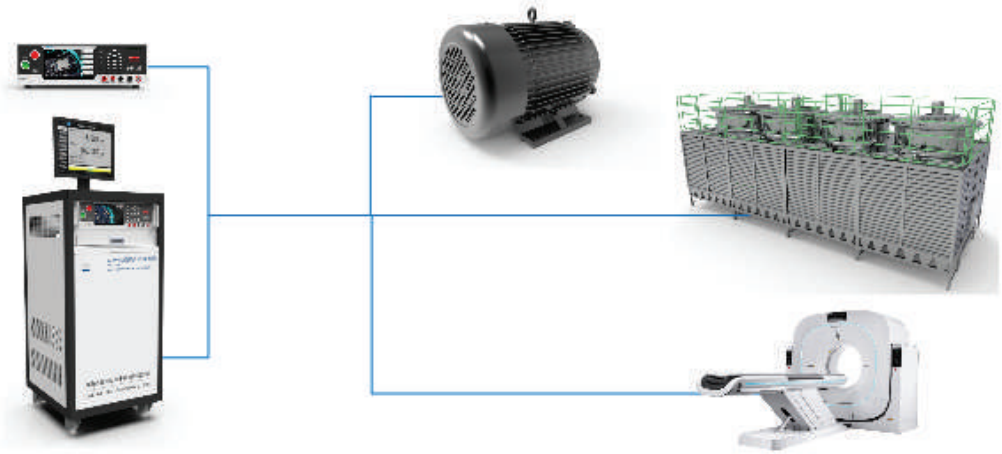
Electrical safety performance comprehensive test solution

TES-9900/9800 series provides professional test solutions for different industries, with the following characteristics:

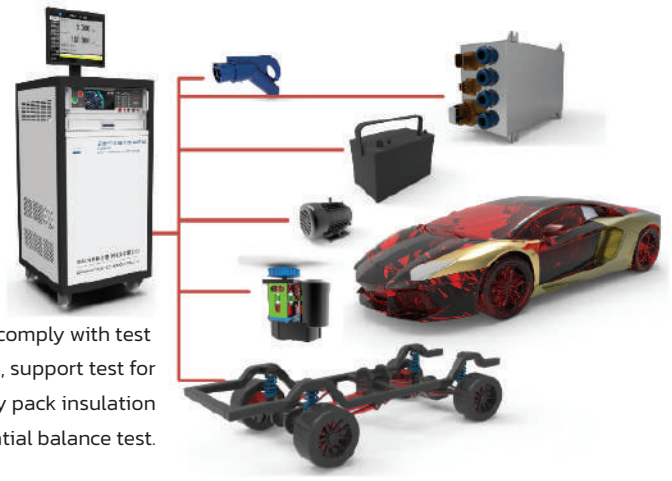
- Mature solutions: Relying on years of industry experience and legal interpretation, whether it's a laboratory or a production line, national or European standards, standard testing requirements or customized special requirements, the HEX series provide targeted mature solutions.
- Independent development: A series of test solutions, whether it is embedded development, mechanical design, electrical design, process, industrial design, and upper computer software, are all independently developed by our company and have independent intellectual property rights.
- Excellent performance: Based on digital development ideas, the CPU of HEX products has exceeded 400MHZ, which is much higher than the current industry's 100MHZ level; the double insurance combination of touch screen and mechanical keys is easy to learn and use, and adapt to the needs of different occasions.
- Stable and reliable: On the basis of perfect electrical protection functions, a 30% design margin is provided in the design plan for stresses such as high temperature, high humidity, and vibration.



Information/News/Eletrical equipment test solution, arc detection, paralell test, open circuit detection, 8 channels scanning test.



Big power 1/3 phase safety comprehensive test solution, comply with the test requirements in standard GB4706-2005. Suitable for 1/3 eletrical appliance. There are 2 types: desktop and cabinet version, basic accuracy is 1%, capacity is 30kVA, can be up to 120kVA.



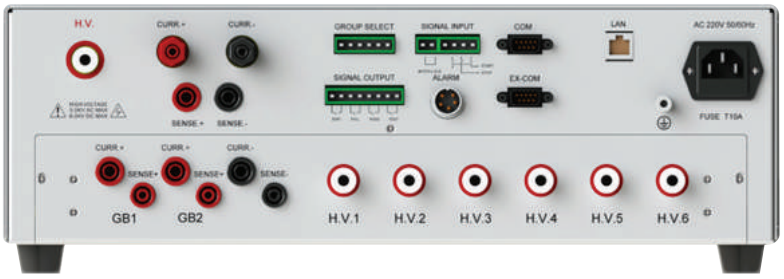
New energy vehicles test solution, comply with test requirements in GB/T 18384-2015, support test for whole vehicle insulation test, battery pack insulation test, potential balance test.

Function differentation of serialized models

TES-990X series
Front panel

Bench-top & Desktop-type series

TES-990X series
Rear panel

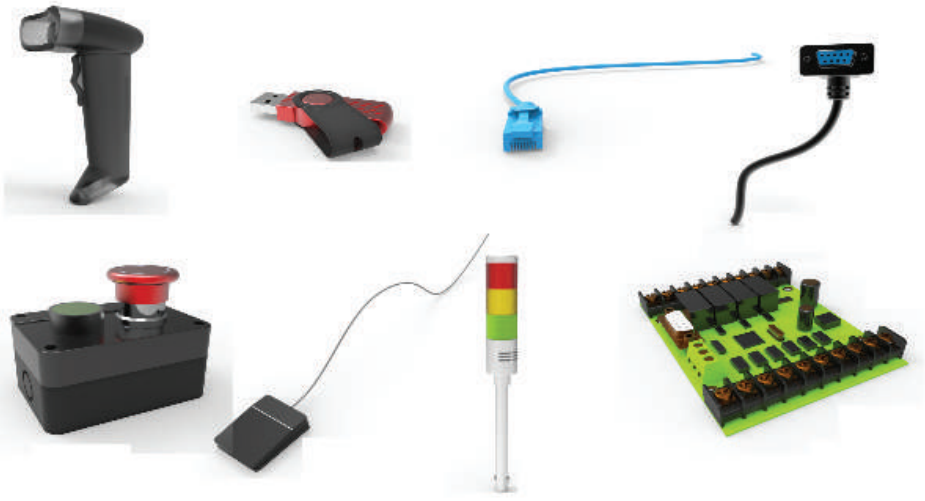


TES-98X0 series
(without Computer)

Cabinet-type series

TES-98X1 series
(with completed Computer)

Extention functions:



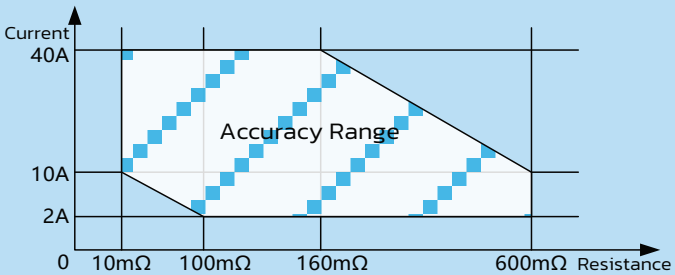
Ordering Information

Safety Analyzer Series	TES-9901	TES-9902	TES-9903	TES-9904	TES-9905
AC and DC withstanding voltage	●	○	○	●	●
Insulation resistance	●	○	○	●	●
Ground conduction resistance	○	○	●	●	●
Leakage current	○	●	○	○	○
Multi-channel scanning	○	○	○	○	●
Synchronous test of withstand voltage and ground resistance	○	○	○	●	●
Arc detection	●	○	○	●	●
Open and short circuit detection	●	○	○	●	●

Desktop Safety Analyzer Series	TES-9910	TES-9920	TES-9930	TES-9940
AC and DC withstanding voltage	●	●	●	●
Insulation resistance	●	●	●	●
Ground conduction resistance	●	●	●	●
Leakage current	●	●	●	●
Power test	●	●	●	●
Starting current	●	●	●	●
Three-phase leakage current	○	○	●	○
Three-phase power test	○	○	●	○
Multi-channel scanning	○	○	○	○
Eight kinds of human body networks contain medical leakage current	○	○	○	●
Protective conductor current	○	●	○	●
Standby power consumption	○	●	○	●
Built-in 500VA power supply	○	●	○	●
Synchronous test of withstand voltage and ground resistance	●	●	●	●
Arc detection	●	●	●	●
Open and short circuit detection	●	●	●	●

Cabinet Safety Analyzer Series	TES-9810	TES-9820	TES-9830
AC and DC withstanding voltage	●	●	●
Arc detection	●	●	●
Ground conduction resistance	●	●	●
Insulation resistance	●	●	●
Leakage current	Single phase	Single phase	Single phase Three phase
Power test	Single phase	Single phase	Single phase Three phase
Starting current	●	●	●
Protective conductor current	○	●	○
Standby power consumption	○	●	○
Capacity of built-in power supply/Isolation transformer	5kVA Frequency Power	5kVA Frequency Power	30kVA Isolation transformer
Synchronous test of withstand voltage and ground resistance	●	●	●
Arc detection	●	●	●
Open and short circuit detection	●	●	●

Specifications

Model	TES-9900 & TES-9800 Series
AC withstanding Voltage Test	
Rated Output Capacity	5000V/100mA, short circuit current greater than 200mA ***Optional : 5kV/200mA, 10kV/40mA, 20kV/20mA***
AC Voltage Output	Range : 100 ~ 5000V, Resolution : 1 V, Accuracy : ±(1% x setting + 5V)
AC Voltage Source/ Measurement	Range : (0.100 ~ 5.000) V, Resolution : 0.001 kV, Accuracy : ±(1% x reading +5 counts)
Output Frequency	50Hz/60Hz, accurancy : ±0.1Hz
Output Regulation	±(1% x setting +2V), From no load to full load and low line to high line
Waveform Distortion	Sinusoidal wave, <2% (resistive load)
AC Current Measurement	Ramge : 0.010 ~ 100.0mA, Resolution : 0.001/0.01mA, Accuracy : ±(1% x reading + 5 counts)
Ramp Up / Down Timer	Range : 0.1s ~ 999.9s, 0 = Closed, Resolution : 0.1s, Accuracy : ±(1% x setting + 1 counts)
Test Timer	Range: 0, (0.5 ~ 999.9)s, 0 = continous,, Resolution : 0.1s, Accuracy : ±(1% x setting + 1 counts)
Arc Detection	1 ~ 9 (9 is the most sentitive), 0 means arc off function
Offset Current	0.000~100.0mA (Imax), total test current + Offset current < 100mA, Automatic or manual
DC withstanding voltage Test	
Rated Output	6000V DC/ 20mA **Optional : 10kV/10mA/ 20kV/5mA**
DC Voltage Output	Range : 100 ~ 6000V VDC, Resolution : 1V, Accuracy : ±(1% x setting + 5V)
DC Voltage Measurement	Range : 0.100 ~ 6.000 kVDC, Resolution : 1V, Error : ±(2% x reading + 5counts)
Output Ripple	<2% (6kV/1mA resistance load)
Output Regulation	±(1% x setting +2V), From no load to full load and low line to high line
DC Current Measurement	Range : 0.0 ~ 350.0/300 ~ 3500μA/3.00 ~ 20.00mA, Resolution : 0.1/1/10μA, Accuracy : ±(2% x reading +5 conuts)
Ramp up / down Timer	Range : 0, (0.4 ~ 999.9)s, 0 = continous, Resolution : 0.1s, Accuracy : ±(1% x setting + 1 counts)
Test Time	Range: 0, (0.5 ~ 999.9)s, 0 is infinite, resolution 0.1s, Error : ±(1% x set value + 1 word)
Arc detection	1 ~ 9 (9 is the most sentitive), 0 = closed
Offset Current	0.000 ~ 20.00mA, Total test current + offset current <20mA, Automatic or manual
Max Capacitive Load	1uF < 1kV, 0.75uF < 2kV, 0.5uF < 3kV, ~,08uF < 4kV, 0.04uF < 5kV
Insulation Resistance Test	
Rated Output	2500V DC / 200GΩ
DC Voltage Output	Range : 100 ~ 2500V DC, Resolution : 1V, Accuracy : ±(1% x setting +5V)
DC Voltage Measurement	Range : 100 ~ 2500V DC, Resolution : 1V, Accuracy : ±(1% x setting +5V)
HI-Limit/LO-Limit Resistance Setting	Range : 1.00MΩ ~ 200000MΩ, HI-Limit : (Included no HI-Limit setting)
Insulation Resistance Measurement	Range : 0.100MΩ ~ 200GΩ, Resolution : 0.001MΩ/ 0.01MΩ/ 0.1MΩ/ 0.001GΩ/ 0.01GΩ Accuracy : 100V ~ 499V : 0.100MΩ ~ 2.000GΩ, ±(5% x reading +2 counts) 500V ~ 2500V : 0.100MΩ ~ 999.9MΩ, ±(2% x reading +2 counts) : 1.000GΩ ~ 9.999GΩ, ±(5% x reading +2 counts) : 10.00GΩ ~ 200.0GΩ, ±(10% x reading +2 counts)
Ramp up / down Timer	Range : 0, (0.1 ~ 999.9)s, 0 = closed, Resolutio : 0.1s
Ground Bond Resistance Test	
Rated Output	Maximum output current 40A, Maximum resistance range 600mΩ, Open circuit voltage <12V ***Optional : 64A, 100A, 130A***
Output Current	Range : 2.0 ~ 40.0A, AC or DC, Resolution : 0.1A, Accuracy : ±(1% x setting + 2 counts)
Current Fluctuattion	≤0.4% x setting / minute
Output Voltage	Range : 3.0 ~ 12.0V, AC or DC, Resolution : 0.1V, Accuracy : ±(1% x setting +2 counts), In open cicuit condition
Output Frequency	50Hz/60Hz, Accurancy : ±0.1Hz
Resistance Measurement	 Range : 10.0 ~ 99.9mΩ, 100 ~ 600mΩ, Resolution : 0.1/1mΩ Measurement Accuracy : <100mΩ, ±(1% x Setting + 1mΩ) ≥ 100mΩ, ±(1% x Setting + 2 counts)
Resistance Offset	0 ~ 200mΩ
Test Time	Range : 0, (0.5 ~ 999.9)s, (0 = continous), Resolution : 0.1s, Accuracy : ±(1% x setting +1 counts)
Touch/Leakage Current Test	
Test Method	Support in Normal working state (Dynamic leakage) and Single failure state (static leakage)
Test Power Supply State	Test power supply Switch : ON / OFF /Auto Test power supply Ground Switch : ON / OFF Test power supply Neutral Line connect switch : ON /OFF
Built-in Measuring Device (MD)	Figure 4 in GB/T 12113 is the main network; Optional built-in 8 different Standard of human body impedance simulation network, customized dedicated network, can meet all regulation and standards
Test Volatge Measurement	Range : 0.0 ~ 300.0V DC, 45 ~ 65 Hz, Accuracy : 20.0V ~ 300.0V, ±(0.4% x reading + 0.1% x raange)
Load Currrent and Power	DC 20A/6kVA Max, Single-phase : 40A/10kW AC Max, Three-phase : 120A/30kW AC Max ***Optional: 60kVA, 90kVA, 120kVA***

Model	TES-9900 & TES-9800 Series
Touch/leakage Current Measurement (Effective Value / Peak value / AC component / DC component)	Range : 0.0 ~ 999.9μA / 1000 ~ 7999μA / 8.00 ~ 20.00mA ***Optional : 100.0mA*** Accuracy : DC, ±(1.5% x reading +10 counts); 15Hz ≤ f ≤ 100kHz, ±(1.5% x reading +10 counts); 100kHz ≤ f ≤ 1000kHz, ±5% x reading
Touch Current Offset	Range: 0.000 ~ 1.000mA, Automatic measurement, can be turnd on or off
Test Time	Range: 0, (1 ~ 999.9)s, 0 = continous, Resolution : 0.1s, Accuracy : ±(1% x setting + 1 counts) When the test mode is AUTO (G-L, G-N), half the time
DC Input Imdedance	2kΩ±1% (GB12113 figure 4)
Input Impedance	≤100kHz: 5%; >100kHz : 10%
Frequency Response	The accuracy is the same as that of current meansurement
Power Run Test	
Alarm function	Power HI-Limit/LO-Limit alarm ***Optional : Voltage/Current/Power factor alarm switch***
Power HI-Limit/LO-Limit Setting	Range : Single-phase 0.00W ~ 10.00kW, Three-phase 0.00W ~ 30.00kW, Resolution : 0.01W / 0.1W / 1W, Accuracy : ±(0.1% x setting + 0.1% x range)
Active Power Measurement	Range : Single-phase 0.1W ~ 10.00kW, Three-phase 0.1W ~ 30.00kW, Resolution : 0.01W / 0.1W / 0.001kW Accuracy : PF > 0.5 : ±(0.1% x reading + 0.1% x range) PF ≤ 0.5 : ±(0.4% x reading + 0.1% x range)
Voltage HI-Limit/LO-Limit Setting	Range : 0.00 ~ 300.0V, Resolution : 0.011V / 0.1V Accuracy : ±(0.1% x setting + 0.1% x range), 45Hz ≤f ≤ 65Hz
Volatge Measurement	Range : 5.00 ~ 300.0V, Crest factor : ≤1.6, Resolution : 0.01V / 0.1V Accuracy : ±(0.1% x setting + 0.1% x range), 45Hz ≤f ≤ 65Hz
Current HI-Lomit/LO-Limit Setting	Range : Single-phase 0.00mA ~ 40.00A, Three-phase 0.00mA ~ 120.0A, Resolution : 0.01mA / 0.1mA / 0.001A, / 0.01A Accuracy : ±(0.1% x setting + 0.1% x range),45Hz ≤f ≤ 65Hz
Current Measurement	Range AC: 0.030 ~ 3.999A / 4.00 ~ 40.00A, Crest factor : ≤1.6 Resolution : 0.01mA / 0.1mA / 0.001A, / 0.01A Accuracy : ±(0.1% x setting + 0.1% x range),45Hz ≤f ≤ 65Hz
Power factor HI-Limit/LO-Limit Set	Range : ±(0.001 ~ 1.000), Resolution : 0.001, Accruacy : ±0.01
Power factor Measurement	Range : ±(0.001 ~ 1.000), Resolution : 0.001, Accruacy : ±0.01 Accuracy : ±0.01 (The volatge/current amplitude is greater than 10% of the corresponding range)
Frequency Measurement	Range : 45.00Hz ~ 65.00Hz, Resolution : 0.001Hz, Accuracy : ±(0.1% x reading)
Test Time	Range: 0, (0.5 ~ 999.9)s, 0 is continuous, Resolution 0.1s, Accuracy : ±1% x setting + 1 count)
Low Voltage Start Test	
Current HI-Limit/LO-Limit Setting	Range : Single-phase 0.00A ~ 40.00A, Three-phase 0.00A ~ 120.00A, Resolution : 0.01A, Accuracy : ±(0.1% x setting + 0.1% x range)
Voltage Measurement	Range : 5.00 ~ 300.0V, Crest factor : ≤1.6, Resolution : 0.01A Accuracy : ±(0.1% x setting + 0.1% x range), 45Hz ≤f ≤ 65Hz
Current Measurement	Range : 0.02 ~ 40.00A, Crest factor : ≤1.6, Resolution : 0.01A Accuracy : ±(0.1% x setting + 0.1% x range), 45Hz ≤f ≤ 65Hz
Test Time	Range: 0, (0.5 ~ 999.9)s, 0 is continuous, Resolution 0.1s, Accuracy : ±1% x setting + 1 count)
General Specifications	
Installation Position	Indoor, altitude not higher than 2000m
Usage Environment	Temperture : 0 ~ 40 °C, Humidity : 40 °C (20 ~ 90)%RH
Storage Environment	Temperture : -10 ~ 50 °C, Humidity : 50 °C, 90%RH, 24h
Input Power	AC 220V±10%, 50Hz±5%, 10A
External Dimension (mm)	Desktop host 430(W) x 132(H) x 470(D)
Weight	Desktop host about 25kg.

Ordering Information

TES-990X : Bench-type, Single & Multi-function Electrical Safety Tester for Single-phase DUT (Device Under Test)

TES-99X0 : Desktop-type, 8 in 1 Electrical Safety Comprehensive Tester for Single-phase and/or Three-phase DUT (Device Under Test)

Remark: Can be customized as a customer requirement

TES-9810 : Cabinet-type, Single-phase Electrical Safety Comprehensive Tester with 5kVA AC Source

TES-9820 : Cabinet-type, Single-phase Electrical Safety Comprehensive Tester with 5kVA AC Source (phpl test for LC)

TES-9830 : Cabinet-type, Single & Three-phase Electrical Safety Comprehensive Tester

TES-98X1 : Cabinet-type, Single & Three-phase Electrical Safety Comprehensive Tester included Computer

Remark: Can be customized as a customer requirement

Standard Accessories :

- User Manual
- Power Cord
- Tower Lamp
- Test box set with cable 2m
- Remote Control
- Test Report
- Foot Switch

Optional Accessories :

- Opearation Software
- AC Power Supply for 1/3 phase load for TES-9831