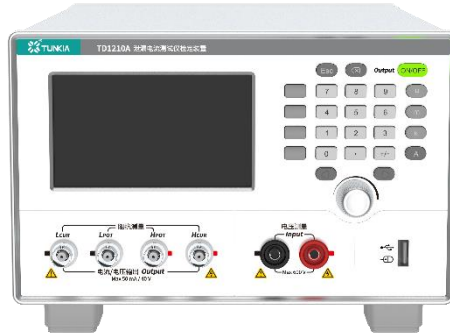


TD1210A Leakage Current Tester Verification Device



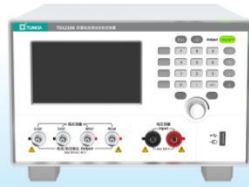
1. Summary

TD1210A leakage current tester Verification device refers to JJG 843-2022 *Leakage Current Tester* and JJG 1188-2022 *Medical Leakage Current Testers* (Tunkia participated in drafting of these two regulations). It integrates a wideband constant current standard source, constant voltage standard source, DC resistance meter, impedance tester, and AC voltage standard meter. A single device can complete the verification of conventional leakage current testers, touch current testers, and medical leakage current testers. Compared to traditional multi-standard instrument solutions, it offers advantages such as simplified wiring, easy operation, and high testing efficiency, making it highly convenient for on-site traceability work.

2. Feature

- Wideband constant current output: $2\ \mu\text{A} \sim 21\ \text{mA}$.
- Wideband constant voltage output: $0.5\ \text{V} \sim 25\ \text{V}$.
- Current source frequency: DC, $10\ \text{Hz} \sim 3\ \text{kHz}$;
- Voltage source frequency: DC, $10\ \text{Hz} \sim 1\ \text{MHz}$.
- Sweep frequency test function of impedance network to measure DC resistance and AC impedance.
- AC voltage measurement: $0.01\ \text{V} \sim 600\ \text{V}$.
- Large-size LCD touch color screen, combined with digital keys, very convenient to operate.
- Small size, light weight, easy to carry.

3. Application



TD1210A Leakage Current Tester Verification Device

- Provincial and Municipal Metrology Institutes
- Third-party Calibration Companies
- Enterprise Metrology Centers



Reference Standard:

JJG 843-2022

JJG 1188-2022



Medical/Non-medical Leakage Current Testers

- Home Appliance Manufacturers
- Medical Device Manufacturers
- Instrument Manufacturers
- Electrical Research Laboratories



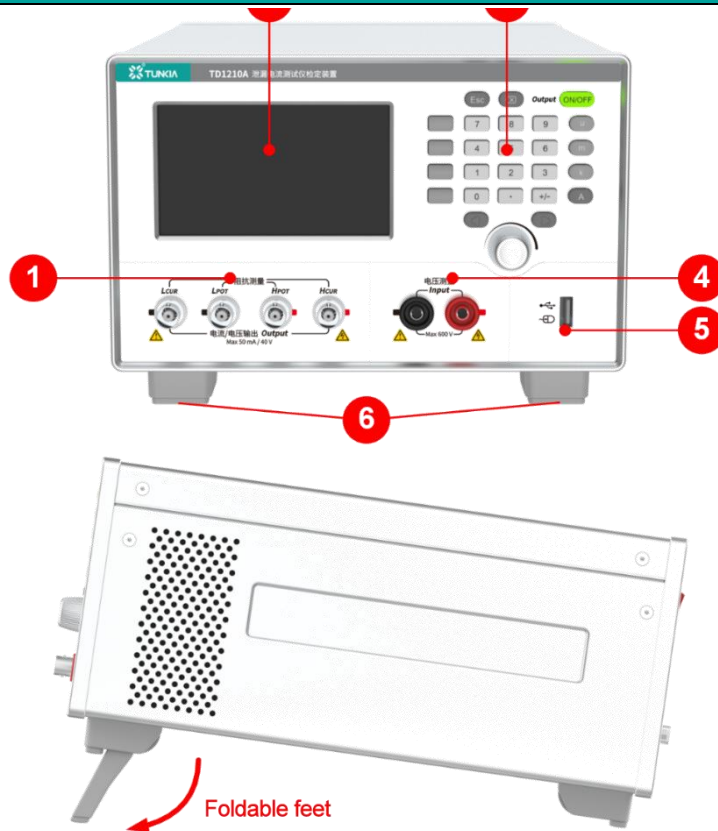
Applicable Industries



The leakage current tester verification device is mainly used by metrology institutions for the electrical parameter traceability of leakage current testers. It supports quality control for common electrical appliances such as household appliances, tools, medical devices, instruments, and lighting products, ensuring user safety.

4. Appearance

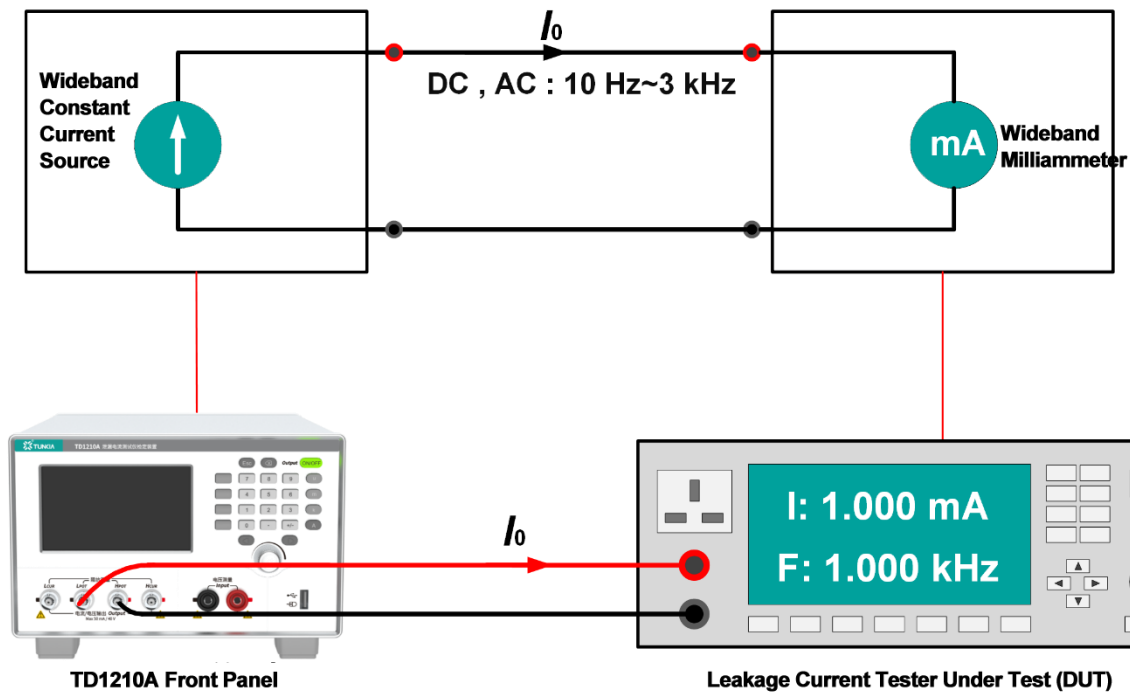
☆ Front / Side Panel



S/N	Function
1	Constant current (CC) or constant voltage (CV) output terminal and impedance four-wire measurement terminal are used to calibrate the error and impedance of the leakage current tester under test.
2	Large-size LCD color screen, intuitive display of multiple power, support touch operation, effectively improve the usability of the instrument.
3	Programmable key area, easy to set standard current value and frequency value.
4	Voltage measurement terminal, used to measure the output voltage of the leakage current tester under test.
5	USB terminal, used for data transmission or connecting mouse operation.
6	Foldable feet, slightly raise the instrument to a certain angle to obtain the best operation and reading angle.

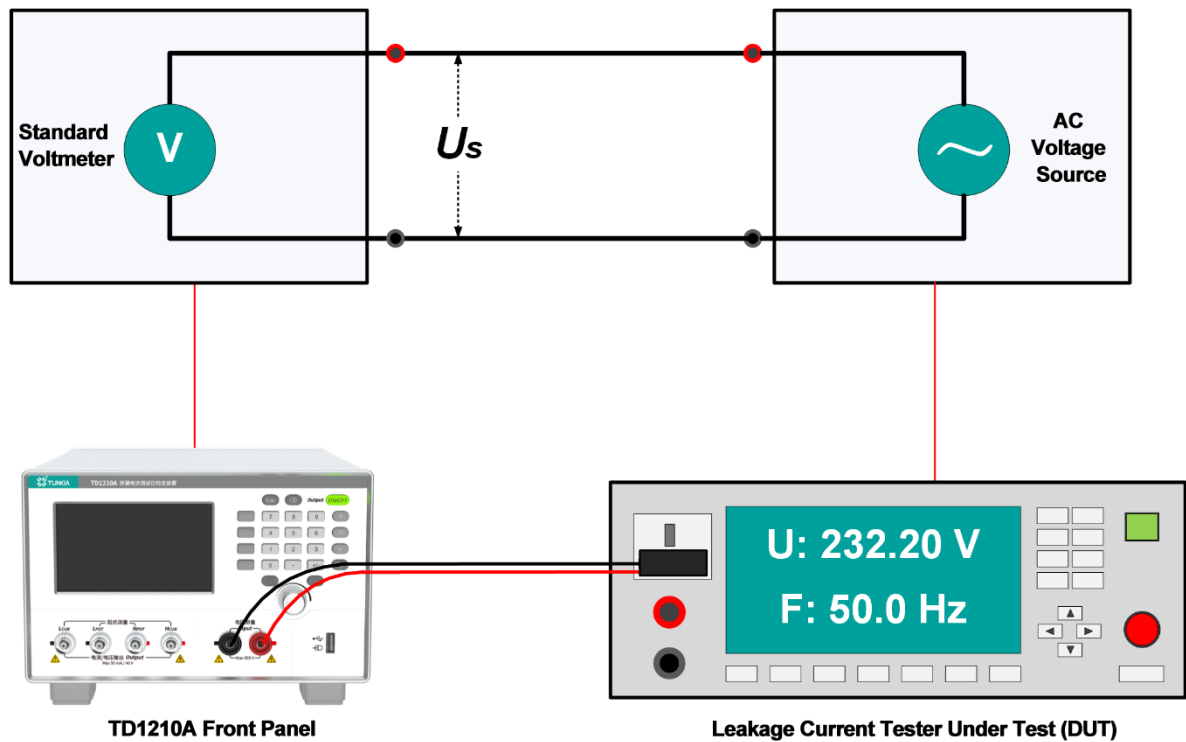
5. Characteristic

☆ Built-in Wideband Constant Current Source



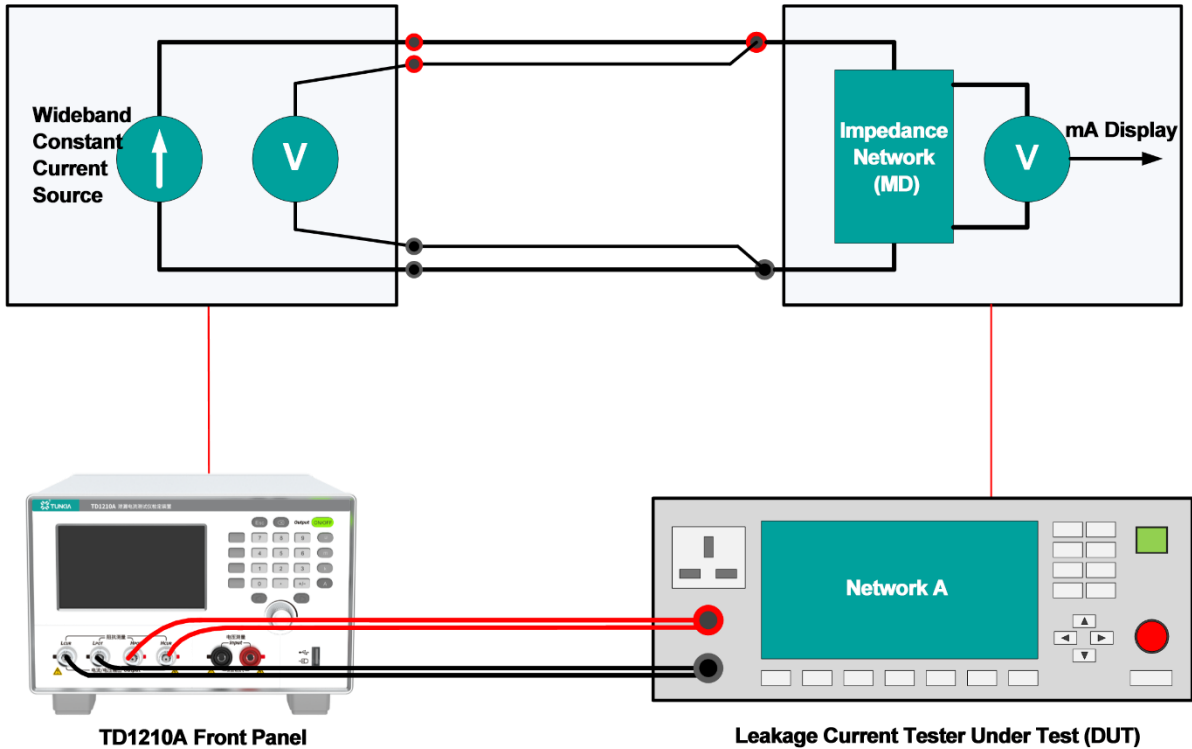
- TD1210 features a built-in wideband constant current source ranging from 2 μA to 21 mA, enabling direct verification of leakage current error using the standard source method.
- The constant current source supports a wide frequency range from DC, AC 10 Hz~3 kHz, meeting the frequency verification requirements for both general and medical leakage current testers.

☆ Built-in Standard Voltmeter



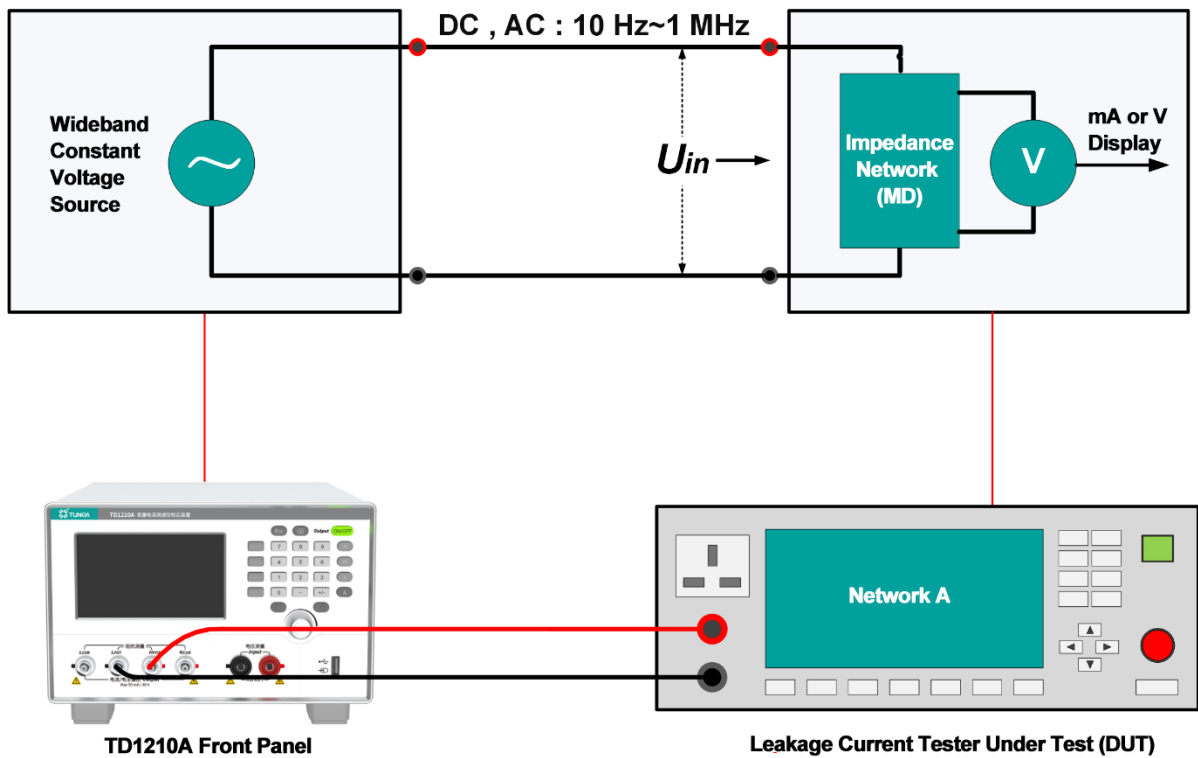
- Built-in AC standard voltmeter enables verification of test voltage error and distortion in accordance with regulations.
- Features data statistical analysis, allowing measurement of maximum value (Max), minimum value (Min), peak-to-peak value (P-P), average value (Avg), and standard deviation (S.dev) to comprehensively assess AC voltage source performance.
- Compared to a standalone digital voltmeter, it offers a higher level of integration, simplified wiring, and more convenient operation.

☆ Measurement Network Testing



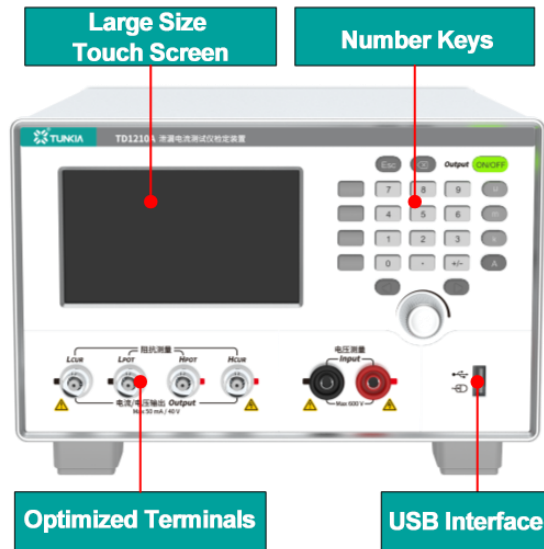
- The verification of the DUT measurement network includes DC input resistance, input impedance, and transmission characteristics/transmission impedance measurements.
- **DC Input Resistance:** The built-in wideband constant current source outputs DC current to the DUT with the human body impedance network applied. The loop voltage is then measured to calculate the DC input resistance of the measurement network.
- **Input Impedance Measurement:** Supports frequency sweep testing of the impedance network. The wideband constant current source outputs current at incrementally increasing frequencies, and the loop voltage is measured to determine the input impedance at different frequencies.

☆ Measurement Network Testing



- Transmission Characteristics Measurement:** The built-in wideband constant voltage source outputs a standard voltage to the DUT with the human body impedance network applied. By referencing the KV lookup table, the standard leakage current I_{OI_0} is obtained. Comparing this with the DUT's displayed current value allows verification of transmission characteristics.
- Transmission Impedance Measurement:** The built-in wideband constant voltage source outputs a standard voltage to the DUT with the human body impedance network applied. The transmission impedance value is calculated based on the ratio of the network's input standard voltage to the output voltage reading.

☆ High Integration and User-Friendly Operation



- **Large LCD Screen:** High-brightness, full-color display with clear image quality; supports touch operation for comprehensive functionality and ease of use.
- **Digital Programmable Keys:** Enables multiple input methods, including direct output, rotary knob, and step adjustment, ensuring convenient and efficient operation.
- **Optimized Terminals:** Designed to minimize the need for frequent test lead changes during calibration, enhancing operational convenience.
- **Lightweight Design:** ½ 3U standard chassis weighing less than 9 kg, making it compact, lightweight, and ideal for on-site applications.
- **High Integration:** Combines a wideband constant current source, wideband constant voltage source, DC resistance meter, impedance tester, AC voltage meter, and distortion analyzer into a single instrument. Compared to single-function testers, this high level of integration simplifies wiring, enhances ease of operation, reduces initial investment costs, and significantly improves testing efficiency.

6. Specification

6.1 Wideband Constant Current Standard Source

Range	Best Resolution	Frequency Range (Hz)	Annual Measurement Uncertainty, k=2 (%*RD + A) ^①	Maximum Load Voltage (V)
20 μA	1 nA	DC	0.12 + 0.016 μ	3
		10 ≤ F ≤ 40	0.3 + 0.04 μ	3
		40 < F ≤ 3 k	0.12 + 0.016 μ	3
200 μA	10 nA	DC	0.12 + 0.016 μ	3
		10 ≤ F ≤ 40	0.3 + 0.04 μ	3
		40 < F ≤ 3 k	0.12 + 0.016 μ	3
2 mA	0.1 μA	DC	0.06 + 0.8 μ	10
		10 ≤ F ≤ 40	0.12 + 1.6 μ	10
		40 < F ≤ 3 k	0.06 + 0.8 μ	10
20 mA	1 μA	DC	0.06 + 8 μ	40
		10 ≤ F ≤ 40	0.12 + 16 μ	40
		40 < F ≤ 3 k	0.06 + 8 μ	40
Note: ①RD is the reading value.				

- Output range: 2 μ A~21 mA, adjustment fineness: 0.01%*RG

6.2 Wideband Constant Voltage Standard Source

Range	Resolution	Frequency Range (Hz)	Annual Measurement Uncertainty, $k=2$ (%*RD+%*RG) ^①	Maximum Load Current (mA)
5 V	0.1 mV	DC	$0.06 + 0.04$	50
		$10 \leq F \leq 40$	$0.12 + 0.08$	50
		$40 < F \leq 1 k$	$0.06 + 0.04$	50
		$1 k < F \leq 10 k$	$0.12 + 0.08$	50
		$10 k < F \leq 100 k$	$0.2 + 0.1$	50
		$100 k < F \leq 300 k$	$0.3 + 0.2$	50

		$300\text{ k} < F \leq 1\text{ M}$	$0.3 + 0.2$	50
10 V	1 mV	DC	$0.06 + 0.04$	50
		$10 \leq F \leq 40$	$0.12 + 0.08$	50
		$40 < F \leq 1\text{ k}$	$0.06 + 0.04$	50
		$1\text{ k} < F \leq 10\text{ k}$	$0.12 + 0.08$	50
		$10\text{ k} < F \leq 100\text{ k}$	$0.2 + 0.1$	50
		$100\text{ k} < F \leq 300\text{ k}$	$0.3 + 0.2$	50
		$300\text{ k} < F \leq 1\text{ M}$	$0.3 + 0.2$	50
25 V	1 mV	DC	$0.06 + 0.04$	50
		$10 \leq F \leq 40$	$0.12 + 0.08$	50
		$40 < F \leq 1\text{ k}$	$0.06 + 0.04$	50
		$1\text{ k} < F \leq 10\text{ k}$	$0.12 + 0.08$	50
		$10\text{ k} < F \leq 100\text{ k}$	$0.2 + 0.1$	50
		$100\text{ k} < F \leq 300\text{ k}$	$0.3 + 0.2$	50
		$300\text{ k} < F \leq 1\text{ M}$	$0.3 + 0.2$	50
Note: ①RD is the reading value, RG is the range value.				

- Output range: 0.5 V ~ 25 V, adjustment fineness: 0.01%*RG

6.3 Other Testing Functions

AC Voltage Measurement	Measuring range		0.01 V ~ 600 V
	Measurement uncertainty (k=2)		0.06%*RD + 0.04%*RG
	Total harmonic distortion uncertainty (k=2)		< 1%
DC Input Resistance Measurement	Measuring range		300 Ω ~ 3 kΩ
	Optimal measurement uncertainty		0.1%
Input Impedance Measurement	Measuring range		300 Ω ~ 3 kΩ
	Measurement uncertainty (k=2)	10 Hz ~ 100 kHz	0.3%
		100 kHz ~ 1 MHz	0.6%

7. General Specifications

Power Supply	AC (220 ± 22) V, (50 ± 2) Hz
Warm-Up Time	30 minutes
Temperature Performance	Operating temperature: 5°C ~ 45°C; Storage temperature: -20°C ~ 60°C
Humidity Performance	Operating humidity: < 80% @ 30°C, < 70% @ 40°C, < 40% @ 50°C Storage humidity: (20% ~ 80%) R·H, non-condensing
Altitude	< 2000 m
Communication Interface	RS 232, LAN, USB
Dimensions	215 mm (W) × 300 mm (D) × 150 mm (H) (excluding feet)
	