TD2100 DC Shunt Verification Device

1. Summary

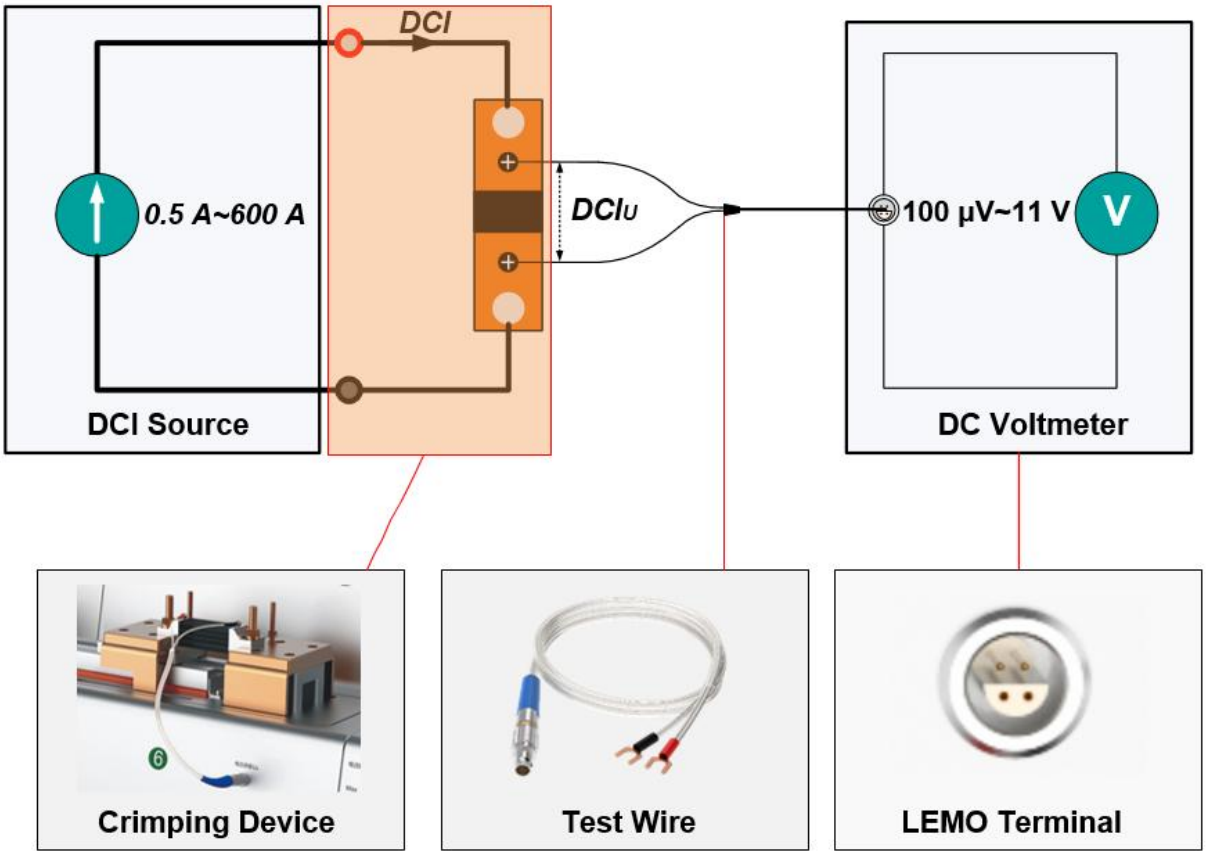
TD2100 is a device specially used to detect DC shunt. It adopts modular design and is composed of multi meter position verification platform, DC high current standard source, precision DC voltmeter, multi-function measurement and control unit, verification software, etc. It can be widely used in all levels of measurement departments and power departments to verify various DC shunt , and it is also suitable for manufacturers to quickly inspect products.

2. Features

- Accuracy: class 0.02/0.05
- DC standard current: 0.5 A ~ 600 A
- Precision DC voltage measurement: 100 μV~ 11 V
- Resistance measurement range: 200 nΩ~6 Ω
- 3/6 meter positions DC shunt calibration table can be selected。
- Constant current source mode is adopted for measurement.
- Shunts manual/automatic crimping device is optional.
- Measure the resistance value and basic error of the shunt, and draw R (I) and R (t) curves。
- Optional temperature measurement function, recording the highest temperature point and thermal balance time of the shunt.

3. Main Applications

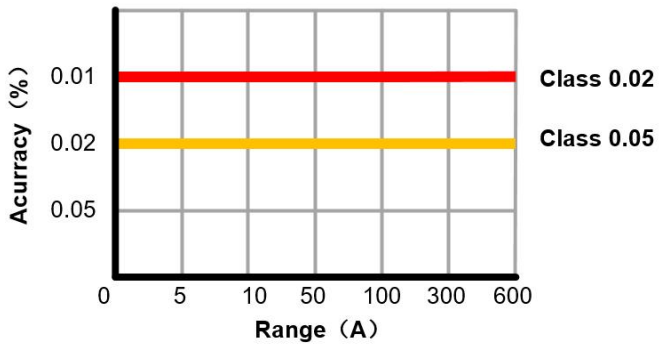
☆ Verification of DC Shunt



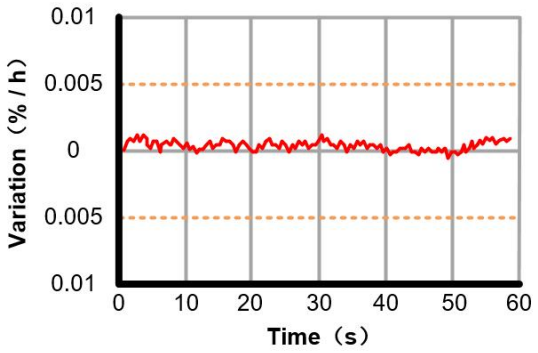
- **DC Standard High Current Source:** The maximum output is 600 A, which can be used as the primary current input of DC shunt.
- **Precision DC voltage measurement:** The support voltage input range is 100 μ V~11V, used to measure the secondary output voltage of the shunt.
- **Verification and test of DC shunt:** the resistance value and basic error of the shunt can be measured, and R (I) and R (t) curves can be drawn.

4. Functional Features

☆High Accuracy and Stability of Current Output



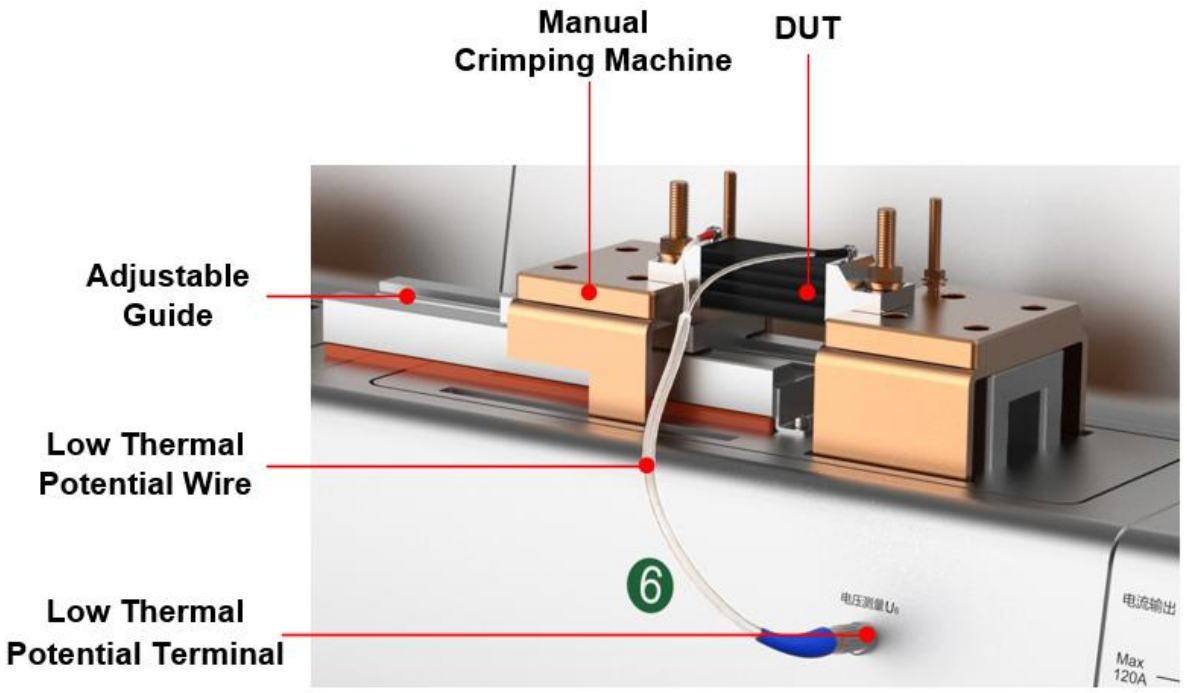
Figure（a）Measurement Accuracy



Figure（b）Short-term Stability

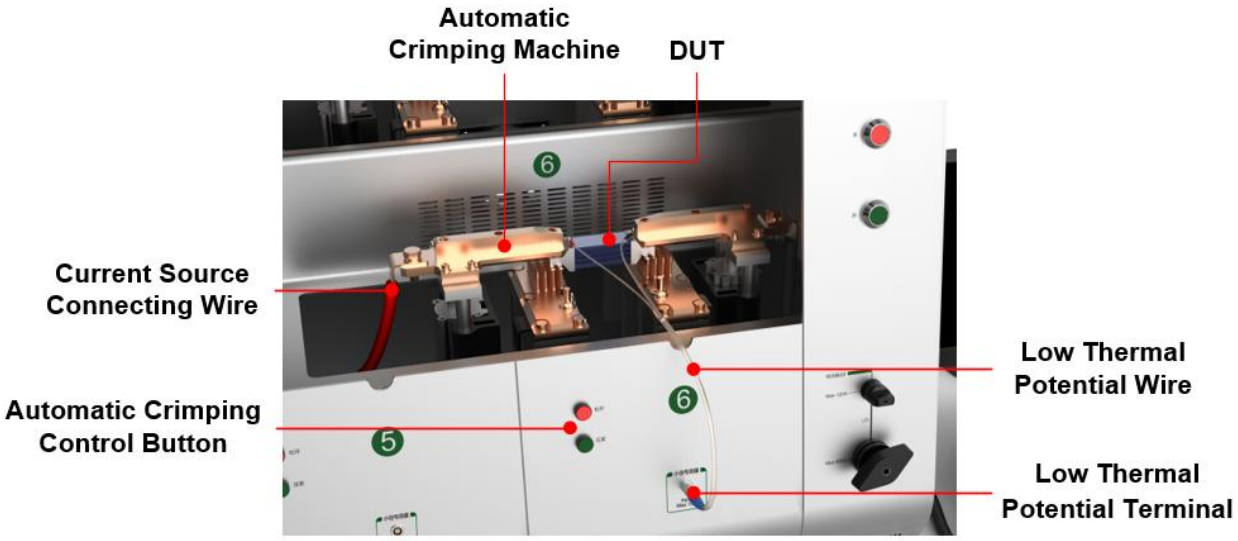
- Precise integrated circuit devices are used to ensure the long-term accuracy of the system.
- Adopt the design principle of closed-loop negative feedback system to ensure the stability of output.

☆Manual Crimping Device (Option)



- **Manual crimping device (option):** Manually press the current terminal of the shunt to be tested, and connect it with the current source to form a current loop; With precise DC voltage measurement function, it can complete the verification of DC shunt;

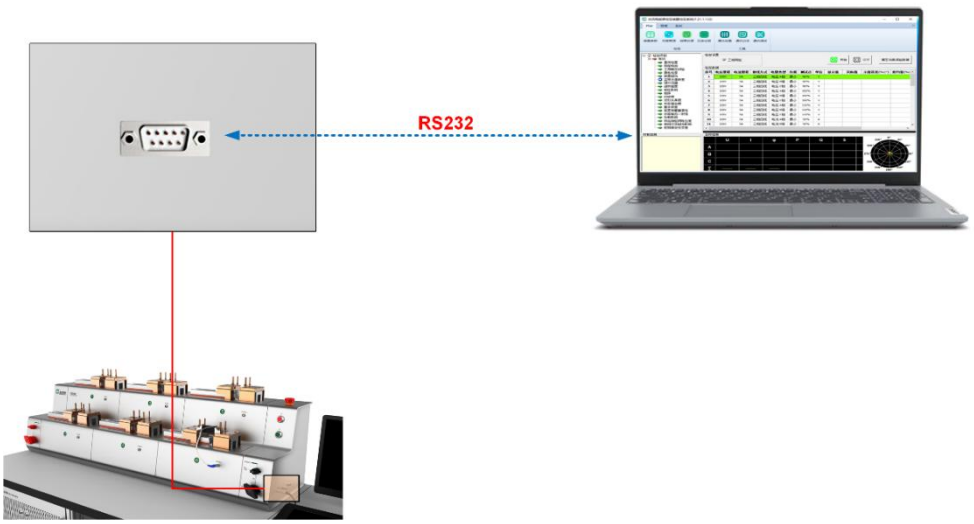
☆Automatic Crimping Device (Option)



- **Automatic crimping device (option):** Automatically press the current terminal of the shunt to be tested, and connect it with the current source to form a current loop; With precise DC

voltage measurement function, it can complete the verification of DC shunt;

☆Professional Test Software



- With RS232 communication interface, software functions can be customized according to customer needs

5. Specifications

5.1 DC current output DCI

Range	Short-term Stability (% / min)		Accuracy (± ppm of reading + ppm of range) [1]		Maximum load (V)
	Class 0.05	Class 0.02	Class 0.05	Class 0.02	
5 A	0.005	0.003	120 + 80	60 + 40	4
10 A	0.005	0.003	120 + 80	60 + 40	4
20 A	0.005	0.003	120 + 80	60 + 40	4
50 A	0.005	0.003	120 + 80	60 + 40	4
100 A	0.005	0.003	120 + 80	60 + 40	4
200 A	0.005	0.003	120 + 80	60 + 40	4
500 A	0.005	0.003	120 + 80	60 + 40	4
Note [1] : (ppm = parts per million) (e.g., 10ppm = 0.001%).					

- Output range: 0.5A～600 A, Ripple coefficient: < 0.1 %
- 7-digits display, Regulating fineness: 0.001%*RG
- Protection function: Open circuit protection, Overload protection

5.2 DC voltage measurement

Range	Accuracy (± ppm of reading + ppm of range)		Temperature coefficient @ (15~30) °C (ppm*RG/°C)	
	Class 0.05	Class 0.02	Class 0.05	Class 0.02
1 mV	150 + 1	80 + 0.5	<30	<15
10 mV	150 + 3	80 + 1.5	<10	<5
100 mV	150 + 10	80 + 5	<10	<5
1 V	150 + 20	80 + 10	<5	<2
10 V	150 + 100	80 + 50	<5	<2

- Measuring range: ± (100 μV~11 V), Manual/automatic range switching, 7-digits display
- Input resistance: >1 GΩ, Input protection: 50 V_{pk}, continuously

5.3 DC resistance measurement

Test current	Voltage range	Measuring range of resistance	Accuracy @ Full scale voltage value②	
			0.05	0.02
5 A	(0.1~1) mV	20 μΩ ≤ R ≤ 200 μΩ	0.135%	0.068%
	(1~10) mV	200 μΩ < R ≤ 2 mΩ	0.065%	0.033%
	(10~100) mV	2 mΩ < R ≤ 20 mΩ	0.045%	0.023%
	(0.1~1) V	20 mΩ < R ≤ 200 mΩ	0.037%	0.019%
	(1~3) V	200 mΩ < R ≤600 mΩ	0.036%	0.019%
10 A	(0.1~1) mV	10 μΩ ≤ R ≤ 100 μΩ	0.135%	0.068%
	(1~10) mV	100 μΩ < R ≤ 1 mΩ	0.065%	0.033%
	(10~100) mV	1 mΩ < R ≤ 10 mΩ	0.045%	0.023%
	(0.1~1) V	10 mΩ < R ≤ 100 mΩ	0.037%	0.019%
	(1~3) V	100 mΩ < R ≤300 mΩ	0.036%	0.019%
20 A	(0.1~1) mV	5 μΩ ≤ R ≤ 50 μΩ	0.135%	0.068%
	(1~10) mV	50 μΩ < R ≤ 500 μΩ	0.065%	0.033%
	(10~100) mV	500 μΩ < R ≤ 5 mΩ	0.045%	0.023%
	(0.1~1) V	5 mΩ < R ≤ 50 mΩ	0.037%	0.019%
	(1~3) V	50 mΩ < R ≤ 150 mΩ	0.036%	0.019%
50 A	(0.1~1) mV	2 μΩ ≤ R ≤ 20 μΩ	0.135%	0.068%
	(1~10) mV	20 μΩ < R ≤ 200 μΩ	0.065%	0.033%
	(10~100) mV	200 μΩ < R ≤ 2 mΩ	0.045%	0.023%
	(0.1~1) V	2 mΩ < R ≤ 20 mΩ	0.037%	0.019%
	(1~3) V	20 mΩ < R ≤ 60 mΩ	0.036%	0.019%
100 A	(0.1~1) mV	1 μΩ ≤ R ≤ 10 μΩ	0.135%	0.068%
	(1~10) mV	10 μΩ < R ≤ 100 μΩ	0.065%	0.033%
	(10~100) mV	100 μΩ < R ≤ 1 mΩ	0.045%	0.023%
	(0.1~1) V	1 mΩ < R ≤ 10 mΩ	0.037%	0.019%
	(1~3) V	10 mΩ < R ≤ 30 mΩ	0.036%	0.019%

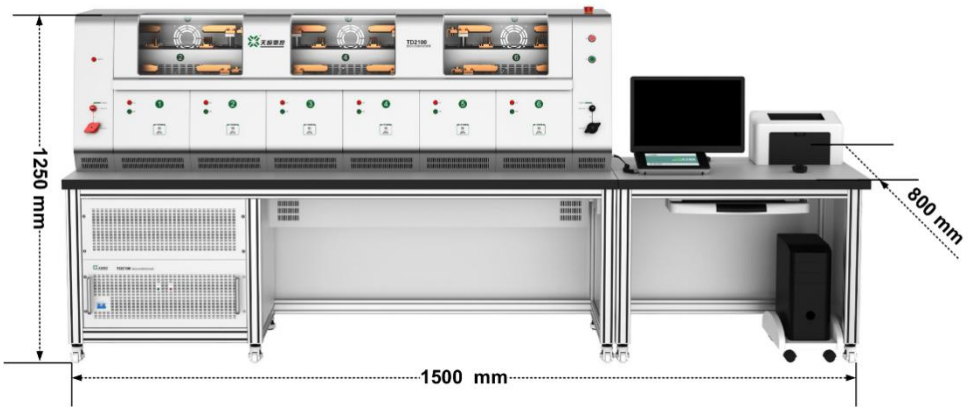
200 A	(0.1~1) mV	500 nΩ ≤ R ≤ 5 μΩ	0.135%	0.068%
	(1~10) mV	5 μΩ < R ≤ 50 μΩ	0.065%	0.033%
	(10~100) mV	50 μΩ < R ≤ 500 μΩ	0.045%	0.023%
	(0.1~1) V	500 μΩ < R ≤ 5 mΩ	0.037%	0.019%
	(1~3) V	5 mΩ< R ≤ 15 mΩ	0.036%	0.019%
500 A	(0.1~1) mV	200 nΩ ≤ R ≤ 2 μΩ	0.135%	0.068%
	(1~10) mV	2 μΩ < R ≤ 20 μΩ	0.065%	0.033%
	(10~100) mV	20 μΩ < R ≤ 200 μΩ	0.045%	0.023%
	(0.1~1) V	200 μΩ < R ≤ 2 mΩ	0.037%	0.019%
	(1~3) V	2 mΩ< R ≤ 6 mΩ	0.036%	0.019%
Note ②: The uncertainty of resistance measurement corresponding to other voltage values=(Δ U/U0+Δ I/I0), U0 and I0 are the reading values of current voltage and current respectively, Δ U and Δ I are the absolute error values of current measured voltage and current respectively				

- Measuring range of resistance: 200 nΩ~6 Ω,6- digits display,Minimum resolution: 1 pΩ
- The current test point can be set through the number keys, and the voltage range: manual/automatic switching
- After loading the test current, the R (t) change curve can be tested

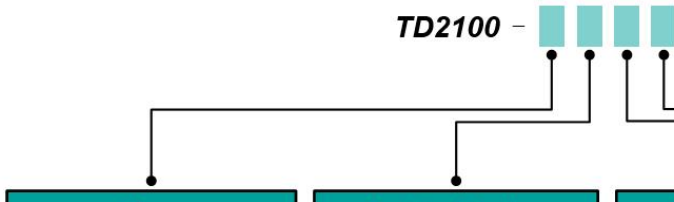
5.4 Multi point continuous temperature measuring device (option)

- Temperature measurement type: average temperature of coverage
- Resolution of infrared array: 16×4
- Temperature measurement range: -50°C~+300°C
- Temperature measurement accuracy: ±0.1°C

6. General Specifications

Power supply	AC (220 ± 22) V,(50 ± 2) Hz;
Temperature performance	Operating temperature: 15 °C~30 °C; Storage temperature: -20 °C ~ 70 °C;
Humidity performance	Operating humidity: (20 % ~ 50%) R·H, No condensation; Storage humidity: (15 % ~ 80%) R·H, No condensation;
communication interface	RS 232
Unit size	1500 mm (W) × 800 mm (D) × 1210 mm (H) @ 3 Table body 1500 mm (W) × 800 mm (D) × 1250 mm (H) @ 6 Table body
	

7. Ordering Information



Class		Position Number		Crimping Device		Temperature Measurement Function	
Code	Note	Code	Note	Code	Note	Code	Note
200	*Class 0.02*	*3*	3 Positions	*M*	Manual	None	——
500	*Class 0.05*	*6*	6 Positions	*A*	Auto	*T*	√

e.g.: ***TD2100-500-6-A-T*** note for Class 0.05, 6 test Positions with Automatic Crimping Device, with Temperature Measurement Function