TD1050 Clamp Meters Calibration Device

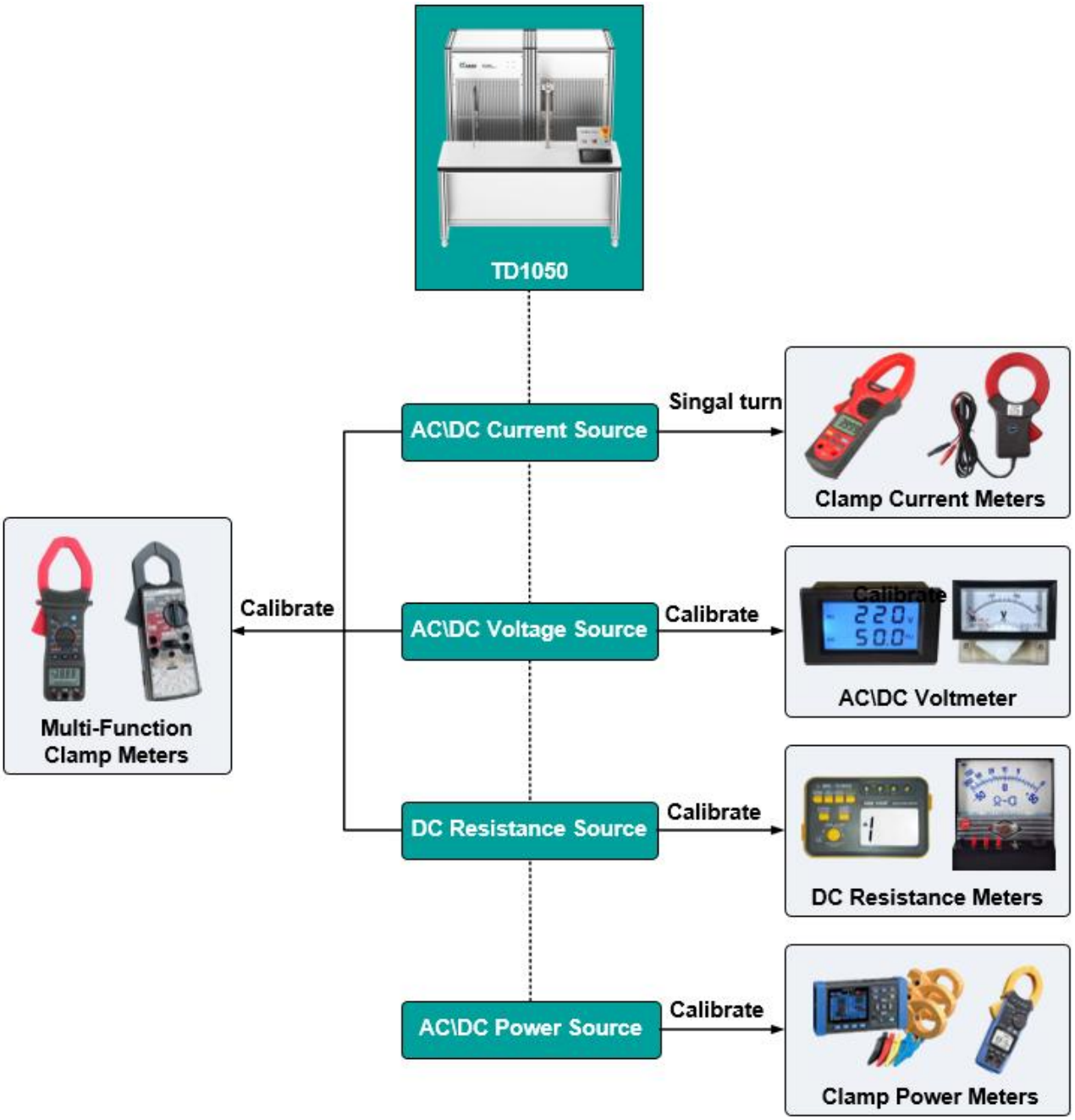
1. Summary

TD1050 is a device for calibrating multi-function clamp meters. It integrates the functions of AC and DC high current standard source, AC and DC voltage standard source and resistance standard source. It also has the function of AC and DC power output and can meet different accuracy levels. The calibration needs of the multi-function clamp meter.

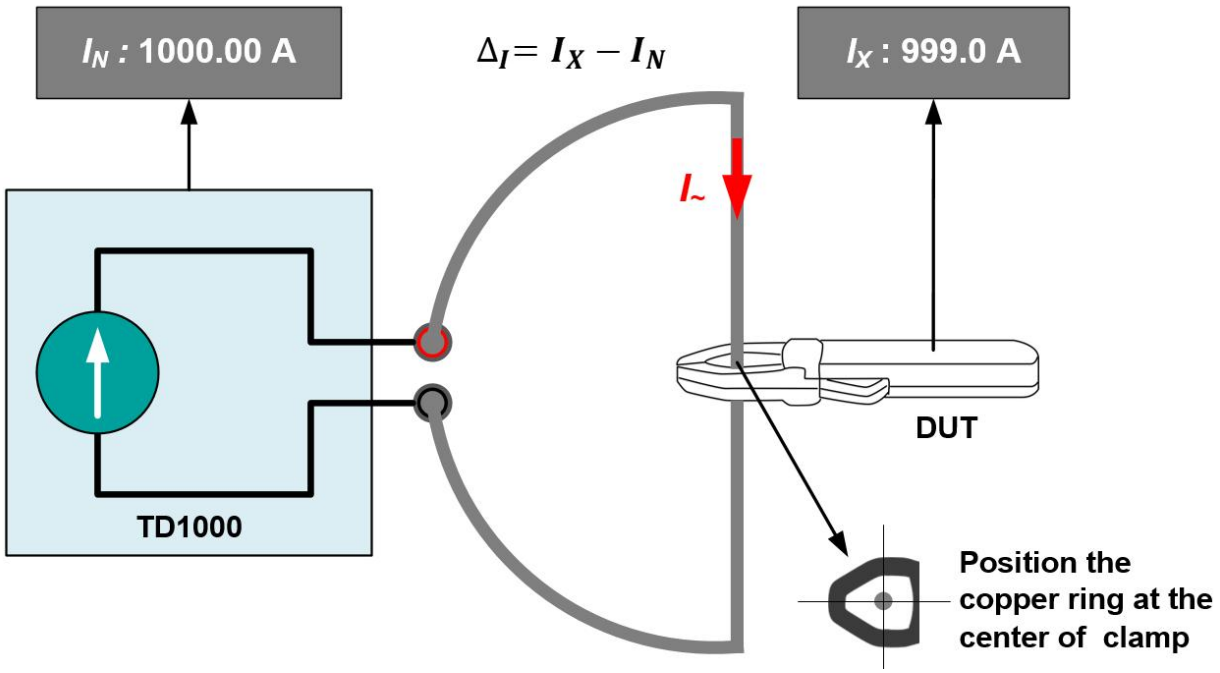
2. Features

- Accuracy: Class 0.05
- DC current: 10 mA ~ 1050 A（2100 A is optional）
- AC current output: 10 mA ~ 1020 A（2050 A is optional）
- DC voltage output(optional): 20 mV ~ 1100 V
- AC voltage output(optional): 1 V ~ 825 V
- Frequency: 40 Hz ~ 400 Hz
- DC resistance output(optional): 10 Ω ~ 110 MΩ
- Two thickness copper rings
- AC/DC power output(optional)

3. Application

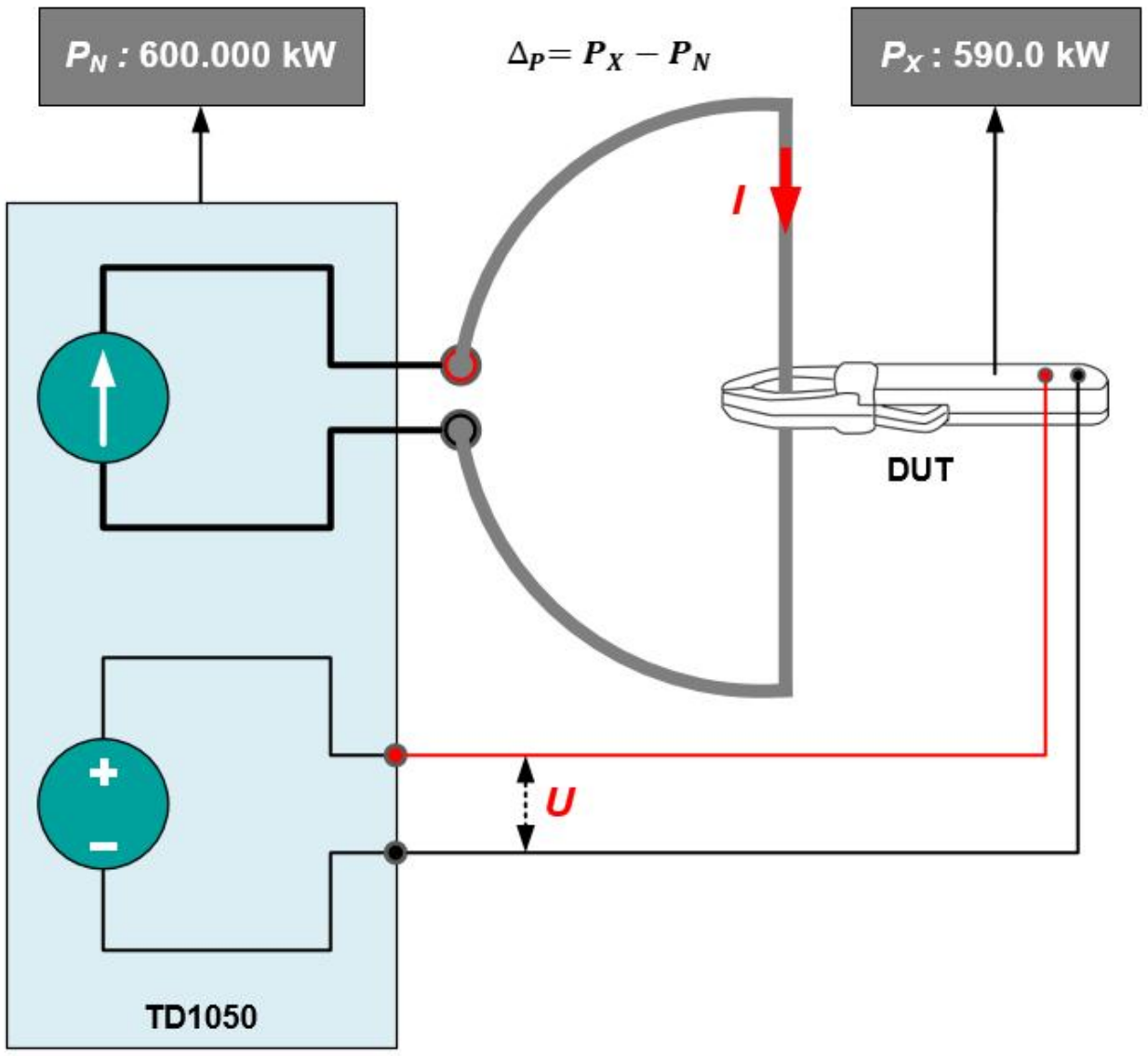


☆ Calibrate Clamp Meter by Single-turn Method



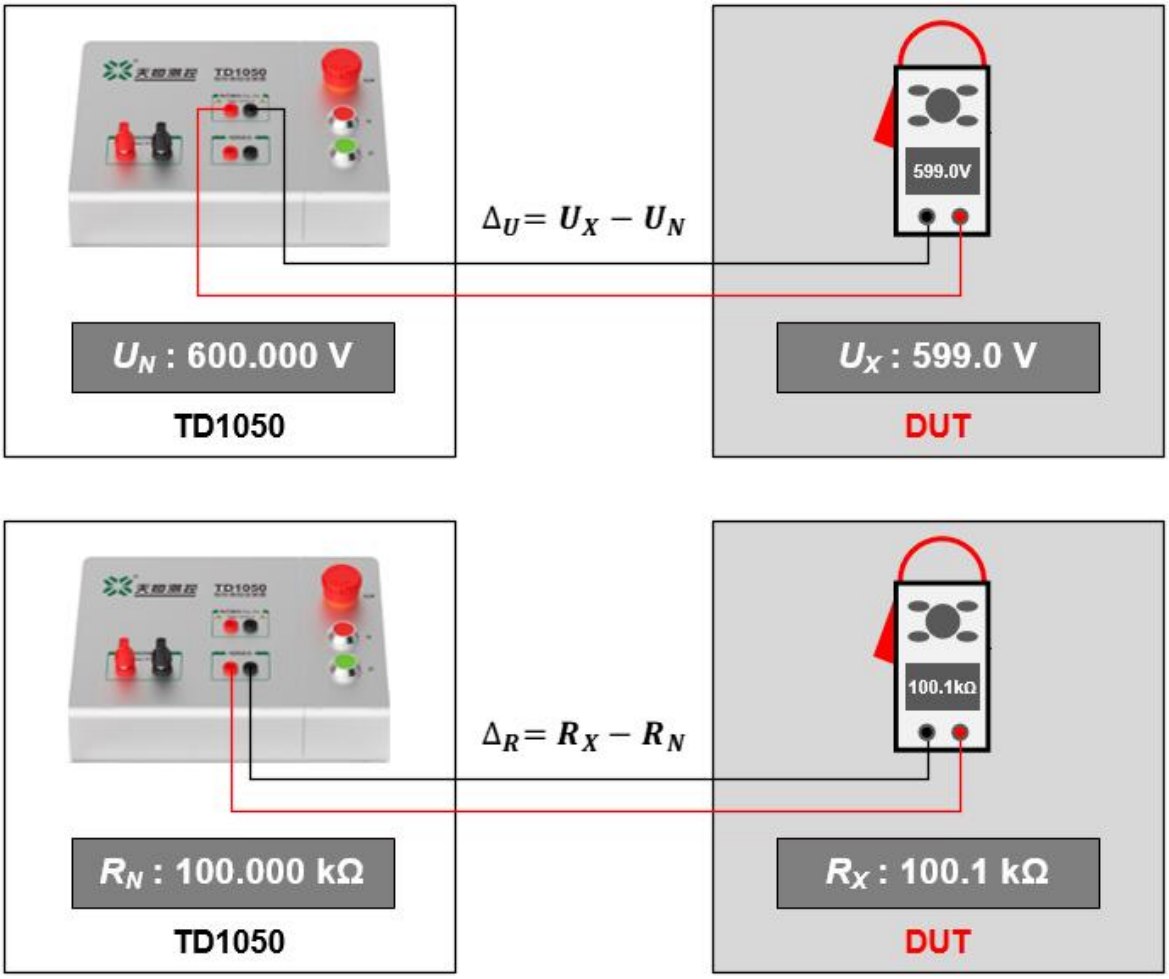
- **DCI** output: 10 mA~1050 A(2100 A is optional)
- **ACI** output: 10 mA~1020 A(2050 A is optional), 40 Hz ~ 400 Hz
- Calibrate AC\DC clamp ammeters

☆ Calibrate Clamp Power Meters(optional)



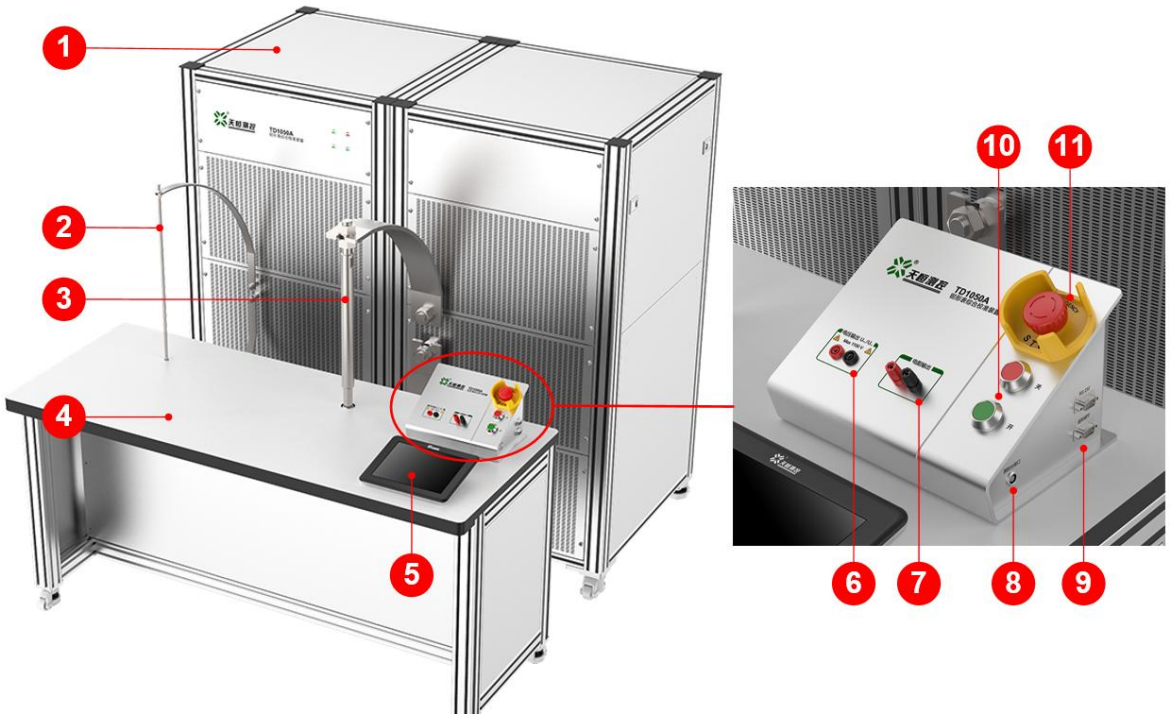
- Integrates AC\DC current and voltage standard source, the U-I phase can be adjusted, which is suitable for calibrating clamp power meters.

☆Calibrate Multi-function Clamp Meters(optional)



- **DCV** Output: 20 mV ~ 1100V
- **ACV** Output: 1 V ~ 825 V, 40 Hz ~ 400 Hz
- **RES** Output Range: 10 Ω ~ 11 MΩ
- Calibrate AC/DC voltmeter and DC resistance meter

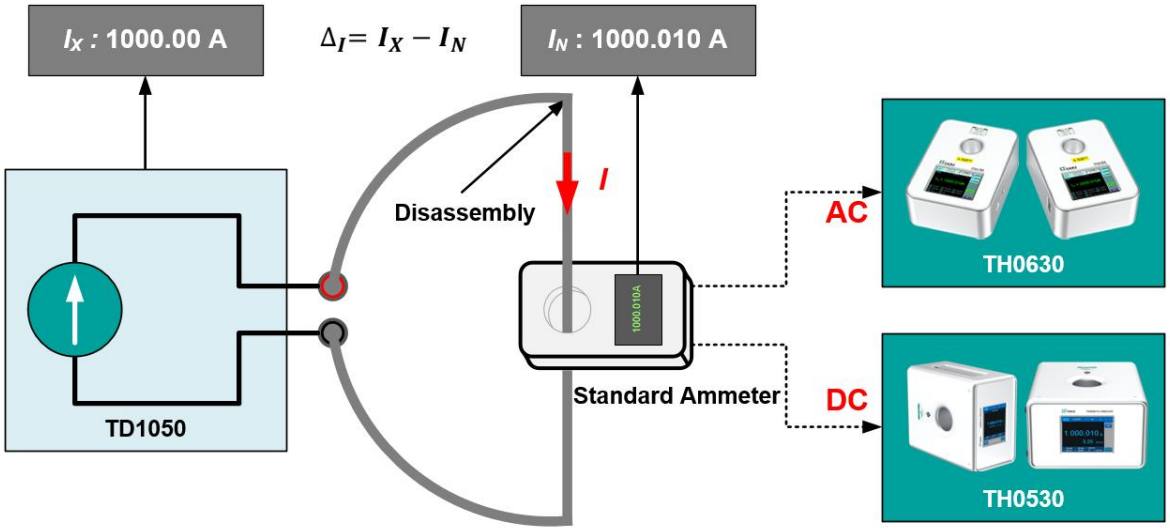
4. Panel Features



Number	Description
1	**Current Source,** Output AC\DC current.
2	**Copper Ring 1,** I≤110 A.
3	**Copper Ring 2,** I>100 A.
4	**Workbench,** used to settle the device.
5	**Operate Panel,** adjust electric parameter of the device.
6	**Voltage Output terminals**
7	**Resistance Output terminals**
8	**Operate Panel terminal,** connected to the control panel.
9	**RS232 Interface,.**
10	**Power Switch**
11	**E-Stop,** Used to stop the power supply in an emergency

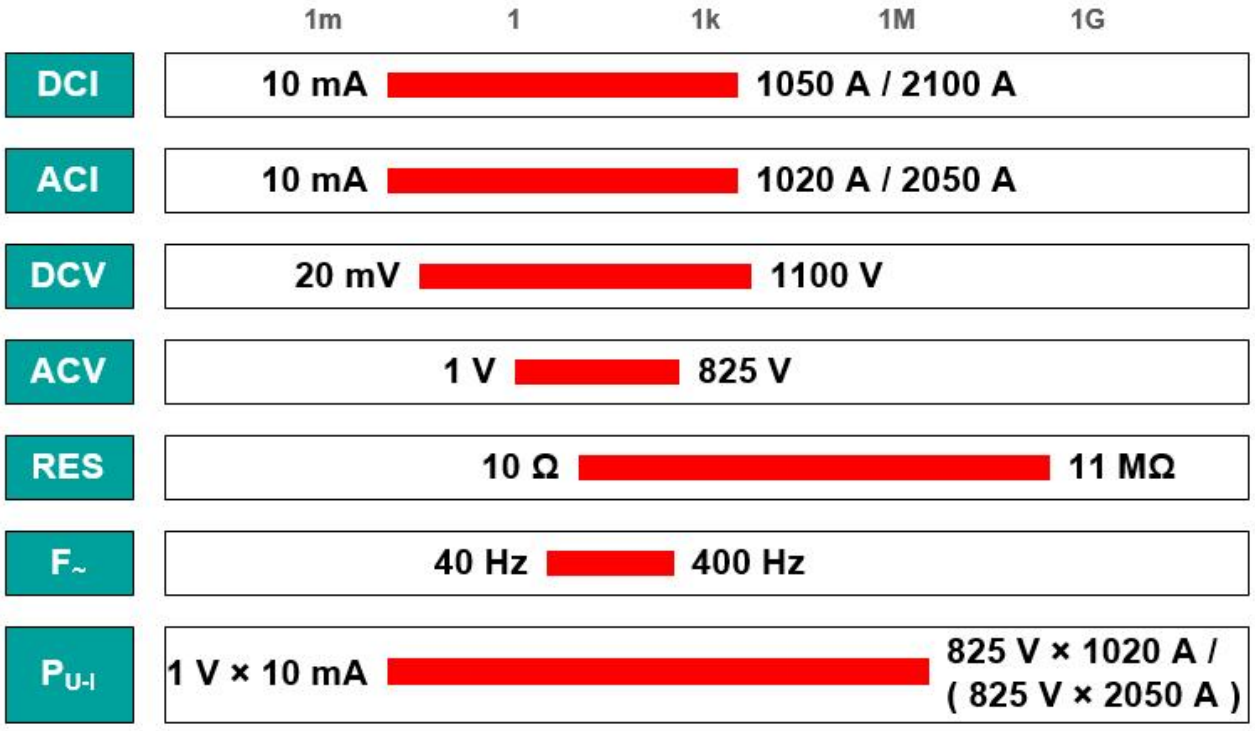
5. Characteristics

☆ Convenient Traceability

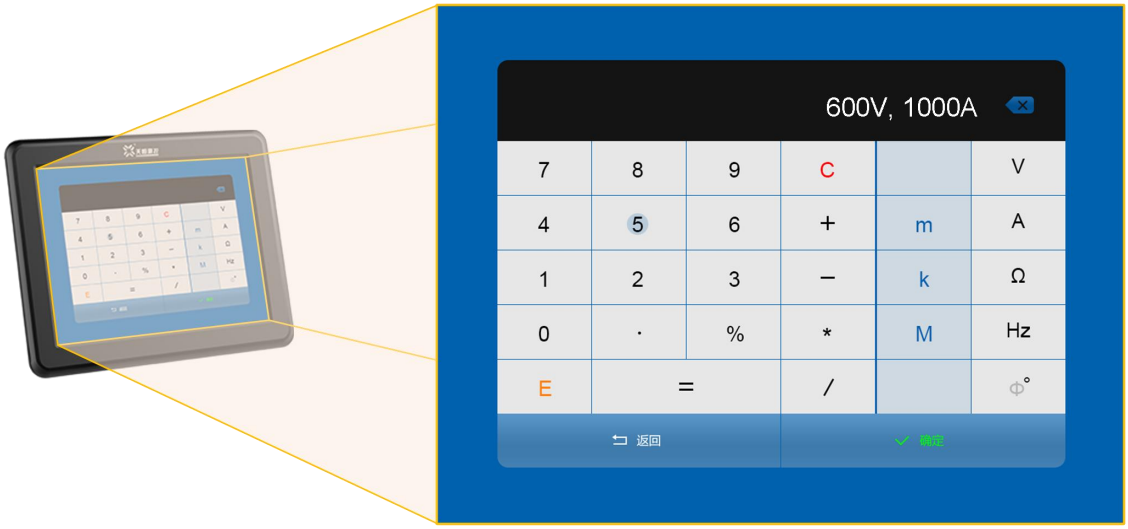


- Calibrate the AC\DC current source through accessing the standard ammeter(TH0630 or TH0530)to the current loop.

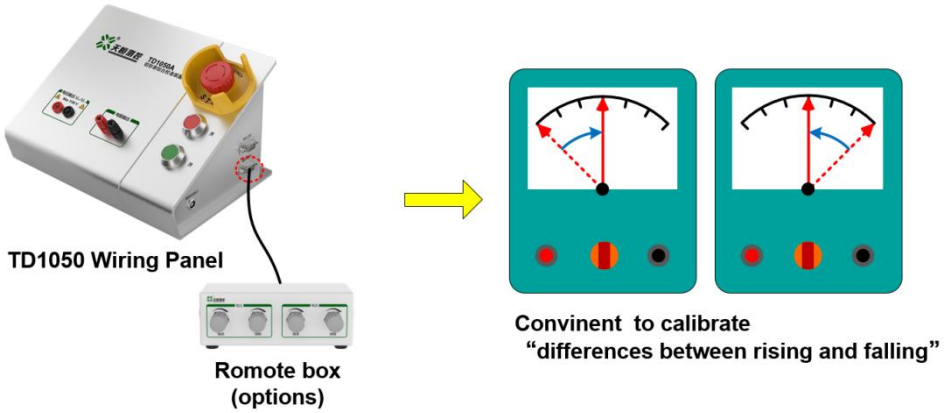
☆ Wide Output Range



☆ Output and Adjustment



- “**Direct Output**” mode: the value output can be set directly by clicking the touch panel.



- Calibration of the analog pointer meter usually needs to test scale by scale, especially "differences between rising and falling" (the change caused by the rise and fall of the calibration point).

6. Specifications

6.1 DC Current

Copper Ring	Range	Resolution	Output Range	Max Load
Ring 1	100 mA	1 μA	10.000 mA ~ 110.000 mA	8 V
	300 mA	1 μA	30.000 mA ~ 330.000 mA	8 V
	1 A	10 μA	0.10000 A ~ 1.10000 A	8 V
	3 A	10 μA	0.30000 A ~ 3.30000 A	8 V
	10 A	100 μA	1.0000 A ~ 11.0000 A	8 V
	30 A	100 μA	3.0000 A ~ 33.0000 A	8 V
	100 A	1 mA	10.000 A ~ 110.000 A	8 V
Ring 2	250 A	1 mA	20.000 A ~ 275.000 A	8 V
	500 A	1 mA	50.000 A ~ 550.000 A	8 V
	1000 A	10 mA	100.00 A ~ 1050.00 A	8 V
	2000 A [1]	10 mA	200.00 A ~ 2100.00 A	8 V
Note[1]: 2000 A is Optional				

Range	Stability (±%/min)	Accuracy, ±(ppm*RD+ppm*RG) [2]	Ripple Factor (%)
100 mA	0.01	300 + 100	<0.5
300 mA	0.01	300 + 100	< 0.5
1 A	0.01	300 + 100	< 0.5
3 A	0.01	300 + 100	< 0.5
10 A	0.01	300 + 100	< 0.5
30 A	0.01	300 + 100	< 0.5
100 A	0.01	300 + 100	< 0.5
250 A	0.01	300 + 100	< 0.5
500 A	0.01	300 + 100	< 0.5
1000 A	0.01	300 + 100	< 0.5
2000 A	0.01	300 + 100	< 0.5
Note[2]: RD=Reading，RG=Range, unless otherwise noted；			

- Output range: 10 mA ~ 1050 A\2100 A
- Manual or automatic range switch.
- Adjustment fineness: 0.002%*RG
- 6 digits decimal display
- Protections: open-circuit protection, overload protection, over-heat protection

6.2 AC Current

Copper Ring	Range	Resolution	Output Range	Frequency	Max Compliance Voltage(rms)
Ring 1	100 mA	1 μA	10.000 mA ~ 110.000 mA	40 Hz ~ 400 Hz	6 V
	300 mA	1 μA	30.000 mA ~ 330.000 mA	40 Hz ~ 400 Hz	6 V
	1 A	10 μA	0.10000 A ~ 1.10000 A	40 Hz ~ 400 Hz	6 V
	3 A	10 μA	0.30000 A ~ 3.30000 A	40 Hz ~ 400 Hz	6 V
	10 A	100 μA	1.0000 A ~ 11.0000 A	40 Hz ~ 400 Hz	6 V
	30 A	100 μA	3.0000 A ~ 33.0000 A	40 Hz ~ 400 Hz	6 V
	100 A	1 mA	10.000 A ~ 110.000 A	40 Hz ~ 400 Hz	6 V
Ring 2	250 A	1 mA	20.000 A ~ 275.000 A	40 Hz ~ 400 Hz	6 V
	500 A	1 mA	50.000 A ~ 550.000 A	40 Hz ~ 400 Hz	6 V
	1000 A	10 mA	100.00 A ~ 1020.00 A	40 Hz ~ 400 Hz	6 V
	2000 A [3]	10 mA	200.00 A ~ 2050.00 A	40 Hz ~ 400 Hz	6 V

Range	Stability (±%/min)	Accuracy ±(ppm*RD+ppm*RG)	Distortion (%)
100 mA	0.01	300 + 100	<0.5
300 mA	0.01	300 + 100	<0.5
1 A	0.01	300 + 100	<0.5
3 A	0.01	300 + 100	<0.5
10 A	0.01	300 + 100	<0.5
30 A	0.01	300 + 100	<0.5

100 A	0.01	300 + 100	<0.5
250 A	0.01	300 + 100	<0.5
500 A	0.01	300 + 100	<0.5
1000 A	0.01	300 + 100	<0.5
2000 A [1]	0.01	300 + 100	<0.5
Note[3]: Range 2000 A is optional.			

- Output range: 10 mA ~ 1020 A (2050 A)
- Frequency: 40 Hz ~ 400 Hz, adjustment fineness 0.001 Hz，accuracy ±0.01%。
- Adjustment fineness: 0.002%*RG
- 6 digits display
- Protections: open-circuit protection, overload protection, over-heat protection

6.3 DC Voltage(optional)

Range	Resolution	Output Range	Max Burden
200 mV	1 μV	20.000 mV ~ 220.000 mV	100 mA
1 V	10 μV	0.10000 V ~ 1.00000 V	100 mA
10 V	100 μV	1.0000 V ~ 11.0000 V	100 mA
30 V	100 μV	3.0000 V ~ 33.0000 V	600 mA
100 V	1 mV	10.000 V ~ 110.000 V	200 mA
300 V	1 mV	30.000 V ~ 330.000 V	60 mA
600 V	1 mV	60.000 V ~ 660.000 V	25 mA
1000 V	10 mV	100.00 V ~ 1100.00 V	20 mA

Range	Stability (±%/min)	Accuracy ±(ppm*RD+ppm*RG)	Ripple Factor (%)
200 mV	0.01	300 + 200	<0.5
1 V	0.01	300 + 200	< 0.5
10 V	0.01	300 + 200	< 0.5
30 V	0.01	300 + 200	< 0.5
100 V	0.01	300 + 200	< 0.5
300 V	0.01	300 + 200	< 0.5
600 V	0.01	300 + 200	< 0.5
1000 V	0.01	300 + 200	< 0.5

- Output range: 20 mV ~ 1100 V
- Manual or automatic range switch
- Adjustment fineness: 0.002%*RG
- 6 digits display
- Protections: short-circuit protection, overload protection, over-heat protection

6.4 AC Voltage(optional)

Range	Resolution	Output Range	Frequency	Max Burden(rms)
10 V	100 μV	1.0000 V ~ 11.0000 V	40 Hz ~ 400 Hz	800 mA
30 V	100 μV	3.0000 V ~ 33.0000 V	40 Hz ~ 400 Hz	700 mA
100 V	1 mV	10.000 V ~ 110.000 V	40 Hz ~ 400 Hz	200 mA
300 V	1 mV	30.000 V ~ 330.000 V	40 Hz ~ 400 Hz	70 mA
750 V	1 mV	75.000 V ~ 825.000 V	40 Hz ~ 400 Hz	30 mA

Range	Stability (±%/min)	Accuracy ±(ppm*RD+ppm*RG)	Distortion Factor (%)
10 V	0.01	300 + 200	<0.5
30 V	0.01	300 + 200	<0.5
100 V	0.01	300 + 200	<0.5
300 V	0.01	300 + 200	<0.5
750 V	0.01	300 + 200	<0.5

- Output range: 1 V ~ 825 V
- Frequency: 40 Hz ~ 400 Hz, adjustment fineness 0.001 Hz, accuracy ±0.01%。
- Manual or automatic range switch
- Adjustment fineness: 0.002%*RG
- 6 digits display
- Protections: short-circuit protection, overload protection, over-heat protection

6.5 DC Resistance(optional)

Range	Resolution	Output Range	Accuracy ±(ppm*RD+ppm*RG)	Allowable Current
100 Ω	1 mΩ	10.000 Ω ~ 110.000 Ω	300 + 200	1 mA ~ 50 mA
1 kΩ	10 mΩ	0.10000 kΩ ~ 1.10000 kΩ	300 + 200	100 μA ~ 5 mA
10 kΩ	100 mΩ	1.0000 kΩ ~ 11.0000 kΩ	300 + 200	10 μA ~ 500 μA
100 kΩ	1 Ω	10.000 kΩ ~ 110.000 kΩ	300 + 200	10 μA ~ 50 μA
1 MΩ	10 Ω	0.10000 MΩ ~ 1.10000 MΩ	300 + 200	1 μA ~ 5 μA
10 MΩ	100 Ω	1.0000 MΩ ~ 11.0000 MΩ	600 + 400	100 nA ~ 500 nA

- Output range: 10 Ω ~ 11 MΩ
- Manual or automatic range switch
- Adjustment fineness: 0.002%*RG
- 6 digits display

6.6 AC\DC Power(optional)

Type	Current Range	Combination of Voltage and Current	Accuracy ±(%*Power Output)[1] [2]
DC	1000 A	(20 mV~1100 V) × (10 mA~1050 A)	0.07~0.29
	2000 A [3]	(20 mV~1100 V) × (10 mA~2100 A)	0.07~0.29
AC	1000 A	(1 V~825 V) × (10 mA~1020 A)	0.07~0.42
	2000 A[3]	(1 V~825 V) × (10 mA~2050 A)	0.07~0.42

Notes[1]: The accuracy formula of AC power: $U_P = \sqrt{{U_U}^2 + {U_I}^2 + {U_\lambda}^2}$, U_U——uncertainty of Voltage, U_I——uncertainty of Current, U_λ——uncertainty of Power Factor.

Notes[2]: Active power $|\cos\varphi| \geq 0.5$, Reactive power $|\sin\varphi| \geq 0.5$。

Notes[3]: Range 2000 A is optional;

6.7 Phase and Power Factor（45 Hz~65 Hz）（optional）

Type	Range	Adjustment fineness	Accuracy[1]
φ	0.000°~359.999°	0.005°	0.1°
λ	-1 … 0 … +1	0.0001	0.30% @ (λ=0.5)

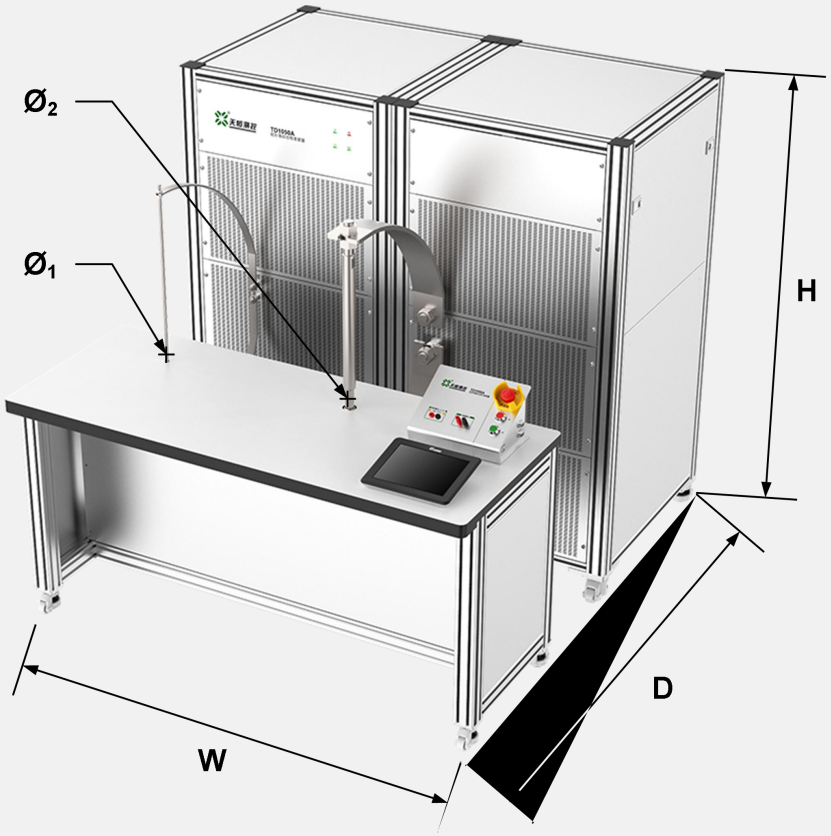
Note[1]: The accuracy formula of Power Factor: $U_\lambda = [1 - \cos(\varphi + \Delta\varphi)/\cos\varphi] \times 100\%$

7. General Specifications

Power supply	AC (380±38)V，(50 ± 2) Hz
Max Power Consumption	16 kVA @ 1000 A Model，32 kVA @ 2000 A Model
Operating Condition	0°C~40°C，(20%~85%) R·H，non-condensing
Storage Condition	-20°C~70°C，(10%~95%) R·H，non-condensing
Standard Interfaces	RS232×1

Dimensions

Range	Width(W)	Depth(D)	Height(H)	Diameter of the copper ring	
				Ring 1($Ø_1$)	Ring 2($Ø_2$)
1000 A	740 mm	1723 mm	1467 mm	10 mm	19 mm
2000 A	1480 mm	1723 mm	1467 mm	10 mm	27 mm



8. Ordering information

Max Current Range	
Code	Note
1kA	*1 kA*
2kA	*2 kA*

Function	
Code	Note
Empty	*Current Only*
M	*Multi-Function*

e.g.： ***TD1050-2kA*** notes for the max current range of the device is 2kA, current output only.

Function	AC/DC Current Output (ACI & DCI)	AC/DC Voltage Output (ACV & DCV)	Resistance Output (Res)	Power Output (Power)
TD1050-X	★	—	—	—
TD1050-X-M	★	★	★	★