

# TD1850 Calibrator for Multimeter V4.0

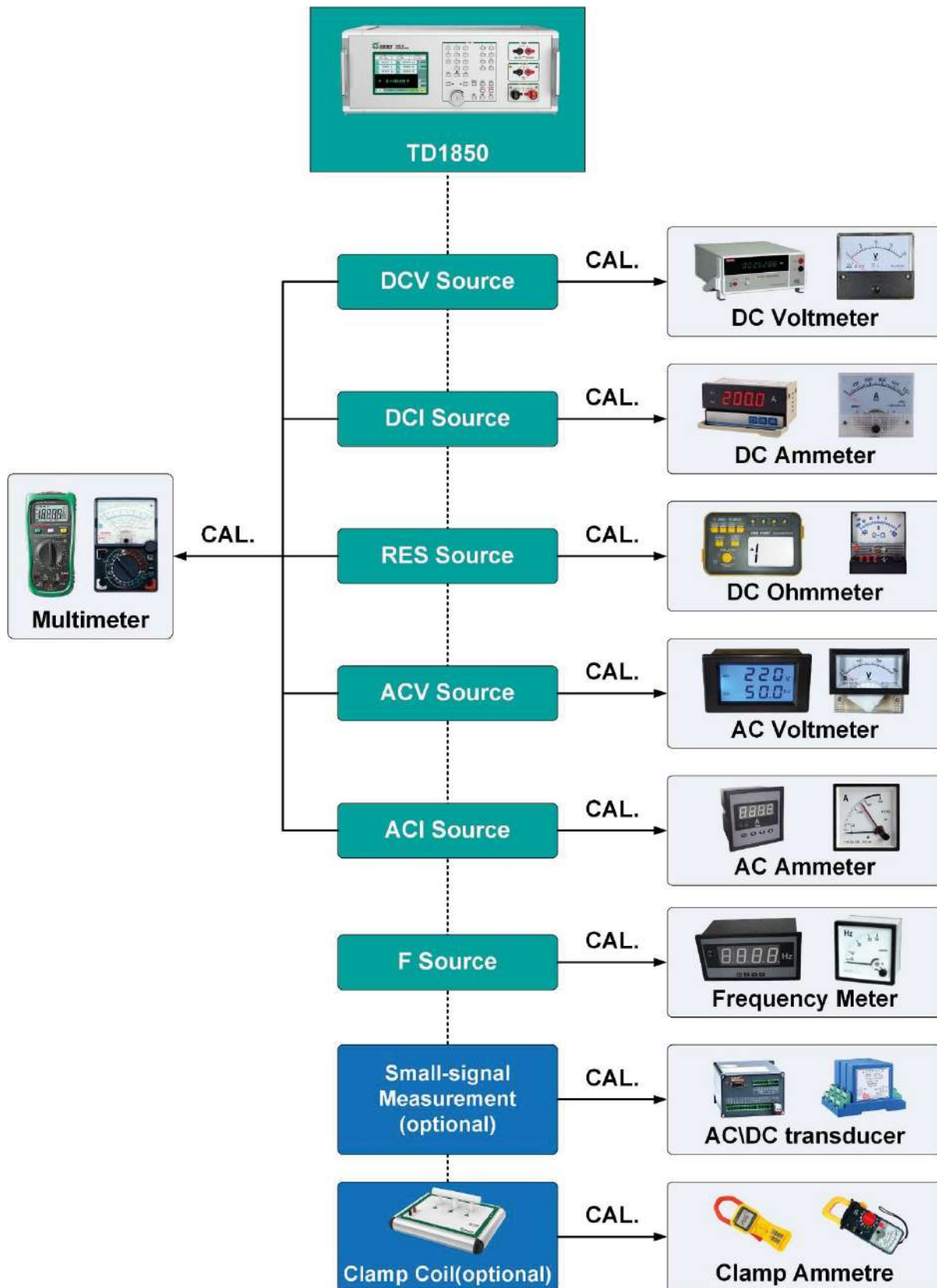


## 1. Summary

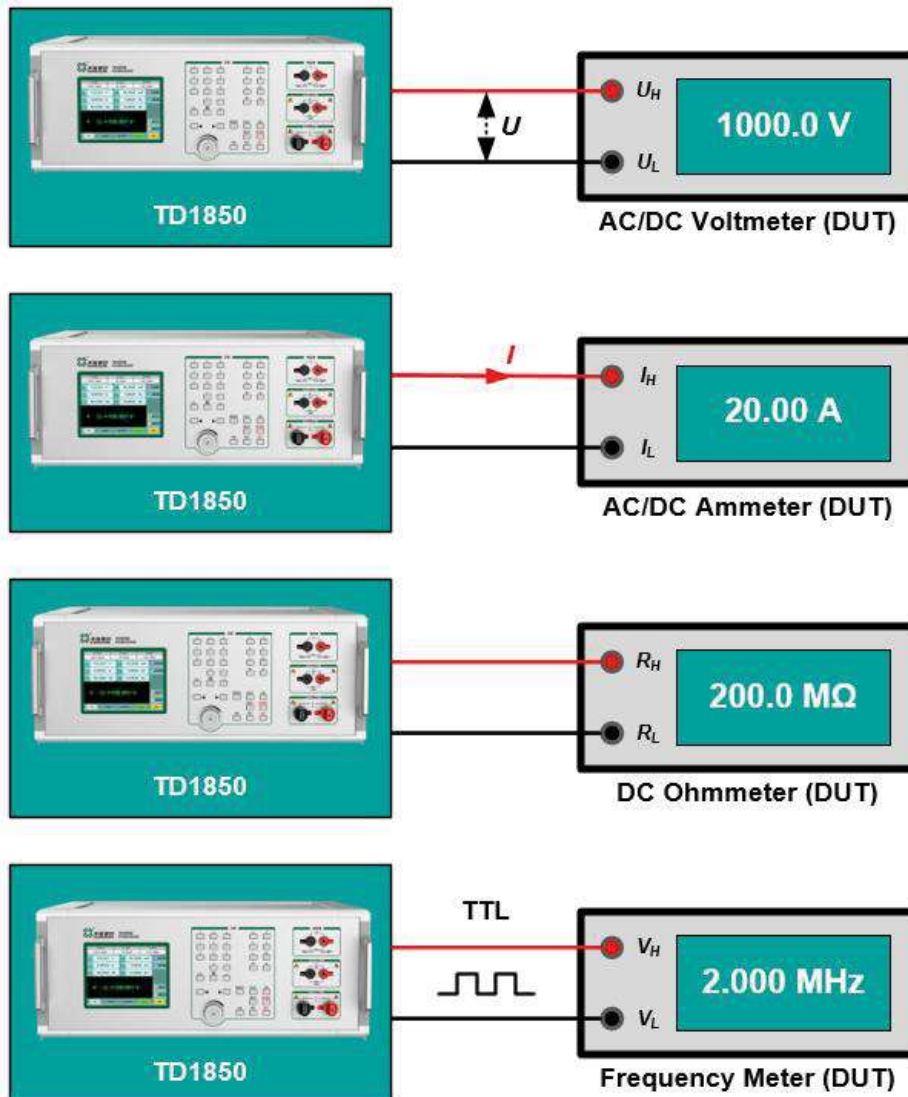
TD1850 is a multi-function calibrator, integrates AC\DC voltage source, AC\DC current source, DC resistance source, etc. The accuracy class is 0.05. It's applied to calibrating 3.5 digits multimeter, voltmeter, ammeter, ohmmeter, power meter.

## 2. Features

- DC voltage output: 20 mV ~ 1100 V
- DC current output: 2  $\mu$ A ~ 22 A (33 A is optional)
- AC voltage output: 20 mV ~ 1100 V
- AC current output: 200  $\mu$ A ~ 22 A (33 A is optional)
- Sinusoidal wave frequency: 45 Hz ~ 1100 Hz
- Simulated DC resistance: 10  $\Omega$  ~ 220 M $\Omega$ .
- 2 MHz square wave frequency output
- Remote adjustment (optional)
- Clamp meter calibration (optional)
- Transducer calibration(optional)

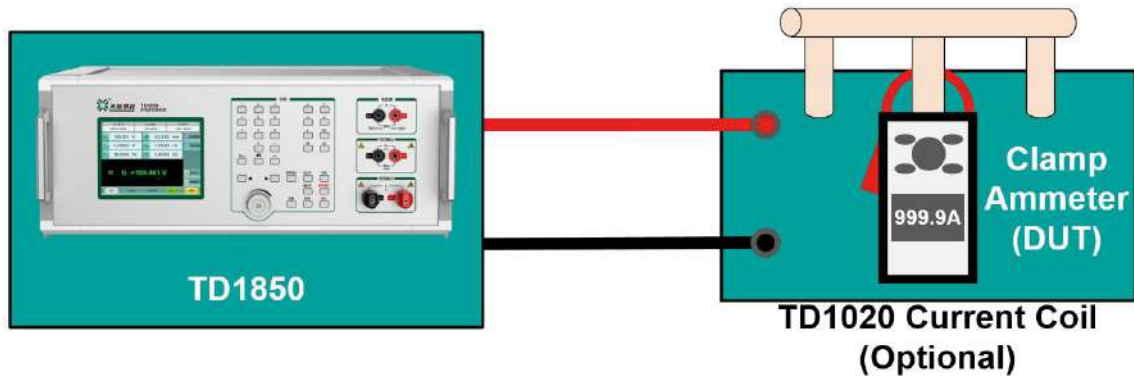


☒ Calibrate AC\DC electrical measuring instruments



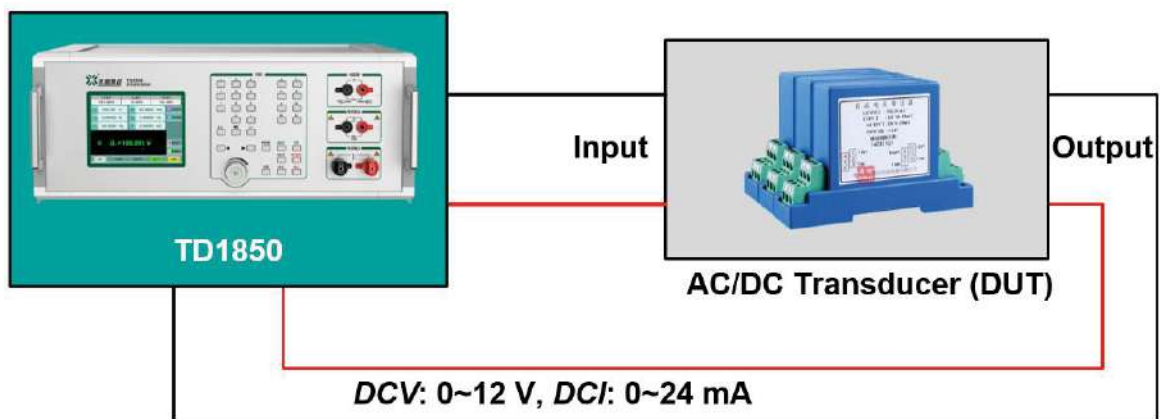
- **DCV output:** 20 mV ~ 1100 V
- **DCI output:** 2  $\mu$ A ~ 22 A\33 A
- **ACV output:** 20 mV ~ 1100 V, 45 Hz ~ 1100 Hz
- **ACI output:** 200  $\mu$ A ~ 22 A\33 A, 45 Hz ~ 1100 Hz
- **RES output:** 10  $\Omega$  ~ 220 M $\Omega$
- **Frequency output:** 1 Hz ~ 2 MHz
- Calibrate digital multimeter, AC/DC voltmeter, AC/DC ammeter, DC ohmmeter, frequency meter.

### ☆ Calibrate clamp ammeter (optional)



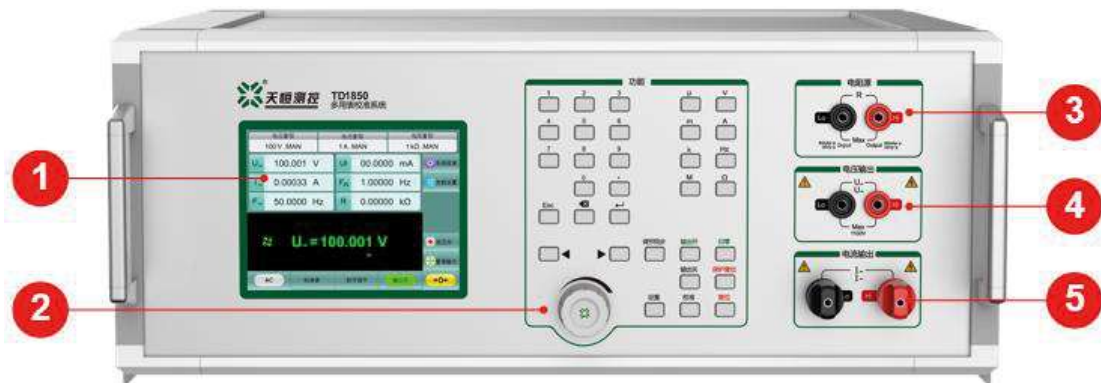
- Equivalent to 1000AT current through input 20A current to the 50T Coil, which is suitable for calibrating DC clamp meters.

### ☒ Calibrate AC/DC Transducer (optional)



- DC small-signal measurement. ( $V_{max}$ : 12 V,  $I_{max}$ : 24 mA)
- Calibrate the proportional error of AC/DC voltage/current transducer.

## Front\Side Panel



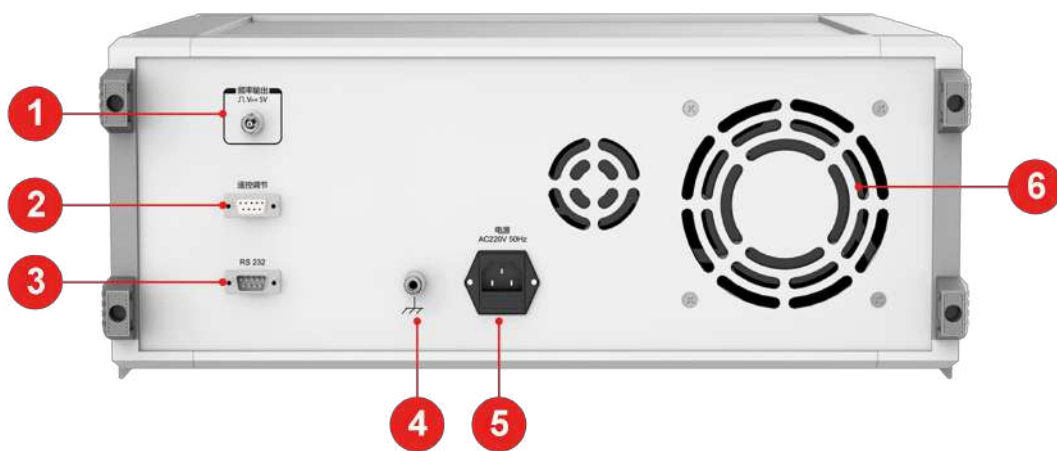
**Figure(a) Front Panel**



**Figure(b) Side Panel**

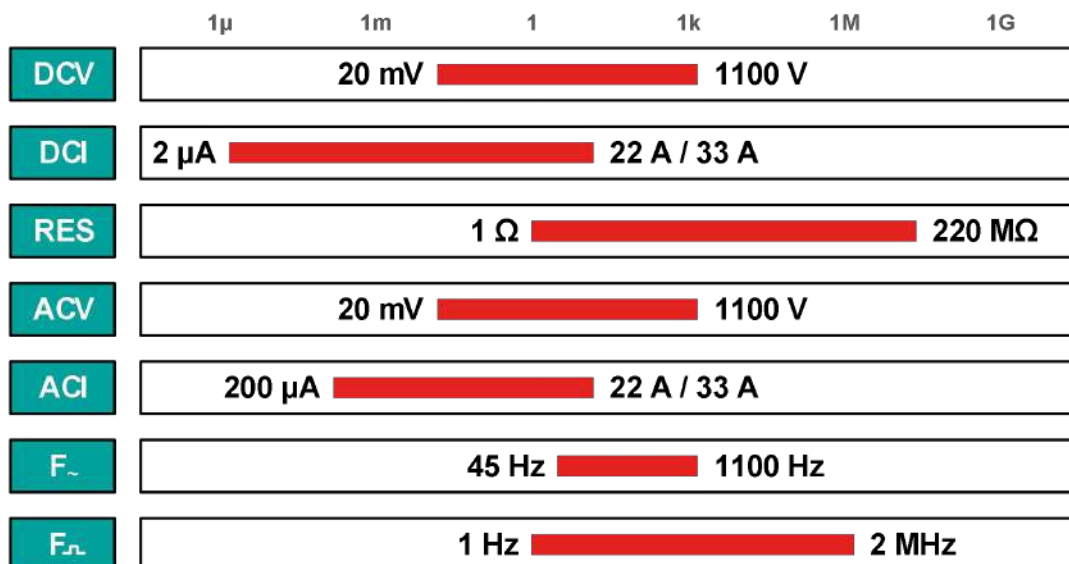
Item	Description
1	LCD touch screen.
2	Operation panel.
3	Simulated DC resistance output terminals.
4	AC/DC voltage output terminals.
5	AC/DC current output terminals.
6	Handle: used for carrying instruments.
7	Input terminals for DC transducer.

## ☒ Rear panel



Item	Description
1	Pulse frequency output terminals.
2	Remote box interface.
3	RS232 communication interface.
4	Chassis ground binding post.
5	AC 220V power interface.
6	Cooling vents.

Wide output range





## Multiple output/adjustment methods

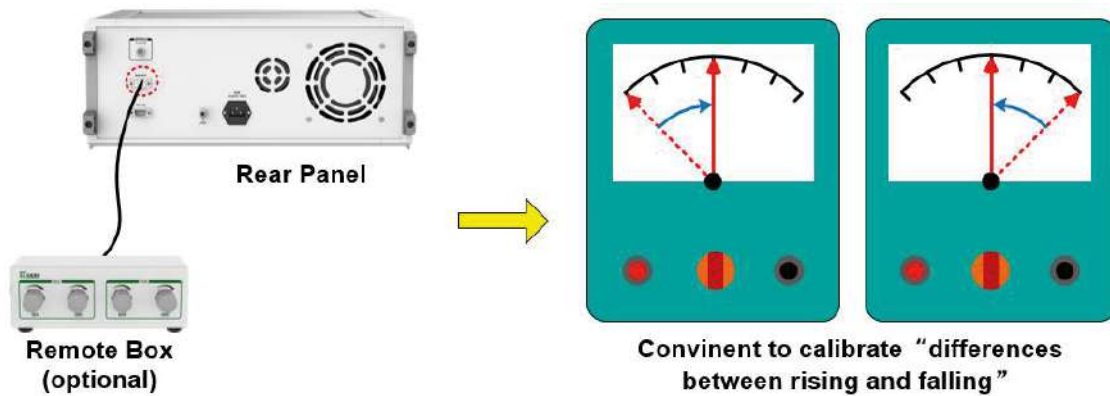


Figure (a) Keypad



Figure (b) Touch Screen Output

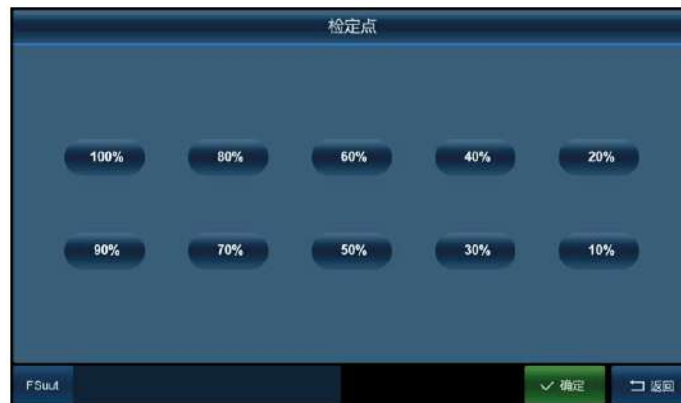
- “ **Direct output** ” mode: the value output can be set directly by physical key or touch screen.



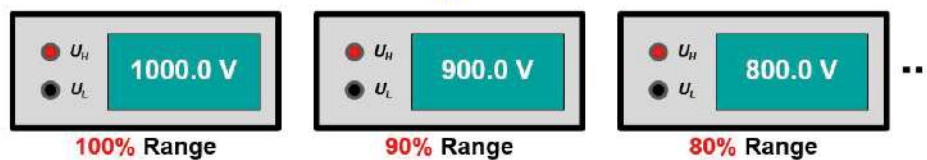
- Calibration of the analog pointer meter usually needs to test scale by scale, especially "differences between rising and falling" (the change caused by the rise and fall of the calibration point).
- Remote box can realize the coarse and fine adjustment of current or voltage.



## ★ Multiple output/adjustment methods



“% setting”



- Touch “**Calibration point**” of screen for “% setting”.



Rotary Knob

U : 100.0000 V

U : 100.1000 V

- “**Rotary Knob**” mode, User can setting in clockwise direction or anticlockwise direction.

Range	Resolution	Stability (±%/min)	Accuracy $\pm(\text{ppm} \cdot \text{RD} + \text{ppm} \cdot \text{RG})^{[1]}$	Max Burden (mA)	Ripple Factor(%)
200 mV	1 $\mu\text{V}$	0.01	300 + 200	300	<0.5
2 V	10 $\mu\text{V}$	0.01	300 + 200	500	<0.5
10 V	100 $\mu\text{V}$	0.01	300 + 200	500	<0.5
30 V	100 $\mu\text{V}$	0.01	300 + 200	800	<0.5
100 V	1 mV	0.01	300 + 200	300	<0.5
300 V	1 mV	0.01	300 + 200	100	<0.5
600 V	1 mV	0.01	300 + 200	50	<0.5
1000 V	10 mV	0.01	300 + 200	30	<0.5

Ranges	Resolution	Stability (±%/min)	Accuracy $\pm(\text{ppm} \cdot \text{RD} + \text{ppm} \cdot \text{RG})$	Compliance Voltage (V)	Ripple Factor(%)
20 $\mu\text{A}$	100pA	0.01	300 + 200	10	<0.5
200 $\mu\text{A}$	1 nA	0.01	300 + 200	9	<0.5
2 mA	10 nA	0.01	300 + 200	9	<0.5
20 mA	100 nA	0.01	300 + 200	9	<0.5
200 mA	1 $\mu\text{A}$	0.01	300 + 200	9	<0.5
2 A	10 $\mu\text{A}$	0.01	300 + 200	3.5	<0.5
10 A	100 $\mu\text{A}$	0.01	300 + 200	2.5	<0.5
20 A (30 A) <sup>[2]</sup>	100 $\mu\text{A}$	0.01	300 + 200	2.5	<0.5

Note[1]: RD is the reading value, RG is the range value;

Note[2]: The 30 A range is optional.

Range	Resolution	Stability (±%/min)	Accuracy ±(ppm*RD+ppm*RG)	Max Burden (mA)	Harmonic (%)
200 mV	1 µV	50 µV	300 + 60 µV	500	<1.0
2 V	10 µV	0.01	300 + 200	500	<0.5
10 V	100 µV	0.01	300 + 200	800	< 0.5
30 V	100 µV	0.01	300 + 200	800	< 0.5
100 V	1 mV	0.01	300 + 200	300	< 0.5
300 V	1 mV	0.01	300 + 200	100	< 0.5
600 V	1 mV	0.01	300 + 200	50	< 0.5
1000 V	10 mV	0.01	300 + 200	30	< 0.5

Range	Resolution	Stability (±%/min)	Accuracy ±(ppm*RD+ppm*RG)	Compliance Voltage (V)	Harmonic (%)
2 mA	10 nA	0.6 µA	300 + 0.6 µA	50	< 0.5
20 mA	100 nA	0.01	300 + 200	50	< 0.5
200 mA	1 µA	0.01	300 + 200	50	< 0.5
1 A	10 µA	0.01	300 + 200	15	< 0.5
2 A	10 µA	0.01	300 + 200	10	< 0.5
5 A	10 µA	0.01	300 + 200	5	< 0.5
20 A(30 A) <sup>[1]</sup>	100 µA	0.01	300 + 200	2.5	< 0.5

Note [1]: 30 A range is optional.

- Voltage output range: 20 mV ~ 1100 V
- Current output range: 2 µA ~ 22 A\33 A
- Voltage and current output frequency: 45 Hz ~ 1100 Hz
- Protections: voltage source short-circuit protection, current source open-circuit protection, overload protection

Range	Resolution	Accuracy $\pm(\text{ppm} \cdot \text{RD} + \text{ppm} \cdot \text{RG})$	Allowable Current
100 $\Omega$	1 m $\Omega$	300 + 200	1mA ~ 80 mA
300 $\Omega$	1 m $\Omega$	300 + 200	1mA ~ 80 mA
1 k $\Omega$	10 m $\Omega$	300 + 200	100 $\mu$ A ~ 8 mA
3k $\Omega$	10 m $\Omega$	300 + 200	100 $\mu$ A ~ 8 mA
10 k $\Omega$	100 m $\Omega$	300 + 200	10 $\mu$ A ~ 0.8 mA
30 k $\Omega$	100 m $\Omega$	300 + 200	10 $\mu$ A ~ 0.8 mA
100 k $\Omega$	1 $\Omega$	300 + 200	10 $\mu$ A ~ 0.8 mA
300 k $\Omega$	1 $\Omega$	300 + 200	1 $\mu$ A ~ 80 $\mu$ A
1 M $\Omega$	10 $\Omega$	300 + 200	1 $\mu$ A ~ 80 $\mu$ A
10 M $\Omega$	100 $\Omega$	600 + 400	100nA ~ 8 $\mu$ A
100 M $\Omega$	1000 $\Omega$	3000 + 2000	10nA ~ 0.8 $\mu$ A
200 M $\Omega$	1000 $\Omega$	3500 + 2500	10nA ~ 0.8 $\mu$ A

- Output range: 10  $\Omega$  ~ 220 M $\Omega$
- Over-current and reverse connection protection

#### 6.4 Sinusoidal Wave Frequency Output

Output Range <sup>[1]</sup>	Resolution	Accuracy
45.0000 Hz $\leq$ F $\leq$ 99.9999 Hz	0.0001 Hz	$\pm 0.01\%$
100.000 Hz $\leq$ F $\leq$ 999.999 Hz	0.001 Hz	$\pm 0.01\%$
1000.00 Hz $\leq$ F $\leq$ 1100.00 Hz	0.01 Hz	$\pm 0.01\%$

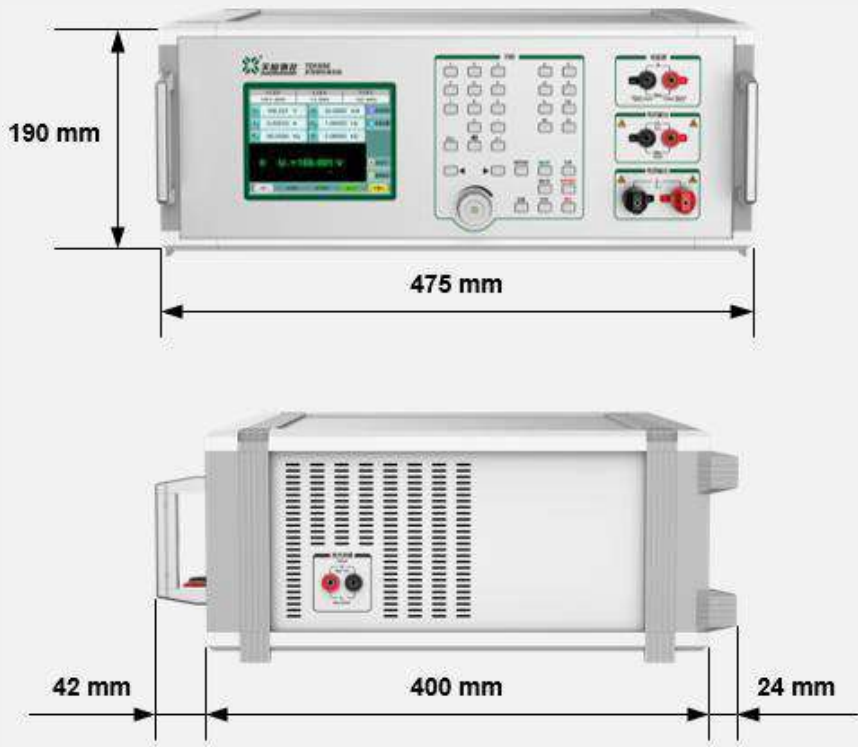
Note [1]: The output mode is AC voltage or AC current.

Range <sup>[1]</sup>	Resolution	Accuracy	Shake
1.000 00 Hz ≤ F ≤ 9.999 99 Hz	10 μHz	±(20 ppm*RD + 20 μHz)	<20 ns
10.000 0 Hz ≤ F ≤ 99.999 9 Hz	0.1 mHz		
100.000 Hz ≤ F ≤ 999.999 Hz	1 mHz		
1.000 00 kHz ≤ F ≤ 9.999 99 kHz	10 mHz		
10.000 0 kHz ≤ F ≤ 99.999 9 kHz	0.1 Hz		
100.000 kHz ≤ F ≤ 999.999 kHz	1 Hz		
1.000 00 MHz ≤ F ≤ 2.000 00 MHz	10 Hz		

Note [1]: The output type is TTL level.

## 6.6 DC Small-signal Measurement (optional)

Type	Range	Measurement range	Accuracy
DCV	1 V	±(0 ~ 1.2) V	±(0.006%*RD + 0.004%*RG)
	10 V	±(0 ~ 12) V	±(0.006%*RD + 0.004%*RG)
DCI	2 mA	±(0 ~ 2.4) mA	±(0.006%*RD + 0.004%*RG)
	20 mA	±(0 ~ 24) mA	±(0.006%*RD + 0.004%*RG)

<b>Power supply</b>	AC (220±22) V, (50±2) Hz
<b>Maximum power consumption</b>	600 VA
<b>Warm up time</b>	Twice the time since last warmed up, to a maximum of 30 minutes.
<b>Temperature performance</b>	Operating temperature: 0°C ~ 40°C Calibration temperature: 18°C ~ 28°C Storage temperature: -20°C ~ 70°C
<b>Humidity performance</b>	Operating humidity: <80% @ 30°C, <70% @ 40°C Storage humidity: (20%~80%) R·H, No condensation
<b>Communication interface</b>	RS 232
<b>Dimensions</b>	475 mm(W) × 400 mm (D) × 190 mm (H), excluding handles and feet.
	
<b>Weight</b>	About 18 kg

