

TD1858 Portable Multifunction Calibrator



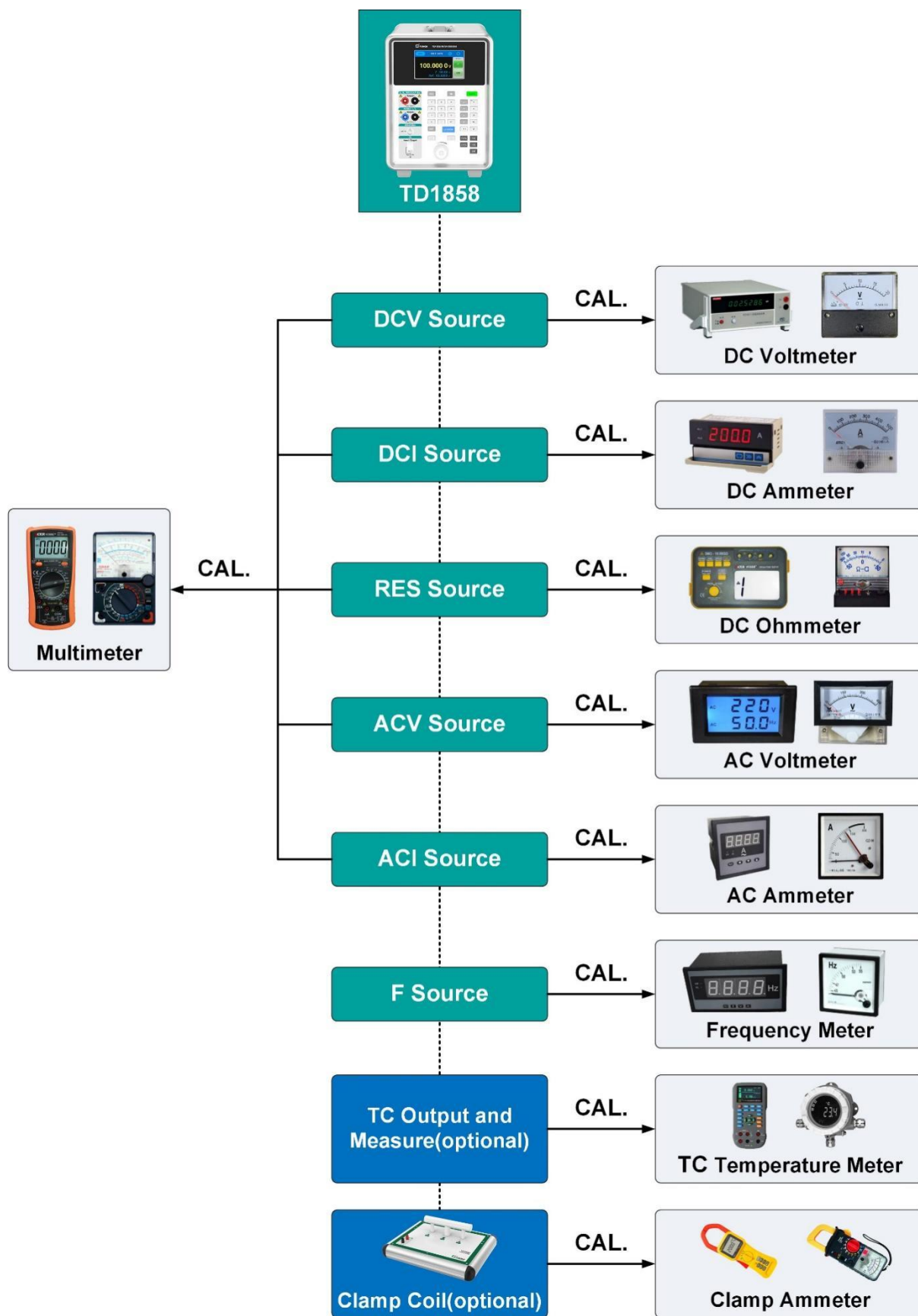
1. Summary

TD1858 is a multifunctional standard source instrument with compact size and light weight, integrating the functions of AC and DC voltage standard source, current standard source, resistance standard source, etc., while still having high performance indicators. Its portable feature is very suitable for carrying to the field to calibrate multimeters and other electrical measuring instruments.

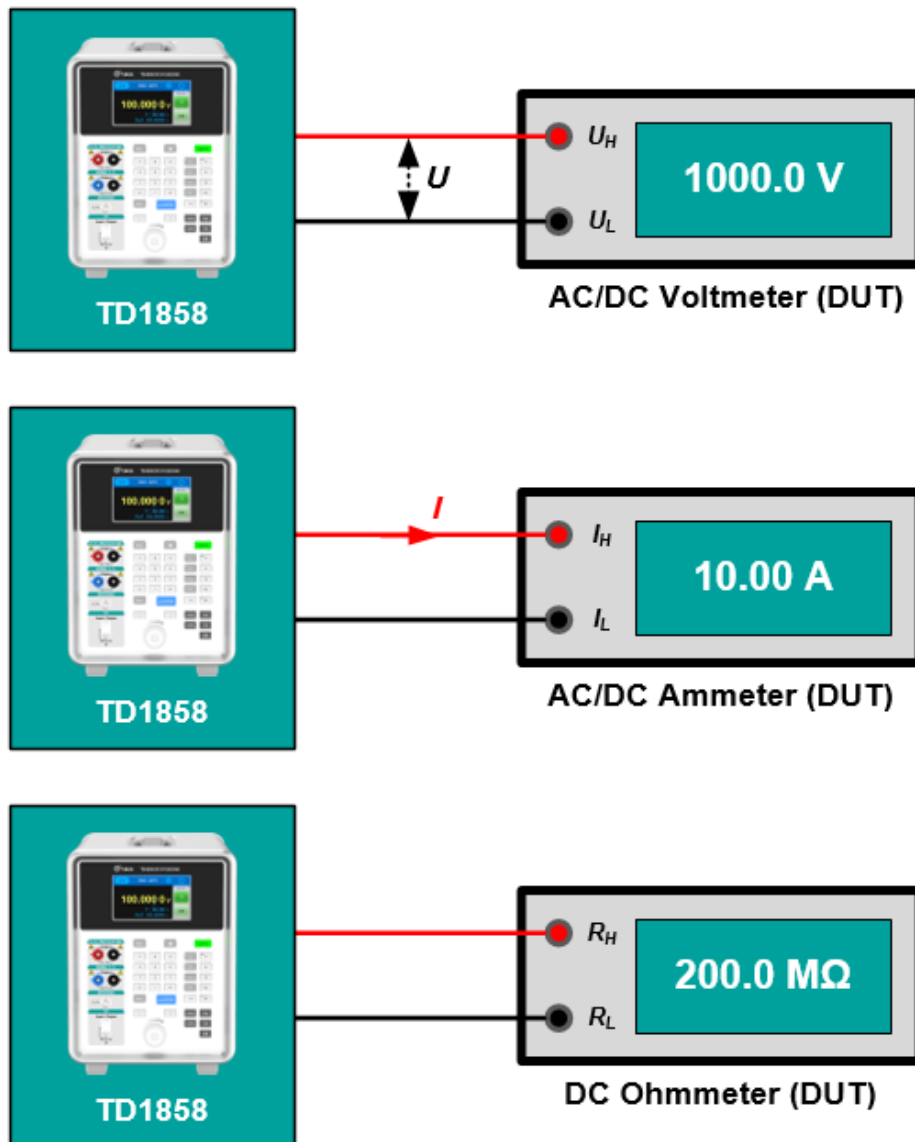
2. Features

- DC voltage output: $+(10\text{ mV} \sim 1020\text{ V})$, $-(10\text{ mV} \sim 10.4\text{ V})$
- DC current output: $\pm(10\text{ }\mu\text{A} \sim 10.2\text{ A})$
- AC voltage output: $10\text{ mV} \sim 1020\text{ V}$
- AC current output: $10\text{ }\mu\text{A} \sim 10.4\text{ A}$
- Sinusoidal Wave frequency: $10\text{ Hz} \sim 20\text{ kHz}$
- Simulated DC resistance: $1\text{ }\Omega \sim 220\text{ M}\Omega$, continuously adjustable
- 2 MHz Square wave frequency output
- 8 types thermocouple outputs (optional)
- Multiple value output modes
- Clamp meter calibration (optional)

3. Application

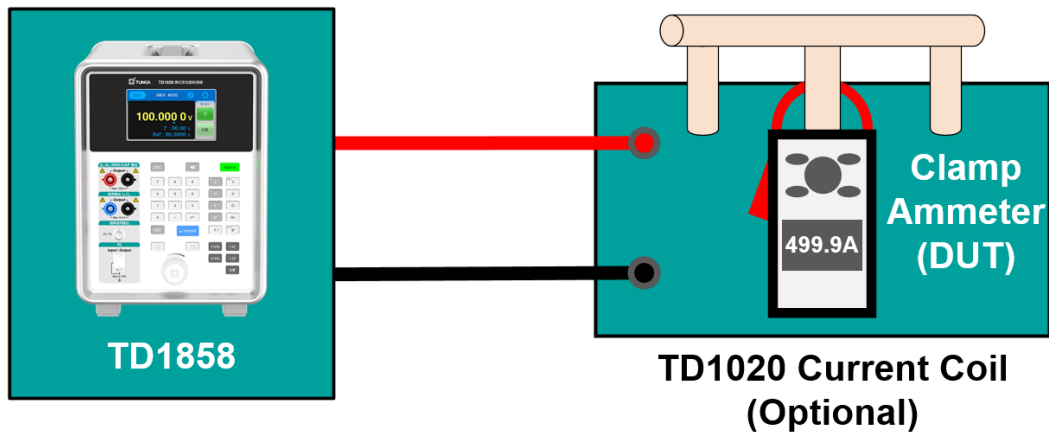


☆ Calibrate AC\DC electrical measuring instruments



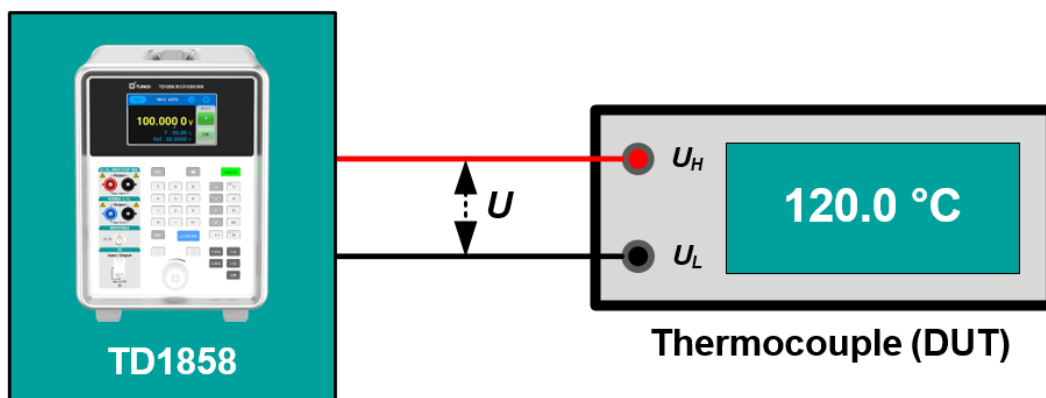
- **DCV output:** +(10 mV ~ 1020 V), -(10 mV ~ 10.4 V)
- **DCI output:** $\pm$ (10 μ A ~ 10.2 A)
- **ACV output:** 10 mV ~ 1020V, 10 Hz ~ 20 kHz
- **ACI output:** 10 μ A ~ 10.4 A, 10 Hz ~ 2 kHz
- **RES output:** 1 Ω ~ 220 M Ω
- **Frequency output:** 1 Hz ~ 2 MHz
- Can calibrate DC voltmeters of class 0.05 and below, DC ammeters of class 0.1 and below, AC voltmeters of class 0.2 and below, AC ammeters of class 0.5 and below, DC resistance meters of class 0.2 and below, and frequency meters of class 0.01 and below.

☆ Calibrate clamp ammeter (optional)



- Users can choose TD1020 current coil (50 turns), TD1858 outputs a maximum of 10 A AC and DC standard current to the current coil, which can achieve a maximum equivalent current output of 500 At, suitable for calibrating clamp ammeters or current clamps with lower accuracy of class 1 and below.
- If you need to calibrate a clamp ammeter with higher accuracy, you can choose clamp ammeter calibration device products such as TD1040 or TD1050A from Tunkia.

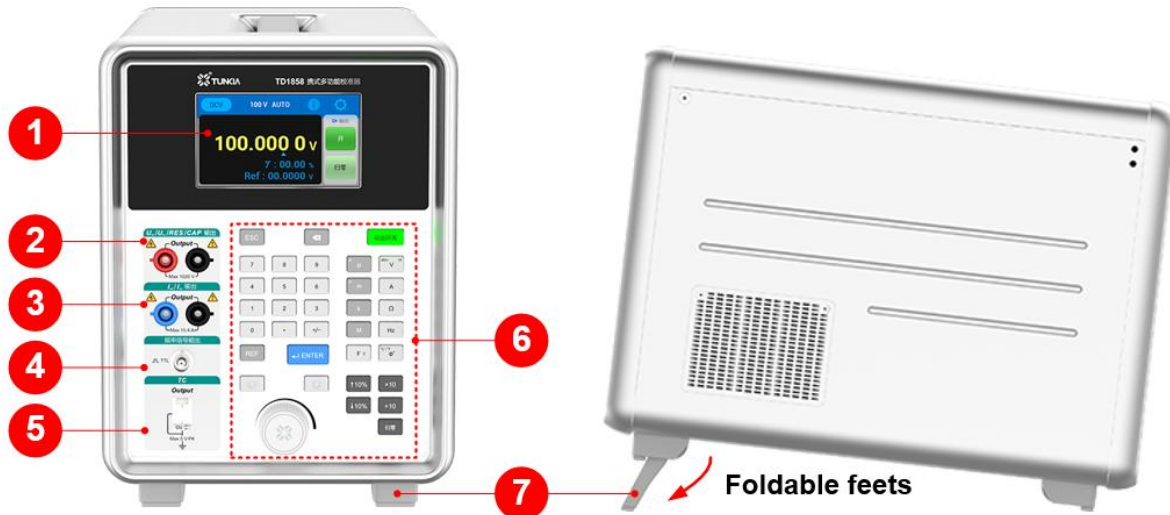
☆ Calibrate thermocouple (optional)



- **Thermocouple (TC) output types:** J, K, T, R, S, B, N, E (8 types in total).
- Users can choose thermocouple calibration options. TD1858 can provide 11 types of thermocouples specified by IEC. After setting the temperature value, the corresponding thermocouple electrical quantity can be output to calibrate the temperature measurement table.

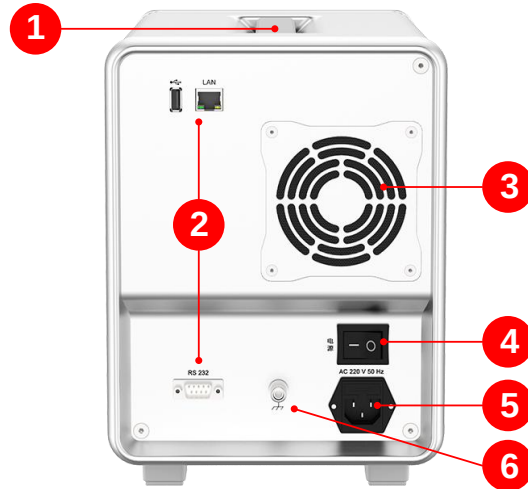
4. Panel Features

☆ Front and Side Panel



Item	Description
1	LCD touch color screen: intuitive display of multiple power levels and touch operation greatly improves the usability of the instrument.
2	AC/DC voltage/resistance output terminals: Protective terminals are used to prevent high voltage hazards caused by misoperation.
3	AC/DC current output terminals: Maximum output current is 10.4 A.
4	Pulse frequency output terminal: BNC female connector, output TTL level pulse signal.
5	Thermocouple output/measurement terminal: Use a dedicated thermocouple test terminal for connection.
6	Button operation panel: Multiple value input and adjustment modes greatly improve the convenience of instrument operation.
7	Foldable feet: Slightly raise the instrument to a certain angle to obtain the best operation and reading angle.

☆ Rear Panel



Item	Description
1	Embedded handle: The front panel is equipped with a pair of handles to facilitate users to move or carry the instrument.
2	USB, LAN, RS232 interface: It can be connected to a computer to facilitate users to program and control the output of multi-function standard source.
3	Cooling outlet: The instrument has built-in fans and radiators to stabilize the ambient temperature and ensure output stability.
4	Power switch: Boat-type power switch.
5	Power input interface: AC 220 V power input interface with fuse.
6	Chassis ground interface: The instrument should be grounded before working to ensure power safety.

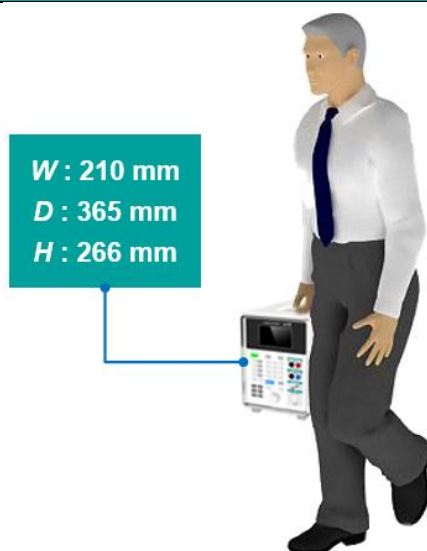
5. Characteristics

☆ Wide output range

	1μ	1m	1	1k	1M	1G
DCV	10 mV  1020 V					
DCI	10 μA  10.2 A					
RES	1 Ω  220 MΩ					
ACV	10 mV  1020 V					
ACI	10 μA  10.4 A					
F _~	10 Hz  20 kHz					
F _~	1 Hz  2 MHz					

- **Solution value:** The multifunctional standard source output range of TD1858 covers the working range of electrical measuring instruments such as digital multimeters, and can be calibrated directly using the standard source method.

☆ Excellent portability



Figure(a) Small Size



Figure(b) Light Weight

- **Small size:** Compared with multi-function calibrators with the same technical indicators, the volume is reduced by 50%.
- **Lightweight:** The weight of the whole machine is less than 10 kg, and personnel can easily carry it.

- **Solution value:** It is very convenient to carry it to the work site to calibrate digital multimeters and other electrical measuring instruments.

☆ Easy to operate



- **Touch screen:** full color, high screen brightness, clear picture quality, support touch operation, comprehensive functions, simple and fast.
- **Front panel wiring:** convenient for users to replace current and voltage test wires when checking the meter.
- **Digital programmable buttons:** can realize multiple input methods such as fixed-point output, rotary encoder, and step adjustment, and the operation is convenient and fast.
- **Solution value:** This combined operation method effectively improves the convenience of operation to adapt to a variety of application scenarios.

☆ Multiple output and adjustment methods



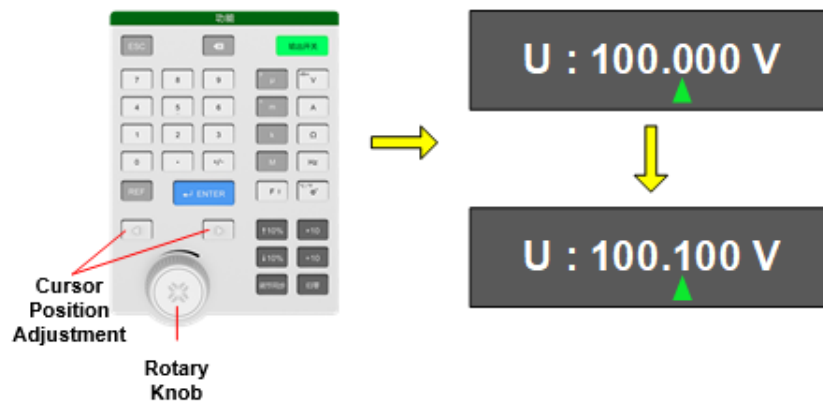
Figure(a) Keypad



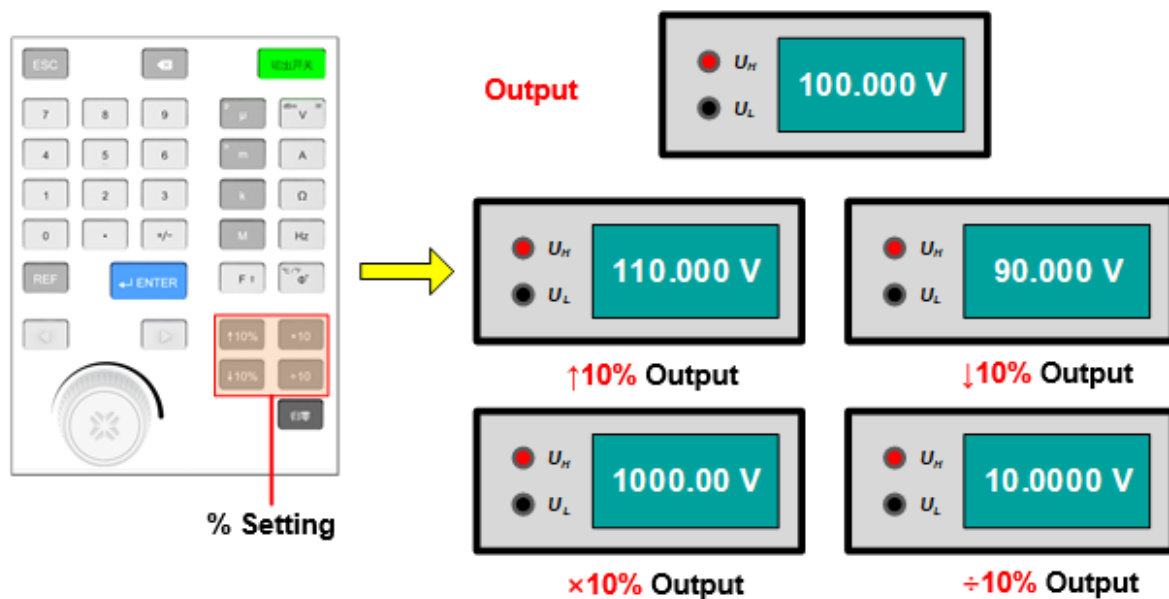
Figure(b) Touch Screen Output

- With " **Direct output** " mode, you can directly set the required output value by pressing the number and unit buttons on the operation panel or clicking the touch screen (as shown in Figure a). The instrument will automatically switch to the optimal range output, which is convenient for calibrating digital instruments.
- Especially when setting AC voltage/current, you can directly enter the amplitude and frequency at the same time (as shown in Figure b), which is convenient and fast.

☆ Multiple output & adjustment methods



- The instrument is equipped with a "**Rotary Knob**" on the front panel. Click the left and right arrow keys to adjust the cursor position, and then rotate clockwise or counterclockwise to increase or decrease the output value.



- Use the key $\uparrow 10\%$, $\downarrow 10\%$, $\times 10$, $\div 10$ on the front panel, can realize the adjustment of the quantity value, and can also be used to perform the relevant test of linearity.

6. Specifications

6.1 DC Voltage Output

Range	Resolution	Uncertainty(k=2), (ppm*RD + μ V) ^[1]			Max Burden (mA)	Ripple Factor (%)
		24 hours (23 $\pm$ 1) $^{\circ}$ C	90 days (23 $\pm$ 5) $^{\circ}$ C	1 year (23 $\pm$ 5) $^{\circ}$ C		
100mV	1 μ V	40 + 10	64 + 10	80 + 10	100	<0.1
1 V	10 μ V	40 + 30	64 + 30	80 + 30	100	<0.1
10 V	100 μ V	40 + 300	64 + 300	80 + 300	100	<0.1
100 V	1 mV	40 + 3000	64 + 3000	80 + 3000	25	<0.1
1000 V	10 mV	40 + 30000	64 + 30000	80 + 30000	12	<0.1

Note [1]: RD is the reading value, same below.

- Output range: +(10 mV ~ 1020 V)、-(10 mV ~ 10.4 V)
- 6 digits display
- Short-circuit and overload protection

6.2 DC Current Output

Range	Resolution	Uncertainty(k=2), (%*RD + μ A)			Compliance Voltage (V)	Ripple Factor (%)
		24 hours (23 $\pm$ 1) $^{\circ}$ C	90 days (23 $\pm$ 5) $^{\circ}$ C	1 year (23 $\pm$ 5) $^{\circ}$ C		
100 μ A	1 nA	0.01+0.03	0.016+0.03	0.02+0.03	8	<0.5
1 mA	10 nA	0.01+0.1	0.016+0.1	0.02+0.1	8	<0.2
10 mA	100 nA	0.01+ 1	0.016+ 1	0.02+ 1	8	<0.1
100 mA	1 μ A	0.01+ 10	0.016+ 10	0.02+ 10	8	<0.1
1 A	10 μ A	0.01+ 100	0.016+ 100	0.02+ 100	4.2	<0.1
10 A	100 μ A	0.015+ 2000	0.024+ 2000	0.03+ 2000	3.9	<0.1

- Output range: $\pm$ (10 μ A ~ 10.2 A)
- 6 digits display
- Open-circuit and overload protection

6.3 AC Voltage Output

Range	Resolution	Frequency (Hz)	Uncertainty(k=2), (%*RD + mV)			Max Burden (mA)	Harmonic (%)
			24 hours (23±1)°C	90 days (23±5)°C	1 year (23±5)°C		
100 mV	1 μV	10 ~ 2k	0.02 + 0.03	0.032 + 0.03	0.04 + 0.03	100	<0.5
		2k ~ 20k	0.03 + 0.05	0.048 + 0.05	0.06 + 0.05		
1 V	10 μV	10 ~ 2k	0.015 + 0.2	0.024 + 0.2	0.03 + 0.2	100	<0.5
		2k ~ 20k	0.025 + 0.5	0.040 + 0.5	0.05 + 0.5		
10 V	100 μV	10 ~ 2k	0.015 + 2	0.024 + 2	0.03 + 2	100	<0.5
		2k ~ 20k	0.025 + 5	0.040 + 5	0.05 + 5		
100 V	1 mV	40 ~ 1k	0.03 + 30	0.048 + 30	0.06 + 30	20	<0.5
1000 V	10 mV	40 ~ 1k	0.03 + 300	0.048 + 300	0.06 + 300	12	<0.5

- Output range: 10 mV ~ 11 V @ 10 Hz ~ 20 kHz, 10 V~1020V @ 40 Hz~1 kHz
- 6 digits display
- Short-circuit and overload protection

6.4 AC Current Output

Range	Resolution	Frequency (Hz)	Uncertainty(k=2), (%*RD+μA)			Compliance Voltage (V)	Harmonic (%)
			24 hours (23±1)°C	90 days (23±5)°C	1 year (23±5)°C		
100 μA	1 nA	10 ~ 2k	0.03+0.24	0.048+0.24	0.06+0.24	6	<0.5
1 mA	10 nA	10 ~ 2k	0.025+0.5	0.04+0.5	0.05+0.5	6	<0.5
10 mA	100 nA	10 ~ 2k	0.025+5	0.04+5	0.05+ 5	6	<0.5
100 mA	1 μA	10 ~ 2k	0.025+50	0.04+50	0.05+50	6	<0.5
1 A	10 μA	10 ~ 2k	0.025+600	0.04+600	0.05+600	4	<0.5
10 A	100 μA	10 ~ 2k	0.03+9000	0.048+9000	0.06+9000	3.6	<0.5

- Output range: 10 μA ~ 10.4 A @ 10 Hz ~ 2 kHz

- 6 digits display
- Open-circuit and overload protection

6.5 Simulated DC Resistance

Range	Resolution	Uncertainty(k=2), (%*RD+Ω)			Allowable Current
		24 hours (23±1)°C	90 days (23±5)°C	1 year (23±5)°C	
10 Ω	100 μΩ	0.025 + 0.05	0.03+0.05	0.05+0.05	1mA~150 mA
100 Ω	1 mΩ	0.015+0.02	0.024+0.02	0.03+0.02	1mA~80 mA
1 kΩ	10 mΩ	0.015+0.2	0.024+0.2	0.03+0.2	0.1mA~8 mA
10 kΩ	100 mΩ	0.015+2	0.024+2	0.03+ 2	10μA~800μA
100 kΩ	1 Ω	0.015+2	0.024+2	0.03+ 20	10μA~200μA
1 MΩ	10 Ω	0.015+20	0.024+20	0.03+ 200	1μA~20 μA
10 MΩ	100 Ω	0.03 + 4000	0.048 + 4000	0.06+ 4000	0.25μA~20 μA
100 MΩ	1 kΩ	0.15 + 200k	0.24 + 200k	0.3+200k	25nA~200nA
200 MΩ	1 kΩ	0.18 + 500k	0.28 + 500k	0.35+500k	15nA~100nA

- Output range: 10 Ω ~ 220 MΩ, continuously adjustable.
- 6 digits display
- Over-current and reverse connection protection

6.6 Sinusoidal Wave Frequency Output

Range ^[2]	Resolution	Uncertainty(k=2), (23±5)°C
10.0000 Hz ≤ F ≤ 99.9999 Hz	0.1 mHz	0.01%
100.000 Hz ≤ F ≤ 999.999 Hz	1 mHz	0.01%
1.000 00kHz ≤ F ≤ 9.999 99kHz	10 mHz	0.01%
10.000 0 kHz ≤ F ≤ 20.000 0 kHz	0.1 Hz	0.01%

Note [2]: The output mode is AC voltage or AC current.

6.7 Pulse Frequency Output

Range ^[3]	Resolution	Uncertainty(k=2), (23±5)°C	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 [3]: The output type is TTL level.			

6.8 Thermocouple Output (optional)

Type	Range ^[4] ^[5] , (°C)		Uncertainty(k=2), (°C) @ (23±5)°C ^[6]	
	min	max	90 days	1 year
J	-210	-100	0.32	0.40
	-100	760	0.16	0.20
	760	1200	0.28	0.35
K	-200	-100	0.40	0.50
	-100	120	0.20	0.25
	120	1370	0.36	0.45
T	-200	-150	0.80	1.00
	-150	400	0.16	0.20
R	-50	250	1.20	1.50
	250	1760	0.72	0.90
S	-50	250	1.20	1.50
	250	1760	0.72	0.90
B	410	1820	1.12	1.40

N	-200	-100	0.64	0.80
	-100	410	0.28	0.35
	410	1300	0.36	0.45
E	-250	-100	0.64	0.80
	-100	650	0.16	0.20
	650	1000	0.20	0.25

Note [4]: temperature display resolution: 0.01 ° C;

Note [5]: Internal resistance of output source: 10 Ω;

Note [6]: thermocouple error is not included.

Note [7]: Use external compensation, J, K, T, R, S, B, N, E conform to ITS-90 international temperature standard.

7. Ordering Information

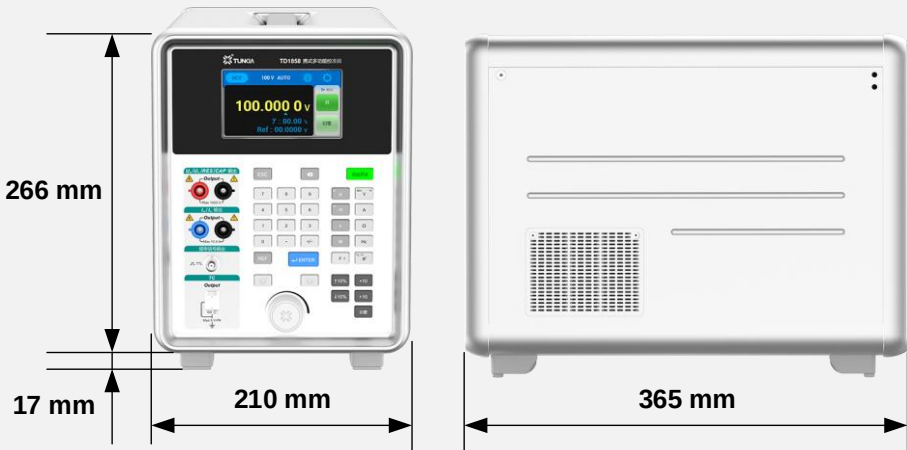
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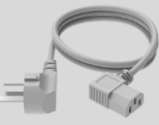
Thermocouple Output	
Code	Note
Empty	/
TC	✓

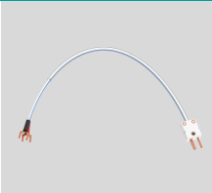
E.g. : *TD1858-TC* notes for the instrument have the function of thermocouple output.

8. General Specifications

Maximum power consumption	500 VA
Warm up time	30 minutes
Temperature performance	Operating temperature: 0°C~40°C Calibration temperature: 18°C~28°C Storage temperature: -20°C~70°C
Humidity performance	Operating humidity: <80% @ 30°C, <70% @ 40°C Storage humidity: (20%~80%) R·H, No condensation
Communication interface	RS232×1, LAN×1, USB×1
Dimensions	210 mm(W)× 365 mm (D) × 266 mm (H), excluding handles and feet. 
Weight	About 9.5 kg

9. Accessory List

S/N	Pic	Name	Specification	Qty	Remark
1		Voltage Test	1.5m / 2.1mm ² / Φ 4- Φ 4 safety	Red 2	Standard
		Leads	banana plug	Black 2	accessory
2		10A Current Test	1.5m / 6mm ² / Φ 4- Φ 4 safety	Red 1	Standard
		Lead	banana plug	Black 1	accessory
3		Current Shorting	0.18m / 1.6mm ² / Φ 4- Φ 4	Red 1	Standard
		Wire	safety banana plug	Black 1	accessory
4		Alligator Clips	Full sheath / Φ 4 jack	Red 2	Standard
				Black 2	accessory
5		Pin Adapter	Φ 2*18mm / Φ 4 jack	Red 2	Standard
				Black 2	accessory
6		U-shaped Blade	Φ 8 thin blade terminal / Φ 4	Red 3	Standard
		Terminal	jack	Black 3	accessory
7		Frequency Test Leads	BNC male to alligator clip	1	Standard accessory
8		Power Cable	AC 220V, 10A	1	Standard accessory
9		Packing Box	Aluminum alloy	1	Standard accessory

S/N	Pic	Name	Specification	Qty	Remark
1		Thermocouple Test Leads	0.6m, TC head to $\Phi 4$ blade terminal	1	Thermocouple output function option

Note: If the user specifies the function selection in the order contract, the corresponding accessories will be shipped by default.

For example: TD1858-TC has a thermocouple output function, so the delivery list includes a thermocouple test lead.

S/N	Pic	Name	Specification	Qty	Remark
1		TD1020 Current Coil	20 A / 50 T	1	Clamp meter calibration options
2		Current Test Leads	1.5m / 16mm ² / $\Phi 12$ - $\Phi 12$ blade terminal	Red 1 Black 1	
3		Calibration software	Card USB	1	Software options
4		Communication Line	1.8m / USB to RS232 (DB9 female)	1	

Note: The above accessories need to be purchased separately and must be specified in the order contract.