value of " ▼ " key to decrease value one by one. He also can press " ▲ " to increase value one by one. He can press main parameter of " ▶ " key for rightward movement of flicker position. He can press " ◀ " key for leftward movement of flicker position of main parameter with corresponding value adjustment. He can press "ENTUP" key to enter into sieving scope for setting and flickering of "TOL" ±1%" symbol on LCD. He can press " ▶ " or " ◀ " key to adjust value within sieving scope. He also can press "ENTER" to confirm setting of sieving & measurement of elements.

2）Exit of sieving mode

User can press "Sorting" key to exit sieving & measurement mode and return to normal mode.

7、Calibration function

Calibration function can be used to reduce interference of distribution parameters brought in by testing wires effectively. Calibration function includes short-circuit calibration and open circuit calibration. Short-circuit calibration can be adopted to reduce influence of contact resistance and testing wire resistance to measure low-impedance elements. Open circuit calibration also can be adopted to reduce

influence of distributed capacitance and distributed resistance of testing wires to measure high-impedance elements.

1）Entry into calibration function (with inserting images)

User can press "CAL" key for a long time to enter into open circuit for calibration. (As shown in Figure 4,) auxiliary display on LCD can show " OPEn " . User also can press "CAL" to begin calibration. (As shown in Figure 5), LCD also will show " PASS " after countdown from 30s to 0.

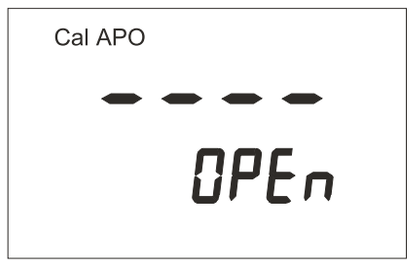


Figure 4

Figure 5

It refers to finishing calibration of open circuit. User can press “CAL” key to show “ SrE ” (shown in Figure 6) on auxiliary display of LCD. User can insert short-circuit pieces into testing terminal and then press “CAL” key to begin calibration. (As shown in Figure 7), LCD will show “ PASS ” after countdown from 30s to 0 to show finishing short-circuit calibration. User also can press “CAL” key to return to normal measurement mode.

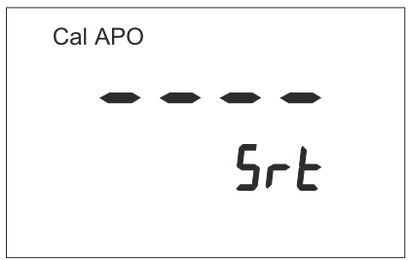


Figure 6

Figure 7

Note: (As shown in Figure 8,) LCD will show “ FAIL ” for open circuit calibration.

Figure 8

It refers to calibration failure. Please check if testing terminal is under open circuit status or not to guarantee re-calibration of open circuit.
(As shown in Figure 9), LCD will show “ FAIL ” for short-circuit calibration.

Figure 9

It refers to calibration failure. Check if testing terminals have been inserted into short-circuit pieces or not to guarantee normal short-circuit re-calibration.

8、PC communication
Press “PC” key to enter into communication function for “ ” display on LCD. Insert USB wire and start software of PC end upper host for data transmission. Press “PC” key to exit communication function and interrupt data transmission.

9、Backlight
Press “LIGHT” key for a long time and start LCD backlight to close backlight automatically after 60S. Press “LIGHT” key for a long time when starting backlight.

10、Auto power off
Power off after about 5 minutes of idling

IX、Fast Application Guideline

1、Selection of serial/parallel mode
Suitable equivalent mode can be selected to gain more precise measurement data. In general, it is suggested to select serial equivalent mode for low-impedance element (such as less than 100Ω). It is suggested to select parallel equivalent mode for high-impedance element (such as more than 10 kΩ). Serial/parallel equivalent mode also has little influence for measurement result.

2、Inductance measurement
1）Press “⏻” for bootstrap.
2）Press “FUNC” to display “Lp” on LCD and select inductance measurement gear.
3）Insert inductance into testing port or connect corresponding fittings to measured inductance (shown in Figure 10).
4）To press “FREQ” key to select suitable testing frequency.
5）Press “D/Q/θ” to select auxiliary parameter to measure.

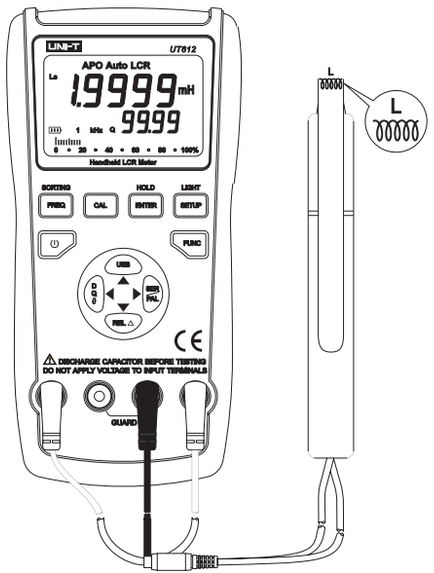


Figure 10

3、Capacitance measurement

Warning! Capacitance must be discharged completely before measurement.

1）Press “⏻” for bootstrap.

2）Press “FUNC” to display “Cp” on LCD and select capacitance measurement gear.

3）Insert capacitance into testing port or connect corresponding fittings to measured capacitance (shown in Figure 11).

4）To press “FREQ” key to select suitable testing frequency.

5）Press “D/Q/θ” to select auxiliary parameter to measure.

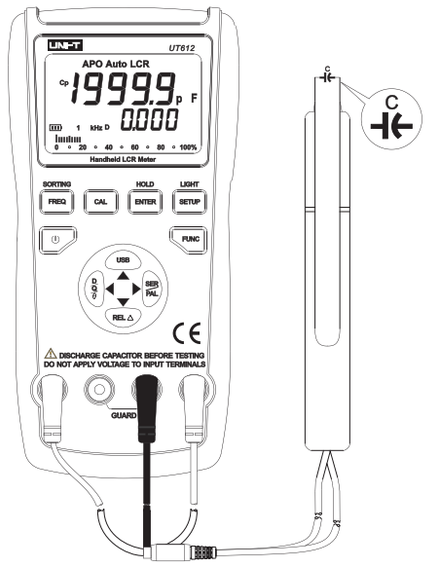


Figure 11

4、Resistance measurement
1）Press “ ⏻ ” for bootstrap.
2）Press “FUNC” to display “Rp” on LCD and select capacitance measurement gear.
3）Insert resistance into testing port or connect corresponding fittings to measured capacitance (shown in Figure 12).
4）To press “FREQ” key to select suitable testing frequency.

Note: Auxiliary parameter of resistance measurement will be neglected and auxiliary parameter will not be displayed on LCD.

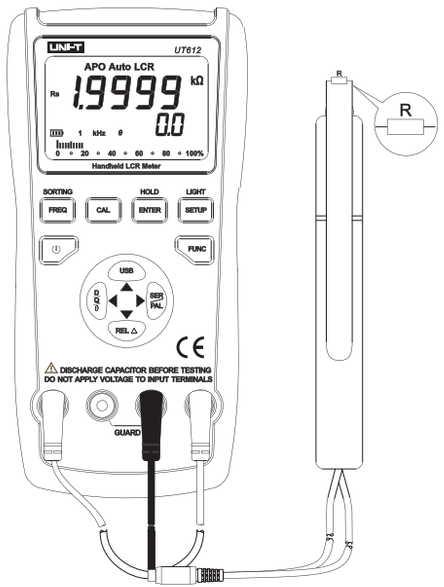


Figure 12

5、Measurement of DC impedance
1）Press “ ⏻ ” for bootstrap.
2）Press “FUNC” to display “DCR” on LCD and select measurement gear of DC resistance.
3）Insert resistance into testing port or connect corresponding fittings to measured resistance (shown in Figure 13).

Note: Auxiliary parameter and measurement frequency of DC resistance will be neglected and auxiliary parameter will not be displayed on LCD.

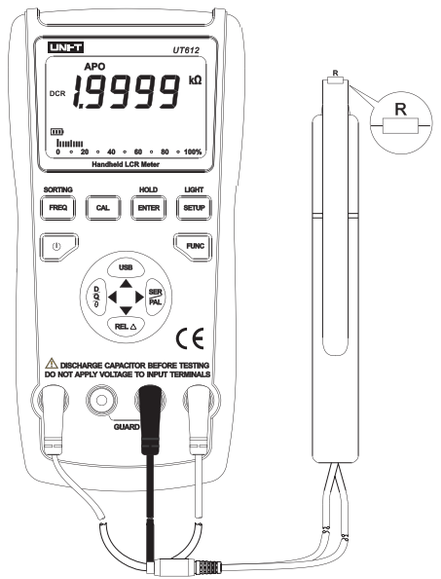


Figure 13

X、PC Communication Protocol

Start PC communication function to connect instrument and computer by USB wire for data acquisition.

Communication parameters:

1）Bit rate: 9600
2）Data bit: 8
3）Start bit: 1
4）Stop bit: 1
5）Inspection: Without

Connection mode is shown in the figure:

XI、Technical Indicators

Note:

1）Testing ambient temperature: 23℃±5℃; Humidity: =75% R.H
2）Pre-heat for 10 minutes before test;
3）Test on port slot of instruments;
4）Calibrate open circuit/short-circuit before test;
5) The actual measurement and displaying scope of the device go beyond the specified scope in the table; but no accuracy is specified for the measuring value

which goes beyond the scope in the table

Function	Measurement mode	Frequency	Range	The minimum resolution	Precision±(a% of reading + b of word quantity) (under 18℃ to 28℃)
L Inductance gear	Rs/Rp	100Hz/120Hz	20.000mH	1uH	1.0%+5
			200.00mH	0.01mH	0.5%+5
			2000.0mH	0.1mH	0.5%+5
			20.000H	1mH	0.5%+5
			200.00H	0.01H	1.0%+5
			2000.0H	0.1H	1.0%+5
			20.000kH	0.001kH	2.0%+5
		1KHz	2000.0uH	0.1uH	1.0%+5
			20.000mH	1uH	0.5%+5
			200.00mH	0.01mH	0.5%+5
			2000.0mH	0.1mH	1.0%+5
			20.000H	1mH	1.0%+5
			200.00H	0.01H	2.0%+5
			2000.0H	0.1H	5.0%+5
		10KHz	200.00uH	0.01uH	1.0%+5
			2000.0uH	0.1uH	0.5%+5
			20.000mH	1uH	0.5%+5
			200.0mH	0.01mH	1.5%+5
			2000.0mH	0.1mH	2.0%+5
			20.000H	1mH	5.0%+5
		100KHz	20.00uH	0.001uH	1.0%+5
			200.00uH	0.01uH	2.0%+5
			2000.0uH	0.01uH	2.0%+5
			20.000mH	1uH	2.0%+5
			200.00mH	0.01mH	5.0%+5

Note: The precision is evaluated if D is less than 0.1. $Ae = Ae * \sqrt{1+D^2}$ if D exceeds 0.1.(Ae: Precision)

Function	Measurement mode	Frequency	Range	The minimum resolution	Precision±(a% of reading + b of word quantity) (under 18℃ to 28℃)
CAP Capacitance gear	Cs/Cp	100Hz/120Hz	20.000nF	1pF	2.0%+5
			200.00nF	0.01nF	0.5%+5
			2000.0nF	0.1nF	0.5%+5
			20.000uF	1nF	0.5%+5
			200.00uF	0.01uF	1.0%+5
			2000.0uF	0.1uF	2.0%+5
			20.00mF	0.01mF	2.0%+5
		1KHz	2000.0pF	0.01pF	1.0%+5
			20.000nF	0.1pF	1.0%+5
			200.00nF	0.01nF	0.5%+5
			2000.0nF	0.1nF	0.5%+5
			20.000uF	1nF	0.5%+5
			200.00uF	0.01uF	1.0%+5
			2000uF	1uF	1.0%+5
		10KHz	200.00pF	0.01pF	2.0%+5
			2000.0pF	0.1pF	1.0%+5
			20.000nF	1pF	1.0%+5
			200.00nF	0.01nF	1.5%+5
			2000.0nF	0.1nF	2.0%+5
		100KHz	200.00pF	0.01pF	2.0%+5
			2000.0pF	0.1pF	2.0%+5
			20.000nF	1pF	2.0%+5
			200.00nF	0.01nF	5.0%+5

Note: The precision is evaluated if D is less than 0.1. $Ae = Ae * \sqrt{1+D^2}$ if D exceeds 0.1. (Ae: Precision)

Function	Measurement mode	Frequency	Range	The minimum resolution	Precision±(a% of reading + b of word quantity) (under 18℃ to 28℃)
R Resistance gear	Rs/Rp	100Hz/120Hz	200.00Ω	0.01Ω	1.0% +5
			2.0000kΩ	0.1Ω	0.3% +5
			20.000kΩ	1Ω	0.3% +5
			200.00kΩ	0.01kΩ	0.5% +5
			2.0000MΩ	0.1kΩ	1.0% +5
			20.000MΩ	1kΩ	2.0% +5
			200.0MΩ	0.1MΩ	2.0% +5
		1KHz	20.000Ω	1mΩ	1.0% +5
			200.00Ω	0.01Ω	1.0% +5
			2.0000kΩ	0.1Ω	0.3% +5
			20.000kΩ	1Ω	0.3% +5
			200.00kΩ	0.01kΩ	0.5% +5
			2.0000MΩ	0.1kΩ	1.0% +5
			20.000MΩ	1kΩ	2.0% +5
			200.0MΩ	0.1MΩ	5.0% +5
		10KHz	20.000Ω	1mΩ	1.0% +5
			200.00Ω	0.01Ω	1.0% +5
			2.0000kΩ	0.1Ω	0.3% +5
			20.000kΩ	1Ω	0.5% +5
			200.00kΩ	0.01kΩ	1.0% +5
		100KHz	20.000Ω	1mΩ	2.0% +5
			200.00Ω	0.01Ω	2.0% +5
			2.0000kΩ	0.1Ω	1.0% +5
			20.000kΩ	1Ω	2.0% +5
	DCR		200.00Ω	0.01Ω	1% +5

R Resistance gear	DCR	2.0000kΩ	0.1Ω	0.3% + 5
		20.000kΩ	1Ω	0.3% + 5
		200.00kΩ	0.01kΩ	0.5% +5
		2.0000MΩ	0.1kΩ	1% +5
		20.000MΩ	1kΩ	2% +5
		200.00MΩ	0.1MΩ	2% +5

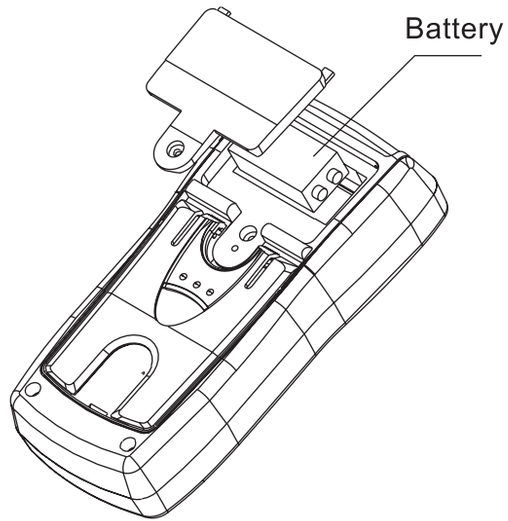
Note: The precision is evaluated if D is less than 0.1. $Ae \quad Ae*\sqrt{1 \quad D^2}$ If D exceeds 0.1. (Ae: Precision)

XII、Battery Replacement

⚠ Warning

Please replace battery in a timely manner When " ▭ " prompt shows on the LCD to avoid influence of measurement precision.

Please replace old battery by alkaline cell of 9V.



XIII、Maintenance

1）Cleaning

Please power off and remove battery and external power before cleaning. Please dip detergent to wipe off dirty location by soft clean cloth to prevent detergent from penetrating into shell inside. It cannot be used until shell cleaning and drying.

2）Moisture prevention

Please use instruments in dry environment and store them in dry locations after use. Please power off instantly and remove battery quickly if water penetrating into shell carelessly. It is not allowed to detach shell individually. Please submit it to related dealers or after-sales agents of our company for detection.

3）Repair

Please inspect battery, external power and power input jack firstly for instrument bootstrap failure. Please check if “ ⏻ ” key is invalid or not.

Please check if testing wires are excellent with excellent contact between clip in testing port and element foot or not for abnormal measurement result. Please confirm correct operation and use. It is not allowed to detach shell or replace element & circuit individually. Please contact related dealers or after-sales service agents of our company for repair confirmation failure.

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