UNI-T®

ISO 9001

UT725

Multifunction Process Calibrator

P/N:110401110426X

Preface

Thank you for purchasing this brand new product. In order to use this product safely and correctly, please read this manual thoroughly, especially the safety notes.

After reading this manual, it is recommended to keep the manual at an easily accessible place, preferably close to the device, for future reference.

Limited Warranty and Liability

Uni-Trend guarantees that the product is free from any defect in material and workmanship within one year from the purchase date. This warranty does not apply to damages caused by accident, negligence, misuse, modification, contamination or improper handling. The dealer shall not be entitled to give any other warranty on behalf of Uni-Trend. If you need warranty service within the warranty period, please contact your seller directly.

Uni-Trend will not be responsible for any special, indirect, incidental or subsequent damage or loss caused by using this device.

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1. Overview

UT725 is a handheld multifunction process calibrator with high accuracy and high performance. This meter can be used to measure and output multiple electrical and physical performances, the accuracy of measurement and output of DC current/voltage reaches up to 0.02%. Auto stepping and ramping function is used for fast linearity detection, the storage function makes users set up the system faster and more conveniently, and the data transfer function enables users to perform a fast communication test.

UT725 supports the processing of two signals, the upper screen can display test voltage, current (loop power supply), resistance and pressure, while the lower screen can display voltage, current, frequency, resistance, voltage, RTD and TC in the form of temperature.

Function	Measurement	Output	Remark
DC voltage	0～50V (Upper screen: ±30V)	0～10V	Two-channel measurement
DC current	0～24mA (Upper screen: ±24mA)	0～24mA	Two-channel measurement
Frequency	1.000Hz～100kHz	0.20Hz～100kHz	
Resistance	0～5000Ω	10～40000Ω	Two-channel measurement
DC millivolt	-10mV~500mV	-10mV～1100mV	Two-channel measurement
RTD	Pt100、Pt200、Pt500、Pt1000、Cu10、Cu50、Cu100、Pt100-392、Pt100-JIS、Ni120		
TC	R、S、K、E、J、T、N、B、L、U、XK、BP		
Gas pressure	With pressure module		Two-channel measurement
Others	Isolated loop power supply, stepping output, ramping output, adjustable range.		

2. Features

a) Up to 0.02% output and measurement accuracy.
b) With percentage output function, different percentage values can be obtained by pressing corresponding button.
c) Auto stepping and ramping output for fast linearity detection.
d) Perform mA measurement at the same time that the loop power is provided to transmitter.
e) Measure and output 10 types of RTD and 12 types of TC signals.
f) Save frequently-used settings for future use.
g) Data transfer function enables users to perform a fast communication test.
h) Adjustable screen brightness.
i) Rechargeable Ni-MH battery.

3. Accessories

Open the package box and take out the device. Please check whether the following items are deficient or damaged, and
contact your supplier immediately if they are.

1. UT725 --- 1 piece
2. Test probe --- 2 pairs
3. Alligator clips -- 2 pairs
4. K-type temperature probe -- 1 piece
5. User manual -- 1 piece
6. AA NI-MH battery --- 6 piece
7. Power adapter --- 1 piece
8. USB cable -- 1 piece
9. Cloth bag --- 1 piece

4. Safety information

Please follow the instructions in this user manual to use the meter, otherwise the protection provided by the meter may be impaired. "Warning" refers to potential hazard, "Attention" refers to the situation where would damage the calibrator or devices under test.

⚠ **Warning**

To avoid electric shock, damage, explosive gas ignition, please obey the followings:
- Please follow the instructions in this user manual to use the meter.
- Check the meter before use, do not use a damaged calibrator.
- Check the connectivity and insulation of the test leads, replace any exposed test leads.
- When using the probes, user only hold the protection end of the probe.
- Do not exert a voltage with more than 50.0 V on any terminals and earth line.
- If a voltage with more than 50.0 V is applied on any terminals, the factory certificate will be out of effect, moreover, the device will be damaged permanently.
- Correct terminals, modes, ranges must be used when it is on output status.
- To prevent the tested device from being damaged, choose a correct mode before connecting the testing lead.
- When connecting the leads, first connect the COM test probe and then connect the other probe. While disconnecting the lead, first disconnect the live probe and then disconnect the COM probe.
- Do not open the calibrator case.
- Before using the calibrator, please ensure that the battery door is tightly closed. Please refer to "Maintenance".
- When low battery indicator ▭ appears, replace or charge the battery as soon as possible to avoid wrong reading value which may cause electric shock. Before opening the battery door, first remove the calibrator from "Dangerous Zone".
- Please refer to "Maintenance".
- Disassemble the test leads of the calibrator before opening the battery door.

● The standard definition of measurement in CAT I is applicable to the circuit that does not directly connect to a power source.
● Specific replacement parts must be used when repairing the calibrators.
● The inside of the calibrator must be free from water.
● Before using the calibrator, input a voltage value to check if the operation is normal.
● Do not use the calibrator wherever there is explosive powder nearby.
● For battery, please refer to "Maintenance".
● Remove the test leads before switching to other outputs.

⚠ **Attention**
● To prevent the calibrator or the test device from being damaged:
● The correct terminals, modes, ranges must be used when it is on output status.
● Select correct jack, function and range when measuring and outputting current.

5. Electrical symbols

▣	Double insulation
⚠	Warning

6. General specifications

1. The maximum voltage between any terminal and earth line, or any two terminals is 30V.
2. Range: manually
3. Operating temperature: -10℃～55℃
4. Storage temperature: -20℃～70℃
5. Relative humidity: ≤95%(0℃～30℃), ≤75%(30℃～40℃), ≤50%(40℃～50℃)
6. Altitude: 0～2000m
7. Battery: AA NI-MH battery 1.2V×6 pieces

8. Drop test: 1 meter
9. Dimension: 224×104×63mm
10.Weight: 640g (including batteries)

7. External structure

1. Input and output terminals

Input and output terminals are indicated in Figure 2, Figure 3 describes how to use these terminals.
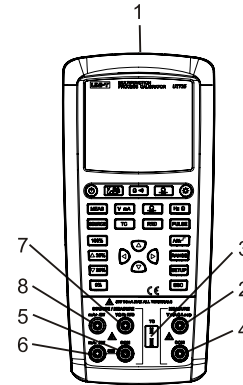

Figure 2 - Input and output terminals

No.	Name	Description
①	Charging, communication and pressure module terminal	Connect with power adapter to charge the rechargeable battery, connect to computer or pressure module.
②④	Function terminals for the measurement of isolated module in upper screen.	Measure millivolt, voltage, current, resistance and continuity, and provide loop power.
③	TC measurement/ output terminal	Used to measure or simulate TC.
⑤⑥	Terminals for current measurement or SIM output	Used for current measurement and SIM output.
⑤⑦	Terminals for measurement /output of V, mV, Hz, Ω, RTD.	Used to output or measure millivolt, voltage, resistance, frequency, pulse, switch quantity and platinum resistance
⑥⑧	Terminals for 3/4-wire measurement of current output and resistance/RTD.	Used in current output, 3/4-wire measurement of resistance or RTD.

2. Buttons

Figure 3 shows the buttons of the meter,
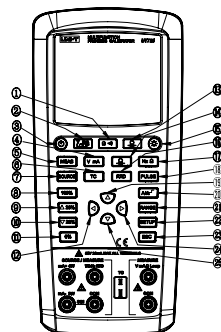table 4 describes the functions of the meter.

Figure 3 - The buttons of the meter

No.	Name	Description
1	Ω ·¹⁾)	Select resistance in upper screen, continuity measurement
2	V mA Loop	Select measurement function of millivolt, voltage, milliampere, loop current and others in upper screen.
3	⏻	Power on/off
4	V mA	Select measurement/output function of millivolt, voltage, milliampere, SIM and others in lower screen.
5	MEAS	Switch the function of lower screen to measurement mode.
6	TC	Select measurement or output function of TC in lower screen. Consecutively short press this button to switch between different TC graduations.
7	SOURCE	Switch the functions of lower screen to output mode.

8	100%	When the lower screen is in output mode, short press to recall and output 100% value of the preset range. Long press to reset the 100% value.
9	▲ 25%	When the lower screen is in output mode, press to increase output by 25% of preset range.
10	▼ 25%	When the lower screen is in output mode, press to decrease output by 25% of preset range.
11	0%	When the lower screen is in output mode, short press to recall and output 0% value of the preset range. Long press to reset the 0% value.
12	◄	Enable the pulse output function.
13	Ω⧖	Select pressure measurement/output function in upper screen. Consecutively short press to switch between different pressure units.
14	Ω⧖	Select pressure measurement/output function in lower screen. Consecutively short press to switch between different pressure units.
15	☼	Adjust screen brightness.
16	RTD	Select measurement/output function of RTD in lower screen. Consecutively short press to switch between different RTD graduations.
17	Hz Ω	Select frequency in lower screen, resistance measurement/output function.
18	PULSE	Select pulse in lower screen, measurement/output function of switch quantity.
19	▲	Direction key (up), used to revise the output value.
20	∧∿⌐	When the lower screen is in output mode, short press to enable ramping output function.
21	RANGE	When the lower screen is in output mode, consecutively short press to switch the range for current range.
22	SETUP	Setup button, long press to enter the setup interface of system parameter.
23	ESC	Exit button
24	►	Direction key (right)
25	▼	Direction key (left)

3. LCD display

Symbol	Description
SOURCE	Source output mode
MESUER	Measurement mode
▲	Data adjustment
SIM	Transmitter output simulation
LOOP	loop measurement
⬛	Battery level
LOAD	Overload
⌁	Ramp/step output
PC	Remote control
APO	Auto power on/off

8. Basic operations

This section introduces some basic operations about the meter.

1. Press and hold ⏻ for more than 2s to power on the meter, then the model of the meter will be displayed on LCD.
2. In any function interface, long press SETUP to enter system setup menu. Press arrow button to set parameter, short press ESC to exit setup menu.
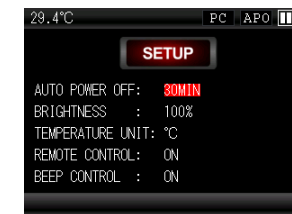
Figure 1 - System setup

1) Auto power off
Press ▼▲ to select AUTO POWER OFF, press ◀▶ to set up the auto power off time. The AUTO POWER OFF time will start when no button is pressed, the counting will restart if any button is pressed. The maximum AUTO POWER OFF time is 30 minutes, "0" represents auto power off is disabled.

2) Brightness
Press ▼▲ to select BRIGHTNESS, press ◀▶ to adjust screen brightness. In setup interface, press ☀ to adjust brightness quickly.

3) Remote control
Press ▼▲ to select REMOTE CONTROL, press ◀▶ to set up for remote PC control.
4) Button beep control
Press ▼▲ to BEEP CONTROL, press ◀▶ to set up button sound. "Beep" once enables button sound, "Beep" twice disables button sound.

5) Temperature unit
Press ▼▲ to select TEMPERATURE UNIT, press ◀▶ to switch between ℃ and ℉. "Beep" once enables button sound, "Beep" twice disables button sound.

9. MEASURE mode

9.1 Millivolt measurement

Upper-screen millivolt measurement

Consecutively short press ⬚V mA/LOOP to switch between mV, V, mA, LOOP until mV is selected.

Figure 4 - Measurement interface
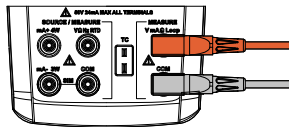
Figure 5 - Connection

Lower-screen millivolt measurement

In measurement mode (If the meter is in output mode, short press ⬚MEAS to switch to measurement mode), consecutively short press ⬚V mA to switch between mV, V, mA until mV is selected.
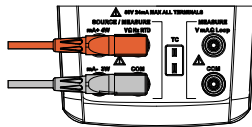

Figure 6 - Measurement interface

Figure 7 - Connection

9.2 Voltage measurement

Upper- screen voltage measurement

Consecutively short press ⬚V mA/LOOP switch between mV, V, mA, LOOP until V is selected.
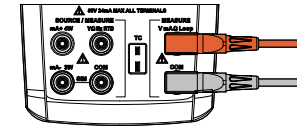

Figure 8 - Measurement interface

Figure 9 - Connection

Lower-screen voltage measurement

In measurement mode (If the meter is in output mode, short press ⬚MEAS to switch to measurement mode), short press ⬚V mA to switch between mV, V, mA until V is selected.
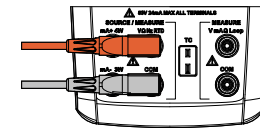

Figure 10 - Measurement interface

Figure 11 - Connection

9.3 Milliampere measurement
Upper-screen milliampere measurement
Consecutively short press [V mA / LOOP] to switch between mV, V, mA, LOOP until mA is selected.
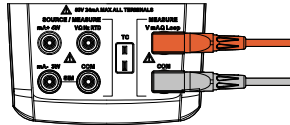

Figure 12 - Measurement interface

Figure 13 - Connection

Lower-screen milliampere measurement
In measurement (If the meter is in output mode, short press [MEAS] to switch to measurement mode), consecutively short press [V mA] to switch between mV, V, mA until mA is selected.
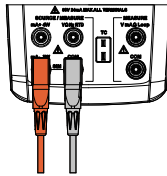

Figure 14 - Measurement interface

Figure 15 - Connection

9.4 LOOP measurement
LOOP measurement function can start the 24V power supply (inside the meter) connected with current measurement circuit in series, this enables users to test the transmitter without power supply of two-wire transmitter on site. Consecutively short press [V mA / LOOP] to switch between mV, V, mA, LOOP until LOOP measurement function is selected.

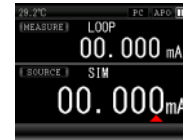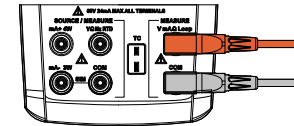
Figure 16 - Measurement interface

Figure 17 - Connection

9.5 Resistance measurement
Upper-screen resistance measurement
Consecutively short press [Ω •))] to switch between resistance measurement function and continuity measurement function until resistance measurement is selected.
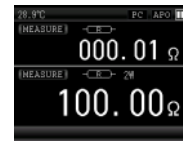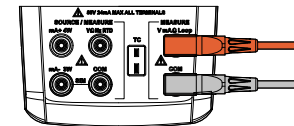

Figure 18 - Measurement interface

Figure 19 - Connection

Lower-screen resistance measurement
In measurement mode (If the meter is in output mode, short press [MEAS] to switch to measurement mode), short press [Hz Ω] to switch between 2/3/4-wire resistance measurement function and frequency measurement function until resistance measurement is selected. Lower-screen resistance measurement supports 2/3/4-wire connection method (Figure 22).
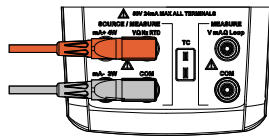

Figure 20 - Measurement interface   Figure 19 - Connection
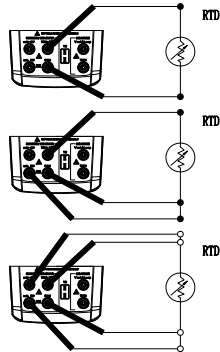
Figure 22 - 2/3/4-wire connection methods

Continuity measurement
Consecutively short press [Ω •))] to switch between continuity measurement function and resistance measurement function until continuity measurement is selected.

Figure 23 - Measurement interface   Figure 24 - Connection

Note: The buzzer sounds when the measured resistance value is less than50Ω.

9.6 Pressure measurement
Upper-screen pressure measurement
Short press [ ] to start pressure measurement function.

Figure 25 - Measurement interface   Figure 26 - Connection

Lower-screen pressure measurement
In measurement mode (If the meter is in output mode, short press [MEAS] to switch to measurement mode), short press [ ] to start pressure measurement function.

Figure 27 - Measurement interface

Figure 28 - Connection

Note: The pressure measurement is with 5-digit display, the specific range depends on pressure transducer. Pressure measurement cannot be performed in upper and lower screen at the same time, upper screen or lower screen will display "--------" if selecting pressure measurement for both upper and lower screen. Press $\boxed{0\%}$ to clear.

Frequency measurement
In measurement mode (If the meter is in output mode, short press $\boxed{\text{MEAS}}$ to switch to measurement mode), consecutively short press $\boxed{\text{Hz }\Omega}$ to switch between frequency measurement function and 2/3/4-wire resistance measurement function until frequency measurement is selected.
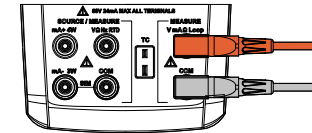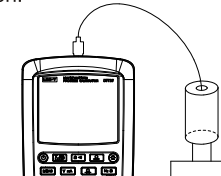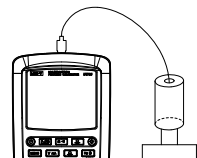

Figure 29 - Measurement interface
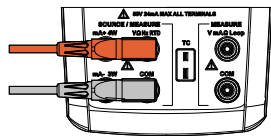
Figure 30 - connection

Pulse measurement
In measurement mode (If the meter is in output mode, short press $\boxed{\text{MEAS}}$ to switch to measurement mode), consecutively short press $\boxed{\text{PULSE}}$ to switch between pulse measurement function and switch measurement function until pulse measurement is selected.

Figure 31 - Measurement interface
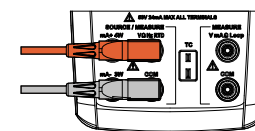
Figure 32 - connection

Note: Press $\boxed{\text{SETUP}}$ to start or stop pulse measurement, press $\boxed{\text{ESC}}$ to reset pulse measurement function, the current pulse counting will be cleared.

Switch quantity measurement
In measurement mode (If the meter is in output mode, short press $\boxed{\text{MEAS}}$ to switch to measurement mode), consecutively press $\boxed{\text{PULSE}}$ to switch between switch quantity measurement and pulse measurement until switch quantity measurement is selected.
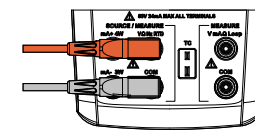

Figure 33 - Measurement interface

Figure 34 - connection

Note: Minimum duration for open/close test is 500ms

10. TC measurement

The meter supports temperature measurement of following thermal couples: R, S, K, E, J, T, N, B, L, U, XK, BP, etc. The temperature ranges and characteristics of these thermal couples are shown in Table 5.

Graduation	Positive conductor	Negative conductor	Temperature range (℃)
R	Platinum (13% rhodium)	Platinum	0～1767
S	Platinum (10% rhodium)	Platinum	0～1767
K	Chromel	Chromel	−100～1372
E	Chromel	Constantan	−50～1000
J	Iron	Constantan	−60～1200
T	Copper	Constantan	−100～400
N	Nickel - Chromium - Silicon	Nickel – Silicon - Magnesium	−200～1300
B	Platinum (30% rhodium)	Platinum (6% rhodium)	600～1820
L	Iron	Constantan	−200～900
U	Copper	Constantan	−200～400
XK	95 % tungsten + 5 % rhenium	80 % tungsten + 20 % rhenium	−200～800
BP	90.5 % nickel+ 9.5 % chromium	56 % copper + 44 % nickel	0～2500

In measurement mode (If the meter is in output mode, short press [MEAS] switch to measurement mode), short press [TC] to start TC temperature measurement function.

Figure 35 - Measurement interface   Figure 36 - connection

1. Short press [SETUP] to set manual CJC value, press the direction button to adjust manual CJC value, short press [ESC] again to complete the input of manual CJC value.
2. Short press [SETUP] to stop setting manual CJC value and switch to auto CJC mode.

Note: If the temperature environment of meter differs from that of thermal couple, please wait for more than one minute to stabilize the plug temperature after connecting TC input/output line.

11. RTD measurement

The meter supports temperature measurement of following RTD: Pt100-385, Pt100-392, Pt100-JIS, Pt200, Pt500, Pt1000, Cu10, Cu50, Cu100, Ni120, etc. The temperature ranges and characteristics of these RTD are shown in Table 6.

Graduation	Material	Temperature range (℃)
PT100-385	Platinum	−200～850
PT100-392	Platinum	−200～630℃
PT100-JIS	Platinum	−200～630℃
PT200-385	Platinum	−200～630
PT500-385	Platinum	−200～630
PT1000-385	Platinum	−200～650
Cu10	Copper	−100～260
Cu50	Copper	−50～150
Cu100	Copper	−50～150
Ni120	Copper	−80～260

In measurement mode (If the meter is in output mode, short press MEAS to switch to measurement mode), short press RTD to start RTD temperature measurement function.
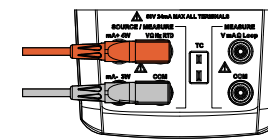

Figure 37 - Measurement interface

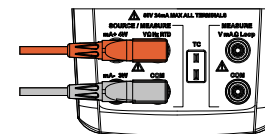
Figure 38 - Two-wire connection

Note: Consecutively short press SETUP to switch between 2-wire, 3-wire and 4-wire connection.

12. SOURCE mode

Millivolt output

In output mode (If the meter is in measurement mode, short press [SOURCE] to switch to output mode), consecutively short press [V mA] to switch between mV, V, mA, and SIM until mV is selected.

Figure 39 – Output interface   Figure 40 - Connection

Note: Press right or left arrow key to change the modified bit of output value, press up or down arrow key to modify the output value. The port outputs corresponding millivolt value in real time when output value is changed.

Voltage output

In output mode (If the meter is in measurement mode, short press [SOURCE] to switch to output mode), short press [V mA] to switch between mV, V, mA and SIM until V is selected.

Figure 41 - Output interface   Figure 42 - Connection

Note: Press right or left arrow key to change the modified bit of output value, press up or down arrow key to modify output value. The port outputs corresponding voltage value in real time when output value is changed.

Milliampere output

In output mode (If the meter is in measurement mode, short press [SOURCE] to switch to output mode), consecutively short press [V mA] to switch between mV, V, mA and SIM until mA is selected.
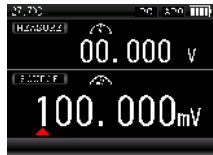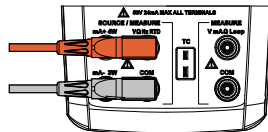

Figure 43 - Output interface   Figure 44 - Connection

Note:
1. Press right or left arrow key to change the modified bit of output value, press up or down arrow key to modify output value. The port outputs corresponding current value in real time when output value is changed.
2. The output value flickers and "LOAD" appears on the screen if output load is too high, please check whether the connection is correct for safety in such situation.

Passive current output (SIM)
In output mode (If the meter is in measurement mode, short press [SOURCE] to switch to output mode), consecutively short press [V mA] to switch between mV, V, mA and SIM until SIM is selected.
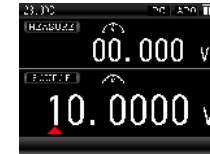

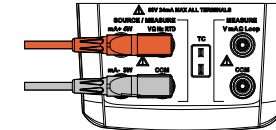Figure 45 – Output interface   Figure 46 - Connection

Note:
1. Press right or left arrow key to change the modified bit of output value, press up or down arrow key to modify output value. The port outputs corresponding current value in real time when output value is changed.
2. The output value flickers and "LOAD" appears on the screen if output load is too high, please check whether the connection is correct for safety in such situation.

Resistance output
In output mode (If the meter is measurement mode, short press [SOURCE] to switch to output mode), consecutively short press [Hz Ω] to switch between resistance output and frequency output until resistance output is selected.
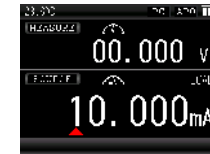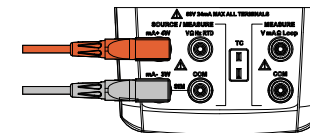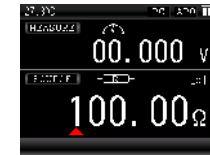

Figure 47 - Output interface   Figure 48 - Connection

Note:
1. Press right or left arrow key to change the modified bit of output value, press up or down arrow key to modify output value. The port outputs corresponding resistance value in real time when output value is changed.
2. Excitation current is required for resistance output. The output value flickers and "ExI HI"/"ExI LO" appears on the screen if excitation current is too high/low, please check the excitation current in such situation.

Frequency output

In output mode (If the meter is in measurement mode, short press [SOURCE] to switch to output mode), consecutively short press [Hz Ω] to switch between frequency output and resistance output until frequency output is selected.

Figure 49 - Output interface
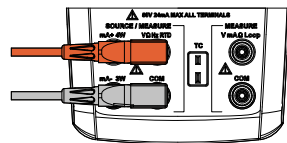
Figure 50 - Connection

Note:
1. Short press RANGE to switch between 200Hz, 2000Hz, 20kHz and 100kHz.
2. Short press SETUP to enter the interface of setting frequency amplitude, in this interface, press direction key to adjust frequency amplitude, short press SETUP again to make the adjustment valid, short press ESC to abort the adjustment.

Pulse output
In output mode (If the meter is in measurement mode, short press SOURCE to switch to output mode), consecutively short press PULSE to switch between pulse output and switch quantity output until pulse output is selected.

Figure 51 – Output interface
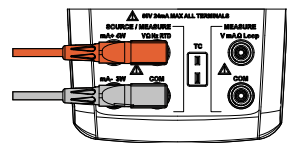
Figure 52 - Connection

Note:
1. Press RANGE to switch between 100Hz, 1kHz and 10kHz.
2. Short press SETUP to enter the status of editing pulse number, in this status, press direction key to edit the number of pulse, short press SETUP again to complete the setting of pulse number and then immediately enter the status of modifying pulse amplitude, in this status, press direction key to modify pulse amplitude, short press SETUP to complete the modification of pulse amplitude, the meter starts outputting a preset number of pulses according to the preset frequency and amplitude.

Switch quantity output
In output mode (If the meter is in measurement mode, short press SOURCE to switch to output mode), consecutively short press PULSE to switch between pulse output and switch quantity output until switch quantity output is selected.

Figure 53 – Output interface
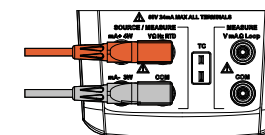
Figure 54 - Connection

Note:
1. Short press RANGE to switch between 100Hz, 1kHz, 10kHz, 100kHz.
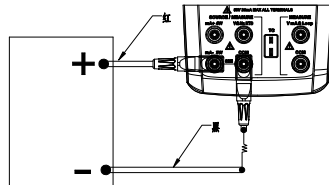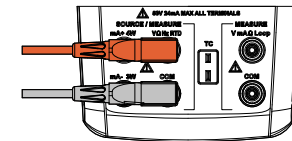2. Press right or left arrow key to change the modified bit of output value, press up or down arrow key to modify output value. The port outputs corresponding switch signal in real time when output value is changed.

TC output

The meter supports simulating temperature output of following thermal couples: R, S, K, E, J, T, N, B, L, U, XK, BP, etc.

In output mode (If the meter is in measurement mode, short press SOURCE to switch to output mode), short press TC to start TC temperature output function.

Figure 55 - Output interface   Figure 56 - Connection
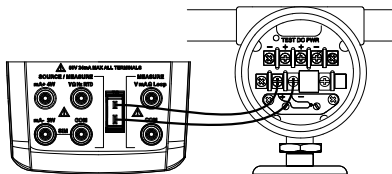
Note:

1. Short press TC to switch between different thermal couples.
2. Short press SETUP to enter the interface of modifying CJC value of thermal couple, in this interface, press direction key to modify CJC value, press SETUP again to complete the input of manual CJC value.
3. Press ESC to switch to auto CJC mode.

RTD output

In output mode (If the meter is measurement mode, short press SOURCE to switch to output mode), short press RTD to start RTD output function.

Figure 57 - Output interface
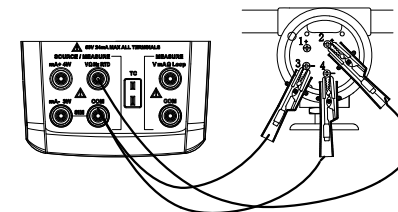
Figure 58 - Connection

Note:

1. Consecutively short press RTD to switch between different RTD.
2. 3-wire and 4-wire terminals are for measurement only (not for output simulation). The meter can simulate the output of a 2-wire RTD. If a 3-wire or 4-wire transmitter needs to be connected, use stacking cables to provide additional wiring.
3. "ExI HI"/"ExI LO" appears on the screen if excitation current of the measured device exceeds the limit.

Remote mode

Based on the instruction, turn on the PC control functionality, set the parameter of serial interface on PC and send the protocol command to control UT725.

Please access to UNI-T official website to download the communication protocol.

13. Advanced applications

Percentage output

Stepping operation and percentage display can be used after the values of 0% and 100% are set. Some values of the meter have been set before delivering. The table below lists the factory setting.

Output functions	0% value	100% value	Output functions	0% value	100% value
Voltage	0 V	10 V	Thermocouple type R	0 ℃	1767 ℃
Millivolt	0 mV	100 mV	Thermocouple type S	0℃	1767 ℃
Current	4 mA	20 mA	Thermocouple type B	600 ℃	1820 ℃
Resistance 400Ω	0 Ω	400 Ω	Thermocouple type L	-200 ℃	900 ℃
Resistance 4000Ω	0 Ω	4000 Ω	Thermocouple type U	-200 ℃	400 ℃
Resistance 40KΩ	0Ω	40000Ω	Thermocouple type XK	-200 ℃	800 ℃
Frequency 200Hz	0 Hz	200 Hz	Thermocouple type BP	0 ℃	2500 ℃
Frequency 2000Hz	200 Hz	2000 Hz	Pt100-385	-200 ℃	850 ℃
Frequency 20 kHz	2 kHz	20 kHz	Pt100-392	-200 ℃	630 ℃
Thermocouple type J	-200 ℃	1200 ℃	Pt100-JIS	-200 ℃	630 ℃
Thermocouple type K	-200 ℃	1372 ℃	Pt200-385	-200 ℃	630 ℃
Thermocouple type T	-250 ℃	400 ℃	Pt500-385	-200 ℃	630 ℃
Thermocouple type E	-200 ℃	1000 ℃	Pt1000-385	-200 ℃	630 ℃

Cu10	-100 ℃	260 ℃	Cu50	-50 ℃	150 ℃
Output function	0% value	100% value	Cu100	-50 ℃	150 ℃
Ni120	-80 ℃	260 ℃			

In output mode, short press 0% , 100% , ▲25% , ▼25% to quickly output the value of corresponding percentage in current function.

0% and 100% values can be set as below:

1. Press direction key to adjust output value of current output function, long press 100% until the buzzer beeps, the current output value is set as new 100% value.
2. Press direction key to adjust output value of current output function, long press 0% until the buzzer beeps, the current output value is set as new 0% value.

Note:

1. 100% value must be greater than 0% value.
2. Short press ▲25% to increase the output by 25% of the difference between 100% value and 0%. Short press ▼25% to decrease the output by 25% of the difference between 100% value and 0%.
3. Short press ▲25% , ▼25% to adjust output value (0% value < output value <100% value).

Ramping output

The auto ramping function allows you to continuously apply a varying signal from the meter to the transmitter. When you press ⋀⋀⌐ , the meter will generate a continuous and repeating 0%-100%-0% ramping output. Three types of ramping waveforms are available:

⋀ 0%-100%-0% 45-second smooth ramp
⋀⋀ 0%-100%-0% 20-second smooth ramp
⌐ 0%-100%-0% 25% step ramp, pausing for 5s at each step

Press any key to exit the ramping output function.

14. Specifications

All specifications are based on one-year calibration period and applied to a temperature range of +18℃ ~+28℃ unless otherwise specified. All specifications are assumed to obtain after 30 minutes operation.

Input specifications

Specifications	Range	Resolution	Accuracy
DC voltage	50mV	0.001mV	±(0.02%+10)
	500mV	0.01mV	±(0.02%+5)
	30V (Upper)	1mV	±(0.02%+2)
	50V (Lower)	0.001V	±(0.02%+2)
DC current	20mA@0-24mA	0.001mA	±(0.02%+2)
	20mA(loop) @0-24mA	0.001mA	±(0.02%+2)
Resistance	500Ω	0.01Ω	±(0.05%+10)
	5000Ω	0.1Ω	±(0.05%+10)
Frequency	100Hz	0.001Hz	±(0.01%+1)
	1kHz	0.01Hz	±(0.01%+1)
	10kHz	0.1Hz	±(0.01%+1)
	100kHz	1Hz	±(0.01%+1)

Thermocouple R (TC)	0~500	1℃/1℉	±1.8℃
	500~1767		±1.5 ℃
Thermocouple S (TC)	0~500	1℃/1℉	±1.8℃
	500~1767		±1.5℃
Thermocouple K (TC)	-100~0	0.1℃	±1.2℃
	0~1372		±0.8℃
Thermocouple E (TC)	-50~0	0.1℃	±0.9℃
	0~1000		±1.5℃
Thermocouple J (TC)	-60~0	0.1℃	±1.0℃
	0~1200		±0.7℃
Thermocouple T (TC)	−100~0	0.1 ℃	±1.0℃
	0~400		±0.7℃
Thermocouple N (TC)	-200~0	0.1 ℃	±1.5℃
	0~1300		±0.9℃

Thermocouple B (TC)	600~800	1℃/1℉	±2.2℃
	800~1000		±1.8℃
	1000~1820		±1.4℃
Thermocouple L (TC)	−200~0	0.1℃/0.1℉	±0.85℃
	0~900		±0.7℃
Thermocouple U (TC)	−200~0	0.1℃/0.1℉	±1.1℃
	0~400		±0.75℃
Thermocouple XK (TC)	−200~−100	0.1℃/0.1℉	±0.5℃
	−100~800		±0.6℃
Thermocouple BP (TC)	0~800	0.1℃/0.1℉	±1.2℃
	800~2500		±2.5℃
RTD Pt100 (RTD)	−200~850（2W/3W）	0.1℃/0.1℉	±0.4℃
	−200~850（4W）		±0.3℃
Pt200 (RTD)	−200~250（2W/3W）	0.1℃/0.1℉	±0.3℃
	−200~250（4W）		±0.2℃
	250~630（2W/3W）		±1.6℃
	250~630（4W）		±0.8℃

Pt500 (RTD)	−200~500（2W/3W）	0.1℃/0.1℉	±0.6℃
	−200~500（4W）		±0.3℃
	500~630（2W/3W）		±0.9℃
	500~630（4W）		±0.4℃
Pt1000 (RTD)	−200~650（2W/3W）	0.1℃/0.1℉	±0.3℃
	−200~650（4W）		±0.15℃
Cu10 (RTD)	−100~260	0.1℃/0.1℉	±1.8℃
Cu50 (RTD)	−50~150（2W/3W）	0.1℃/0.1℉	±0.8℃
	−50~150（4W）		±0.5℃
Cu100 (RTD)	−50~150（2W/3W）	0.1℃/0.1℉	±0.4℃
	−50~150（4W）		±0.25℃
Pt100-392 (RTD)	−200~630（2W/3W）	0.1℃/0.1℉	±0.5℃
	−200~630（4W）		±0.3℃
Pt100-JIS (RTD)	−200~630（2W/3W）	0.1℃/0.1℉	±0.5℃
	−200~630（4W）	0.1℃/0.1℉	±0.3℃

Ni120 (RTD)	-80~260（2W/3W）	0.1℃/0.1℉	±0.3℃
	-80~260（4W）		±0.2℃
Switch quantity measurement	Minimum duration for open/close test is 500ms		CLOSE/OPEN
Continuity detection	500Ω	0.01Ω	Beeps at ≤50Ω
Pulse	0~15kHz（0~100000）		

Note:
1. For 2-wire measurement of resistance, the error does not include the conductor resistance.
2. For 3-wire measurement of resistance, a matched test lead should be used, the conductor resistance is not greater than 25Ω.
3. For 4-wire measurement of resistance, the conductor resistance is not greater than 100Ω.
4. The sensitivity of frequency measurement: Vpp≥1V; waveform: rectangular wave, sine wave, triangular wave, etc.
5. The accuracy of pressure measurement is based on the accuracy grade of pressure module.

15. Output specification

Specifications	Range	Resolution	Accuracy
DC voltage	100mV	0.001mV	±（0.02%+10）
	1V	0.01mV	±（0.02%+10）
	10V	0.0001V	±（0.02%+10）
DC current	20mA @ 0 - 24mA	0.001mA	±（0.02%+2）
	20mA (SIM) @ 0 - 24mA	0.001mA	±（0.02%+2）
Resistance	400Ω	0.01Ω	±（0.02%+8）
	4000Ω	0.1Ω	±（0.05%+10）
	40kΩ	1Ω	±（0.1%+40）
Frequency	200Hz	0.01Hz	±（0.01%+1）（±3dig）
	2000Hz	0.1Hz	±（0.01%+1）（±3dig）
	20kHz	1Hz	±（0.01%+1）（±3dig）
	100kHz	10Hz	±5dig
Pulse	100Hz (1~100000)	1cyc	±2dig
	1kHz (1~100000)		±2dig
	10kHz (1~100000)		±2dig

Switch quantity	100Hz(1Hz~110Hz)	0. 01Hz	±2dig
	1kHz(0.1kHz~1.1kHz)	0. 1Hz	±2dig
	10kHz(1kHz~11kHz)	1Hz	±2dig
	100kHz(10kHz~110kHz)	10Hz	±2dig
Thermocouple R (TC)	0~100℃	1℃/1℉	±1.5℃
	100~1767℃		±1.2℃
Thermocouple S (TC)	0~100℃	1℃/1℉	±1.5℃
	100~1767℃		±1.2℃
Thermocouple K (TC)	-200~-100℃	0.1℃/0.1℉	±0.6℃
	-100~400℃		±0.5℃
	400~1200℃		±0.7℃
	1200~1372℃		±0.9℃
Thermocouple E (TC)	-200~-100℃	0.1℃/0.1℉	±0.6℃
	-100~600℃		±0.5℃
	600~1000℃		±0.4℃

Thermocouple J (TC)	-200~ -100℃	0.1℃/0.1℉	±0.6℃
	-100~800℃		±0.5℃
	800~1200℃		±0.7℃
Thermocouple T (TC)	-250~400℃	0.1℃/0.1℉	±0.6℃
Thermocouple N (TC)	-200~-100℃	0.1℃/0.1℉	±1.0℃
	-100~900℃	0.1℃/0.1℉	±0.7℃
	900~1300℃	0.1℃/0.1℉	±0.8℃
Thermocouple B (TC)	600~800℃	1℃/1℉	±1.5℃
	800~1820℃	1℃/1℉	±1.1℃
Thermocouple L (TC)	-200~0℃	0.1℃/0.1℉	±0.85℃
	0~900℃	0.1℃/0.1℉	±0.7℃
Thermocouple U (TC)	-200~0℃	0.1℃/0.1℉	±1.1℃
	0~400℃	0.1℃/0.1℉	±0.75℃
Thermocouple XK (TC)	-200~ -100℃	0.1℃/0.1℉	±0.5℃
	-100~800℃	0.1℃/0.1℉	±0.6℃

Thermocouple BP (TC)	0~800℃	0.1℃/0.1℉	±1.2℃
	800~2500℃	0.1℃/0.1℉	±2.5℃
Pt100-385 (RTD)	-200~800℃	0.1℃/0.1℉	±0.33℃
Pt100-392 (RTD)	-200~630℃	0.1℃/0.1℉	±0.3℃
Pt200-385 (RTD)	-200~250℃	0.1℃/0.1℉	±0.2℃
	250~630℃	0.1℃/0.1℉	±0.8℃
Pt100-JIS (RTD)	-200~630℃	0.1℃/0.1℉	±0.3℃
Pt500-385 (RTD)	-200~500℃	0.1℃/0.1℉	±0.3℃
	500~630℃	0.1℃/0.1℉	±0.4℃
Pt1000-385 (RTD)	-200~100℃	0.1℃/0.1℉	±0.2℃
	100~630℃	0.1℃/0.1℉	±0.2℃
RTD Cu10	-100~260℃	0.1℃/0.1℉	±1.8℃
RTD Cu50	-50~150℃	0.1℃/0.1℉	±0.5℃
RTD Cu100	-50~150℃	0.1℃/0.1℉	±0.25℃
RTD Ni120	-80~260℃	0.1℃/0.1℉	±0.2℃

Note:
1.Temperature coefficient for -10℃~18℃ and +28℃~55℃: ±0.005%FS/℃.
2.Maximum load of DC voltage output: 1mA or 10kΩ, whichever is lower load.
3.Maximum load resistance of DC current output: 1000Ω@20mA.
4.Frequency output: rectangular wave with a duty ratio of 50% approximately.

16. Maintenance and Repair

⚠ **Warning:** Make sure that the power is off before opening the rear cover of the calibrator or battery cover, and that he probe is away from input terminal and tested circuit.

1. General maintenance and repair
* Clean the case by damp cloth and mild detergent, do not use abrasives or solvents.
* If there is any malfunction, stop using the calibrator and send it for repair.
* Please ensure that the calibrator is repaired by professionals or designated repair center.
* Calibrate the meter once a year to ensure its performance.
* If the meter is not in use, turn off the power. If the meter is not in use for a long time, please take out the batteries.
* Ensure that the instrumentation is free from moisture, high temperature and strong electromagnetic fields.

2. Install or replace the battery (Figure 59)
NOTE: When the battery power display ▭, it means the rest of battery power is less than 20%, to ensure that the calibrator can work normally, please replace the battery in time, otherwise the measurement accuracy might be affected. Please replace the old battery by 1.5V alkaline battery or 1.2V NI-MH battery.

The contents of this manual are subject to change without notice.

UNI-T

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