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※ **Please make sure to read the operation manual before using.**

※ **Please use the device correctly on the basis of complete understanding.**

■TX-600N Specifications

Input Types	K, J, E, T, B, R, N, S, C thermocouple types; With Dual-channel input
Measurement Range	K: -200.0 ~ +1370.0℃(-328.0~+2498.0℉) J:-200.0 ~ +1200.0℃(-328.0~+2192.0℉) E:-210.0 ~ +1000.0℃(-346.0~+1832.0℉) T:-220.0 ~ +400.0℃(-364.0~+752.0℉) B:+320.0 ~ +1800.0℃(+608.0~+3272.0℉) R:-20.0 ~ +1700.0℃(-4.0~+3092.0℉) N:-200.0 ~ +1300.0℃(-328.0~+2372.0℉) S:-20.0 ~ +1750.0℃(-4.0~+3182.0℉) C:0.0 ~ +2300.0℃(+32.0~+4172.0℉)
Accuracy	± 0.1% of rdg + 0.1℃ (In 23±5℃ operating environment) ± 0.1% of rdg + 0.2℃(Out off 23±5℃ operating environment) ※Built-in cold junction compensation function
Resolution	K, J, E, T, N, C Type: 0.1℃/0.1℉;
	B, R, S Type: 0.5℃/0.5℉
Reading Rate	Approx 0.4 sec
Logging Sampling Rate	2 second to 120 minutes (User Selectable)
Memory	16,000 readings x 2CH
Baud Rate	57,600
Main Functions	Switchable 9 kinds of thermocouple type input, Hi/Lo Alarm, T1-T2, Data hold, Max/Min/Avg Functions, USB/RS-232 interface, Perpetual calendar, Data-Logging, Switchable ℃/℉ , AC/DC power, Battery sign and low battery warning, Auto / Manual shutdown, Calibration function, Large LED back-light, IP66 water and dust proof.
Output	Software with USB Interface cable, RS-232 Output
Power Source	One 9 V battery or AC Adaptor
Dimensions / Weight	150 x 75 x 28 mm, Approx 320g (battery included)
Input Connections	Standard mini thermocouple socket x 2
Operating Environment	-20~+60℃; 0~100%RH

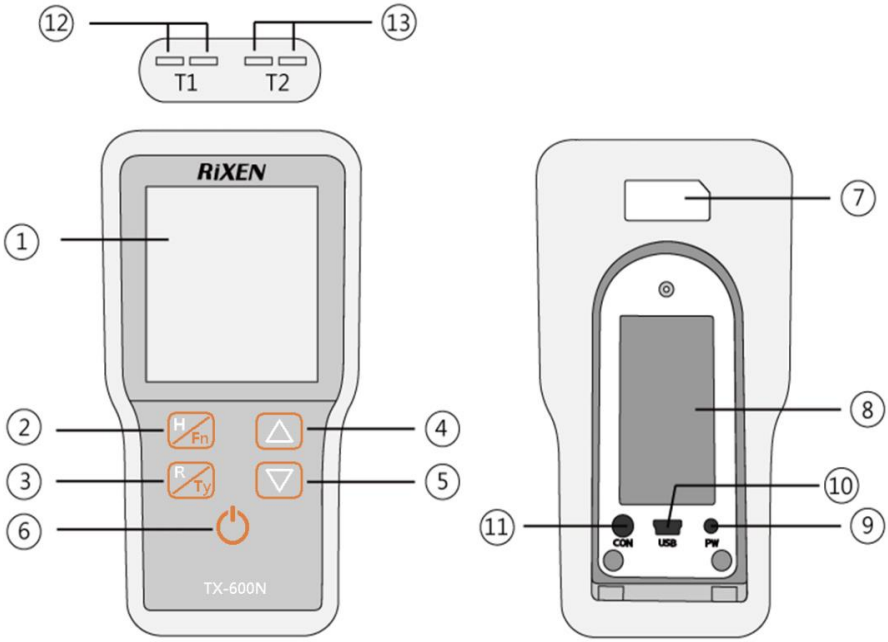
※About accuracy and sampling rate excludes errors generated by temperature probe.

Option Accessories

Temperature Probes LP series	Please select from LP series temperature probe (Customized)
TU-RS232-W	RS-232 interface cable
TU-USB-W	USB interface cable and WINDOWS software
TU-609	9 V battery

※Specifications are subject to change without notice.

■Instrument descriptions



① Multi-Function LCD display

② Function key and setting key

③ Record key and thermocouple switch key

④ Movement key

⑤ Movement key

⑥ Power switch

⑦ Model No. and Serial No.

⑧ Battery cover

⑨ AC Adaptor input

⑩ USB Output port

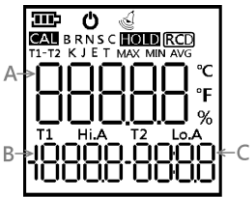
⑪ RS-232 Output connector

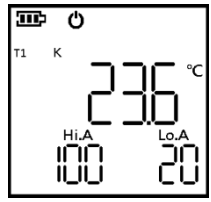
⑫ T1 Probe input connector

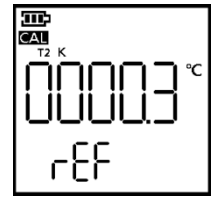
⑬ T2 Probe input connector

※This instrument is a completely waterproof (IP66), in order to maintain the stability of its characteristic function, please avoid falling, shocking or disassemble.

■Display descriptions







Display	Descriptions
	Battery power symbol
	Manual shut down
	Buzzer on
CAL	Under calibrating
HOLD	Data hold
RCD	Data-logging
MAX	Maximum value
MIN	Minimum value
AVG	Average value
T1	T1 probe
T2	T2 probe
Hi.A	High point alarm
Lo.A	Low point alarm
English words zone	thermocouple types
A.B.C. figures zone	Data value display
℃/℉	℃ : Celsius units, ℉ : Fahrenheit
Hidden symbols	Appeared when entering the setup mode or unusual condition

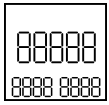
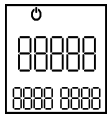
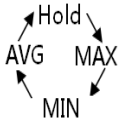
Abnormal displays

A. When Area A shows ----- , please release all keys until the device return to normal status

B. When Area A shows Error, the situations may be causes by the following reasons:

1. Exceed the measuring range of this device.
2. The Temperature probe is damaged or not inserted the connector.
3. The probe is abnormal when showing the T1 - T2 real temperature.
4. If is appears when turn on the instrument, please release all keys and tune it on again.

■Key descriptions

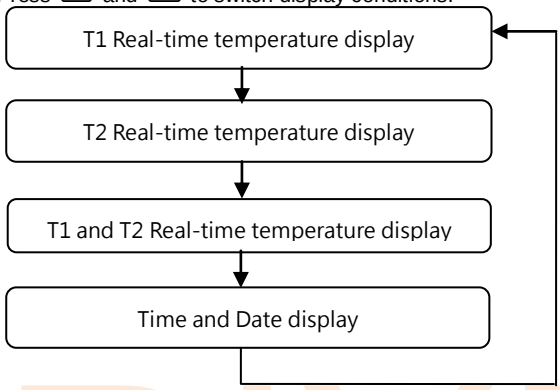
Key	Function	Descriptions	LCD display
⏻	On/Off	Press ⏻ one second (Be-) can turn on the power. Press ⏻ one second (Be---) can turn off the power. If the instrument is left without any operation for five minutes, it will turn off automatically.	
⏻ + H/Fn	Manual turn off	When the device is on off state, hold H/Fn ,then press ⏻ to turn on. When ⏻ appears, please release this two keys. It is finished to entering the manual turn off mode.	
	Hold mode	Under testing mode, press H/Fn to enter the reading HOLD mode. Use △ and ▽ to change the displayed functions. Press H/Fn to exit. When MAX and MIN are showed, area B will shows the first occurred data sheet, area C will shows the time (hour : minute). When AVG is showed, area B and area C will shows the total recording time (hour-minute: second)	
H/Fn (2S)	Setting mode (Hi.A/Lo.A Ref,Span, date,time, sampling rate, temperature unit)	Under measurement mode, press and hold H/Fn more than two seconds, when area A appears SEt, release the H/Fn to enter the setting mode, there are several selects in the setting mode, press H/Fn to enter. **Hi.A/Lo.A setting:** Entering this mode when Hi.A and Lo.A appeared on the screen. Use △ and ▽ to change the data value, values are from 0 to 9 cycles, press R/Ty to switch to the value, and press the H/Fn to determine the value. **Ref, Span setting:** To enter when rEF and SPAn appeared on the screen, use △ and ▽ to switching the value, press R/Ty to switch to the value, and press H/Fn to determine the value. **Date setting:** Entering when dAtE appears, use △ and ▽ to switching the value, long press can speed up the switch, press R/Ty to switch to the value, and press H/Fn to determine the value. **Sampling rate setting**: Entering when SP-t appears, use △ and ▽ to switching it, press H/Fn to determine the value. **Temperature setting**: Entering when ℃ ℉ appears, use △ and ▽ to switching the value, press H/Fn to determine the value. **Exit:** when the screen shows End , use H/Fn to exit.	

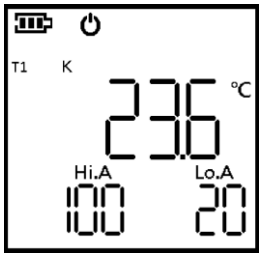
R/Ty	RCD Recode mode	Under testing mode, and there is no recording data, press R/Ty to enter RCD record mode. The RCD will flashes when record. Press R/Ty or ⏻ to stop recording.	
	RCD Reading mode	Under testing mode, press R/Ty to into the data reading hold mode. Use △▽ to switch the displayed record value; long press the can switch quickly. Press and hold H/Fn can switch 100 readings at once. Press R/Ty to exit. Press and hold R/Ty can switch to the RCD clear mode.	
	RCD Clear mode	Under RCD reading mode or RCD hold mode, press and hold R/Ty two seconds to entering the RCD Clear mode. It will display CLEAr. Use △ and ▽ to select options, press H/Fn to confirm. The no twinkled means not to clear the data, and the YES twinkled means to clear the data. It needs 7 to 10 seconds when processing this instruction.	
	Thermocouple switch mode	Under testing mode, press and hold R/Ty more than two seconds to entering the thermocouple switch modes when the 9 type of thermocouple are displayed. Use △ and ▽ to select options, press H/Fn to confirm.	
△	Change the value	Press △ in any mode to change the values	--
▽	Change the value	Press ▽ in any mode to change the values	--
△ + ▽	turn on back light	Under any mode, press △ and ▽ simultaneously, the back light will be turned on. Note:When the battery power is under 25%，the LED back light will not be able to function.	
	turn on buzzer (2S)	Under any mode, press and hold △ and ▽ simultaneously more then 2 seconds. The buzzer will be turned on when appeared.	

■Instructions

A. Testing Mode:

Press △ and ▽ to switch display conditions.





In the testing mode, the display content as below:

Status	Display contents
Normal conditions	Probe condition, Probe type, warning data condition, Power indication
T1 Real-time Temperature display	Area A: T1 Measuring data value Area B: High point alert data Area C: Low point alert data
T2 Real-time Temperature display	Area A: T2 Measuring data value Area B: High point alert data Area C: Low point alert data
T1-T2 Real-time Temperature display	Area A: T1-T2 Temp. data Area B: T1 Measuring data value Area C: T2 Measuring data value
Time and Date display	Area A: Year Area B: Month, day Area C: Hour, minute

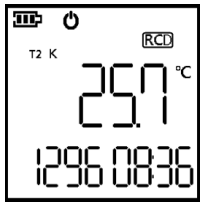
※Warning alert

When the temperature is higher than the **HI.A**, the **HI.A** symbol will flash.
When the temperature is lower than the **LO.A**, the **LO.A** symbol will flash.
The buzzer will make the warning sound if is turned on.

※Please let go off all keys, while waiting for the reading test mode and setting mode to return to the testing mode.

B.RCD Record mode:

※Please use the AC Adaptor when you need to record for a long time



Under testing mode, press R/Ty into the record mode, It will show the sampling rate before starting record. Under the record mode press △ and ▽ can switch the display, the RCD will flashed when recording. T1 and T2 will show the number of records with the present time, Press R/Ty Or ⏻ to stop record. The RCD will be displayed when there are log data in the internal. The screen will shown FULL when the amount of record are full. Press R/Ty or ⏻ to exit. Alarm function cannot be switched on the record mode.

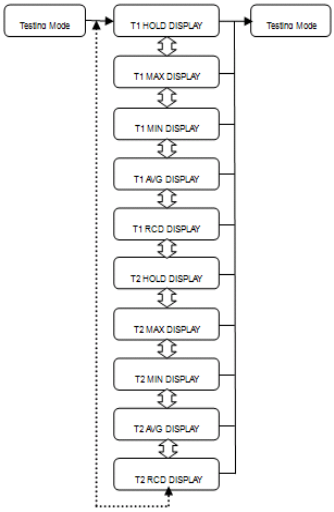
Status	Display contents
Normal conditions	Probe condition, Probe type, warning data condition, Power indication
T1 Real-time Temperature display	Area A: T1 Measuring data value Area B: Reading Record Area C: Current time
T2 Real-time Temperature display	Area A: T2 Measuring data value Area B: Reading Record Area C: Current time
T1-T2 Real-time Temperature display	Area A: T1-T2 Temp. data Area B: T1 Measuring data value Area C: T2 Measuring data value
Time and Date display	Area A: Year Area B: Month, day Area C: Hour, minute

C. Thermocouple switch mode:

Under the testing mode, press and hold R/Ty more than two seconds. Entering the thermocouple switch mode when TYPE appeared, press △ and ▽ to switching the type, press R/Ty to finish the switch.

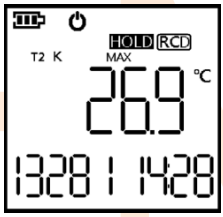
D.Hold Mode:

Under testing mode, press H/Fn to enter the reading hold mode, Use △ and ▽ to switch the T1 and T2 values, press H/Fn again to return to the testing mode. If there are data log in internal, the record will show the maximum, minimum, average. Press and hold R/Ty two seconds to entering the RCD clear mode.



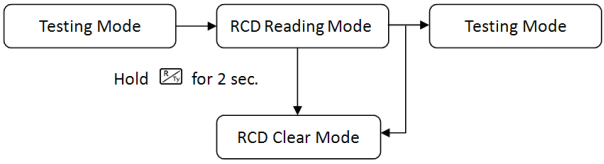
In lock mode, display content as description below:

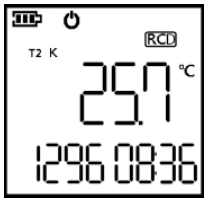
Display content	Description (Area A)
T1-HOLD display	Hold the T1 temperature data
T1-MAX display	T1 maximum temperature data
T1-MIN display	T1 minimum temperature data
T1-AVG display	T1 average temperature data
T2-HOLD display	Hold the T2 temperature data
T2-MAX display	T2 maximum temperature data
T2-MIN display	T2 minimum temperature data
T2-AVG display	T2 average temperature data



E. RCD Reading Mode:

Under the testing mode, press R/Ty to enter the RCD clear mode. Use △ and ▽ to switch the displayed record value. Press the R/Ty again can back to the testing mode. Press and hold the △ and ▽ can speed us the switch. Press and hold H/Fn than press the △ and ▽ can switch 100 readings at once. Press R/Ty for 2 seconds to switch to the RCD clear mode.



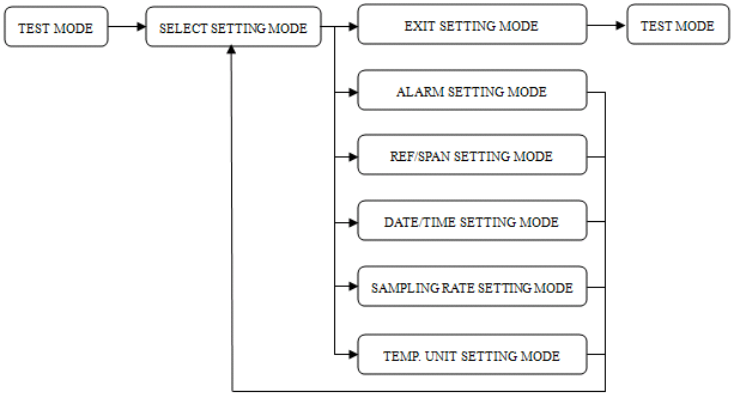


F. RCD Clear Mode:

Under the RCD reading mode or the hold mode, press and hold [R/ty] to enter the RCD clear mode. Then CLEAr will be displayed. Press [△] and [▽] to select and use [R/ty] to confirm. The no twinkled means not to clear the data, and the YES twinkled means to clear the data. When clearing the data, the CLEAr will twinkled, please waiting for the – below disappeared.

G.Select Setting Mode:

Under testing mode, press and hold [H/fn] for more than two seconds, release [H/fn] when SEt appears, Use [△] and [▽] to select options, press [H/fn] to enter that mode. Press [H/fn] again can exit.



Select the setting mode to view the content as described below:

Display content	Description
Hi.A Lo.A	Enter the alarm setting mode
rEF SPAn	Enter the REF/SPAN setting mode
dAtE	Enter the DATE/TIME setting mode
SP-t	Enter the sampling rate setting mode
℃ ℉	Enter the temperature unit setting mode
End	Exit the setting mode

Setting mode instructions

1. Alarm setting mode

This mode is for setting the Hi.A and Lo.A, press R/Ty to change the digit you want to change, and press △ and ▽ to select the circulation figures from 0 to 9. It's thousands of bits can be switched to the negative sign. Press H/Fn to confirm the setting. Setting range: 2300 ℃ ~ -220 ℃ (4172 ℉ ~ -364 ℉)

2. REF/SPAN setting mode

This mode is for setting the REF and SPAN, press R/Ty to change the digit you want to change, and press △ and ▽ to select the circulation figures from 0 to 9. it's thousands of bits can be switched to the negative sign. Press H/Fn to confirm the setting. REF setting range: 100.0℃~ -100.0 ℃ (180.0℉~ -180.0℉); SPAN setting range: 200.00%~ 0.00%

3. DATE/TIME setting mode

This mode is for setting the date and time, press R/Ty to change the digit you want to change, and press △ and ▽ to select the circulation figures. Press and hold △ and ▽ can accelerate switching. The number of seconds cannot be set, the maximum of year is set to 2099. Press H/Fn to confirm the setting.

4. Sampling rate setting mode

This mode is use to setting the sampling rate, press △ and ▽ to switch the rate. Display format: hour- min: sec; Press H/Fn to confirm the setting.
Sampling rate setting: 2 seconds, 5 seconds, 10 seconds, 20 seconds, 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes, 30 minutes, 1 hour, 2 hours

5. Temperature unit setting mode

This mode is for setting the temperature unit, press △ and ▽ to switch the unit. Press H/Fn to confirm the setting.

6. Exit the setting mode

Use this option when you finish your setting.

■ RS-232 Transmission Agreements

※Please connect the AC Adaptor if it required a long time to transfer the data. RS-232 is for one-way data transfer, receive and input the signal by three grounded wires. Recommending using the transmission line which is manufacture by OE factory or shorter than 10 meters of cable to connect the computer and the instrument.

Transfer rate: 57600
Transfer Status: /8 / N / 1
Transmission Content: (8 BIT)
Read instructions: by function 03H (Read Holding Registers)
Modbus RTU CRC16 check

A. Request Data Frame

Ex: Read the data from address 00h (Read 1-byte of data from address 0000H)

Slave address	Function	Starting address Hi	Starting address Lo	No. of Word Hi	No. of Word Lo	CRC Lo	CRC Hi
03H	03H	00H	00H	00H	01H	85H	E8H

Response Data Frame Ex: response data 2-Byte = 0x109D

Slave address	Function	Byte count	Data Hi	Data Lo	CRC Lo	CRC Hi
03H	03H	02H	10H	9DH	0DH	EDH

0x109D=4253，actual value =(Data-4000)/10=25.3

B. Request Data Frame

Ex: Read the data from address 00h (Read 2-byte of data from address 0000H)

Slave address	Function	Starting address Hi	Starting address Lo	No. of Word Hi	No. of Word Lo	CRC Lo	CRC Hi
03H	03H	00H	00H	00H	02H	C5H	E9H

Response Data Frame Ex. response data 4-Byte =0x109C and 0x109D

Slave address	Function	Byte count	Data(1) Hi	Data(1) Lo
03H	03H	04H	10H	9CH

Data(2) Hi	Data (2) Lo	CRC Lo	CRC Hi
10H	9DH	D1H	74H

0x109C=4252，actual value =(Data-4000)/10=25.2

0x109D=4253，actual value = (Data-4000)/10=25.3

C. Request Data Frame

Ex: Read the data from address 02h (Read 5-byte of data from address 0002H)

Slave address	Function	Starting address Hi	Starting address Lo	No. of Word Hi	No. of Word Lo	CRC Lo	CRC Hi
03H	03H	00H	02H	00H	05H	25H	EBH

Response Data Frame Ex. response data =10-byte

Slave address	Function	Byte count	Data(1) Hi	Data(1) Lo	Data(2) Hi	Data (2) Lo
03H	03H	0AH	08H	FCH	FFH	24H

Data(3) Hi	Data (3) Lo	Data(4) Hi	Data (4) Lo	Data(5) Hi	Data(5) Lo	CRC Lo	CRC Hi
08H	FCH	FFH	24H	00H	01H	38H	9FH

Data(1) =T1-Hi.A 0x08FC=2300
Data(2) =T1-Lo.A 0xFF24=-220
Data(3) =T2-Hi.A 0x08FC=2300
Data(4) =T2-Lo.A 0xFF24=-220
Data(5) Hi and Data(5) Lo of MOD = 0x0001

1. Data(5) Hi =Thermocouple type >>> Value=0 represent K type thermocouple
2. Data(5) Lo bit 05=℉/℃ Judgment >>> Value =0 represent ℃
   >>> Value =1 represent ℉
3. Data(5) Lo bit 04 No value
4. Data(5) Lo bit 03=T2-Error judgment >>> Value =1 represent T2-Error
5. Data(5) Lo bit 02=T1-Error judgment >>> Value =1 represent T1-Error
6. Data(5) Lo bit 01~00=Power gauge >>> Value =1 represent battery power of 50~25%

【**Example**】Set mode:

1. K Type thermocouple
2. Temperature unit=℃
3. T1 no ERROR
4. T2 no ERROR
5. Power74~50%

MOD setting mode

0= K Type thermocouple, 1= J Type thermocouple, 2= E Type thermocouple,
3= T Type thermocouple, 4= B Type thermocouple, 5=R Type thermocouple,
6=N Type thermocouple, 7= S Type thermocouple, 8= C Type thermocouple.

Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01~ Bit 00
X	X	℉=1 ℃=0	X	T2 Error=1	T1 Error=1	Power

☆Power Meter is divided into 4 parts 11=100~75% 10=74~50%
01=49~25% 00=24~0%

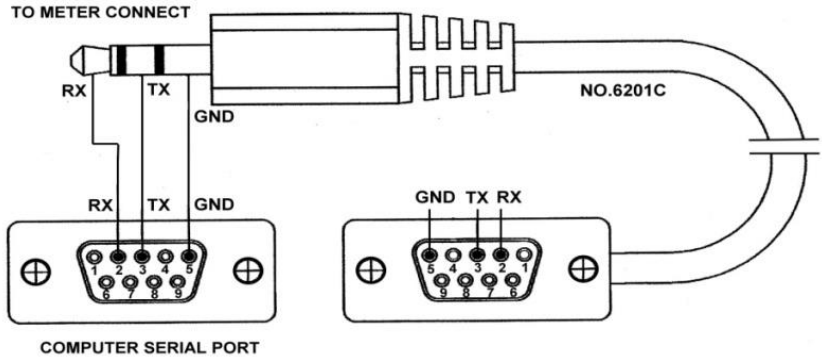
Interpretation of data:

The data value read only observed in the real-time testing mode
The actual value of T1-real-time and T2-real-time is (Data-4000) / 10
The actual value of T1-Hi.A, T1-Lo.A, T2-Hi.A, and T2-Lo.A is read data value

Address/ Data name Comparison Table

Address	Data name
0000h	T1 Real-Time Data
0001h	T2 Real-Time Data
0002h	T1 Hi.A
0003h	T1 Lo.A
0004h	T2 Hi.A
0005h	T2 Lo.A
0006h	T1 T2 status (Type, ℃/℉ ,Battery)
0007h	Record amount

D. Cable illustrated



■ *Precautions*

1. This instrument has a waterproof function; please do not use it in a high temperature environment or with corrosive materials to avoid leakage or damage.

2. Proposed to use the company's original signal cable (sold separately) to avoid the instrument inability to communicate to computer.

3. If you want to get a more accurate measurement value, keep a moment to let the temperature uniform and steady when measuring.

4. When the instrument shows power shortages, please replace the battery immediately.

5. When the device will not be used in a long time, please set the device and all accessories into the protective case, stored in a dry place, and avoid exposure to sunlight directly.

6. If there are any operation questions or malfunction, please contact your local distributor or our service department.

MEMO