Portable Non-Contact Thermometer

Instruction Manual

THERMO-HUNTER *PT-S80/U80*

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Thank you very much for purchasing this products. This device is a non-contact thermometer to convert the infrared energy emitted from the surface of an object into temperature. This thermometer measures the surface temperature of solid and liquid without contacting them. The temperature of gas cannot be measured by this thermometer.

Contents

introduction ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 2
Safe Usage ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 3
Warnings & Caution on Environment and Usage ・・・・・・・・・・・・ 4
Specifications ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 5
Name of Components ・・・・・・・・・・・・・・・・・・・・・・・・ 6
Operation ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 8
Selection of Display Function ・・・・・・・・・・・・・・・・・・・・ 9
Selection of Temperature Unit ・・・・・・・・・・・・・・・・・・・・ 9
Default Value of Each Setting ・・・・・・・・・・・・・・・・・・・・ 9
Field of View ・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 10
Setting/Resetting the Upper/Lower Limit Temperature Alarm ・・・・・・ 11
[PT-S80] 12
Recording Measured Temperature ・・・・・・・・・・・・・・・・ 13
• Record Measured Temperature(MEM.mode) ・・・・・・・・・・・ 13
• Call Temperature Record(CALL mode) ・・・・・・・・・・・・・ 13
Emissivity Setting ・・・・・・・・・・・・・・・・・・・・・・・・ 13
[PT-U80] 14
Date and Time Setting ・・・・・・・・・・・・・・・・・・・・・・・ 15
Emissivity Setting ・・・・・・・・・・・・・・・・・・・・・・・・・ 17
Recording Measured Temperature ・・・・・・・・・・・・・・・・・・ 18
• Record Measured Temperature(MEM.mode) ・・・・・・・・・・・ 18
• Call Temperature Record(CALL mode) ・・・・・・・・・・・・・ 18
• Delete All the Temperature Records ・・・・・・・・・・・・・・・ 19
Continuous Measurement ・・・・・・・・・・・・・・・・・・・・・・ 19
USB Connection ・・・・・・・・・・・・・・・・・・・・・・・・・・ 20
Trouble Shooting ・・・・・・・・・・・・・・・・・・・・・・・・・・ 21
Maintenance Method ・・・・・・・・・・・・・・・・・・・・・・・・ 22
Batteries ・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・ 23

Introduction

- **Please make sure the model you purchased is the one you specified.**
- **Please read the manual thoroughly before using the THERMO-HUNTER PT-S80/U80 for correct usage.**
- **After reading this manual,please retain it for future reference.**
- **OPTEX FA is not liable for any incidental or consequential damages or losses including losses of data or changes of measurement,arising from accident, misuse or abnormal conditions of operation or handling.**

Conformance to EU Directives

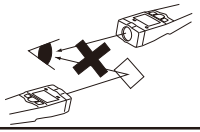
- This in a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

Safe Usage

This instruction manual contains various warnings for your safety and proper usage to avoid possible personal injury. Please be sure to heed the warnings and strictly follow safety instructions.

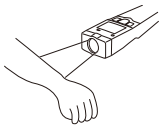
⚠Caution : This symbol signifies that improper usage may result in injuries or damage.

⚠ CAUTION



Do not look into the laser beam, nor point it directly at eyes. Even the reflection is harmful. This laser may cause eye injury or damage to your health.

⚠ CAUTION



This product is not a clinical thermometer and therefore, can not be used for medical purposes.

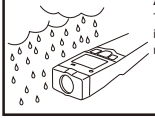
⚠ CAUTION



Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

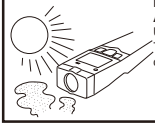
Safe Usage _ Environmental warnings/Cautions

Environmental Warnings ⃠ — Warning ❗ — Caution



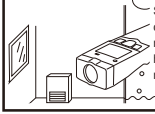
KEEP THE THERMOMETER AWAY FROM DROPPING WATER AND DO NOT USE IN WATER.

This thermometer is not waterproofing. Usage in such environments may cause irreparable damages.



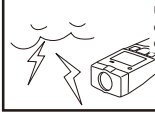
KEEP THE THERMOMETER AWAY FROM DIRECT SUNLIGHT, DUST,HIGH TEMPERATURES AND HIGH HUMIDITY DURING USE AND STORAGE.

This may cause irreparable damage or incorrect measurement.



KEEP THE THERMOMETER AWAY FROM SUDDEN CHANGE IN AMBIENT TEMPERATURE.

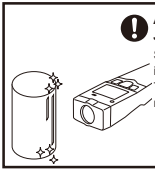
Sudden temperature change may cause incorrect measurement. Start measurement when temperature has become stable after leaving the meter for a while.



KEEP THE THERMOMETER AWAY FROM STRONG ELECTROMAGNETIC SOURCES.

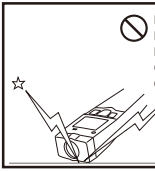
Usage in such environments may cause irreparable damage or incorrect measurement.

Usage Warnings ⃠ — Warning ❗ — Caution

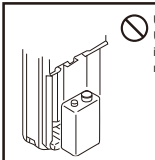


AVOID MEASURING SHINY OBJECTS.

Shiny objects reflect surrounding infrared energy.
Therefore, it results in incorrect measurement.

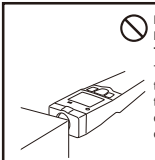


DO NOT DROP THIS THERMOMETER NOR GIVE A STRONG IMPACT TO IT, WHICH MAY CAUSE IRREPARABLE DAMAGE OR INCORRECT MEASUREMENT.



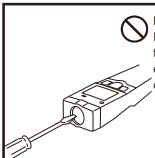
USE THE SPECIFIED BATTERIES.

Use of the other batteries may cause irreparable damage or incorrect measurement.



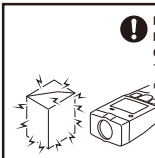
DO NOT LET THE THERMOMETER TOUCH THE OBJECT THAT IS BEING MEASURED.

This product is a non-contact thermometer. Touching high-temperature object may cause deformation of the meter, irreparable damage or incorrect measurement.



DO NOT TOUCH THE FILTER.

Do not let a solid or sharp object touch the filter and do not insert foreign objects into the filter. These may cause incorrect measurement.



DO NOT BRING THE THERMOMETER CLOSE TO ELECTRICALLY CHARGED OBJECTS.

This may cause irreparable damage or incorrect measurement.

Specifications

Model	PT-S80	PT-U80
Measuring range	-30 to 600°C	
Field of view	□30/1000mm (D:S=33:1)	
Optics	Si lens	
Sensing element	Thermopile	
Wavelength	8 to 14 μm	
Response time	0.5sec. / 90%	
Accuracy ($\varepsilon \fallingdotseq 0.95$)	-30.0 to 0°C : ±3°C, 0.1 to 200°C : ±2°C, 200 to 600°C : ±1% of reading value	
Repeatability	±1°C of reading value	
Display resolution	-30.0 to 199.9°C : 0.1°C, 200 to 600°C : 1°C ※1	
Sighting method	Coaxial laser pointer (Class 2)	
HOLD time	15 seconds	
Continuous measurement mode	–	ON / OFF Selectable
USB output	–	○
Memory	1-point memory	35-point memory
High/Low Alarm LED/Buzzer	Alarm LED/Buzzer ON/OFF Selectable	
Emissivity (ε) Adjustment	0.95/0.85/0.70 Selectable	ε Adjustable (0.30 to 1.20/0.01step)
Temperature unit	°C / °F (Selectable)	
Display function	NOR / MAX / MIN	
Power supply	AA Battery x2pcs.	
Battery life	15 Hours (with max load)	
Ambient temperature	0 to 50°C	
Ambient humidity	35% to 85%Rh (Without due condensation)	
Storage temperature/humidity	-10 to 60°C/35% to 85% Rh	
Material	ABS/TEEE	
Dimension	H x W x D = 182 x 56 x 38 mm	
Weight	Approx. 250g (Including batteries)	
Applicable regulations	EMC Directive (2014/30/EU),RoHS Directive (2011/65/EU),China RoHS (MIIT Order No.32) FDA (21 CFR 1040.10 and 1040.11) (expect for deviations pursuant to Laser Notice No.56) Consumer product safety Act.(PSC Mark)	
Applicable standards	EN IEC 61326-1, IEC 60825-1	

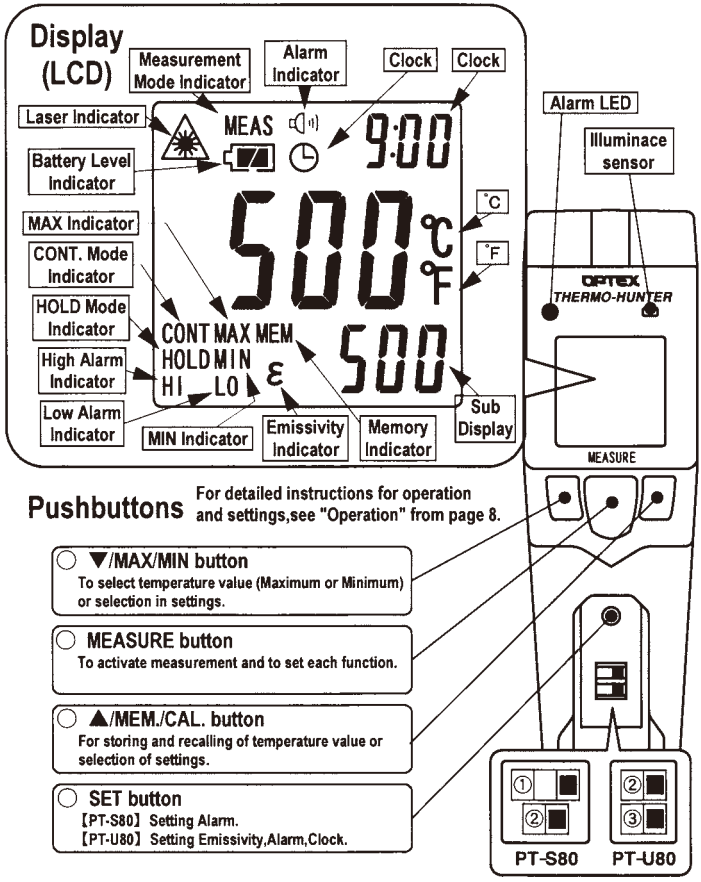
※1 The measurement accuracy in the specification is limited to the calibration conditions of our factory.

Accessories : AA battery x 2pcs. (for checking operations), Instruction manual (this document)
exclusive protective case, USB cable (Only for PT-U80)

Optional : Blackbody tape

For China RoHS, please refer to http://www.optex-fa.com/rohs_cn/

Name of Components

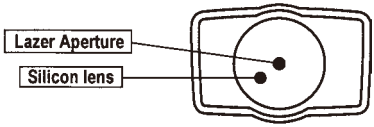


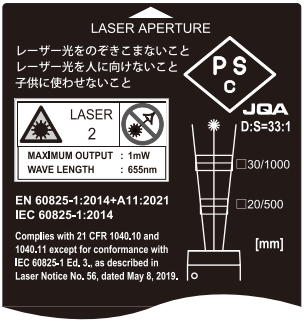
Pushbuttons

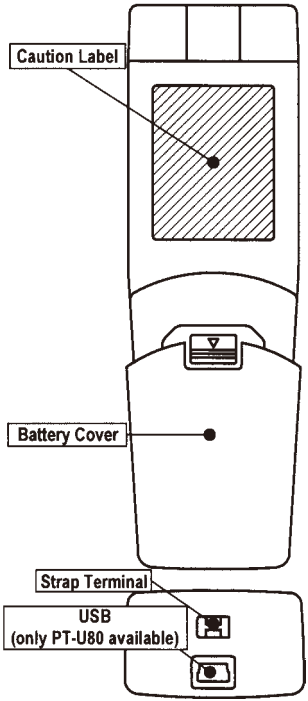
For detailed instructions for operation and settings,see "Operation" from page 8.

- ▼/MAX/MIN button
  To select temperature value (Maximum or Minimum) or selection in settings.
- MEASURE button
  To activate measurement and to set each function.
- ▲/MEM./CAL. button
  For storing and recalling of temperature value or selection of settings.
- SET button
  【PT-S80】 Setting Alarm.
  【PT-U80】 Setting Emissivity,Alarm,Clock.

* There is no button to turn ON/OFF the supper supply.







DIP switches

1. 0.95 / 0.85 / 0.7
Setting Emissivity to fit objects surface.

2.˚C / ˚F
Setting display units (˚C / ˚F).

3. NOR. / CONT.
Selecting NOR.(Normal Mode) or CONT. (Continuous Mode).

Operation

Temperature can be measured while the (MEASURE) button is being pressed.
Set the batteries supplied as an accessory and operate the unit according to the following procedure.

1





Pressing the (MEASURE) button to turns ON the power supply. A laser beam emitted and the measurement starts.
In the Normal Measurement mode, the units takes measurement while (MEASURE) button is pressed.

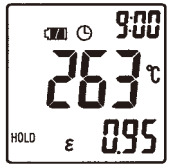
2



Point the laser beam at a measurement object and aim it at the center of the area to be measured. For the distance from this thermometer to the measuring object, refer to page10.

3





When the (MEASURE) button is released, the **"MEAS"** and laser beam symbols go out and **"HOLD"** and **"C (°F)"** symbols light up. After the last temperature value is displayed for 15seconds (HOLD mode), the power is automatically turned OFF.

Selection of display function

Each time the (▼/MAX/MIN) button is pressed, the display function is switched in order of NOR., MAX, and MIN.

NOR. :**"** ε **"** is displayed at the bottom of LCD and the currently set emissivity is displayed on the sub-display.
MAX: **"MAX"** is displayed at the bottom of LCD and the maximum value during measurement is displayed on the sub-display.
MIN: **"MIN"** is displayed at the bottom of LCD and the minimum value during measurement is displayed on the sub-display.

Selection of temperature unit

Selection the temperature unit (°C or °F) referring to the **"**DIP switch setting**"** in page 7.

*The temperature unit is automatically switched with regard to the temperature displayed in the HOLD mode, display function, setting values for upper/lower temperature alarms, and recorded data.

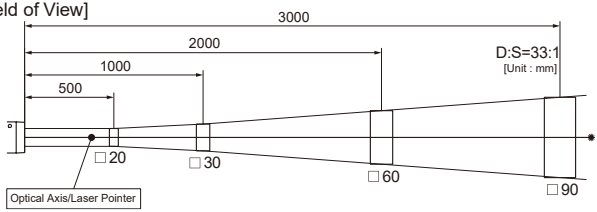
Default value for each setting (at the time of shipment)

	PT-S80	PT-U80
Temperature unit	°C	
Display function	NOR.	
Maximum temperature alarm	Temperature setting : 600°C Function : OFF	
Minimum temperature alarm	Temperature setting : -30°C Function : OFF	
Emissivity (ε)	0.95	
Memory	Nothing	
Continuous measurement mode	–	OFF

Field of View

For the non-contact thermometer (infrared thermometer), the field of view (spot size) is specified depending on the distance from the thermometer to the measuring object as shown below. The temperature value displayed is the average temperature within the spot size. To take an accurate measurement, check the correlation between the size of object and the distance to it.

[Field of View]



* **Remarks**

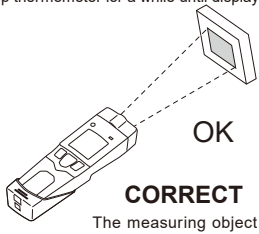
ex.) The average temperature of surface of the square 90mm in diameter is measured at a distance of 3000mm away from the measuring object.

* The laser beam points center of the field of view. The laser pointer functions as a sighting method and not a sensing element.

* It is possible to take temperatures with this thermometer at a distance of 1,000mm or more away from the measuring object, unless there is any obstacle. However, please note that the measuring field of view depends on measuring distance. This thermometer has an optical resolution of 33:1 [D(Distance to the measuring object):S(Spot size)].

[For Correct Measurement]

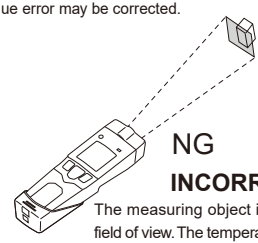
The optical resolution values stated in "Field of View" are at minimum 90% energy. The size of measuring object should be sufficiently larger than the field of view (spot size) shown in the above illustration.
Please keep away from target as far as you can within spot ratio when you measure high temperature.
Sudden ambient temperature change may cause thermometer display value error. In this case, please keep thermometer for a while until display value error may be corrected.



OK

CORRECT

The measuring object is bigger than the field of view.



NG

INCORRECT

The measuring object is smaller than the field of view. The temperature of background influences the measuring value.

Setting/Resetting the High/Low Temperature Alarm

When the measured temperature of the object exceeds the High alarm value, the alarm LED blinks in red and a buzzer (high tone) sounds. When it is below the Low alarm value, the alarm LED blinks in green and a buzzer (low tone) sounds. The “High alarm” is set up first, and then the “Low alarm”.
Set up the alarms according to the following steps.

1

SET

Press the (SET) button while the power is ON.



Pressing the (SET) button displays **“ALM”** on the top of **LCD**.
(Regarding PT-U80, the display is switched in order of **“ALM”**, **“EMS”** and **“TIME”** each time the (SET) button is pressed.)

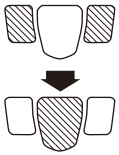
2

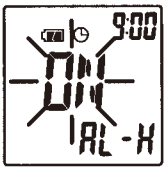




Pressing the (MEASURE) button blinks **“ALM”**. Then, **“ON”** or **“OFF”** (currently set status) is displayed on the top of LCD and **“AL-H”** is displayed on the sub-display. (The High alarm is set up.)

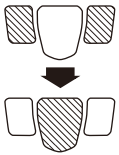
3

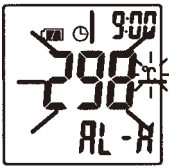




Press the (▼/MAX/MIN) or (▲/MAX/MIN) button to select ON or OFF, and then press the (MEASURE) button to confirm the setting.
When OFF is selected, the display shifts to the setting for the lower limit temperature alarm.

4





The alarm temperature is displayed on the top of LCD by selecting ON.
Press the (▼/MAX/MIN) or (▲/MAX/MIN) button to select ON or OFF, and then press the (MEASURE) button to confirm the setting.
When the setting has been completed, the display shifts to the setting for the Low temperature alarm.

For the setting/resetting of the lower limit temperature alarm, the above steps can be applied excluding that **“AL-H”** on the sub-display is changed to **“AL-L”** in step 2 and later.
When the lower limit setting has been completed, the mode is changed to HOLD.
When the upper and lower limit alarms are set, **“HI”** and **“LO”** lamps are lit on the display.

Note) The upper limit temperature cannot be set to the value less than the setting for the lower limit temperature alarm, and the lower limit temperature cannot be set to the value more than the setting for the upper limit temperature alarm.

PT-S80

■ P.13 Recording Measured Temperature
□ Record Measured Temperature (MEM.Mode)
□ *Call* Temperature Record (CALL Mode)
■ P.13 Emissivity Setting

Recording Measured Temperature

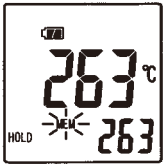
PT-S80 can store one (1) temperature measurement data.
Perform the following steps.

[Record measured temperature/ MEM. mode]

1



1 Press this button for 2 seconds or more while the power is ON.



After **"CALL"** is displayed on the sub-display, **"MEM"** blinks on the display and the temperature value that had been displayed on the sub-display when the (▲/MEM./CAL) button was pressed starts to light up. Then the value is stored in memory.
After the data is stored, the mode is changed to HOLD.

[Call temperature record/CALL mode]

1



1 Press this button for less than 2 seconds while the power is ON.



"CALL" is displayed on the sub-display, and then the stored temperature data displayed.

2





Press the (MEASURE) button to terminate the CALL mode. Then, the normal measurement mode is restored.

Emissivity Setting

Emissivity (ε) refers to the ratio of infrared energy emitted from all the object surfaces. All objects has their own emissivity, which changes depending on the surface conditions and object temperature. This thermometer has 3 fixed emissivities. Refer to the following examples.
0.95...Food, rubber, plastic, paintwork, etc.
0.85...Temperature of refrigerated food can be measured almost accurately.
0.70...Temperature of oxidized metal surfaces can be measured almost accurately.
The displayed temperature could differ from the actual temperature of objects that have different emissivity. In such cases, regard the displayed temperature as a rough standard. When you wish to measure shiny metal surfaces, put a piece of optional blackbody tape (ε =0.95) on the surface of the measured object.

When the emissivity (0.95/0.85/0.7) is selected according to "DIP switch setting" in page 7, the temperature value converted into the selected emissivity is displayed.

PT-U80

- P.15 Date and Time Setting
- P.17 Emissivity Setting
- P.18 Recording Measured Temperature
  - Record Measured Temperature (MEM.Mode)
  - Call Temperature Record (CALL Mode)
  - Delete All the Temperature Records
- P.19 Continuous Measurement
- P.20 USB Connection

Date and Time Setting

Date and time can be set in PT-U80.
Perform the following steps.
*The setting returns to the default if batteries are removed.

1

Press this button while the power is ON.



The LCD display is switched in order of "**ALM**", "**EMS**" and "**TIME**" each time the (SET) button is pressed. Display "**TIME**" on the LCD.

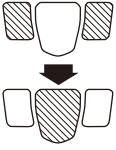
2

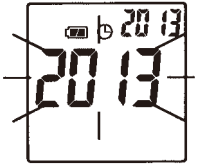




After "**TIME**" blinks, "**YEAR**" blinks. Then, the display is automatically shifted to the state that "**YEAR**" lights up and the dominical year blinks.

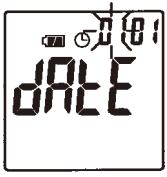
3





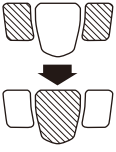
Press the (▼/MAX/MIN) or (▲ /MEM./CAL.) button to adjust the year. Then press the (MEASURE) button to fix the setting.
After the setting, the set year blinks on the LCD.

4



After the set year blinks, "**date**" blinks, then the display is automatically shifted to the state that "**date**" lights up, the left 2 digits of the clock (month) blinks and the right 2 digits (day) lights up.
The left 2 digits of the clock indicate a "month" and the right 2 digits indicate a "day".

5

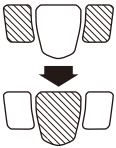


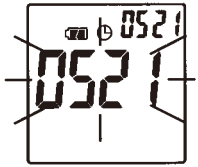


Press the (▼/MAX/MIN) or (▲ /MEM./CAL) button to adjust the month. Then press the (MEASURE) button to fix the setting.
After the setting, the right 2 digits of the clock blink. Then go to the "date" setting.

To the page that follows

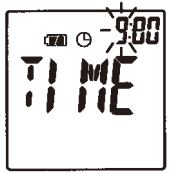
6





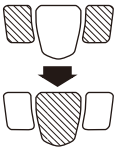
Press the (▼/MAX/MIN) or (▲/MEM./CAL.) button to adjust the month. Then press the (MEASURE) button to fix the setting.
After the setting, the set month and date blink on LCD.

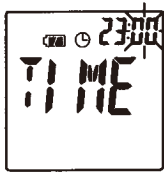
7



After the set date blinks, "TIME" blinks, and then the display is changed to the state that the time lights up, the left 2 digits of the clock (hour) blinks and the right 2 digits (minute) light up.

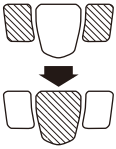
8

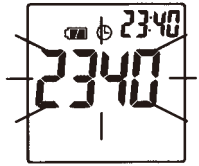




Press the (▼/MAX/MIN) or (▲/MEM.CAL.) button to adjust the hour. Then press the (MEASURE) button to fix the setting.
After the setting, the right 2 digits of the clock start to blink for the "minute" setting.

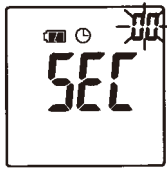
9





Press the (▼/MAX/MIN) or (▲/MEM.CAL.) button to adjust the hour. Then press the (MEASURE) button to fix the setting.
Then, the set time blinks on LCD.

10

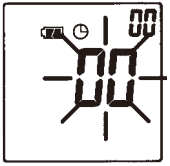


After the set time blinks, "SEC" start to blink and then the display is automatically changed to the state that "SEC" lights up and the "00" blinks on the clock.

To the page that follows

11





When the (MEASURE) button is pressed, the second is set to 0. Press the button so that the second is accurately set. The date and time setting is now complete. After "00" blinks on LCD, the mode is switched to HOLD.

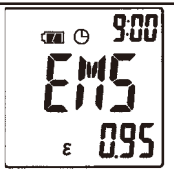
Emissivity Setting

Emissivity setting
Emissivity (ε) refers to the ratio of infrared energy emitted from all the object surfaces. All objects has their own emissivity, which changes depending on the surface conditions and object temperature. The emissivity setting for this thermometer can be changed, so that emissivity can correspond to a measured object and more accurate values can be measured.
Objects with low emissivity (ex: shiny metal surfaces) reflect the surrounding temperatures due to the high reflectivity. If an object other than the measured object such as a high-temperature object exists on the periphery, temperature for the other object is reflected, which will cause incorrect measurement. Thus, it is necessary to block off the obstacle.
Although the maximum emissivity is primarily 1.00, the value up to 1.20 can be set for this thermometer in consideration of convenience.

1

SET

1 Press this button while the power is ON.



The LCD display is switched in order of **"ALM"**, **"EMS"** and **"TIME"** each time the (SET) button is pressed. Display **"EMS"** on the LCD. (The currently set emissivity is displayed on the sub-display.)

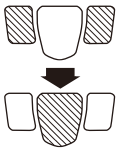
2

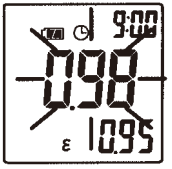




After **"EMS"** blinks, the currently set emissivity appears on LCD. (The currently set emissivity is displayed on the sub-display.)

3





Press the (▼/MAX/MIN) or (▲/MEM./CAL) button to display the emissivity to be set up. The setting is completed by pressing the (MEASURE) button.
After the setting, the mode is changed to HOLD.

Recording Measurement Temperature

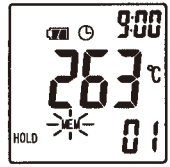
PT-U80 can store 35 temperature measurement data.
Perform the following steps.

[Record measured temperature/ MEM. mode]

1



1 Press this button for 2 seconds or more while the power is ON.



After **"CALL"** is displayed on the sub-display, **"MEM"** blinks on the display and a memory No. lights up on the sub-display. Then the temperature value that had been displayed when the (▲/MEM./CAL) button was pressed is stored in memory.
After the data is stored, the mode is changed to HOLD.

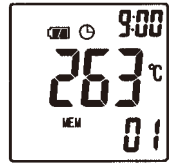
*If the number of stored data has exceeded the capacity, **"FULL"** lights up on LCD.

[Call temperature record/CALL mode]

1



1 Press this button for less than 2 seconds while the power is ON.



"CALL" is displayed on the sub-display, and then the latest stored temperature data and the corresponding memory No. are displayed.
*Data cannot be called during the continuous measurement mode.

2



When the memory No. is changed, the corresponding temperature data is displayed in order.

3





Press the (MEASURE) button to terminate the CALL mode. Then, the normal measurement mode is restored.

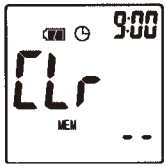
To the page that follows

[Delete all the temperature records]

1



Press the (SET) button during the CALL mode.



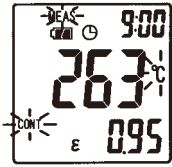
"CLR" is displayed on LCD, and all the temperature records are deleted. After the deletion, the HOLD mode is restored.

Continuous Measurement

For PT-U80, continuous measurement can be performed without pressing the (MEASURE) button. Perform the following steps.

1

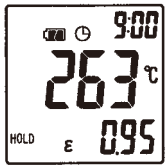




When the (MEASURE) button is pressed while the DIP switch is adjusted to the CONT. side (Refer to "DIP switch setting" in page 7.), **"CONT"** is lit on LCD and continuous measurement is started. Measurement continues even if releasing the (MEASURE) button.

2





When the (MEASURE) button is pressed again or the DIP switch is changed over to the NOR. side, the mode is changed to HOLD.

*Laser beam is not radiated during the continuous measurement mode.

USB Connection

PT-U80 is connectable to PC with the exclusive software and included USB cable. The exclusive software is downloadable at following Web address.

URL https://www.optex-fa.com/download/products/pt_80/

<< Adaptable hardware >>

Computer with USB connector (Type-A) and Windows 10 or Windows 11 installed.

Note: Mac OS is not acceptable.
See the URL above for detail.

Connection

1: Download and install the exclusive software into PC.
Please make sure the PT-U80 turns off when connecting PC.Otherwise stored data is deleted.
2: Connect USB cable to PC.
3: Set up the exclusive software.
4: Push MEASURE switch on thermometer.
USB cable provides power to thermometer in connecting.

The outlook of exclusive software

1: Software is capable of reading, revising and writing of data inside thermometer.
2: PC can read all date instantly on thermometers continuous mode.
3: Output all data by CSV format.
4: Set up each parameters.
Clock
Emissivity
Change memory capability

For the details, please see the exclusive software.

Shut down

1: Finish the exclusive software.
2: Disconnect USB cable from PC with PO indication.
3: Disconnect USB cable from thermometer.

Troubleshooting

Symptom	Cause	Countermeasure
Display does not appear.	The batteries have been exhausted. Battery installation is incorrect.	Replace the batteries. Re-install the batteries correctly.
Laser beam is not radiated. (*Laser beam is not radiated during the continuous measurement mode.)	The laser ejection exit is dirty.	Clean the laser ejection exit according to the“Body”in “Maintenance method ” in page 22.
	Voltage necessary for lighting up laser beam is not satisfied.	Replace the batteries, (The -b- symbol blinks.) or re-install the batteries correctly.
Measured value are unusual.	The lens section is dirty.	Clean the filter referring to the“Lens” in “Maintenance method” of page 22.
	The sight is out of the range.	Locate the optical axis on the center of an object to be measured referring to the“Field of view”in page 10.
	The measured object is smaller than the field of view.	Adjust the measuring distance referring to the “Field of view” in page 10.
	The measured object is adjacent to a high-temperature object and subjected to heat.	Cut off the heat sources with a shield or such.
Measured value are unstable.	A shiny metal surface is being measured.	This thermometer causes an error when measuring a shiny metal surface. Perform measurement after putting optional blackbody tape onto the object.
	The thermometer is being subject to sudden temperature change.	Set aside the thermometer until the temperature becomes stable.

When the above symptoms are not removed even after the corresponding countermeasure has been taken, the thermometer may have a fault. In such cases, contact the shop in which you purchased the product or OPTEX FA.

Maintenance method

[Lens]

Dust or dirt adhering to the lens and flaws on the lens may cause incorrect measurement. When the lens is dirty, remove the adhering objects from the lens using a blower for lens cleaning, etc. If dirt remains, wipe the lens softly using a cotton swab or lens wiping cloth moistened with a small amount of ethyl alcohol.

[Body]

Wipe it with a soft cloth.
When the body is extremely dirty, wipe it with a cloth moistened with diluted detergent after wrung sufficiently.
Note) Do not use hot water exceeding 50°C and chemical agents such as thinner and benzene, which may cause fading of characters, deformation, or damage.

[Periodical inspection]

It is advisable to perform an annual calibration inspection. For further information, please contact OPTEX FA.

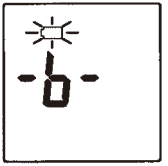
Battery

[Battery replacement]

When the BATT. symbol as a battery indicator and “-b-” on the display have started to blink, it is time to replace the batteries.

Note)
- **When replacing the batteries, be sure to install new batteries without mixing an old one.**
- **Do not use a battery after best before date, or do not continue to use, but replace those once have had the out of battery display as mentioned above.**
- **Once liquid leakage, change in color and shape, damage and abnormal odor on the batteries are observed, immediately stop using the product, remove the batteries and keep them away from fire.**

(1) Seize it lightly face and back of the battery cover by hand, and pull it out.
*A battery cover is the structure which doesn’t come off easily to prevent falling.
(2) Install new batteries in the correct direction.



*The attached batteries are to be used for checking operations. The battery life mentioned in Specifications is not assured for these batteries.

Precautions when handling batteries

- Do not throw exhausted batteries in the fire, nor charge them.
- Do not dispose of exhausted batteries together with general waste. Take them to an appliance dealer or dispose of them when permitted.
- When battery leakage happens, do not touch the liquid directly.
- When the product is not used for long time, e.g. for 2 weeks, remove the batteries and keep them at a cool place.

Memo