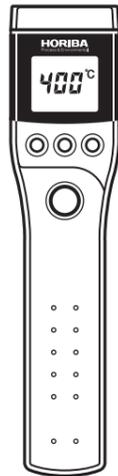# HORIBA
Process & Environmental

INSTRUCTION MANUAL

INFRARED THERMOMETER
IT-545 NH/N/S

Before using the INFRARED THERMOMETER, thoroughly read this manual for the proper operation.
After reading, keep this manual for future reference.
This is the English translation of an original Japanese document.

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レーザ光 LASER RADIATION

ビームをのぞき込まないこと
DO NOT STARE INTO BEAM

最大出力1mW 波長637nm
MAX.1mW   WAVELENGTH 637nm

クラス 2 レーザ製品
CLASS 2 LASER PRODUCT

JIS C 6802   EN60825-1

⚠ Precautions for LASER

Class 2 laser is used in IT-545NH/N.
Do not stare into beam or direct it toward eyes.
(Avoid using laser around reflective objects such as glass.)

Do not disassemble or modify the product.

Precautions

Follow the instructions here, or it may cause breakage or a malfunction.

Usage

- Do not bring the lens into contact with an object to be measured.
- Do not drop the product, and do not subject it to strong impact.
- Do not touch the lens with anything hard, and do not apply force on it. And do not insert a foreign matter into it.
- Do not bring the product into contact with electrically charged bodies.
- Set the emissivity value correctly. Otherwise, measurement results will be incorrect.
- Keep the product well away from a hot object.

Environment

- Do not use or store the product in a dusty or hot and humid area.
- Do not expose the product to direct sunlight for a long time.
- Do not use the product near an electromagnetic source, such as transceivers and radiophones.
- Do not allow dew condensation to form on unit (ex., bringing it from cold to warm environments).
- Unit is not water-proof; do not allow it to get wet.
- Use the product within the operable temperature range. The °C indicator on the display blinks when the ambient temperature is out of the range.

Prior to use

Set batteries into the battery compartment on the back.

Battery Replacement

When " 🔋 " indicator blinks, replace batteries.

1. Slide cover off battery compartment at rear of main unit.
2. Insert new R03 (#AAA) batteries as shown on battery compartment inside diagram. Do not mix new batteries with the old ones.

Notes

- Check the parameter settings after replacing batteries.
- Make sure not to put used battery into fire. Do not attempt to recharge old batteries.
- Remove batteries when unit unused for more than six months.
- The batteries provided with the product may run out soon.

Maintenance

Lens cleaning
Use a camera lens blower to remove dust on the lens. Use cotton applicator soaked in alcohol to wipe away insistent dirt on the lens.
(Lens is the most important part for temperature measurement. Lens dirt may cause measurement error and may result in lens erosion.)

Body cleaning
Wipe gently with dry cloth. Use a cloth wrung out with diluted neutral detergent to wipe out insistent dirt. Do not use organic solvents, which may cause surface erosion.

Keys and Indicators

🔆 There is no power switch. Press the **MEAS** key to turn ON the power. Power is turned OFF in 15 seconds after the SET or HOLD indicator is lit on the display.

Operating part

545NH/N   **545S**

Mode select key **MODE**
This key switches values displayed among current measured temperature, maximum temperature, or minimum temperature. Also, you can set emissivity and alarm temp. upper/lower limits by pressing this key when the HOLD indicator is lit.

Parameter adjust keys ▼▲
These keys raise/lower emissivity and alarm-temp. upper/lower limits.

▼ Decrease
▲ Increase

Measure key **MEAS**
Press this key to start measurement and release it to stop measurement. Measurement continues while the key is pressed, and the last measured value is held after it is released.

Measuring

Holding

Lens
Laser marker port
Laser warning label (545NH/N)
LED marker port
PSC label
Laser specification and caution label (545NH/N)
Battery compartment

Liquid crystal display
Entire display blinks when Measurement temp. range exceeded.

Laser indicator
(545NH/N)
Displayed: the laser is ready.
Blinking: the laser is in use.

Alarm indicator
Displayed: the alarm temp. limits setting mode.
Blinking: an alarm is going on.

Battery indicator
Blinking: the battery level is low. Replace the batteries.

Centigrade
Emissivity
Displayed: the emissivity setting mode.

SET
Blinking: the emissivity or alarm temp. limit setting mode.

HOLD
Displayed: measured value is held.

MAX/MIN temp.
Shows what the displayed measurement value is.
MAX displayed: the maximum measured value
MIN displayed: the minimum measured value
Neither MAX/MIN displayed: the current measured value

Measuring

First, confirm the emissivity setting matches the object to be measured. Make measurement using following procedure.

1 Start measurement

Aim the lens toward the object to be measured. ⇨ **MEAS** (Measurement continues while this key is pressed.)

You can check the measured area using the marker (laser or LED).

2 Complete measurement

Release the **MEAS** key.
The marker beam turns OFF, and the measured value is held.
Power turns OFF in 15 seconds.

Displaying the previous measurement value

Power OFF ⇨ **MEAS** ⇨ Release the **MEAS** key within 1 second.

🔆 If you hold the **MEAS** key down longer, measurement will start and the previous measurement value will be deleted.

Continuous measuring

Power OFF ⇨ Hold the **MODE** key down and press the **MEAS** key.
(Press the MEAS key to switch modes (measurement or HOLD).)
Power does not turn OFF during continuous measurement.
To turn OFF the power, press the **MEAS** key to display the **HOLD** indicator.
Power turns OFF in 15 seconds.

Notes

The marker lights only while the **MEAS** key is pressed during measurement.

Target size and sight

Target size ⌀14 ⌀40(60) ⌀72(95) ⌀140(163)

545NH/N
500
1000
2000
--- Sight Distance (mm)
( ) Sight dimension

Target size ⌀2,5 ⌀10,1 ⌀32,4

545S
30
50
100
Distance (mm)

The LED marker 🔘 comes into focus and the target area is the smallest (⌀2.5 mm) at 30 mm in distance.

Diameter of target size
Object

The laser marker displays at the both sides of diameter of the target area.

When the LED marker looks like 🔘 (bottom missing), target area is not the smallest.

Notes
- Target size means 90% energy limit. The measured object must be 1.5 to 2 times larger than the target area.
- The marker may be difficult to see depending on the temperature and color of the object.

Displaying MAX (MIN) temp.

HOLD or during measurement ⇨ **MODE** ⇨ MAX / MIN

- The previous measurement results are displayed in the HOLD mode.
- The maximum (minimum) measured value is displayed during measurement.

Switching laser marker function ON/OFF (545NH/N)

HOLD or during measurement ⇨ ▲ (Press this key to switch function settings (ON or OFF).)

When laser is ready, the 🔺 indicator displays.

Setting emissivity (ε)

Emissivity is substance-specific. Set this parameter appropriately according to the measurement objects to obtain correct measurement results. The initial setting is 0.95.

HOLD ⇨ **MODE** ⇨ ε ⇨ ▼ ▲

Example

Measurement object	Emissivity
Paint lacquer	0.80 to 0.95
Rubber (black)	0.94
Plastics	0.85 to 0.95

🔆 Objects with low emissivity, such as metal surface, may cause fluctuations in instrument reading. In such cases, it is recommended to use optional black-body spray or tape.

Setting alarm temp. upper/lower limits ⬇ALM⬆

HOLD ⇨ **MODE** ⇨ ALM⬆/⬇ALM Upper limit / Lower limit ⇨ ▼ ▲

Alarm settings	Alarm conditions	Display
Lower limit < Upper limit	Measured value < Lower limit	⬇ALM
	Upper limit < Measured value	ALM⬆
Lower limit > Upper limit	Upper limit < Measured value and Measured value < Lower limit	⬇ALM⬆
Lower limit = Upper limit	No alarm	—

Example   When setting Lower set < Upper set

Upper limit → Lower limit

🔆 In the alarm state, the marker and the ALM indicator blinks and a buzzer sounds.

Specifications

Model	IT-545NH	IT-545N	IT-545S
Detector/Lens	Thermopile/Silicon		
Spectral response	8 μm to 14 μm		
Measurement temp.range	−50°C to 1000°C	−50°C to 500°C	
Resolution	0.1°C for 0.0°C to 199.9°C / 1°C for other than above		

Accuracy	
−50°C to −0°C	±(5% of absolute reading +1.5)°C
0°C to 199.9°C	±1.0°C
200°C to 500°C	±(0.5% of reading +0.5)°C
501°C to 1000°C	±(0.5% of reading +0.5)°C [*]

Conditions
Ambient temp. 18°C to 28°C
Relative humidity: 55%
Emissivity: ε=1.00

Repeatability	
−50°C to −0°C	±1°C
0°C to 199.9°C	±0.3°C
200°C to 500°C	±1°C
501°C to 1000°C	±1°C [*]

Display update time	0.4 seconds
Response time	Less than 0.8 seconds (95% response）
Target size	⌀40 mm (at 500 mm distance) / ⌀2.5 mm (at 30 mm distance)
Emissivity setting range	0.10 to 1.00 (0.01 step)
Sighting	Twin laser maker (class 2) / LED spot marker
Operable ambient cond.	Temp.: 0°C to 50°C, Relative humidity: 35% to 85% (no condensation)
Storage temp. range	−20°C to 55°C (no condensation)
Power	R03 (#AAA) battery × 4
Dimensions	170 (L) × 40(W) × 36(H) mm
Mass	Approx. 140 g (including batteries)
Functions	Upper/Lower limit alarm, Maximum/Minimum values, Measured value hold, battery alarm, Automatic power OFF
Accessories	R03 (#AAA) battery × 4, Instruction manual, Carrying case, Regulations and Safety

[*] Only for IT-545NH

Troubleshooting

Problem	Cause	Countermeasure
No readout	Low battery or batteries are set incorrectly.	Replace or reset batteries.
Incorrect readout	Lens is dirty.	Clean lens.
	Hot heat source is near by.	Shield the product from the heat source.
	Emissivity setting is improper.	Set correctly.
"Err" displayed	Product defective	Contact representative.