

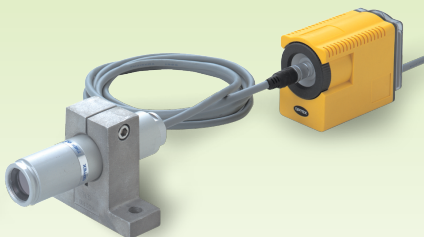
**Stationary-type non-contact thermometer**  
**Sensor/amplifier separate type**

Measurement range  
**0 to 500°C (32 to 932°F)**

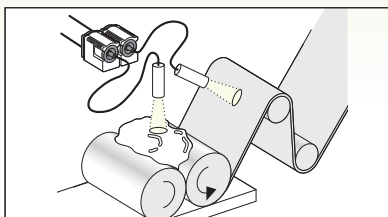
**THERMO-HUNTER®**  
**BS series**

**Sensor head**  
 <Wide-angle area type> **BS-30T**  
 <Small spot type> **BS-05T**

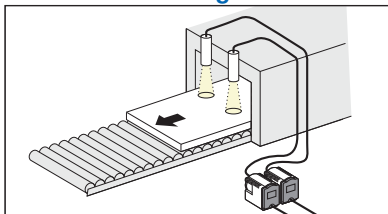
**Amplifier unit**  
 Use in combination with a sensor head  
 <4 to 20 mA output type> **BS-A**  
 <1 mV/°C output type> **BS-V**



Temperature control for rubber kneading



Temperature control for painted surfaces of building materials



- Environmental-resistant
- IP67 sensor head
- Heat-resistant to 150°C (302°F) with purge unit
- Digital display on amplifier
- Emissivity teaching
- 8 m heat-resistant extension cable

**Features**

**Sensor/amplifier separate type for flexible mounting**

The sensor/amplifier separate design provides improved environmental resistance. The compact sensor features a stainless-steel body and a special steel structure for IP67-level waterproofing. A detachable connector cable is used between the sensor and the amplifier. This design reduces the effort needed for changing the installation location or when performing maintenance.



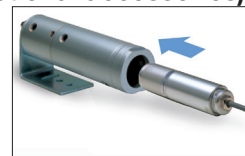
**IP67 waterproof sensor head**

In harsh manufacturing lines, water and dust can cause sensors to fail, so environmental resistance is a must. The BS series is the first thermometer in its class to offer IP67 waterproofing and dustproofing.



**Heat-resistant up to 150°C (302°F) (with use of optional accessories)**

Using the optional BS-WP1 air purge/water-cooling jacket provides even greater environmental resistance. With water-cooling, the product can handle temperatures up to 150°C (302°F). The BS-WP1 can also be used for air purging, where air is blown onto the lens to protect against dust and dirt.



**Built-in easy-to-configure digital display**

The amplifier of the BS series is equipped with a digital display. The digital display allows users to easily check various function settings and measurement values.

**Simple emissivity adjustment: Teaching function**

This product is equipped with a TEACH function that allows users to calculate and store emissivity automatically by inputting a temperature. This allows for drastic reductions in time spent on configuring settings.

**Two types of analog output**

The lineup includes a voltage output type that can be easily connected to a panel meter, and a current output type that is ideal for long-range transmissions. Users are able to select the desired type when selecting a model.

**Type key**

● **Sensor head**  
 BS-□□T  
 { 30: ø30 mm/500 mm  
 [Field of view] { 05: ø5 mm/100 mm  
 [Type] BS Sensor/amplifier separate type

● **Amplifier unit**  
 BS-□□  
 { A: 4 to 20 mA output  
 [Output] { V: 1 mV/°C output

## Specifications

### ■ Sensor head

Model	BS-30T	BS-05T
Measurement range	0 to 500°C (32 to 932°F) (Display: -20 to 520°C (-4 to 968°F))	
Field of view	ø30 mm/500 mm (Refer to field of view)	ø 5 mm/100 mm (Refer to field of view)
Optics	Silicone lens	
Sensing element/ spectral response	Thermopile/8 to 14 μm	
Response time	0.5 sec./90%	
Accuracy <sup>1</sup> (ε≈1.0)	±2°C (3.6°F) or ±1% of reading value, whichever is greater	
Repeatability	±1°C (1.8°F)	
Emissivity (ε) adjustment	0.10 to 1.20 (0.01 per step)	
Ambient temperature	0 to 65°C (32 to 149°F), With air purge/water-cooling jacket installed: Air-cooled: 0 to 80°C (32 to 176°F), Water-cooled: 0 to 150°C (32 to 302°F)	
Ambient humidity	35 to 85% RH (no condensation)	
Storage temperature	-20 to 70°C (-4 to 158°F)	
Vibration resistance	3G (20 to 50 Hz, according to IEC 60068-2-6)	
Degree of protection	IP67	
Applicable regulations	EMC	EMC Directive (2014 / 30 / EU)
	Environment	RoHS Directive (2011 / 65 / EU), China RoHS (MIIT Order No.32)
Applicable standards	EN 60825-1	
Weight	Approx. 300 g (including connector cable)	
Material	Aluminum	
Standard included accessories	—	

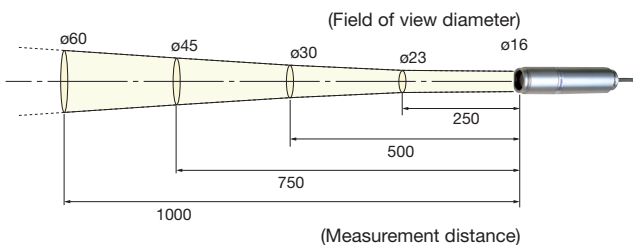
<sup>1</sup>The measurement accuracy in the specification is limited to the calibration conditions of our factory.

• Note that specifications are subject to change without prior notice for product improvement purposes.

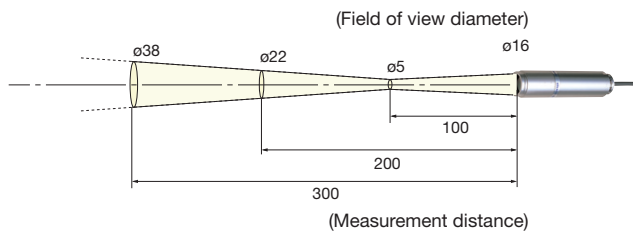
### Field of view

#### ●BS-30T/BS-30T

(Unit: mm)



#### ●BS-05T/BS-05T



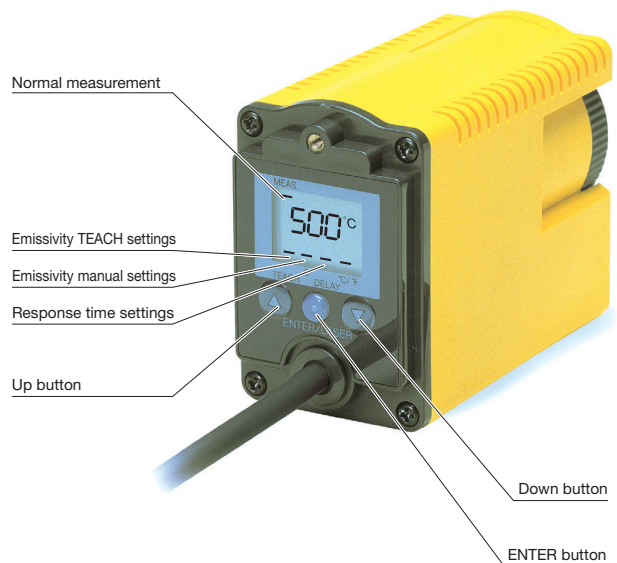
The field of view stated above are measurement diameters with an optical response of 90%. The size of the measurement target must be sufficiently larger than the figures shown in the above diagram.

### ■ Amplifier unit

Model	BS-A	BS-V
Analog output	4 to 20 mA	1 mV/°C
Analog output resolution	0.2°C (0.36°F)	
Digital display resolution	1°C (1°F) (digital display on back of amplifier)	
Functions	Simple emissivity adjustment: TEACH function Response time selection (DELAY) function: 1 (0.5 sec.) to 200 (approx. 10 sec.)	
Supply voltage/ current consumption	12 to 24 VDC ±10%/100 mA or less (at max. load)	
Ambient temperature	0 to 50°C (32 to 122°F)	
Ambient humidity	35 to 85% RH (no condensation)	
Storage temperature	-20 to 60°C (-4 to 140°F)	
Vibration resistance	3G (20 to 50 Hz, according to IEC 60068-2-6)	
Degree of protection	IP65	
Weight	Approx. 320 g (including cable)	
Material	Ring/housing: Glass-filled PBT, Rear / Cover: PC	
Standard included accessories	Amplifier mounting bracket ×1, amplifier mounting screw (M4) ×2	

• Note that specifications are subject to change without prior notice for product improvement purposes.

### Operating panel



Selection guide

Stationary-type

CS

SA-80

BA

BA-TC

BS

BS-02

BF

Portable-type

PT-7LD

PT-5LD

PT-S80  
PT-U80

PT-2LD

PT-3S

Q & A

Support

Company

Options/Accessories

Stationary-type

CS

SA-80

BA

BA-TC

BS

BS-02

BF

Portable-type

PT-7LD

PT-5LD

PT-S80  
PT-U80

PT-2LD

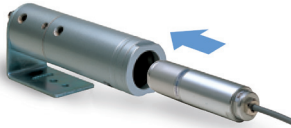
PT-3S

Q & A

Support

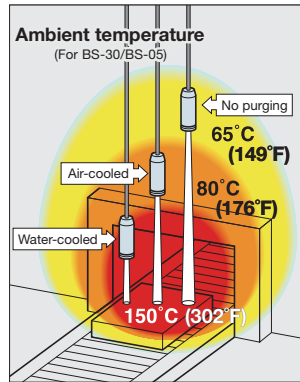
Company

**Air purge/water-cooling jacket BS-WP1**



Attaching an air purge/water-cooling jacket to the sensor head provides greatly improved environmental resistance.

- Instrumentation air or coolant is required.
- There is no need for sensor head fixture NB-SH30A when using BS-WP1.



**Specifications**

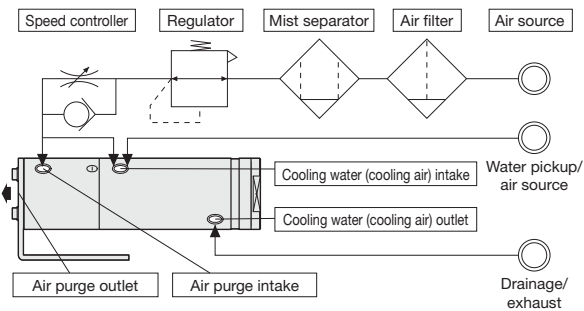
**Air-cooled**

Air is blown onto the lens of the surface during cooling to prevent the adhesion of dust. Ambient temperature: Up to 80°C (176°F)  
Air flow rate: 50 to 150 NI/min.  
Air temperature: 20°C (68°F)  
Air pressure: 0.2 Mpa (2 kgf/cm<sup>2</sup>) or less (limited to instrumentation air)

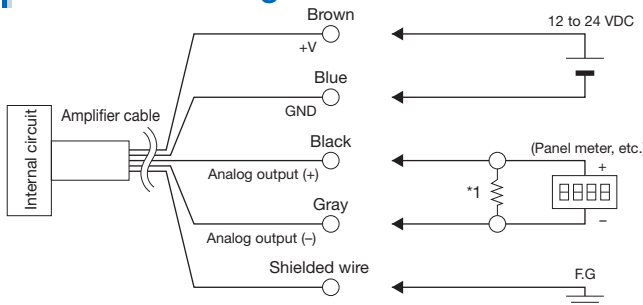
**Water-cooled**

Used for cooling only. Use in combination with air cooling can cause scattering of dust. Ambient temperature: Up to 150°C (302°F)  
Flow rate: 0.5 to 2 l/min.  
Temperature: 30°C (86°F)  
Pressure: 0.1 Mpa (1 kgf/cm<sup>2</sup>) or less

**Piping example**



**Connection diagram**



**Sensor-to-amplifier extension cable BS-EC8**



Connecting the optional BS-EC8 cable (8 m) to the standard connector cable (2 m) between the sensor and the amplifier provides up to 10 m of extension. Both standard and optional cables can handle temperatures up to 150°C (302°F).

**Sensor head fixture NB-SH30A**



This base is used to fix cylindrical-type sensor heads. It is a convenient accessory for installation.

- Cannot be used in combination with BS-WP1.

**Black tape for glossy objects HB-250**



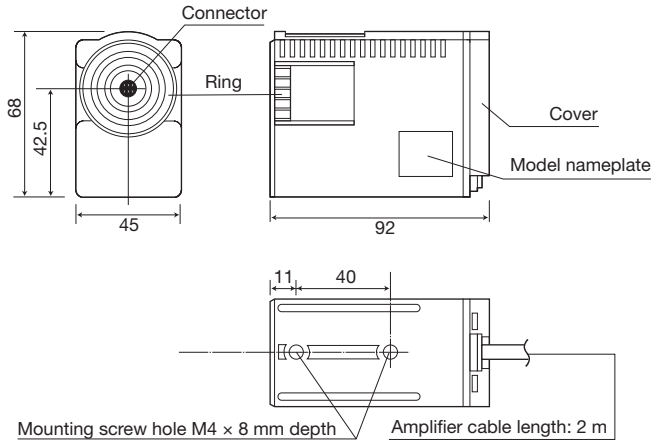
When attached to the surface of an object with unknown emissivity or a glossy object, this tape provides an emissivity of 0.95, enabling accurate non-contact temperature measurement. When using the tape, set the emissivity to  $\epsilon = 0.95$ . The tape is built with material resistant to heat up to 250°C (482°F). Total area: 60 mm × 2000 mm

**Notes regarding connections**

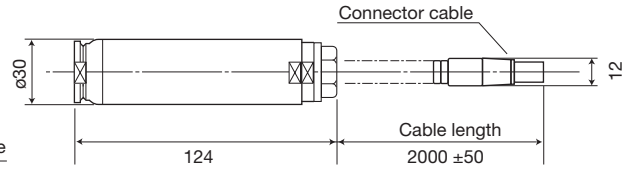
1. Use a power supply within the rated range, and pay careful attention to polarity.
2. For the meter and other products when connecting analog output for a voltage output type (BS-30TV/BS-05TV), use products with a power impedance of 100 k $\Omega$  or more.
3. When connecting analog output from a current output type (BS-30TA/BS-05TA) to a meter or other product, connect with a load resistance of 250  $\Omega$  or less (\*1).
4. Do not connect the analog output (-) to GND or the like. Doing so will result in an error.
5. Do not short-circuit the analog output (+).
6. Using the same piping for parallel wiring with wiring input/output lines, power lines, or high-voltage lines may cause malfunctions due to EMI noise. Use shielded wire or a separate metal conduit.

## Dimensions

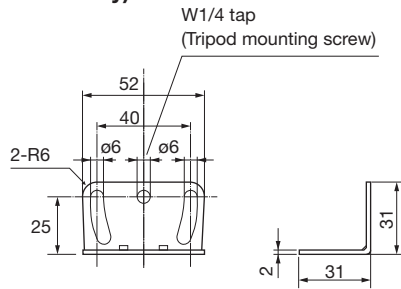
### ● Amplifier



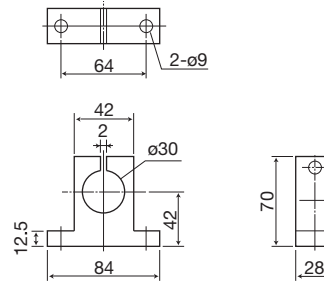
### ● Sensor head



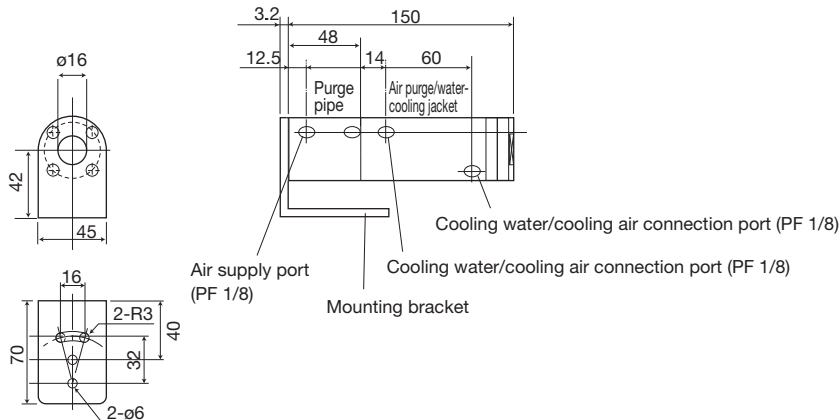
### ● Amplifier mounting bracket (Included accessory)



### ● Sensor head fixture NB-SH30A (sold separately)



### ● Air purge/water-cooling jacket BS-WP1 (sold separately)



(Unit: mm)

## Correct use

### ■ Situations where measurement may be difficult

- When measuring a mirror-like surface such as shiny metal.
- (Measure after attaching optional accessory HB-250 or after creating a matte finish using paint or the like.)
- When measuring through glass.

### ■ Correct use

- Be sure to read the instruction manual thoroughly before using the product.
- This instrument is not a thermometer for taking body temperatures. It is not intended for use in medical practices.
- Sudden changes in ambient temperature can cause measurement errors. Please ensure the product is not subject to sudden temperature changes during use.
- Do not use the product near objects that generate strong electromagnetic waves, or in environments with corrosive gases or explosive gases.
- Use only the rated power supply with the product. Using the product outside of the 12 to 24 VDC range may cause malfunction, short-circuiting, fire, or injury.
- Do not touch the product to the measurement target. This product is a non-contact thermometer. Contact with a high-temperature surface may result in deformation, the need for repairs, and measurement errors.

Selection  
guide

Stationary-  
type

CS

SA-80

BA

BA-TC

BS

BS-02

BF

Portable-  
type

PT-7LD

PT-5LD

PT-S80  
PT-U80

PT-2LD

PT-3S

Q & A

Support

Company

Stationary-type non-contact thermometer  
Sensor/amplifier separate type  
(Fine-point)

Measurement range  
0 to 500°C (32 to 932°F)

**THERMO-HUNTER®**  
**BS-02 series**

Sensor head  
<Fine spot type>  
**BS-02T**

Amplifier unit  
Use in combination with a sensor head  
<4 to 20 mA output type> <1 mV/°C output type>  
**BS-A**                      **BS-V**



- ø2.5mm fine spot
- Coaxial laser marker
- IP67 sensor head
- Digital display on amplifier
- Emissivity teaching
- 8 m heat-resistant extension cable

## Features

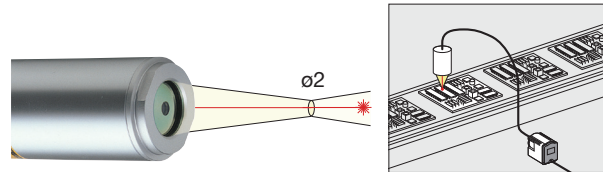
### Sensor/amplifier separate type for flexible mounting

The sensor/amplifier separate design provides improved environmental resistance. The compact sensor features a stainless-steel body and a special steel structure for IP67-level waterproofing. A detachable connector cable is used between the sensor and the amplifier. This design reduces the effort needed for changing the installation location or when performing maintenance.



### ø2 mm fine-spot measurement with precise laser-marker sighting

This product features a field of view designed for measurement of heat generated by objects as small as ø2 mm. In addition, the built-in coaxial laser marker points directly to the center of the field of view, ensuring the point of measurement is clearly visible. This means aiming is accurate even with minute targets in addition to easier sensor positioning during installation.



### IP67 waterproof sensor head

In harsh manufacturing lines, water and dust can cause sensors to fail, so environmental resistance is a must. The BS series is the first thermometer in its class to offer IP67 waterproofing and dustproofing.

### Built-in easy-to-configure digital display

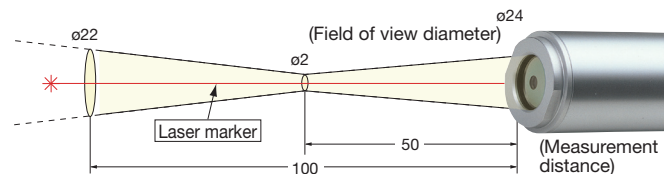
The amplifier of the BS series is equipped with a digital display. The digital display allows users to easily check various function settings and measurement values.



### Simple emissivity adjustment: Teaching function

This product is equipped with a TEACH function that allows users to calculate and store emissivity automatically by inputting a temperature. This allows for drastic reductions in time spent on configuring settings.

## Field of view



- The laser marker points directly to the center of the field of view.
- The field of view stated above are measurement diameters with an optical response of 90%.
- The size of the measurement target must be approx. 1.5 times larger than the measurement diameters shown in the above diagram.

(Unit: mm)

## Type key

### ● Sensor head

BS-02T  
[Field of view] 02: ø2 mm/50 mm  
BS sensor/amplifier separate type  
[Type]

### ● Amplifier unit

BS-□  
[Output] A: 4 to 20 mA output  
V: 1 mV/°C output





## Specifications

### ■ Sensor head

Model	BS-02T	
Measurement range	0 to 500°C (32 to 932°F) (Display: -20 to 520°C (-4 to 968°F))	
Field of view	ø2 mm/50 mm (Refer to field of view)	
Optics	Silicone lens	
Sensing element/spectral response	Thermopile/8 to 14 μm	
Response time	0.5 sec./90%	
Accuracy <sup>1</sup> (ε≈1.0)	±2°C (3.6°F) or ±1% of reading value, whichever is greater	
Repeatability	±1°C (1.8°F)	
Emissivity (ε) adjustment	0.10 to 1.20 (0.01 per step)	
Sighting function	Coaxial laser marker Class 2 (IEC / JIS / FDA <sup>2</sup> )	
Ambient temperature	0 to 50°C (32 to 122°F)	
Ambient humidity	35 to 85% RH (no condensation)	
Storage temperature	-20 to 60°C (-4 to 140°F)	
Vibration resistance	3G (20 to 50 Hz, according to IEC 60068-2-6)	
Degree of protection	IP67	
Applicable regulations	EMC	EMC Directive (2014 / 30 / EU)
	Environment	RoHS Directive (2011 / 65 / EU), China RoHS (MIIT Order No.32)
	Safety	FDA Regulations (21 CFR 1040.10 and 1040.11) (except for deviations pursuant to Laser Notice No.50)
Applicable standards	EN 60825-1	
Weight	Approx. 400 g (including connector cable)	
Material	Aluminum	
Standard included accessories	Sensor head mounting bracket	

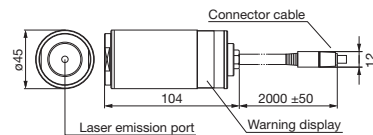
<sup>1</sup> The measurement accuracy in the specification is limited to the calibration conditions of our factory.

<sup>2</sup> This product is classified as Class 2 by IEC 60825-1: 2007 according to Laser Notice No.50, FDA Guidance Document.

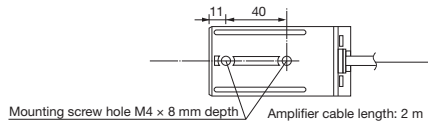
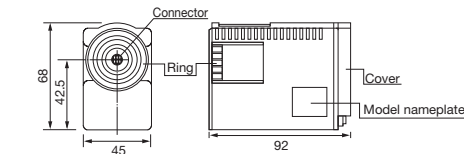
• Note that specifications are subject to change without prior notice for product improvement purposes.

## Dimensions

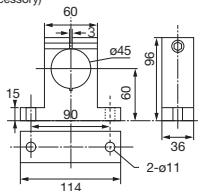
### ● Sensor head



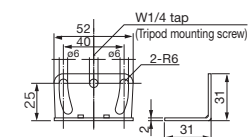
### ● Amplifier



### ● Sensor head fixture NB-SH40A (Optional accessory)



### ● Amplifier mounting bracket (Included accessory)



(Unit: mm)

### ■ Amplifier unit

Model	BS-A	BS-V
Analog output	4 to 20 mA	1 mV/°C
Analog output resolution	0.2°C (0.36°F)	
Digital display resolution	1°C (1°F) (digital display on back of amplifier)	
Functions	Simple emissivity adjustment: TEACH function Response time selection (DELAY) function: 1 (0.5 sec.) to 200 (approx. 10 sec.)	
Supply voltage/current consumption	12 to 24 VDC ±10%/100 mA or less (at max. load)	
Ambient temperature	0 to 50°C (32 to 122°F)	
Ambient humidity	35 to 85% RH (no condensation)	
Storage temperature	-20 to 60°C (-4 to 140°F)	
Vibration resistance	3G (20 to 50 Hz, according to IEC 60068-2-6)	
Degree of protection	IP65	
Weight	Approx. 320 g (including cable)	
Material	Ring/housing: Glass-filled PBT, Rear / Cover: PC	
Standard included accessories	Amplifier mounting bracket x1, amplifier mounting screw (M4) x2	

• Note that specifications are subject to change without prior notice for product improvement purposes.

## Options/Accessories

### Sensor-to-amplifier extension cable BS-EC8



Connecting the optional BS-EC8 cable (8 m) to the standard connector cable (2 m) between the sensor and the amplifier provides up to 10 m of extension. Both standard and optional cables can handle temperatures up to 150°C (302°F).

### Sensor head fixture NB-SH40A



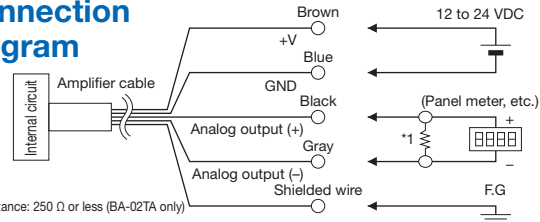
This base is used to fix cylindrical-type sensor heads. It is a convenient accessory for installation.

### Black tape for glossy objects HB-250



When attached to the surface of an object with unknown emissivity or a glossy object, this tape provides an emissivity of 0.95, enabling accurate non-contact temperature measurement. When using the tape, set the emissivity to ε = 0.95. The tape is built with material resistant to heat up to 250°C (482°F). Total area: 60 mm x 2000 mm

## Connection diagram



<sup>1</sup> Load resistance: 250 Ω or less (BA-02TA only)

## Correct use

### ■ Situations where measurement may be difficult

- When measuring a mirror-like surface such as shiny metal.
- (Measure after attaching optional accessory HB-250 or after creating a matte finish using paint or the like.)
- When measuring through glass.

### ■ Correct use

- Be sure to read the instruction manual thoroughly before using the product.
- This instrument is not a thermometer for taking body temperatures. It is not intended for use in medical practices.
- Sudden changes in ambient temperature can cause measurement errors. Please ensure the product is not subject to sudden temperature changes during use.
- Do not use the product near objects that generate strong electromagnetic waves, or in environments with corrosive gases or explosive gases.
- Use only the rated power supply with the product. Using the product outside of the 12 to 24 VDC range may cause malfunction, short-circuiting, fire, or injury.
- Do not touch the product to the measurement target. This product is a non-contact thermometer. Contact with a high-temperature surface may result in deformation, the need for repairs, and measurement errors.

### ■ Precautions for laser use

This product emits a Class 1 or Class 2 visible laser beam that is compliant with JIS C6802/IEC 60825-1/FDA laser safety standards. Labels for applicable standards are affixed and attached to the sides of the sensor.

Type of laser used in this product

Type	Red semiconductor laser
Wavelength	670 nm
Output	390 μW/1 mW

### ● Export to the United States

If this product is to be exported to the United States, it is necessary to follow laser standards as stipulated by the US Food and Drug Administration (FDA). This product has already been submitted to the CDRH (Center for Devices and Radiological Health).



## Selection guide

### Stationary-type

CS

SA-80

BA

BA-TC

BS

BS-02

BF

### Portable-type

PT-7LD

PT-5LD

PT-S80  
PT-U80

PT-2LD

PT-3S

## Q & A

### Support

### Company