

# 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> <Small spot type>

**BS-30T**

**BS-05T**

## Amplifier unit

Use in combination with a sensor head

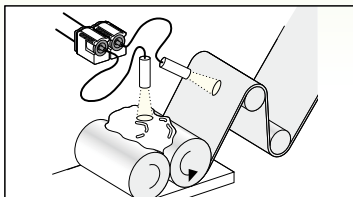
<4 to 20 mA output type> <1 mV/°C output type>

**BS-A**

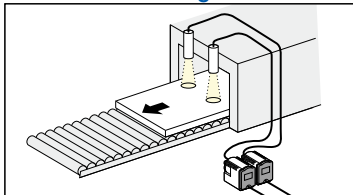
**BS-V**



## 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  
05: ø5 mm/100 mm

[Field of view]

BS Sensor/amplifier separate type

[Type]

### ● Amplifier unit

BS-□

{ A: 4 to 20 mA output  
V: 1 mV/°C output

[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)	ø5 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 (ε≈1.0)	±1% or ±2°C (3.6°F) of reading, whichever is greater	
Repeatability	±1°C (1.8°F) of reading	
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 JIS C0911)	
Degree of protection	IP67 (equivalent to Grade 7 in the JIS protection rating)	
Weight	Approx. 300 g (including connector cable)	
Material	Aluminum	
Standard included accessories	—	

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

### ■ Amplifier unit

Model	BS-A	BS-V
Analog output	4 to 20 mA	1 mV/°C
Analog output resolution	0.2°C (32.4°F)	
Analog display resolution	1°C (33.8°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 JIS C0911)	
Degree of protection	IP65 (equivalent to Grade 5 in the JIS protection rating)	
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.

### 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

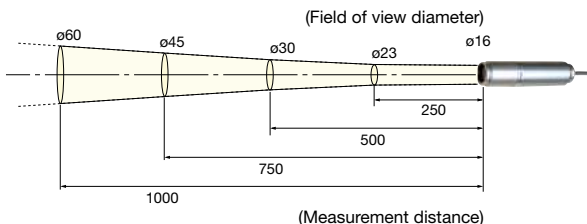
### Q & A

### Support

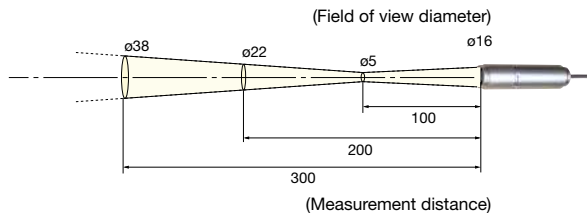
## Field of view

### ●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.

## Operating panel



## Options/Accessories

### 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

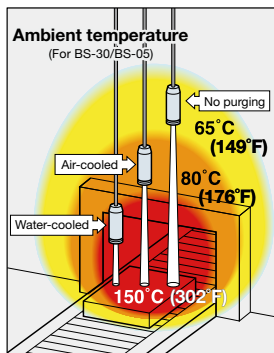
Q & A

Support

### 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

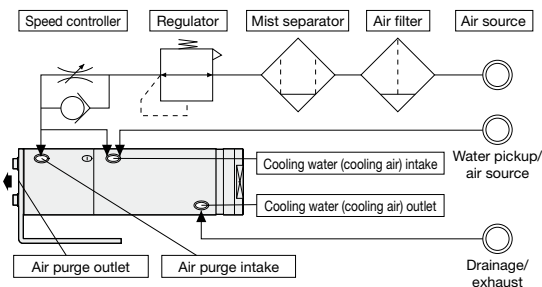
#### Air-cooled

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 Nl/min.  
Air temperature: 20°C (68°F)  
Air pressure: 0.2 Mpa (2 kgf/cm<sup>2</sup>) or less  
(limited to instrumentation air)

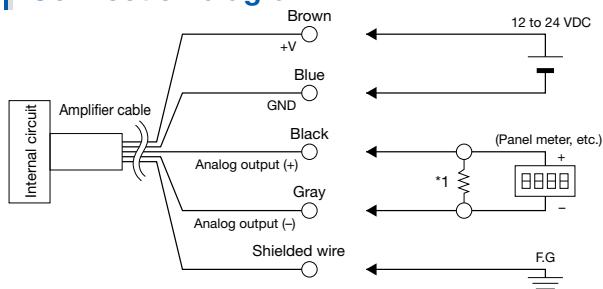
#### Water-cooled

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



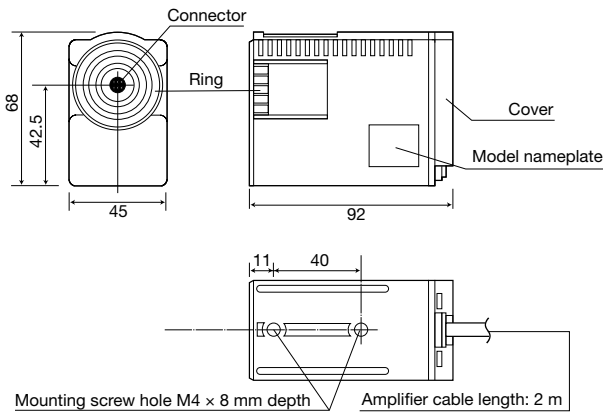
When attached to the surface of an object with unknown emissivity or a glossy object, this tape provides an emissivity of 0.95, enabling accurate non-contact temperature measurement. When using the tape, set the emissivity to  $\epsilon = 0.95$ . The tape is built with material resistant to heat up to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

### Notes regarding connections

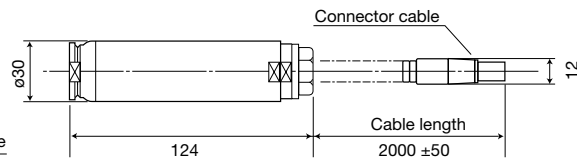
1. Use a power supply within the rated range, and pay careful attention to polarity.
2. For the meter and other products when connecting analog output for a voltage output type (BS-30TV/BS-05TV), use products with a power impedance of 100 kΩ or more.
3. When connecting analog output from a current output type (BS-30TA/BS-05TA) to a meter or other product, connect with a load resistance of 250 Ω 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

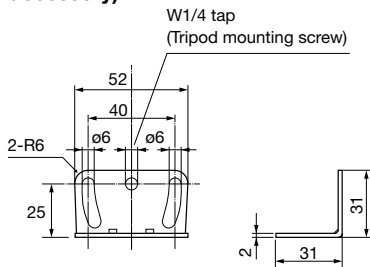
### ● Amplifier



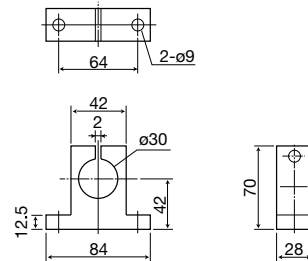
### ● Sensor head



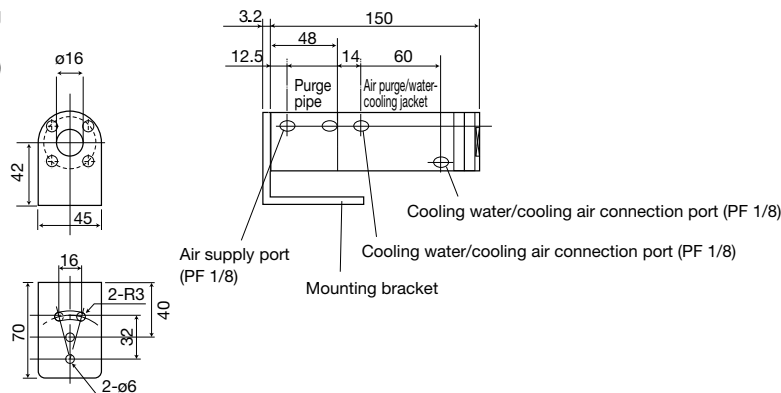
### ● Amplifier mounting bracket (Included accessory)



### ● 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.

### ■ Exporting

- CE Mark: All Optex FA non-contact thermometers are available with CE compatibility.

### ■ 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

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

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

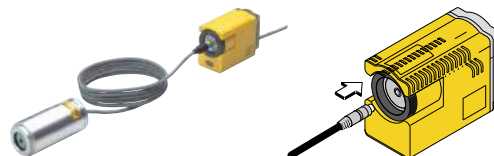
Emissivity  
teaching

8 m heat-resistant  
extension cable

## Features

### Sensor/amplifier separate type for flexible mounting

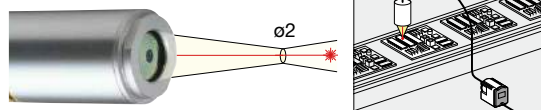
The sensor/amplifier separate design provides improved environmental resistance. The compact sensor features a stainless-steel body and a special steel structure for IP67-level waterproofing. A detachable connector cable is used between the sensor and the amplifier. This design reduces the effort needed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

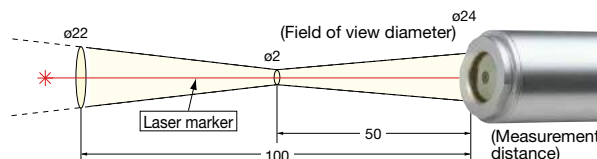
The amplifier of the BS series is equipped with a digital display. The digital display allows users to easily check various function settings and measurement values.



### 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  
[Type] BS sensor/amplifier separate type

### ● Amplifier unit

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



レーザー光  
ビームをのぞきとまないと  
最大出力1.0mW 波長630～650nm  
クラス2レーザー製品  
レーザー光が直接あるいは鏡面体で反射して  
目に入らないようご注意ください。

## 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 ( $\epsilon \approx 1.0$ )	$\pm 1\%$ or $\pm 2^\circ\text{C}$ (3.6°F) of reading, whichever is greater
Repeatability	$\pm 1^\circ\text{C}$ (1.8°F) of reading
Emissivity ( $\epsilon$ ) adjustment	0.10 to 1.20 (0.01 per step)
Sighting function	Coaxial laser marker (Class 2)
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 JIS C0911)
Degree of protection	IP67 (equivalent to Grade 7 in the JIS protection rating)
Weight	Approx. 400 g (including connector cable)
Material	Aluminum
Standard included accessories	Sensor head mounting bracket

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

### ■ Amplifier unit

Model	BS-A	BS-V
Analog output	4 to 20 mA	1 mV/°C
Analog output resolution	0.2°C (32.4°F)	
Analog display resolution	1°C (33.8°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 $\pm 10\%$ /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 JIS C0911)	
Degree of protection	IP65 (equivalent to Grade 5 in the JIS protection rating)	
Weight	Approx. 320 g (including cable)	
Material	Ring/housing: Glass-filled PBT, Rear / Cover: PC	
Standard included accessories	Amplifier mounting bracket $\times 1$ , amplifier mounting screw (M4) $\times 2$	

\*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.

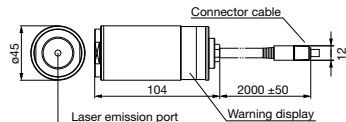
### Black tape for glossy objects HB-250



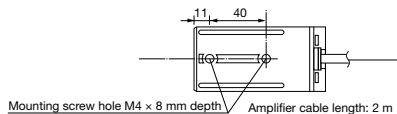
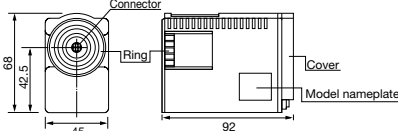
When attached to the surface of an object with unknown emissivity or a glossy object, this tape provides an emissivity of 0.95, enabling accurate non-contact temperature measurement. When using the tape, set the emissivity to  $\epsilon = 0.95$ . The tape is built with material resistant to heat up to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

## Dimensions

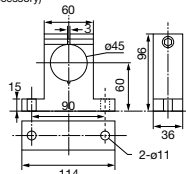
### ● Sensor head



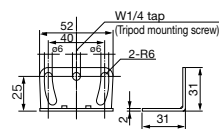
### ● Amplifier



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

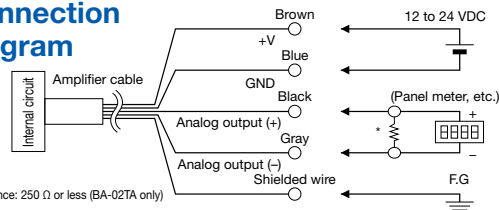


### ● Amplifier mounting bracket (Included accessory)



(Unit: mm)

## Connection diagram



\*Load resistance: 250  $\Omega$  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.

### ■ Laser beam

- This product uses a Class 2 laser that conforms to JIS C 6802. Use the product according to the affixed labels.



### ■ Exporting

- Laser warning labels: Product specifications may differ slightly depending on the laws and compliance standards of the export destination country. Contact us for details.
- CE Mark: All Optex FA non-contact thermometers are available with CE compatibility.

## 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