Stationary-type non-contact thermometer
All-in-one with analog output

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

THERMO-HUNTER®
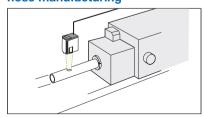# BA series

<4 to 20 mA output type>
BA-30TA-S/BA-06TA-S
<1 mV/°C output type>
BA-30TV-S/BA-06TV-S

Temperature control for painted surfaces of cars

Temperature control for rubber hose manufacturing

LASER RADIATION
DO NOT STARE INTO BEAM
MAXIMUM OUTPUT : 1mW
WAVE LENGTH : 670 nm
CLASS 2 LASER PRODUCT

| All in one | Coaxial laser marker | Digital display | Emissivity teaching | 2 types of analog output | IP65 |

Features

Compact body with integrated sensor and amplifier
Compact design with the integrate sensor and amplifier. This allows for restriction-free installation. This all-in-one type allows for measurement, output, display, and configuration.

First-in-class integrated digital display type
The BA series is the first thermometer in its class with integrated digital display. This product allows various functions to be configured on-site, and includes a display that makes checking temperatures easy. Changing settings can even be performed by a single person even while the line is running.

Built-in coaxial laser marker
The product includes a coaxial laser marker that points directly to the center of the field of view. This allows for more accurate positioning and easier installation.
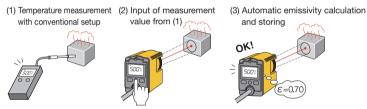
• The laser marker turns off automatically after about 20 seconds.

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.

(1) Temperature measurement with conventional setup
(2) Input of measurement value from (1)
(3) Automatic emissivity calculation and storing

OK!
ε=0.70

Spot measurements from a distance
The BA series of thermometers includes a long-range spot measurement type (BA-30 model) and a narrow-field measurement type (BA-06 model) to suit various measurement target size and measurement distance needs. Moreover, the coaxial laser marker enables accurate measurement of small targets at a distance.
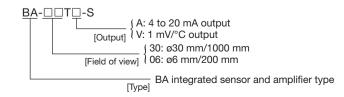
Two types of analog output • BA-30TA-S / BA-06TA-S, BA-30TV-S / BA-06TV-S only
The lineup includes a voltage output type that can be easily connected to a panel meter, and a current output type that is ideal for long-range transmissions. Users are able to select the desired type when selecting a model.

Built-in analog scaling function (4 to 20 mA analog type only)
Users are able to set the temperature range of the analog output as desired.

Type key

BA-☐☐T☐-S

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

[Field of view]
30: ø30 mm/1000 mm
06: ø6 mm/200 mm

[Type]
BA integrated sensor and amplifier type

Specifications

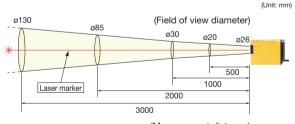| Model	BA-30TA-S	BA-30TV-S	BA-06TA-S	BA-06TV-S
Measurement range	0 to 500°C (32 to 932°F) (Display: −20 to 520°C (−4 to 968°F))			
Field of view	ø30 mm/1000 mm (Refer to field of view)		ø6 mm/200 mm (Refer to field of view)	
Optics	Silicone lens			
Sensing element/ spectral response	Thermopile/8 to 14 µm			
Response time	0.1 sec./90% response			
Accuracy[*1] (ε≈1.0)	(±2°C (3.6°F) or ±1% of reading value, whichever is greater) ±1 digit			
Repeatability	±1°C (1.8°F)			
Emissivity (ε) adjustment	0.10 to 1.20 (0.01 per step)			
Digital display resolution	1°C (1°F) (digital display on back of main unit)			
Analog output	4 to 20 mA, Scalable	1 mV/°C	4 to 20 mA, Scalable	1 mV/°C
Analog output resolution	0.2°C (0.36°F)			
Functions	Sighting function: Coaxial laser marker Class 2 (IEC / JIS / FDA[*2]) 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%/150 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	−10 to 60°C (14 to 140°F)			
Vibration resistance	3G (20 to 50 Hz, according to IEC 60068-2-6)			
Degree of protection	IP65			
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. 350 g (including cable)			
Material	Ring/housing: Glass-filled PBT, Rear: PSF, Cover: PC			
Standard included accessories	Main unit mounting bracket ×1, mounting screw (M4) ×2			

*1 The measurement accuracy in the specification is limited to the calibration conditions of our factory.
*2 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.
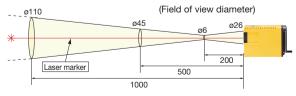
Field of view

● BA-30TA-S/BA-30TV-S

(Unit: mm)

(Field of view diameter)

ø130 ø85 ø30 ø20 ø26

Laser marker

500
1000
2000
3000

(Measurement distance)

● BA-06TA-S/BA-06TV-S

(Field of view diameter)

ø110 ø45 ø6 ø26

Laser marker

200
500
1000

(Measurement distance)

The laser marker points directly to the center of the field of view. The fields 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

Normal measurement
Emissivity TEACH settings
Emissivity manual settings
Response time settings
Up button
Down button
ENTER/LASER ON/OFF switch

Stationary-type non-contact thermometer
All-in-one with Photo MOS Relay

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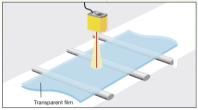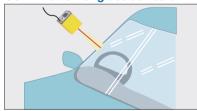## 0 to 500°C (32 to 932°F)

THERMO-HUNTER®
BA-TC series

<Photo MOS relay type>
BA-30TC
BA-06TC

Detection of transparent films

Transparent film

Confirmation of glass adhesion

CE

LASER RADIATION
DO NOT STARE INTO BEAM
MAXIMUM OUTPUT : 1mW
WAVE LENGTH : 670 nm
CLASS 2 LASER PRODUCT

All in one	Coaxial laser marker	Digital display	Emissivity teaching	Photo MOS relay	IP65

Features

Benefits of temperature-based detection
• Immune to the influence of colors of measured objects
• Measurement possible even if the target is vibrating
• Long-distance detection (30 mm diameter at a distance of 1000 mm)
• Detection even in severe environments

Photo MOS relay output
The photo MOS relay output function makes configuration of upper and lower limit settings possible.

Compact body with integrated sensor and amplifier
Compact design with the integrate sensor and amplifier. This allows for restriction-free installation. This all-in-one type allows for measurement, output, display, and configuration.

First-in-class integrated digital display
The BA series is the first thermometer in its class with integrated digital display. This product allows various functions to be configured on-site, and includes a display that makes checking temperatures easy. Changing settings can even be performed by a single person even while the line is running.

Built-in coaxial laser marker
The product includes a coaxial laser marker that points directly to the center of the field of view.
This allows for more accurate positioning and easier installation.
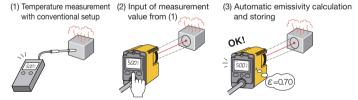• The laser marker turns off automatically after about 20 seconds.

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.
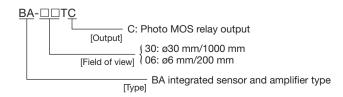This allows for drastic reductions in time spent on configuring settings.

(1) Temperature measurement with conventional setup
(2) Input of measurement value from (1)
(3) Automatic emissivity calculation and storing

Spot measurements from a distance
The BA-TC series of thermometers includes a long-range spot measurement type (BA-30 model) and a narrow-field measurement type (BA-06 model) to suit various measurement target size and measurement distance needs. Moreover, the coaxial laser marker enables accurate measurement of small targets at a distance.

Type key

BA-☐☐TC

C: Photo MOS relay output
[Output]
30: ø30 mm/1000 mm
06: ø6 mm/200 mm
[Field of view]
BA integrated sensor and amplifier type
[Type]

Specifications

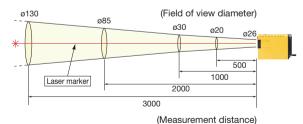| Model	BA-30TC	BA-06TC
Measurement range	0 to 500°C (32 to 932°F) (Display: −20 to 520°C (−4 to 968°F))	
Field of view	ø30 mm/1000 mm (Refer to field of view)	ø6 mm/200 mm (Refer to field of view)
Optics	Silicone lens	
Sensing element/ spectral response	Thermopile/8 to 14 μm	
Response time	0.5 sec./90% response	
Accuracy*1 (ε≈1.0)	(±2°C (3.6°F) or ±1% of reading value, whichever is greater) ±1 digit	
Repeatability	±1°C (1.8°F)	
Emissivity (ε) adjustment	0.10 to 1.20 (0.01 per step)	
Digital display resolution	1°C (1°F) (digital display on back of main unit)	
Relay output	Photo MOS, 350 mA/100 VDC or less (1 output)	
Output update time	50 ms	
Functions	Sighting function: Coaxial laser marker Class 2 (IEC / JIS / FDA*2) 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%/150 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	−10 to 60°C (14 to 140°F)	
Vibration resistance	3G (20 to 50 Hz, according to IEC 60068-2-6)	
Degree of protection	IP65	
Applicable regulations — EMC	EMC Directive (2014 / 30 / EU)	
Applicable regulations — Environment	RoHS Directive (2011 / 65 / EU), China RoHS (MIIT Order No.32)	
Applicable regulations — 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. 360 g (including cable)	
Material	Ring/housing: Glass-filled PBT, Rear: PSF, Cover: PC	
Standard included accessories	Main unit mounting bracket ×1, mounting screw (M4) ×2	

*1 The measurement accuracy in the specification is limited to the calibration conditions of our factory.
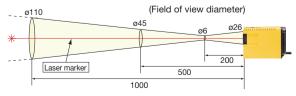*2 This product is classified as Class 2 by IEC 60825-1: 2007 according to Laser Notice No.50, FDA Guidance Document.
• Note that specifications are subject to change without prior notice for product improvement purposes.

Field of view

● **BA-30TC**

(Unit: mm)

(Field of view diameter)

ø130 ø85 ø30 ø20 ø26

Laser marker

500
1000
2000
3000

(Measurement distance)

● **BA-06TC**

(Field of view diameter)

ø110 ø45 ø6 ø26

Laser marker

200
500
1000

(Measurement distance)

The laser marker points directly to the center of the field of view. The fields 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.
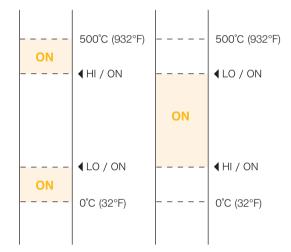
Output settings

HI/ON: Output turns on when the measurement is equal to or greater than the setting.
LO/ON: Output turns on when the measurement is equal to or greater than the setting.

1. Align the menu bar to the HI/ON or LO/ON position, and then press the ENTER button.
2. Press the △ or ▽ button to change the setting, and then press the ENTER button to register the setting.
3. Press the △ or ▽ button to set ON (enabled) or OFF (disabled), and then press the ENTER button.

When setting to ON, output will be turned on when the ENTER button is pressed.

• During output, the ENTER button will illuminate at the same time the laser is irradiated. When the HI setting is smaller than the LO setting, output will turn on only between HI and LO.

500°C (932°F)
ON
◀ HI / ON
◀ LO / ON
ON
0°C (32°F)

500°C (932°F)
◀ LO / ON
ON
◀ HI / ON
0°C (32°F)

Operating panel

LO/ON (– LO output)
HI/ON (– HI output)
Normal measurement

500°C

Emissivity TEACH settings
Emissivity manual settings
Response time settings

Up button

Down button

ENTER/LASER ON/OFF switch

Options/Accessories

Air purge collar
BA-AP1

Blowing air on the surface of the lens helps prevent the adherence of dust and dirt.

● Specifications

Air pressure	0.2 Mpa (2 kgf/cm²) or less (limited to instrumentation air)
Air flow rate	50 to 150 Nl/min.
Ambient temperature	0 to 50°C (32 to 122°F)
Operating air temperature	0 to 50°C (32 to 122°F)
Port size	G (PF) 1/8
Weight	Approx. 90 g
Material	Aluminum

● Piping example

Speed controller | Regulator | Mist separator | Air filter | Air source

Air intake

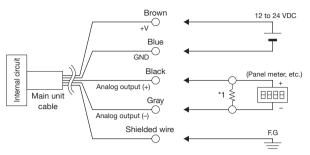Black tape for glossy objects

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).
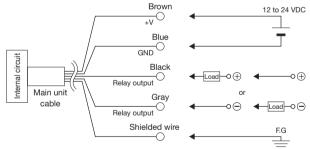Total area: 60 mm × 2000 mm

Connection diagram

BA-30TA-S/TV-S, BA-06TA-S/TV-S

Internal circuit — Main unit cable

Brown — +V
Blue — GND
Black — Analog output (+)
Gray — Analog output (–)
Shielded wire

12 to 24 VDC

(Panel meter, etc.)
*1

F.G

Notes regarding connections

1. GND and analog output (–) are connected internally. Be careful not to cause a short-circuit by applying voltage mistakenly.
2. For the meter and other products when connecting the analog output, use products with a power impedance of 100 kΩ or more. (BA-30TV-S/BA-06TV-S only)
3. When connecting analog output from a current output type (BA-30TA-S/BA-06TA-S) 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 to any other output lines.
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.
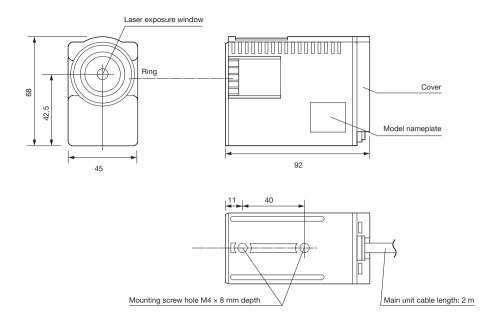
BA-30TC, BA-06TC

Internal circuit — Main unit cable

Brown — +V
Blue — GND
Black — Relay output
Gray — Relay output
Shielded wire

12 to 24 VDC

Load — ⊕   or   ⊕ — Load
Load — ⊖   ⊖ — Load

F.G

Notes regarding connections

1. Use a power supply within the rated voltage range, and pay careful attention to polarity.
2. Do not short-circuit the relay output to any other output lines.
3. The relay output uses a photo MOS relay, so it is insulated from the circuit. The ON resistance is 2.5 Ω or less.
4. For use in environments with strong EMI noise, countermeasures such as passing the output cord through an iron pipe are necessary.
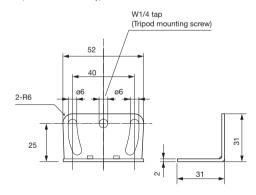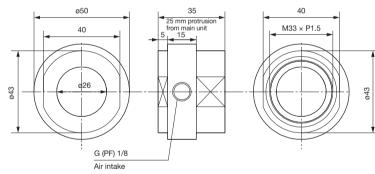
Dimensions

● Main unit

Laser exposure window

Ring

Cover

Model nameplate

68
42.5
45
92

11
40

Mounting screw hole M4 × 8 mm depth

Main unit cable length: 2 m

● Main unit mounting bracket
(Included accessory)

W1/4 tap
(Tripod mounting screw)

52
40
ø6   ø6
2-R6
25
31
2
31

● Air purge collar
BA-AP1 (optional accessory)

ø50
40
ø43
ø26

35
25 mm protrusion
from main unit
5 15

40
M33 × P1.5
ø43

G (PF) 1/8
Air intake

(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.

■ 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.

LASER RADIATION
DO NOT STARE INTO BEAM
MAXIMUM OUTPUT : 1mW
WAVE LENGTH : 670 nm
CLASS 2 LASER PRODUCT

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 comply with the 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