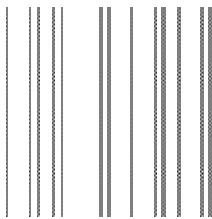


**CHINO**

**IR-BAT□□ series  
COMPACT INFRARED  
RADIATION THERMOMETER**

**Model:IR-BAT1A, IR-BAT1B, IR-BAT2A  
IR-BATSA, IR-BATSB  
IR-BAT1M, IR-BAT1P, IR-BAT2M  
IR-BATSM, IR-BATSP**

 **INSTRUCTIONS**

■ **PREFACE/ Request and notices**

Thank you for your purchase of IR-BAT□□ series Compact infrared radiation thermometer.

Please read this instruction manual for using this thermometer correctly, safely and also preventing troubles in advance.

**CE** marking

EMC directive.

EN61326 - 1 Class A

**Request to designers, instrument controllers, and sale agents**

Make sure to deliver this instruction manual to the operator of this thermometer

**Request to the operator of this instrument**

This instruction manual is necessary for maintenance, too.

Keep this manual with due care until this thermometer is discarded.

**NOTE**

- 1.The descriptions of this manual are subject to change without notice.
- 2.If a question has arisen or if an omission was found in this manual, please contact your nearest CHINO's sales agent.
- 3.We are not responsible for any results by operation of this thermometer.


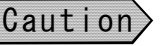


**CHINO**

<b>◆ FOR SAFE USE</b>
-----------------------

For the purpose of using this thermometer safely, observe the following cautions for safety during the operation, maintenance, and repair of this thermometer.

Take safety measures separately against wrong operation, troubles, and other circumstances of this thermometer if necessary.

•This instruction manual uses the following symbol marks for safe.

	Observe this caution item strictly for avoiding a danger, otherwise negligence of this caution may cause an electric shock accident or other accidents resulting in operator's death or injuries.
	Observe this caution item strictly, otherwise negligence of this caution may cause the damage of this thermometer or measuring errors.
	This mark is attached to each title covering <b>Warning</b> instructions
	This mark shows the act of the prohibition.

•CAUTIONS FOR SAFETY

Item	Cautions
Power supply	Make sure that the voltage of the power source meets the rated power supply of this thermometer before operation.
Prohibition of use in a gaseous atmosphere	Never operate this thermometer at a place where a combustible gas, an explosive gas or their vapors exist, otherwise a very dangerous accident will occur. It is extremely dangerous to use this thermometer under such environments.
Never touch the interior	To prevent from trouble, don't touch the inside of this thermometer by hand.
Caution on external connections	For connection to external equipment, make sure to turn off the power supply and also read instruction manual for the equipments.
Prohibition disassembling and modification	Don't disassemble nor modify this thermometer. If you disassemble or modify this thermometer, it will be dangerous to causing the trouble.
Cautions on maintenance and check of the lens	When wiping out the dirt of the lens, don't use organics solvents except an alcohol, water and the detergents absolutely. If used, it will cause the trouble.

**1. Models and main specifications**

(\*Response time: 95%)

Type	Model	Measuring range	Response time (*)	Diameter/Distance	Measuring wavelength	
General	General type	IR-BAT1A	0 to 300 °C	100ms	Ø40/500mm	8 to 14 µm
		IR-BAT1B	0 to 600 °C			
	Small diameter, short distance	IR-BAT2A	0 to 300 °C	100ms	Ø5/80mm	
	Small diameter, long distance	IR-BATSA	0 to 300 °C	100ms	Ø40/1000mm	
IR-BATSB		0 to 600 °C				

Type	Model	Measuring range	Response time (*)	Measuring diameter	Measuring wavelength	
High speed	General type	IR-BAT1M	0 to 300 °C	50ms	Ø40/500mm	8 to 14 µm
		IR-BAT1P	0 to 600 °C			
	Small diameter, short distance	IR-BAT2M	0 to 300 °C	50ms	Ø5/80mm	
	Small diameter, long distance	IR-BATSM	0 to 300 °C	50ms	Ø40/1000mm	
IR-BATSP		0 to 600 °C				

## 2. General

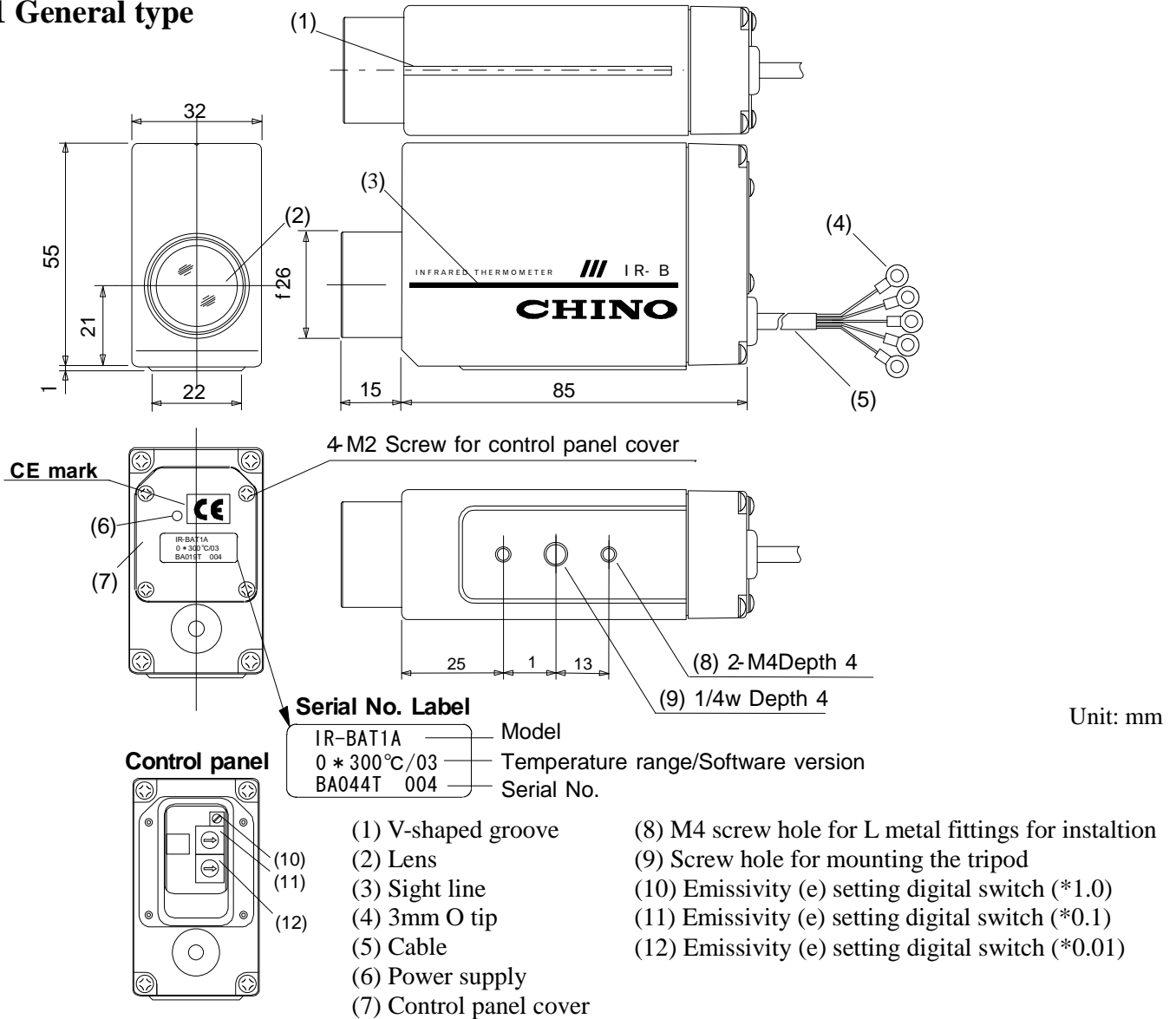
This infrared radiation thermometer measures temperature quickly without contact and can be used as a FA sensor and a temperature switch. The converting functions are built-in. Read the pertinent chapter well concerning use.

### Conditions for CE conformance:

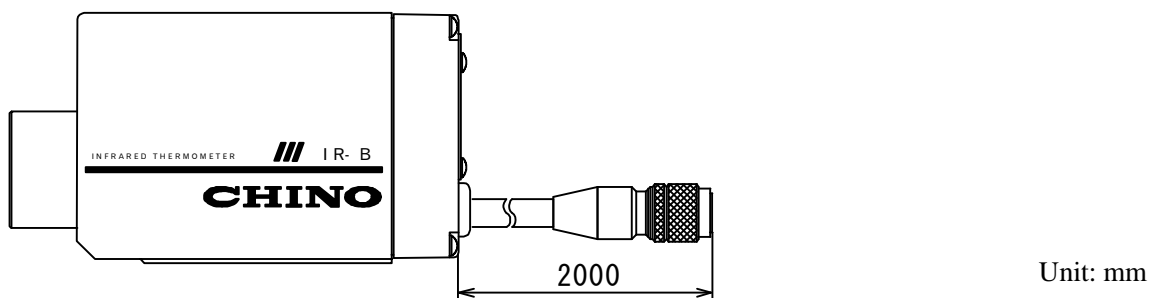
One (1) set of the thermometer should be used with the connection cable (up to 30m) connected to one (1) set of DC power source unit, and all of these should be used in doors.

## 3. Each part name and outside dimensions

### 3.1 General type



### 3.2 Extension cable type: Figure of extension cable



## 4. Installation

Refer to [ 3. Each part name and outside dimensions]

### 4.1 Cautions on installation

For installation, use holes indicated by (9) or (10).

#### Caution

Avoid installation in the following places.

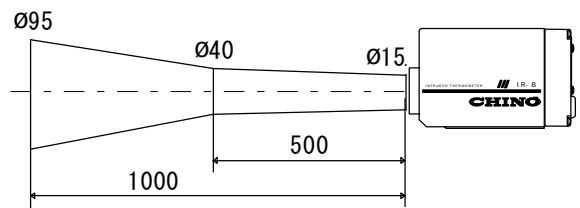
- Places receiving vibration or impact
- Places where the ambient temperature is not 0 to 50°C
- Places having noises
- Places where dusts, fine particles and other materials are surrounding
- Places where this thermometer and the measurement objects receive heat radiation by flames, sunlight and other sources
- Places where there is dangerous gas such as combustible gas and explosion gas

### 4.2 Measuring distance and measuring diameter

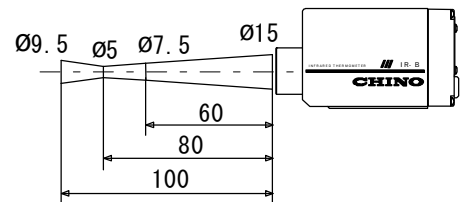
#### Caution

Place this thermometer at the distance where the diameter of the measurement object is more than 1.5 times of the measurement diameter calculated by the following relation.

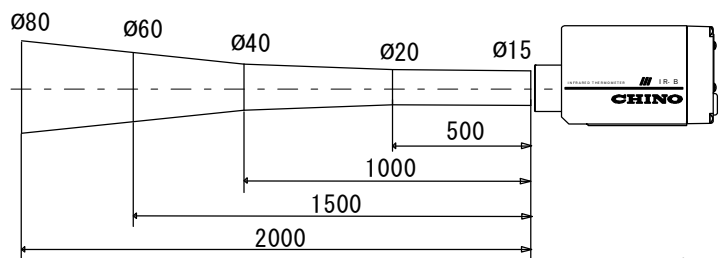
- IR-BAT1A, IR-BAT1B  
(General: General type)
- IR-BAT1M, IR-BAT1P  
(High speed: General type)



- IR-BAT2A  
(General: Small diameter, short distance)
- IR-BAT2M  
(High speed small diameter, short distance)



- IR-BATSA, IR-BATSB  
(General: Small diameter, long distance)
- IR-BATSM, IR-BATSP  
(High speed small diameter, long distance)



Unit: mm

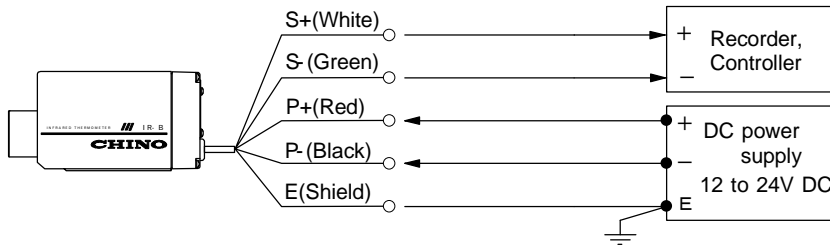
### 4.3 Targeting

Target this thermometer to the measurement object by utilizing a (1)V-shaped groove on the upper side panel and a (3)Sight line on the side panel.

#### Reference

When the temperature of the measurement object is higher than the ambient temperature, change the direction of this thermometer slightly to the direction having the maximum output. On this direction, you will have the accurate measurement.

## 5. Connection



Marker	Cable color	Item	Remarks
S+	White	Analog output (+)	4 to 20mA DC Load resistance Less than 280Ω
S-	Green	Analog output (-)	
P+	Red	Power supply (+)	12 to 24V DC (±10%) 60mA
P-	Black	Power supply (-)	
E	Clear (Shield)	Ground (E)	Ground

**Warning** For connection work, make sure to turn off the power supply for preventing an electric shock accident.

**Caution** Supply voltage: 12 to 24V DC (±10%), 60mA.  
Don't short each lead wires. Lead wires not using should be taped or cut off.

**Reference** Lead wires not using should be taped or cut off.  
For connection with Model IR-GBHA1 (Indicator with power supply), and IR-GC1(Indicator with power supply) and Model IR-GBG2(Converter with reflection compensation), refer to the instruction manual for each model.

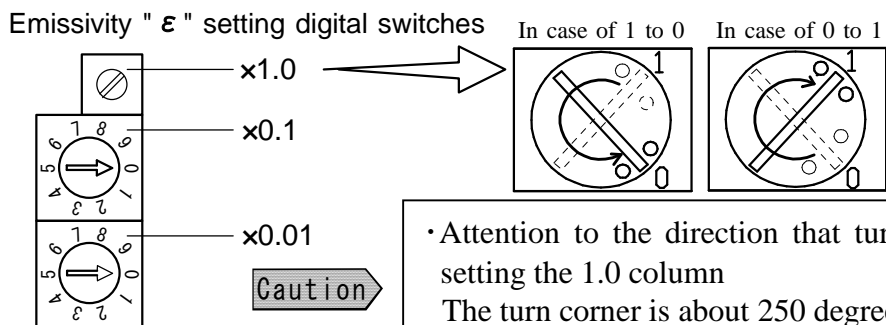
## 6. Operation

- Turn on the power supply after making sure all connections are adequate.  
(6) Power supply indicator lamp is lighted.
- Remove the (7) Control panel cover for the control panel and adjust (11),(12),(13) Emissivity ("ε") setting digital switches so that the analog output matches the temperature of the measurement object.

**Caution**

- If the temperature of the measurement object is unknown, measure it with a thermocouple and adjust Emissivity ("ε") setting digital switches.
- Adjustments may not be possible in the following cases:
  - When the reflectance ratio of the measurement object is high like as a metal gloss surface.
  - When there is a strong heat source near the measurement object.

**Reference** For measuring temperature with the infrared radiation thermometer, it is necessary to set the emissivity in accordance with the measurement object for accurate readings. Emissivity varies depending on the material and surface condition of the measurement object, and you need to set the emissivity in accordance with the measurement object.



**Caution**

- Attention to the direction that turns it, in case of setting the 1.0 column
- The turn corner is about 250 degree
- Attention not to turn too much, in case of using the driver of accessory

## 7. Check and maintenance

- 1) Regularly check the (2) Lens for dust or dirt. If dirt is present, remove it with a blower for camera lenses. If the dirt cannot be removed with the blower, wipe the lens gently with cotton ball soaked in alcohol.

**Caution**

When wiping out the dirt of the lens, don't use organic solvents except alcohol, water and detergent absolutely. If used, it will cause the trouble.

- 2) Check if the thermometer targets the measurement object.
- 3) Check if the "lead wires" is connected tight.

## 8. Trouble shooting

Please refer the table below if a trouble happens.

If this thermometer still does not work properly, contact CHINO's agent.

Problems	Cause	Solutions
<b>Power supply lamp does not light.</b>	<ol style="list-style-type: none"> <li>1) Power is not supplied.</li> <li>2) Power voltage is low.</li> </ol>	<ol style="list-style-type: none"> <li>1) Check the connection of lead wires.</li> <li>2) Check the power voltage.</li> </ol>
<b>Measured value is incorrect.</b>	<ol style="list-style-type: none"> <li>1) Loosen connections of lead wires</li> <li>2) Noises affect measurement.</li> <li>3) Emissivity (“ε”) setting digital switch is incorrect.</li> <li>4) A heat source affects measurement</li> <li>5) The lens is dirty.</li> <li>6) Un adequate target.</li> </ol>	<ol style="list-style-type: none"> <li>1) Tighten any loosen connections of lead wires.</li> <li>2) Move this thermometer from noise sources.</li> <li>3) Set “Emissivity” correctly.</li> <li>4) Insulate the measured object from the heat sources.</li> <li>5) Remove the dirt from the lens.</li> <li>6) Adjust the target.</li> </ol>

## 9. Cautions

### 9.1 Setting

**Caution**

- 1) Install this thermometer at places where the ambient temperature is 0 to 50°C.
- 2) Avoid to sets this thermometer at places where there are dust or other airborne particles.
- 3) Avoid to sets this thermometer at places with vibration or impact.
- 4) Avoid to sets this thermometer at places where there is dangerous gas such as combustible explosion gas.

### 9.2 Connection

**Caution**

Don't wire 3)-(5) cable near a noise occurrence source, relay drive lines or high frequency lines. Avoid to bunch these lines with lines having noise or place them in the same duct which the lines having noise are placed.

### 9.3 Power supply

**Caution**

- 1) If the line voltage fluctuates over the range of ±10 % of the rated voltage, you will have malfunction or trouble.
- 2) Avoid the use of the power source in which the spike -shape noise occurs when it is turned on or off.

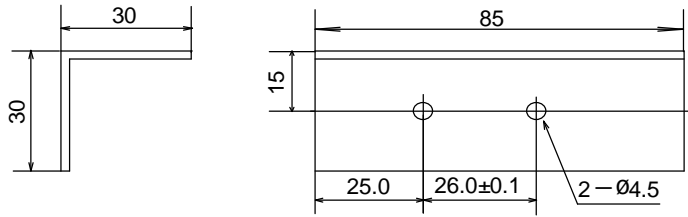
### 9.4 Warm up

**Caution**

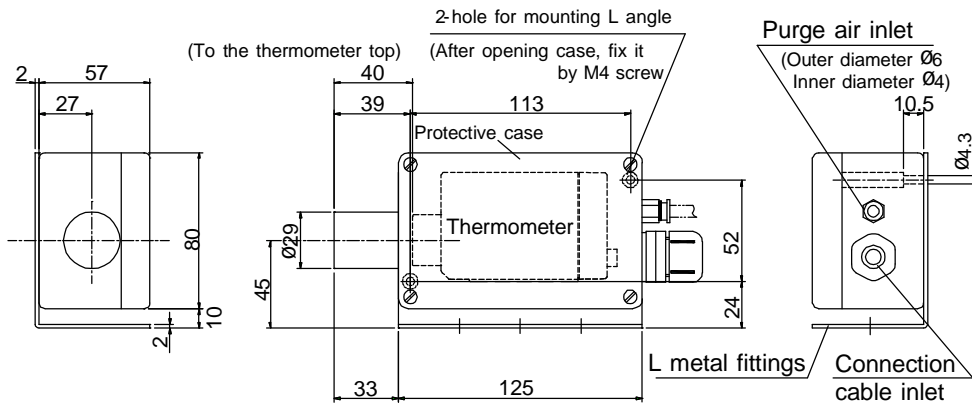
This thermometer works immediately when the power supply is turned on, but it is necessary to warm up this thermometer for about 30 minutes to have the accurate measurement.

**10. Accessories**

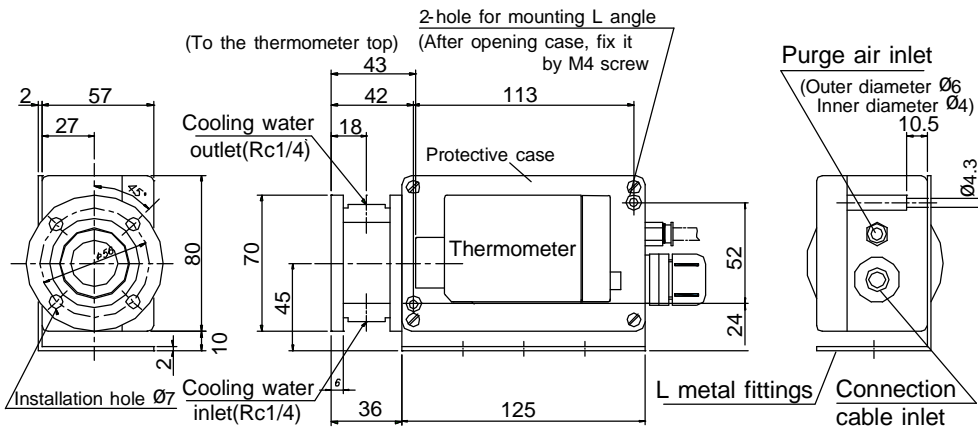
•L metal fittings **IR-ZBML**



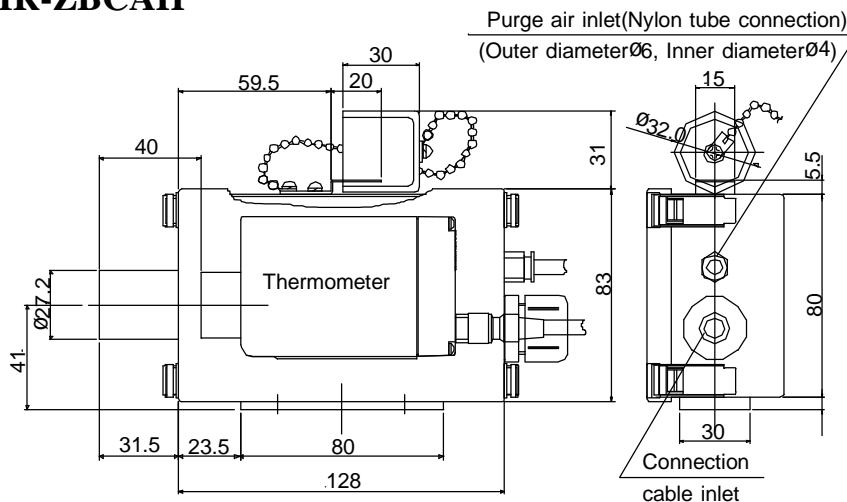
•Protective case **IR-ZBCSH (With L metal fittings)**



•Protective case with water cooling **IR-ZBCWH (With L metal fittings)**



•Sanitary case **IR-ZBCAH**



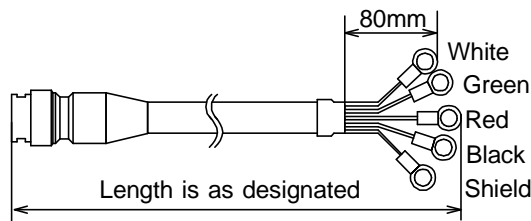
# 11. Specifications

**Notice:** For the measuring ranges, the response time, the measuring diameter/ distance, and the measuring wave length of each model, refer to [1. Models and main specifications].

Common specifications	
Measurement system	Wide-band infrared radiation thermometer
Detector element	Thermopile
Measuring wavelength	8 to 14 $\mu$ m
Accuracy rating	Less than 300°C: $\pm 3$ °C More than 300°C: $\pm 1.0\%$ of a measured value (at $\epsilon=1.0$ , 23 °C $\pm 5$ °C, 35 to 75% RH)
Optical system	Ge lens
Emissivity correction	$\epsilon=1.99$ to 0.10 (digital switch)
Analog output	4 to 20 mA DC (load resistance:less than 280 $\Omega$ )
Operating temperature range	0 to 50 °C
Power supply voltage	12 to 24V DC( $\pm 10\%$ )
Current	Less than 60mA
Connecting cable length	Standard 2m (up to 30m), Out of CE Marking: Max 200m
Extension cable type	2000mm (IR-ZBRA□□□: Max length is 200m): Out of CE Marking
Case	Aluminum die-cast
Waterproof	JIS C-0920, Water-drop protection II type, IP-X2
Mounting method	By 2 M4 screws or on tripod
Weight	About 220g
CE	EN61326-1 Class A
Conditions for CE conformance	1. The connection cable should be used indoors and its length should be up to 30m. 2. One (1) set of DC power source unit should be individually connected to on (1) set of the thermometer.

Specification by models	IR-BAT1A, IR-BAT2A, IR-BATSA IR-BAT1M, IR-BAT2M, IR-BATSM	IR-BAT1B, IR-BATSB, IR-BAT1P, IR-BATSP
Measuring range	0 to 300 °C	0 to 600 °C
Resolution	0.2 °C (JIS standard)	0.5°C (JIS standard)
Stability	$\pm 10$ °C (Under EMC test environment)	
Repeatability	$\pm 0.2$ °C	$\pm 0.3$ °C

**[External dimensions of IR-ZBRA□□□]**



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