Infrared Thermosensor
ES1B

CSM_ES1B_DS_E_3_2

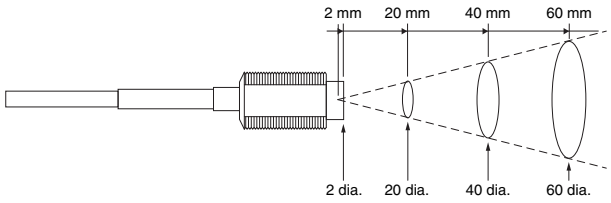
Achieve Low-cost Measurements with an Infrared Thermosensor.

- The ES1B has an electromotive output as high as that of a thermocouple, thus connecting directly to the thermocouple input terminal of the Temperature Controller is possible.
- Four temperature ranges are available to cover a wide range of temperature measurement needs, including those in the food processing, packaging, molding, and electronics industries.
- High-accuracy temperature measurement is ensured by a high-speed response of 300 ms (for a 63% response) and an indication reproducibility of ±1% PV.
- Unlike thermocouples, the Thermosensor does not deteriorate. Therefore, stable, real-time temperature control can be maintained.

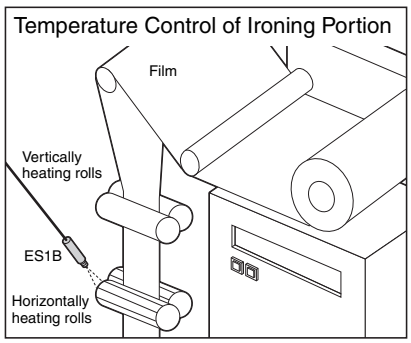
⚠ Refer to *Safety Precautions for All Temperature Controllers.*

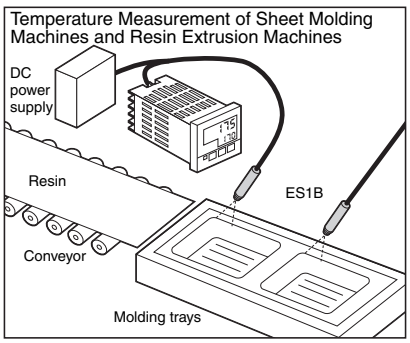
Ordering Information

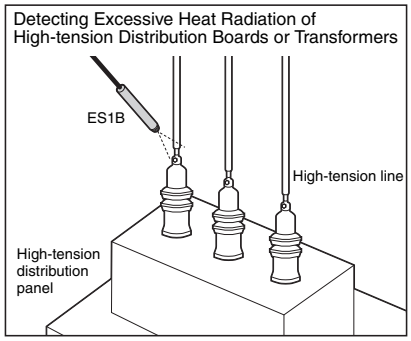
■ List of Models

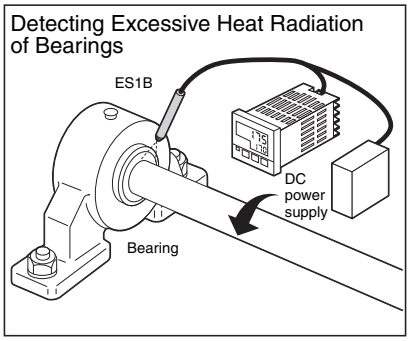
Appearance and sensing characteristic	Specification (temperature range)	Model
	10 to 70°C	ES1B
	60 to 120°C	
	115 to 165°C	
	140 to 260°C	

Application Examples



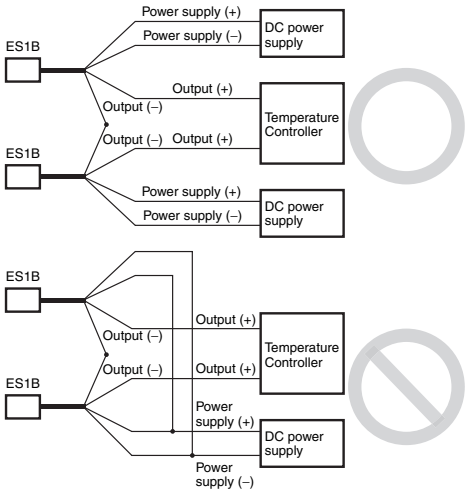






Note: 1. Either a 12 VDC or 24 VDC power supply is required for the ES1B.

2. To measure the difference in temperature between two points, use two isolated power supplies.



Do not use the Infrared Thermosensor in locations where the ambient temperature changes rapidly. To use the Infrared Thermosensor in locations subject to rapid changes in temperature due to radiant heat or movement of hot air, use a heat shield or other method to reduce rapid changes in temperature as much as possible.

Specifications

■ Ratings/Characteristics

Item		ES1B
Power supply voltage		12/24 VDC
Operating voltage range		90% to 110% of the power supply voltage
Current consumption		20 mA max.
Measuring temperature range		10 to 70°C, 60 to 120°C, 115 to 165°C, 140 to 260°C
Accuracy (See note 1.)	**±5°C (See note 2.)**	±2% PV or ±2°C, whichever is larger
	±10°C (See note 2.)	±4% PV or ±4°C, whichever is larger
	±30°C (See note 2.)	±6% PV or ±6°C, whichever is larger
	±40°C (See note 2.)	±8% PV or ±8°C, whichever is larger
Reproducibility		±1% PV or ±1°C, whichever is larger
Temperature drift		0.4°C/°C max.
Sensing distance vs. sensing diameter		1:1 typ.
Measurement wavelength		6.5 to 14.0 μm
Receiver element		Thermopile
Response speed		Approximately 300 ms at response rate of 63%
Output impedance		1 to 4 kΩ
Operating temperature		–25°C to 70°C (with no icing or condensation)
Allowable ambient humidity		35% to 85%
Vibration resistance (destruction)		98 m/s^2 for 2 hours each in X, Y, and Z directions at 10 to 55 Hz
Shock resistance (destruction)		300 m/s^2 for 3 times each in X, Y, and Z directions
Casing material		ABS resin
Degree of protection		IP65
Applicable safety standards		CE Marking
Weight		Approx. 120 g
Cable		Compensating conductor: 3 m
		PVC-covered cable with a shield wire resisting 70°C

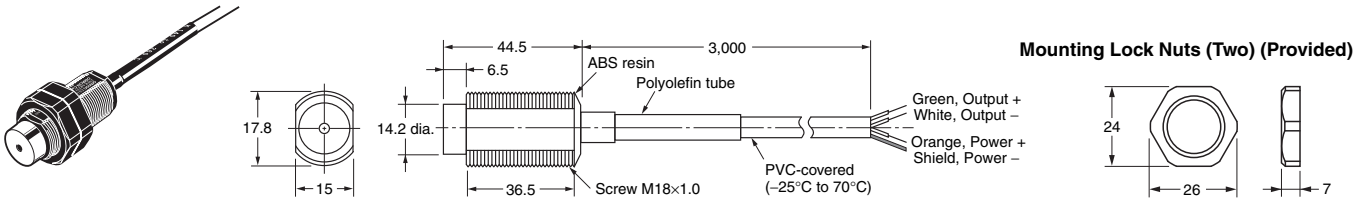
Note: 1. Based on characteristics of K-type thermocouple and radiation rate of 0.98.

2. The accuracy is given as the change in temperature from any reference temperature of the sensing object. For example, if the reference temperature is 50°C, the accuracy at 55°C would be ±2% PV or ±2°C, whichever is larger and the accuracy at 60°C would be ±4% PV or ±4°C, whichever is larger.

Dimensions

Note: All units are in millimeters unless otherwise indicated.

ES1B

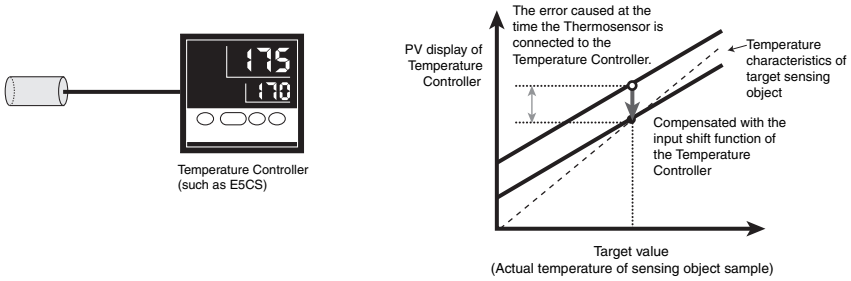


Adjustment Methods

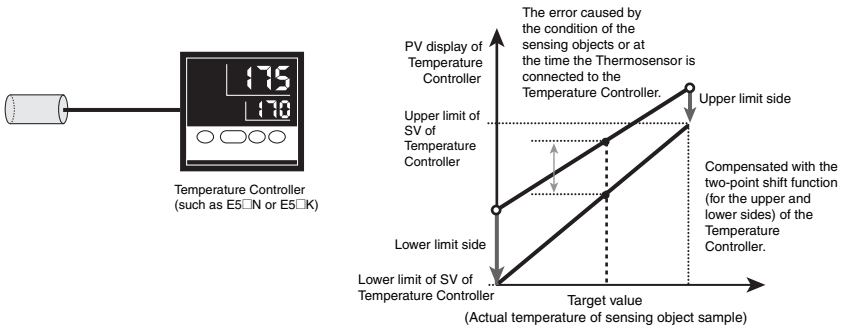
Adjust the Thermosensor as described below before using it.

Adjust the Thermosensor according to the conditions of the sensing object and characteristics of the Temperature Controller.

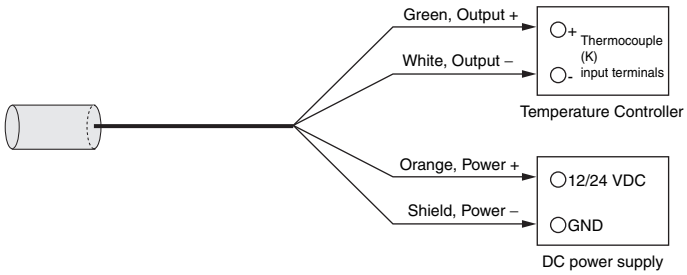
Offset Compensation for Target Value with Input Shift Function



Gain and Offset Compensation with Two-point Shift Function



Connections



Safety Precautions

Refer to the *ES1B Infrared Thermosensor datasheet* (Cat. No. H127) for application precautions.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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