

## **SECTION 3**

### **Specifications**

This section provides the ratings, field-of-view characteristics, and accuracy of the ES1A.

3-1	Ratings .....
3-2	Field-of-vision .....
3-3	Accuracy .....

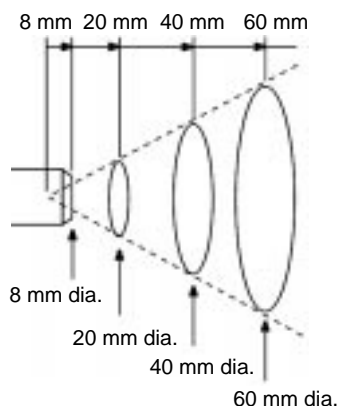
## 3-1 Ratings

Item		ES1A-A	ES1A-B	ES1A-C
Temperature range		10°C to 70°C, 60°C to 120°C, 115°C to 165°C	10°C to 70°C, 60°C to 120°C, 115°C to 165°C, 160°C to 260°C	
Precision (Based on characteristics of K-type thermocouple and radiation rate of 0.9)	Temperature change from reference temperature of sensing objects ±5°C ±10°C ±30°C ±40°C	±2% PV or ±2°C, whichever is larger. ±4% PV or ±4°C, whichever is larger. ±6% PV or ±6°C, whichever is larger. ±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.		2:1 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		3 to 10 kΩ
Ambient operating temperature		−25°C to 70°C (with no icing or condensation)	10°C to 70°C, 60°C to 120°C models: −25°C to 85°C 115°C to 165°C, 160°C to 260°C models: −25°C to 100°C ----- With no icing or condensation	At 120°C max. in air purge operation and 250°C max. with the Cooling Jacket used, provided that there is no icing or condensation
Ambient humidity		Operating: 35% to 85%		
Vibration resistance		100 m/s <sup>2</sup> for 2 hours each in X, Y, and Z directions at 10 to 55 Hz		
Shock resistance		300 m/s <sup>2</sup> for 3 times each in X, Y, and Z directions.		
Casing material		Hard ABS resin	SUS303	
Degree of protection		IP65		IP60
Weight		55 g	65 g	70 g
Cable		Compensating conductor: 3 m	Thermocouple cable: 3 m	
		PVC-covered cable resisting 70°C.	Teflon-covered cable with a shielded wire resisting 180°C.	

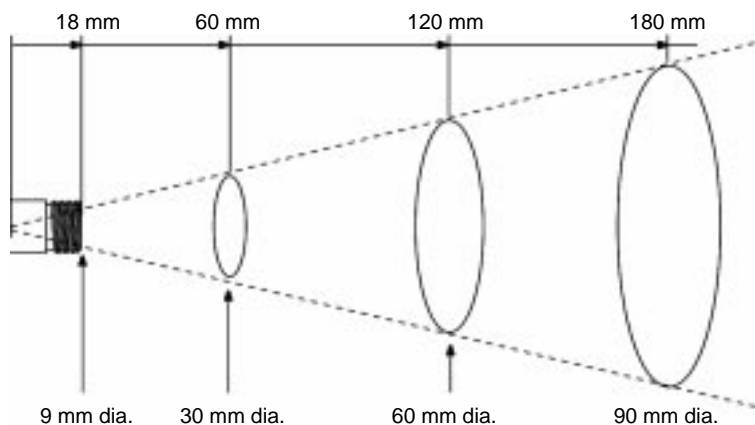
## 3-2 Field-of-vision

Each of the following field-of-vision spots detects 50% of energy emitted from the sensing object. The actual sensing object must be 1.5 times larger than the spot.

**ES1A-A, ES1A-B**



**ES1A-C**



## 3-3 Accuracy

The accuracy of the ES1A is expressed by the fluctuation (D) of the ES1A's output voltage based on the characteristic (C) of the K-type thermocouple, provided that the fluctuation (D) is caused by the temperature (B) deviation of the reference temperature (A). The reference temperature (A) is obtained after compensating the PV error that results when the ES1A is connected to the Temperature Controller.

