

## SPECIFICATIONS

### Sensor heads

Item	Type	Cylindrical type				Spatter-resistant type
	Model No.	<b>GH-2SE</b>	<b>GH-3SE</b>	<b>GH-5SE</b>	<b>GH-8SE</b>	<b>GH-F8SE</b>
Applicable amplifier		<b>GA-311</b>				
Stable sensing range (Note 1)		0 to 0.6 mm <b>0 to 0.024 in</b>	0 to 0.8 mm <b>0 to 0.031 in</b>	0 to 1.0 mm <b>0 to 0.039 in</b>	0 to 2.0 mm <b>0 to 0.079 in</b>	
Max. operation distance (Note 1)		1.2 mm <b>0.047 in</b>	1.8 mm <b>0.071 in</b>	2.4 mm <b>0.094 in</b>	4.0 mm <b>0.157 in</b>	
Standard sensing object		Iron sheet 5 × 5 × t 1 mm <b>0.197 × 0.197 × t 0.039 in</b>			Iron sheet 10 × 10 × t 1 mm <b>0.394 × 0.394 × t 0.039 in</b>	
Hysteresis (Note 2)		0.07 mm <b>0.003 in</b> or less	0.05 mm <b>0.002 in</b> or less		0.04 mm <b>0.002 in</b> or less	
Repeatability (Note 2)		Along sensing axis, perpendicular to sensing axis: 1 μm <b>0.039 mil</b> or less				
Environmental resistance	Protection	IP50 (IEC)	IP67 (IEC), IP67g (JEM)			
	Ambient temperature	− 10 to + 60 °C <b>14 to + 140 °F</b> , Storage: − 20 to + 70 °C <b>− 4 to + 158 °F</b>				
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH				
	Vibration resistance	10 to 55 Hz frequency, 1.5 mm <b>0.059 in</b> amplitude in X, Y and Z directions for two hours each				
	Shock resistance	500 m/s <sup>2</sup> acceleration (50 G approx.) in X, Y and Z directions for five times each				
Temperature characteristics (Note 3)		Within ± 7 %	Within ± 5 %	Within ± 4 %		
Material		Enclosure: Stainless steel (SUS303) Sensing part: PVC	Enclosure: Stainless steel (SUS303) Sensing part: ABS	Enclosure: Stainless steel (SUS303) Sensing part: PAR	Enclosure: Stainless steel (SUS303) Sensing part: ABS	Enclosure: Stainless steel (SUS303) Sensing part: Fluorine resin
Cable (Note 4)		Oil-resistant [Spatter-resistant type: Spatter-resistant cable (Sheath: Fluorine resin)] high-frequency coaxial cable, 3 m <b>9.843 ft</b> long, with a connector at the end				
Weight		Net weight: 15 g approx., Gross weight: 30 g approx.	Net weight: 35 g approx., Gross weight: 45 g approx.		Net weight: 40 g approx., Gross weight: 55 g approx.	Net weight: 55 g approx., Gross weight: 70 g approx.

- Notes: 1) The stable sensing range represents the sensing range for which the sensor can satisfy all the given specifications with the standard sensing object. The maximum operation distance represents the maximum distance for which the sensor can detect the standard sensing object at + 20 °C **+ 68 °F** constant ambient temperature. Usage within the stable sensing range is recommended for accurate sensing applications.
- 2) Value is given for the stable sensing range.
- 3) The value represents the variation in the operation distance, that has been set within the stable sensing range at + 20 °C **+ 68 °F**, for an ambient temperature drift from 0 to + 55 °C **+ 32 to + 131 °F**. (Values are for sensor head only.)
- 4) The length of the sensor head cable cannot be changed.

### Amplifier

Item	Model No.	<b>GA-311</b>
Applicable sensor head		<b>GH-□SE</b>
Supply voltage		12 to 24 V DC ± 10 % Ripple P-P 10 % or less
Current consumption		25 mA or less
Output		NPN open-collector transistor <ul style="list-style-type: none"> <li>• Maximum sink current: 100 mA (50 mA, if five, or more, amplifiers are connected in cascade.)</li> <li>• Applied voltage: 30 V DC or less (between sensing output and 0 V)</li> <li>• Residual voltage: 1 V or less [at 100 mA (at 50 mA, if five, or more, amplifiers are connected in cascade) sink current.]</li> </ul>
	Output operation	Switchable either Normally open or Normally closed
	Short-circuit protection	Incorporated
Max. response frequency		3.3 kHz
Operation indicator		Orange LED (lights up when the output is ON)
Disconnection alarm indicator		Red LED (lights up when the sensor head cable is disconnected or misconnected)
Sensitivity adjuster		18-turn potentiometer
Environmental resistance	Ambient temperature	− 10 to + 60 °C <b>+ 14 to + 140 °F</b> (If 4 to 7 units are connected in cascade: − 10 to + 50 °C <b>+ 14 to + 122 °F</b> , if 8 to 16 units are connected in cascade: − 10 to + 45 °C <b>+ 14 to + 113 °F</b> ) (No dew condensation or icing allowed), Storage: − 20 to + 70 °C <b>− 4 to + 158 °F</b>
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure
	Insulation resistance	20 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure
	Vibration resistance	10 to 150 Hz frequency, 0.75 mm <b>0.030 in</b> amplitude in X, Y and Z directions for two hours each
	Shock resistance	100 m/s <sup>2</sup> acceleration (10 G approx.) in X, Y and Z directions for three times each
Temperature characteristics (Note 1)		Within ± 5 %
Material		Enclosure: Heat-resistant ABS, Cover: Polycarbonate
Connecting method		Connector (Note 2)
Cable extension		Extension up to total 100 m <b>328.084 ft</b> (If 5 to 8 units are connected in cascade: 50 m <b>164.042 ft</b> , if 9 to 16 units are connected in cascade: 20 m <b>65.617 ft</b> ) is possible with 0.3 mm <sup>2</sup> , or more, cable.
Weight		Net weight: 15 g approx., Gross weight: 40 g approx.

- Notes: 1) The value of the temperature characteristics gives the variation in the operation distance, that has been set within the stable sensing range at + 20 °C **+ 68 °F**, for an ambient temperature drift from 0 to + 55 °C **+ 32 to + 131 °F**. (Value is for amplifier only.)
- 2) The cable for amplifier connection is not supplied as an accessory. Make sure to use the optional quick-connection cable given below.  
 Main cable (3-core): **CN-73-C1** (cable length 1 m **3.281 ft**), **CN-73-C2** (cable length 2 m **6.562 ft**), **CN-73-C5** (cable length 5 m **16.404 ft**)  
 Sub cable (1-core): **CN-71-C1** (cable length 1 m **3.281 ft**), **CN-71-C2** (cable length 2 m **6.562 ft**), **CN-71-C5** (cable length 5 m **16.404 ft**)