

High Accuracy Positioning Sensors EG Series

Refer to P.821 for a list of products complying with EU Directives.

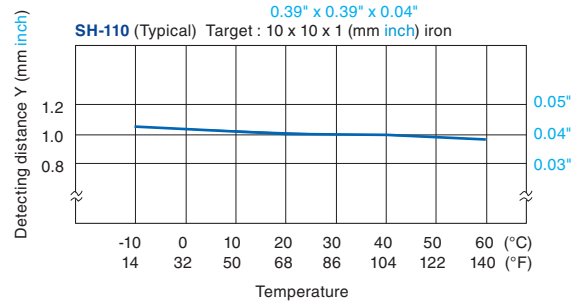


Repeatability of 1 μm 0.04 Mil

The EG Series incorporates a highly stable amplifier circuit, providing a repeatability of 1 μm 0.04 Mil. This sensor is ideal for detecting slight differences in shape or for confirming die closure.

Stable detection in wide temperature range

KEYENCE's original built-in compensator circuit minimizes temperature-oriented sensitivity fluctuation. Once set, the sensitivity does not require adjustment.



Heat-resistant sensor head (SH-809, 816, and 822)

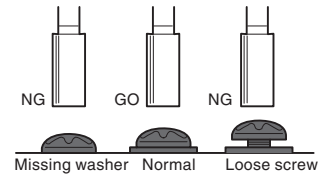
Heat-resistant sensor heads are available which withstand temperatures up to 200°C (392°F).

Oil-resistant cable

EG Series sensor heads employ oil-resistant cable to ensure extended usage.

Detection of tolerances with single sensor head (EG-547)

A single sensor can be used to detect missing/loose screws or washers.



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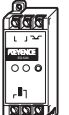






Selection Chart

Sensor head

Type	Size	Appearance	Detecting distance	Model
Shielded	Cylindrical	2.8 mm dia. 0.11"	 0.6 mm 0.02"	SH-302
		3.8 mm dia. 0.15"	 0.8 mm 0.03"	SH-303A
		5.4 mm dia. 0.21"	 1 mm 0.04"	SH-305
		8 mm dia. 0.31"	 2 mm 0.08"	SH-308
	Threaded	M10	 2 mm 0.08"	SH-110
		M14	 5 mm 0.20"	SH-114
	Thin	t=4.8 mm 0.19"	 5 mm 0.20"	SH-614A
Threaded/Oil-resistant	M 8	 2 mm 0.08"	SH-108	
Non-shielded	Cylindrical/Threaded	14.5 mm dia. 0.57"	 6 mm 0.24"	SH-416
		22 mm dia. 0.87"	 9 mm 0.35"	SH-422
		30 mm dia. 1.18"	 12 mm 0.47"	SH-430
		40 mm dia. 1.57"	 18 mm 0.71"	SH-440
Cylindrical	90 mm dia. 3.54"	 35 mm 1.38"	SH-290	
	Shielded	Cylindrical/Heat-resistant	9.4 mm dia. 0.37"	 0.5 to 2 mm 0.02" to 0.08"
Threaded/Heat-resistant		M16	 1 to 4 mm 0.04" to 0.16"	SH-816
Non-shielded	Cylindrical/Heat-resistant/Threaded	22 mm dia. 0.87"	 2 to 8 mm 0.08" to 0.31"	SH-822

Amplifier

Appearance	Power supply	Features	Output mode	Model
	11 to 30 VDC	DC-driven	N.O./N.C. selectable NPN	EG-520
	12 to 24 VDC	DC-driven with disconnection Alarm output DIN-rail mountable	N.O./N.C. selectable NPN	EG-530
	110/120, 220/240 VAC	AC-driven	NPN SPDT 250 VAC 2A relay	EG-540 ¹
	110/120, 220/240 VAC	AC-driven Adjuster dial included	NPN SPDT 250 VAC 2A relay	EG-545 ¹
	110/120, 220/240 VAC	AC-driven Tolerance setting capability	SPST-NO 250 VAC 0.5A relay Analog voltage monitoring output	EG-547 ²

1. This product does not comply with the EMC directive.
2. Please contact KEYENCE for information on products that comply with the EMC directive.

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Specifications

Sensor head

Type	Standard							Oil-resistant ²
	Shielded							Shielded
	Cylindrical			Threaded		Thin		Threaded
Model	SH-302 ¹	SH-303A	SH-305	SH-308	SH-110	SH-114	SH-614A	SH-108
Stable detecting range	0 to 0.6 mm 0.02 [*]	0 to 0.8 mm 0.03 [*]	0 to 1 mm 0.04 [*]	0 to 2 mm 0.08 [*]		0 to 5 mm 0.20 [*]		0 to 2 mm 0.08 [*]
Maximum detecting distance	1.6 mm 0.06 [*]	2 mm 0.08 [*]	3 mm 0.12 [*]	5 mm 0.20 [*]		10 mm 0.39 [*]		3.5 mm 0.14 [*]
Detectable object	Ferrous metal (see Characteristics for nonferrous metals)							
Standard target (iron, t=1 mm 0.04 [*])	5 x 5 mm 0.20 [*]			10 x 10 mm 0.39 [*]		15 x 15 mm 0.59 [*]		10 x 10 mm 0.39 [*]
Repeatability	0.001 mm 0.00004 [*]			0.002 mm 0.00008 [*]				
Hysteresis	0.03 mm 0.001 [*]	0.05 mm 0.002 [*]	0.01 mm 0.0004 [*]			0.015 mm 0.0006 [*]		0.05 mm 0.002 [*]
Temperature fluctuation	0.3%/°C			0.08%/°C		0.04%/°C		0.2%/°C
Enclosure rating	IP67							
Ambient temperature	-10 to +60°C (14 to 140°F), No freezing							
Relative humidity	35 to 85%, No condensation							
Vibration resistance	10 to 55 Hz, 1.5 mm 0.06 [*] double amplitude in X, Y, and Z directions, 2 hours respectively							
Weight (including nuts and 3-m 9.8' cable)	Approx. 30 g	Approx. 35 g	Approx. 45 g	Approx. 55 g		Approx. 63 g	Approx. 60 g	Approx. 45 g

Above values obtained when the detecting distance is set at 50% of the maximum stable detecting distance.

- The SH-302 cannot be used in combination with the EG-547.
- Not designed for immersed use.

Type	Standard					Heat-resistant ²		
	Non-shielded					Shielded		Non-shielded
	Cylindrical & Threaded			Cylindrical	Cylindrical	Threaded	Cylindrical & Threaded	
Model ¹	SH-416	SH-422	SH-430	SH-440	SH-290	SH-809	SH-816	SH-822
Stable detecting range	0 to 6 mm 0.24 [*]	0 to 9 mm 0.35 [*]	0 to 12 mm 0.47 [*]	0 to 18 mm 0.71 [*]	0 to 35 mm 1.38 [*]	0.5 to 2 mm 0.02 [*] to 0.08 [*]	1 to 4 mm 0.04 [*] to 0.16 [*]	0.08 [*] to 0.31 [*]
Maximum detecting distance	15 mm 0.59 [*]	22 mm 0.87 [*]	30 mm 1.18 [*]	40 mm 1.57 [*]	70 mm 2.76 [*]	—		
Detectable object	Ferrous metal (see Characteristics for nonferrous metals)							
Standard target (iron, t=1 mm 0.04 [*])	20 x 20 mm 0.79 [*]	25 x 25 mm 0.98 [*]	30 x 30 mm 1.18 [*]	40 x 40 mm 1.57 [*]	150 x 150 mm 5.91 [*]	15 x 15 mm 0.59 [*]	20 x 20 mm 0.79 [*]	30 x 30 mm 1.18 [*]
Repeatability	0.005 mm 0.0002 [*]	0.008 mm 0.0003 [*]	0.01 mm 0.0004 [*]	0.015 mm 0.0006 [*]	0.03 mm 0.001 [*]	0.002 mm 0.00008 [*]	0.005 mm 0.0002 [*]	0.008 mm 0.0003 [*]
Hysteresis	0.015 mm 0.0006 [*]	0.02 mm 0.0008 [*]	0.03 mm 0.001 [*]	0.05 mm 0.0002 [*]	0.1 mm 0.004 [*]	0.04 mm 0.002 [*]		
Temperature fluctuation	0.08%/°C					0.2%/°C		
Enclosure rating	IP67							
Ambient temperature	-10 to +60°C (14 to 140°F), No freezing					-10 to +200°C (14 to 392°F), No freezing		
Relative humidity	35 to 85%, No condensation							
Vibration resistance	10 to 55 Hz, 1.5 mm 0.06 [*] double amplitude in X, Y, and Z directions, 2 hours respectively							
Weight (including nuts and 3-m 9.8' cable)	Approx. 73 g	Approx. 195 g	Approx. 225 g	Approx. 280 g	Approx. 650 g	Approx. 55 g	Approx. 83 g	Approx. 170 g

Above values obtained when the detecting distance is set at 50% of the maximum stable detecting distance.

- The EG-547(W) cannot be used in combination with SH-422, 430, 440, 290, 809, 816 and 822.
- Precautions when using heat-resistant sensor head:
 - Use the sensor within the stable detecting range.
 - The heat-resistant sensor head is not waterproof; do not use this sensor head in a location directly exposed to liquid or steam.

Amplifier

Type	DC		AC	AC adj-dial	AC tolerance setting
Model	EG-520	EG-530	EG-540 ²	EG-545 ²	EG-547 ^{1,4}
Operation mode	N.O./N.C. (switch-selectable)		N.O./N.C. switch-selectable (contact output only)		External synchronization, analog voltage switch-selectable
Sensitivity adjustment	15-turn trimmer			10-turn potentiometer dial	
Control output	Transistor ² (NPN)	200 mA max. (40 V max.) Residual voltage: 1 V max.	100 mA max. (40 V max.) Residual voltage: 1 V max.		
	Relay contact	—	SPDT, 250 VAC, 2 A max. (resistive load)		DPST (N.O.), 250 VAC, 0.5 A max. (resistive load)
Disconnection alarm output (NPN)	—	100 mA max. (40 V max.) Residual voltage: 1 V max.	—		
Response time	Transistor	1 ms			
	Relay contact	—	10 ms		3 ms
OFF delay time	—		65 ms (contact output only)		—
Power supply	11 to 30 VDC: 10% max.	12 to 24 VDC: 10% max.	110/120/220/240 VAC ±10%, 50/60 Hz		
Power/current consumption	100 mA max.		5 VA max.		
Temperature fluctuation	0.08%/°C				
Ambient temperature	0 to 50°C (32 to 122°F)				
Relative humidity	35 to 85%, No condensation				
Vibration resistance	10 to 55 Hz, 1.5 mm 0.06 [*] double amplitude in X, Y, and Z directions, 2 hours respectively				
Weight	Approx. 110 g	Approx. 75 g	Approx. 330 g	Approx. 350 g	Approx. 390 g

Above values obtained when the detecting distance is set at 50% of the maximum stable detecting distance.

- The EG-547(W) cannot be used in combination with SH-422, 430, 440, 290, 809, 816 and 822.
- NPN output can easily be converted to PNP output by connecting the optional OP-5148 PNP Output Converter.
- This product does not comply with EMC directives.
- Please contact KEYENCE for information on products that comply with the EMC directive.



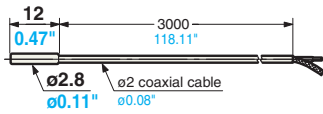
Dimensions

Unit: mm inch

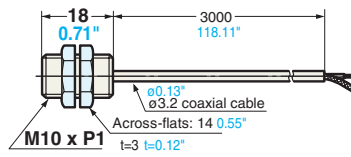
- EV
- EZ
- ED
- EM
- ES
- ET
- TA
- EG
- DD

Sensor heads

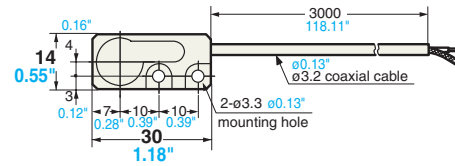
SH-302



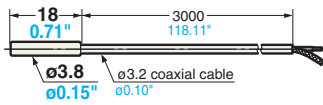
SH-110



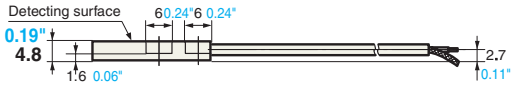
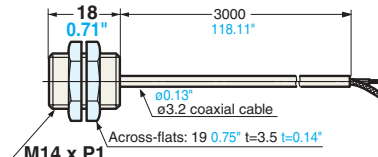
SH-614A



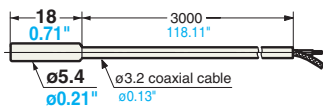
SH-303A



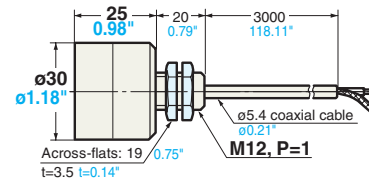
SH-114



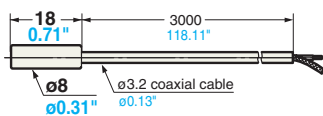
SH-305



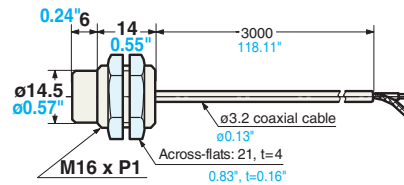
SH-430



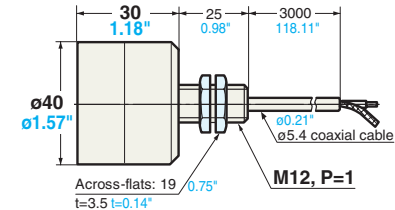
SH-308



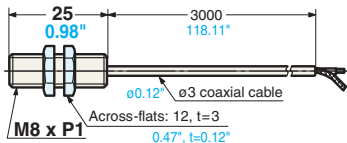
SH-416



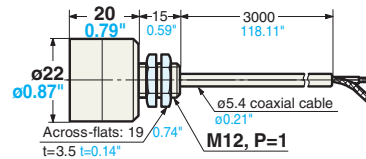
SH-440



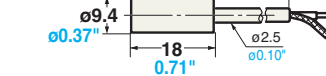
SH-108



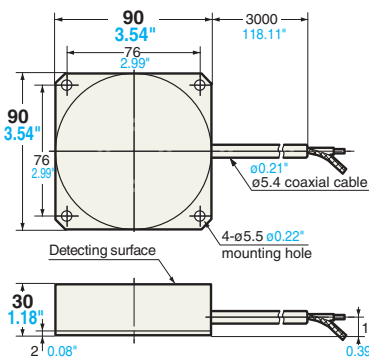
SH-422



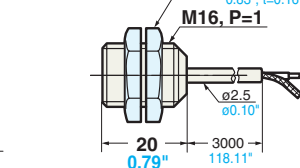
SH-809



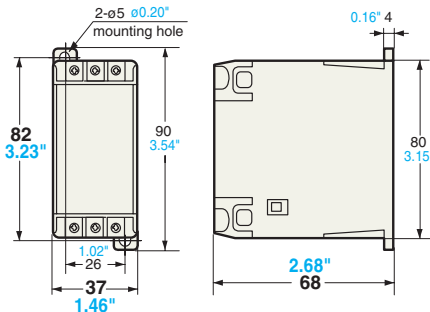
SH-290



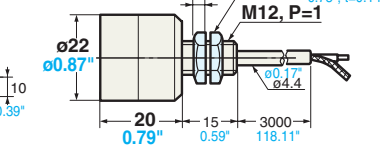
SH-816



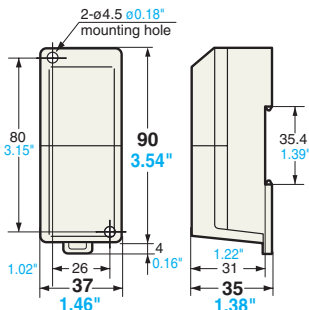
Amplifiers
EG-520



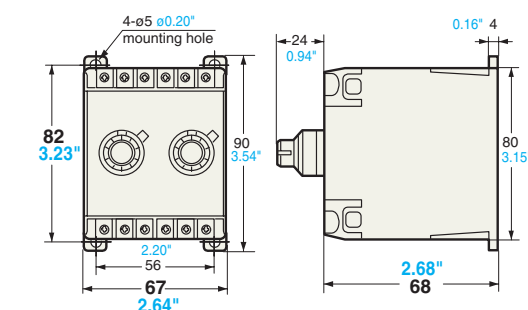
SH-822



EG-530



EG-540/545/547



EG-540 has no dial.
EG-545 has one dial.
EG-547 has two dials.

