



Quadrature Speed and Direction
Sensors
SNG-Q Series



SNG-Q Series

Honeywell's SNG-Q Series Quadrature Speed and Direction Sensor with 4-wire quadrature sensing is the first release of the new SNG-Q Series Speed Sensor Platform. The sensor design and manufacturing use a platform-based approach that enables cost-competitiveness and mechanical and electrical configurability.

The SNG-Q Series provide both speed and direction information. Speed information is provided from digital square wave outputs; direction is provided using a quadrature output with signals 90° phase shifted from each other. With the quadrature output, target direction is determined by output lead/lag phase shifting.

This product is designed for applications where enhanced accuracy is required to detect small target features. This accuracy is enabled by dual differential Hall-effect sensor IC technology. The SNG-Q Series is designed for a wide operating temperature range, robust electrical noise immunity and industry leading environmental sealing capability.

This product includes an O-ring seal for pressure applications, and a fixed mounting flange for simple installation using one fastener.

Features

- **Wide operating temperature range:** -40 °C to 150 °C [-40 °F to 302 °F]
- **Environmental sealing:** Moisture ingress protection rated to IP69k
- **Robust electrical noise immunity:** Electrical noise radiated immunity (EMC) rated to 100 V/m
- **High frequency switching capability:** 3 Hz to 20 kHz
- **Direction information:** From phase-shifted dual output signals
- **O-ring seal:** Enables environmental sealing to mounting surface
- **Supply voltage range:** 4.5 V to 26 V

Potential Applications

INDUSTRIAL

- **AC induction motors in material handling, agriculture, and construction machines:** May be used to help control power delivered by the ac induction motor
- **Hydraulic pump motors in material handling, agriculture, and construction machines:** May be used to help control power delivered by the hydraulic pump motor
- **Escalators and elevators:** May be used to help control speed and position

TRANSPORTATION

- **Hybrid electric transmissions in heavy duty trucks, buses, agriculture and construction machines:** May be used to help control power regulation of the hybrid system
- **Wheel speed detection in material handling, agriculture, and construction machines:** May be used to detect the speed and direction of the wheels, which translates to the speed and direction of the machine
- **Hybrid engines in heavy duty trucks, buses, agriculture and construction machines:** May be used to help control power regulation of the hybrid system

SNG-Q Series

Table 1. Order Guide

Catalog Listing	Availability	Description
SNG-QPLA-000	Now	SNG-Q Series, 4-wire quadrature speed and direction sensor, plastic housing, 500 mm [19.7 in] cable with leads, right angle exit, 35 mm [1.38 in] housing length
SNG-QPRA-000	Coming soon	SNG-Q Series, 4-wire quadrature speed and direction sensor, plastic housing, integral Amp Superseal 1.5 connector, right angle exit, 35 mm [1.38 in] housing length
SNG-QPMB-000	Coming soon	SNG-Q Series, 4-wire quadrature speed and direction sensor, plastic housing, 500 mm [19.7 in] cable with leads, straight exit, 45 mm [1.77 in] housing length

Figure 1. Nomenclature Guide

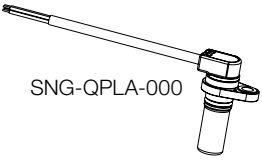
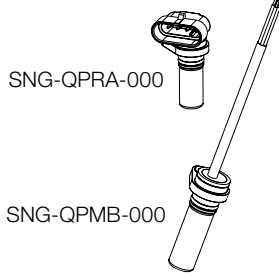
For example, **SNG-QPLA-000** defines an SNG-Q Series quadrature speed and direction sensor, 500 mm [19.7 in] cable with leads, right angle exit, 35 mm [1.38 in] housing length.

SNG-Q Series	P Housing Material	L Connection Type ²	A Housing Length	- 000 For Internal Use Only
4-wire quadrature speed and direction sensor	P Plastic	S Integral Amp Superseal 1.5 connector, straight exit (coming soon)	A 35 mm [1.38 in]	
	Stainless steel ¹	R Integral Amp Superseal 1.5 connector, right angle exit (coming soon)	B 45 mm [1.77 in] (coming soon)	
	Brass ¹	L 500 mm [19.7 in] cable with leads, right angle exit		
	Aluminum ¹	M 500 mm [19.7 in] cable with leads, straight exit (coming soon)		
	Special ¹	C Cable with Amp Superseal 1.5 connector, right angle exit (coming soon)		
		D Cable with Amp Superseal 1.5 connector, straight exit (coming soon)		
		X Special (refer to last three digits) (coming soon)		

¹ To learn more about Honeywell's sensing and control products, call +1-815-235-6847 or 1-800-537-6945, visit sensing.honeywell.com, or e-mail inquiries to info.sc@honeywell.com

² Other cable lengths available upon request.

Table 2. Electrical Specifications

Characteristic	Parameter		Comment
	Available Now	Coming Soon	
			
Supply voltage	4.5 V to 26 V	4.5 V to 26 V	—
Output signal: type	square wave	square wave	two channel, phase shifted by 90° either channel, may lead or lag dependent on target geometry and sensor-to-target orientation; see Figures 2, 3, 4 for recommended orientation
duty cycle ¹	50% ±10%	50% ±10%	
phase shift	90° ±45°	90° ±45°	dependent on target geometry and sensor-to-target orientation; see Figures 2, 3, 4 for recommended orientation
high	≥Vs - 0.5 V	≥Vs - 0.5 V	—
low	≤0.5 V	≤0.5 V	—
load current	40 mA max.	40 mA max.	each output at all conditions
rise time	10 μs max.	10 μs max.	1 kOhm pull-up resistor, dependent on load resistor
fall time	5 μs max.	5 μs max.	1 kOhm pull-up resistor, dependent on load resistor
frequency	3 kHz to 20 kHz	3 kHz to 20 kHz	frequencies >10 kHz may be dependent on target geometry and air gap
Short circuit protection	50 mA max.	50 mA max.	—
Supply current	12 mA normal, 18 mA max.	12 mA normal, 18 mA max.	all conditions
Reverse voltage	-26 V max.	-26 V max.	10 min duration

¹Duty cycle = Time high/time total.

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Table 3. Environmental Specifications

Characteristic	Condition	Parameter	
		Available Now	Coming Soon
		SNG-QPLA-000	SNG-QPRA-000 SNG-QPMB-000
EMI: radiated immunity bulk current injection ESD	ISO 11452-2, 400 MHz to 1 GHz ISO 11452-4, 1 MHz to 400 MHz ISO 10605, Section 9	100 V/m 100 mA ±8 kV contact, ±15 kV air	100 V/m 100 mA ±8 kV contact, ±15 kV air
Operating temp.	—	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
Thermal shock, air to air	40 °C to 150 °C [-40 °F to 302 °F], 60 min. soak. <3 s transfer	500 cycles	500 cycles
Humidity	95% humidity at 38 °C [100 °F]	240 hr	240 hr
Salt fog	5% salt solution by mass at 35 °C [95 °F]	96 hr	96 hr
Thermal saline dunk	100 °C to 25 °C [212 °F to 77 °F] air to liquid, 5% saline	10 cycles	10 cycles
High temperature exposure with power	150 °C [302 °F], 13.5 Vdc, 1 kOhm load	500 hr	500 hr
Vibration	3 perpendicular axes, 48 hr per axis	29.8 G _{rms} , 24 Hz to 2000 Hz	29.8 G _{rms} , 24 Hz to 2000 Hz
Degree of protection	—	IP69k	IP69k
Resistance to fluids	—	general under-the-hood automotive fluids	general under-the-hood automotive fluids

Table 4. Mechanical Specifications

Characteristic	Parameter		Comment
	Available Now	Coming Soon	
	SNG-QPLA-000	SNG-QPRA-000 SNG-QPMB-000	
Sensing air gap	0,0 mm to 2,0 mm [0.0 in to 0.08 in]	0,0 mm to 2,0 mm [0.0 in to 0.08 in]	—
Target: width slot width tooth width tooth height	>5,0 mm [0.20 in] recommended; 12,7 mm [0.5 in] typ. 2,0 mm [0.08 in] 2,0 mm [0.08 in] >3,0 mm [0.12 in] recommended; 5,0 mm [0.20 in] typ.	>5,0 mm [0.20 in] recommended; 12,7 mm [0.5 in] typ. 2,0 mm [0.08 in] 2,0 mm [0.08 in] >3,0 mm [0.12 in] recommended; 5,0 mm [0.20 in] typ.	narrower targets may limit axial offsets other geometry may be suitable other geometry may be suitable shorter tooth heights may limit maximum air gap performance
Materials: housing bushing O-ring cable	PBT brass 70 durometer fluorocarbon with PTFE coating, Ø11,8 mm [Ø0.47 in] OD x Ø1,80 mm [Ø0.07 in] CS EVA, four conductor, 36 AWG, 28 strand, Ø5,2 mm [Ø0.20 in] jacket	PBT brass 70 durometer fluorocarbon with PTFE coating, Ø11,8 mm [Ø0.47 in] OD x Ø1,80 mm [Ø0.07 in] CS EVA, four conductor, 36 AWG, 28 strand, Ø5,2 mm [Ø0.20 in] jacket (SNG-QPRA-000 only)	—
Mounting: bore size torque	Ø15,15 mm to ø15,40 mm [Ø0.60 in to Ø0.61 in] 10 N m [88.5 in-lb] max. with M6 X 1.0 bolt	Ø15,15 mm to ø15,40 mm [Ø0.60 in to Ø0.61 in] 10 N m [88.5 in-lb] max. with M6 X 1.0 bolt	application dependent —

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Figure 1. Sensor Output (All catalog listings)

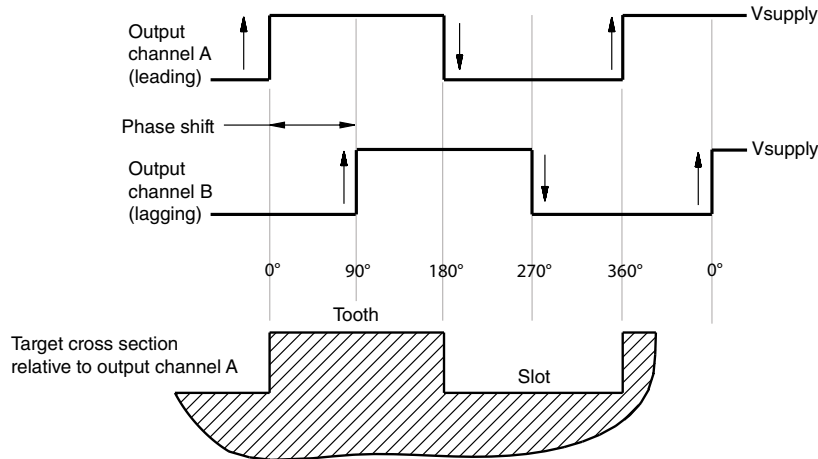
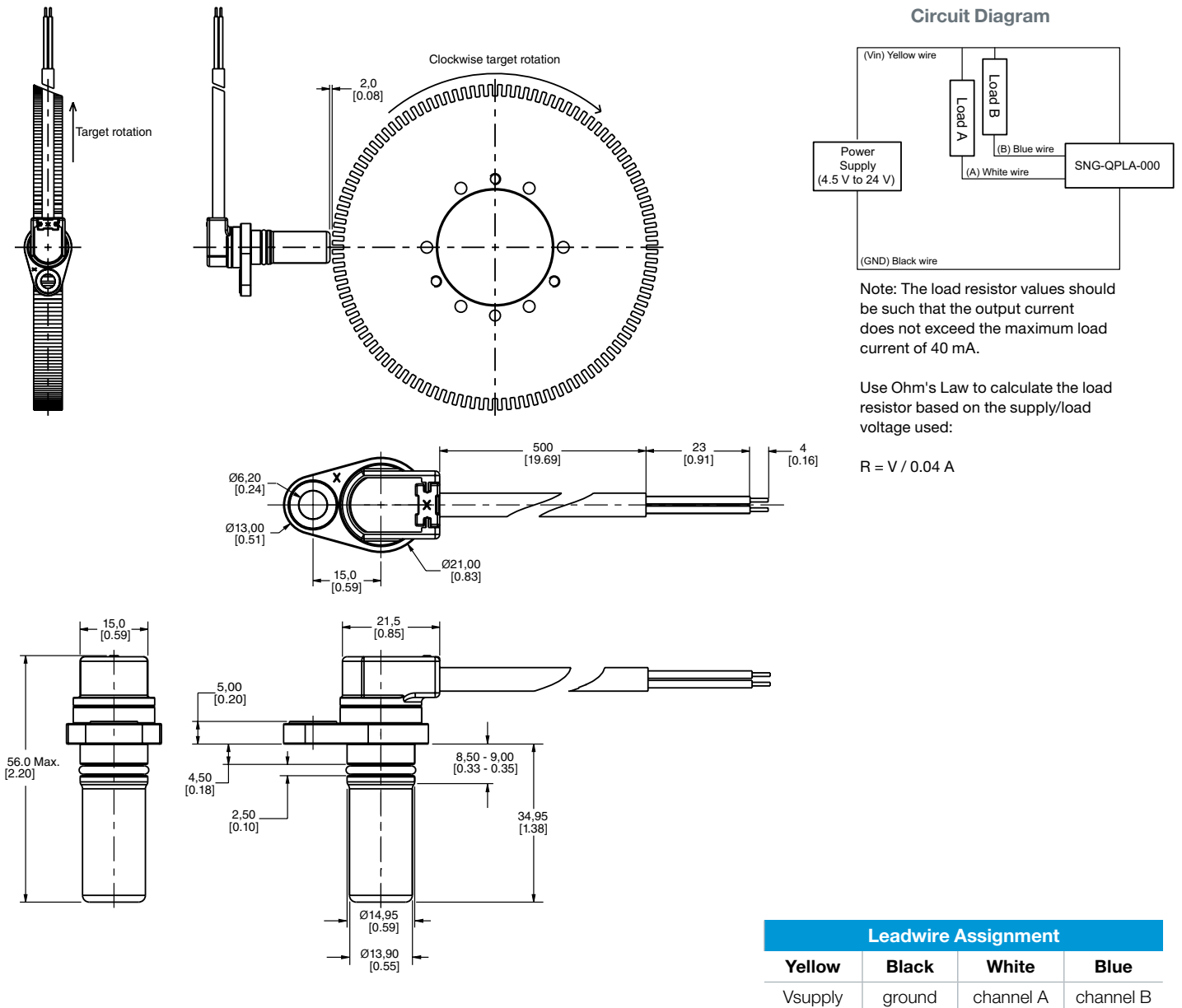
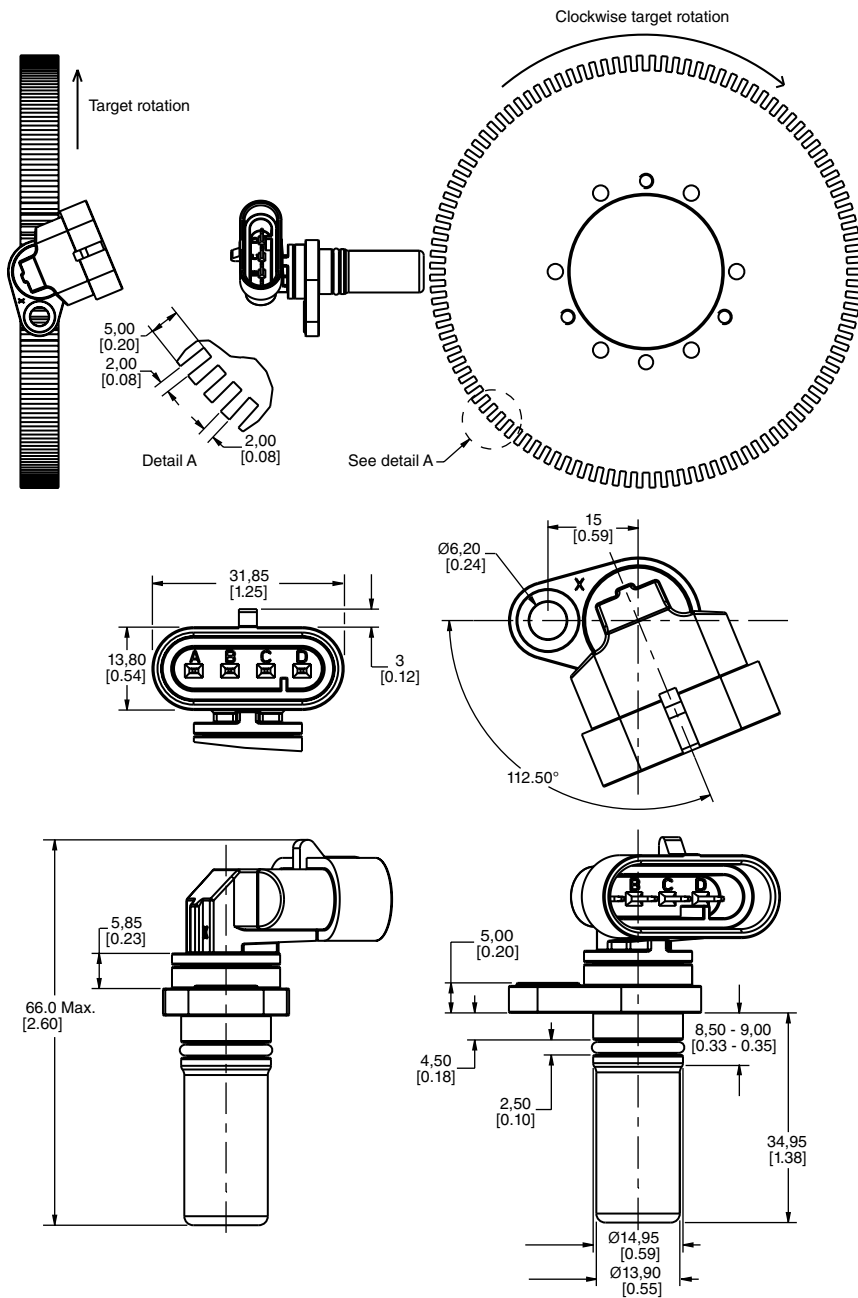


Figure 2. SNG-QPLA-000 Mounting Dimensions (For reference only: mm/[in.]) (Available now.)



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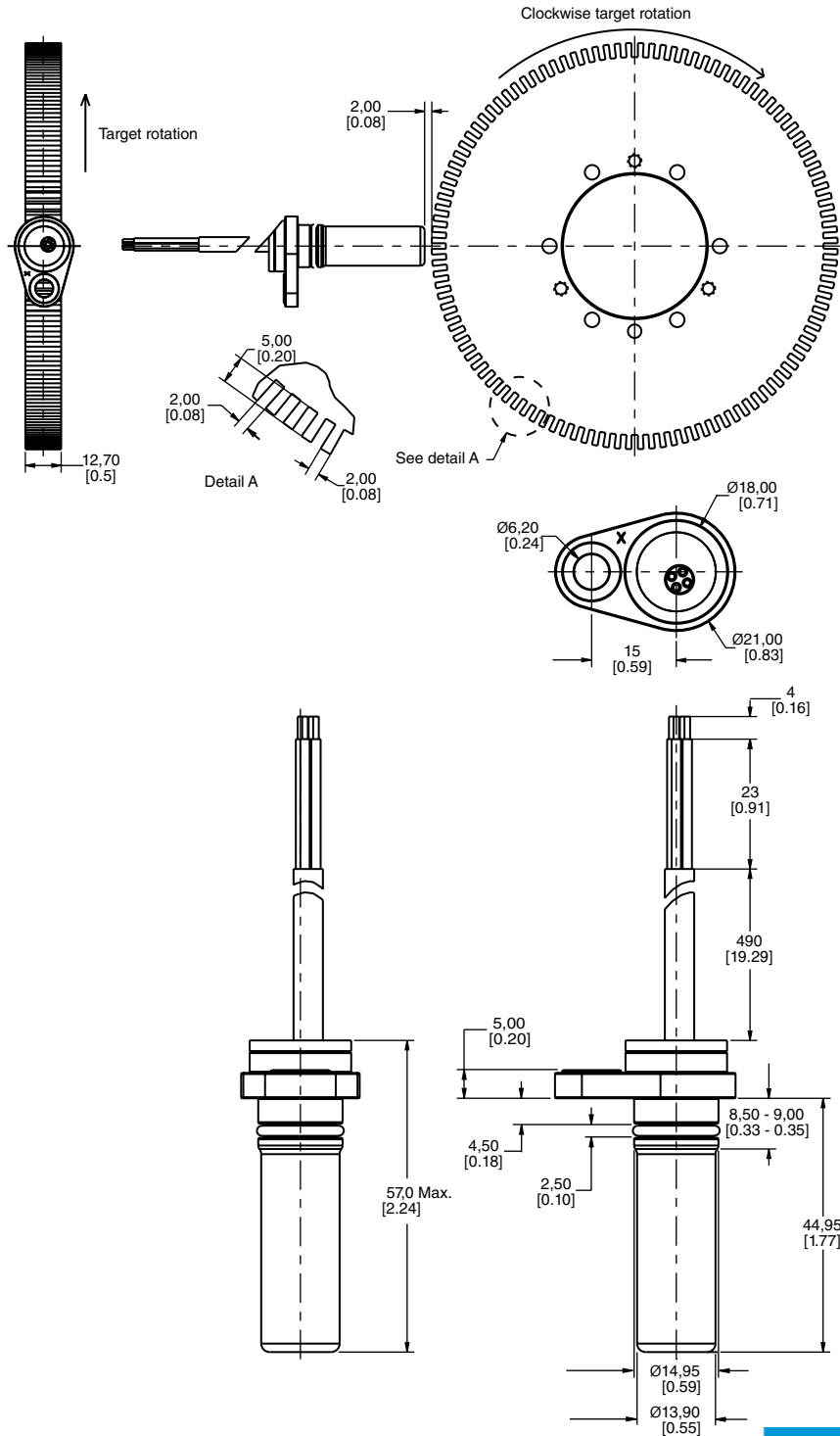
Figure 3. SNG-QPRA-000 Mounting Dimensions (For reference only: mm/[in].) (Coming soon.)



Pin Assignment			
A	B	C	D
ground	channel A	channel A	channel A

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Figure 4. SNG-QPMB-000 Mounting Dimensions (For reference only: mm/[in.]) (Coming soon.)



Leadwire Assignment			
A	B	C	D
Vsupply	ground	channel A	channel A

ADDITIONAL INFORMATION

The following associated literature is available at sensing.honeywell.com:

- Product Range Guide
- Product Line Guide
- Installation Instructions
- Application Note

For SNG-QPLA-000 (Available now.)

⚠ WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

⚠ WARNING

MISUSE OF DOCUMENTATION

- The information presented in this datasheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

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For SNG-QPRA-000 and SNG-QPMB-000 (Coming soon.)

NOTICE

EVALUATION PRODUCTS

THESE PRODUCT ARE PROTOTYPE PREPRODUCTION ITEMS THAT HAVE YET TO COMPLETE ALL PHASES OF PRODUCT RELEASE TESTING AND ARE FOR CUSTOMER EVALUATION ONLY.

THESE ITEMS ARE SOLD "AS IS" WITHOUT WARRANTY EXPRESS OR IMPLIED, INCLUDING THAT OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

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Preliminary

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