



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

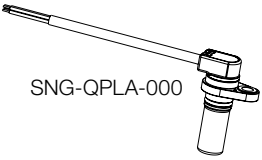
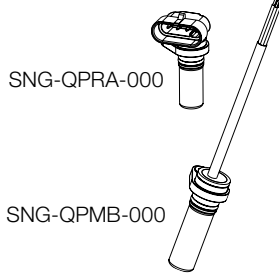
For example, **SNG-QPLA-000** defines an SNG-Q Series quadrature speed and direction sensor, 500 mm [19.7 in] cable with leads, right angle exit, 35 mm [1.38 in] housing length.

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

<sup>1</sup> 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

<sup>2</sup> 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 <sup>1</sup>	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

<sup>1</sup>Duty cycle = Time high/time total.

# Quadrature Speed and Direction Sensors

**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 <sub>rms</sub> , 24 Hz to 2000 Hz	29.8 G <sub>rms</sub> , 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**

Character- istic	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 —

# SNG-Q Series

Figure 1. Sensor Output (All catalog listings)

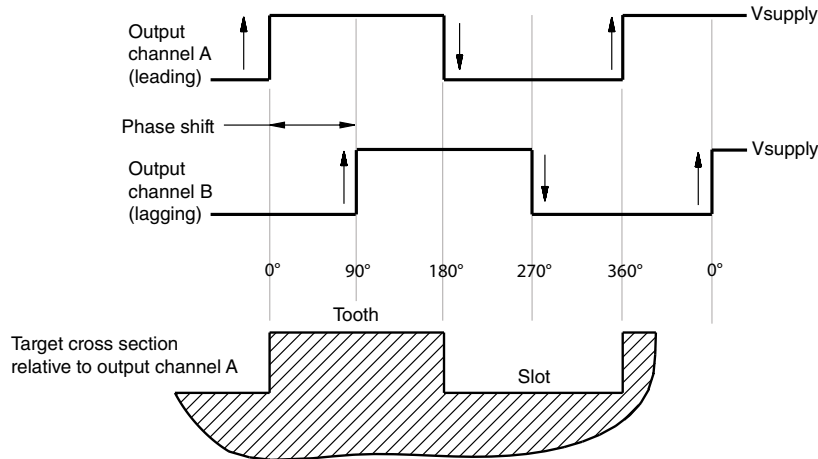
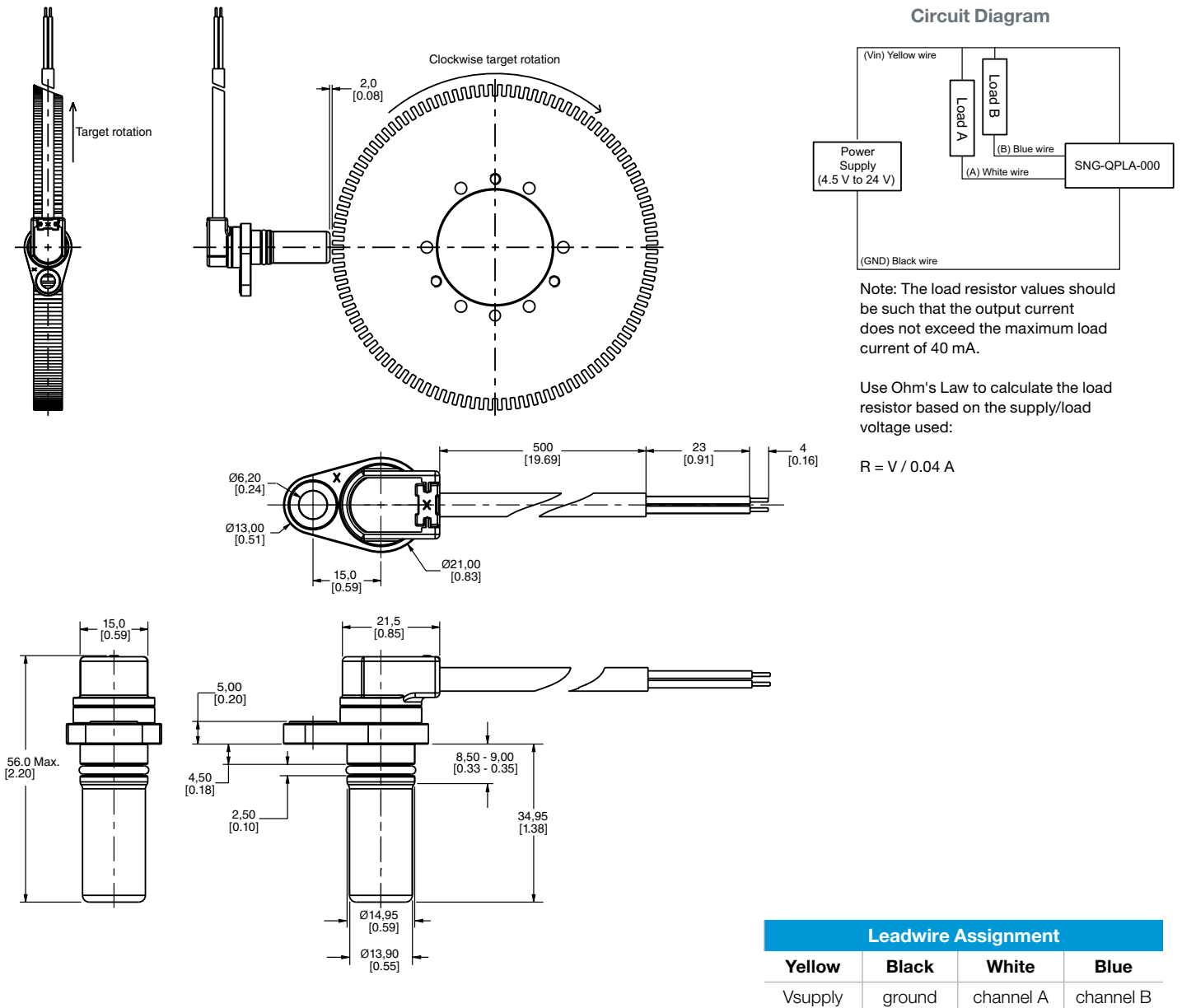
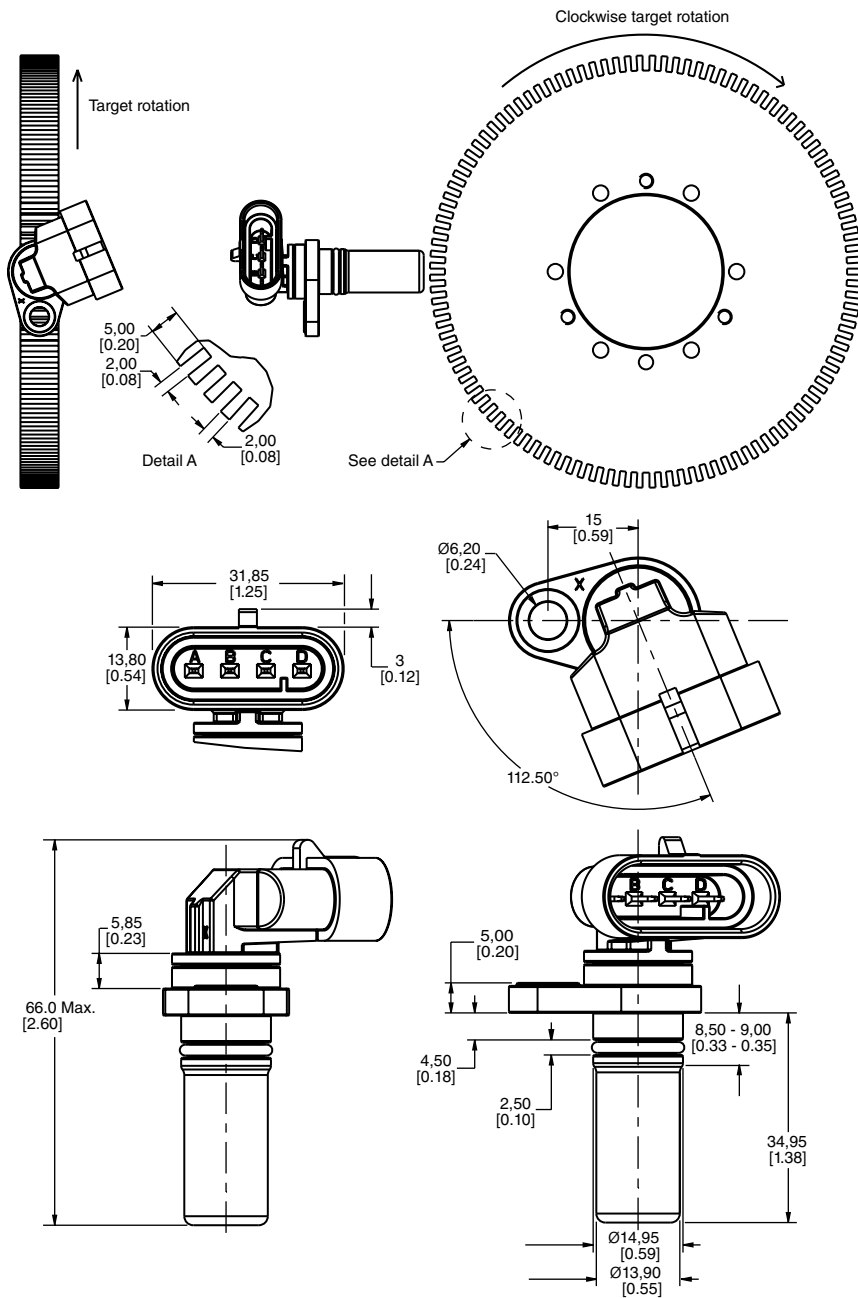


Figure 2. SNG-QPLA-000 Mounting Dimensions (For reference only: mm/[in.]) (Available now.)



# Quadrature Speed and Direction Sensors

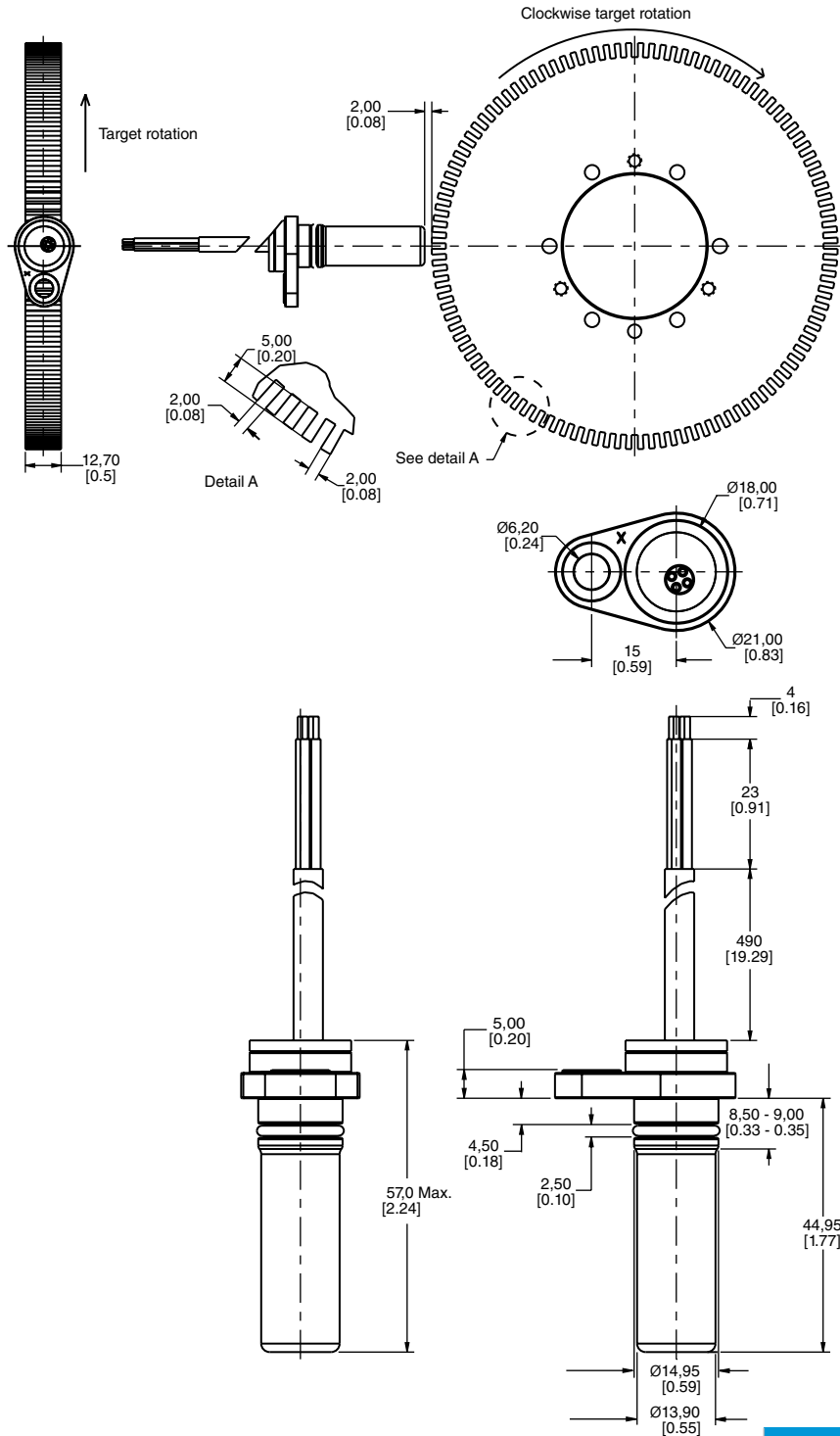
Figure 3. SNG-QPRA-000 Mounting Dimensions (For reference only: mm/[in].) (Coming soon.)



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

# SNG-Q Series

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](http://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.**

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

## **NOTICE**

### **EVALUATION PRODUCTS**

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# Preliminary

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