

## 946 Series

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### Ultrasonic Sensors Teachable 30 mm Diameter, Precision Digital Outputs



#### DESCRIPTION

The 946 Series provides a compromise between easy usage and advanced features. Adjustment is easily done by auto-tuning. By inserting a plug with four positions one can program the sensor in a matter of seconds; the parameters are stored in a non-volatile memory (EEPROM).

#### FEATURES AND BENEFITS

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- Scan ranges from 0,3 m to 6,0 m [0.93 ft to 19.68 ft]
- Auto-tuning by four positions plug
- Independent/Windows® output choice (switching output models)
- Stainless steel M30 housing, IP65
- Two switching outputs, open collector PNP
- Temperature compensation
- M12 four-pin connector
- Connector cable 2,0 m [78.75 in] included
- Two independent setpoints
- Teach-in programming
- NO/NC window characteristic possible
- Voltage or current output

#### POTENTIAL APPLICATIONS

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##### Industrial:

- Loop control, product height measurement
- Tank liquid level measurement
- Reel diameter measurement
- Tire manufacturing

# 946 Series

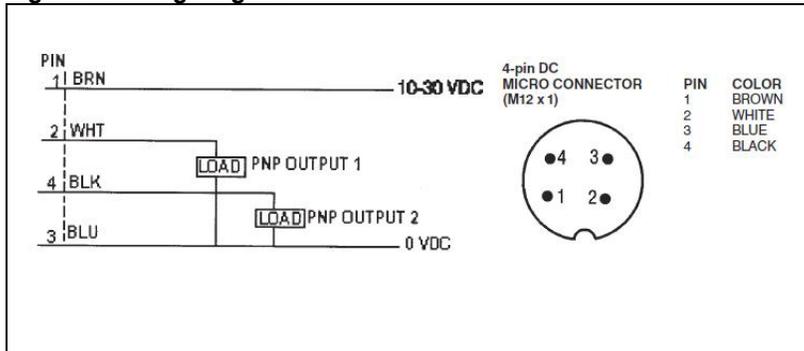
**Table 1: Order Guide and Specifications for Connectorized Versions**

Characteristic	946A4V-2D-001-65E	946-A4V-2D-001-175E	946-A4V-2D-001-400E
Sensor package style	30 mm [1.18 in] dia. stainless steel		
Sensing distance <sup>1</sup> max. min.	6000 mm [236 in] 350 mm [13.8 in]	1000 mm [39.4 in] 200 mm [7.87 in]	300 mm [11.8 in] 60 mm [2.36 in]
Termination <sup>2</sup>	connector		
Digital output	pnp		
Beam angle	5°		
Supply voltage	10 Vdc to 30 Vdc		
Supply current	<25 mA without load		
Circuit protection	reverse polarity		
Load current	0 mA to 200 mA		
Hysteresis	3.2%		
Switching frequency	1 Hz	5 Hz	15 Hz
Repeatability	≤0.1% of reading		
Setpoint adjustment	programmable with probe coded plug		
Circuit protection	short circuit		
Operating temperature	-25 °C to 70 °C [-13 °F to 150 °F]		
Storage temperature	-40 °C to 85°C [-40 °F to 185 °F]		
Sealing	IP65		
LED indicator	red: illuminates when object is not recognized, probe coded plug withdrawn or short circuited yellow: illuminates when indicating output function or output status green: illuminates when target is recognized during “teach mode” or normal operation		

**Notes:**

- Standard target is 120 mm thick square of mild steel perpendicular to ultrasonic beam.
- Includes 2 m cable with straight connector.

**Figure 1. Wiring Diagram**



**Table 2. Accessories for Connectorized Versions**

Catalog Listing	Description
804000A09M020 <sup>1</sup>	2 m cable with straight connector (used for wiring to connector)
804001A09M020	2 m cable with right angle connector (used for wiring to connector)

**Note:**

- Supplied with sensor.

# Teachable 30 mm Diameter, Precision Digital Outputs

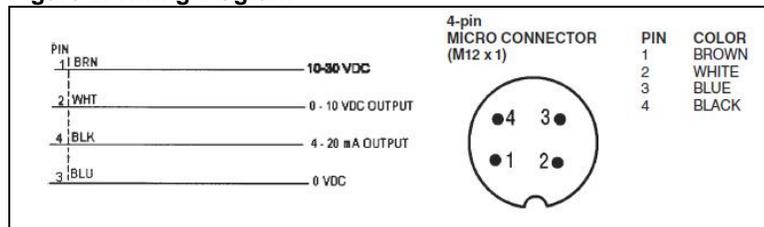
**Table 3: Order Guide and Specifications for Cable Versions**

	946-A4V-2D-2C0-65E	946-A4V-2D-2C0-85E	946-A4V-2D-2C0-175E	946-A4V-2D-2C0-380E
Package style	30 mm [1.18 in] dia. stainless steel			
Sensing distance <sup>1</sup> max. min.	6000 mm [236 in] 350 mm [13.8 in]	4000 mm [157.5 in] 500 mm [19.7 in]	2000 mm [78.74 in] 200 mm [7.87 in]	500 mm [19.7 in] 60 mm [2.36 in]
Termination <sup>2</sup>	cable			
Digital output	analog; 4 mA to 20 mA, 0 Vdc to 10 Vdc			
Beam angle	5°			
Supply voltage	10 Vdc to 30 Vdc			
Supply current	<33 mA without load			
Circuit protection	reverse polarity			
Switching frequency	2 Hz	3.3 Hz	10 Hz	28.6 Hz
Repeatability	≤0.1% of reading			
Linearity	≤0.1%			
Setpoint adjustment	programmable with probe coded plug			
Load resistance: minimum maximum	1000 Ohm (10 Vdc to 10 Vdc output) 500 Ohm (4 mA to 20 mA output)			
Slope of output	positive or negative; programmable with probe coded plug			
Circuit protection	short circuit			
Operating temp.	-25 °C to 75 °C [-13 °F to 167 °F]			
Storage temp.	-40 °C to 85°C [-40 °F to 185 °F]			
Sealing	IP 65			
LED indicator	red: illuminates when object is not recognized, probe coded plug withdrawn or short circuited yellow: illuminates when indicating output function or output status green: illuminates when target is recognized during “teach mode” or normal operation			

**Notes:**

- Standard target is 120 mm thick square of mild steel perpendicular to ultrasonic beam.
- Includes 2 meter cable with straight connector.

**Figure 2. Wiring Diagram**



**Table 4: Accessories for Cable Versions**

Catalog Listing	Description
804000A09M020 <sup>1</sup>	2 m cable with straight connector (used for wiring to connector)
804001A09M020	2 m cable with right angle connector (used for wiring to connector)

**Note:**

- Supplied with sensor.

## **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.**

### **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.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

## **WARNING**

### **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet 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.**

### **SALES AND SERVICE**

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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