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Sensing and Control  
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### Sensing and Control

Honeywell Inc.

11 West Spring Street

Freeport, IL 61032

# Ultrasonic Sensors

946 Series

## Teachable 30 mm Diameter Precision Digital Outputs

### FEATURES

- Two independent setpoints
- Teach-in programming
- N.O., N.C. window characteristic possible



### ORDER GUIDE

Sensor Package Style	Sensing Range* mm (in.)	Termination**	Digital Output	Catalog Listing
30 mm (1.18 in.) Stainless Steel	800 - 6000 (31.5-236)	Connector	PNP	946-A4V-2D-001-65E
	200 - 1000 (7.87-39.4)	Connector	PNP	946-A4V-2D-001-175E
	60 - 300 (2.36-11.8)	Connector	PNP	946-A4V-2D-001-400E

\* Standard target is 120 mm thick square of mild steel perpendicular to ultrasonic beam.

\*\*Includes 2 meter cable with straight connector.

### SPECIFICATIONS

#### SENSING CHARACTERISTICS

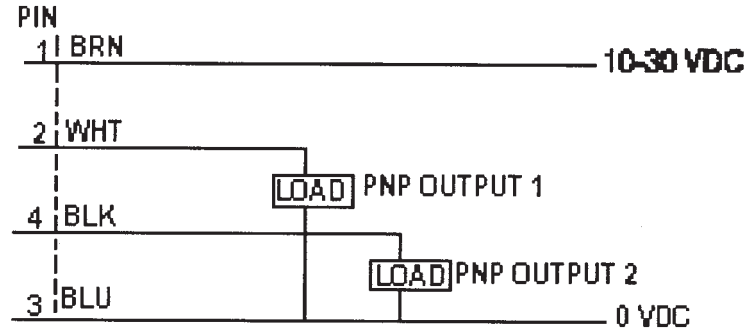
Catalog Listings	946A4V-3D-001-65E	946-A4V-2D-001-175E	946-A4V-2D-001-400E
Max. Sensing Distance	6000 mm (236 in.)	1000 mm (39.4 in.)	300 mm (11.8 in.)
Min. Sensing Distance	800 mm (31.5 in.)	200 mm (7.87 in.)	60 mm (2.36 in.)
Beam Angle	5°		
<b>POWER SUPPLY</b>			
Supply Voltage	10 - 30 VDC		
Supply Current	<25 mA without load		
Circuit Protection	Reverse polarity		
<b>OUTPUT CHARACTERISTICS</b>			
Load Current	0 - 200 mA		
Hysteresis	≤3.2%		
Switching Frequency	1 Hz	5Hz	15 Hz
Repeatability	≤ 0.1% of reading		
Setpoint Adjustment	Programmable with probe coded plug		
Circuit Protection	Short Circuit		
<b>ENVIRONMENTAL</b>			
Operating Temperature	-25 to 70°C (-13 to 150°F)		
Storage Temperature	-40 to 85°C (-40 to 185°F)		
Sealing	IP 65		
<b>SPECIAL FEATURES</b>			
LED Indicator	RED - Illuminates when object is not recognized, probe coded plug withdrawn or short circuited YELLOW - Illuminates when indicating output function or output status GREEN - Illuminates when target is recognized during "teach mode" or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		

# Ultrasonic Sensors

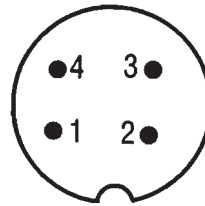
946 Series

Teachable 30 mm Diameter  
Precision Digital Outputs

## WIRING DIAGRAMS



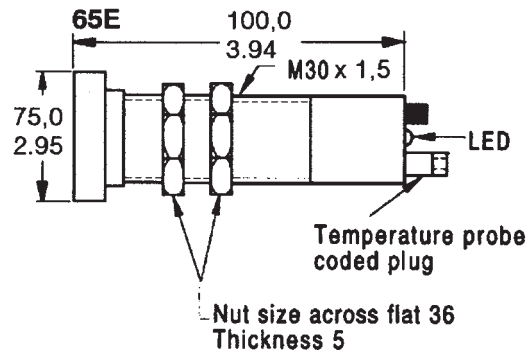
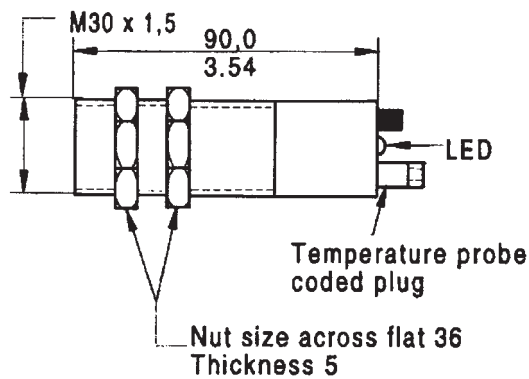
4-pin DC  
MICRO CONNECTOR  
(M12 x 1)



PIN	COLOR
1	BROWN
2	WHITE
3	BLUE
4	BLACK

## MOUNTING DIMENSIONS (For reference only)

### 175E/400E



Proximity

## ACCESSORIES

	Catalog Listing	Features
2 Meter cable with straight connector*	804000A09M020	Used for wiring to connector
2 Meter cable with right angle connector	804001A09M020	Used for wiring to connector
24 VDC Power supply, relay output, 110 VAC input	FF-MADB24RB	See page B24 for more information

\*Supplied with sensor.

# Ultrasonic Sensors

946 Series

## Teachable 30 mm Diameter Precision Analog Outputs

### FEATURES

- Voltage and current output
- Teach-in programming
- Measuring range up to 6000 mm (236 inches)



### ORDER GUIDE

Sensor Package Style	Sensing Range* mm (in.)	Termination	Analog Output	Catalog Listing
30 mm (1.18 in.) Stainless Steel	800 - 6000 (31.5-236)	Cable	4 - 20 mA 0 - 10 VDC	946-A4V-2D-2C0-65E
	500 - 4000 (19.7-157.5)	Cable	4 - 20 mA 0 - 10 VDC	946-A4V-2D-2C0-85E
	200 - 2000 (7.87-78.74)	Cable	4 - 20 mA 0 - 10 VDC	946-A4V-2D-2C0-175E
	60 - 500 (2.36-19.7)	Cable	4 - 20 mA 0 - 10 VDC	946-A4V-2D-2C0-380E

\* Standard target is 120 mm thick square of mild steel perpendicular to ultrasonic beam.

### SPECIFICATIONS

#### SENSING CHARACTERISTICS

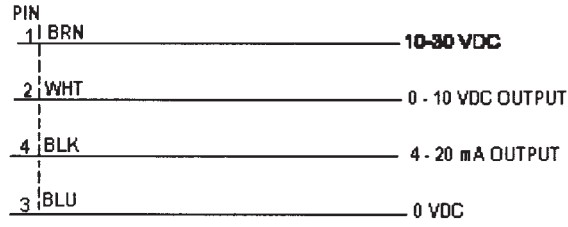
Catalog Listings	946-A4V-3D-2C0-65E	946-A4V-2D-2C0-85E	946-A4V-2D-2C0-175E	946-A4V-2D-2C0-380E
Max. Sensing Distance	6000 mm (236 in.)	4000 mm (157.5 in.)	2000 mm (78.74 in.)	500 mm (19.7 in.)
Min. Sensing Distance	800 mm (31.5 in.)	500 mm (19.7 in.)	200 mm (7.87 in.)	60 mm (2.36 in.)
Beam Angle	5°			
<b>POWER SUPPLY</b>				
Supply Voltage	10 - 30 VDC			
Supply Current	<33 mA without load			
Circuit Protection	Reverse polarity			
<b>OUTPUT CHARACTERISTICS</b>				
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			
Min. Load Resistance (VDC)	1000 Ohms (0 - 10 VDC Output)			
Max. Load Resistance (mA)	500 Ohms (4 - 20 mA Output)			
Slope of Output	Positive or Negative; Programmable with Probe Coded Plug			
Circuit Protection	Short Circuit			
<b>ENVIRONMENTAL</b>				
Operating Temperature	-25 to 75°C (-13 to 167°F)			
Storage Temperature	-40 to 85°C (-40 to 185°F)			
Sealing	IP 65			
<b>SPECIAL FEATURES</b>				
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			

# Ultrasonic Sensors

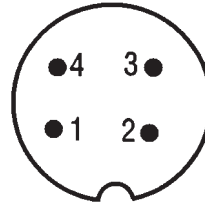
946 Series

## Teachable 30 mm Diameter Precision Analog Outputs

### WIRING DIAGRAM



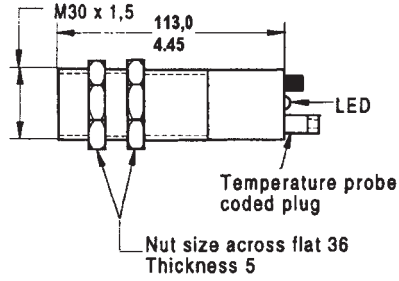
4-pin  
MICRO CONNECTOR  
(M12 x 1)



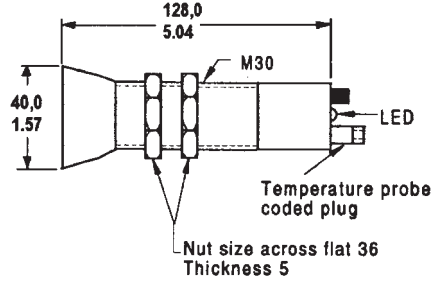
PIN	COLOR
1	BROWN
2	WHITE
3	BLUE
4	BLACK

### MOUNTING DIMENSIONS (For reference only)

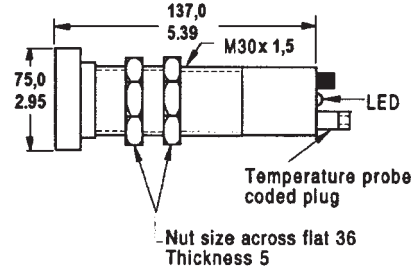
175E/380E



85E



65E



### ACCESSORIES

	Catalog Listing	Features
2 Meter cable with straight connector*	804000A09M020	Used for wiring to connector
2 Meter cable with right angle connector	804001A09M020	Used for wiring to connector

\*Supplied with sensor

Proximity