

# Ultrasonic Sensors


## Compact 18 mm Diameter Digital

940 Series

### FEATURES

- Sensing distance up to 1,5 meters
- 18 mm diameter housing
- IP 67 sealing
- High output current
- High power transducer
- Microprocessor controlled

### ORDER GUIDE

| Sensor Package Style   | Sensing Range* mm (in.)      | Digital Output | Termination     | Catalog Listing     |
|--|------------------------------|----------------|-----------------|---------------------|
| 18 mm dia.<br>PBTB Plastic<br> | 200 - 1500<br>(7.87 - 59.05) | PNP, N.O.      | Cable           | 940-F4Y-2D-001-180E |
|  |                              | NPN, N.O.      | Cable           | 940-F4Y-2D-002-180E |
|  |                              | PNP, N.O.      | Connector cable | 940-F4X-2D-001-180E |
|  |                              | NPN, N.O.      | Connector cable | 940-F4X-2D-002-180E |
|  | 150 - 700<br>(5.9 - 27.5)    | PNP, N.O.      | Cable           | 940-F4Y-2D-001-300E |
|  |                              | NPN, N.O.      | Cable           | 940-F4Y-2D-002-300E |
|  |                              | PNP, N.O.      | Connector cable | 940-F4X-2D-001-300E |
|  |                              | NPN, N.O.      | Connector cable | 940-F4X-2D-002-300E |

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

### SPECIFICATIONS

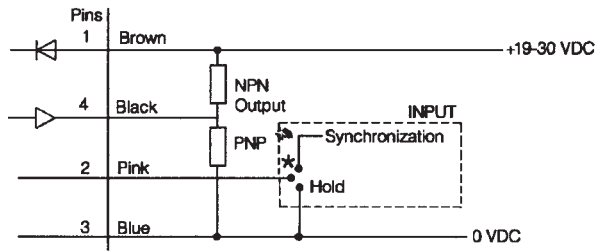
| Catalog Listings              | 940-F4Y-2D-001-180E<br>940-F4Y-2D-002-180E<br>940-F4X-2D-001-180E<br>940-F4X-2D-002-180E                                  | 940-F4Y-2D-001-300E<br>940-F4Y-2D-002-300E<br>940-F4X-2D-001-300E<br>940-F4X-2D-002-300E |
|-------------------------------|---|--|
| Max. Sensing Distance         | 1500 mm (59.05 in.)   | 700 mm (27.5 in.)  |
| Min. Sensing Distance         | 200 mm (7.87 in.)   | 150 mm (5.91 in.)  |
| Beam Angle                    | 8°  | 8°   |
| <b>POWER SUPPLY</b>           |   |  |
| Supply Voltage                | 19 - 30 VDC   |  |
| Supply Current                | <25 mA without load   | <35 mA without load  |
| Circuit Protection            | Reverse polarity  |  |
| <b>OUTPUT CHARACTERISTICS</b> |   |  |
| Load Current                  | 0 - 500 mA  |  |
| Switching Frequency           | 8 Hz  | 25 Hz  |
| Hysteresis                    | ~ 2% of setpoint  | ~ 2.5% of setpoint   |
| Repeatability                 | ± 1 mm  |  |
| Setpoint Adjustment           | 4-turn potentiometer  |  |
| Circuit Protection            | Short circuit   |  |
| <b>ENVIRONMENTAL</b>          |   |  |
| Operating Temperature         | -15 to 70°C (5 to 158°F)  |  |
| Storage Temperature           | -25 to 85°C (-13 to 185°F)  |  |
| Sealing                       | IP 67   |  |
| <b>SPECIAL FEATURES</b>       |   |  |
| Hold Input                    | Stops transmission and reception when input is connected to 0 VDC. Last output will be stored until input is disconnected |  |
| Synchronization Input         | Avoids mutual interference from several sensors by interconnecting the hold input from each sensor.                       |  |
| LED Indicator                 | Illuminates when sensor detects target  |  |

# Ultrasonic Sensors

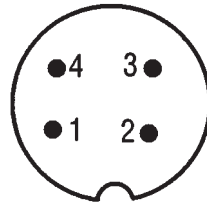
940 Series

## Compact 18 mm Diameter Digital

### WIRING DIAGRAM



940-F4X/Y-20-001/2-300E Versions only



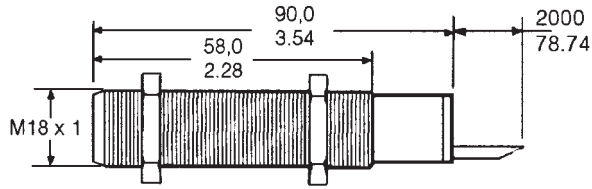
4-pin DC Micro (M12 x 1)

| Pin | Color |
|-----|-------|
| 1   | BRN   |
| 2   | PINK  |
| 3   | BLU   |
| 4   | BLK   |

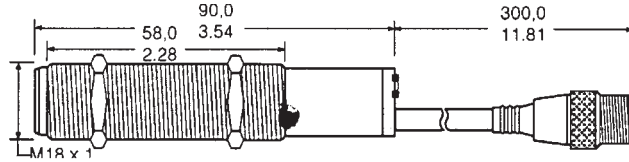
\*Normal operation with no connection

### MOUNTING DIMENSIONS (For reference only)

940-F4X/Y-20-001/2-180E



940-F4X/Y-2D-001/2-300E



### ACCESSORIES

|  | Catalog Listing | Feature   |
|--|-----------------|---|
| Mounting clamp                                   | 43178389-018    | Allows mounting to a flat surface                                 |
| Beam deflector                                   | 43192871-003    | Allows right angle mounting (Approx. dim. 50 x 170 mm)            |
| Focusing beam deflector                          | 43192871-004    | Reduces beam angle by approximately 1/2 (Approx. dim. 35 x 52 mm) |
| Straight connector w/o cable                     | 66195044-001    | Connector has screw terminals for wiring connection               |
| Right angle connector w/o cable                  | 66195045-001    | Connector has screw terminals for wiring connection               |
| 24 VDC Power supply, Relay output, 110 VAC input | FF-MADB24RB     | See page B102 for more information                                |
| 24 VDC Power supply, On/Off delay, 110 VAC input | FF-MADC24RB     | See page B102 for more information                                |

Proximity

# Ultrasonic Sensors


## 30 mm Diameter Analog

940 Series

### FEATURES

- Measuring range up to 2000 mm (78.74 in.)
- High repeatability

### ORDER GUIDE

| Sensor Package Style  | Sensing Range* mm (in.)    | Analog Output | Termination | Catalog Listing     |
|---|----------------------------|---------------|-------------|---------------------|
|  30 mm dia. Stainless Steel | 300 - 2000 (11.81 - 78.74) | 1.5 - 10 V    | Cable       | 940-A4Y-AD-1C0-130E |
|   | 150 - 1200 (5.90 - 47.24)  | 1.25 - 10 V   | Cable       | 940-A4Y-AD-1C0      |
|   |                            |               | Connector   | 940-A4V-AD-1C0      |
|   |                            |               |             |                     |

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

### SPECIFICATIONS

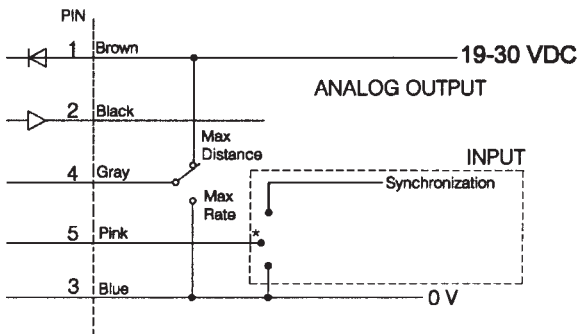
| Catalog Listings              | 940-A4Y-AD-1C0-130E  |                     | 940-A4Y-AD-1C0<br>940-A4V-AD-1C0 |                   |
|-------------------------------|--|---------------------|----------------------------------|-------------------|
|                               | Max. Range   | Max. Rate           | Max. Range                       | Max. Rate         |
| Max. Sensing Distance         | 2000 mm (78.74 in.)  | 1000 mm (39.37 in.) | 1200 mm (47.2 in.)               | 600 mm (23.6 in.) |
| Min. Sensing Distance         | 300 mm (11.8 in.)  |                     | 150 mm (5.91 in.)                |                   |
| Beam Angle                    | 8°   |                     | 10°                              |                   |
| <b>POWER SUPPLY</b>           |  |                     |                                  |                   |
| Supply Voltage                | 19 - 30 VDC  |                     |                                  |                   |
| Supply Current                | <20 mA without load  |                     |                                  |                   |
| Circuit Protection            | Reverse polarity   |                     |                                  |                   |
| <b>OUTPUT CHARACTERISTICS</b> |  |                     |                                  |                   |
| Load Current                  | 10 mA max.   |                     |                                  |                   |
| Switching Frequency           | 6 Hz   |                     | 11 Hz                            |                   |
| Repeatability                 | ±2 mm  |                     | ±1 mm                            |                   |
| Linearity                     | <0.2%  |                     |                                  |                   |
| Output Adjustment             | 4 Turn Potentiometer   |                     |                                  |                   |
| Output Mode                   | Max. Range or Max. Rate selected by wiring terminal connection   |                     |                                  |                   |
| Circuit Protection            | Short Circuit  |                     |                                  |                   |
| <b>ENVIRONMENTAL</b>          |  |                     |                                  |                   |
| Operating Temperature         | 0 to 50°C (32 to 122°F)  |                     |                                  |                   |
| Storage Temperature           | 0 to 70°C (32 to 158°F)  |                     |                                  |                   |
| Sealing                       | IP 65  |                     |                                  |                   |
| <b>SPECIAL FEATURES</b>       |  |                     |                                  |                   |
| Hold Input                    | Stops transmission and reception of sensor when input is connected to 0 VDC. Analog output would be zero.            |                     |                                  |                   |
| Synchronization Input         | Avoids mutual interference from several ultrasonic sensors (external synchronization unit required; see Accessories) |                     |                                  |                   |
| LED Indicator                 | Illuminates when sensor detects a target   |                     |                                  |                   |

# Ultrasonic Sensors

940 Series

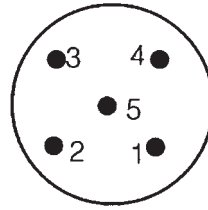
## 30 mm Diameter Analog

### WIRING DIAGRAM



\*Normal operation with connection +19-30 VDC

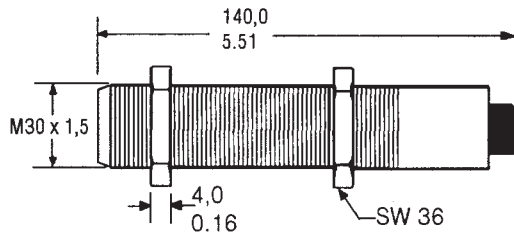
### CONNECTOR VERSION ONLY



| Pin | Color |
|-----|-------|
| 1   | BRN   |
| 2   | WHT   |
| 3   | BLU   |
| 4   | BLK   |
| 5   | GRAY  |

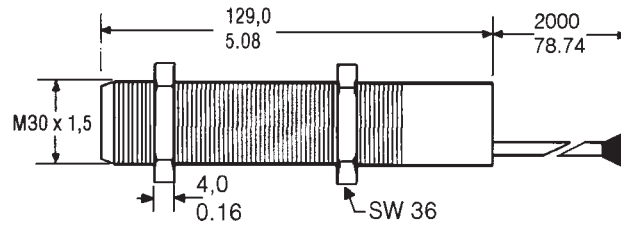
### MOUNTING DIMENSIONS (For reference only)

#### 940-A4V-AD-1C0



#### 940-A4Y-AD-1C0-130E

#### 940-A4Y-AD-1C0



### ACCESSORIES

|                                      | Catalog Listing | Feature  |
|--------------------------------------|-----------------|--|
| Mounting clamp, 30 mm sensor         | 43178389-030    | Allows mounting to a flat surface                      |
| Beam deflector                       | 43192871-001    | Allows right angle mounting (Approx. dim. 50 x 170 mm) |
| Focusing beam deflector              | 43192871-002    | Reduces beam angle by approximately 1/2                |
| Compact deflector                    | 66195116-001    | Allows right angle mounting (Approx. dim. 35 x 52 mm)  |
| 2 meter cable, Straight connector    | RKT5-612/2M     | Used for wiring to connector version                   |
| 5 meter cable, Straight connector    | RKT5-612/5M     | Used for wiring to connector version                   |
| 2 meter cable, Right angle connector | RKWT5-612/2M    | Used for wiring to connector version                   |
| 5 meter cable, Right angle connector | RKWT5-612/5M    | Used for wiring to connector version                   |
| Synchronization unit                 | 55000001        | Controls up to 100 sensors                             |

Proximity