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MINI-A PB Ultrasonic Transducer

SensComp's Series MINI-A electrostatic ultrasonic transducer system provides a complete sensor solution to simplify your product design and packaging.

Features

- 50 KHz Electrostatic Transducer with Integrated SMT Electronic Circuitry
- Ranges from 1" to 12", 6" to 20' or from 12" to 40'
- Analog Output from 0 to 5 VDC or from 0 to 10 VDC
- Independent Push-Button Settable Zero and Span Adjustment of Analog Output
- Range Window LED Indication
- Analog Output Temperature Compensated

Part No.

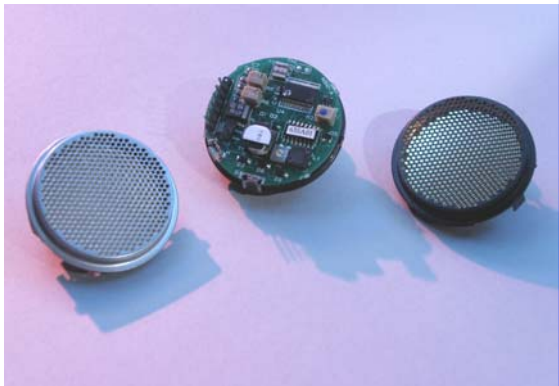
Part Numbers (PID#): MINI-A - Instrument Grade; MINI-AE - Environmental Grade; MINI-AO - Open Face

MINI-A	MINI-AE	MINI-AO	OUTPUT	RANGE
#616020	#616130	#616160	5VDC	1 - 12 inch
#616010	#616110	#616150	5VDC	0.5 - 20 feet
#616015	#616120	#616155	5VDC	1 - 40 feet
#616025	#616125	#616145	10VDC	1 - 12 inch
#616005	#616105	#616140	10VDC	0.5 - 20 feet
#616000	#616100	#616115	10VDC	1 - 40 feet

Benefits

- Self Contained Compact Design
- Can be triggered internally or Externally
- Excellent Receive Sensitivity
- Push Button Range Settings for Quick and Easy Set-up.

Specifications



Applications

Level Measurement, Proximity Detection, Presence Detection, Robotics, Educational Products

Description

The Series MINI-A provides a total system in a compact package, containing an ultra sensitive electrostatic transducer and the supporting circuitry to provide a 0 to +5 VDC (or 0 to +10 VDC) output with fully independent zero and span adjustments over the entire operating range of detecting a target from 1-12 inches, 6 " -20', or from 12" – 40' away. The MINI-A can be externally triggered, or can continually sense at a 10 Hz rate.

Typical Beam Pattern At 50 kHz

Beam Pattern

Note: dB normalized to on-axis response.
 Note: Curves are representative only. Individual responses may differ.

Series MINI-A Instrument Grade, Environmental Grade, and Open Face Specifications

Distance Ranges:

0.025 - 0.3 M.....0.15 - 6.10 M 0.3 -12.2 M
 (1.0 - 12 inches).....(0.5 -20 feet) (1.0 - 40 feet)

Accuracy (over entire range) ± 0.1%

(0.025-0.3 M range = ± 1.0%)

Beam Pattern See Graph (Typically 15° nominal)

Repetition Rate (astable) 10 Hz

May be externally triggered up to a 50 Hz rate

Output Voltage (Analog) 0 to 5 VDC
 (or 0 to 10 VDC)

Output Current (maximum)..... 5 ma

Output Response Time:

Analog output is filtered to the approximate formula:

$$V_{OUT} = 0.9 (V_{new \ value}) + 0.1(V_{past \ avg. \ value})$$

Specifications subject to change without notice

Power Requirements 8 to 24 VDC (for 5V output)

12 to 24 VDC (for 10V output)

(Maximum Current = 30 mA)

Operating Temperature -40 to +85° C

(-40 to 185° F)

Weight 17 grams (0.6 oz)

Dimensions

Thickness 0.950 inch

Diameter..... 1.700 inch

Mounting Diameter..... 1.525 inch

Use RTV silicone or edge clips to secure in place

Housing, Standard Finish

Instrument Grade Flat Black Cold Rolled Steel

Environmental Grade..... 304 Stainless Steel

Open Face..... Parylene Coated 304
 Stainless Steel

General Installation Procedures

1. Always Mount the MINI-A in a suitable dry location. The MINI-A is designed to be used in indoors or protected environments only. The MINI-AE and the MINI-AO are designed for harsher environments and higher humidity conditions. Excessive moisture in the circuit board (and MINI-A transducer) will result in damage and improper operation, and will void all warranties.
2. Mount the MINI-A as far off the ground as practical, in a location where environmental interference sources are minimized (examples are EMI sources, air nozzles, excessive air turbulence, etc.)
3. If necessary, adjust the gain to the minimum setting necessary to insure reliable target detection (excessive gain can result in false detections).
4. As supplied the MINI-A has been calibrated and should function without further calibration. See manual for factory settings.

Calibration Procedures (if required)

1. Apply DC power (see requirements above) to the MINI-A (connector header pin 1)
2. Allow several minutes warm-up time for the MINI-A to reach operating temperature before calibrating the unit.
3. Connect a DC voltmeter's (DVM) Plus (+) lead to the Analog Output (pin 6) and the DVM Minus (-) lead to Common (pin2).
4. Cover the sensor face tightly with a stiff piece of flat paper. Adjust the "SCALE Adjust" potentiometer until a +5.0 VDC (or +10.0 VDC) reading is obtained.
5. Place the target at the desired distance desired for the full scale voltage output. This can be either the minimum range or the maximum range between the sensor and the target. Depress and hold the "MAX VOLT RANGE SET" push button, and wait for the LED indicator to stop flashing and the transducer generates a "chirp" sound before releasing. The MINI-A is now calibrated to your desired target distance for full scale analog voltage output.
6. Place the target at the desired distance desired for the zero voltage output. This can be either the minimum range or the maximum range between the sensor and the target. Depress and hold the "MIN VOLT RANGE SET" push button, and wait for the LED indicator to stop flashing and the transducer generates a "chirp" sound before releasing. The MINI-A is now calibrated to your desired target distance for zero analog voltage output.
7. Gain Control: The MINI-S gain was pre-set at the factory for optimum performance. To re-calibrate the "GAIN Set" potentiometer, place the target at the maximum desired detection distance. Rotate the GAIN potentiometer fully counter-clockwise (CCW). Slowly rotate the GAIN control clockwise (CW) until detection occurs. Rotate the Gain control CW an additional 1/16 turn.

Note: Always calibrate the GAIN control for minimum gain required for reliable detection. Excessive gain may result in false target detection.

System Wiring Information

- Pin 1** – Power Supply -----Requires a +8 to +24 VDC regulated power source with a 30 mA current capacity
 (the 0 to 10 VDC analog output requires a +12 to +24 VDC power source).
- Pin 2** – Common-----Common Return for DC power supply, analog output, and clock signals.
- Pin 3** – External Trigger -----Accepts TTL compatible logic level clock signals (0-5 VDC).
- Pin 4** – Trigger Enable -----Allows the MINI-A to accept an external trigger signal. Enable by connecting this pin (pin 4) to common (pin 2).
- Pin 5** – Clock Output -----Delivers a TTL compatible echo return clock signal (0-5 VDC). This signal goes high at the start of a cycle, and returns to a low state when the returned echo from a target is detected.
- Pin 6** – Analog Output -----0 to +5 VDC (or 0 to +10 VDC) analog measurement output.
- Pin 7** – no connection