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# MINI-S PB Ultrasonic Transducer

SensComp's Series MINI-S 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
- Two (2) Independent Push-button Settable Digital Outputs (Outputs are NPN Open Collector)
- Outputs and Range LED Indications
- Ranges from 1" to 12", 6" to 20', or from 12" to 40'
- Temperature Compensated Switch Point Settings

## Part No.

Part Numbers (PID#): MINI-S - Instrument Grade;  
 MINI-SE - Environmental Grade; MINI-SO - Open Face

MINI-S	MINI-SE	MINI-SO	RANGE
PID#616210	PID#616310	PID#616350	1 - 12 inch
PID#616200	PID#616300	PID#616340	0.5 - 20 feet
PID#616205	PID#616305	PID#616345	1 - 40 feet

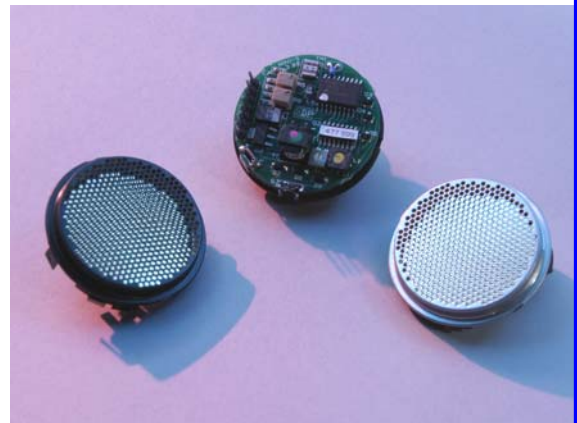
## Benefits

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

## Applications

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

## Specifications



## Description

The Series Mini-S provides a total system in a compact package, containing an ultra sensitive electrostatic transducer and supporting circuitry to provide two (2) independently outputs, each output settable to indicate the detection of a target at a distance between 1 inch to 12 inches, 6 inches to 20 feet, or between 12 inches to 40 feet away. The Mini-S can be externally triggered, or continually sense at a 10 Hz rate. The MINI-S is insensitive to temperature, humidity, and pressure changes. It can also withstand high audio and EMI/RFI levels.

Typical Beam Pattern At 50 kHz

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

**Beam Pattern**

**Series Mini-S 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 50 Hz

**Outputs** (NPN Digital Open Collector)..... 2  
Maximum Output Voltage..... 40 VDC  
Maximum Output Current..... 600 ma  
Maximum Power Dissipation..... 330 mW

**Output Response Time:**

On (goes high) – three (3) consecutive target hits  
Off (goes low) – three (3) consecutive misses

**Power Requirements** ..... 8 to 24 VDC  
(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

Specifications subject to change without notice

**General Installation Procedures**

1. Always Mount the Mini-S in a suitable dry location. The Mini-S is designed to be used in indoors or protected environments only. Excessive moisture in the circuit board and transducer will result in damage and improper operation, and will void all warranties.
2. Mount the Mini-S as far off the ground as practical.
3. Adjust the gain to the Minimum setting necessary to insure reliable target detection (excessive gain can result in false detections).
4. Mount the Mini-S in a location where environmental interference sources are Minimized (examples are EMI sources, air nozzles, excessive air turbulence, etc.)
5. The two (2) NPN open collector digital outputs require pull-up resistors to an external positive power source of less than 40 VDC (typically 4700 ohms when connected to +5 VDC for interfacing to TTL circuits).
6. The Trigger Enable and External Trigger pins can be left un-connected when the External trigger option is not desired,

**Calibration Procedures**

1. Apply DC power ( +8 to +24 VDC) to the MINI-S (connector header pin 1)
2. Allow several minutes warm-up time the MINI-S to reach operating temperature before calibrating the unit.
3. Setting Output 1: Place the target at the desired detection distance from the face of the MINI-S. Depress the “RANGE SET 1” push button, and wait for the LED indicator to stop flashing and the sensor’s transducer generates a “chirp” sound before releasing. The MINI-S is now calibrated to your desired target distance for Output 1.
4. Setting Output 2: Place the target at the desired detection distance from the face of the MINI-S. Depress the “RANGE SET 2” push button, and wait for the LED indicator to stop flashing and the sensor’s transducer generates a “chirp” sound before releasing. The MINI-S is now calibrated to your desired target distance for Output 2.
5. Gain Control: The MINI-S gain was pre-set at the factory for optimum performance. To re-calibrate the GAIN potentiometer setting, 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.

**Pin 2** – Common -----Return for DC power supply, TTL outputs and clock signals.

**Pin 3** – External Trigger --Accepts TTL compatible logic level clock signals (0-5 VDC). Trigger occurs on the Low to High logic transition.

**Pin 4** – Trigger Enable----Allows the MINI-S to accept an external trigger signal. Enable by connecting pin 4 to pin 2.

**Pin 5** – Clock Output -----Delivers a TTL compatible 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** – NPN Output 1 -----This NPN open collector output turns on and off when a target is detected (on) or missing (off) as set by the adjusted Range Control 1 setting.

**Pin 7** – NPN Output 2-----This NPN open collector output turns on and off when a target is detected (on) or missing (off) as set by the adjusted Range Control 2 setting.

NPN open collector outputs are continuously energized during the detection period. The outputs switch on (NPN low output to common) when the sensor detects three consecutive target present at the range control set point. The outputs switch off (open collector output) when the sensor detects three consecutive missing targets at the range control set point.