Development, Calibration, and Production of Fine Infrasound Sensors

Chaparral Physics

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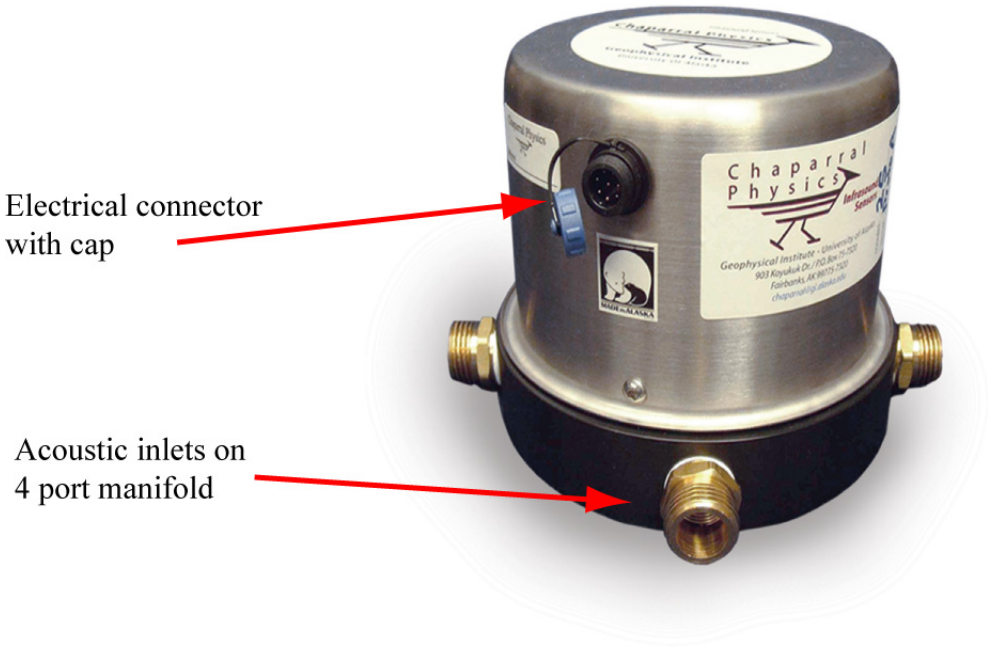
Model 20 / 24 Infrasound Sensor



Chaparral Physics sensors combine rugged construction with wide bandwidth and low noise to ensure accurate measurements in the most demanding of environments. They have no need for altitude adjustments, and are carefully designed to reduce the effect of environmental temperature variations and mechanical vibrations. From the Ross ice-shelf in Antarctica through the rain forests of Central America to Alaska's tundra, Chaparral Physics microphones have proven their reliability and value as the finest infrasound measuring instruments in the world.

Features

Some of the important features which give our sensors an advantage in real world installations include:

- Robust physical build quality with stainless steel and sealed electronics
- Built in manifold for connecting to a noise reduction array (M24 only)
- High dynamic range
- Low noise floor
- Low power consumption
- Differential output
- 11 octave bandwidth that includes the low audio spectrum (0.10 Hz to 200 Hz)
- Low Cost

The Model 20 and 24 are an excellent choice for any application requiring a high resolution infrasound sensor in a small form factor at a low cost. It excels at accurately recording signals which span the low audio/infrasound boundary, such as explosions and avalanches, and makes an excellent sensor for campaign style experiments because of its rugged construction. If your application requires a high quality infrasound sensor, the Chaparral Physics Model 20/24 provides you with a compact, robust solution with excellent value.

These sensors and their technology are intended for the sole use of the purchaser in the United States of America. The purchaser is hereby advised that these sensors are controlled under the International Traffic in Arms Regulations (22 CFR 120-130). These commodities and the related technology have been designated as defense articles and significant military equipment under Category XI (b) of the United States Munitions List (22 CFR 121.1). Transfer of these commodities or associated technology to a non-U.S. destination or to a non-U.S. person in the U.S. or abroad, except as specifically exempted in the ITAR, requires an export license issued by the U.S. Department of State. It is the responsibility of the purchaser to insure compliance with all applicable U.S. export regulations.

SPECIFICATIONS

Nominal Sensitivity:

0.4 volts/Pa @ 1 Hz, 90 Pa full scale range

Individual sensor's calibrated value is +/-5% from nominal. Calibration value is traceable to the Los Alamos National Laboratory (LANL) calibration chamber.

Output:

Output type	Differential
Maximum	36 volts peak-to-peak (signal+ to signal-) ±9 volt max, signal to ground
Frequency Response	Flat to within +0, -3 dB from 0.1 Hz to 200 Hz Flat to within +0, -0.5 dB from 0.3 Hz to 50 Hz
Self noise	Less then 0.63μPa^2/Hz @ 1 Hz (-62dB Pa^2/Hz, rel to 1 Pa) Less than 3 mPa RMS 0.1 to 40 Hz Less than 0.8mPa RMS 0.5 to 2 Hz
Dynamic range	101dB low gain (@ 0.8mPa RMS self noise)
Output Impedance	150Ω non-reactive (recommended load > 10 kΩ) (Recommend less than 10,000pf capacitive loading)
Short circuit protected	signal+ to signal– and signal to ground

Power Requirements:

DC Source	12 volts, (9-18 volts) DC, reverse voltage protected.
Current Drain	Less than 40 ma @ 12 v

Physical:	Sensor will function in any position or attitude. Sealed to IP-67 with acoustic inlets sealed and mating electrical connector or cap installed
Operating Temperature	-40º C to +65º C
Humidity	95% (non-condensing)
Dimensions M24	5.5" (14 cm) maximum height, 9" (23 cm) maximum diameter
Weight M24	5.3 lbs (2.4 kg), for 4-port version
Std Acoustic inlets M24	4 ports (maximum 12), male, Garden-Hose-Thread.
Dimensions M20	7" (18 cm) maximum height w/ legs, 5.75" (14.6 cm) w/o legs, 7" (18 cm) maximum diameter
Weight M20	3.25 lbs (1.5 kg) w/legs, 2.75 lbs (1.25 kg) w/o legs
Std Acoustic inlet M20	1 port, right angle, male, Garden-Hose-Thread.

We reserve the right to modify and improve the sensor's performance.

Standard OPTIONS

Option	Approximate Price
On M24 - 2 to 12 port custom manifold. Ports can be together or evenly spaced.	There is a fixed setup charge of $200 per order plus a per port fee of $25 for each port over four.
On M20 – Straight Port	A straight port can be installed instead of the standard right angle port. This makes the sensor w/o legs slightly smaller and can make the routing of hoses easier when in a enclosure.
Plastic Connector	(-$50 per sensor) In a fixed installation the ruggedness of the Mil. Spec. connector is not required.
"Volcano Mod"	(no extra charge) The V mod changes several items inside the sensor and reduces the sensitivity to maximize the dynamic range. For the details of the differences see the M25V manual on the website.
Custom Sensitivity	(no extra charge) Sensitivity can be set to any value requested by the user. Standard range is 0.05 to 5 V/Pa. A value outside the standard range may result in a per sensor charge.
Pelican Shipping Box	Sensors can be shipped in a reusable Pelican case. Inquire for details and pricing.

Chaparral Physics is able to customize the sensor to your needs. Please inquire about other modifications to make the sensor best fit your application.