

Specifications for

AirSonic™ Flex –

Quick Install Mounting

Ultrasonic Measurement of Gas Turbine Intake Air Mass Flow Rate

Operations and Performance

Duct Sizes

- 3 - 20 ft sound pulse flight path

Principle of Measurement

- Air mass flow rate =
air mass flow rate per unit area
x duct area x duct factor
- Air mass flow rate per unit area =
air speed x air density
- Air speed: calculated from sound pulse
flight times
- Air density: calculated from sound pulse
flight times and physical sensor readings
- Duct area: calculated from duct survey
- Duct factor: calculated from CFD analysis

Ranges

- Air speed: 0 to 150 ft/s
- Pressure: 12 to 16 psia
- Relative humidity: 0 to 100% non-
condensing
- Temperature: -22 to +176 °F



Update Interval

- Less than 0.5 second for typical gas turbine
duct sizes

Accuracy of Air Mass Flow Rate Measurement

- Custom calculation based upon duct
geometry and air speed
- Typically less than 0.5% total uncertainty for
air speed
- Typically less than 1.0% total uncertainty for
air mass flow rate

Data Communications

AIRSONIC™ Data Server accessible over LAN/WLAN from supplied Data Client. One data client connection is allowed per system. All signals can be interrogated from Data Client:

- Air density
- Air mass flow rate per unit area
- Air mass flow rate
- Air speed
- Flight times
- Noise levels
- Sonic velocity

Ultrasonic Probes

Material:

- Probe Housing: Aluminum
- Transducers: Aluminum
- Mounting U bracket: 316 SS
- Mounting Tube: 316 SS

Weight: 2 lbs ea.

Size: Dia. 4.75" x 7 ¼" long

Max Protrusion (Interior of Inlet Duct):
4" Maximum

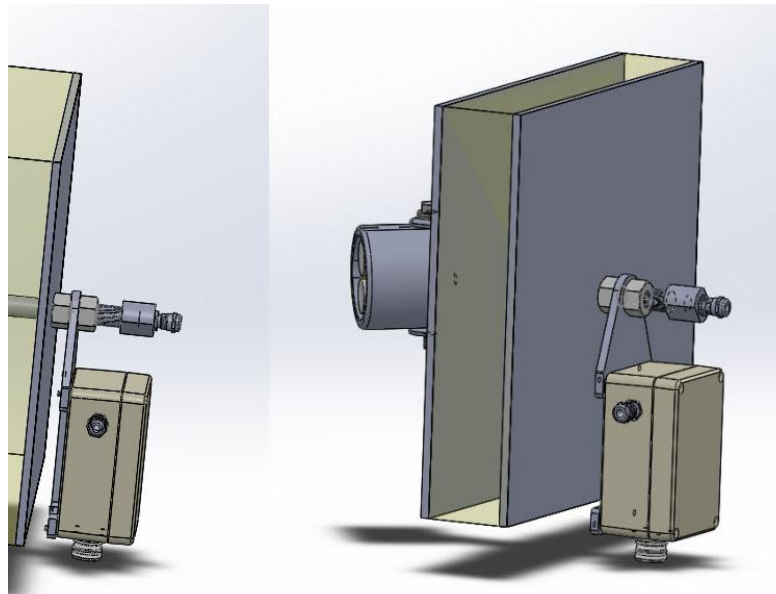
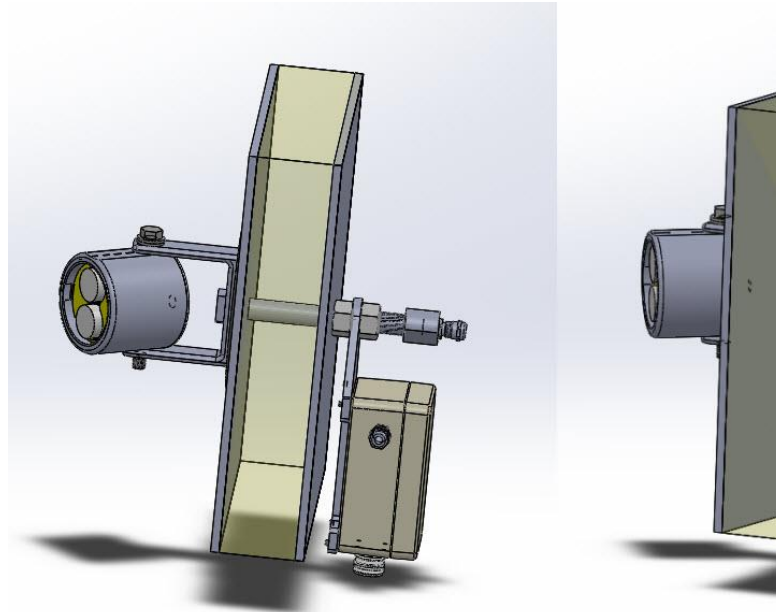
Max Protrusion (Exterior of Inlet Duct):
4" Maximum

Environmental Specification

- NEMA4 (IP65)
- -35°C to 60°C (-31°F to 140°F)
- Max Inlet Duct Pressure 20" H₂O

Optional Physical Sensors

- Static Pressure (800 – 1100 mbar, ± 1 mbar)
- Temperature (-30 to +70 °C, ± 0.5 °C)
- Relative Humidity (0 to 100%, ± 2%)





Control Box

Dimensions

Main Enclosure

Weight 82 lb

Size (H x W x D): 24" x 24" x 8"

Enclosure

- 14 ga. Steel, solid single door, flush-mount.
- Finish: ANSI 61 gray.
- UL 508A Listed; Type 4, 12; File No. E61997
- NEMA/EEMAC Type 4, 12, 13
- CSA, File No. 42186: Type 4, 12
- VDE IP66
- IEC 60529, IP66



Power Supplies

- 110 – 120 VAC, 60 Hz Standard
- 220 – 240 VAC, 50 Hz Optional

Power Consumption

< 10 amps

Operating Temperature

-30°C to 50°C (-22°F to 122°F)

Storage Temperature

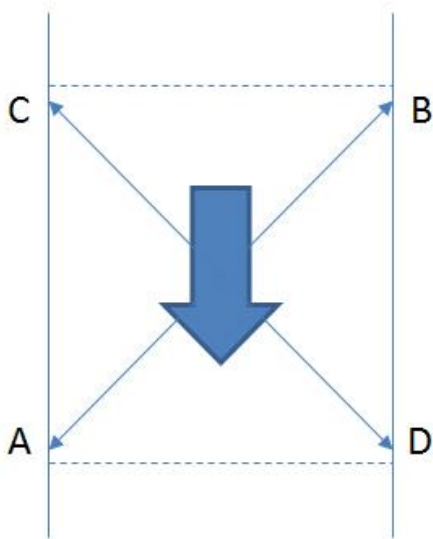
-55°C to 75°C (-67°F to 167°F)

Transducer Cables

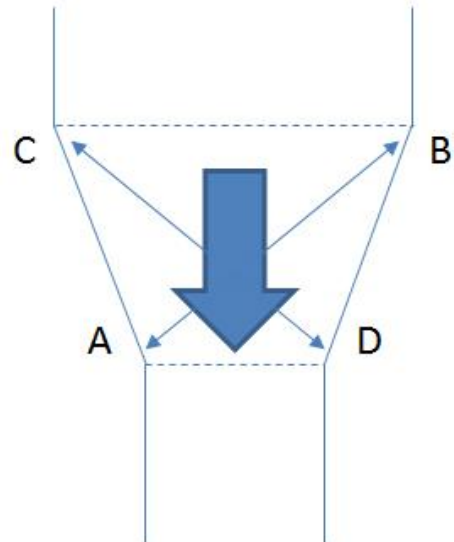
4 pair, Individual & overall shielded

Best Probe Locations For Different Duct Geometries

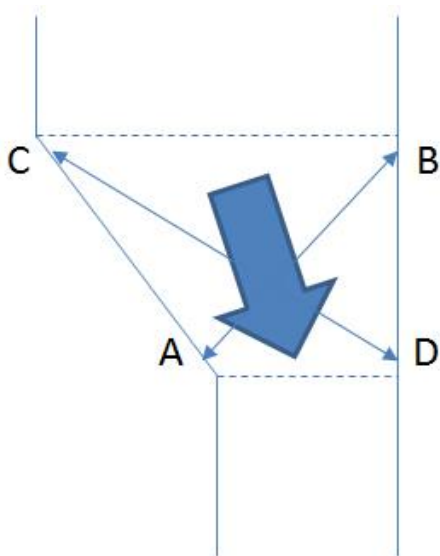
Rectangular



Symmetric Trapezium



Asymmetric Trapezium



Final locations for probes is always subject to local constraints (support girders, seams, wall thickness), therefore pre-installation photographic survey of duct interior and exterior is always required.