



Series 160F Straight Pitot Tubes

Installation and Operating Instructions

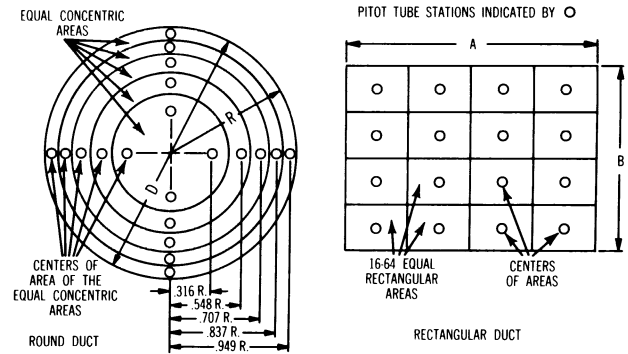
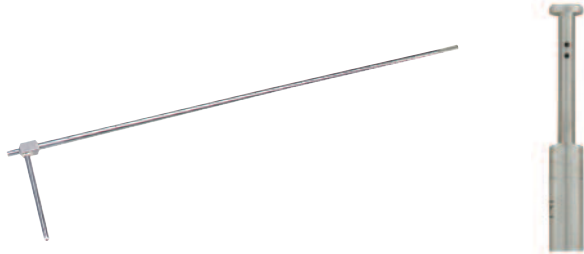


FIG. 4 – TRAVERSE ON ROUND AND SQUARE DUCT AREAS

Series 160F Pitot Tubes are designed to meet the need of the environmental testing field for an inexpensive, yet accurate and reliable way to measure the flow of air or gas streams.

For maximum accuracy of $\pm 2\%$, as in laboratory applications, care is required and the following recommendations should be followed.

1. Duct diameter should be 4" or larger.
2. Point **total pressure** opening upstream facing flow, and **static pressure** opening downstream pointing in the direction of the flow. The faces of both openings must be perpendicular to the airflow.
3. Make an accurate traverse per drawings; calculate the velocities at each point and average them.
4. Take readings in a smooth, straight duct section a minimum of 10-15 duct diameters in length upstream and 5 diameters downstream from the pitot tube.
5. Provide an egg-crate type straightener upstream from the pitot tube for best performance.

TAKING AIR VELOCITY READINGS

To measure air velocity with a Series 160F Pitot Tube, make a 0.35" opening in duct. Connect tubing from total pressure port or port facing flow to high pressure side of manometer, and from static pressure port or port facing perpendicular to flow to the low pressure side. If reading is negative, reverse connections.

Make a series of readings traversing the duct in horizontal and vertical planes. Using velocity pressures recorded at each location, calculate velocities and average them for final velocity value.

SPECIFICATIONS

Wetted Material: 304 SS.

Accuracy: $\pm 2\%$ FS, 0 to 9000 FPM (45 M/s).

K-Factor: 0.81.

Temperature Limit: 1500°F (815°C).

Process Connections: 1/4" OD.

Weight: 4.3 oz (122 g).

CALCULATING VELOCITY

$$\text{Air Velocity} = 1096.2 (C_p) \sqrt{\frac{P_v}{D}}$$

where:

P_v = Sensed pressure difference (velocity pressure)
in inches of water column

D = Air density in lbs./ft.³ (dry air = .075)

C_p = Pitot tube coefficient: 0.81

$$\text{Air Density} = 1.325 \times \frac{P_B}{T}$$

P_B = Barometric pressure in inches of mercury

T = Absolute Temperature (Indicated Temperature in °F plus 460)

Flow in cubic feet per minute equals duct cross sectional area in square feet x air velocity in feet per minute.

With dry air at 29.9 inches of mercury, air velocity can be read directly from temperature correction charts on reverse.

