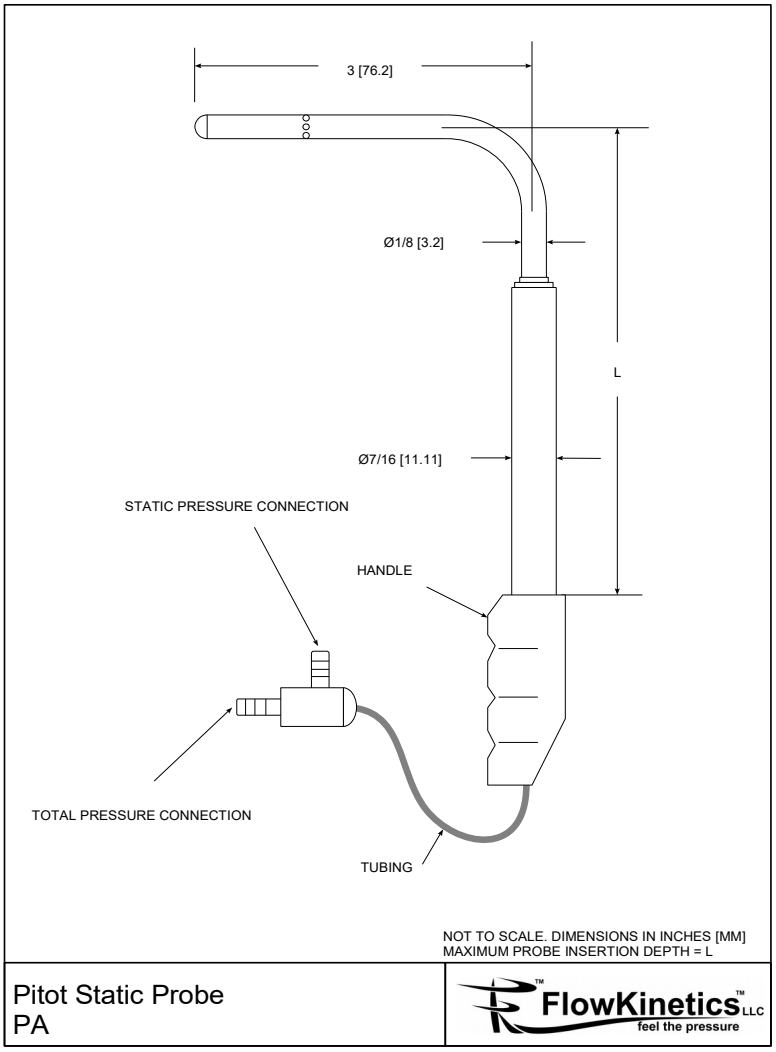
PA Pitot-Static Probe

Operating Instructions:

- To use the Pitot first extend the tip by gently pulling and twisting it slowly back and forth until it engages with the end of the first telescoping section. After extending the tip extend the rest of the sections until the desired length and rotate them until the tip is aligned with the grips of the handle. When the Pitot is inserted into the duct you can use the grip as a guide for the tip orientation.
- Measure in straight duct sections that are at least 1.5 diameters upstream and 8.5 diameters downstream of any duct disturbance such as elbows and meshes.
- Duct diameter should be at least 30 times the diameter of the probe tip. Minimum recommended duct diameter is 95 mm (3.8 inches). Smaller ducts will interfere with the dynamic pressure readings.
- Keep probe head aligned within 15 degrees of the flow direction. Errors in dynamic pressure readings will be less than 0.5% up to 12 degrees and increase to 2% at 15 degrees.
- Pitot can be used with insertion lengths from 8.9 to 35.7 inches (22.5 to 90.7 cm).
- Always extend the tip to its full length of 3 inches for maximum accuracy.
- When retracting or extending the telescoping sections make sure that the rubber tubing moves freely through the opening at the bottom of the handle.



Pitot Static Probe
PA

FlowKinetics™ LLC
feel the pressure

- The static pressure port in the connector is marked S and the total pressure port is marked T.
- Pitot tube has a flow coefficient (*K*) of 1.0 and requires no calibration.
- Pitot tube is rated to 200°F (93°C).

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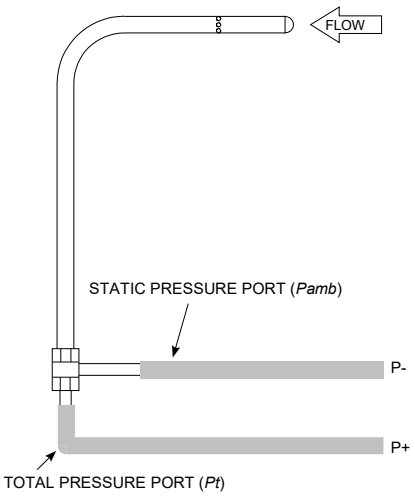
Measuring standard velocity

You will need a differential manometer only.

Using this method you assume that the temperature and pressure in the test area are at standard conditions where Pamb=14.696psi (101325 Pa), Temp=70ºF (21.1ºC) and RH=0%.

Connect the Pitot static pressure port to the low pressure port (P-) of the differential manometer. The Pitot stagnation pressure port should be connected to the high pressure (P+) port on the differential manometer.



Standard velocity in m/sec is calculated using

$$V = \sqrt{\frac{2 \cdot \Delta P}{density}}$$

where

density = 1.2 kg/m^3 for standard air

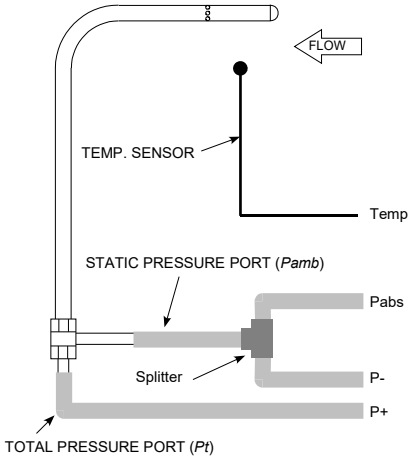
ΔP is the differential pressure reading from the manometer in Pascals.

If you are using a FlowKinetics manometer the velocity is calculated automatically.

Measuring actual velocity

You will need a differential pressure manometer, an absolute pressure manometer and a temperature meter.

Using a splitter connect the Pitot static pressure port to the low pressure port (P-) of the differential manometer and the absolute pressure port (Pabs) of the absolute manometer. The Pitot stagnation pressure port should be connected to the high pressure (P+) port on the differential manometer. This way you can measure the differential pressure and the static pressure simultaneously. Also insert the temperature sensor into the flow.



Actual velocity in m/sec is calculated using

$$V = \sqrt{\frac{2 \cdot \Delta P}{density}}$$

where

ΔP is the differential pressure reading from the manometer in Pascals.

$$density = \frac{Pabs}{R \cdot (Temp + 273.15)} \text{ in kg/m}^3$$

Temp is the temperature of the flow in Celsius.

R is the gas constant. $R = 287.026 \frac{joule}{kg \cdot Kelvin}$ for air.

Pabs is the static pressure measured with the absolute pressure manometer in Pascals.

If you are using a FlowKinetics FKT series manometer the velocity is calculated and corrected automatically for temperature, ambient pressure, humidity and gas type.

Limitations of Usage and Cautions

FlowKinetics™ LLC's products including, but not limited to, instruments, sensors, probes and accessories are not "intrinsically safe", and must not be used in dangerous or hazardous areas. Servicing of these instruments incorporating battery changing must only occur in a safe area. Use of the FKS series may require working in a hazardous environment. Necessary safety precautions must be followed.

FlowKinetics™ LLC's products are not authorized for use as any component in a life support system or device or as component of an aircraft's on board flight system. Life support systems or devices are defined as any system that can sustain, monitor or support life.

Any attempts to service or modify or alter the product in any way, will void the warranty and will negate any right of claim against FlowKinetics™ LLC, relating to any liability in respect of the product.