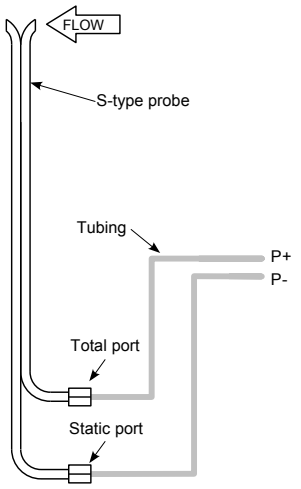
FlowKinetics™ LLC
feel the pressure

S-Type Pitot Tube

Operating Instructions

- Duct diameter should be 4 inches or more.
- Take readings in a smooth and straight section of the duct. The section should be 1.5 duct diameters upstream and 8.5 duct diameters downstream of any disturbances. Use a flow straightener upstream of the Pitot tube if possible.
- Pitot tube has a flow coefficient, or correction factor, of K = 0.84.
- Probe is rated to 1500°F (815°C).
- If you use any of FlowKinetics instruments the velocity is automatically calculated.
- As an approximation within 5% mean velocity in the duct corresponds to 90% of the velocity measured at the center of duct.
  $V_{mean} = 0.9 \cdot V_{center}$

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

Standard velocity in m/sec is calculated using

$V = K \cdot \sqrt{\frac{2 \cdot \Delta P}{density}}$ where density = 1.2 kg/m^3 for standard air

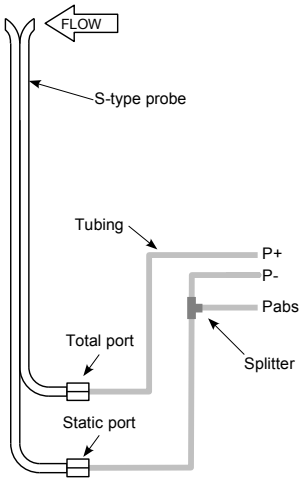
ΔP is the differential pressure reading from the manometer in Pascals.

K is the Pitot flow coefficient (0.84)

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 static pressure port to the low pressure port (P-) of the differential manometer and the absolute pressure port (Pabs) of the absolute manometer. The 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

$V = K \cdot \sqrt{\frac{2 \cdot \Delta P}{density}}$ where $density = \frac{Pabs + (1 - K^2) \cdot \Delta P}{R \cdot (Temp + 273.15)}$

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

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 reading from the absolute pressure manometer in Pascals.

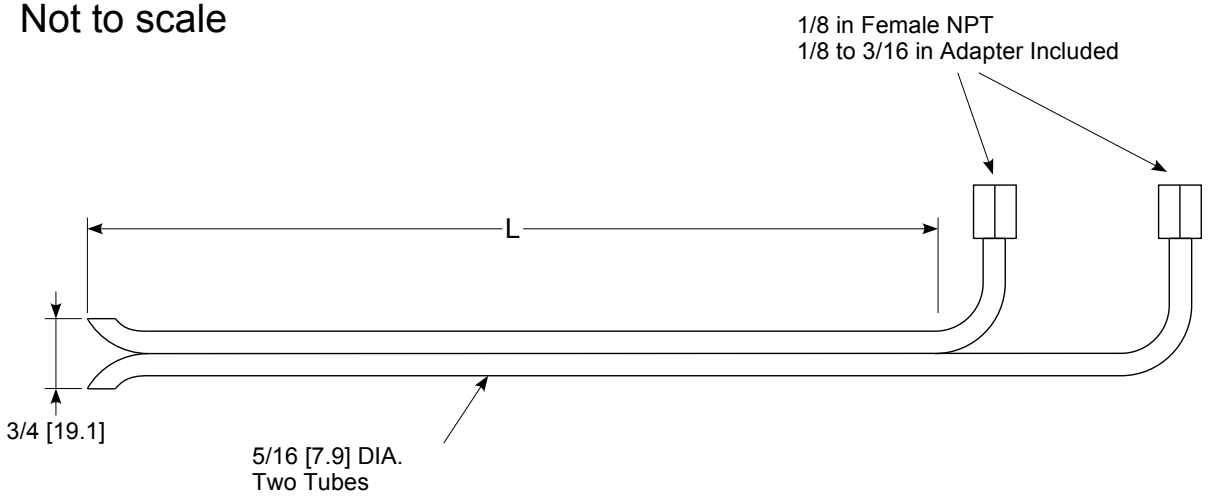
K is the Pitot flow coefficient (0.84)

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

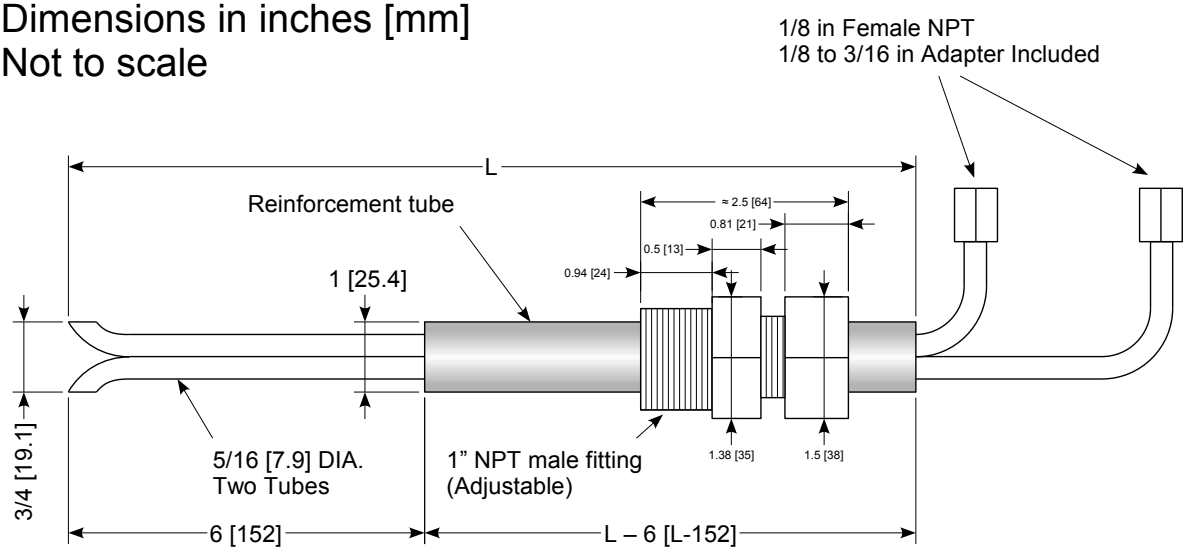
FlowKinetics™ LLC • 528 Helena Street, Bryan, TX 77801, USA • www.flowkinetics.com • inform@flowkinetics.com • Tel/Fax: USA-(979) 680-0659

General Dimensions

S18 to S72
L = insertion length
Dimensions in inches [mm]
Not to scale



S18R to S72R
L = insertion length
Dimensions in inches [mm]
Not to scale



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 FlowKineticsTM LLC, relating to any liability in respect of the product.