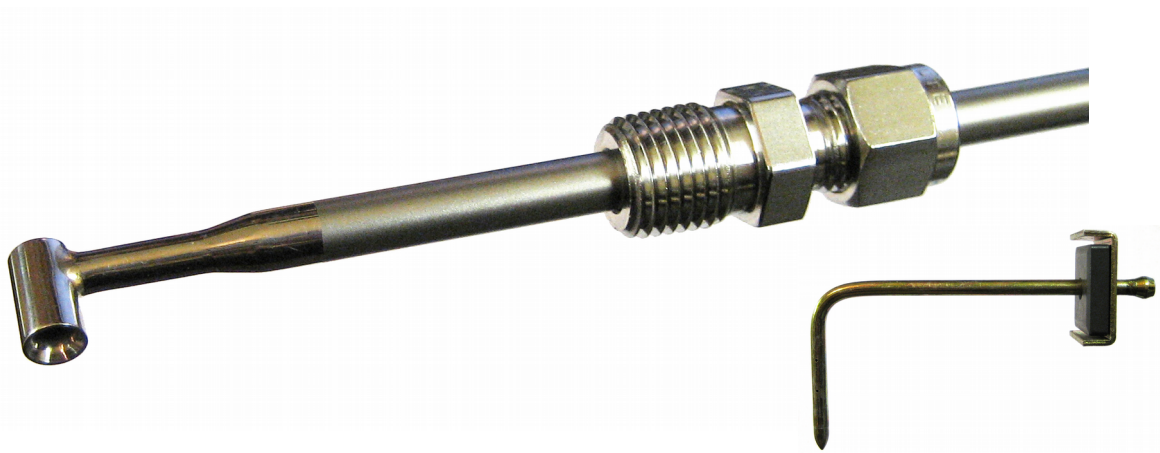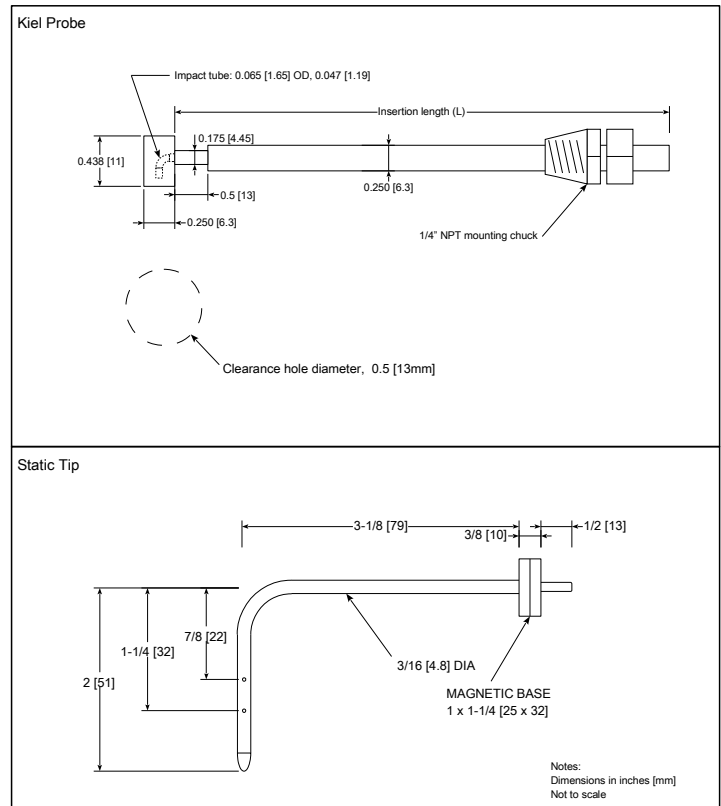## Operating Instructions:

- 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. Minimum recommended duct diameter is 191 mm (7.5 inches). Smaller ducts will interfere with the dynamic pressure readings.

- Kiel probes are total pressure probes designed to measure speed where the direction of flow changes considerably during testing.

- To measure the dynamic pressure a static tip (included) or a wall tap must be used with the Kiel probe.

- This type of probe experiences very low sensitivity to turbulence, Reynolds number and Mach number.

- The Kiel probe has a flow coefficient (K) of 1.0 and requires no calibration.

- Temperature rating: 900°F (482°C) if using a mounting chuck with a stainless steel ferrule; 400°F (204°C) if using a Teflon ferrule.

- Flow yaw / pitch range: +/-49º.

Kiel Probe

Impact tube: 0.065 [1.65] OD, 0.047 [1.19]

Insertion length (L)

0.438 [11]

0.175 [4.45]

0.250 [6.3]

0.5 [13]

0.250 [6.3]

1/4" NPT mounting chuck

Clearance hole diameter, 0.5 [13mm]

Static Tip

3-1/8 [79]

3/8 [10]

1/2 [13]

7/8 [22]

1-1/4 [32]

2 [51]

3/16 [4.8] DIA

MAGNETIC BASE
1 x 1-1/4 [25 x 32]

Notes:
Dimensions in inches [mm]
Not to scale

Measuring standard speed

You will need a simple differential manometer. 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 tip / wall tap port to the low pressure port (P-) of the differential manometer. The Kiel port should be connected to the high pressure (P+) port on the differential manometer.

Standard speed in m/sec is calculated using

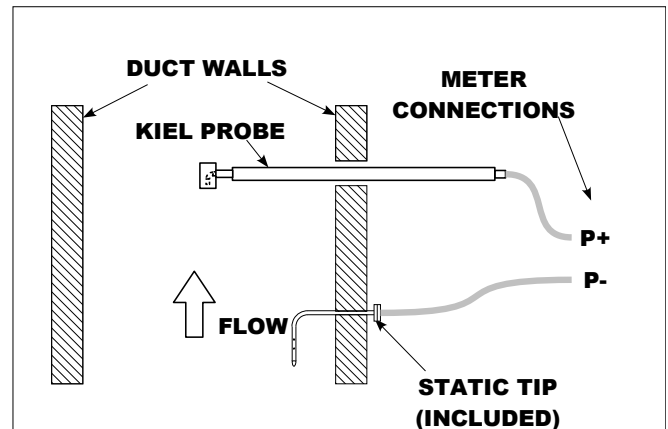$$V = K \cdot \sqrt{\frac{2 \cdot \Delta P}{density}}$$

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 (1.0)

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

Measuring actual speed

To obtain the actual speed you will need a differential and an absolute pressure manometer. You will also need a way to measure the temperature of the flow being tested.

Using a splitter connect the static tip / wall tap port to the low pressure port (P-) of the differential manometer and the absolute pressure port (Pabs) of the absolute manometer. The Kiel 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 speed in m/sec is calculated using

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

where

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

$$density = \frac{Pabs + (1 - K^2) \cdot \Delta P}{R \cdot (Temp + 273.15)} \text{ in kg/m}^3$$

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.

K is the Pitot flow coefficient (1.0)

If **you are using a FlowKinetics FKT series manometer the speed is calculated and corrected automatically for temperature, ambient pressure, humidity and gas type.**
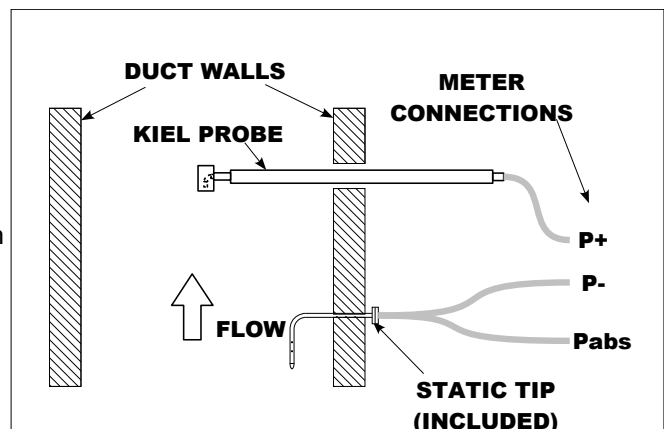
Limitations of Usage and Cautions

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

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