

AMP025 CENTER-AVERAGING FLOW PROBE KIT

APPLICATION

Ruskin model AMP025 was developed to satisfy the requirement for an accurate center-averaging, flow probe for use in spiral duct applications. The AMP025 installs in a slot cut in the existing duct. A Ruskin model DPT-IQ pressure transducer with LCD display and field selectable ranges ships with the device. The output signal is proportional to flow. All necessary mounting hardware and gasketing material is included.

SPECIFICATIONS

FRAME

20 (0.9) Gage galvanized steel

PROBE MATERIAL

High impact ABS

SEAL MATERIAL

.19" (5) thick Polyurethane Foam

PRESSURE TRANSDUCER

Ruskin DPT-IQ (refer to product sheet)

ACCURACY

+/- 5% of flow

VELOCITY RANGE

400 through 5,000 feet per minute (2.0 through 25.4 meters per second)

OPERATING TEMPERATURE

20°F to +120°F (-7° C to 49° C)

MINIMUM SIZE

6" (152) Dia.

MAXIMUM SIZE

16" (406) Dia.

PACKAGE CONTENTS

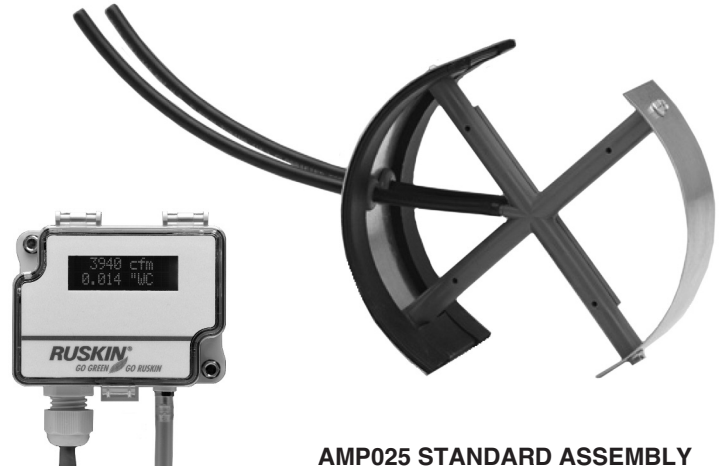
- Flow probe assembly with .25" (6) O.D. Polyethylene tubing and gasketed frame as shown above.
- Ruskin Model DPT-IQ pressure transducer
- Mounting screws & Installation Instructions

NOTE:

Values shown in parenthesis () indicate metric units.

MULTI-POINT CENTER AVERAGING

Multi-point center averaging flow probes take the pressure readings at the center of the assembly. Center averaging improves performance because they are not as affected by poor inlet conditions when compared to linear averaging flow devices. This is because each total pressure port has the same "weight" in determining the pressure reading. In contrast, the total pressure port closest to the point where the reading is taken will have a higher "weight" than the port that is farthest away from the reading.



AMP025 STANDARD ASSEMBLY
(DPT-IQ Transducer ships loose)



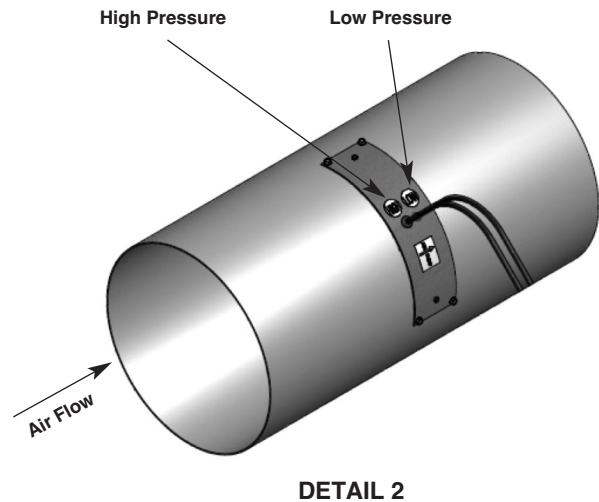
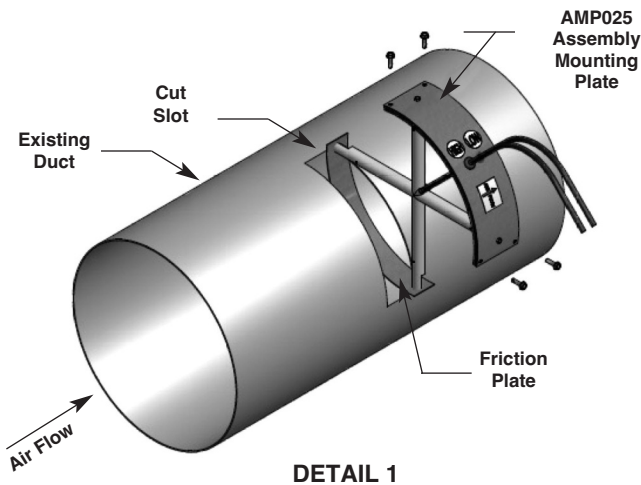
VARIATIONS

- Ruskin Model AMS810 pressure transducer
- Ruskin Model RU274R2VDC pressure transducer
- Transducer by others (omit from kit)

AMPLIFICATION

Amplification is the ability of the flow probe to produce a signal greater than the velocity pressure. Pitot tubes read true velocity pressure, which requires 4005 fpm (20.3 m/s) to produce a 1" w.g. (249 Pa) signal. Velocity pressure is the difference between total pressure and static pressure. Amplified flow probes improve upon this signal by taking the difference between total pressure and a reduced static pressure. Amplification is critical to accurate control of minimum flow rates. The AMP025 is capable of providing a signal of sufficient magnitude for any type of controller to monitor easily. The performance ranges from 1.42 to 1.76, depending on the inlet size.

INSTALLATION DETAILS



INSTALLATION INSTRUCTIONS

First, cut a slot in the existing duct (Detail 1). The slot should be large enough to insert the friction plate (non-gasketed frame piece), but small enough so that the gasketed frame piece fully covers the hole. Next, insert the AMP025 assembly into the slot. Using the 10-16 x 3/4" long tek screws, provided, secure the mounting plate to the duct. After this, a single tek screw can be used to secure the friction plate on the opposite side of the duct. Detail 2 illustrates the

installed AMP025 assembly. Install the pressure transducer in accordance with the Ruskin DPT-IQ installation instructions. Last, pipe the AMP025 high and low pressure tubes to the DPT-IQ pressure ports. Make sure the high pressure tube is connected to the high pressure port and the low pressure tube is connected to the low pressure port. Use the formula below to determine flow.

$$CFM (l/s) = (Area \times Ka) \times \sqrt{PAMS}$$

$$Area = \pi R^2 / 144 (\pi R^2)$$

$$PAMS = \text{Velocity Pressure Inches Water Gage (Pa)}$$

AMP025 K-FACTORS	
Inlet Size	Ka
6" (152)	2282
7" (178)	2496
8" (203)	2590
9" (229)	2642
10" (254)	2633
12" (305)	2408
14" (356)	2820
16" (406)	2749

AMP025 SENSITIVITY

Inlet sensitivity is a measure of flow sensing accuracy that can be lost to less than ideal inlet conditions. SMACNA recommends a minimum of three duct diameters of straight duct in front of any flow measuring device. This is not generally the standard practice on many job sites. Duct obstructions result in jogs and turns in both rigid and flexible supply duct. Real world conditions require a flow probe that is capable of measuring air volume to a +/- 5% accuracy, regardless of inlet conditions. If excessive inlet sensitivity results in a reduced flow signal for a given flow volume, the benefit of amplification has been lost. Regardless of sophistication, no controller can overcome less than adequate accuracy from a flow sensor under common field conditions.

The AMP025 has less inlet sensitivity than any other flow probe on the market, with no more than +/- 5% error regardless of inlet condition. In contrast, other center-averaging designs are capable of +/- 10% error. Linear averaging designs can range from +/- 10% to 35% depending on exact condition and angle of approach.

SUGGESTED SPECIFICATION

Install, at locations indicated on plans and in accordance with schedules, a center-averaging differential pressure flow probe assembly. Device shall be cross shaped, multi-point, center averaging, made of a high impact ABS material. Flow probe shall output an amplified differential pressure signal that is at least 1.5 times the equivalent velocity pressure signal obtained from a conventional pitot tube and be capable of measuring air volume to a +/- 5%

accuracy. The complete assembly shall be equipped with gasketed mounting plate and all necessary mounting hardware. Flow probe shall be assembled in an ISO9001 certified facility. Accuracy shall be supported by testing done in accordance with AMCA test standards. Device shall be equal, in all respects, to Ruskin model AMP025.

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