Overview

Carrier carries a full line of differential, static, and velocity (flow) pitot tubes. The PT Series is designed to sense air flow velocity in VAV and other small ducts found in many of today's HVAC Systems. When selecting the proper PT series pitot tube, you want to make sure that the insertion length of the pitot tube is long enough to reach the midpoint of the duct and at least 10 straight duct diameters upstream and downstream for best results. Note that the pitot tube should also be mounted so that the arrow on the pitot tube is facing in the direction of the air flow. And that the tube is kept free of dirt and debris. A foam pad is adhered to mounting plate to seal the installation opening and to reduce vibrations.

Applications: Used to monitor fan operation and true air flow with varying amounts of static pressure in non-critical applications.

Part Numbers

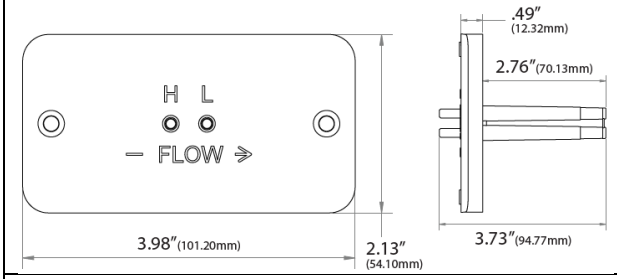
NSA-PT 3 **NSA-PT 5.2** **NSA-PT 7.5** **NSA-PT 9.7**

Specifications

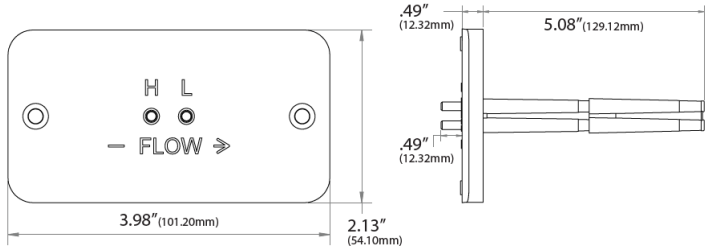
Tubing Connections:	3/16" OD (4.8 mm) connection for ¼" (6.4 mm) OD Poly Tubing
Sensing (Insertion) Length | # Sensing Points:	**NSA-PT 3**: 3.0" (7.6 cm) | 1 Set | **NSA-PT 5.2**: 5.2" (13.2 cm) | 2 Sets **NSA-PT 7.5**: 7.5" (19.1 cm) | 3 Sets | **NSA-PT 9.7**: 9.7" (24.6 cm) | 4 Sets
Recommended Duct Size:	**NSA-PT 3**: 4 - 6" (10.2 - 15.2 cm) | **NSA-PT 5.2**: 6 - 8" (15.2 - 20.3 cm) **NSA-PT 7.5**: 8 - 10" (20.3 - 25.4 cm) | **NSA-PT 9.7**: 10 - 18" (25.4 – 45.7 cm)
Recommended Air Flow:	200 FPM (60.96 MPM) minimum to 3000 FPM (914.4 MPM) maximum
Operating Temperature Range:	40 to 120ºF (4 to 49ºC)
Storage Temperature Range:	-40 to 185ºF (-40 to 85ºC)
Operating Humidity Range:	0 to 90% RH non-condensing
Material Type:	ABS
Material Flammability Rating	UL-94 HB
Product Dimensions (W x H x L) | Weight:	**NSA-PT 3**: 4.00" (10.2 cm) x 2.1" (5.3 cm) x 3.6" (9.1 cm) / 0.06 lbs (0.03 kg) **NSA-PT 5.2**: 4.00" (10.2 cm) x 2.1" (5.3 cm) x 6.0" (15.2 cm) / 0.07 lbs (0.032 kg) **NSA-PT 7.5**: 4.00" (10.2 cm) x 2.1" (5.3 cm) x 8.3" (21.1 cm) / 0.075 lbs (0.034 kg) **NSA-PT 9.7**: 4.00" (10.2 cm) x 2.1" (5.3 cm) x 10.6" (26.9 cm) / 0.086 lbs (0.04 kg)
Approvals	RoHS2, WEEE, Reach

Dimensional Drawing

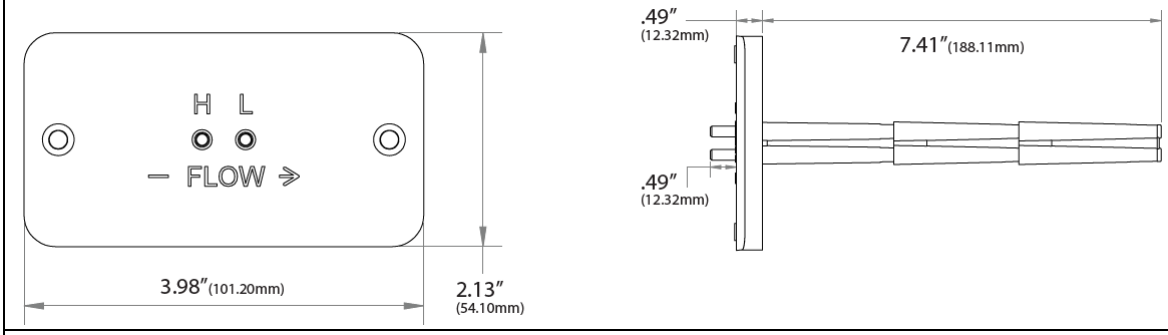
NSA-PT 3



NSA-PT 5.2



NSA-PT 7.5



NSA-PT 9.7

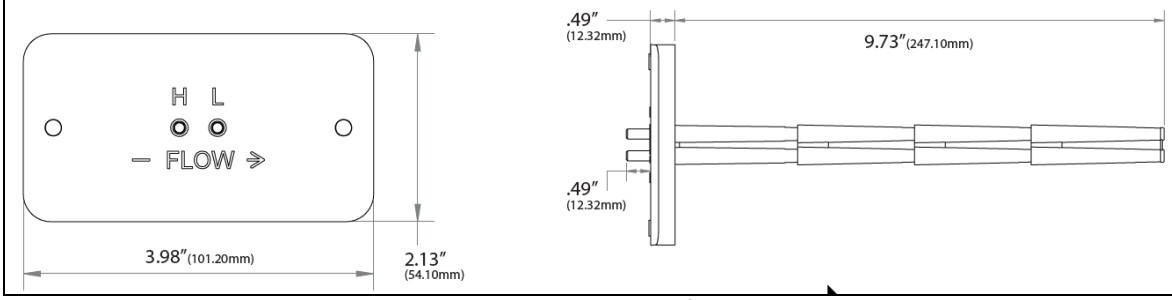


Figure 1

Installation

Select the correct PT model to fit the duct; to get a good reading of the velocity pressure, the PT sensor must be at least half the width of the duct when inserted, see **Specifications**. For best accuracy, the PT needs 10 straight duct diameters upstream and downstream from any elbows or reducers.

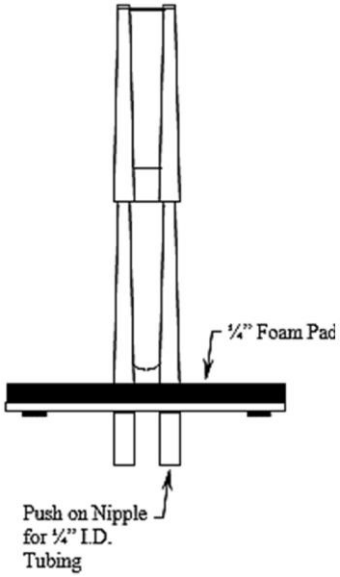


Figure 2

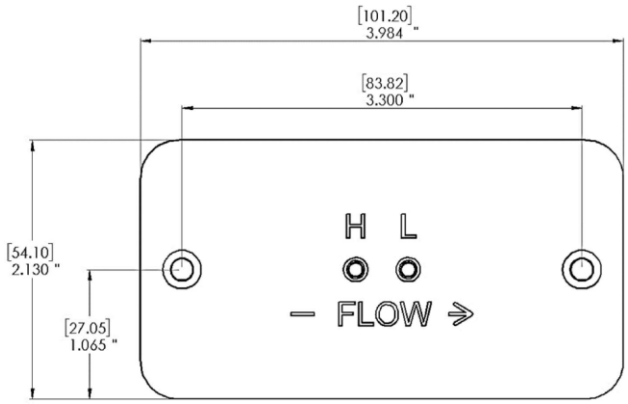


Figure 3

Mounting

The PT sensor requires a 7/8" (2.2cm) hole in the duct for mounting, and has a flange with gasket and two 3/16" (4.76mm) holes spaced 3.3" (8.38cm) center-to-center, see drill template Figure 5. The sensor must be installed so the flow arrow imprint is pointing in the direction of the duct's airflow, see Figure 4. The flange should then be tightly mounted to the duct using two sheet metal screws or rivets inserted in the mounting holes. The flow performance chart can be used to determine the flow based upon the measured differential pressure, see Figure 6.

Duct Static **Flow**

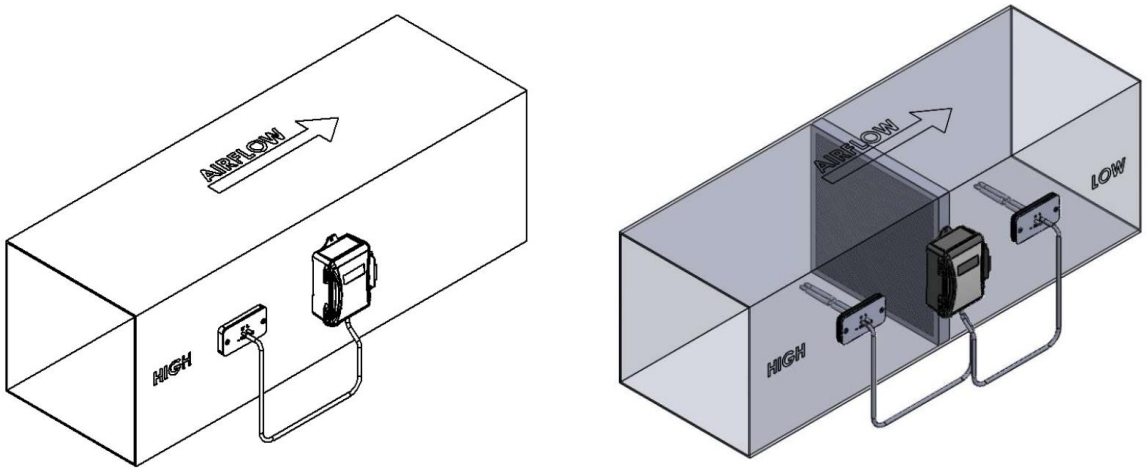


Figure 4

Drill Template (mm, not to scale)

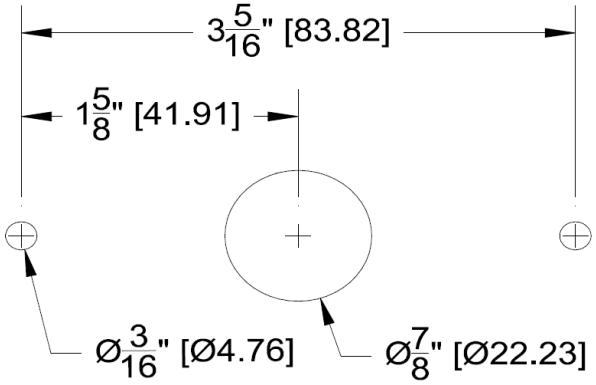
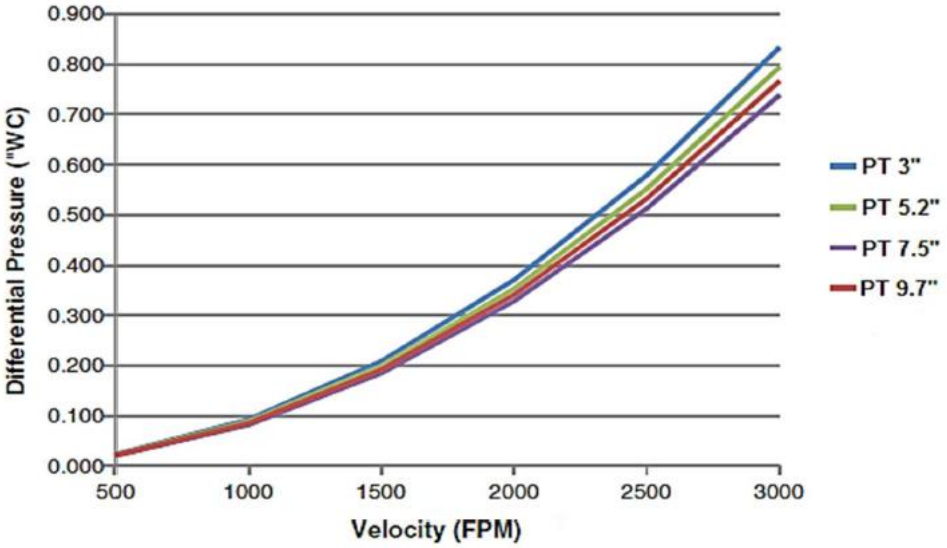


Figure 5

Flow Performance



PT 3"	Velocity = 3285(√ΔP)
PT 5.2"	Velocity = 3365(√ΔP)
PT 7.5"	Velocity = 3490(√ΔP)
PT 9.7"	Velocity = 3425(√ΔP)

Figure 6

NOTES

- Test data based on round duct sizes 6” (PT 3”), 8 (PT 5.2”), 10” (PT 7.5”), and 12” (PT 9.7”).
- Flow coefficients derived by averaging data for each sensor size.

Connections

When connecting the tubing, be extremely careful that no sharp bends are made, this may cause leakage as the tubing ages and stretches. Using 1/4" (6.35 mm) OD poly tubing, connect the "H" port to a differential pressure gauge or transmitter "High" input port, and the "L" port to the gauge or transmitter's "Low" input port.

Maintenance

To ensure reliable performance, the sensor pickup openings must be kept free of dirt and dust accumulation.

Formulas

- For rectangular ducts, KCFM = KFPM x (W" x H"/144)2 (with duct cross-section measurements in inches).
- For round ducts, KCFM = KFPM x (πr2/144)2 (with duct cross-section measurements in inches).

For Flow		For Volume	
$\Delta P = (FPM/K_{FPM})^2$	$FPM = K_{FPM} \times SQRT(\Delta P)$	$\Delta P = \left(\frac{CFM}{K_{FPM} \times Area}\right)^2$	$CFM = K_{FPM} \times SQRT(\Delta P) \times Area$
Feet Per Minute in a VAV box equals the (relevant model's) K factor times the square root of the differential pressure (in "wc").		Cubic Feet per Minute in a VAV box equals the relevant sensor model's K factor times the square root of the differential pressure (in "wc") times the cross-section area (in square feet).	