

AF-SPP

Space Pressure Primary

DESCRIPTION

The Space Pressure Primary (AF-SPP) is a combination of two Space Pressure Sensors (AF-SPS) and a single Hood Static Probe™ (AF-HSP) used to measure hood face velocity. The AF-SPP works by measuring the total pressure loss, not the static pressure, across an opening.

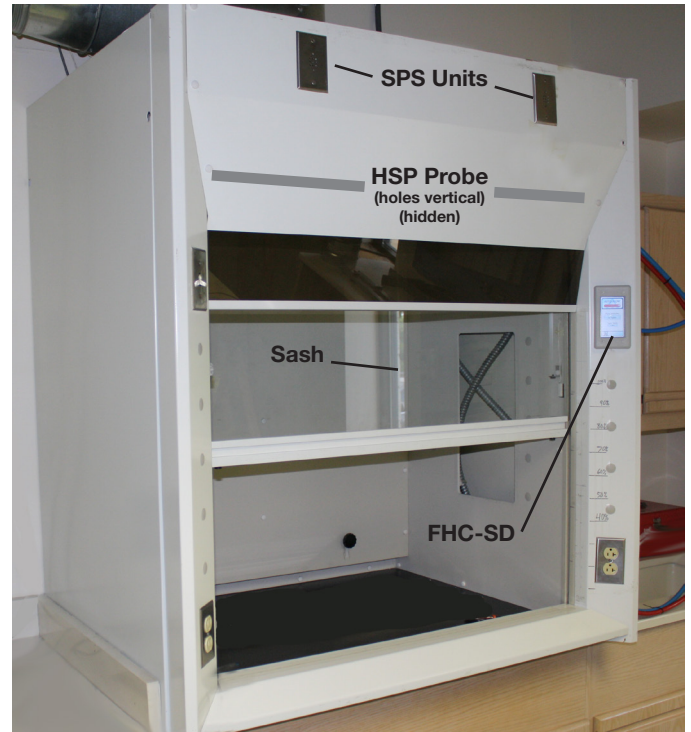
While designed primarily for walk-in hoods, the AF-SPP will perform equally well on standard hoods. The resulting installation is simple, transparent to the user, and does not interfere with hood operation. Use of total pressure instead of static pressure sensors minimizes the effect of extraneous air currents on the sensor.

The AF-SPP is designed to measure air velocities down to approximately 50 fpm (0.25 m/s) and must be used with an ultra-low differential pressure Slack Membrane™ transmitter (AF-FVR). The AF-FVR is a true differential pressure transmitter in that it does not use thermal techniques.

For standard fume hood applications operating at a 60 fpm setpoint, the FVR-1A is recommended. This device has a scale of 1.5 in-mil. For walk-in fume hoods, or applications with face velocity setpoints at or above 100 fpm, the FVR-1B (3.0 in-mil wc) is recommended.

ADVANTAGES

- ▼ Improved fume hood containment
- ▼ Maintains constant face velocity over a range of sash positions, independent of movement direction
- ▼ Isolates hood from room pressure variations/ exhaust dust static variations
- ▼ Saves energy
- ▼ Allows operation at minimum safe face velocity



Typical Fume Hood Installation

CALCULATIONS

The AF-SPP coefficient, C, is equal to the total pressure loss through an opening. A typical installation will have a C equal to approximately 0.75 (see graph on back) in still air. This coefficient is somewhat sensitive to the shape of the opening, but remains relatively constant over a broad range of shapes.

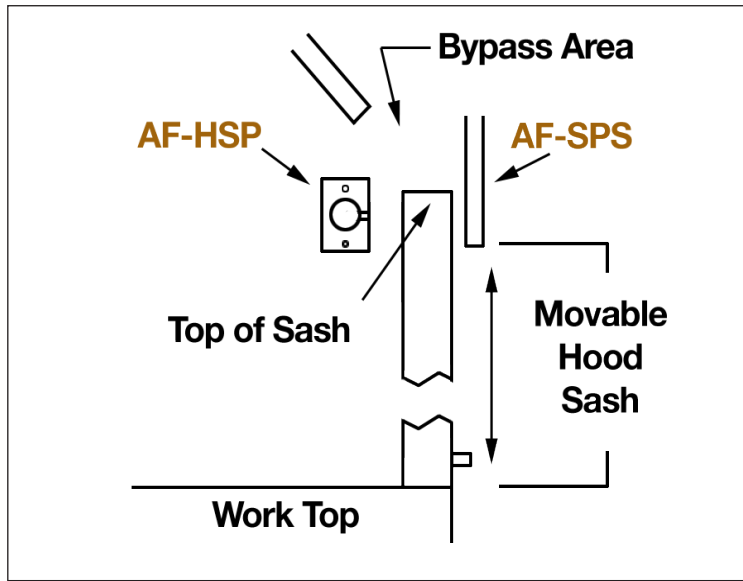
The equation for face velocity in fpm with pressure in in. wc at standard conditions is:

$$V_{\text{FACE}} = C \times 4005 \sqrt{\Delta}$$

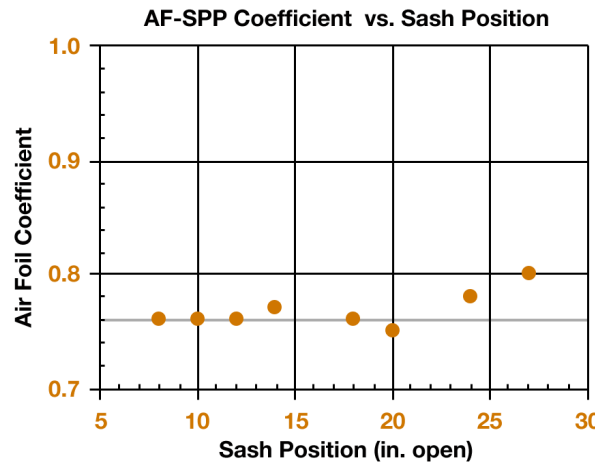
For a face velocity of 100 fpm and C of 0.76, Δp

$$\Delta = \left\{ \frac{V_{\text{FACE}}}{C \times 4005} \right\}^2 = \left\{ \frac{100}{0.76 \times 4005} \right\}^2 = 1.08 \text{ in-mil wc}$$

For a 3.0 in-mil transmitter (FVR-1B): (1.08/3.0) = 36% full-scale.



Cutaway view facing right side of hood



Average Deviation = 1.2%

Maximum Deviation From Average = 4.2%

Standard Deviation = 1.5%

Average = 0.77

ORDERING INFORMATION†

The AF-SPP is ordered by the hoods' maximum inside width. Some 6 ft (1.83 m) hoods have an inside width of only 60 in. (1.52 m) while others are as wide as 63 in. (1.60 m). The AF-SPP requires 3/8 in. ID tubing.

- AF-SPP2-48** Includes an 48 in. (1.22 m) Hood Space Probe (AF-HSP) hardware, and two Space Pressure Sensors (AF-SPS) for outside hood.
- AF-SPP2-60** Includes an 60 in. (1.52 m) Hood Space Probe (AF-HSP) hardware, and two Space Pressure Sensors (AF-SPS) for outside hood.
- AF-SPP2-72** Includes an 72 in. (1.83 m) Hood Space Probe (AF-HSP) hardware, and two Space Pressure Sensors (AF-SPS) for outside hood.
- AF-SPP2-84** Includes an 84 in. (2.13 m) Hood Space Probe (AF-HSP) hardware, and two Space Pressure Sensors (AF-SPS) for outside hood.
- AF-SPP2-96** Includes an 84 in. (2.44 m) Hood Space Probe (AF-HSP) hardware, and two Space Pressure Sensors (AF-SPS) for outside hood.



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