SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

METHOD 2.3

DETERMINATION OF GAS VELOCITY AND VOLUMETRIC FLOW RATE FROM SMALL STACKS OR DUCTS

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1. Overview

1.1 Principle

The average gas velocity in a stack or duct is determined from the gas density and from measurement of the average velocity head with a standard Pitot tube.

1.2 Applicability

This method is applicable for measuring average gas velocity of stationary source stacks or ducts less than about 0.30 m (12 in.) in diameter or 0.071 m^2 (113 $in.^2$) in cross sectional area, but equal to or greater than about 0.10 m (4 in.) in diameter or 0.087 m^2 (12.57 $in.^2$) in cross sectional area.

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2. Field Procedure

The apparatus, procedure, calibration, and calculation are the same as in Method 2.1, except as noted below.

2.1 Apparatus

2.1.1 Standard Pitot Tube

Use a standard Pitot tube to measure the gas velocity heads. The standard Pitot tube must meet the specification of Section 2.1.1 c of Method 2.1. Use a coefficient of 0.99 unless it is calibrated against another standard Pitot tube with an NBS traceable coefficient. Alternatively, use a modified hemispherical-nosed Pitot tube, which features a shortened stem and enlarged impact and static pressure holes. Use a

coefficient of 0.99 unless it is calibrated against another standard Pitot tube with an NBS traceable coefficient.

2.2 Procedure

Follow the general procedure described in Method 2.1, Section 2.2, except conduct the measurement at the traverse points specified in Method 1.2.

The static and impact pressure holes of standard Pitot tubes are susceptible to plugging in particulate-aden gas streams. Therefore, the tester must furnish proof that the openings of the Pitot tube have not plugged during the traverse period. To test the tube, measure the velocity head (ΔP) at the final traverse point, clean out the impact and static holes of the standard Pitot tube by back-purging with pressurized air, and then take another ΔP reading. If the ΔP readings made before and after the air purge are the same ($\leq \pm 5$ percent), the traverse is acceptable. Otherwise reject the run.

If the ΔP at the final traverse point is unsuitably low, use another point. If back-

purging at a regular interval is part of the procedure, take comparative ▲P readings, as above, for the last two purges at which suitably high ▲P readings are observed.

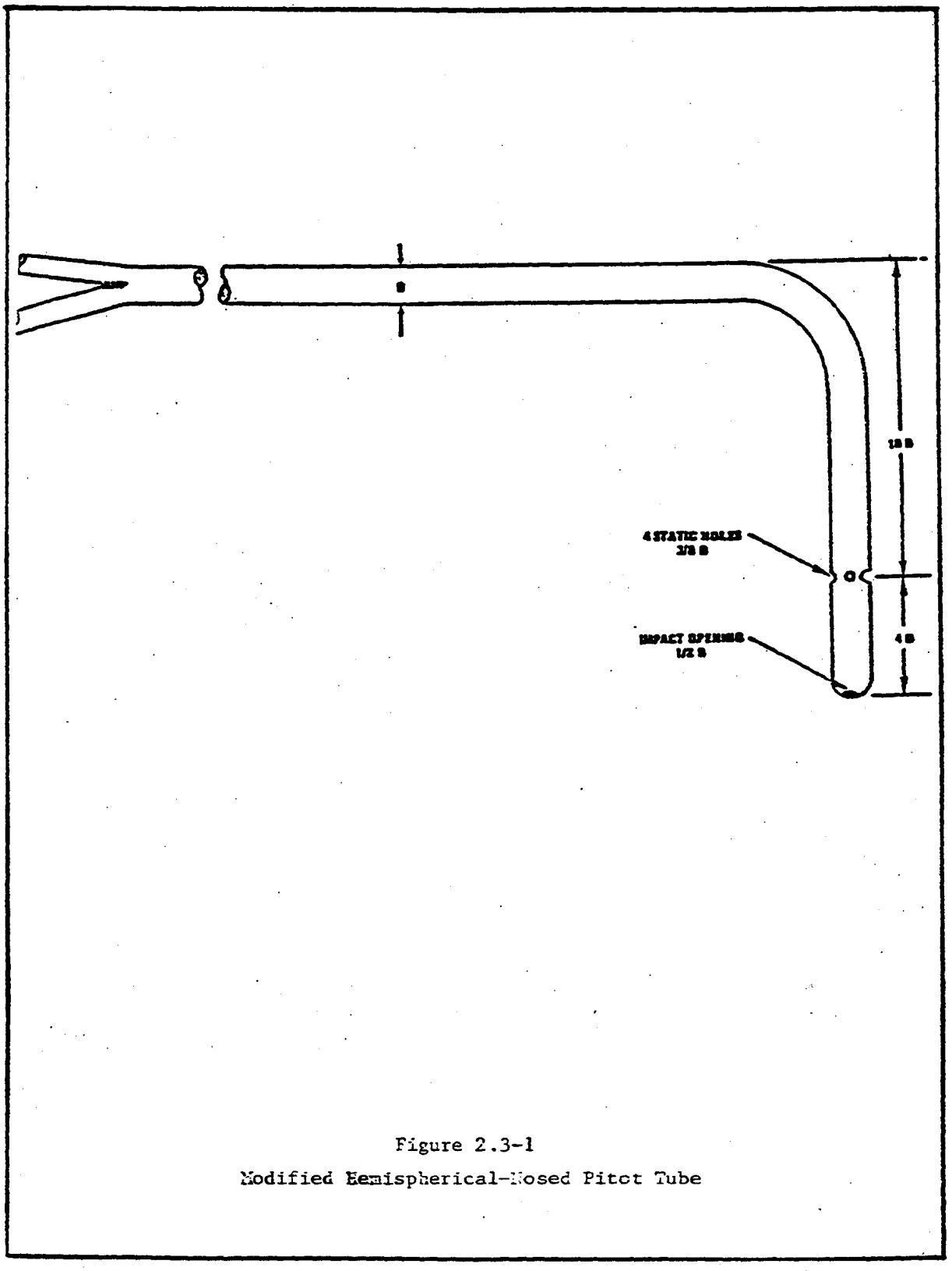

Figure 2.3-1

Modified Hemispherical-Nosed Pitot Tube