

SECTION 5.15

ROTAMETER CALIBRATION

1.0 Purpose

To describe the procedure for the calibration of rotameter, used for air sampling.

2.0 Responsibilities

- The site coordinator is responsible for assuring that this procedure is implemented.
- Survey team personnel are responsible for following this procedure.

3.0 Procedure

3.1 Equipment

- ✓ Rotameter.
- ✓ Wet Test or Dry Gas Meter.
- ✓ Stopwatch.
- ✓ Ring stand or other suitable holding device
- ✓ Air adjusting valve.
- ✓ Vacuum pump.
- ✓ Thermometer.
- ✓ Record forms.

3.2 General

- 3.2.1 A calibration curve shall be made upon initial receipt of a rotameter, following repairs or disassembly for cleaning, if malfunctions are suspected, or within six months of intended use.
- 3.2.2 Rotameters are to be checked at 25% and 75% of their scale prior to each survey.
- 3.2.3 Calibration is to be performed using a wet test or dry gas meter.

3.2.4 Originals of calibration records are to be maintained at the Oak Ridge facilities; copies should accompany personnel to the survey location.

3.3 Preparation for Calibration of Rotameter

3.3.1 Procedure for Set-Up of Wet Test Meter

3.3.1.1 Level meter using bubble level on top in conjunction with leveling screws on bottom of legs.

3.3.1.2 Fill meter with distilled water by opening valve under funnel and fill until water is level with top of needle in sight tube. Any over-fill can be drained by opening valve on bottom of sight tube.

3.3.1.3 With distilled water in manometer, adjust to zero by sliding graduated scale up or down.

3.3.1.4 Mount the rotameter in a vertical position using a ring stand or other similar device (see Figure 5.15).

3.3.1.5 Run 3/8" tubing from the top barbed connector (outlet) of the wet test meter to the lower barbed connector (inlet) of the rotameter.

3.3.1.6 Attach a 3/8" tube from the top barbed connector of the rotameter to the air adjusting valve on the suction side of the pump. If rotameter has a built-in valve, open fully.

3.3.1.7 Close the air adjusting valve and turn on pump. Open valve slowly to keep water from surging into system.

3.3.1.8 Adjust the vacuum relief valve on the pump along with the air adjusting valve to obtain a high rate of air flow (not exceeding 60 cfh or 28 lpm). Do not exceed 5 inches of mercury vacuum on inlet gauge.

3.3.1.9 Aerate the system for approximately one hour before attempting calibrations. Proceed to step 3.4.

3.3.2 Procedure for Set-Up of Dry Gas Meter

3.3.2.1 Mount the rotameter in a vertical position using a ring stand or other similar device (see Figure 5.15).

3.3.2.2 Run 3/8" tubing from the outlet side of the dry gas meter to the lower barbed connector (inlet) of the rotameter.

3.3.2.3 Attach a 3/8" tube from the top barbed connector of the rotameter to the air adjusting valve on the suction side of the pump. If rotameter has a built-in valve, open fully.

3.3.2.4 Close the air adjusting valve and turn on pump. Open valve slowly to keep the sight ball of the rotameter from striking the roof of the unit causing possible damage. Proceed to Step 3.4.

3.4 Rotameter Calibration

3.4.1 Adjust rotameter to a low setting representing about 25% of full scale.

3.4.2 Using a stop watch, measure the time required to draw the appropriate volume of air through the meter. Record temperature, time and pressure differential on pump and meter, as appropriate on the Rotameter Calibration Form (Figure B-8 or equivalent).

3.4.3 Repeat steps 3.4.1 and 3.4.2 for rotameter settings of 50%, 75% and 100% full scale.

3.4.4 Calculate the actual flow rates using the formula provided.

3.4.5 Plot the actual cfh or lpm data, vs. indicated cfh or lpm, on graph paper.

3.4.6 Record the ambient temperature and pressure, and the pressure differential of the manometer if using the wet test meter on the Rotameter Calibration Form (Figure B-8 or equivalent).

DIAGRAM OF ROTAMETER CALIBRATION EQUIPMENT

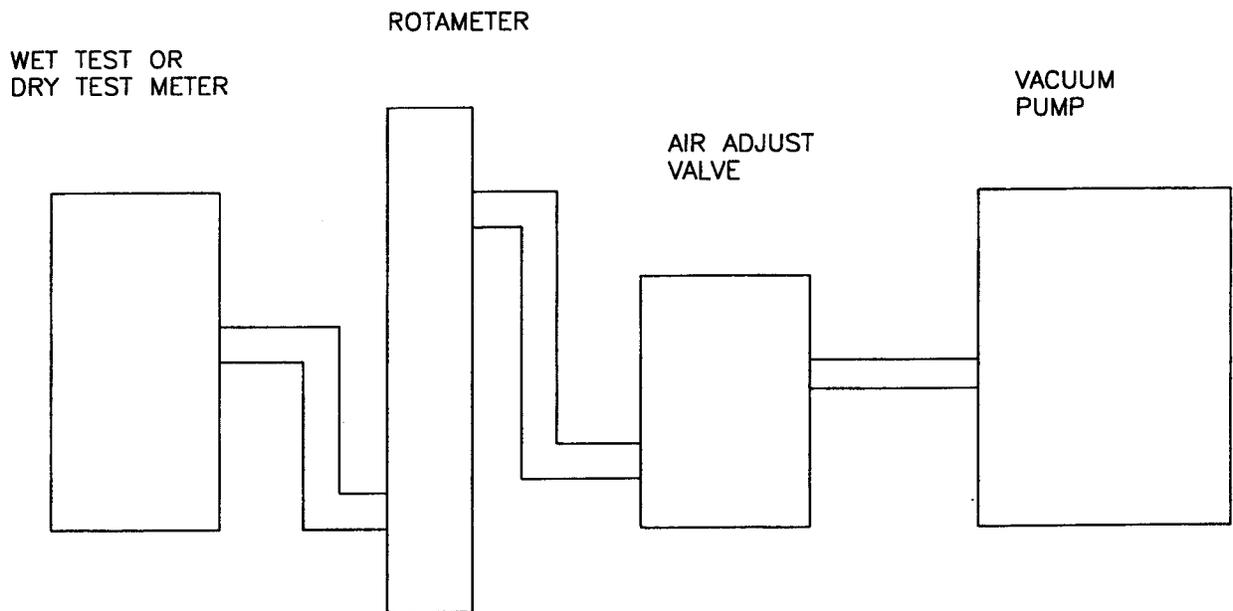


Figure 5.15