

KES

Calibration Test of Critical Flow Ventury

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1. Purpose

This shall be for the purpose of improving a work efficiency by acquiring a calibration test of a CFV. (Critical Flow Ventury : hereinafter, this shall be referred to as CFV.)

2. Scope of Application

This shall regulate a calibration test of a CFV.

3. Preparation

Micro manometer, water pole manometer (U-type pipe precision manometer), laminar flow meter, butterfly, filter, precision thermometer, seal material.

4. Work Method

- (1) Stabilize a CFV as its usage condition. (About 20 minutes) However, during a calibration, a heater should be OFF.
- (2) Stop a CFV and take out bolts from each flange section. Set up a flow meter (LFE) and manometer.
- (3) After setting up, open a butterfly valve wide and warm up it for 5 minutes.
- (4) Measure a temperature and atmospheric pressure before a measurement.
- (5) Change a inlet pressure of a CFV by a butterfly valve. At that time, record an inlet pressure, and temperature of a CFV, a differential and full pressure and inlet temperature of a LFE on the data sheet.
- (6) As the same method as (5), take more than 8 points at each 25mmAq from a opening of a butterfly valve. However, when changing a inlet pressure of a CFE, in the case of a stabilization for 2 minutes, continue until the temperature is stable,
- (7) After a measurement ends, measure a temperature and atmospheric pressure one more time.

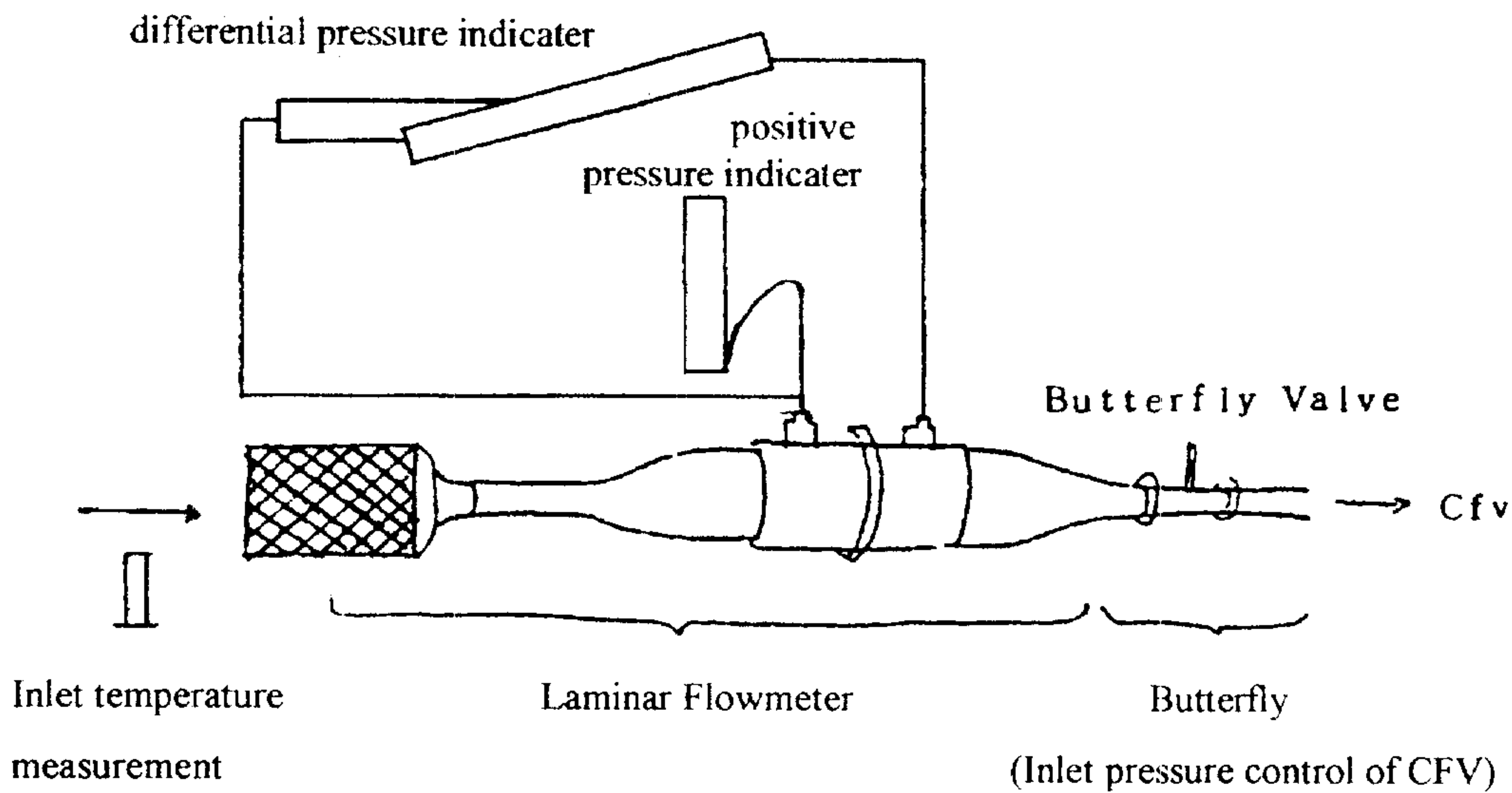


Figure 1

5. Data Process (number calculation)

- (1) Read a flow amount $V(\Delta P)m^3 / \text{min}$ with a fixed curve by a differential pressure of LFE.
- (2) Read a temperature amendment coefficient K_2 with a amendment coefficient table by an inlet temperature of LFE.
- (3) Calculate a absolute pressure P_m by (atmospheric pressure mmHg)-(LFE full pressure mmHg).
However, calculate a pressure amendment value K_1 by $P_m/760 \text{ mmHg}$.
- (4) Calculate a flow amount V_{SCMM} (standard cubic meter per minute) of a standard condition by calculating a $V(\Delta P)$, K_2 and K_1 .

$$V_{SCMM} = V(\Delta P) \times K_1 \times K_2$$

- (5) Calculate a flow coefficient C_1 at V_{SCMM} , CFV inlet pressure of P_1 and at CFV inlet temperature of T_1 .

$$C_1 = V_{SCMM} \times \frac{\sqrt{273.16 + T_1}}{P_a - (P_1/13.57)}$$