### Ventilation Measurements

- For evaluation, planning, improvements and changes – ventilation surveys
- Air velocity and air pressure most important
- Air temperature and specific weight especially needed in air conditioning
- Regular spot checks to check status of system
- Continuous monitoring of more threatening conditions to maintain safety

### Min-218 Lab Ventilation Instrumentation

- **Air Quantity**
  - Indirect Method (V and A)
- **Pressure**
  - Altimeter, Manometer, Pitot Tube, Magnehelic Gauge
- **Temperature**
  - Sling Psychrometer, Kata Thermometer, etc.
- **Air Quality**
  - Dust, DPM, Methane, Moisture
- **Noise**
  - Noise Meter

### Accurate Airflow Measurements

- **Air Quantity (Q)** – Measured Indirectly
  - \( Q = V \times A \)
- **Pressure**
  - Direct Method: Manometer, Pitot Tube, Hose, & Magnehelic Gage
- **Temperature**
  - Wet- and Dry-bulb Temperatures
  - Thermometer

### Accurate Airflow Measurements

- **Air Quantity (Q)** – Measured Indirectly
  - \( Q = V \times A \)
- **Pressure**
  - Direct Method: Manometer, Pitot Tube, Hose, & Magnehelic Gage
  - Indirect Method: Altimeter
- **Air Temperature (T)**: Wet- and Dry-bulb Temperatures
  - Thermometer
Measuring Air Velocity Using Anemometers

Source of Errors . . .

• **Inherent – Bearing Friction**
  – Frequent Calibration Necessary
• **Atmospheric Condition – Dust, Moistures, etc.**
• **Operator’s Techniques**
  – Instrument Position
  – Measuring Method

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**True Velocity vs. Angle of Yaw**

![Graph showing percent of true velocity vs angle of yaw in degrees.]

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**True Velocity vs. Operator Proximity**

![Graph showing deviation from true velocity vs operator proximity in feet.]

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**True Velocity vs. Operator Proximity**

![Graph showing deviation from true velocity vs true velocity of air current in fpm.]

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**True Velocity vs. Traversing Speed**

![Graph showing registered velocity vs traversing speed.]

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Measuring Air Velocity Using Anemometers

Source of Errors . . . Operator’s Techniques

• **Instrument Position**
  – Anemometer Orientation (Angle of Yaw)
  – Operator Proximity (Too Close to Body)
  – Operator Position (Block Airway Area)
• **Measuring Method**
  – Location (Stay Away from Bends/Turns)
  – Traversing Speed (<10% of Air Velocity)
  – Single Reading (Always Take Double Reading)
Taylor and Davis Anemometers

Pitot Tube Readings

Arrangement for Accurate Pressure Readings

Rel-tek Gas Detection Monitoring/Control Systems

Software: Millennium-DX
Hardware:
- MultiBoss: Pressure Transducer (0-10" W.G.)
- SmokeBoss*100 (0-10% Optical Density)
- OxyBoss*100 (0-100% Oxygen)
- AirBoss*200W (0-2000 fpm)
- GasBoss*100/AP (0-5% CH4)
- FireBoss*100B (CO: 0-200 ppm)

UPS – Uninterrupted Power System
Work on Most PC System

Rel-tek Gas Detection Monitoring/Control Systems

Rel-tek provides the most complete, reliable, size proven, modular, expandable systems.*