

# Air Capture Hood Measurement Basics for Building System Commissioning

## Agenda

- Why use hoods?
- Capture hood applications
- Sensing technologies
- Where to use
- How to use
- Common pitfalls
- Wrap up



## Why use a hood?

- Direct volumetric measurements
- Industry accepted
- Easy to use
- Reasonable accuracy (5% typical)
- Technician familiarity
- Can measure other parameters

## Applications

- Typical Measurements
  - Air Volume
    - Supply & Return air flow
    - Occupant comfort
    - Energy savings
      - Ensure adequate not excessive air flow
      - Air handler system balancing
  - Other air quality parameters
    - Temperature
    - Humidity (%RH, Wetbulb, Dewpoint)
    - Air Velocity

# Applications

- Unique measurements
  - Bio-safety cabinets
    - Air Volume
    - Direct inflow measurement

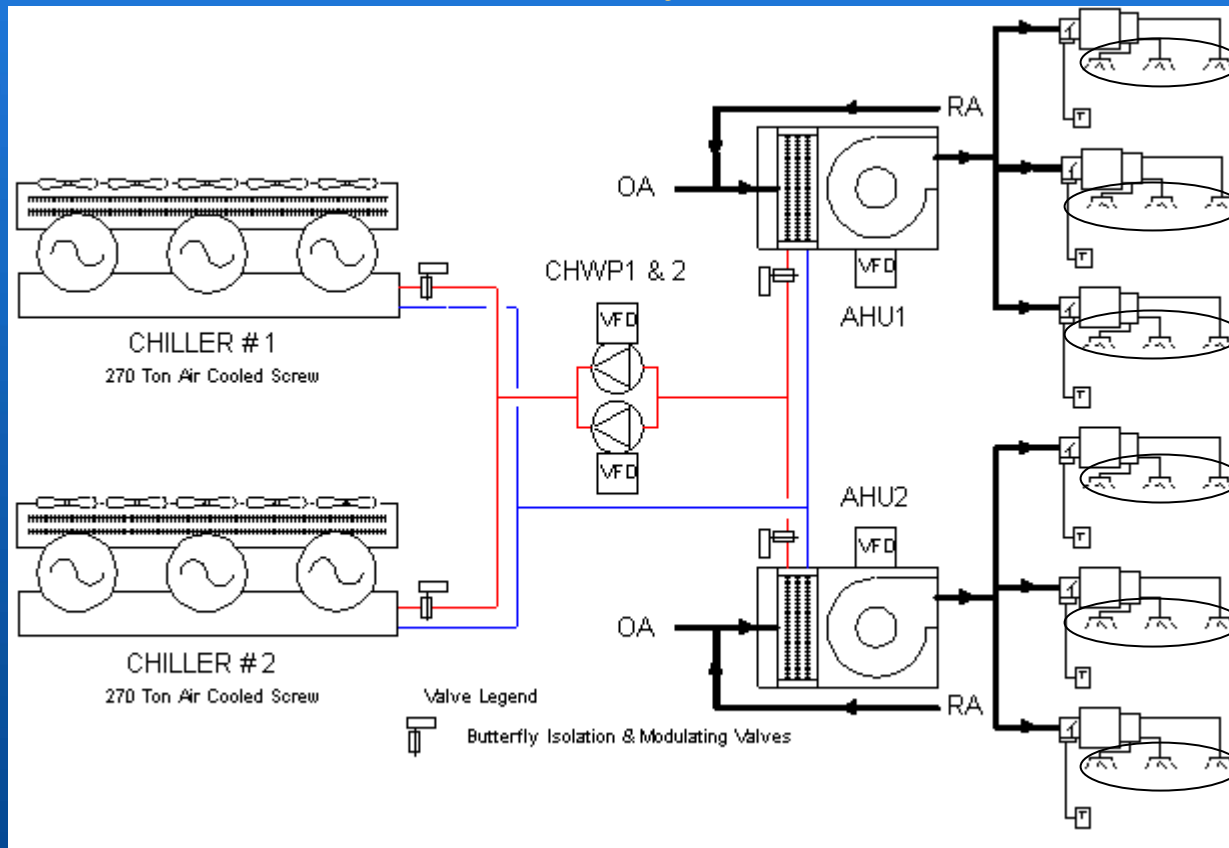


# Applications

- Facility Types
- Commercial
  - Retail (malls, department stores, restaurants)
  - Office buildings (low and high rises)
  - Health care center (clinics, hospitals)
  - Education (universities, primary & secondary schools)
  - Government (local, state, Federal)
- Industrial
  - Process plants
- Residential
  - Forced air systems

# Applications

## Chiller System



## Applications

- Where to measure
  - Air Handler systems (with hood)
    - Diffusers (supply and return)
    - Wall, ceiling, floor locations
    - New construction or remodeling

## Applications

- Where to use (cont.)
  - Air Handler systems (without hood)
    - Ductwork (duct traverse)
    - Filter banks
    - Coils

# Sensing Technologies

- Swinging Vane
  - Simple, no batteries
  - Pressure forces needle to move
  - Susceptible to handling induced errors
- Thermal Anemometry
  - Hot wire technology
  - Data-logging
  - 180-200 F. temperature limitation

# Sensing Technologies

- Digital Differential Pressure
  - Accurate
  - Other measurement parameters
  - Data-logging
  - Statistics
  - Not susceptible to handling induced errors
  - Lightweight
  - Many have auto-zeroing
  - Pressure and temperature compensated readings

## How to use

- Measure at diffuser
  - Select correct hood size
  - Zero adjust (analog)
  - Select range (analog)
  - Use low flow screen when appropriate
    - Not recommended over 75 CFM

## How to use

- Measure at diffuser (cont.)
  - Center hood (ok to overlap small diffusers)
  - Verify good seal
  - Change orientation, repeat measurement
    - Looking for turbulent air flow
    - If more than 5% different, measure 4 compass points and average readings
    - Document readings and/or store (data-log)
    - Consider duct traverse and apply “k” factor to hood readings

## Common Pitfalls

- Watch Out!
  - Damaged analog hood meter (dropped, rough handling, etc.)
  - Calibration certificate up to date?
  - Bad seal
  - Leaky ductwork upstream of diffuser
  - High temperatures: don't use hot-wire technology
  - Very low flows (<50 CFM) take multiple samples
  - Damaged hood fabric

## Wrap up

- Why use hoods?
- Applications
- Technologies
- Where to use
- How to use
- Pitfalls

## Wrap up

- Future Technology
- Your Input
- Questions?
- Thank you!!