**Dirty Filter Alarm**

The differential pressure loss across the filter is monitored.

- Products used: ADPS Pressure Switch and 616KD Differential Pressure Transmitter

**Fan Validation**

Proving a fan is operating can be done in several ways:

1. Monitor the differential pressure between upstream and downstream of the fan.
   - Product used: ADPS Pressure Switch
2. Monitor the air flow or velocity exiting the fan.
   - Products used: DH, DHII, DH3, MS, AVU, VTT, 641 Transmitter or 616KD Differential Pressure Transmitter in conjunction with an air flow station FLST
3. Monitor the current usage of the fan.
   - Product used: SCS Current Switch

**Duct Static Pressure**

A pressure transmitter is used with a static pressure tip or optional inherent static probe to monitor discharge or mixing air duct static pressures.

- Products used: 1831 Low Differential Pressure Switch and MS Pressure Transmitter with A-302 Static Pressure Tip or MS with integral static pressure probe

**Duct Humidity Sensor**

A humidity transmitter is inserted into the duct to monitor the zone discharge humidity.

- Product used: RHP Humidity Transmitter

**Duct Humidity/Temperature Sensor**

A dual humidity and temperature transmitter is inserted into the duct to monitor the exhaust air humidity and temperature.

- Product used: RHP Humidity/Temperature Transmitter

**Duct Temperature Sensor**

A temperature sensor is inserted into the duct to monitor the supply air, mix air, and exhaust air temperature.

- Products used: TE-D Series Temperature Sensor, TE-A Averaging Temperature Sensor or DFS Low Limit Temperature Switch

**Frozen coil Alarm**

A differential pressure loss across the cooling coil indicates ice build up on the coil.

- Products used: ADPS Pressure Switch or EDPS UL508 listed Pressure Switch
PRODUCTS APPLIED FOR AIR HANDLER APPLICATION

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The differential pressure loss across the filter is monitored.
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A dual humidity and temperature transmitter is inserted into the duct to monitor the exhaust air humidity and temperature.
- Product used: RHP Humidity/Temperature Transmitter

**Duct Temperature Sensor**
A temperature sensor is inserted into the duct to monitor the supply air, mix air, and exhaust air temperature.
- Products used: TE-D Series Temperature Sensor, TE-A Averaging Temperature Sensor or DFS Low Limit Temperature Switch

**Frozen Coil Alarm**
A differential pressure loss across the cooling coil indicates ice build up on the coil.
- Products used: ADPS Pressure Switch or EDPS UL508 listed Pressure Switch
PRODUCTS APPLIED FOR AIR HANDLER APPLICATION

Dirty Filter Alarm
The differential pressure loss across the filter is monitored.
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• Product used: RHP Humidity/Temperature Transmitter

Duct Temperature Sensor
A temperature sensor is inserted into the duct to monitor the supply air, mix air, and exhaust air temperature.
• Products used: TE-D Series Temperature Sensor, TE-A Averaging Temperature Sensor or DFS Low Limit Temperature Switch

Frozen Coil Alarm
A differential pressure loss across the cooling coil indicates ice build up on the coil.
• Products used: ADPS Pressure Switch or EDPS UL508 listed Pressure Switch
outDoor HumiDity & temPerAture trAnsmitterS

Outdoor humidity/temperature sensors are used for determining how much outside air to bring into the building for economizer applications.

• Products used: WHT and RHP

outDoor temPerAture SenSorS

For low humidity regions, outdoor temperature is used to determine how much outside air can be used as free cooling.

• Products used: O-4, TE-RND, TE-OND

HeatinG & coolinG APPlicAtion

PRODUCTS APPLIED FOR

- Variable-Air-Volume Application
- Outdoor & Parking Garage Application

VAriAble-Air-Volume APPlicAtion

PRODUCTS APPLIED FOR

- Outdoor & Parking Garage Application

VAriAble-Air-Volume APPlicAtion

PRODUCTS APPLIED FOR

- Outdoor & Parking Garage Application

outDoor & PArKinG GArAGe APPlicAtion

PRODUCTS APPLIED FOR

Water miXinG VAlVe

Three-way valves are used to mix return and supply water and chilled and hot water together.

• Products used: GV Globe Valve with EVA Electric Actuator, or BV3 Ball Valve with Electric Actuator

WAter temPerAture monitor

A temperature sensor is inserted into the water pipeline to monitor the system supply, system return, condenser return, condenser supply, and boiler supply water temperature.

• Product used: TE-I RTD Temperature Sensor with Thermowell

PumP VAliDAtion/FloW ProVinG

Proving a pump is operating can be done in several ways:

1. Monitor the differential pressure between upstream and downstream of the pump.

• Product used: DX Pressure Switch

2. Monitor the water flow exiting the pump.

• Products used: FS-2, V8 or V7 Flow Switch

3. Monitor the current usage of the pump.

• Product used: SCS Current Switch

4. Ensure proper differential pressure is created from sufficient flow through chiller.

• Product used: 629 Differential Pressure Transmitter

leAK Detection/DriP PAn monitor

A conductivity sensor is used to detect leaks of fluids around equipment and valves or to detect full drip pans.

• Products used: WD or WD3 Leak Detectors

WAter FloW control

VAV systems can include heating coils of hot water that the air flows past. A zone valve is used to change the amount of hot water added to the heating coil. Zone systems can include radiant heating systems. A zone valve is used to change the amount of hot water added to the radiator in the zone.

• Products used: ZV1 or ZV2 Zone Valves

Duct SuPPly temPerAture

VAV duct temperature sensors measure the supply or discharge air to determine if the reheat coils are needed to condition the air entering the room.

• Products used: TE-D Series Temperature Sensors

Air Volume control

The amount of air added to the zone is controlled by opening and closing the air duct via a damper with a damper actuator which receives a feedback signal from a differential pressure transmitter.

• Products used: DDA Damper Actuator and 616KD Differential Pressure Transmitter

room temPerAture AnD cArbon DioXiDe

The amount of air flow to a zone is varied based on occupancy in a zone. The occupancy is determined by the concentration of carbon dioxide in the zone.

• Product used: CDT-W Carbon Dioxide and Temperature Transmitter

room temPerAture AnD HumiDity

A wall mounted temperature and humidity transmitter is placed in the zone to monitor the zone conditions and determine demand.

•  Product used: RHP-W Humidity and Temperature Transmitter

eXceSS GAS eXHAuSt

High gas concentrations of carbon monoxide and nitrogen dioxide from vehicle exhaust are expelled from a parking garage by bringing in fresh outside air through dampers and exhausting the gas saturated air via exhaust fans.

• Products used: GSTA-C and CMT200 Carbon Monoxide Transmitters, GSTA-N Nitrogen Dioxide Transmitter, SCD Process Controller, DD Damper Actuator

eXHAuSt FAn VAliDAtion

Proving an exhaust fan is operating in a parking garage is done by using current switches to monitor the current usage of the fan.

• Products used: SCS, CCS
Outdoor humidity/temperature sensors are used for determining how much outside air to bring into the building for economizer applications.

- Products used: WHT and RHP

Outdoor temperature sensors are used for low humidity regions to determine how much outside air can be used as free cooling.

- Products used: O-4, TE-RND, TE-OND

**Heat and Cooling Application**

**Variable-Air-Volume Application**

- Products applied for Variable-Air-Volume Application
  - Water mixing valve
  - Three-way valves are used to mix return and supply water and chilled and hot water together.
  - Products used: GV Globe Valve with EVA Electric Actuator, or BV3 Ball Valve with Electric Actuator
  - Water temperature monitor
  - A temperature sensor is inserted into the water pipeline to monitor the system supply, system return, condenser return, condenser supply, and boiler supply water temperature.
  - Product used: TE-I RTD Temperature Sensor with Thermowell

**Pump Validation/Flow Proving**

- Proving a pump is operating can be done in several ways:
  1. Monitor the differential pressure between upstream and downstream of the pump.
    - Product used: DX Pressure Switch
  2. Monitor the water flow exiting the pump.
    - Products used: FS-2, V8 or V7 Flow Switch
  3. Monitor the current usage of the pump.
    - Product used: SCS Current Switch
  4. Ensure proper differential pressure is created from sufficient flow through chiller.
    - Product used: 629 Differential Pressure Transmitter

**Leak Detection/Drip Pan Monitor**

- A conductivity sensor is used to detect leaks of fluids around equipment and valves or to detect full drip pans.
- Products used: WD or WD3 Leak Detectors

**Water Flow Control**

- VAV systems can include heating coils of hot water that the air flows past. A zone valve is used to change the amount of hot water added to the heating coil. Zone systems can include radiant heating systems. A zone valve is used to change the amount of hot water added to the radiator in the zone.
- Products used: ZV1 or ZV2 Zone Valves

**Duct Supply Temperature**

- VAV duct temperature sensors measure the supply or discharge air to determine if the reheat coils are needed to condition the air entering the room.
- Products used: TE-D Series Temperature Sensors

**Air Volume Control**

- The amount of air added to the zone is controlled by opening and closing the air duct via a damper with a damper actuator which receives a feedback signal from a differential pressure transmitter.
- Products used: DDA Damper Actuator and 616KD Differential Pressure Transmitter

**Room Temperature and Carbon Dioxide**

- The amount of air flow to a zone is varied based on occupancy in a zone. The occupancy is determined by the concentration of carbon dioxide in the zone.
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**Room Temperature and Humidity**

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**Excess Gas Exhaust**

- High gas concentrations of carbon monoxide and nitrogen dioxide from vehicle exhaust are expelled from a parking garage by bringing in fresh outside air through dampers and exhausting the gas saturated air via exhaust fans.
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**Heating & Cooling Application**

**Products Applied For**

- Variable-Air-Volume Application
- Outdoor & Parking Garage Application

**Water Mixing Valve**

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