MUA(1-4) Sequence of Operations

Supply Fan:
The supply fan shall run anytime the unit is commanded to run, and when it's associated HF fan is operational. To prevent short cycling, the supply fan shall have a user definable (adj.) minimum runtime, unless shutdown on safeties.
Alarms shall be provided as follows:

- Supply Fan Failure: Commanded on, but the status is off.
- Supply Fan in Hand: Commanded off, but the status is on.
- Supply Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

Supply Air Temperature Setpoint - Optimized:
The controller shall monitor the supply air temperature and shall maintain a supply air temperature setpoint reset based on unit(s) cooling and heating requirements.
The supply air temperature setpoint shall be reset for cooling based on zone cooling requirements as follows:

- The initial supply air temperature setpoint shall be 13.0°C (adj.).
- As cooling demand increases, the setpoint shall incrementally reset down to a minimum of 11.5°C (adj.).
- As cooling demand decreases, the setpoint shall incrementally reset up to a maximum of 22.0°C (adj.) .

If more zones need heating than cooling, then the supply air temperature setpoint shall be reset for heating as follows:

- The initial supply air temperature setpoint shall be 22.0°C (adj.).
- As heating demand increases, the setpoint shall incrementally reset up to a maximum of 35.0°C (adj.).
- As heating demand decreases, the setpoint shall incrementally reset down to a minimum of 16.0°C (adj.).

Heating Coil Valve:
The controller shall measure the supply air temperature and enable the heating mode and modulate the heating coil valve to maintain its heating setpoint.
The heating enable relay shall be enabled whenever: Outside air temperature is less than 3°C (adj.), and heating is required

Minimum Outside Air Ventilation - Nitrogen Dioxide (NO2) Control:
The controller shall continuously measure the space NO2 levels.
Alarms shall be provided as follows:

- High Nitrogen Dioxide Concentration: If the NO2 concentration is greater than 4 ppm (adj.).

Exhaust Fan:
The associated exhaust fan shall run anytime the unit is commanded to run.
Alarms shall be provided as follows:

- Exhaust Fan Failure: Commanded on, but the status is off.
- Exhaust Fan in Hand: Commanded off, but the status is on.
- Exhaust Fan Runtime Exceeded: Status runtime exceeds a user definable limit (adj.).

Supply Air Temperature:
The controller shall monitor the supply air temperature.
Alarms shall be provided as follows:

- High Supply Air Temp: If the supply air temperature is greater than 49°C (adj.).
- Low Supply Air Temp: If the supply air temperature is less than 8°C (adj.).

Unit Heater
The unit heater shall operate to maintain the space temperature setpoint. The unit heater shall be enabled whenever:

- Outside air temperature is less than 15.0°C (adj.).
- AND the space temperature is below the heating setpoint.

The setpoint shall be programmed by the DDC system and shall be complete with night setback (if required).

Overhead Door Contacts:
The contoller shall continuously monitor the overhead door contacts.
Alarms shall be provided as follows:

- Overhead Door Alarm: The overhead door has been open for more than 60 minutes (adj.) and the outside air temperature is less than 5°C (adj.).

For Wiring details on MUA1 and MUA4 refer to page 22

For Wiring details on MUA2 and MUA3 refer to page 23

Winnipeg Transit Winnipeg, Manitoba			
Integrated Control Systems			
MUA(1-4) Sequence of Operations			
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