

Target Truck Bay Air Handler Controls Description TD8030

1. Operating Philosophy

1.1. Purpose

The purpose of air handler operations is to:

1. Provide the operator with modes of operation that insure adequate control and aid in trouble shooting and startup testing
2. Provide automatic start/stop based on the door limit switch
3. Provide alarm if fan does not automatically start when truck bay door is open

1.2. Assumptions

1. Space temperature setpoints will not be automatically changed (such as between winter and summer). Manually changing the setpoints will be possible.

1.3. Operator Controls and Operating Modes

1. OFF: Air handler is not in use. Heating valve is closed and chilled water valve is closed. Setpoints remain at last setting.
2. Auto: Once the truck door is opened and the fan is in the Off mode, the fan will be energized and the space temperature will be maintained (via heating control valve or chilled water control valve) and automatically transitions from one configuration to the other as appropriate. Once the truck door is closed, the air handler will operate until the setpoint is maintained within 1 DegF of the setpoint and then placed into the Off mode.
3. Heat: Air handler is forced to control space temperature with heat. Fan is energized. Chilled water valve is closed. Heating water valve is modulated.
4. Cool: Air handler is forced to control space temperature with chilled water. Fan is energized. Heating water valve is closed. Chilled water valve is modulated.

2. Operator Interface Definitions

2.1. Local Hardware/Manual Operator Controls

1. HOA switch on MCC for supply fan starter (*HS2513, HS2514*)
2. Chilled water supply temperature indicator (*TI2513D, TI2514D*)
3. Chilled water return temperature indicator (*TI2513C, TI2514C*)
4. Heated water supply temperature indicator (*TI2513B, TI2514B*)
5. Heated water return temperature indicator (*TI2513A, TI2514A*)
6. FAULT indicator light on MCC
7. READY indicator light on MCC
8. RUN indicator light on MCC

2.2. Software HMI/EPICS Digital Operator Controls

1. Temperature control mode (selection switch)
 - a. Off

- b. Semi- Auto (Heat Only)
- c. Semi- Auto (Cool W/CHW)
- d. Auto

2.3. Software HMI/EPICS Digital Displays

1. Mode switch status
 - a. OFF
 - b. Auto
 - c. Semi- Auto (Heat Only)
 - d. Semi- Auto (Cool W/CHW)
2. Supply air fan/damper HOA switch status (*HS2513, HS2514*)
3. Supply fan pressure differential switch (*PDS2513, PDS1514*)
4. Supply air fan status (*F2513, F2514*)
5. Truck door status (*ZSC2513, ZSC1514*)

2.4. Software HMI/EPICS Analog Operator Controls

1. Temperature sp (return air for building space)

2.5. Software HMI/EPICS Analog Displays

1. Space air temperature (*TT2513, TT2514*)
2. Building heated water valve controller output (*IP2513A/TCV2513A, IP2514A/TCV2514A*)
3. Building chilled water valve controller output (*IP2513B/TCV2513B, IP2514B/TCV2514B*)

2.6. Software HMI/EPICS Alarms (via EPICS Alarm Handler)

1. High and low temperature
2. Fan not started alarm

3. Operational Modes Descriptions

3.1. Control Logic Description

In the OFF mode, the air handler is not in use. All control valves are closed and the temperature setpoint remains at the last value.

Automatic temperature controls used in the AUTO mode work as follows:

The fan is energized when the truck bay door switch indicates the door is open. The fan will be switched to the Off mode once the setpoint has been achieved and the truck bay door switch indicates the door is closed.

If the building space temperature is less than the temperature setpoint, modulate the heating control valve to obtain the space temperature at the setpoint. The cooling control valve is closed.

If the building space temperature is greater than the temperature setpoint, modulate the cooling control valve to obtain the space temperature at the setpoint. The heating control valve is closed.

In the manual modes the air handler is forced to cool with chilled water by modulating the chilled water valve or heat by modulating the heating water valve.

If the fan has been commanded to energize and the differential pressure switch does not indicate the fan is running after 15 seconds, generate an alarm to the operator.

