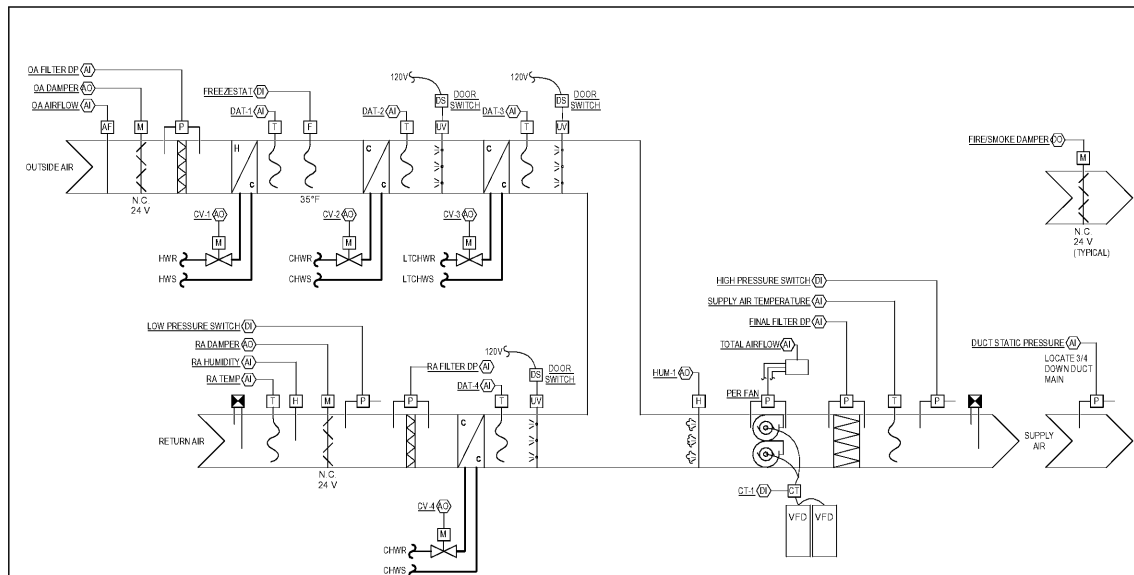


**NOT FOR
CONSTRUCTION**

No.	Description	Date
1	00 - GMP	2/19/2015



A. General
The unit is a VAV air handler. It will have occupied and unoccupied modes of operation that will be determined based on a time of day schedule. All setpoints are user adjustable (ADJ). All points must be capable of being tripped. The unit will be provided with electronic pressure reset, and supply temperature reset.

B. Occupied Mode (24/7)
The unit will receive a run signal from the system based on time of day schedule and/or override switch. On a call to start from the BAS system the supply fan will start after dampers open. The OA control algorithm will activate, general exhaust fans will start, building pressure control algorithm will start, preheat coil control will activate, and cooling coil control will activate.

C. Supply Fan Control
On a call to start from the BAS system, the supply fan will ramp up to speed over 120 seconds (ADJ) before starting, and will stop on dampers must prove they are open before the fan starts. The fan speed will modulate to maintain a duct static pressure setpoint.

D. OA Control
Outdoor airflow to the unit will be measured by an airflow measuring station. The outdoor air and return air dampers will modulate to maintain the OA AIRFLOW setpoint. The return damper will default to 100% open and will modulate closed if the outdoor air damper is 100% open and the outdoor airflow is above setpoint then the outdoor air damper will modulate closed. At least one damper will always be 100% open.

E. Preheat coil control
Preheat coil control will always be enabled when the supply fan is on to preheat the cooling coil from heating. The preheat coil control valve will modulate to control to a discharge air temperature setpoint DAT1.

F. Humidifier control
The humidifier shall use factory provided control algorithm to maintain MIN RA HUMIDITY setpoint.

G. Cooling coil control
The cooling coil control valves will modulate to maintain the discharge air temperature setpoints DAT2,3,4.

H. Duct Static Pressure Reset
The system will reset the static pressure setpoint so that 1 terminal box damper is always 95% open. The system will monitor terminal box damper position. If all boxes are 95%, duct static pressure setpoint will be reduced by 0.25" (ADJ) to MIN DUCT STATIC PRESSURE setpoint. If any one terminal box is at 100% or two or more are at 95%, the setpoint will be increased by 0.12" (ADJ).

I. Supply Temperature Reset
If all terminal boxes are satisfied, at minimum position, and reheating, the system will reset the unit discharge air temperature between MIN DAT-4 and MAX DAT-4. Fan speed takes priority over temperature reset. For temperatures to be reset, humidity must be monitored. If space or return humidity rise above MAX RA HUMIDITY then the unit will reset the cooling coil DAT-4 over. If any terminal box is falling to meet SPACE TEMPERATURE setpoint, then DAT-4 shall be reset lower.

ALARM TYPE	SETPPOINT	NOTES
SUPPLY FAN FAILURE	-	-
HIGH STATIC PRESSURE SAFETY	4" W.G.	MANUAL RESET
LOW STATIC PRESSURE SAFETY	-4" W.G.	MANUAL RESET
FREEZE/STAT	35°F	MANUAL RESET
HIGH SUPPLY AIR TEMPERATURE	>110% SP	-
LOW SUPPLY AIR TEMPERATURE	<90% SP	-
HIGH RA TEMPERATURE	>110% SP	-
LOW RA TEMPERATURE	<90% SP	-
HIGH RA HUMIDITY	>110% SP	-
LOW RA HUMIDITY	<90% SP	-
LOW OA AIRFLOW	<90% SP	-
HIGH DUCT STATIC PRESSURE	>110% SP	-
LOW DUCT STATIC PRESSURE	<90% SP	-
DIRTY PRE-FILTER	1" W.G.	-
DIRTY FINAL FILTER	1.5" W.G.	-

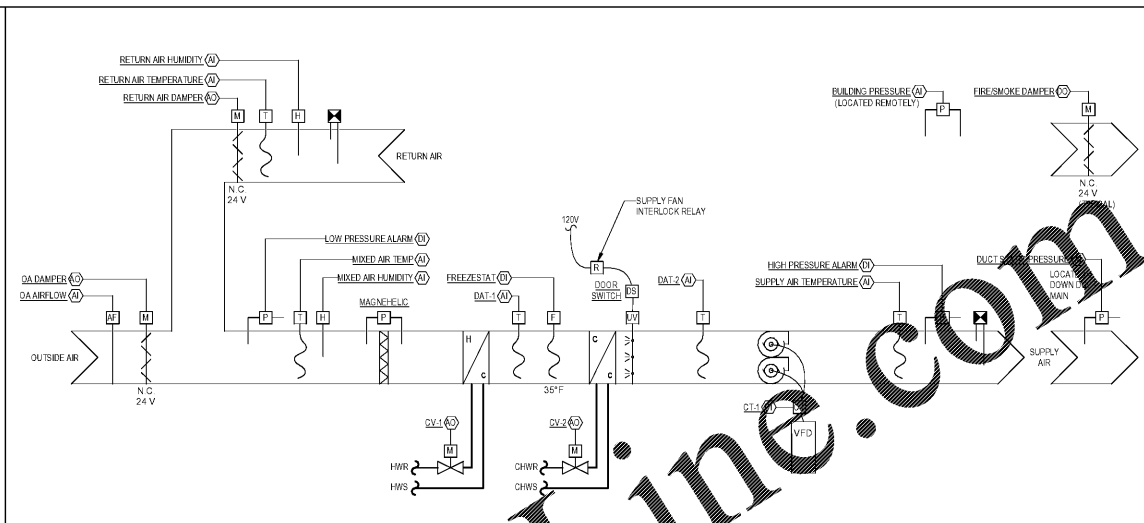
ALARM WHEN MEASURED VALUES EXCEED SETPOINTS FOR 10 MIN (ADJ).

MODE	MODES OF OPERATION						
	OA DAMPER	RA DAMPER	HW VALVE	CHW VALVE	SUPPLY FANS	FRESMOKE DAMPERS	EXHAUST FANS
NORMAL (OCCUPIED)	MODULATING	MODULATING	MODULATING	MODULATING	MODULATING	OPEN	ON
MAINTENANCE SHUTDOWN	CLOSED	CLOSED	CLOSED	CLOSED	OFF	CLOSED	OFF
FIRE ALARM	CLOSED	CLOSED	CLOSED	CLOSED	OFF	CLOSED	OFF
HIGH/LOW STATIC SHUTDOWN	CLOSED	CLOSED	CLOSED	CLOSED	OFF	CLOSED	OFF
FREEZE/STAT	CLOSED	CLOSED	100%	100%	OFF	CLOSED	OFF

NOTE: REFER TO FAN SCHEDULES FOR EXHAUST FAN/AHU INTERLOCKS

POINT NAME	VALUE	NOTES
OA MIN AIRFLOW	SCHEDULE	ADJ.
MIN RA HUMIDITY	60% RH	ADJ.
MAX RA HUMIDITY	80% RH	ADJ.
DAT-1	85°F	ADJ.
DAT-2	55°F	ADJ.
DAT-3	ADJ.	ADJ.
MIN DAT-4	ADJ.	ADJ.
MAX DAT-4	85°F	ADJ.
MIN DUCT STATIC PRESSURE	0.25" W.G.	ADJ.
SPACE TEMPERATURE	-	REFER TO TERMINAL LIMIT DIAGRAM

AHU - CHW/HW VAV UNIT (DUAL PATH)
No Scale **2**



A. General
The unit is a VAV air handler. It will have occupied and unoccupied modes of operation that will be determined based on a time of day schedule. All setpoints are user adjustable (ADJ). All points must be capable of being tripped. The unit will be provided with electronic pressure reset, and supply temperature reset, fan speed control, and building pressure control.

B. Occupied Mode
The unit will receive a run signal from the system based on time of day schedule and/or override switch. On a call to start from the BAS system the supply fan will start after dampers open. The OA control algorithm will activate, general exhaust fans will start, building pressure control algorithm will start, preheat coil control will activate, and cooling coil control will activate.

C. Unoccupied Mode
The unit will be off when the space temperature is between unoccupied heating setpoints and unoccupied heating setpoints. During this state, the supply fan will be off, the preheat coil control will be off, and the cooling coil control will be off. The smoke damper will be off. The unit will run if the space temperature is above unoccupied cooling setpoint. The unit will start after return air damper opens. The unit will start after return air damper opens. The unit will start after return air damper opens. The unit will start after return air damper opens.

D. Supply Fan Control
On a call to start from the BAS system, the supply fan will ramp up to speed over 120 seconds (ADJ) before starting, and will stop on dampers must prove they are open before the fan starts. The fan speed will modulate to maintain a duct static pressure setpoint.

E. OA Control
Outdoor airflow to the unit will be measured by an airflow measuring station. The outdoor air and return air dampers will modulate to maintain the OA AIRFLOW setpoint. The return damper will default to 100% open and will modulate closed if the outdoor air damper is 100% open and the outdoor airflow is above setpoint then the outdoor air damper will modulate closed. At least one damper will always be 100% open.

F. Preheat coil control
Preheat coil control will always be enabled when the supply fan is on to preheat the cooling coil from heating. The preheat coil control valve will modulate to control to a discharge air temperature setpoint DAT1.

G. Cooling coil control
The cooling coil control valve will modulate to maintain the discharge air temperature setpoint DAT2.

H. Optional Start/Stop
The BAS system will start the system before scheduled occupied mode. The BAS system will start the system as soon as possible via a predictive algorithm that anticipates building loads. The system should ramp back on and turn off. OA damper will close during warm up / cool down periods.

I. Night Setback
See unoccupied mode of operation above. The BAS system will poll the space temperatures during night setback every 15 min (ADJ). See VAV box controls for Night Setback or unoccupied mode space setpoints.

J. Duct Static Pressure Reset
The system will reset the static pressure setpoint so that 1 terminal box damper is always 95% open. The system will monitor terminal box damper position every 5 minutes (ADJ). If all boxes are 95%, duct static pressure setpoint will be reduced by 0.25" (ADJ) to MIN DUCT STATIC PRESSURE setpoint. If any one terminal box is at 100% or two or more are at 95%, the setpoint will be increased by 0.12" (ADJ).

K. Supply Temperature Reset
The system will reset the supply air temperature between MIN DAT-2 and MAX DAT-2 setpoints when outdoor air temperature is below MIN DAT-2 and MAX DAT-2 setpoints. The system will reset the supply air temperature between MIN DAT-2 and MAX DAT-2 setpoints when outdoor air temperature is below MIN DAT-2 and MAX DAT-2 setpoints. The system will reset the supply air temperature between MIN DAT-2 and MAX DAT-2 setpoints when outdoor air temperature is below MIN DAT-2 and MAX DAT-2 setpoints.

L. Building Pressure Control
The BAS system will control building pressure. If the pressure relief fans are at minimum flow and the supply fan is on, the BAS system will modulate the return air damper to maintain the minimum space or low space air and the building pressure setpoint is satisfied.

ALARM TYPE	SETPPOINT	NOTES
SUPPLY FAN FAILURE	-	-
HIGH STATIC PRESSURE SAFETY	4" W.G.	MANUAL RESET
LOW STATIC PRESSURE SAFETY	-4" W.G.	MANUAL RESET
FREEZE/STAT	35°F	MANUAL RESET
HIGH SUPPLY AIR TEMPERATURE	99°F	-
LOW SUPPLY AIR TEMPERATURE	40°F	-
HIGH SPACE CO2	1000 PPM	MANUAL RESET

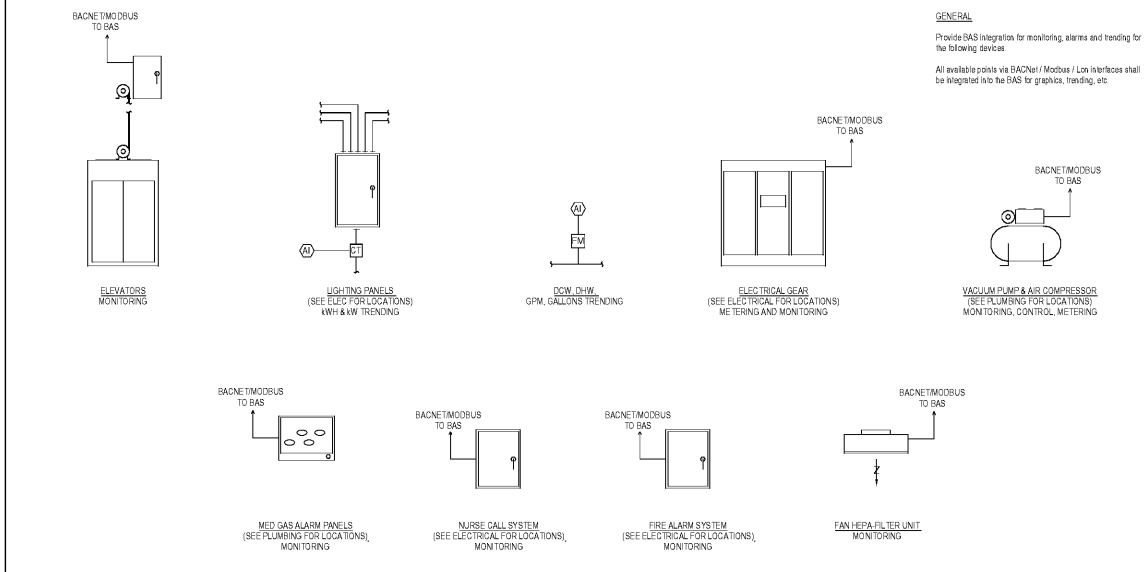
ALARM WHEN MEASURED VALUES EXCEED SETPOINTS FOR 10 MIN (ADJ).

POINT NAME	VALUE	NOTES
OA MIN AIRFLOW	SCHEDULE	ADJ.
OA MAX AIRFLOW	SCHEDULE	ADJ.
MAX RA HUMIDITY	80% RH	ADJ.
DAT-1	85°F	ADJ.
MIN DAT-2	65°F	ADJ.
MAX DAT-2	85°F	ADJ.
MIN SAT RESET ENABLE	55°F	ADJ.
MAX SAT RESET ENABLE	75°F	ADJ.
MIN DUCT STATIC PRESSURE	0.25" W.G.	ADJ.
MIN BUILDING PRESSURE	0.85" W.G.	ADJ.

MODE	MODES OF OPERATION						
	OA DAMPER	RA DAMPER	HW VALVE	CHW VALVE	SUPPLY FANS	FRESMOKE DAMPERS	EXHAUST FANS
NORMAL (OCCUPIED)	MODULATING	MODULATING	MODULATING	MODULATING	MODULATING	OPEN	ON
UNOCCUPIED	CLOSED	CLOSED	MODULATING	MODULATING	MODULATING	OPEN	OFF
MAINTENANCE SHUTDOWN	CLOSED	CLOSED	CLOSED	CLOSED	OFF	CLOSED	OFF
FIRE ALARM	CLOSED	CLOSED	CLOSED	CLOSED	OFF	CLOSED	OFF
HIGH/LOW STATIC SHUTDOWN	CLOSED	CLOSED	CLOSED	CLOSED	OFF	CLOSED	OFF
FREEZE/STAT	CLOSED	CLOSED	100%	100%	OFF	CLOSED	OFF

NOTE: REFER TO FAN SCHEDULES FOR EXHAUST FAN/AHU INTERLOCKS

AHU - CHW/HW VAV
No Scale **1**



MISCELLANEOUS MONITORING POINTS
No Scale **3**

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