

SEQUENCE OF OPERATION

GENERAL:

1. ALL CONTROLS SYSTEMS SHALL BE COMPLETE AND OPERATIONAL AT THE CONCLUSION OF THE CONSTRUCTION PROJECT.
2. IN A VISIBLE LOCATION ON HVAC EQUIPMENT UNDER DIRECT DIGITAL CONTROLLER (DDC) CONTROL, MOUNT A LAMINATED PLATE INSCRIBED WITH THE FOLLOWING:
 "CAUTION: THIS EQUIPMENT IS UNDER CENTRAL CONTROL AND MAY START OR STOP SUDDENLY. CONTACT PUBLIC WORKS BEFORE PERFORMING ANY MAINTENANCE OR DISCONNECTING ANY COMPONENTS."
3. DDC CONTROLLERS SHALL UTILIZE SHORT CYCLING DELAYS TO PROTECT NONMODULATING TYPE EQUIPMENT SUCH AS FANS, PUMPS, COMPRESSORS, ETC. FROM SHORT CYCLING. CONTROL SYSTEM FOR AHU-1 THROUGH AHU-4 SHALL CONSIST OF A CENTRAL CONTROL PANEL (E.G. TRANES "TRACE SC" CONTROL PANEL) THAT COMMUNICATE WITH A DIGITAL CONTROLLER AT EACH AHU-1 THROUGH AHU-4 (E.G. THANE COMMUNICATING THERMOSTATS FOR HEAT PUMPS WITH HUMIDITY CONTROL) THAT MONITOR BOTH TEMPERATURE AND RELATIVE HUMIDITY.
4. ALL CONTROL AND INTERLOCK WIRING SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE SUPPLIED UNITS MANUFACTURERS RECOMMENDATIONS.

AIR HANDLER UNITS 1-4:

GENERAL:

1. THE AHU SHALL BE STARTED AND STOPPED BY ITS DIRECT DIGITAL CONTROLLER (DDC) BASED ON A TIMED OCCUPANCY AS SCHEDULED.
2. A DUCT MOUNTED SMOKE DETECTOR SHALL SHUT DOWN THE AIR HANDLING UNIT AND SIGNAL THE BUILDING FIRE ALARM CONTROL PANEL UPON SENSING SMOKE.
3. AHU SHALL BE ENABLED/DISABLED BY THE DDC SYSTEM. ZONE THERMOSTAT SHALL CONTROL AHU.
4. IN THE COOLING MODE THE AIR HANDLER SHALL MAINTAIN THE SPACE SETPOINT OF 75°F (ADJUSTABLE).
5. IN THE HEATING MODE THE AIR HANDLER SHALL MAINTAIN THE SPACE SETPOINT OF 70°F (ADJUSTABLE).
6. A TEMPERATURE RISE ABOVE 85° SHALL ALARM THE DDC FOR UNIT MAINTENANCE.

OCCUPIED MODE:

1. DURING OCCUPIED MODE THE AHU AND THE ERU WILL RUN CONTINUOUSLY. THE SUPPLY AND EXHAUST OA DAMPERS WILL BE OPEN. THE COMPRESSOR WILL TURN ON OR OFF WITH TEMPERATURE. AS THE SPACE TEMPERATURE BEGINS TO RISE ABOVE THE COOLING SET POINT (ADJUSTABLE) AS SENSED BY THE ZONE SENSOR, THE SYSTEM PANEL WILL ENERGIZE THE REVERSING VALVE AND COMPRESSOR FOR MECHANICAL COOLING. AS THE SPACE TEMPERATURE BEGINS TO DROP BELOW THE HEATING SET POINT (ADJUSTABLE) AS SENSED BY THE ZONE SENSOR, THE SYSTEM PANEL WILL ENERGIZE THE COMPRESSOR FOR MECHANICAL HEAT. RELATIVE HUMIDITY SET POINT ON INDIVIDUAL THERMOSTATS SHALL BE SET AT 50% RH.
2. COOLING MODE SET POINT IS 75°F
HEATING MODE SET POINT IS 70°F

UNOCCUPIED MODE:

1. DURING THE UNOCCUPIED MODE, THE OUTSIDE AIR DAMPER (OPPOSED BLADE) SHALL REMAIN CLOSED. OPERATION OF AHU'S 1 THRU 4 SHALL BE CONTROLLED BY THE SYSTEM CONTROL PANEL THROUGH THE ZONE SENSOR TO MAINTAIN SET BACK (68 DEGREES F) OR SET UP (80 DEGREES F) ZONE TEMPERATURE (ADJUSTABLE) AND FANS SHALL CYCLE DURING UNOCCUPIED PERIOD. RELATIVE HUMIDITY SET POINT ON INDIVIDUAL THERMOSTATS SHALL BE SET AT 50% RH.
2. THE AHU SHALL DE-ENERGIZE WHEN SETBACK TEMPERATURES ARE SATISFIED.

SAFETY FEATURE:

1. A FREEZE STAT SHALL SHUT DOWN THE FAN AND CLOSE THE OUTSIDE AIR DAMPER WHEN TEMPERATURE LEAVING THE COOLING COIL DROPS BELOW 37°F (ADJUSTABLE).
2. UPON ACTIVATION OF ANY DUCT SMOKE DETECTOR OR ACTIVATION OF THE BUILDING FIRE ALARM CONTROL PANEL, THE AHU SHALL SHUT DOWN.

ERU

OCCUPIED MODE:

1. OPERATION OF THE ERU SHALL BE CONTROLLED BY THE PANEL. THE UNIT SHALL RUN WHENEVER THE AHU IS ON.

UNOCCUPIED MODE:

2. OPERATION SHALL BE CONTROLLED BY THE PANEL. DURING THE UNOCCUPIED MODE THE UNIT SHALL BE OFF AND THE OUTSIDE AIR DAMPER SHALL BE CLOSED.

AIR HANDLER UNITS 5 & 6:

GENERAL:

1. AHU 5&6 ARE NOT ON DDC CONTROL, BUT INDIVIDUAL DIGITAL THERMOSTATS. ROOM COMM 27 SHALL HAVE A RH ALARM INSTALLED AND SET AT 60% RH.
2. COOLING MODE SET POINT IS 81°F FOR AHU-6.
3. COOLING MODE FOR AHU-5 SHALL HAVE A SETPOINT OF 68°F.

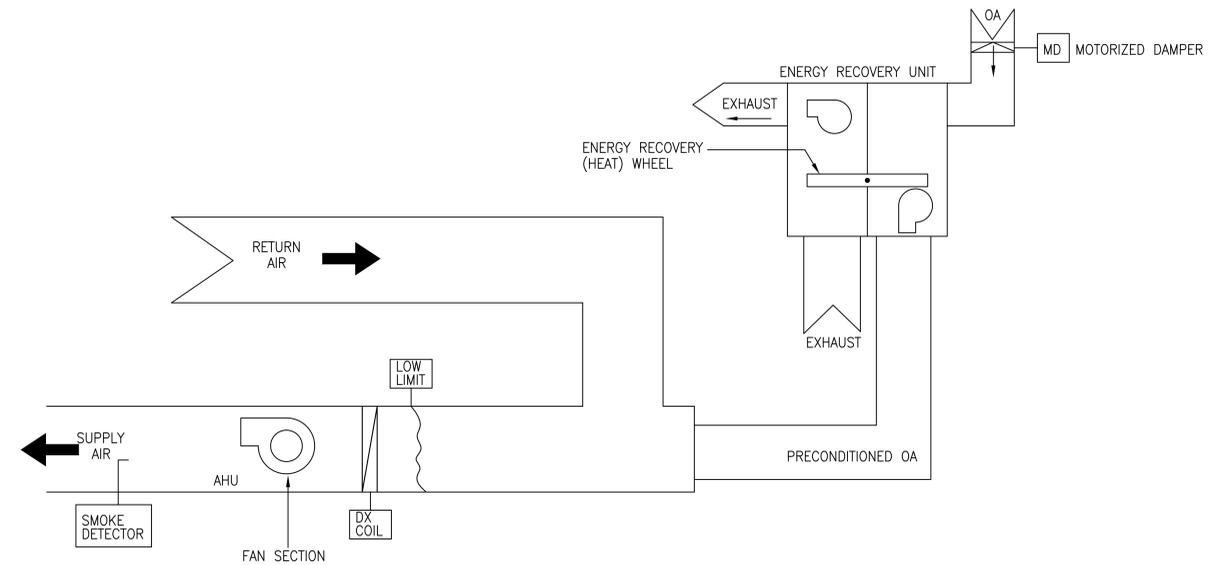
DIGITAL TSTATS

GENERAL:

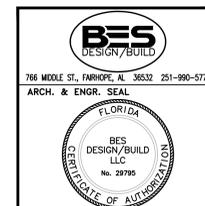
1. T STAT MUST EITHER BE PASSWORD PROTECTED OR COVERED BY A CLEAR LOCKABLE BOX (PASSWORD PROTECTION IS PREFERRED)

DDC INPUT/OUTPUT (I/O) SUMMARY	
GEN.	SOFTWARE
	CONTROL PROGRAM FUNCTION
UNIT	GRAPHIC DISPLAY
	GRAPHIC PROGRAMMING
	TIME SCHEDULING
AHU-1 THRU AHU-4	
ERU	
OA DAMPER	
HP-1 THRU HP-4	

NOTE: SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION ON DDC CONTROL REQUIREMENTS.



TYPICAL AHU WITH ENERGY RECOVERY (ERU)



FINAL SUBMISSION
APRIL 9, 2013

IF SHEET IS LESS THAN (30"x42") IT IS A REDUCED PRINT; SCALE ACCORDINGLY

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