Leon County

Board of County Commissioners

301 South Monroe Street, Tallahassee, Florida 32301
(850) 606-5302 www.leoncountyfl.gov

Purchasing Division
2284 Miccosukee Road
Tallahassee, Florida 32308
(850) 606-1600

Commissioners

BILL PROCTOR
District 1

JANE G. SAULS
District 2

JOHN DAILEY
District 3

BRYAN DESLOGE
District 4

BOB RACKLEFF
District 5

CLIFF THAELL
At-Large

AKIN AKINYEMI
At-Large

PARWEZ ALAM
County Administrator

HERBERT W.A. THIELE
County Attorney

March 10, 2010

RE: Northeast Branch Library Addition, Bid No: BC-03-11-10-19
Opening Date: ~~Thursday, March 11, 2010 at 2:00 PM~~
Revised to Wednesday, March 17, 2010 at 2:00 PM

ADDENDUM #5

Dear Contractor:

This letter serves as Addendum #5 for the above referenced project.

1. The bid due date is being revised to Wednesday, March 17, 2010 at 2:00 PM.

2. Attached is the missing appendix to specification section 15900, Building Automation System.

Acknowledgment of this addendum is required as part of your bid submittal. Failure to acknowledge this addendum may result in rejection of your bid.

Should you have any questions, feel free to call me at (850) 606-1600.

Sincerely,

Keith M. Roberts
Purchasing Director

ABBREVIATIONS

AFD	ADJUSTABLE FREQUENCY DRIVE
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AO	ANALOG OUTPUT
AVG	AVERAGING SENSOR
BI	BINARY INPUT
BO	BINARY OUTPUT
C	RELAY COIL
C/C	COOLING COIL
CE	CARBON DIOXIDE SENSOR / TRANSMITTER
CNT	CONTACTOR
CS	CURRENT SWITCH
CV	COOLING VALVE
D	DAMPER
DP	DIFFERENTIAL PRESSURE SENSOR / TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH
FE	FLOW SENSOR / TRANSMITTER
H/C	HEATING COIL
HE	HUMIDITY SENSOR
LAN	LOCAL AREA NETWORK
LTF	LOW TEMPERATURE FREEZESTAT
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
R	RELAY
RA	RETURN AIR
SA	SUPPLY AIR
SD	SMOKE DETECTOR
SF	SUPPLY FAN
SP	STATIC PRESSURE SENSOR / TRANSMITTER
TE	TEMPERATURE SENSOR / TRANSMITTER
V	VALVE
----	24V CONTROL WIRING
———	120V CONTROL WIRING

BARNETT FRONCZAK BARLOWE ARCHITECTS

NE BRANCH LIBRARY

ABBREVIATIONS - CONTROLS

114 EAST 5th AVENUE TALLAHASSEE, FL
32303 PHONE 850.222.7920
FAX 850.222.7922

THIS DOCUMENT IS THE PROPERTY OF HSEngineers AND IS PROTECTED BY COPYRIGHT LAWS. ANY USE, REUSE OR REPRODUCTION, EXCEPT BY WRITTEN AUTHORIZATION FROM HSEngineers, IS PROHIBITED.

HSE PROJECT No. 1907

Florida Certificate of Authorization #2485

HSE ENGINEERING

PROJECT	09-27
DATE	12/15/09
DRAWN	REM
CHECKED	DMH/RLC
FILE NO.	.

REV	DATE
1	/ /

DRAWING NO.

C-1

SHEET

. OF .

A-1 AIR HANDLING UNIT CONTROL (AHU-3):

1. General

a. The air handling unit shall be controlled by a stand-alone building or advanced application controller. Sequence of operation shall not rely on a communication interface with a remote panel; all control logic shall reside in control panel serving equipment.

b. The unit controller shall reside on a Peer-to-Peer Building Level Network as defined in Article 2.2 “Communications” of Specification 15900.

2. Run Conditions

a. Occupied Mode: Enable the air handling unit based on a user definable occupied time schedule.

b. Unoccupied Mode

1) Humidity Control: If space humidity rises above setpoint during unoccupied hours; then initiate an unoccupied dehumidification mode of operation until space humidity is below setpoint minus a deadband.

2) Tenant Override: If the override button is activated from any terminal unit ASC; then initiate an occupied mode of operation for a minimum time delay.

3) Associated Equipment: If the system is initiated during unoccupied hours; then all other equipment (pumps, chiller, etc.) that is required for occupied operation shall be placed into a mode of occupied operation as defined in their respective sequences of operation.

c. Dehumidification Mode: If the space humidity is above setpoint plus a deadband; then enter unoccupied dehumidification mode until the space humidity is below setpoint minus a deadband.

3. Supply Fan

a. Start/Stop: Start/stop of the supply fan shall be controlled through the H-O-A switch on the adjustable frequency drive (AFD). Enable the supply fan based on an occupied time schedule or unoccupied overrides.

b. Status: Supply fan operation shall be proved through a current switch. Upon failure, the BAS shall annunciate one of the following alarms (manual reset):

1) Supply Fan Failure: If the fan is commanded on, but the status is off.

2) Supply Fan in Hand Mode: If the fan is commanded off, but the status is on.

c. Speed: Once enabled; the AFD shall ramp the supply fan speed to operating setpoint over a 60 second time delay (Program ramp time in AFD).

1) Supply Air Static Pressure Control: Modulate supply fan speed to maintain a duct static pressure setpoint. Static pressure shall be measured by a sensor located approximately 2/3 down the longest duct run or as indicated on the drawings.

a) Static Pressure Reset: Continuously poll all of the variable volume terminals served by the air handling unit and calculate a sliding window average of the maximum damper position. Reset the static pressure setpoint based on maximum damper position. If communication between the terminal unit ASCs and the air handling unit CAC is failed; then revert to a default value.

2) Maximum Fan Speed Reset: If the outside air damper is open greater than 95% and the return air damper is at minimum position and outside airflow rate is below setpoint for a minimum time delay, then reset minimum fan speed setpoint to maintain outside airflow setpoint.

4. Outside Air Damper

a. Enable/Disable: If the supply fan is enabled during occupied hours; then modulate the outside air damper to maintain an outside air flow setpoint. If the supply fan is enabled during unoccupied hours or is shut down; then close the outside air damper.

1) Alarms: The BAS shall annunciate the following alarms (auto reset):

a) High Outside Air Flow: If the outside air flow is 20% (adj.) greater than setpoint for a minimum time delay.

b) Low Outside Air Flow: If the outside air flow is 20% (adj.) less than setpoint for a minimum time delay.

c) High CO2 Concentration: If the CO2 level is greater than setpoint for a minimum time delay.

2) Outside Airflow Target Reset:

a) Provide a minimum and maximum outside airflow setpoint. Reset the outside airflow setpoint to maintain indoor CO_2 concentration setpoint.

5. Return Air Damper: If the outside air damper position is greater than 95% open for a minimum time delay and if outside air flow is below setpoint; then modulate the return air damper to maintain the outside airflow setpoint. Provide a minimum damper position setpoint.

6. Cooling Valve

a. Enable/Disable: If the supply fan is on; then enable the cooling valve. If the supply fan is off; then close the cooling valve.

b. Supply Temperature Control: Modulate the cooling valve to maintain a supply air temperature target.

1) Alarms: The BAS shall annunciate the following alarms (auto reset):

a) High Supply Air Temperature: If the supply air temperature is 5 °F (adj.) greater than setpoint for a minimum time delay.

b) Low Supply Air Temperature: If the supply air temperature is 5 °F (adj.) less than setpoint for a minimum time delay.

Supply Temperature Target Reset: Continuously poll each of the variable volume terminals and calculate the differential between space temperature and control setpoint. Calculate a sliding window average of the calculated differentials and reset the supply air discharge setpoint to maintain a zero average. Concurrently reset the supply air setpoint to maintain a return air humidity setpoint. Reset the supply air setpoint to the minimum output of the two reset schemes.

c. Dehumidification Mode: During dehumidification mode, override supply temperature control and modulate cooling valve to full open position.

7. Electric Preheat (EDH-3)

a. Enable/Disable: If the supply fan is on; then enable the electric preheat. If the supply fan is off; then disable the electric preheat.

b. Supply Temperature Control: Stage the electric preheat to maintain a mixed air temperature setpoint minus a deadband.

8. Safeties

a. Smoke Detector(s): Smoke detector is provided by others but shall be wired to an auxiliary contact on the AFD to shut down the air handler fan upon detection of smoke.

b. High Pressure Limit: Provide a pressure switch at the supply fan discharge, wired to an auxiliary contact on the AFD. If static pressure exceeds 3.0 in. w.g, the switch shall override all controls and shut down the unit.

c. Low Temperature Limit Thermostat: If the chilled water coil entering air temperature is less than 35°F; then shut down the supply fan. The low limit thermostat shall be hard wired to an auxiliary contact on the AFD to override all controls.

d. Float Switch: Provide a float switch in the auxiliary drain pan wired to an auxiliary contact on the AFD.

9. Miscellaneous Alarms: The BAS shall annunciate the following alarms:

   a. Dirty Filter: If the differential pressure across the filter is greater than 1.0" w.g. (adj.) for a minimum time delay.

   b. Low Mixed Air Temperature: If the mixed air temperature is less than 35 °F (adj.) for a minimum time delay.

10. Required Reports

   a. Title: Air Handling Unit Failure
      Frequency: Upon failure of supply fan
      Data: Instantaneous value of all points on air handling unit.

   b. Title: Runtime Report
      Frequency: Weekly
      Data: The runtime hours per day for the supply fan.

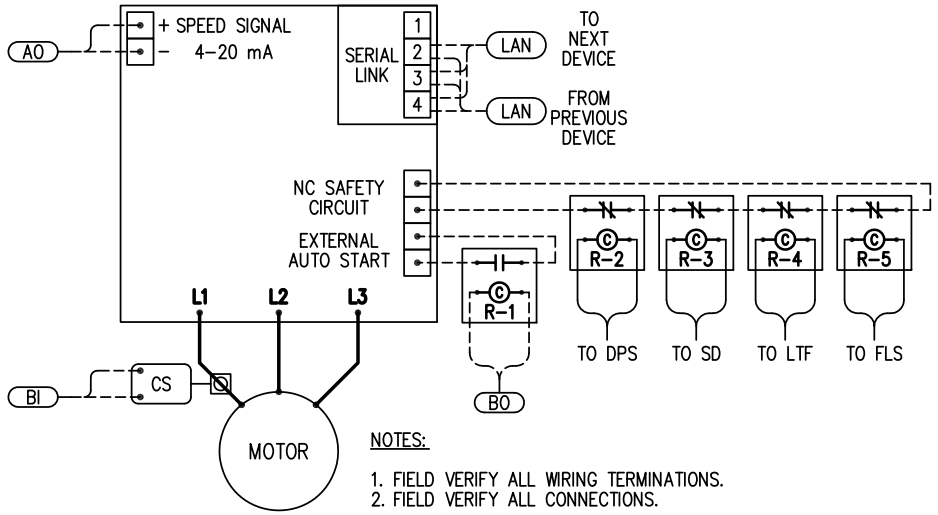
   c. Title: Return Air Temperature
      Frequency: Weekly
      Data: Low, high, and average return air temperature per day.

BAS Object (Point) List

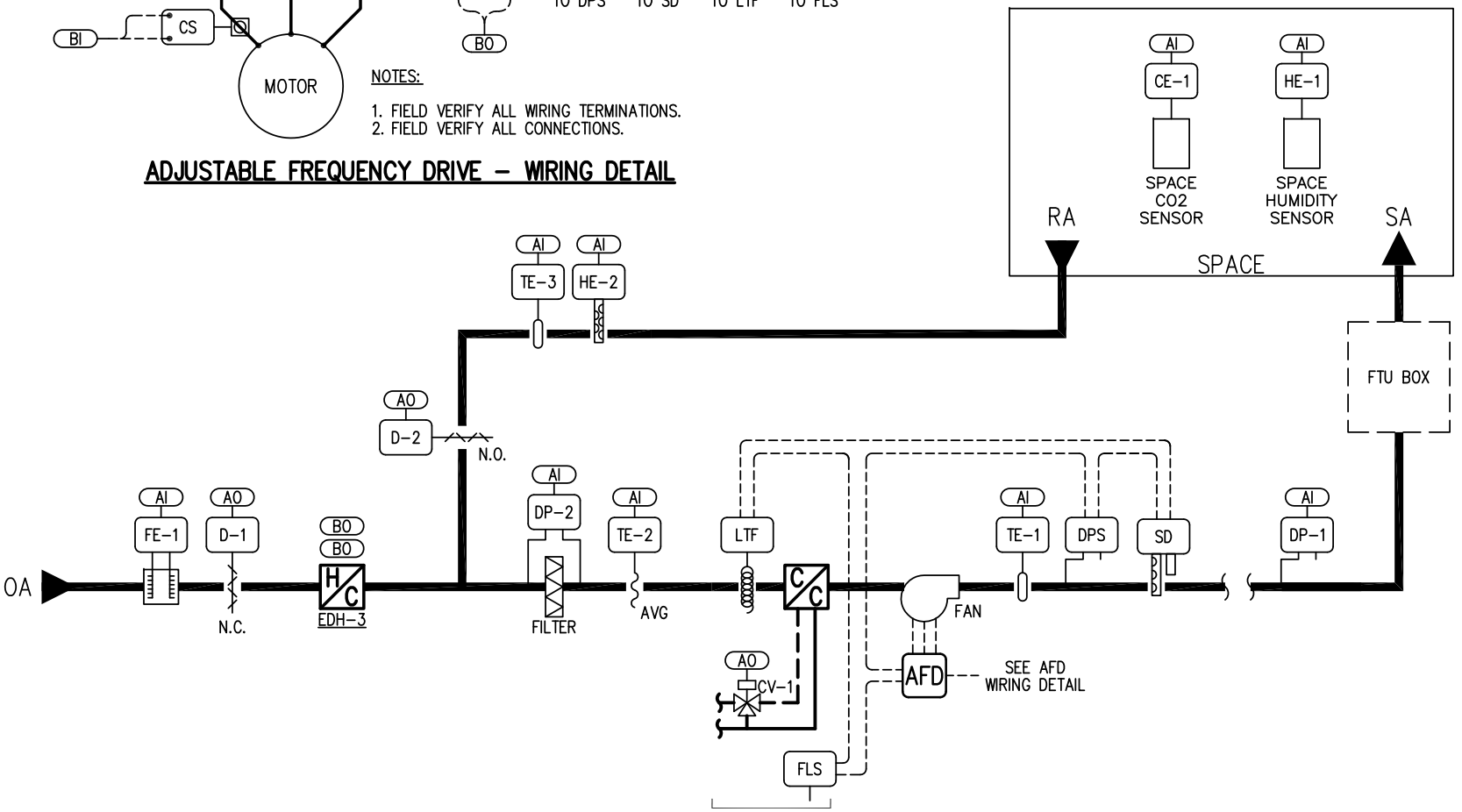
Project: N.E. Library

HH Job #: 09-27
Date: 12/15/2009
BAS Controller:
AAC
Screens:
Variable Volume Air Handling Unit

| | OPERATOR INTERFACE | | | | | POINTS | | | | | | | APPLICATIONS | | | | | | |



ADJUSTABLE FREQUENCY DRIVE – WIRING DETAIL



| | | |

A-1 FAN POWERED TERMINAL UNIT WITH ELECTRIC HEAT (FTU):

1. General

a. The terminal unit shall be controlled by a standalone ASC. The ASC shall monitor and control the unit in a stand-alone mode or as directed by the BAS.

b. The ASC reside on a sub-network as defined in Article 2.2 “Communications” of Specification 15900.

2. Run Conditions

a. Occupied Mode: Enable the terminal unit based on a user definable occupied time schedule. Enable heating and cooling modes of operation to maintain the occupied setpoints.

b. Unoccupied Mode:

1) Temperature Control: During unoccupied hours reset the heating and cooling setpoints equal to the respective unoccupied setpoints. Enable heating and cooling modes of operation to maintain the unoccupied setpoints. If unoccupied mode is enabled; then send signal to respective air handler AAC to initiate unoccupied operation.

2) Tenant Override: If the override button is activated at the space sensor; then initiate an occupied mode of operation for a minimum time delay. If tenant override is enabled; then send signal to respective air handler AAC to initiate occupied operation.

c. Cooling / Heating Changeover

1) Heating Mode: If primary airflow is at the minimum airflow setpoint and space temperature is below heating setpoint; then change to Heating Mode.

2) Cooling Mode: If space temperature is above cooling setpoint; then change to Cooling Mode.

3. Inlet Damper

a. Enable/Disable: The inlet damper shall be enabled during heating and cooling modes of operation.

b. Airflow Setpoints: Provide minimum and maximum airflow setpoints. (Initial value: See Terminal Box Schedule).

c. Space Setpoints: Provide a space temperature cooling setpoint. Heating setpoint shall be equal to the cooling setpoint minus a deadband. Provide unoccupied heating and cooling setpoint.

d. Cooling Mode: Modulate inlet damper between minimum and maximum airflow setpoints to maintain space setpoint.

e. Heating Mode: Modulate inlet damper to maintain minimum airflow setpoint.

4. Fan Control

   a. Enable/Disable: Enable the fan during heating mode of operation. Disable the fan during cooling mode of operation.

5. Electric Heat

   a. Enable/Disable: Enable the electric heat during heating mode of operation. Disable the electric heat during cooling mode of operation.

   b. Heating Mode: Once the inlet damper is maintaining the minimum airflow setpoint, stage the electric heat to maintain space heating setpoint.

6. Alarms: The BAS shall annunciate the following alarms (auto reset):

   a. High Space Temperature: If the space temperature is 3 °F (adj.) greater than setpoint for a minimum time delay.

   b. Low Space Temperature: If the space temperature is 3 °F (adj.) less than setpoint for a minimum time delay.

7. Required Reports

   a. Title: Space Temperature
      Frequency: Weekly
      Data: Low, high, and average space temperature per day

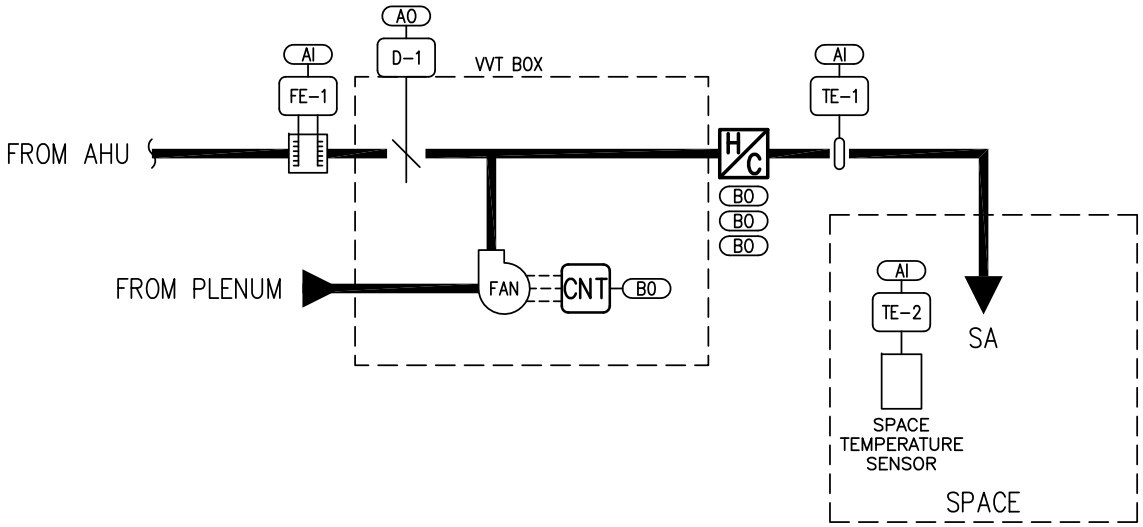
   b. Title: Electric Heat Runtime
      Frequency: Weekly
      Data: The runtime hours per day for each stage of electric heat.

BAS Object (Point) List

Project: N.E. Library

HH Job #: 09-27
Date: 12/15/2009
BAS Controller:
ASC
Screens:
Fan Terminal Units

	OPERATOR INTERFACE					POINTS							APPLICATIONS																								REPORTS / MESSAGES						
									PHYSICAL				ALARMS					TRENDS			PROGRAMS																						
									INPUT		OUTPUT																																		
	GRAPHIC SCREEN	DYNAMIC GRAPHICS	TEXT BASED USER INTERFACE	USER ADJUSTABLE	DYNAMIC CHARTING	INTEROPERABLE POINT TYPE	CALCULATED POINT	VIRTUAL POINT	BINARY	ANALOG	BINARY	ANALOG	INITIAL VALUE	BINARY ALARM	HIGH LEVEL ALARM	LOW LEVEL ALARM	HIGH LEVEL SETPOINT	LOW LEVEL SETPOINT	TREND (CHANGE OF VALUE)	TREND (SAMPLE INTERVAL)	C.O.V. or SAMPLE INTERVAL	SCHEDULING	OPTIMAL START / STOP	SEQUENCING	LEAD / LAG ROTATION	SOFT START	DEMAND LIMITING	STAGGARED START	ON / OFF WITH DIFFERENTIAL	RUNTIME TOTALIZATION	START TOTALIZATION	ANTI-SHORT CYCLE	SETPOINT RESET PROGRAM	OPERATOR OVERRIDE	PID CONTROL	ALARM LOG (REPORT DAILY)	REPORT (DAILY)	REPORT (MONTHLY)	REPORT (ANNUAL)	ALARM INSTRUCTION	MAINTENANCE MESSAGE	REMARKS
FTU Screens	X																																									
Occupied / Unoccupied Mode		X						X																										X								Display Mode
Unoccupied Time Delay		X		X				X					2 HR																													
Heating / Cooling Mode		X						X																																		Display Mode
Induction Fan Start/Stop		X									1																															
Primary Airflow (FE-1)		X								1																																
Maximum Airflow Setpoint		X		X				X					Sched																													
Minimum Airflow Setpoint		X		X				X					Sched																													
Primary Air Valve Position (D-1)		X										1																								X						
Supply Temperature (TE-1)		X								1																																
Space Temperature (TE-2)		X								1				X	X	SP +3 F	SP -3 F																			X				X		"SPACE TEMPERATURE OUT OF RANGE"
Space Temperature Setpoint		X		X				X					74 F																													
Heating Deadband		X		X				X					2 F																													
Unoccupied Cooling Setpoint		X		X				X					85 F																													
Unoccupied Heating Setpoint		X		X				X					68 F																													
Electric Heat		X									3																									X						
Sub-Total									0	3	4	1																														
Total w/ Spare									0	4	5	2																														



DRAWING NO.	C-3
SHEET	.
OF	.
REV	△
DATE	/ /
FILE NO.	.
CHECKED	DMH/RLC
DRAWN	REM
DATE	12/15/09
PROJECT	09-27

ENGINEERING

114 EAST 5th AVENUE TALLAHASSEE, FL
32303 PHONE: 850.224.7922
www.H2Engineering.com

H2E PROJECT No. 0927

THIS DOCUMENT IS THE PROPERTY OF H2Engineering AND IS PREPARED AS AN INSTRUMENT OF SERVICE. ITS USE, REUSE OR REPRODUCTION, EXCEPT BY WRITTEN AGREEMENT WITH H2Engineering, IS PROHIBITED.

Florida Certificate of Authorization #2485

FAN POWERED TERMINAL UNITS - CONTROLS

NE BRANCH LIBRARY

BARNETT FRONCZAK BARLOWE ARCHITECTS

A-1 SINGLE DUCT VARIABLE VOLUME TERMINAL WITH NO HEAT (VVT):

1. General

   a. The terminal unit shall be controlled by a standalone ASC. The ASC shall monitor and control the unit in a stand-alone mode or as directed by the BAS.

   b. The ASC reside on a sub-network as defined in Article 2.2 “Communications” of Specification 15900.

2. Space Temperature Control

   a. Space Setpoints: Provide a space temperature cooling setpoint. Provide unoccupied cooling setpoint.

   b. Inlet Damper: Provide minimum and maximum airflow setpoints (Initial value: See Terminal Box Schedule). Modulate inlet damper between minimum and maximum airflow setpoints to maintain space setpoint.

3. Unoccupied Operation

   a. Temperature Control: During unoccupied hours reset the cooling setpoint equal to the unoccupied setpoint. Enable unoccupied mode of operation to maintain the unoccupied setpoint. Send signal to respective air handler AAC to initiate unoccupied operation.

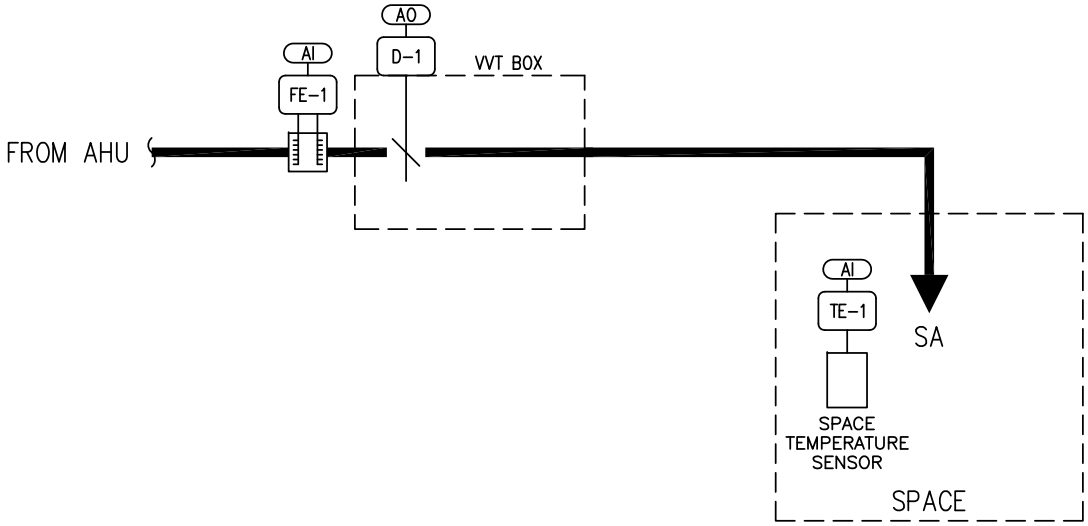
   b. Tenant Override: If the override button is activated at the space sensor; then initiate an occupied mode of operation for a minimum time delay. If tenant override is enabled; then send signal to respective air handler AAC to initiate occupied operation.

BAS Object (Point) List

Project: N.E. Library

HH Job #: 09-27
Date: 12/15/2009
BAS Controller:
AAC
Screens:
Single Duct Variable Volume Terminal Units (No Heat)

	OPERATOR INTERFACE					POINTS							APPLICATIONS																												REPORTS / MESSAGES						
									PHYSICAL				ALARMS					TRENDS			PROGRAMS																									
									INPUT		OUTPUT																																					
	GRAPHIC SCREEN	DYNAMIC GRAPHICS	TEXT BASED USER INTERFACE	USER ADJUSTABLE	DYNAMIC CHARTING	INTEROPERABLE POINT TYPE	CALCULATED POINT	VIRTUAL POINT	BINARY	ANALOG	BINARY	ANALOG	INITIAL VALUE	BINARY ALARM	HIGH LEVEL ALARM	LOW LEVEL ALARM	HIGH LEVEL SETPOINT	LOW LEVEL SETPOINT	TREND (CHANGE OF VALUE)	TREND (SAMPLE INTERVAL)	C.O.V. or SAMPLE INTERVAL	SCHEDULING	OPTIMAL START / STOP	SEQUENCING	LEAD / LAG ROTATION	SOFT START	DEMAND LIMITING	STAGGARED START	ON / OFF WITH DIFFERENTIAL	RUNTIME TOTALIZATION	START TOTALIZATION	ANTI-SHORT CYCLE		SETPOINT RESET PROGRAM	OPERATOR OVERRIDE	PID CONTROL	ALARM LOG (REPORT DAILY)	REPORT (DAILY)	REPORT (MONTHLY)	REPORT (ANNUAL)	ALARM INSTRUCTION	MAINTENANCE MESSAGE	REMARKS
VVT Screens	X																																										
Occupied / Unoccupied Mode		X						X																										X								
Unoccupied Time Delay		X		X				X					2 HR																														
Primary Airflow (FE-1)		X								1																																	
Maximum Airflow Setpoint		X		X				X					Sched																														
Minimum Airflow Setpoint		X		X				X					Sched																														
Primary Air Valve Position		X										1																										X					
Space Temperature (TE-1)		X								1				X	X	+3 F	-3 F																				X					Variance from Setpoint
Space Temperature Setpoint		X		X				X					74 F																						X								
Unoccupied Cooling Setpoint		X		X				X					85 F																														



PROJECT	09-27
DATE	12/15/09
DRAWN	REM
CHECKED	DMH/RLC
FILE NO.	.
REV	DATE
1	/ /

DRAWING NO. C-4

SHEET . OF .

ENGINEERING

114 EAST 5th AVENUE TALLAHASSEE, FL
32303 PHONE 850.224.7922
www.H2Engineering.com

H2E PROJECT No. 0927

THIS DOCUMENT IS THE PROPERTY OF H2Engineering AND IS PREPARED AS AN INSTRUMENT OF SERVICE. ITS USE, REUSE OR REPRODUCTION, EXCEPT BY WRITTEN AGREEMENT WITH H2Engineering, IS PROHIBITED.

Florida Certificate of Authorization #2485

VARIABLE VOLUME TERMINAL UNITS - CONTROLS

NE BRANCH LIBRARY

BARNETT FRONCZAK BARLOWE ARCHITECTS