SIEMENS

Start-up Procedures for Project HAR-030998-1

TEC 0534.11

Table of Contents

Overview

This section presents start-up procedures for Unit Vent Controllers with Mixed Air Control and Dehumidification – 0-10V Output. Refer to Figure 1.

NOTES:
1. Update each controller at the field panel immediately after you complete the controller start-up procedures, and have made all other changes to the controller's point database (including tuning, etc.).

2. If free cooling is desired, then add the appropriate PPCL statements at the field panel to command the point FREE CLG (number 23) to ON when free cooling is available and OFF when it is not available.

Verify power to controller

Verify that the Unit Vent Controller with Mixed Air Control and Dehumidification – 0-10V Output is powered up. Check that the BST LED on the controller is flashing. If the BST LED does not flash ON/OFF once per second, then refer to the *APOGEE Automation Service Procedures Manual* (125-3013) for troubleshooting information.

NOTE: The Controller Interface Software (CIS) used with the Unit Vent Controller – 0-10V Output must be Rev. 2.0 or greater.

Set controller address and application

Using the portable operator's terminal, set the controller address and application following these steps:

1. Verify that the point APPLICATION (number 2) is set to 2384 (slave mode).

2. Display the STARTUP report.

3. Set the point CTLR ADDRESS (number 1) to the appropriate address number.

4. Set the point APPLICATION (number 2) to the appropriate Unit Vent Controller – 0-10V Output application. Refer to the following table for application names and numbers.

Application	Revision UD10 or Higher
Heating and/or Chilled Water Cooling with Mixed Air Control and Dehumidification	2352
Heating and/or DX Cooling with Mixed Air Control Dehumidification	2353
Slave Mode	2384

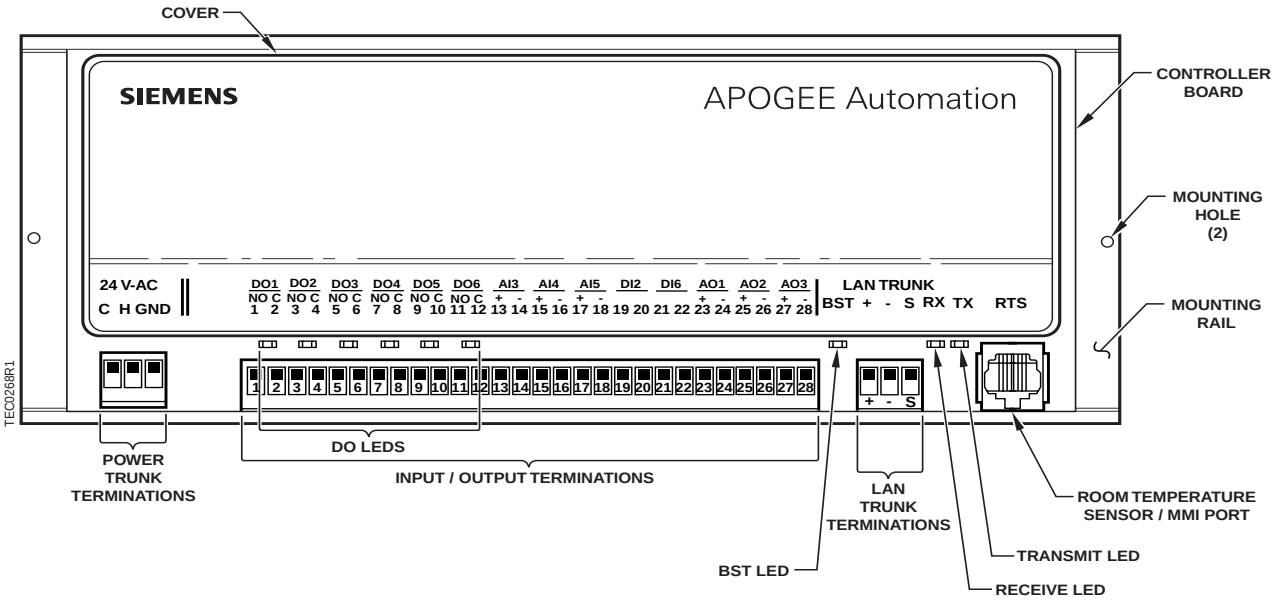

Figure 1. Unit Vent with Mixed Air Control and Dehumidification – 0-10V Output.

After you set the application, the controller will go through a shut-down/load sequence as it switches from slave mode to the application selected. After the application loads and the OVERVIEW report appears, change to the UECYC I.II report (if in application 2352) or the UECYC I.II DX report (if in application 2353) and continue with the following procedures.

Set the DX cooling timers

Application 2353 only: Determine the minimum on time desired for the DX cooling. Set CMP MIN ON (number 76) to this value.

Determine the minimum off time desired for the DX cooling. Set CMP MIN OFF (number 75) to this value.

Enable auxiliary radiation

Applications 2352 and 2353: If the unit has auxiliary radiation that will be controlled by DO 1, then set the point AUX.NOAUX (number 50) to AUX. For all other units, leave AUX.NOAUX at its default value of NOAUX.

Set room temperature set points

Follow these steps to set the room temperature set points:

1. Display the STARTUP report.

2. If the room temperature sensor has a set point dial, and if the point RM STPT DIAL (number 13) is to be used by the controller, then set the point STPT DIAL (number 14) to YES; otherwise, set STPT DIAL to NO.

NOTE: If STPT DIAL is set to YES, then the points DAY HTG STPT (number 7) and DAY CLG STPT (number 6) will not be used. Instead, the value of RM STPT DIAL will be used.

3. Display the SETPOINTS report.

   Set the following points to the appropriate values:

   - DAY CLG STPT (number 6)
   - DAY HTG STPT (number 7)
   - NGT CLG STPT (number 8)
   - NGT HTG STPT (number 9)

4. If the room temperature sensor has a set point dial and the set point dial is to be used, then set the points RM STPT MIN (number 11) and RM STPT MAX (number 12) for the minimum and the maximum allowable room temperature set point values, respectively. Valid values range from 55° to 95°F (13° to 35°C). Common values for these points are 65°F (18°C) for RM STPT MIN and 80°F (27°C) for RM STPT MAX.

Set outdoor air damper minimum position

Follow these steps to set the outdoor air damper minimum position:

1. Display the STARTUP report.

2. If the minimum position for the outdoor air damper is a value other than the default value of 14.8%, then set the point OADPR MINPOS (number 10) to the desired value.

Set override time

If using night override, set the point OVRD TIME (number 20) to the number of whole hours that an override should last. Otherwise, leave OVRD TIME at its default value of 1 (night override is disabled).

Set the LTDT contact value

Applications 2352 and 2353: The TEC needs to know whether the low temperature detector is Normally Closed or Normally Opened. If it is Normally Closed, then set the point LTDT CONTACT (number 87) to NCLOSE. If it is Normally Opened, then set LTDT CONTACT to NOPEN.

NOTE: If a low temperature detector is not being used, then set the point LTDT CONTACT (number 87) to NOPEN.

Enable the fan proof

Applications 2352 and 2353: If the fan is being proofed, then set the point PROOF USED (number 51) to YES. Otherwise, leave PROOF USED at its default value of NO.

Set the fan proof time

Applications 2352 and 2353: If the fan is being proofed, then set the point PROOF TIME (number 22) to desired value (the default is 30 seconds).

PROOF TIME is the amount of time that the fan DI has to proof before the fan goes into alarm.

Set start and span of voltages for the 0-10V actuators

Depending on the actuators you are using, set the points listed in Table 2 to the appropriate starting voltage position and the voltage range for the actuators.

NOTE: The maximum voltage output for the AOs is 10V. Therefore, the starting voltages and the voltage ranges **must not** exceed 10V. The controller **will not** control the valve or damper actuator beyond 10V.

Table 2. Start and Span Voltages for Actuators.

Descriptor	Point Number	Siemens Business Technologies P/N SQB 61.1	Barber-Coleman P/N MP5433
		Voltage Range	
AOV1 SPAN AOV2 SPAN AOV3 SPAN	31 33 35	10 (default)	3
		Starting Voltage	
AOV1 START AOV2 START AOV3 START	32 34 36	0 (default)	6

Set AO DIR.REV

If the normal (de-energized) state of all of the devices controlled by AOs is direct acting, then leave the point AO DIR.REV (number 37) at its default value of 0. Otherwise, reverse the action of the appropriate AO, or combination of AOs, as follows:

1. Add the values in Table 3 for each AO you wish to make reverse acting.

2. Set AO DIR.REV to this value.

Table 3. AO DIR.REV Values.

Reverse-Acting AO	Value
AO1	1
AO2	2
AO3	4

Enable night heating

If using hot water heat, then leave the point NGT HW HTG (number 53) at its default position of YES, which will open the hot water valve during night mode.

If using steam or electric heat, then set NGT HW HTG to NO.

Enable night cooling

If cooling is desired during night mode, then set the point NGT CLG MODE (number 54) to YES.

NOTE: For cooling only units, NGT CLG MODE **must** be set to YES to enable cooling in the night mode.

Otherwise, leave NGT CLG MODE at its default value of NO.

Enable night dehumidification

If dehumidification is desired during night mode, then set the point NITE DEHUMID (number 25) to YES.

Otherwise, leave NITE DEHUMID at its default value of NO.

Set the relative humidity HI and LO limits

Set RH HI LIMIT (number 16) to the highest relative humidity desired before dehumidification is used. Set RH LO LIMIT (number 17) to the lowest relative humidity desired before dehumidification is shut off.

Set DO DIR.REV

If the normal (de-energized) state of all of the devices controlled by DOs is direct acting, then leave the point DO DIR.REV (number 59) at its default value of 0. Otherwise, reverse the action of the devices as follows:

1. Add the values in Table 4 for each DO you wish to make reverse acting.
2. Set DO DIR.REV to this value.

Table 4. DO DIR.REV Values.

Reverse-Acting DO	Value
DO1	32
DO2	16
DO3	8
DO4	4
DO5	2
DO6	1
DO7	64
DO8	128

Set the type of outside air damper control

Display the STARTUP report. Set the point MA CONTROL (number 58) according to how you want the outside air damper to be controlled:

- If you want the outside air damper controlled by the mixed air PID loop, then set MA CONTROL to ENABLE.
- If you want the outside air damper controlled by the heating PID LOOP in the heating mode and the cooling PID loop in the cooling mode, then set MA CONTROL to DISABL.

Set the mixed air set points

Applications 2352 and 2353: If MA CONTROL is set to ENABLE, then choose the desired mixed air set points. Change to the SETPOINTS menu. Set the point MAX MA STPT (number 81) to the warmest mixed air set point desired. Set the point MIN MA STPT (number 82) to the coldest mixed air set point desired.

When free cooling is needed least, MA STPT (number 03) will be set equal to MAX MA STPT. When free cooling is needed most, MA STPT will be set equal to MIN MA STPT.

Set gains

Display the TUNING report. Set the P, I, and D gains for the system. Refer to Table 5.

Table 5. Recommended P, I, and D Gains for Applications 2352 and 2353.

Hardware Configuration	Cooling Loop 63 CLG P GAIN 64 CLG I GAIN 65 CLG D GAIN	Heating Loop 67 HTG P GAIN 68 HTG I GAIN 69 HTG D GAIN	Room Loop 70 ROOM P GAIN 71 ROOM I GAIN 72 ROOM D GAIN
VALVES			
Steam	Does not apply.	0.4 (0.72) 0.015 (0.027) 5 (9)	2.3 (4.14) 0.00504 (0.009072) 76 (136.8)
HW	Does not apply.	0.06 (1.08) 0.02 (0.036) 15 (27)	2.3 (4.14) 0.00504 (0.009072) 76 (136.8)
CHW	1.6 (2.88) 0.05 (0.09) 10 (18)	Does not apply.	2.3 (4.14) 0.00504 (0.009072) 76 (136.8)
DAMPERS			
FBP Steam	Does not apply.	0.3 (0.54) 0.02 (0.036) 0	2.3 (4.14) 0.00504 (0.009072) 76 (136.8)
FBP HW	Does not apply.	0.5 (0.9) 0.03 (0.054) 0	2.3 (4.14) 0.00504 (0.009072) 76 (136.8)
FBP CHW	0.6 (1.08) 0.04 (0.072) 0	Does not apply.	2.3 (4.14) 0.00504 (0.009072) 76 (136.8)
DX			
DX	10 (18) 0.02 (0.036) 200 (360)	Does not apply.	Does not apply.

Set mixed air gains

If MA CONTROL is set to ENABLE, then set the P, I, and D mixed air gains for the system. Refer to table 6.

Table 6. Recommended Mixed Air P, I, and D Gains for Applications 2352 and 2353.

Point Number	Point Name	Value (Metric)
55	MA P GAIN	5.0 (9.0)
56	MA I GAIN	0.02 (0.036)
57	MA D GAIN	0.0 (0.0)

NOTE: Update each controller at the field panel immediately after you complete the controller start-up procedures and have made all other changes to the controller's point database (including tuning, etc.).

The Unit Vent Controller with Mixed Air Control – 0-10V Output start-up is complete.