

Start-up Procedures for TEC Custom Solutions Unit Vent with Humidity Control — 0-10V Output Applications 2306, 2307 and 2319

TEC 0515.11

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Overview

This document presents start-up procedures for the Unit Vent with Humidity Control – 0-10V Output. Refer to *Figure 1*.

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.

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

Verifying Power to Controller

Verify that the Unit Vent Controller – 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* in InfoLink 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. Voyager's point database may also be used for start-up.

Setting Controller Address and Application

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

1. Display the STARTUP report.
2. Set CTLR ADDRESS (Point 1) to the appropriate address number.

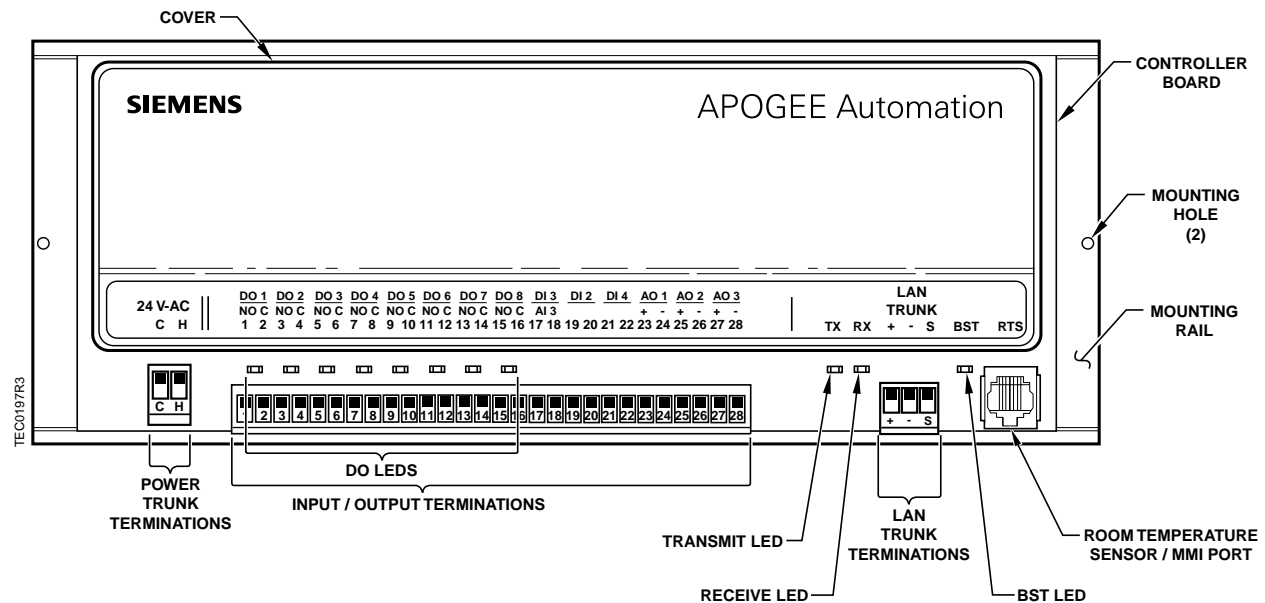


Figure 1. Unit Vent with Humidity Control – 0-10V Output.

- Set APPLICATION (Point 2) to the appropriate Unit Vent with Humidity Control – 0-10V Output application. Refer to *Table 1* for application names and numbers.

Table 1. Unit Vent with Humidity Control – 0-10V Output Applications.

Application	Revision UJ10 or higher
Heating and/or Chilled Water Cooling, Relative Humidity Control	2306
Heating and/or Chilled Water Cooling, Dewpoint Temperature Control	2307
Electric Heating and Chilled Water Cooling, Relative Humidity Control	2319
Slave Mode	2299

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, continue with the following procedures.

Setting Room Temperature Set Points

Follow these steps to set the room temperature set points:

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

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

3. If there is no set point dial on the room temperature sensor, then verify that STPT DIAL is set to **NO**.
4. Set the following points to the appropriate values:
 - DAY CLG STPT (Point 6)
 - DAY HTG STPT (Point 7)
 - NGT CLG STPT (Point 8)
 - NGT HTG STPT (Point 9)
5. If the room temperature sensor has a set point dial and the set point dial is to be used, then set RM STPT MIN (Point 11) and RM STPT MAX (Point 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.

Setting DAMPER AO.DO

1. Display the STARTUP report.
2. If the outdoor air damper is controlled by an AO, then set DAMPER AO.DO (Point 17) to **AO**. If the damper is controlled by DOs, or if there is no damper, then set DAMPER AO.DO to **DO**.

Setting the Outdoor Air Damper Minimum Position

If the damper is controlled by an AO and the required minimum position for the outdoor air damper is a value other than the default value of 14.8%, then set OADPR MINPOS (Point 10) according to the job specifications.

Setting HUMID AO.DO

If the humidifier is controlled by an AO, then set HUMID AO.DO (Point 17) to **AO**. If the humidifier is controlled by a DO, then set HUMID AO.DO to **DO**.

Setting Valve Configuration

Applications 2306 and 2307 only: If the unit has 1 valve that controls a coil that changes from heating to cooling depending on the season (a 2-pipe heat/cool configuration), then set 1 VLV HTGCLG (Point 16) to **YES**.

For all other units, leave 1 VLV HTGCLG at its default value of **NO**.

Setting Override Time

If using night override, then set OVRD TIME (Point 20) to the number of whole hours that an override should last.

Otherwise, set OVRD TIME to **0**.

Setting Start and Span of Voltages for the 0-10V Actuators

Depending on the actuators you are using, set 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. The starting voltage and the voltage range 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	Landis & Staefa 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

Setting AO DIR.REV

1. If the normal (de-energized) state of all of the devices controlled by AOs is closed, then leave AO DIR.REV (Point 37) at its default value of 0.

Otherwise, reverse the action of the appropriate AO, or combination of AOs, as follows:

- Add the values in Table 3 for each AO you wish to make reverse-acting.
- Set AO DIR.REV to this value.

Table 3. AO DIR.REV Values.

Reverse-Acting AO	Value
AO1	1
AO2	2
AO3	4

Enabling Night Heating

Applications 2306 and 2307 only: If using hot water heat, then leave NGT HW HTG (Point 53) at its default position of YES, which will open the hot water valve during night mode.

If using steam, then set NGT HW HTG to **NO**.

Enabling Night Cooling

If cooling is desired during night mode, then set NGT CLG MODE (Point 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.

Setting DO DIR.REV

1. If the normal (de-energized) state of all of the devices controlled by DOs is off, then leave DO DIR.REV (Point 59) at its default value of 0.

Otherwise, reverse the action of the devices as follows:

- Add the values in Table 4 for each DO you wish to make reverse-acting.
- 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

Setting DEHUM MODE

If dehumidification is allowed, then set DEHUM MODE (Point 28) to **ENABLE**. If not allowed, then set to **DISABL**.

Setting Humidifier Pulse Width Modulation

If the humidifier is to be controlled by a DO, then set HUM PWM TIME (Point 57) to the length of the pulsing period. Also, set HUM MIN ON (Point 95) and HUM MIN OFF (Point 96) to the appropriate values. The sum of HUM MIN ON and HUM MIN OFF must not exceed the value of HUM PWM TIME.

Setting the Relative Humidity Set Point

Applications 2306 and 2319 only: Set RH STPT (Point 93) to the required relative humidity set point.

Setting the Dewpoint Temperature Set Point

Application 2307 only: Set DPT STPT (Point 93) to the required dewpoint temperature set point.

Setting Humidity Sensor Type

If the RH/DPT sensor provides a 0-10V signal, then set AI3 VOLT.CUR (Point 97) to **VOLT**. If it provides a 4-20 mA signal, then set AI3 VOLT.CUR to **CURRENT**.

NOTE: If a 4-20 mA sensor is used, then special wiring requirements must be taken. Each 4-20 mA sensor requires a dedicated 24 VDC power supply and the entire circuit must be ungrounded, including the 4-20 mA sensor. Refer to the Installation Instructions for Unit Vent with Humidity Control – 0-10V Output.

Setting Dehumidification Coil Scaling Factor

The DEHUM COEFF (Point 87) is used to determine how much the heating coil will open to counteract the cooling effect when the cooling coil is opened for dehumidification. If opening the heating valve by 10% counteracts the cooling coil being opened to 20%, then set DEHUM COEFF to 0.5.

Setting 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.

(SI Units)		
Hardware Configuration	Cooling Loop	Heating Loop
	63 CLG P GAIN	67 HTG P GAIN
	64 CLG I GAIN	68 HTG I GAIN
	65 CLG D GAIN	69 HTG D GAIN
	66 CLG BIAS	70 HTG BIAS
VALVES		
Steam	Does not apply.	2.5 (4.5) 0.005 (0.009) 127 (228.6) 0*
HW	Does not apply.	5 (9) 0.008 (0.0144) 250 (450) 0*
Electric Reheat	Does not apply.	5 (9) 0.008 (0.0144) 250 (450) 50
CHW	8 (14.4) 0.01 (0.018) 250 (450) 0*	Does not apply.

NOTE: If controlling the damper with an AO, then set the heating and cooling bias points to 50.

Setting Stand-alone Mode

Applications 2306 and 2307 only: If the controller will be running stand-alone (no FLN trunk connected), then set STAND ALONE (Point 89) to **YES**.

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 with Humidity Control – 0-10V Output start-up is complete.