

Unit Vent Controller—0 to 10V Output Start-up Procedures

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This document presents start-up procedures for the Unit Vent Controllers—0 to 10V Output. See Figure 1.

NOTES: 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, 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.

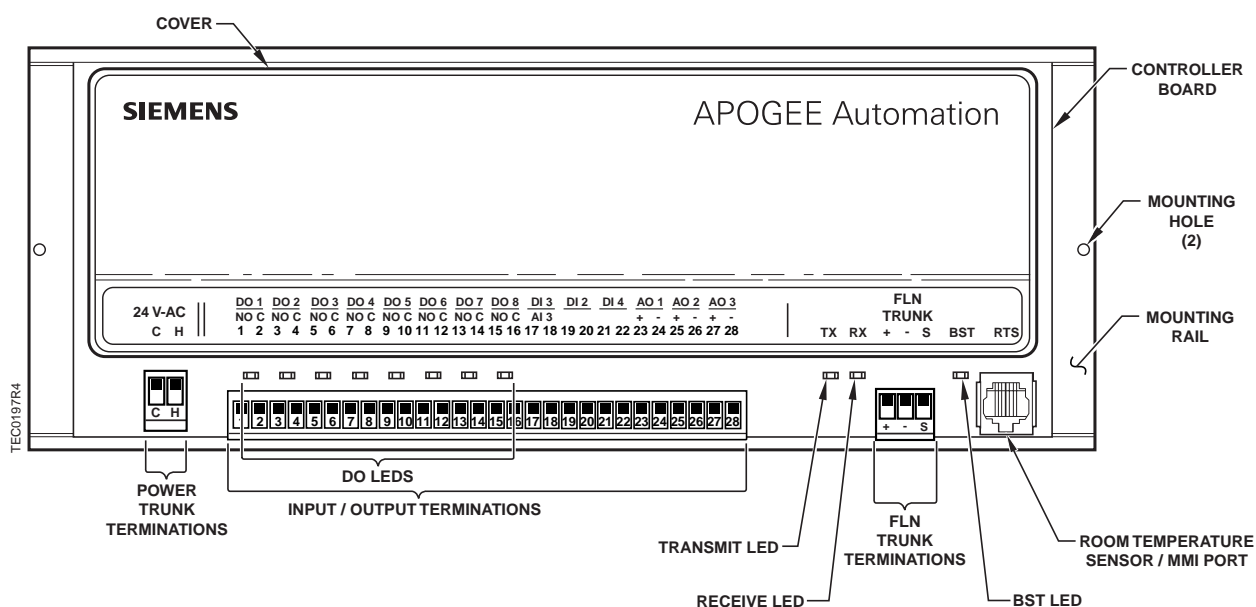


Figure 1. Unit Vent Controller—0–10V Output.

Verifying Power to Controller

Verify that the Unit Vent Controller—0 to 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, see the iKnow troubleshooting tool or contact Field Support for troubleshooting information.

Setting the Application

Using the portable operator's terminal, set APPLICATION (Point 2) to the appropriate Unit Vent Controller application. See Table 1 for application names and numbers.

Table 1. Unit Vent Controller—0 to 10V Output Applications.

Application	Revision UE10 or later
Heating and/or Chilled Water Cooling, ASHRAE Cycles I and II	2281
Heating and/or Chilled Water Cooling, ASHRAE Cycle III	2283
Heating and DX Cooling, ASHRAE Cycles I and II	2284
Heating and DX Cooling, ASHRAE Cycle III	2286
Nesbitt Cycle W	2287
Slave Mode	2299

After you set the application, the controller goes 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 Start and Span of Voltages for the 0 to 10V Actuators

Depending on the actuators you are using, setpoints listed in Table 2, refer to the appropriate starting voltage position and the voltage range (span) for the actuators.

NOTE: The maximum voltage output for the AOs is 10V. The starting voltage plus 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	Siemens actuators	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

The point AO DIR.REV (Point 37) should be set based on whether the actuators are normally open or normally closed.

Set AO DIR.REV to the value shown in Table 3.

Table 3. AO DIR.REV Values.

Normal Position of actuator on AO1	Normal Position of actuator on AO2	Normal Position of actuator on AO3	AO DIR.REV value
Closed	Closed	Closed	0 (default)
Open	Closed	Closed	1
Closed	Open	Closed	2
Open	Open	Closed	3
Closed	Closed	Open	4
Open	Closed	Open	5
Closed	Open	Open	6
Open	Open	Open	7

Enabling Night Heating

If using hot water heat, 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 or electric heat, set NGT HW HTG to **NO**.

Enabling Night Cooling

If cooling is desired during night mode, 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 night mode.

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

Setting DO DIR.REV

If the normal (de-energized) state of all of the devices controlled by DOs is direct-acting, leave DO DIR.REV (Point 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 want 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

Enabling Auxiliary Radiation

Applications 2281, 2283, 2284, and 2286: If the unit has auxiliary radiation that will be controlled by DO1, set AUX.NOAUX (Point 22) to **AUX**.

For all other units, leave AUX.NOAUX at its default value of NOAUX.

Enabling Electric Heat

Applications 2281, 2283, 2284, and 2286: If the unit has electric heating coils that will be controlled by DOs, set ELEC.NOELEC (Point 27) to **ELEC**.

If the unit has valve control, leave ELEC.NOELEC at its default value of NOELEC.

Enabling DX Cooling

Applications 2284 and 2286: No action is required. DX cooling is enabled internally.

Application 2287: If the unit has DX cooling, set DX COOLING (Point 27) to **YES** to enable DX cooling.

Enabling Closure of 2-position Valve

Applications 2281, 2283, 2284, and 2286: If the unit has a face-bypass damper and 2-position valves, set FBP.2PSVCTL (Point 28) to **ENABLE** to allow the 2-position valve to close when the face-bypass damper is at the bypass closed position.

For all other units, leave FBP.2PSVCTL at its default position of DISABL.

Setting Room Temperature Setpoints

If the Controller is to Use a Setpoint Dial

1. Display the SETPOINTS report.
2. If the room temperature sensor has a setpoint dial, and if RM STPT DIAL (Point 13) is used by the controller, set STPT DIAL (Point 14) to **YES**.

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

3. Set the night setpoints to the appropriate values:
 - NGT CLG STPT (Point 8)
 - NGT HTG STPT (Point 9)
4. Set RM STPT MIN (Point 11) and RM STPT MAX (Point 12) for the minimum and the maximum allowable room temperature setpoint values, respectively. Valid values range from 55°F to 95°F (13°C to 35°C).

If No Setpoint Dial is Used

1. Display the SETPOINTS report.
2. Verify that STPT DIAL (Point 14) is set to **NO**.
3. 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)

Setting Outdoor Air Damper Minimum Position

Display the STARTUP report. If the minimum position for the outdoor air damper is a value other than the default value of 14.8%, set OADPR MINPOS (Point 10) as follows:

- For ASHRAE Cycle I, set OADPR MIN POS to **100**.
- For ASHRAE Cycle II, III, or Nesbitt Cycle W, consult the job documentation for the appropriate value.

Setting Valve Configuration

Applications 2281 and 2283: If the unit has one valve that controls a coil that changes from heating to cooling depending on the season (a two-pipe heat/cool configuration), set 1 VLV HTGCLG (Point 16) to **YES**.

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

Enabling Face-bypass Damper

Applications 2281, 2283, 2284, and 2286: If the unit has a face-bypass damper, set FBP.MODVALVE (Point 17) to **FBP**.

For all other units, leave FBP.MODVALVE at its default value of VALVE.

Setting Override Time

If using night override, set OVRD TIME (Point 20) to the number of whole hours that an override should last. To disable night override, set OVRD TIME to **0**.

Enabling Wall Switch

If a wall switch is used for day/night control, enable it by setting WALL SWITCH (Point 18) to **YES**. Otherwise, leave WALL SWITCH at its default value of NO.

Setting Gains and Bias

Display the TUNING report. Set the P, I, and D gains and bias according to the appropriate table:

- [Applications 2281 and 2284 \(ASHRAE Cycles I and II\):](#) Table 5 ([p. 8](#)).
- [Applications 2283 and 2286 \(ASHRAE Cycle III\):](#) Table 6 ([p. 9](#)).
- [Applications 2287 \(Nesbitt Cycle W\):](#) Table 7 ([p. 10](#)).

Table 5. Recommended P, I, and D Gains for Applications 2281 and 2284.

Hardware Configuration	ASHRAE Cycles I and II (SI Units)					
	Cooling Loop		Heating Loop		Room Loop	
	63	CLG P GAIN	67	HTG P GAIN	71	ROOM P GAIN
	64	CLG I GAIN	68	HTG I GAIN	72	ROOM I GAIN
	65	CLG D GAIN	69	HTG D GAIN	73	ROOM D GAIN
	66	CLG BIAS	70	HTG BIAS	74	ROOM BIAS
	81	AUX P GAIN				
	82	AUX I GAIN				
	83	AUX D GAIN				
	84	AUX BIAS				
VALVES						
Steam	Does not apply.		0.4 (0.72) 0.015 (0.027) 5 (9) 50 (50)		2.3 (4.14) 0.00504 (0.009072) 76 (136.8) 72 (22.38)	0.4 (0.72) 0.00099 (0.001782) 50 (80) 0 (0)
HW	Does not apply.		0.06 (1.08) 0.02 (0.036) 15 (27) 50 (50)		2.3 (4.14) 0.00504 (0.009072) 76 (136.8) 72 (22.38)	0.04 (0.72) 0.00099 (0.001782) 50 (80) 0 (0)
CHW	1.6 (2.88) 0.05 (0.09) 10 (18) 50 (50)		Does not apply.		2.3 (4.14) 0.00504 (0.009072) 76 (136.8) 72 (22.38)	Does not apply.
DAMPERS						
FBP Steam	Does not apply.		0.3 (0.54) 0.02 (0.036) 0 (0) 50 (50)		2.3 (4.14) 0.00504 (0.009072) 76 (136.8) 72 (22.38)	Does not apply.
FBP HW	Does not apply.		0.5 (0.9) 0.03 (0.054) 0 (0) 50 (50)		2.3 (4.14) 0.00504 (0.009072) 76 (136.8) 72 (22.38)	Does not apply.
FBP CHW	0.6 (1.08) 0.04 (0.072) 0 (0) 50 (50)		Does not apply.		2.3 (4.14) 0.00504 (0.009072) 76 (136.8) 72 (22.38)	Does not apply.
ELECTRIC						
3 Steps	Does not apply.		1 (1.8) 0.02 (0.036) 10 (18) 50 (50)		2.3 (4.14) 0.00504 (0.009072) 76 (136.8) 72 (22.38)	Does not apply.
DX						
DX	10 (18) 0.02 (0.036) 200 (360) 50 (50)		Does not apply.		Does not apply.	Does not apply.

Table 6. Recommended P, I, and D Gains for Applications 2283 and 2286.

Hardware Configuration	ASHRAE Cycle III (SI Units)					
	Cooling Loop		Heating Loop		Mixed Air Loop	
	63	CLG P GAIN	67	HTG P GAIN	81	MA P GAIN
	64	CLG I GAIN	68	HTG I GAIN	82	MA I GAIN
	65	CLG D GAIN	69	HTG D GAIN	83	MA D GAIN
	66	CLG BIAS	70	HTG BIAS	84	MA BIAS
VALVES						
Steam	Does not apply.		2.5 (4.5) 0.005 (0.009) 127 (228.6) 50 (50)		Does not apply.	
HW	Does not apply.		5 (9) 0.008 (0.0144) 250 (450) 50 (50)		Does not apply.	
CHW	8 (14.4) 0.01 (0.018) 250 (450) 0 (0)		Does not apply.		Does not apply.	
DAMPERS						
Mixed Air	Does not apply.		Does not apply.		1 (1.8) 0.05004 (0.090072) 0 (0) 14.8 (14.8)	
FBP Steam	Does not apply.		2.5 (4.5) 0.005 (0.009) 127 (228.6) 50 (50)		Does not apply.	
FBP HW	Does not apply.		5 (9) 0.008 (0.0144) 250 (450) 50 (50)		Does not apply.	
FBP CHW	8 (14.4) 0.01 (0.018) 250 (450) 0 (0)		Does not apply.		Does not apply.	
ELECTRIC						
3 Steps	Does not apply.		5 (9) 0.008 (0.0144) 250 (450) 50 (50)		Does not apply.	
DX						
DX	10 (18) 0.02 (0.036) 200 (360) 50 (50)		Does not apply.		Does not apply.	

Table 7. Recommended P, I, and D Gains for Application 2287.

Hardware Configuration	Nesbitt Cycle W (SI Units)					
	Cooling Loop		Heating Loop		Outdoor Air Loop	
	63	CLG P GAIN	67	HTG P GAIN	81	OA P GAIN
	64	CLG I GAIN	68	HTG I GAIN	82	OA I GAIN
	65	CLG D GAIN	69	HTG D GAIN	83	OA D GAIN
	66	CLG BIAS	70	HTG BIAS	84	OA BIAS
VALVES						
Steam	Does not apply.		2.5 (4.5) 0.005 (0.009) 127 (228.6) 40 (40)		Does not apply.	
HW	Does not apply.		5 (9) 0.008 (0.0144) 250 (450) 40 (40)		Does not apply.	
CHW	8 (14.4) 0.01 (0.018) 250 (450) 0 (0)		Does not apply.		Does not apply.	
DAMPERS						
Mixed Air	Does not apply.		Does not apply.		1 (1.8) 0.05004 (0.090072) 0 (0) 14.8 (14.8)	
DX						
DX	10 (18) 0.02 (0.036) 200 (360) 50 (50)		Does not apply.		Does not apply.	

Setting Controller Address

Set the controller address by setting CTLR ADDRESS (Point 1) to the appropriate number.

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.).

Start-up of the Unit Vent Controller—0 to 10V Output is complete.