

Application 2349 Unit Vent Controller with Free Cooling, Night Purge and Dehumidification

Overview

In Application 2349, the Unit Vent Controller controls a unit ventilator with numerous features, including:

- Morning warm-up/cool-down
- Night mode override
- Free-cooling
- Night purge
- Dehumidification in the day during the cooling season
- Auxiliary radiation in heating mode

Temperature control is achieved with a modulating face and bypass damper and a htg/clg valve. (Even though this is an analog valve, it is controlled as a 2-position valve, either fully closed or fully opened.)

This application controls room temperature indirectly by setting the discharge set point. This set point is sent to the heating and cooling PID loops, which directly control the coil devices.

This application accomplishes dehumidification by using full mechanical cooling and shutting the outside air damper.

Night purge is accomplished by turning the fan ON and setting the outside air damper fully opened.

This application can determine whether free cooling is available if a field panel sends it the outside air temperature. When free cooling is available, the outside air damper can be modulated as a source of free cooling.

The unit ventilator fan is also controlled in this application. Refer to Figures 2349-1 through 2349-3.

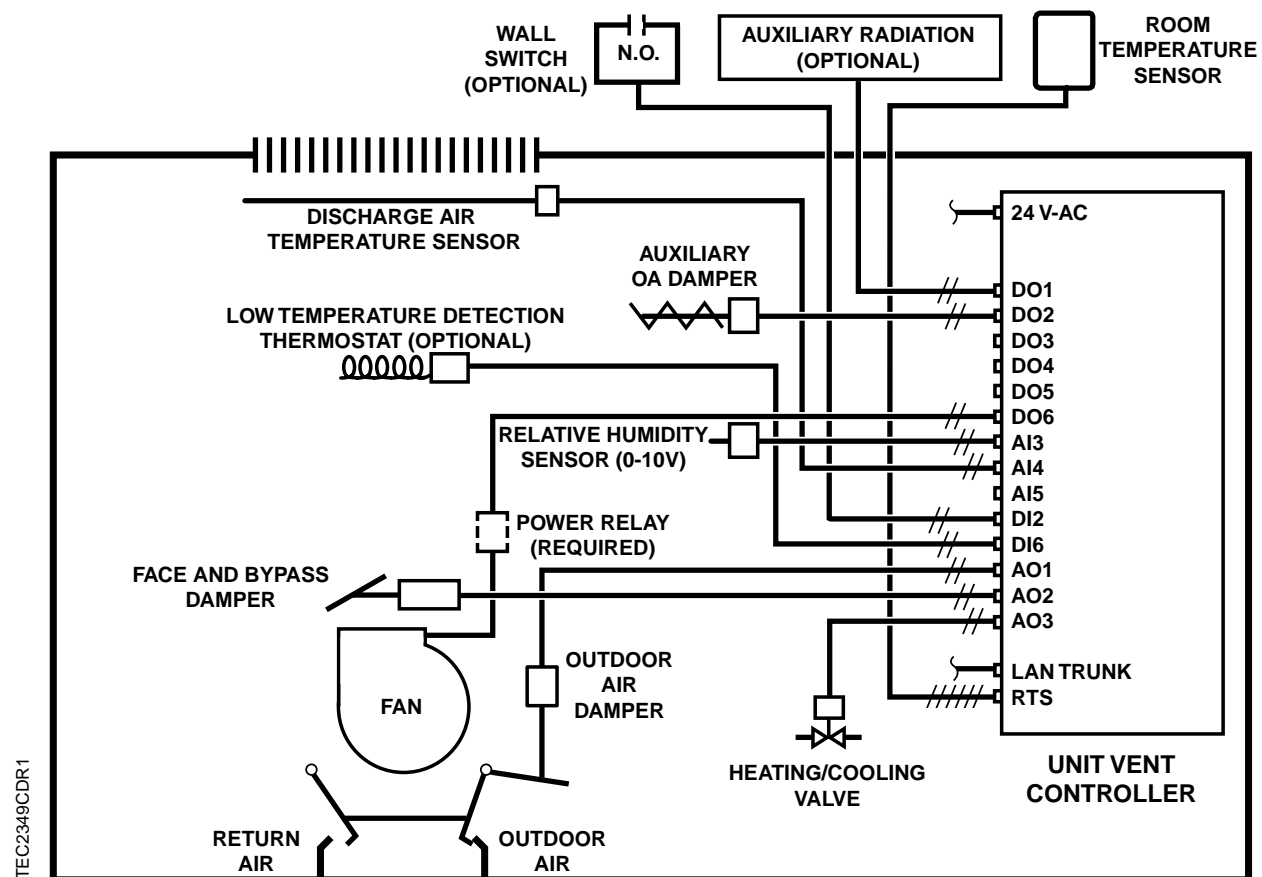
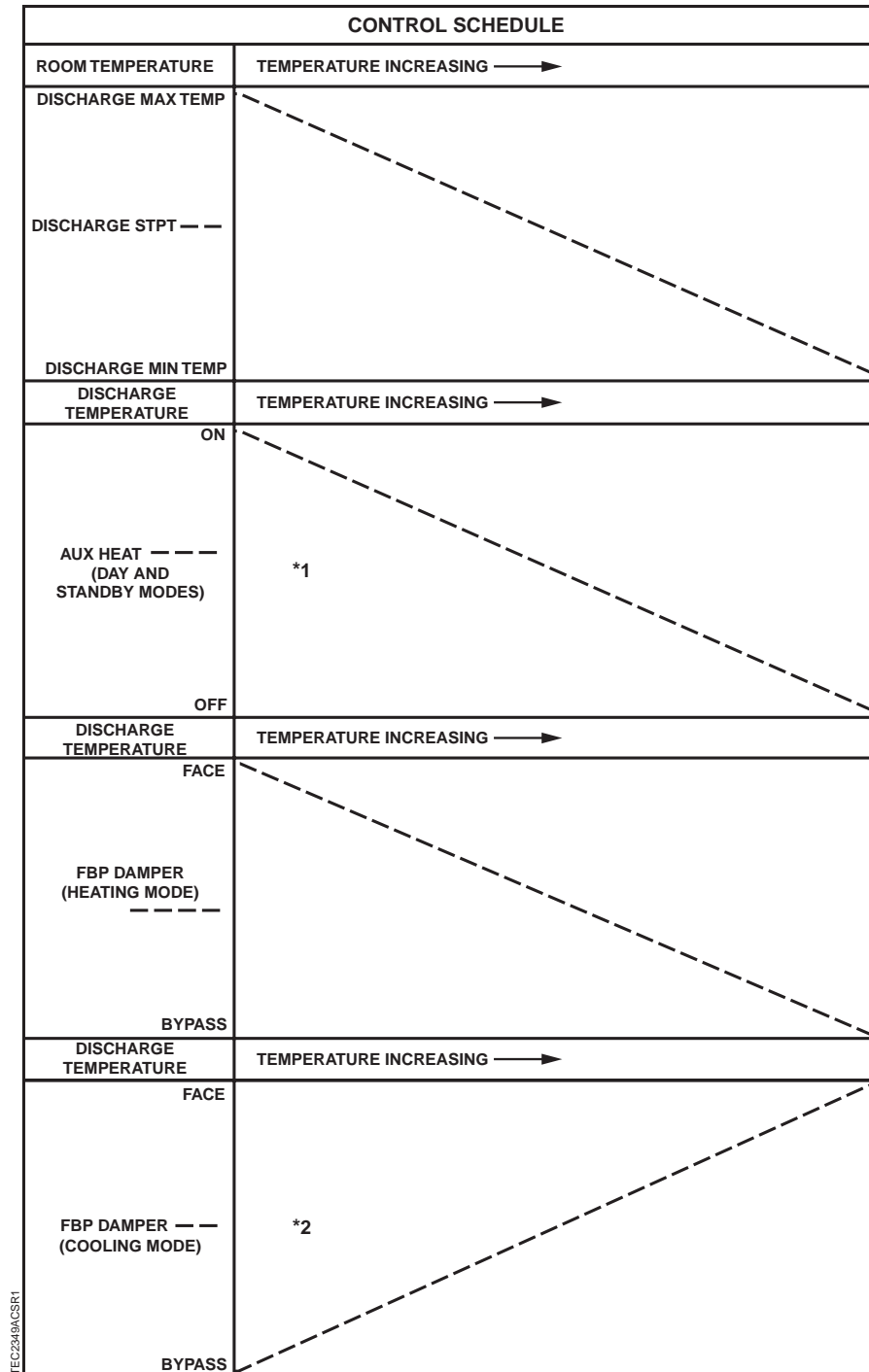
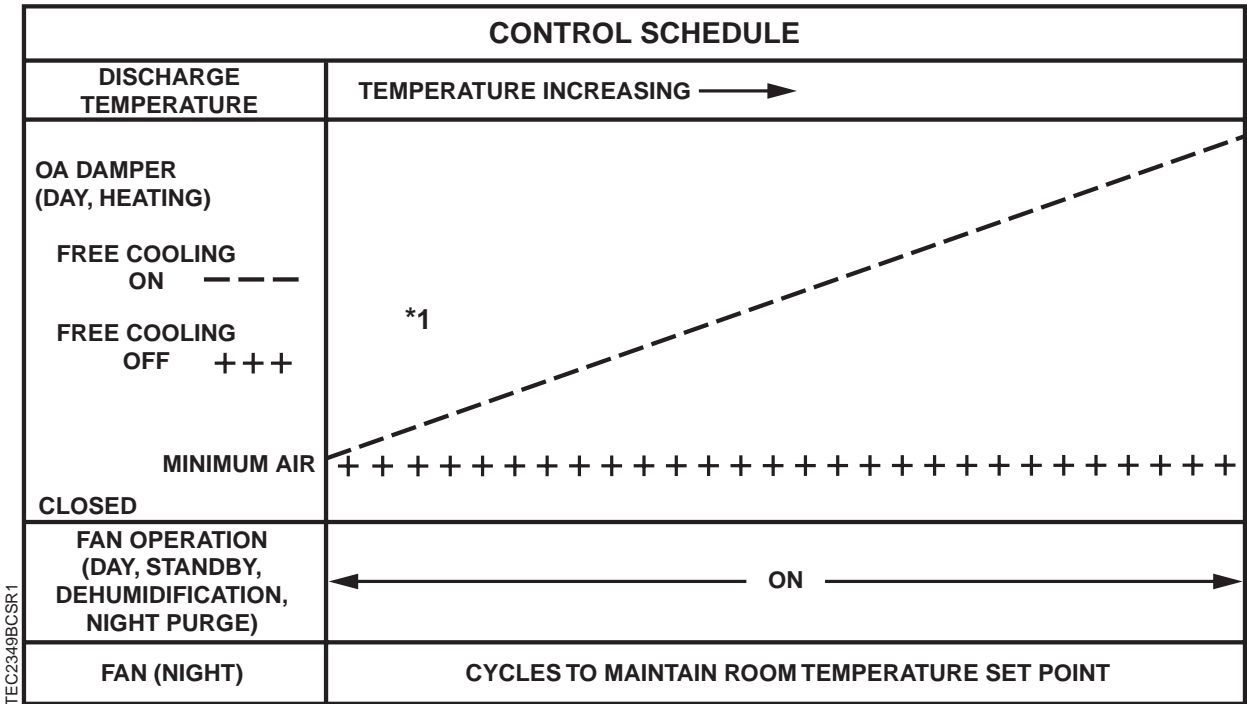


Figure 2349-1. Application 2349 Control Drawing.



1. Auxiliary radiation (AUX HEAT) is shown for day and standby modes only. During night heating mode, auxiliary radiation cycles with the fan. During warm-up, it is ON all the time.
2. When dehumidification is needed, the FBP damper is in the face position.

Figure 2349-2. Application 2349 Control Schedules.



1. During day cooling mode, the OA damper is at minimum position. During night mode, standby, warm-up or cool-down, the OA damper is shut. The OA damper is also shut when dehumidification is needed.

Figure 2349-3. Application 2349 Control Schedule.

Hardware inputs

Analog

- Discharge air temperature sensor
- Relative humidity sensor
- Room temperature sensor
- Room temperature set point dial (optional)

Digital

- Night mode override (optional)
- Fan proof (optional)
- Low temperature detector (optional)

Hardware outputs

The following is a list of devices that can be used by this application depending on your hardware configuration.

Analog (0-10V)

- Outdoor air damper actuator
- Heating valve
- Cooling valve
- Face and bypass damper

Digital

- Auxiliary radiation
- 2-position cooling valve
- 2-position heating valve
- Unit fan

Sequence of Operation

The following paragraphs present the sequence of operation for Application 2349, "Unit Vent Controller with Free Cooling, Night Purge and Dehumidification."

Control temperature set points

Depending on the controller's current operational mode (day or night), the control temperature set point, CTL STPT (number 92) holds the value of one of the following set points:

Day Mode – In day mode, CTL STPT holds the value of the point DAY CLG STPT (number 6) or the point DAY HTG STPT (number 7). If the room temperature sensor has a set point dial and the point STPT DIAL (number 14) is set to YES, then CTL STPT holds the value of the point RM STPT DIAL (number 13). Refer to the *Day cooling set point schedule* section of this document for more information.

If the set point dial is used and the value of RM STPT DIAL is less than the value of the point RM STPT MIN (number 11), then CTL STPT holds the value of RM STPT MIN. If the value of RM STPT DIAL is greater than the value of the point RM STPT MAX (number 12), then CTL STPT holds the value of RM STPT MAX.

Night Mode – In night mode, CTL STPT holds the value of the point NGT CLG STPT (number 8) or the point NGT HTG STPT (number 9).

NOTE: The value of the point CTL TEMP (number 77) is the same as the value of the point ROOM TEMP (number 4), unless CTL TEMP is overridden.

Day cooling set point schedule

If desired, the point DAY CLG STPT (number 6) can be reset based on the outside air temperature in the following ways:

- When the point OA TEMP (number 73) is less than (or equal to) the point MIN OA TEMP (number 74), DAY CLG STPT will be set equal to the point MIN CLG STPT (number 56).
- When the point OA TEMP is greater than (or equal to) the point MAX OA TEMP (number 75), DAY CLG STPT will be set equal to the point MAX CLG STPT (number 57).
- When the point OA TEMP is between MIN OA TEMP and MAX OA TEMP, DAY CLG STPT will be set equal to a value between MIN CLG STPT and MAX CLG STPT, just like a PPCL table statement would.

If the point STPT DIAL is set to NO and MAX CLG STPT is set equal to MIN CLG STPT, then DAY CLG STPT will remain constant.

If the point STPT DIAL (number 14) is set to YES, then this feature is not used. Instead, the DAY CLG STPT will be set to the value of the room set point dial. See the Control temperature set points section of this document for more information.

Day and night modes

The day/night status of the space is determined by the status of the point DAY.NGT (number 29). The control of this point differs depending on whether the controller is monitoring the status of a wall switch or if the controller is connected to a field panel.

When a wall switch is physically connected to the termination strip on the controller at DI 2 (Figures 2349-1 and 2349-4), and the point WALL SWITCH (number 18) equals YES, the controller monitors the status of DI 2. When the status of the point DI 2 (number 24) is ON (the switch is closed), DAY.NGT will be set to DAY indicating that the controller is in the day mode. When the status of DI 2 is OFF (the switch is open), DAY.NGT will be set to NIGHT, indicating that the controller is in the NIGHT mode.

When WALL SWITCH equals NO, the controller does not monitor the status of the wall switch, even if one is connected to it. In this case, and if the controller is operating stand-alone (that is, not connected to a field panel), then the controller stays in the day mode all the time. If the controller is operating with centralized control (connected to a field panel), then the field panel can send a PPCL DAY/NIGHT command to override the status of the point DAY.NGT. Refer to *Powers Process Control Language (PPCL) User's Manual* (125-1896) for more information.

Night mode override switch

If an override switch is present on the room temperature sensor and a value (in hours) other than zero has been entered into the point OVRD TIME (number 20), then by pressing the override switch a room occupant can reset the controller to day operational mode for the amount of time that is set in OVRD TIME. The status of the point NGT OVRD (number 21) changes to DAY and remains there until after the override time elapses, at which time the controller returns to night mode and the status of NGT OVRD changes back to NIGHT.

It is only when the controller is in night mode that the override switch on the room sensor will have any effect on the controller.

Free cooling control

This module tells the application whether free cooling is available by setting the value of the FREE CLG point (number 23) as follows:

- If the point OA TEMP (number 73) is greater than the point UPPER LIMIT (number 97), then the point FREE CLG is shut OFF. If OA TEMP is less than the point LOWER LIMIT (number 96), then FREE CLG is turned ON.

Day heating operation

In day heating operation, the controller maintains the room temperature at the value stored in the point CTL STPT (number 92) by operating as follows:

- The room PID controller adjusts the DISCH STPT (number 93) which is used in the heating PID loop. (The heating PID loop controls the supply air temperature in the heating mode.)
- The heating PID loop modulates the heating. This means modulating the FBP damper between full face and full bypass position while the htg/clg valve is operating as a heating valve and is fully opened. (**IMPORTANT:** It is up to the user of this application to make sure that hot water is running through the valve and that the HEAT.COOL point is set to HEAT.)
- Auxiliary radiation (if provided) is controlled using a pulse-width modulation algorithm. The auxiliary radiation will be on for a percentage of the time held in the point AUX HTG TIMR (number 55). The on-time is based on the difference between DISCH STPT and AUX D STPT (number 91). If DISCH STPT goes below AUX D STPT, then the on-time of the auxiliary radiation decreases. If the reverse occurs, then the on-time increases.
- If free cooling is not available (FREE CLG (number 23) is NO), then the outside air damper is sent to minimum position. (OA DMPR POS (number 58) is set equal to OADPR MINPOS (number 10)).
- If free cooling is available (FREE CLG (number 23) is YES), then the outside air damper is modulated by the heating PID loop. Specifically, as HTG LOOPOUT (number 79) goes from 50% to 0%, OA DMPR POS goes from minimum position to 100% open. OA DMPR POS will remain equal to minimum position as long as HTG LOOPOUT is equal to or greater than 50%.

Keep in mind that dehumidification does not occur in the day heating mode.

Standby heating operation

The standby heating mode can only be entered into at night. In this mode the controller maintains the room temperature at the value stored in the point CTL STPT (number 92) by doing the following:

- The room PID controller adjusts the DISCH STPT (number 93), which is used in the heating PID loop. (The heating PID loop controls the supply air temperature in the heating mode.)
- The heating PID loop modulates the heating. This means modulating the FBP damper between full face and full bypass position while the htg/clg valve is operating as a heating valve and is fully opened. (**IMPORTANT:** It is up to the user of this application to make sure that hot water is running through the valve and that the HEAT.COOL point is set to HEAT.)

- Auxiliary radiation (if provided) is controlled using a pulse-width modulation algorithm. The auxiliary radiation will be on for a percentage of the time held in the point AUX HTG TIMR (number 55). The on-time is based on the difference between DISCH STPT and AUX D STPT (number 91). If DISCH STPT goes below AUX D STPT, then the on-time of the auxiliary radiation decreases. If the reverse occurs, then the on-time increases.
- The outside air damper is kept shut.

Dehumidification does not occur during the standby heating mode.

Dehumidification determination

This feature determines whether dehumidification occurs by controlling the value of the point DEHUMIDIFY (number 50). DEHUMIDIFY is turned ON only if **all** of the following conditions are true:

- The relative humidity sensor (RH, number 15) is NORMAL.
- Mechanical cooling is available. (MECH CLG (number 51) is ON).
- CTL TEMP (number 77) is greater than 70°F.
- There is high relative humidity in the space (RH is greater than RH HI LIMIT (number 83)).

Dehumidification does not occur if the point DEHUMIDIFY is turned OFF. DEHUMIDIFY will be OFF if **at least one** of the following conditions is true:

- The relative humidity sensor is FAILED.
- Mechanical cooling is unavailable (MECH CLG is OFF).
- CTL TEMP is less than or equal to 70°F.
- There is low relative humidity in the space (RH is less than RH LO LIMIT (number 84)).

NOTE: If RH is less than or equal to RH HI LIMIT but greater than or equal to RH LO LIMIT (number 84), then DEHUMIDIFY will be left in its last commanded state.

Day cooling operation

When dehumidification is not needed during day cooling operation, the controller maintains the room temperature at the value stored in the point CTL STPT (number 92) by doing the following:

- The room PID controller adjusts the DISCH STPT (number 93) which is used in the cooling PID loop. (The cooling PID loop controls the supply air temperature in the cooling mode.)
- The cooling PID loop modulates the cooling. This means modulating the FBP damper between full face and full bypass position while the htg/clg valve is operating as a cooling valve and is fully opened. (**IMPORTANT:** It is up to the user of this application to make sure that chilled water is running through the valve and that the HEAT.COOL point is set to COOL.)
- The outside air damper is sent to minimum position. (OA DMPR POS (number 58) is set equal to OADPR MINPOS (number 10)).

When dehumidification is needed during day cooling the following events occur:

- Full cooling is used. This means the FBP damper is set to full face position while the htg/clg valve is operating as a cooling valve and is fully opened. (**IMPORTANT:** It is up to the user of this application to make sure that chilled water is running through the valve and that the HEAT.COOL point is set to COOL.)
- The outside air damper is kept shut.

NOTE: When dehumidification is occurring no actual temperature control is going on. The space won't get "too cold" however, because dehumidification is shut off if the room temperature (CTL TEMP (number 77)) drops below 70°F.

Standby cooling operation

The standby cooling mode can only be entered into at night. In the standby cooling mode, the controller maintains the room temperature at the value stored in the point CTL STPT (number 92) by doing the following:

- The room PID controller adjusts the DISCH STPT (number 93) which is used in the cooling PID loop. (The cooling PID loop controls the supply air temperature in the cooling mode.)
- The cooling PID loop modulates the cooling. This means modulating the FBP damper between full face and full bypass position while the htg/clg valve is operating as a cooling valve and is fully opened. (**IMPORTANT:** It is up to the user of this application to make sure that chilled water is running through the valve and that the HEAT.COOL point is set to COOL.)
- The outside air damper is kept shut.

Dehumidification does not occur during the standby cooling mode.

Night heating operation

The controller maintains the room temperature at the value stored in the point CTL STPT (number 92) by doing the following:

- If the point CTL TEMP (number 77) drops below the value of the point NGT HTG STPT (number 9) minus the value of the point NGT DBAND (number 88), then:
 - The fan turns ON.
 - Full heating is used. This means the FBP damper is set to full face position while the htg/clg valve is operating as a heating valve and is fully opened. (**IMPORTANT:** It is up to the user of this application to make sure that hot water is running through the valve and that the HEAT.COOL point is set to HEAT.)

- If CTL TEMP rises above NGT HTG STPT, then:
 - The fan turns OFF.
 - No heating is used. This means the FBP damper is set to full bypass position. The htg/clg valve will be fully closed 2 minutes after the FBP damper is in the full bypass position under the following 2 circumstances:
 - a. The point FBP.2PSVCTL (number 30) is set to ENABLE.
 - b. The point FBP.2PSVCTL is set to DISABLE and OA TEMP (number 73) is greater than DISABLE TEMP (number 66).

Otherwise, this valve will remain opened.

NOTE: It is the customer's responsibility to make sure that hot water is coming out of the htg/clg valve and that the HEAT.COOL point (number 5) is set to HEAT.

Other points to keep in mind with night heating operation:

- When the fan turns ON, the auxiliary radiation is turned on. When the fan turns OFF, the auxiliary radiation is turned off.
- The outside air damper is shut.
- Dehumidification does not occur.
- For units with steam, NGT HW HTG must be set to NO so that the coils can be cycled.

Night purge determination and control

Night purge takes advantage of free cooling at night. Night purge is allowed only if **all** of the following six conditions are true:

1. It's the cooling mode (HEAT.COOL (number 5) is COOL).
2. It's night (DAY.NGT (number 29) equals NIGHT and NGT OVRD (number 21) equals NIGHT).
3. The application is not in the standby mode (STANDBY (number 49) is OFF).
4. The customer wants the night purge feature to be operational (COOLDOWN (number 52) is ENABLE).
5. The space temperature (CTL TEMP, number 77) is greater than or equal to 75°F.
6. The space temperature (CTL TEMP) is greater than or equal to DAY CLG STPT (number 8).

Night purge is not allowed if **one or more** of the following 6 conditions are true:

1. It's the heating mode (HEAT.COOL (number 5) is HEAT).
2. It's day (DAY.NGT (number 29) equals DAY or NGT OVRD (number 21) equals DAY).
3. The application is in the standby mode (STANDBY, (number 49) is ON).
4. The customer doesn't want the night purge feature to be operational (COOLDOWN (number 52) is DISABLE).

5. The space temperature (CTL TEMP, number 77) is less than 75°F.
6. The space temperature (CTL TEMP) is less than DAY CLG STPT.

During night purge:

- The FAN is ON.
- The OA DAMPR is fully opened.
- The htg/clg valve is closed.
- The face and bypass damper is set to the full bypass position.
- Any auxiliary radiation is shut OFF.
- Dehumidification does not occur.

When night purge is over, normal night cooling operation resumes. (See next section for more information on night cooling operation.)

Night cooling operation

This section describes what happens during night cooling when night purge is not in effect. For more information on night purge, refer to previous section.

Night cooling tip:

For modulated hot water or steam, NGT HW HTG must be set to NO so that the heating coils can be kept shut.

In night cooling operation, the controller operates as follows:

- If the point CTL TEMP (number 77) rises above the sum of the points NGT CLG STPT (number 8) and NGT DBAND (number 88), then:
 - The fan turns ON.
 - Full cooling is used. This means the FBP damper is set to full face position while the htg/clg valve is operating as a cooling valve and is fully opened. (**IMPORTANT:** It is up to the user of this application to make sure that chilled water is running through the valve and that the HEAT.COOL point is set to COOL.)
- If CTL TEMP drops below NGT CLG STPT, then:
 - The fan turns OFF.
 - No cooling is used. This means the FBP damper is set to full bypass position. The htg/clg valve will be fully closed 2 minutes after the FBP damper is in the full bypass position if the point FBP.2PSVCTL (number 30) is set to ENABLE. Otherwise, this valve will remain opened.

NOTE: Note: It is the customer's responsibility to make sure that cold water is coming out of the htg/clg valve and that the HEAT.COOL point (number 5) is set to COOL.

Keep in mind that no dehumidification occurs during night cooling and that the outside air damper remains shut.

Heating/cooling switchover

The heating/cooling switchover feature is not provided in this application. If heating/cooling switchover is desired, then a field panel must be used to control the point HEAT.COOL (number 5).

Control loops

The unit ventilator is controlled by four Proportional, Integral, and Derivative (PID) control loops; a room loop, a heating loop, a cooling loop, and a mixed air loop.

Room Loop – The heating loop uses the value of the point CTL STPT (number 92) and the point CTL TEMP (number 77) to modulate the value of the point DISCH STPT (number 93). The discharge set point will not be adjusted above DSH MAX TEMP (number 95) or below DSH MIN TEMP (number 94).

Heating Loop – The heating loop uses the value of the point DISCH STPT (number 93) and the point DISCH TEMP (number 47) to modulate the value of the point HTG LOOPOUT (number 79).

Cooling Loop – The cooling loop uses the value of DISCH STPT and DISCH TEMP to modulate the value of the point CLG LOOPOUT (number 78).

Aux Loop – The auxiliary loop uses the difference between AUX D STPT (number 91) and DISCH STPT to control the auxiliary space heating.

Morning warm-up/cool-down

Morning warm-up or cool-down occurs after the controller switches from night mode to day mode, upon power-up, or if the controller is reset. During morning warm-up or cool-down, the controller provides maximum heating or cooling with the outdoor air damper closed until the temperature of the space reaches the value of the point CTL STPT (number 92) plus or minus the value of the point MORN DBAND (number 89). In morning cool-down, the outdoor air damper is opened if the point FREE CLG (number 23) is set to ENABLE.

In heating mode, normal day heating operation begins when the temperature of the room reaches the value of CTL STPT minus MORN DBAND. For example, if CTL STPT is 72°F (22.2°C) and MORN DBAND is 3°F (1.6°C), then normal day heating operation begins when the temperature of the room reaches 69°F (20.6°C).

In cooling mode, normal day cooling operation begins when the temperature of the room reaches the value of CTL STPT plus MORN DBAND.

Fan operation

The point FAN (number 46) is ON all of the time during the following four modes:

- Day mode. (DAY.NGT (number 29) is DAY or NGT OVRD (number 21) is DAY).

- Night purge mode. (See *Night purge determination and control* section of this document for information on when the night purge mode occurs.)
- Standby mode. (STANDBY (number 49) is ON.)
- Dehumidification mode. (DEHUMIDIFY (number 50) is ON.)

In night mode, the fan only operates when required for heating or cooling.

In night heating, the fan turns ON when the temperature drops below the value of the points CTL STPT (number 92) minus NGT DBAND (number 88). When the temperature rises above CTL STPT, the fan turns OFF.

In night cooling, the fan turns ON when the temperature rises above the value of CTL STPT plus NGT DBAND. When the temperature drops below CTL STPT, the fan turns OFF.

Auxiliary damper control

During the day mode, the auxiliary damper is opened. (This damper is connected to AUX DAMPER (number 42)). At night, this damper is closed.

Fail-safe operation

The unit vent controller has a fail-safe operation that can be triggered by several occurrences.

A low temperature detection thermostat LOW TEMP DET (number 27) connected to DI 6 (number 26) can be used to signal the controller when the temperature, sensed by the LTDT, is below the low temperature limit. This LTDT can be either normally opened or normally closed, depending on the value of LTDT CONTACT (number 28).

NOTE: If an LTDT is not wired to DI 6, then LTDT CONTACT should be set to NOPEN in order to prevent the LTDT failure mode.

Shutdown:

In the table below, Shutdown is mentioned often. Here is an explanation of what is meant by Shutdown:

- The OA damper is closed.
- The auxiliary damper is closed.
- The fan is OFF.
- The auxiliary radiation is OFF.
- The face and bypass damper is opened to face.
- The htg/clg valve is fully opened.

The table below lists what happens when certain failure modes display:

Safety/Failure	APP 2349 Safety Sequence
LTDT = ON	"Shutdown"
FAN ALARM = ON	"Shutdown"
Disch/MA sensor fails	<p>If last valid value was greater than 150 degrees: Turn the FAN ON, shut the htg/clg valve and send the FBP valve to the bypass position. The other equipment behaves as it does during Shutdown. If sensor does not come back within 10 minutes, "Shutdown"</p> <p>If last valid value was less than 150 degrees, "Shutdown"</p>
Room Temp. sensor fails	"Shutdown"
Any Combination of the above	"Shutdown"

If the failures clear, then normal control resumes.

Analog and digital outputs cannot be commanded when the controller is in fail-safe mode, however, failed points may be overridden, allowing the controller to return from fail-safe mode. In this instance, room temperature control is not possible.

Application notes

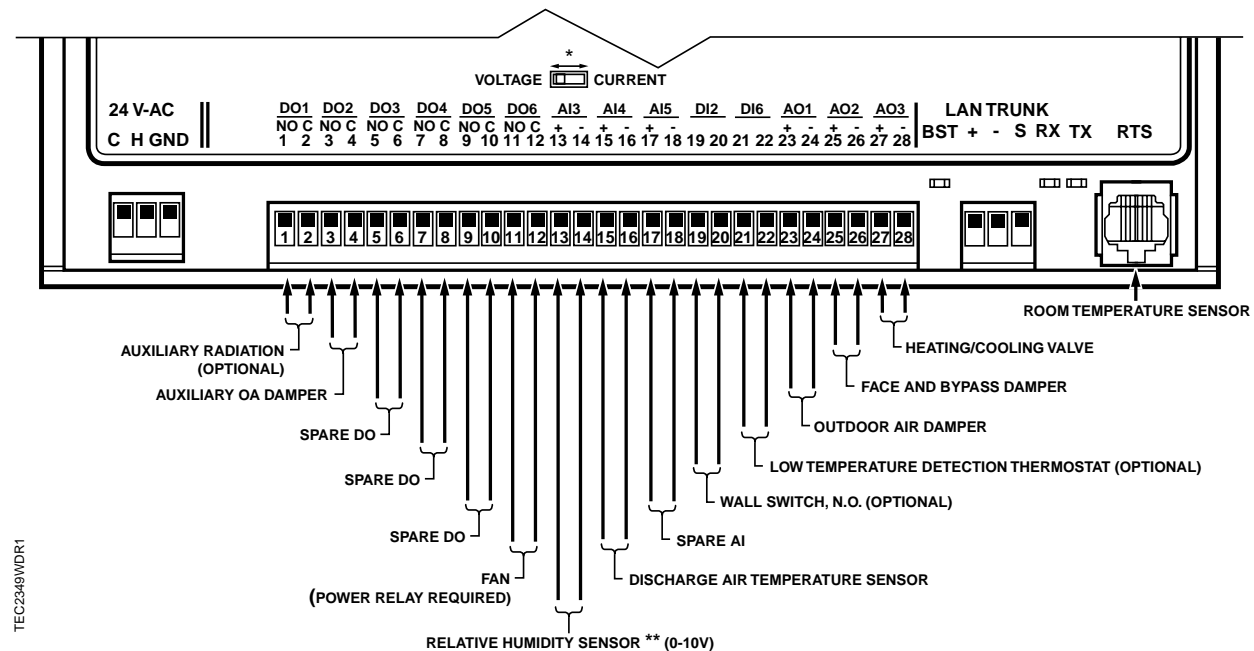
1. If the unit ventilator cycles excessively, or if the temperature swings in the room are excessive, or if there is trouble in maintaining the set point, then either the cooling loop, the heating loop or both need to be tuned.
2. The Unit Vent Controller, as shipped from the factory, keeps all associated equipment OFF. Refer to the *Start-up* document for this controller for information on how to release the controller and its equipment to application control.
3. When the fan is manually switched OFF at the unit fan speed switch, the actuators should be wired so they return to their normal state.

Wiring diagrams

The point wiring for Application 2349 is shown in Figure 2349-4.

**CAUTION:**

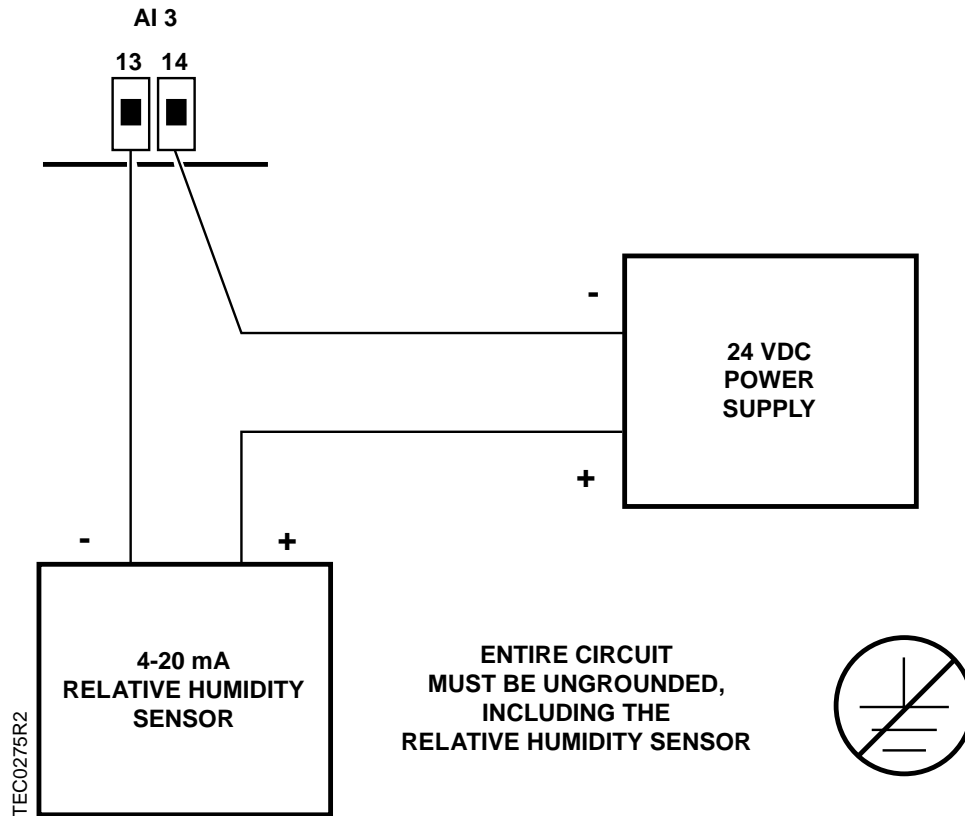
The Unit Vent Controller's Digital Outputs (DOs) control 24 Vac loads only. The maximum rating is 12 VA for each DO. For higher VA requirements, 110 or 220 Vac requirements, separate requirements used to power the load, or DC power requirements, use an interposing 220 V 4-relay module.



* If AI 3 monitors a 0-10 volt sensor, then dip-switch located behind AI 3 on controller's circuit board (under controller assembly's cover) must be set to the left (voltage position). If AI 3 monitors a 4-20 mA sensor, this dip-switch must be set to right (current position).

**A 4-20 mA relative humidity sensor, if used, requires special wiring requirements. Refer to Figure 2349-5.

Figure 2349-4. Application 2349 wiring diagram.



NOTE: Each 4-20 mA sensor requires a dedicated 24V DC power supply.

Figure 2349-5. Wiring Diagram for AI 3 if 4-20 mA Sensor is Used.

Table 2349-1. Point Database for Application 2349.

Point Number	Descriptor	Factory Default (SI Units)	Engr Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	CTLR ADDRESS	99	--	1	0	--	--
02	APPLICATION	2384	--	1	0	--	--
{03}	WRMUP.COOLDN	OFF	--	--	--	ON	OFF
{04}	ROOM TEMP	74.0 (23.45)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
{05}	HEAT.COOL	COOL	--	--	--	HEAT	COOL
{06}	DAY CLG STPT	74.0 (23.45)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
07	DAY HTG STPT	70.0 (21.21)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
08	NGT CLG STPT	82.0 (27.93)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
09	NGT HTG STPT	65.0 (18.41)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
10	OADPR MINPOS	0.0	PCT	0.4	0.0	--	--
11	RM STPT MIN	55.0 (12.81)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
12	RM STPT MAX	90.0 (32.41)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
{13}	RM STPT DIAL	74.0 (23.45)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
14	STPT DIAL	NO	--	--	--	YES	NO
{15}	RH	0.0	PCT	0.4	0.0	--	--
18	WALL SWITCH	NO	--	--	--	YES	NO
{19}	DI OVRD SW	OFF	--	--	--	ON	OFF
20	OVRD TIME	1	HRS	1	0	--	--
{21}	NGT OVRD	DAY	--	--	--	NIGHT	DAY
22	AUX.NOAUX	NOAUX	--	--	--	AUX	NOAUX
{23}	FREE CLG	DISABL	--	--	--	ENABLE	DISABL
{24}	DI 2	OFF	--	--	--	ON	OFF
{25}	NIGHT PURGE	OFF	--	--	--	ON	OFF
{26}	DI 6	OFF	--	--	--	ON	OFF
{27}	LOW TEMP DET	OFF	--	--	--	ON	OFF
28	LTDT CONTACT	NCLOSE	--	--	--	NCLOSE	NOPEN
{29}	DAY.NGT	DAY	--	--	--	NIGHT	DAY
30	FBP.2PSVCTL	DISABL	--	--	--	ENABLE	DISABL
31	AOV1 SPAN	10.0	VOLTS	0.01	0.0	--	--
32	AOV1 START	0.0	VOLTS	0.01	0.0	--	--
33	AOV2 SPAN	10.0	VOLTS	0.01	0.0	--	--
34	AOV2 START	0.0	VOLTS	0.01	0.0	--	--
35	AOV3 SPAN	10.0	VOLTS	0.01	0.0	--	--
36	AOV3 START	0.0	VOLTS	0.01	0.0	--	--
37	AO DIR.REV	0	--	1	0	--	--

1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets {} may be unbundled at the field panel.

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Table 2349-1. Point Database for Application 2349.

Point Number	Descriptor	Factory Default (SI Units)	Engr Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
{38}	AOV1	0.0	VOLTS	0.01	0.0	--	--
{39}	AOV2	0.0	VOLTS	0.01	0.0	--	--
{40}	AOV3	0.0	VOLTS	0.01	0.0	--	--
{41}	AUX RAD	OFF	--	--	--	ON	OFF
{42}	AUX DAMPER	OFF	--	--	--	ON	OFF
{43}	DO 3	OFF	--	--	--	ON	OFF
{44}	DO 4	OFF	--	--	--	ON	OFF
{45}	DO 5	OFF	--	--	--	ON	OFF
{46}	FAN	OFF	--	--	--	ON	OFF
{47}	DISCH TEMP	74.0 (23.496)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{48}	AI 5	74.0 (23.496)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{49}	STANDBY	OFF	--	--	--	ON	OFF
{50}	DEHUMIDIFY	OFF	--	--	--	ON	OFF
{51}	MECH CLG	OFF	--	--	--	ON	OFF
{52}	COOLDOWN	DISABL	--	--	--	ENABLE	DISABL
{54}	AUX OUTPUT	0.0	PCT	0.4	0.0	--	--
55	AUX HTG TIMR	10	MIN	1	0	--	--
{56}	MIN CLG STPT	70.0 (21.21)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
{57}	MAX CLG STPT	78.0 (25.69)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
{58}	OA DMPR POS	0.0	PCT	0.4	0.0	--	--
59	DO DIR.REV	0	--	1	0	--	--
{60}	HTG OUTPUT	0.0	PCT	0.4	0.0	--	--
{61}	CLG OUTPUT	0.0	PCT	0.4	0.0	--	--
62	CLG P GAIN	1.6 (2.88)	--	0.2 (0.36)	0.0	--	--
63	CLG I GAIN	0.05 (0.09)	--	0.0005 (0.0009)	0.0	--	--
64	CLG D GAIN	10 (18.0)	--	2 (3.6)	0	--	--
65	ENABLE TEMP	33.0 (18.48)	DEG F (DEG C)	0.5 (0.28)	0.0	--	--
66	DISABLE TEMP	35.0 (19.6)	DEG F (DEG C)	0.5 (0.28)	0.0	--	--
67	HTG P GAIN	0.4 (0.72)	--	0.05 (0.09)	0.0	--	--
68	HTG I GAIN	0.015 (0.027)	--	0.0002 (0.00036)	0.0	--	--
69	HTG D GAIN	5 (9.0)	--	1 (1.8)	0	--	--
70	ROOM P GAIN	2.3 (4.14)	--	0.05 (0.09)	0.0	--	--
71	ROOM I GAIN	0.00504 (0.009072)	--	0.00009 (0.000162)	0.0	--	--
72	ROOM D GAIN	76 (136.8)	--	2 (3.6)	0	--	--
{73}	OA TEMP	65.0 (36.4)	DEG F (DEG C)	0.5 (0.28)	0.0	--	--

1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets {} may be unbundled at the field panel.

continued on the next page...

Table 2349-1. Point Database for Application 2349.

Point Number	Descriptor	Factory Default (SI Units)	Engr Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
{74}	MIN OA TEMP	55.0 (30.8)	DEG F (DEG C)	0.5 (0.28)	0.0	--	--
{75}	MAX OA TEMP	75.0 (42.0)	DEG F (DEG C)	0.5 (0.28)	0.0	--	--
{76}	AUX LOOPOUT	0.0	PCT	0.2	0.0	--	--
{77}	CTL TEMP	74.0 (23.45)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
{78}	CLG LOOPOUT	0.0	PCT	0.2	0.0	--	--
{79}	HTG LOOPOUT	0.0	PCT	0.2	0.0	--	--
{80}	AUX P GAIN	0.2 (0.36)	--	0.02 (0.036)	0.0	--	--
{81}	AUX I GAIN	0.00054 (0.000972)	--	0.00009 (0.000162)	0.0	--	--
{82}	AUX D GAIN	24 (43.2)	--	1 (1.8)	0	--	--
83	RH HI LIMIT	50.0	PCT	0.4	0.0	--	--
84	RH LO LIMIT	30.0	PCT	0.4	0.0	--	--
87	NGT HW HTG	YES	--	--	--	YES	NO
88	NGT DBAND	3.0 (1.68)	DEG F (DEG C)	0.25 (0.14)	0.0	--	--
89	MORN DBAND	2.0 (1.12)	DEG F (DEG C)	0.25 (0.14)	0.0	--	--
91	AUX D STPT	80.0 (26.856)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{92}	CTL STPT	74.0 (23.45)	DEG F (DEG C)	0.25 (0.14)	48.0(8.89)	--	--
{93}	DISCH STPT	74.0 (23.496)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{94}	DSH MIN TEMP	60.0 (15.656)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{95}	DSH MAX TEMP	110.0 (43.656)	DEG F (DEG C)	0.5 (0.28)	37.5(3.056)	--	--
{96}	LOWER LIMIT	55.0 (30.8)	DEG F (DEG C)	0.5 (0.28)	0.0	--	--
{97}	UPPER LIMIT	75.0 (42.0)	DEG F (DEG C)	0.5 (0.28)	0.0	--	--
98	LOOP TIME	5	SEC	1	0	--	--
{99}	ERROR STATUS	0	--	1	0	--	--

1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets {} may be unbundled at the field panel.