SIEMENS

Dual Duct Controller—Two AVS

VAV with Two Inlet Sensors and Optional Reheat

Application 67

Application Note

(Firmware Revision DD06)

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Overview

In Application 67, the controller modulates two inlet damper actuators—one for the hot duct and one for the cold duct. In cooling mode, the controller modulates the cold duct damper to maintain the room temperature setpoint and modulates the hot duct damper to ensure minimum airflow. In heating mode, the controller modulates the hot duct damper in order to maintain the room temperature setpoint and modulates the cold duct damper to ensure minimum airflow. If auxiliary heat is used, the controller modulates an optional hot water valve or up to three stages of electric reheat to maintain the room temperature setpoint.

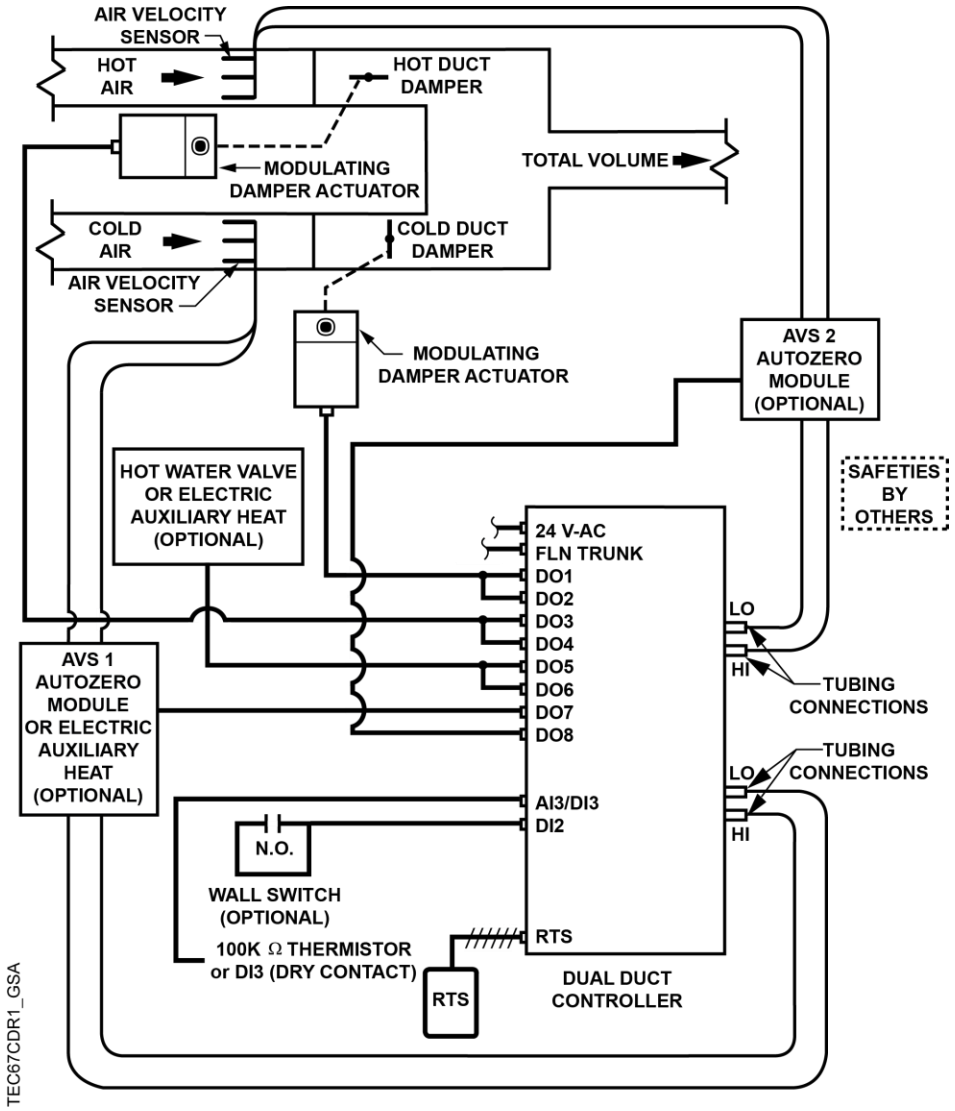
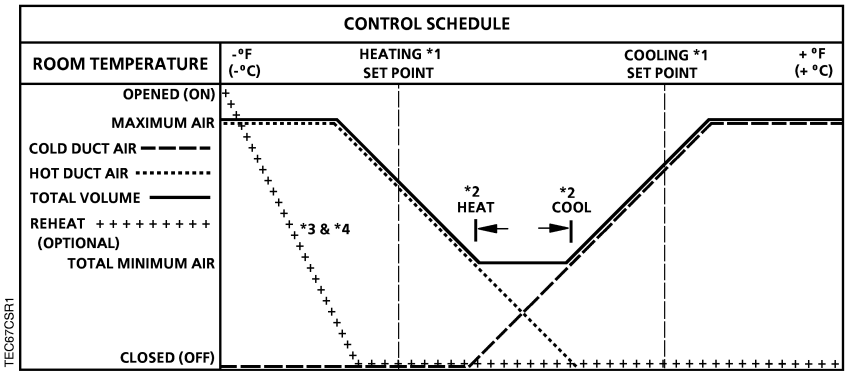


Figure 67-1. Application 67 Control Drawing.



1. See Sequence of Operation, *Control Temperature Setpoints*.
2. See Sequence of Operation, *Heating/Cooling Switchover*.
3. The reheat can be either a hot water valve or time modulated electric reheat. See Sequence of Operation, *Optional Auxiliary Heat*.
4. The reheat can be sequenced to operate either in series or in parallel with the supply air. It is shown in series.

Figure 67-2. Application 67 Control Schedule.

Hardware Inputs

Analog

- Air velocity sensor (two required)
- Room temperature sensor

Digital

- Night mode override (optional)
- Wall switch (optional)

Hardware Outputs

Analog

- None

Digital

- Damper actuator (two required)
- Stage 1 electric auxiliary heat (optional)
- Stage 2 electric auxiliary heat (optional)
- Stage 3 electric auxiliary heat (optional) or Autozero Module (optional)
- Valve actuator (optional)

Ordering Notes

Dual Duct Controller—Two Air Velocity Sensors–Electronic Output (540-506N-GS)

This controller with Autozero Modules is used in applications where it is not possible, due to 24-hour operational requirements, to calibrate the air velocity transducers by fully closing the dampers.

See *APOGEE Automation Configuration and Sizing Guidelines* on InfoLink for product numbers.

Damper actuator (two required)

Terminal Equipment Controller Room Temperature Sensor

Valve actuator (optional)

Autozero Modules (optional) two required

Point Database

Table 67-1 presents the point database information for Application 67.

Sequence of Operation

The following paragraphs present the sequence of operation for Application 67, “Dual Duct VAV–Two Inlet Sensors with Optional Reheat”.

Control Temperature Setpoints

This application has a number of different room temperature setpoints (DAY HTG STPT, NGT CLG STPT, RM STPT DIAL, etc.). The application actually controls to CTL STPT. CTL STPT is set to different values depending on its override status, the time of day, whether or not a temperature deadband (zero energy band) has been configured, and the type of RTS used.

CTL STPT is Overridden:

If CTL STPT is overridden, that value is used regardless of any other settings. This disables the setpoint deadband feature.

CTL STPT in Night Mode:

The controller is in Night Mode if DAY.NGT = NGT and NGT OVRD = NGT.

When the controller is in night mode, CTL STPT holds the value of NGT CLG STPT or NGT HTG STPT depending on the value of HEAT.COOL. When the controller is in night mode the value of RM STPT DIAL is ignored.

CTL STPT in Day Mode:

The controller is in Day Mode if DAY.NGT = DAY or NGT OVRD = DAY.

Without setpoint dial:

When the controller is in day mode and STPT DIAL = NO, CTL STPT holds the value of DAY CLG STPT or DAY HTG STPT depending on the value of HEAT.COOL.

With setpoint dial:

When the controller is in day mode and STPT DIAL = YES. CTL STPT is set based on the value of the setpoint dial and the setpoint deadband. The setpoint deadband exists to allow the controller to provide a separation of the heating and cooling temperature setpoints when a setpoint dial is enabled. The setpoint deadband is the difference between the cooling and heating day setpoints (DAY CLG STPT - DAY HTG STPT). The setpoint deadband can be disabled by setting DAY HTG STPT equal to DAY CLG STPT. When DAY HTG STPT does not equal DAY CLG STPT, a setpoint deadband (or zero energy band) is used.

The following values are used in the calculation of CTL STPT:

- *Dial value* is the value of RM STPT DIAL limited between the value of RM STPT MIN and RM STPT MAX.
- *Deadband* is the value of the difference between DAY CLG STPT and DAY HTG STPT, half of which is applied to establish the current heating and cooling setpoints.
  - *Deadband* = (DAY CLG STPT – DAY HTG STPT)

CTL STPT is calculated as follows:

With Deadband Disabled:

CTL STPT = *Dial value*

With Deadband enabled in Heat Mode:

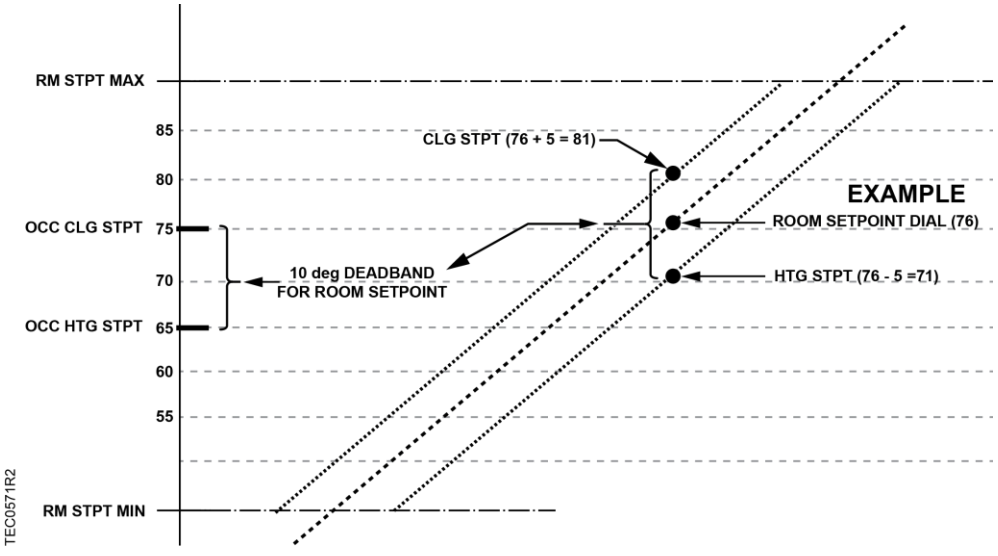
CTL STPT = *Dial value* – 0.5 × *Deadband* (limited between the value of RM STPT MIN and RM STPT MAX)

With Deadband enabled in Cool Mode:

CTL STPT = *Dial value* + 0.5 × *Deadband* (limited between the value of RM STPT MIN and RM STPT MAX).

NOTE:

If RM STPT DIAL is failed, it maintains the last known value.



Day and Night Modes

The day/night status of the space is determined by the status of DAY.NGT (Point 29). 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 (Figure 67-3 and Figure 67-4), and WALL SWITCH (Point 18) = YES, the controller monitors the status of DI 2 (Point 24). When DI 2 is ON (the switch is closed), the DAY.NGT will be set to DAY indicating that the controller is in day mode. When DI 2 is OFF (the switch is open), DAY.NGT will be set to NIGHT indicating that the controller is in night mode.

When WALL SWITCH = NO, the controller does not monitor the status of the wall switch, even if one is connected to it. In this case, if the controller is operating stand-alone, the controller stays in day mode all the time. If the controller is operating with centralized control (that is, connected to a field panel), the field panel can send a command to switch the controller between day and night modes and will override the status of DAY.NGT.

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 OVRD TIME (Point 20), pressing the override switch will reset the controller to day operational mode for the time period that is set in OVRD TIME. The status of NGT OVRD (Point 21) changes to DAY. After the override time elapses, the controller returns to night mode and NGT OVRD changes back to NIGHT.

The override switch on the room sensor will only have an effect on the controller when the controller is in night mode.

Heating/Cooling Switchover

HEAT.COOL (Point 5) controls whether the controller is in heating mode or cooling mode. When the controller is in heating mode the status of HEAT.COOL reads HEAT; in cooling mode its status reads COOL.

If the following conditions are met for the length of time set in SWITCH TIME (Point 86), the controller switches from heating to cooling mode by setting HEAT.COOL to COOL.

- The value of HTG LOOPOUT (Point 80) < 5%.
- The value of CTL TEMP (Point 78) > CTL STPT (Point 92) by at least the value set in SWITCH DBAND (Point 90).

If the following conditions are met for the length of time set in SWITCH TIME, the controller switches from cooling to heating mode by setting HEAT.COOL to HEAT.

- The value of CLG LOOPOUT (Point 79) < 5%.
- The value of CTL TEMP (Point 78) < CTL STPT (Point 92) by at least the value set in SWITCH DBAND (Point 90).

Control Loops

The dual duct is controlled by four Proportional, Integral, and Derivative (PID) control loops; two temperature loops and two flow loops.

Advanced PID algorithm for the temperature control loops is employed to provide stability and to reduce unnecessary changes in the Flow setpoint when the room temperature is at or near the room temperature setpoint.

Temperature Loops – The two temperature loops are a cooling loop and a heating loop. The active temperature loop maintains CTL STPT (Point 92). See *Control Temperature Setpoints*.

Flow Loops – The two flow loops are a cooling flow loop and a heating flow loop.

NOTE: The following guidelines apply to the control flow setpoints, CLG FLOW MAX (Point 32), HTG FLOW MAX (Point 34), and TOT FLOW MIN (Point 33):

- Do not set CLG FLOW MAX to 0 cfm (0 lps).
- For optimum control, the value of TOT FLOW MIN should not be greater than the values of CLG FLOW MAX and HTG FLOW MAX.
- If desired, the values of CLG FLOW MAX, HTG FLOW MAX, and TOT FLOW MIN may be set equal to each other.

The cooling flow loop maintains CLG FLO STPT (Point 93) by modulating the cold duct damper point, CLG DMP CMD (Point 48). The cooling flow loop maintains the cold duct airflow between 0 cfm and the value of CLG FLOW MAX.

CLG FLOW (Point 75) is the input value for the cooling flow loop. It is calculated as a percentage based on where CLG VOLUME (Point 35) is between 0 cfm and the value of CLG FLOW MAX (Point 32).

- If CLG VOLUME (Point 35) = 0 cfm, CLG FLOW (Point 75) is 0%.
- If CLG VOLUME (Point 35) = CLG FLOW MAX (Point 32), CLG FLOW (Point 75) is 100%.

The heating flow loop maintains HTG FLO STPT (Point 85) by modulating the hot duct damper point, HTG DMP CMD (Point 52). The heating flow loop maintains the hot duct airflow between 0 cfm and the value of HTG FLOW MAX (Point 34).

HTG FLOW (Point 74) is the input value for the heating flow loop. It is calculated as a percentage based on where HTG VOLUME (Point 30) is between 0 cfm and the value of HTG FLOW MAX (Point 34).

- If HTG VOLUME (Point 30) = 0 cfm, HTG FLOW (Point 74) is 0%.
- If HTG VOLUME (Point 30) = HTG FLOW MAX (Point 34), HTG FLOW (Point 74) is 100%.

Cooling Operation

In both day and night cooling modes, the output of the cooling loop, CLG LOOPOUT (Point 79), becomes the setpoint for the cooling flow loop, CLG FLO STPT (Point 93). This flow loop maintains the space temperature. In this mode, the cooling flow loop limits the airflow supplied by the cold duct to the value of CLG FLOW MAX (Point 32). The heating flow loop provides any make up air that is necessary to ensure that the airflow from the dual duct box is at least the value stored in TOT FLOW MIN (Point 33). When the cooling loop provides an airflow from the cold duct that is greater than or equal to TOT FLOW MIN, the heating flow loop sets HTG DMP CMD (Point 52) to 0% open, causing the hot duct damper to close.

Heating Operation

In both day and night heating modes, the value of HTG FLO STPT (Point 85) depends on the value of HTG LOOPOUT (Point 80). Room temperature control is maintained by the heating flow loop and the auxiliary heat working in sequence, simultaneously, or overlapping. See *Optional Auxiliary Heat* for more information.

In heating mode, the cooling flow loop is used to provide any additional air needed in order to ensure that the airflow out of the dual duct box is at least the same as the value stored in TOT FLOW MIN (Point 33). When the heating loop provides an airflow from the hot duct that is greater than or equal to TOT FLOW MIN, the cooling flow loop sets CLG DMP CMD (Point 48) to 0% open, causing the cold duct damper to close.

Optional Auxiliary Heat

If AUX HTG USED (Point 82) = YES, this application also controls auxiliary heat. The value of AUX HTG TYPE (Point 83) indicates the type of auxiliary heat control. If AUX HTG USED = NO, no auxiliary heat is used regardless of the value of AUX HTG TYPE.

CAUTION:

If using electric heat, verify that the equipment is supplied with safeties by others to ensure that there is airflow across the heating coils when they are to be energized. Otherwise, equipment damage may result.

Do not set minimum airflows to zero.

Hot Water Auxiliary Heat – If AUX HTG TYPE (Point 83) = HW, the application controls auxiliary hot water heat. The heating loop modulates the heating valve point, VALVE COMD (Point 37) in order to warm the space. When the controller is in cooling mode, the heating valve is closed.

Electric Auxiliary Heat – If AUX HTG TYPE (Point 83) = ELEC, the application controls auxiliary electric heat. The heating loop controls two stages of electric auxiliary heat (or up to three stages if Autozero Modules are not used) to warm the room. The electric auxiliary heat is modulated using a duty cycle as shown in the following example. When the controller is in cooling mode, the electric heat is OFF at all times.

Example: If the duty cycle is 10 minutes (STAGE TIME (Point 89) = 10 minutes) and the heating loop is calling for 60% of heating (HTG LOOPOUT (Point 80) = 60%), for every 10-minute period, the stages of electric auxiliary heat cycle as follows:

	Stage 1: minutes		Stage 2: minutes		Stage 3: minutes	
	ON	**OFF**	**ON**	**OFF**	**ON**	**OFF**
With 1 stage of electric heat:	6	4	–	–	–	–
With 2 stage of electric heat:	10	0	2	8	–	–
With 3 stage of electric heat:	10	0	8	2	0	10

Auxiliary Heat Operation – In heating mode, this application includes logic that allows the auxiliary heat to operate either in sequence, simultaneously, or overlapping with the heating flow loop. This algorithm is similar to the spring range sequencing of valves and dampers. Portions of the output of the heating loop, HTG LOOPOUT (Point 80), drive both the flow loop and the auxiliary heat from 0 to 100%. See the following three examples:

Example 1

Assume that your system has hot water auxiliary heat that is to operate *sequenced* with the heating flow loop. If,

- FLOW START (Point 16) = 0%
- FLOW END (Point 17) = 50%
- REHEAT START (Point 22) = 50%
- REHEAT END (Point 23) = 100%

then,

- When HTG LOOPOUT = 0%, HTG FLO STPT (Point 85) will equal 0% flow.
- When HTG LOOPOUT ≥ 50%, HTG FLO STPT will equal 100% flow.
- When HTG LOOPOUT ≤ 50%, VALVE COMD (Point 37) will equal 0% open.
- When HTG LOOPOUT = 100%, VALVE COMD will equal 100% open.

Example 2

Assume that your system has hot water auxiliary heat that is to operate *simultaneously* with the heating flow loop. If,

- FLOW START = 0%
- FLOW END = 100%
- REHEAT START = 0%
- REHEAT END = 100%

then,

- When HTG LOOPOUT = 0%, HTG FLOW STPT will equal 0% flow.
- When HTG LOOPOUT ≥ 100%, HTG FLOW STPT will equal 100% flow.
- When HTG LOOPOUT is 0%, VALVE COMD will equal 0% open.
- When HTG LOOPOUT = 100%, VALVE COMD will equal 100% open.

Example 3

Assume that your system has hot water auxiliary heat that is to operate *overlapping* with the heating flow loop. If,

- FLOW START = 0%
- FLOW END = 75%
- REHEAT START = 25%
- REHEAT END = 100%

then,

- When HTG LOOPOUT = 0%, HTG FLOW STPT will equal 0% flow.
- When HTG LOOPOUT ≥ 75%, HTG FLOW STPT will equal 100% flow.
- When HTG LOOPOUT ≤ 25%, VALVE COMD will equal 0% open.
- When HTG LOOPOUT = 100%, VALVE COMD will equal 100% open.

Calibration

Air Velocity Transducer – Calibration of the controller's internal air velocity transducers is periodically required to maintain accurate air velocity readings.

CAL SETUP (Point 95) is set with the desired calibration option during controller startup. Depending on the value of CAL SETUP, calibration may be set to take place automatically or manually. If CAL AIR (Point 94) = YES, calibration is in progress.

- For a controller used without Autozero Modules, the dampers are commanded closed to get a zero airflow reading during calibration.
- For a controller used with Autozero Modules, calibration occurs without closing the dampers.

Hot Water Valve – Calibration of a hot water valve (if used) is done by commanding the valve to closed. Calibration of the valve is not affected by the presence of Autozero Modules.

At the end of a calibration sequence, CAL AIR (Point 94) automatically returns to NO. A status of NO indicates that the controller is not in a calibration sequence.

In addition to the existing options for floating control actuator full stroke actions; all floating control actuators are provided with additional logic to fully drive open or closed when commanded to 100% or 0%.

Fail-safe Operation

If either of the air velocity sensor points, CLG VOLUME (Point 35) or HTG VOLUME (Point 30), fails, control of the dampers depends on the status of HEAT.COOL (Point 5).

- If HEAT.COOL reads HEAT, the following occurs:
  - HTG DMP CMD (Point 52) is set equal to HTG FLO STPT (Point 85),
  - CLG DMP CMD (Point 48) is set equal to 100 minus HTG FLO STPT.

    This causes the hot duct and the cold duct dampers to be controlled as pressure dependent dampers by the heating temperature loop.
- If HEAT.COOL reads COOL, the following occurs:
  - CLG DMP CMD is set equal to CLG LOOPOUT (Point 79),
  - HTG DMP CMD is set equal to 100 minus CLG LOOPOUT.

    This causes the hot duct and the cold duct dampers to be controlled as pressure dependent dampers by the cooling temperature loop.

If the temperature sensor fails, the controller operates using the last known temperature value.

Application Notes

If temperature swings in the room are excessive or if there is trouble maintaining the setpoint, the cooling temperature loop, the heating temperature loop, or both need to be tuned. If the cold duct damper is oscillating while CLG FLO STPT (Point 93) is constant, the cooling flow loop requires tuning. If the hot duct damper is oscillating while HTG FLO STPT (Point 85) is constant, the heating flow loop requires tuning.

The Dual Duct Controller—Two Air Velocity Sensors—Electronic Output, as shipped from the factory, keeps all associated equipment OFF. See *Equipment Controllers* in the *APOGEE Automation Start-up Procedures* on InfoLink for information on how to release the controller and its equipment to application control.

Wiring Diagrams

Figure 67-3 and Figure 67-4 present the point wiring for Application 67.

CAUTION:

The controller's DOs control 24 Vac loads only. The maximum rating is 12 VA for each DO. Use an interposing 220V 4-relay module for any of the following:

- VA requirements higher than the maximum
- 110 or 220 Vac requirements
- DC power requirements
- Separate transformers used to power the load

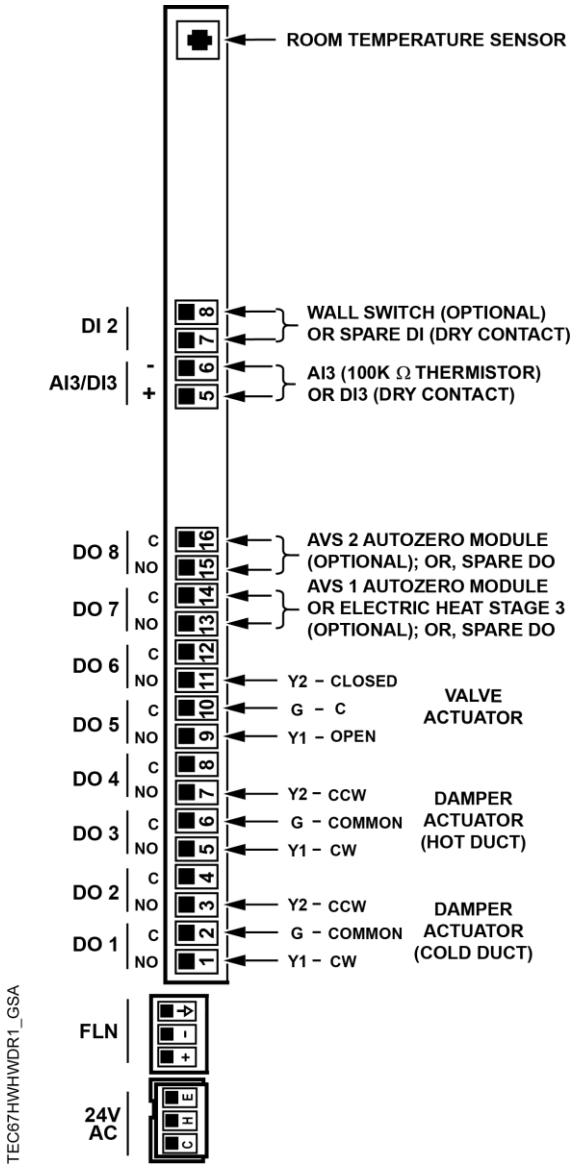


Figure 67-3. Application 67 Wiring Diagram with Hot Water Reheat.

CAUTION:

The controller's DOs control 24 Vac loads only. The maximum rating is 12 VA for each DO. Use an interposing 220V 4-relay module for any of the following:

- VA requirements higher than the maximum
- 110 or 220 Vac requirements
- DC power requirements
- Separate transformers used to power the load

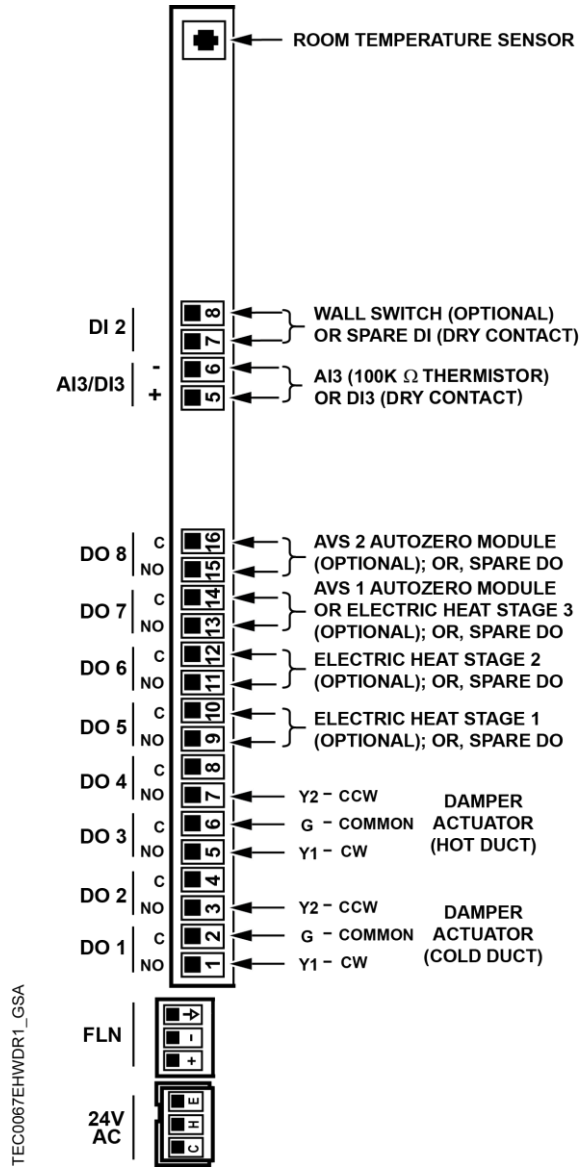


Figure 67-4. Application 67 Wiring Diagram with Electric Auxiliary Reheat.

Table 67-1. Point Database for Application 67.

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	93	–	1	0	–	–
{04}	ROOM TEMP	74.000 (23.449)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
{05}	HEAT.COOL	COOL	–	–	–	HEAT	COOL
06	DAY CLG STPT	74.000 (23.449)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
07	DAY HTG STPT	70.000 (21.209)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
08	NGT CLG STPT	82.000 (27.929)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
09	NGT HTG STPT	65.000 (18.409)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
11	RM STPT MIN	55.000 (12.809)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
12	RM STPT MAX	90.000 (32.409)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
{13}	RM STPT DIAL	74.000 (23.449)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
14	STPT DIAL	NO	–	–	–	YES	NO
{15}	AUX TEMP	74.000 (23.496)	DEG F (DEG C)	0.500 (0.280)	37.500 (3.056)	–	–
16	FLOW START	0.000	PCT	0.400	0.000	–	–
17	FLOW END	100.000	PCT	0.400	0.000	–	–
18	WALL SWITCH	NO	–	–	–	YES	NO
{19}	DI OVRD SW	OFF	–	–	–	ON	OFF
20	OVRD TIME	0.000	HRS	1.000	0.000	–	–
{21}	NGT OVRD	NIGHT	–	–	–	NIGHT	DAY
22	REHEAT START	50.000	PCT	0.400	0.000	–	–
23	REHEAT END	100.000	PCT	0.400	0.000	–	–
{24}	DI 2	OFF	–	–	–	ON	OFF
{25}	DI 3	OFF	–	–	–	ON	OFF
26	HTGFLO PGAIN	0.250	–	0.250	0.000	–	–

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 67-1. Point Database for Application 67.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
27	HTGFLO IGAIN	0.018	–	0.006	0.000	–	–
28	HTGFLO DGAIN	0.000	–	2.000	0.000	–	–
{29}	DAY.NGT	DAY	–	–	–	NIGHT	DAY
{30}	HTG VOLUME	0.000	CFM (LPS)	4.000 (20.320)	0.000	–	–
32	CLG FLOW MAX	2200.000 (11176.000)	CFM (LPS)	4.000 (20.320)	0.000	–	–
33	TOT FLOW MIN	220.000 (1117.600)	CFM (LPS)	4.000 (20.320)	0.000	–	–
34	HTG FLOW MAX	2200.000 (11176.000)	CFM (LPS)	4.000 (20.320)	0.000	–	–
{35}	CLG VOLUME	0.000	CFM (LPS)	4.000 (20.320)	0.000	–	–
36	CLG FLO COEF	1.000	–	0.010	0.000	–	–
37	VALVE COMD	0.000	PCT	0.400	0.000	–	–
38	VALVE POS	0.000	PCT	0.400	0.000	–	–
39	MTR3 TIMING	130.000	SEC	1.000	0.000	–	–
{41}	DO 1	OFF	–	–	–	ON	OFF
{42}	DO 2	OFF	–	–	–	ON	OFF
{43}	DO 3	OFF	–	–	–	ON	OFF
{44}	DO 4	OFF	–	–	–	ON	OFF
{45}	DO 5	OFF	–	–	–	ON	OFF
{46}	DO 6	OFF	–	–	–	ON	OFF
{47}	DO 7	OFF	–	–	–	ON	OFF
{48}	CLG DMP CMD	0.000	PCT	0.400	0.000	–	–
{49}	CLG DMP POS	0.000	PCT	0.400	0.000	–	–
{50}	DO 8	OFF	–	–	–	ON	OFF
51	MTR1 TIMING	95.000	SEC	1.000	0.000	–	–
{52}	HTG DMP CMD	0.000	PCT	0.400	0.000	–	–
{53}	HTG DMP POS	0.000	PCT	0.400	0.000	–	–
54	HTG FLO COEF	1.000	–	0.010	0.000	–	–

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 67-1. Point Database for Application 67.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
55	MTR2 TIMING	95.000	SEC	1.000	0.000	–	–
56	DPR1 ROT ANG	90.000	–	1.000	0.000	–	–
57	DPR2 ROT ANG	90.000	–	1.000	0.000	–	–
58	MTR SETUP	0.000	–	1.000	0.000	–	–
59	DO DIR.REV	0.000	–	1.000	0.000	–	–
60	HTGDUCT AREA	1.000 (0.093)	SQ FT (SQ M)	0.025 (0.002)	0.000	–	–
63	CLG P GAIN	20.000 (36.000)	–	0.250 (0.450)	0.000	–	–
64	CLG I GAIN	0.012 (0.022)	–	0.006 (0.011)	0.000	–	–
65	CLG D GAIN	0.000	–	2.000 (3.600)	0.000	–	–
66	CLG BIAS	50.000	PCT	0.400	0.000	–	–
67	HTG P GAIN	10.000 (18.000)	–	0.250 (0.450)	0.000	–	–
68	HTG I GAIN	0.012 (0.022)	–	0.006 (0.011)	0.000	–	–
69	HTG D GAIN	0.000	–	2.000 (3.600)	0.000	–	–
70	HTG BIAS	50.000	PCT	0.400	0.000	–	–
71	CLGFLO PGAIN	0.250	–	0.250	0.000	–	–
72	CLGFLO IGAIN	0.018	–	0.006	0.000	–	–
73	CLGFLO DGAIN	0.000	–	2.000	0.000	–	–
{74}	HTG FLOW	0.000	PCT	1.000	-50.000	–	–
{75}	CLG FLOW	0.000	PCT	1.000	-50.000	–	–
{78}	CTL TEMP	74.000 (23.449)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
{79}	CLG LOOPOUT	50.000	PCT	0.400	0.000	–	–
{80}	HTG LOOPOUT	0.000	PCT	0.400	0.000	–	–
{81}	AVG HEAT OUT	0.000	–	2.000	0.000	–	–
82	AUX HTG USED	NO	–	–	–	YES	NO

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 67-1. Point Database for Application 67.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
83	AUX HTG TYPE	HW	–	–	–	ELEC	HW
84	DMPR STATUS	CAL	–	–	–	RECAL	CAL
{85}	HTG FLO STPT	0.000	PCT	1.000	-50.000	–	–
86	SWITCH TIME	10.000	MIN	1.000	0.000	–	–
87	CAL MODULE	NO	–	–	–	YES	NO
88	STAGE COUNT	1.000	–	1.000	0.000	–	–
89	STAGE TIME	10.000	MIN	1.000	0.000	–	–
90	SWITCH DBAND	1.000 (0.560)	DEG F (DEG C)	0.250 (0.140)	0.000	–	–
{91}	TOTALIZD VOL	0.000	CF (L)	4.000 (4781.177)	0.000	–	–
{92}	CTL STPT	74.000 (23.449)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
{93}	CLG FLO STPT	0.000	PCT	1.000	-50.000	–	–
{94}	CAL AIR	NO	–	–	–	YES	NO
95	CAL SETUP	4.000	–	1.000	0.000	–	–
96	CAL TIMER	12.000	HRS	1.000	0.000	–	–
97	CLGDUCT AREA	1.000 (0.093)	SQ FT (SQ M)	0.025 (0.002)	0.000	–	–
98	LOOP TIME	5.000	SEC	1.000	0.000	–	–
{99}	ERROR STATUS	0.000	–	1.000	0.000	–	–

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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