Application 2066: Dual Duct Variable Air Volume – One Inlet and One Outlet Damper Actuator with Optional Reheat

Overview

In Application 2066, the controller provides modulating control of mechanically linked hot duct and cold duct actuators and independent control of a modulating volume actuator. The controller modulates the volume damper to maintain the temperature setpoint of the space. See Figure 2066-1 and Figure 2066-2.

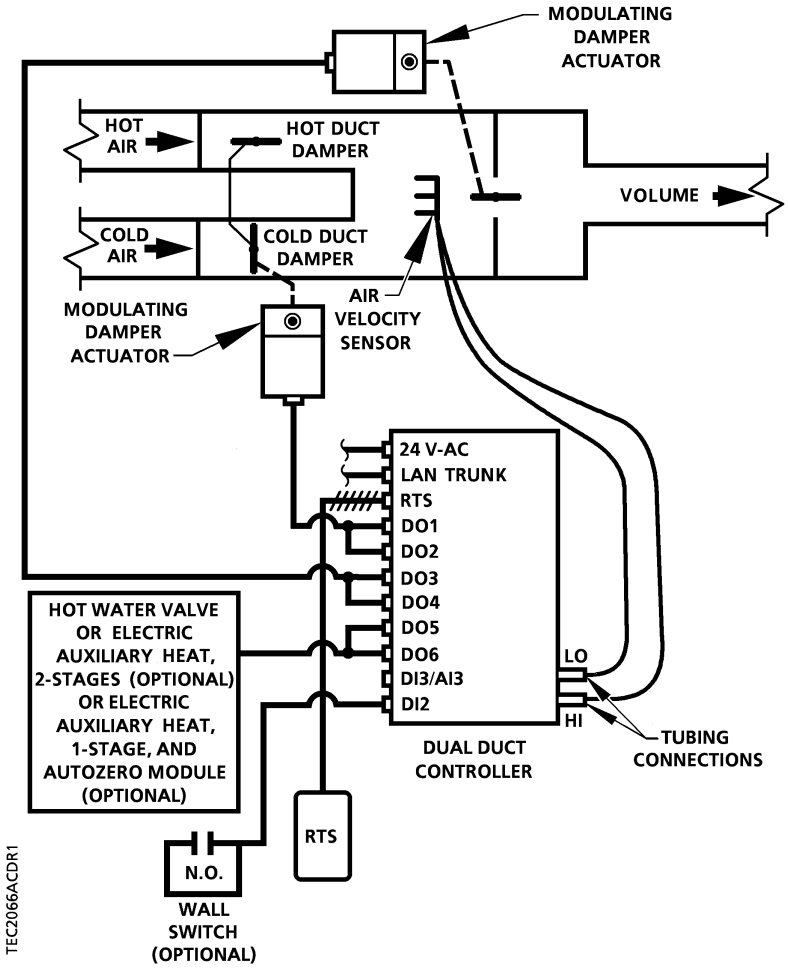
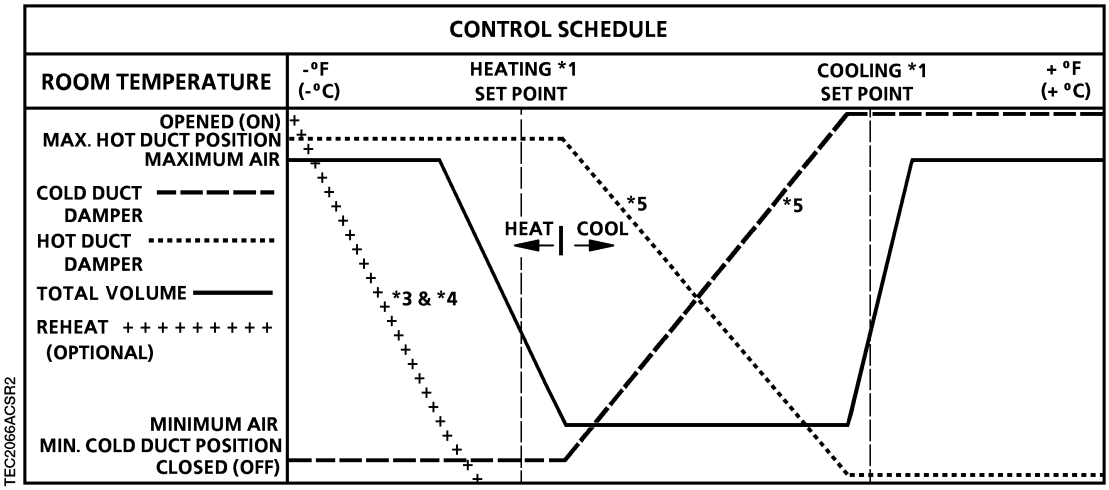


Figure 2066-1. Application 2066 Control Drawing.



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 parallel with the supply air. It is shown in series.
5. The hot duct and cold duct dampers are mechanically linked.

Figure 2066-2. Application 2066 Control Schedule.

Hardware Inputs

Analog

- Air velocity sensor
- Room temperature sensor
- Room temperature setpoint dial (optional)

Digital

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

Hardware Outputs

Analog

- None

Digital

- Damper actuator (2 required)
- Stage 1 electric auxiliary heat (optional)
- Stage 2 electric auxiliary heat or autozero module (optional)
- Valve actuator (optional)

Ordering Notes

Dual Duct Controller – One Air Velocity Sensor – Electronic Output	540-106
Dual Duct Controller – One Air Velocity Sensor – Electronic Output with Autozero Module*	540-107*

*This controller is used in applications:

- Where it is not possible, due to operational restrictions, to calibrate the air velocity transducer by fully closing the damper (for example, clean rooms, laboratories),
- When a minimum position damper stop is used.

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

Autozero Module (optional)
Damper actuator (two required)
Terminal Equipment Controller room temperature sensor
Valve actuator (optional)

Point Database

Table 2066-1 presents the point database information for Application 2066.

Sequence of Operation

The following paragraphs present the sequence of operation for Application 2066, "Dual Duct Variable Air Volume–One Inlet and One Outlet Damper Actuator with Optional Reheat".

Control Temperature Setpoints

Depending on the controller's current operational mode (day or night), CTL STPT (Point 92) holds the value of one of the following setpoints:

Day Mode – CTL STPT holds the value of DAY HTG STPT (Point 7) in heating mode or DAY CLG STPT (Point 6) in cooling mode. However, if the room temperature sensor has a setpoint dial and STPT DIAL (Point 14) = YES, CTL STPT holds the value of RM STPT DIAL (Point 13).

If the setpoint dial is used and RM STPT DIAL < RM STPT MIN (Point 11), CTL STPT holds the value of RM STPT MIN. If RM STPT DIAL > RM STPT MAX (Point 12), CTL STPT holds the value of RM STPT MAX.

Night Mode – CTL STPT holds the value of NGT HTG STPT (Point 9) in heating mode or NGT CLG STPT (Point 8) in cooling mode.

NOTE: The value of CTL TEMP (Point 78) is the same as ROOM TEMP (Point 4) unless CTL TEMP is overridden.

Day and Night Modes

The day/night status of the space is determined by the status of DAY.NGT (Point 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 (Figure 2066-1, Figure 2066-4, and Figure 2066-5) and WALL SWITCH (Point 18) = YES, the controller monitors the status of DI 2. When the status of DI 2 (Point 24) is ON (the switch is closed), DAY.NGT will be set to DAY indicating that the controller is in 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 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 an operator or program command to override the status of DAY.NGT. See *Powers Process Control Language (PPCL) User's Manual* (125-1896) and *Field Panel User's Manual* (125-1895) 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 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 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 temperature sensor will have any effect on the controller.

Heating/Cooling Switchover

The heating/cooling switchover determines whether the controller is in heating or cooling mode by monitoring the room temperature and the demand for heating and cooling (as determined by the temperature control loops).

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 (Point 5) to COOL:

- HTG LOOPOUT (Point 80) < 5.2%.
- CTL TEMP (Point 78) > CTL STPT (Point 92) by at least the value set in SWITCH DBAND (Point 90).
- CTL TEMP > the appropriate cooling setpoint minus SWITCH DBAND.

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:

- CLG LOOPOUT (Point 79) < 5.2%.
- CTL TEMP < CTL STPT by at least the value set SWITCH DBAND.
- CTL TEMP < the appropriate heating setpoint plus SWITCH DBAND.

Control Loops

The dual duct is controlled by three Proportional, Integral, and Derivative (PID) control loops; two temperature loops (one for cooling and one for heating), and a flow loop.

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

Cooling Loop – When CLG LOOPOUT (Point 79) = 0%, CLG DMP CMD (Point 48) = CLG DMP MIN (Point 60) (or 0% in unoccupied mode). When CLG LOOPOUT > 0%, CLG DMP CMD also increases. As the cooling damper opens, the heating damper closes because the dampers are mechanically linked. When CLG LOOPOUT ≥ 50%, CLG DMP CMD = 100% open.

When CLG LOOPOUT ≤ 50%, FLOW STPT (Point 93), equals the percentage corresponding to CLG FLOW MIN (Point 31). (This maintains minimum airflow through the dual duct box. When CLG LOOPOUT > 50%, FLOW STPT increases. When CLG LOOPOUT = 100%, FLOW STPT = 100%.

If the controller is in cooling mode, CTL FLOW MIN (Point 76) is set to CLG FLOW MIN (Point 31) and CTL FLOW MAX (Point 77) is set to CLG FLOW MAX (Point 32).

Heating Loop – CLG DMP CMD = CLG DMP MIN, which closes the cold duct damper to minimum (or 0% in unoccupied mode) and opens the hot duct damper. The value of FLOW STPT depends on the value of the output of the heating loop, HTG LOOPOUT (Point 80).

If the controller is in heating mode, CTL FLOW MIN is set to HTG FLOW MIN (Point 33) and CTL FLOW MAX is set to HTG FLOW MAX (Point 34).

Flow Loop – FLOW STPT is maintained by modulating the volume damper point, TOT DMP CMD (Point 52). The flow loop maintains the airflow between the limits set in CTL FLOW MIN and CTL FLOW MAX.

FLOW (Point 75) is the input value for the flow loop. It is calculated as a percentage based on where AIR VOLUME (Point 35) is between 0 CFM and CTL FLOW MAX. In the following text, this percentage will be referred to as % flow.

- If AIR VOLUME = 0 CFM, FLOW is 0% flow.
- If AIR VOLUME = CTL FLOW MAX, FLOW is 100% flow.

The flow loop ensures that the supply air will not be less than CTL FLOW MIN. The low limit of FLOW STPT will be the percentage that corresponds to the volume given in CTL FLOW MIN. This percentage can be calculated as: (CTL FLOW MIN ÷ CTL FLOW MAX) × 100% flow.

Example

If CTL FLOW MIN = 250 CFM and CTL FLOW MAX = 1000 CFM,

The low limit of FLOW STPT=(250 CFM ÷1000 CFM) × 100% flow
= 0.25 × 100% flow
= 25% flow

Since 25% of 1000 CFM = 250 CFM, the minimum airflow out of the terminal box will be 250 CFM.

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.

CAUTION:

If using electric heat, the 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 or equipment damage may result.

Do not set minimum airflows to zero.

Hot Water Auxiliary Heat – If AUX HTG TYPE = 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 = ELEC, the heating loop controls up to two stages of electric reheat to warm up the room. The electric reheat is time 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 ON	Stage 1: minutes OFF	Stage 2: minutes ON	Stage 2: minutes OFF
With 1 stage of electric heat:	6	4	–	–
With 2 stages of electric heat:	10	0	2	8

Sequencing Logic (optional)

In heating mode, this application includes logic that allows the flow loop to operate either in sequence, parallel, or overlapping with the hot water valve(s). This algorithm is very similar to the spring range sequencing of valves and dampers. Portions of the output of the heating loop, HTG LOOPOUT (Point 80), will drive both the flow loop and the auxiliary heat (if used) from 0 to 100%. See the following three examples.

The ladder diagrams in Figure 2066-3 shows sequenced, parallel, and overlapping flow loop operations with auxiliary reheat. The vertical bars show the output of heating loopout from 0 to 100%. The horizontal bars (reheat start, flow start, etc.) show the action that occurs when the loop output rises above the horizontal bar. The relative positions shown on the graphs are for illustration purposes only and may differ from the examples.

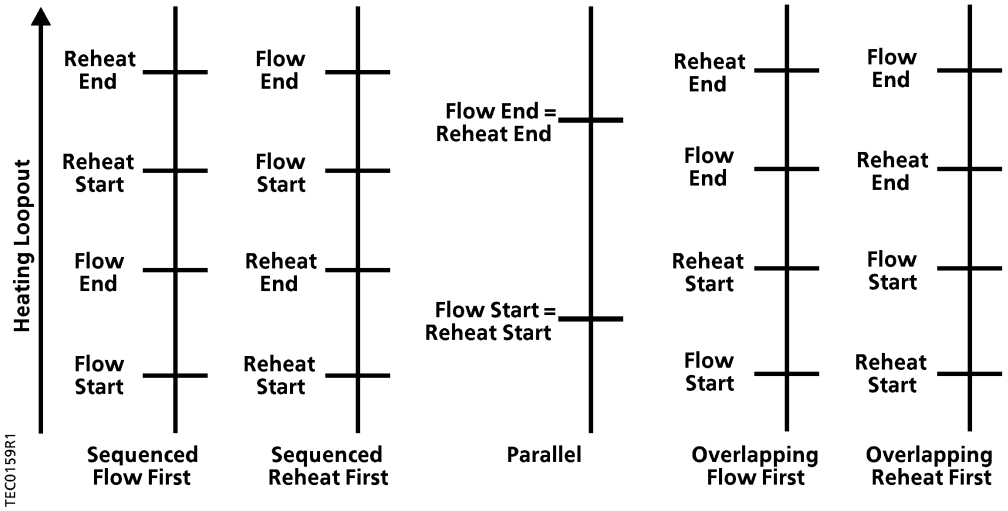


Figure 2066-3. Sequenced, Parallel, and Overlapping Flow Looping Operations with Reheat.

For simplicity, assume that in these examples:

- TOT FLOW MIN (Point 33) = 0 CFM
- AUX HTG USED (Point 82) = YES
- AUX HTG TYPE (Point 83) = HW
- There is a hot water valve for auxiliary heat. (When this is done, FLOW STPT (Point 93) will equal 0 when HTG LOOPOUT = 0).

Example 1

Assume that your system has a hot water valve that is to operate in *sequence* with the 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%, FLOW STPT will equal 0% flow.
- When HTG LOOPOUT = 25%, FLOW STPT will equal 50% flow.
- When HTG LOOPOUT ≥ 50%, FLOW STPT will equal 100% flow.
- When HTG LOOPOUT ≤ 50%, VALVE COMD (Point 37) will equal 0% open.
- When HTG LOOPOUT = 75%, VALVE COMD will equal 50% open.
- When HTG LOOPOUT = 100%, VALVE COMD will equal 100% open.

Example 2

Assume that your system has a hot water valve that is to operate in *parallel* with the flow loop. If,

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

then,

- When HTG LOOPOUT = 0%, FLOW STPT will equal 0% flow.
- When HTG LOOPOUT = 50%, FLOW STPT will equal 50% flow.
- When HTG LOOPOUT = 100%, FLOW STPT will equal 100% flow.
- When HTG LOOPOUT = 0%, VALVE COMD will equal 0% open.
- When HTG LOOPOUT = 50%, VALVE COMD will equal 50% open.
- When HTG LOOPOUT = 100%, VALVE COMD will equal 100% open.

Example 3

Assume that your system has a hot water valve that is to operate *overlapping* with the flow loop. If,

- FLOW START (Point 16) = 0%
- FLOW END (Point 17) = 75%
- REHEAT START (Point 22) = 25%
- REHEAT END (Point 23) = 100%

then,

- When HTG LOOPOUT = 0%, FLOW STPT will equal 0% flow.
- When HTG LOOPOUT = 37.5%, FLOW STPT will equal 50% flow.
- When HTG LOOPOUT ≥ 75%, FLOW STPT will equal 100% flow.
- When HTG LOOPOUT ≤ 25%, VALVE COMD will equal 0% open.
- When HTG LOOPOUT = 62.5%, VALVE COMD will equal 50% open.
- When HTG LOOPOUT = 100%, VALVE COMD will equal 100% open.

Another option that the sequencing logic provides is to have the flow loop provide an airflow equal to TOT FLOW MIN throughout the heating mode with all of the temperature control being done by the hot water valve(s). The airflow minimum will be maintained by setting the FLOW START and FLOW END to 0% which will cause FLOW STPT to hold the value corresponding to minimum flow throughout the entire heating mode, regardless of the value of HTG LOOPOUT.

Calibration

Air Velocity Transducer – Calibration of the controller's internal air velocity transducer is periodically required to maintain accurate air velocity readings. CAL SETUP (Point 95) is set with the desired calibration option during controller start-up. Depending on the value of CAL SETUP, calibration may be set to take place automatically, by the operator command, or manually when the override switch on the room temperature sensor is pressed. If CAL AIR (Point 94) = YES, calibration is in progress.

- For a controller used without an Autozero Module, (CAL MODULE (Point 87) = NO), the volume damper is commanded closed to get a zero airflow reading during calibration.
- For a controller used with an Autozero Module (CAL MODULE = YES), calibration occurs without closing the volume damper.

NOTE: The first time after start-up or initialization, the controller will calibrate the damper as if not using an Autozero Module, although the Autozero Module will be activated. All subsequent calibrations will use the Autozero Module only.

Damper Status Operation

Under normal operation DMPR STATUS (Point 84) reads CAL. However, when using an Autozero Module, it is possible after a period of operation for the calculated damper position points, CLG DMP POS (Point 49) and TOT DMP POS (Point 53), to differ from the actual (physical) damper position.

If this occurs, the controller will *automatically* compensate for any difference by setting DMPR STATUS to RECAL which readjusts the value of DMPR POS. DMPR STATUS will be set to RECAL if all of the following conditions are true:

- CLG DMP POS and TOT DMP POS = 100%

- Air velocity (AIR VOLUME (Point 35) ÷ DUCT AREA (Point 97)) > 200 FPM
- FLOW (Point 75) < FLOW STPT (Point 93)

- or -

- CLG DMP POS and TOT DMP POS = 0%
- Air velocity (AIR VOLUME ÷ DUCT AREA) > 200 FPM
- FLOW > FLOW STPT

If DMPR STATUS has been changed to RECAL in response to the conditions described above, do one of the following:

1. If flow is currently being properly controlled, set DMPR STATUS to CAL and release it.
2. If flow is not being properly controlled (that is, the conditions described above are still present) or if it is important that the damper position be accurate, initialize the controller.

If these steps do not fix the problem of maintaining flow, a mechanical problem might exist.

Fail-safe Operation

If AIR VOLUME (Point 35) is failed, TOT DMP CMD (Point 52) is set equal to FLOW STPT (Point 93). This causes the volume damper to be controlled as a pressure dependent damper by the temperature loop currently in control.

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

Application Notes

1. If temperature variations in the room are excessive or there is trouble maintaining the setpoint, the cooling loop, the heating loop, or both need to be tuned. If FLOW (Point 75) is oscillating while FLOW STPT (Point 93) is constant, the flow loop requires tuning. See *APOGEE Automation Maintenance and Troubleshooting Procedures* on InfoLink for more information.
2. The Dual Duct Controller – One Air Velocity Sensor – Electronic Output, as shipped from the factory, keeps all associated equipment OFF. See the *Equipment Controllers* section in the *APOGEE Automation Start-up Procedures* on InfoLink for information on how to release the controller and its equipment to application control.
3. Spare DOs can be used as auxiliary points that are controlled by the field panel after being defined in the field panel's database. DO 5 and DO 6 may be used as auxiliary motor points. If using a pair of spare DOs to control a motor, you must unbundle the corresponding motor command point.

Wiring Diagrams

The point wiring for Application 2066 is shown in Figure 2066-4 and Figure 2066-5.

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

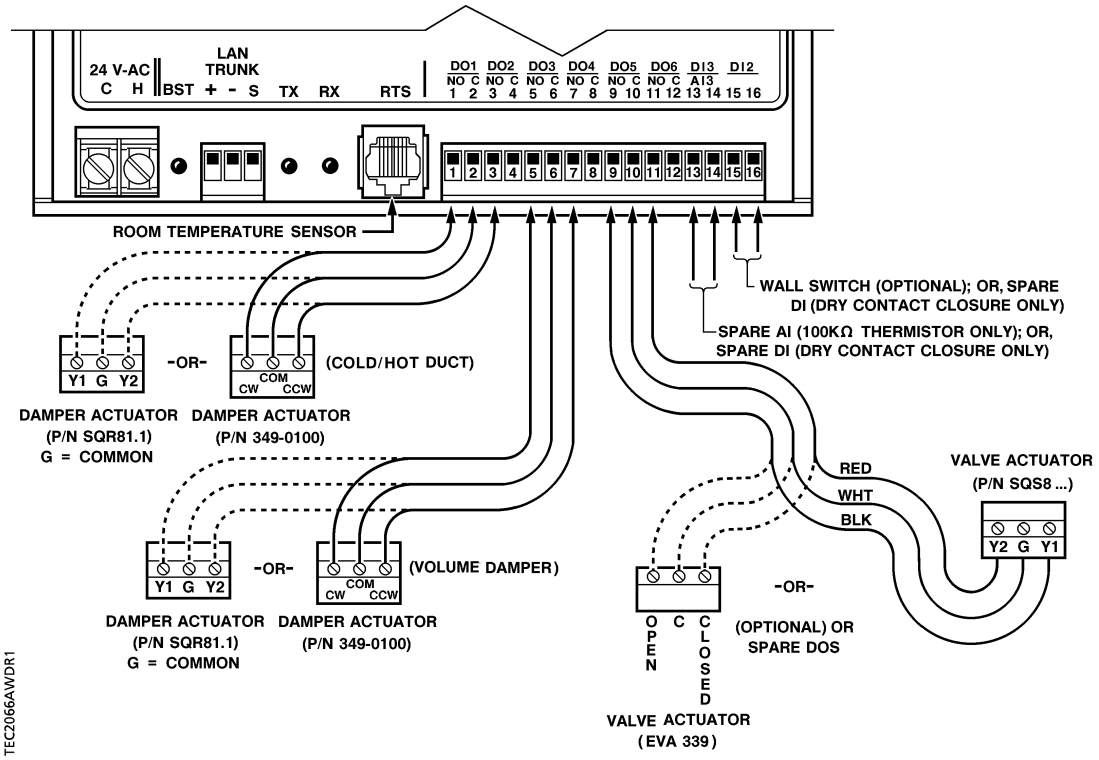


Figure 2066-4. Application 2066 Wiring Diagram with Hot Water Reheat.

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

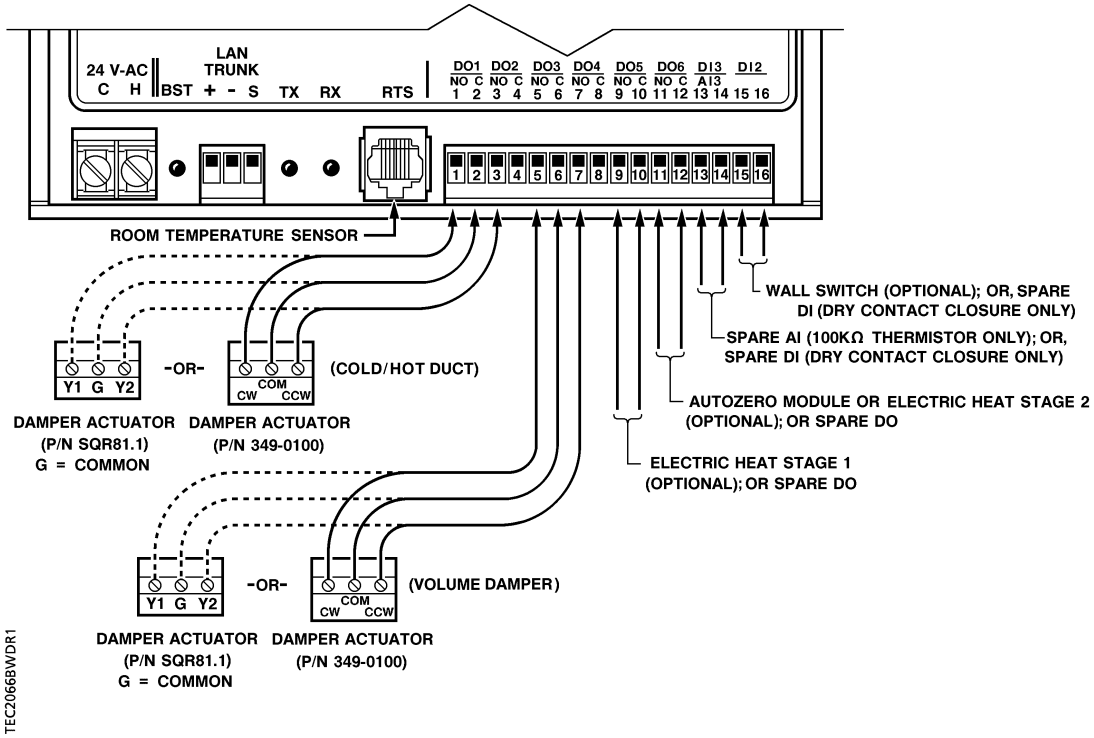


Figure 2066-5. Application 2066 Wiring Diagram with Electric Auxiliary Reheat.

Table 2066-1. Point Database for Application 2066.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	CTLR ADDRESS	99.000	–	1.000	0.000	–	–
02	APPLICATION	2092	–	1.000	0.000	–	–
{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

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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{29}	DAY.NGT	DAY	–	–	–	NIGHT	DAY

Table 2066-1. Point Database for Application 2066.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
31	CLG FLOW MIN	220.000 (103.818)	CFM (LPS)	4.000 (1.888)	0.000	–	–
32	CLG FLOW MAX	2200.000 (1038.180)	CFM (LPS)	4.000 (1.888)	0.000	–	–
33	TOT FLOW MIN	220.000 (103.818)	CFM (LPS)	4.000 (1.888)	0.000	–	–
34	TOT FLOW MAX	2200.000 (1038.180)	CFM (LPS)	4.000 (1.888)	0.000	–	–
{35}	AIR VOLUME	0.000	CFM (LPS)	4.000 (1.888)	0.000	–	–
36	FLOW COEFF	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
{48}	CLG DMP CMD	0.000	PCT	0.400	0.000	–	–
{49}	CLG DMP POS	0.000	PCT	0.400	0.000	–	–
51	MTR1 TIMING	95.000	SEC	1.000	0.000	–	–
{52}	TOT DMP CMD	0.000	PCT	0.400	0.000	–	–
{53}	TOT DMP POS	0.000	PCT	0.400	0.000	–	–
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	–	–

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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59	DO DIR. REV	0.000	–	1.000	0.000	–	–
60	CLG DMP MIN	0.000	PCT	0.400	0.000	–	–

Table 2066-1. Point Database for Application 2066.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
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	FLOW P GAIN	0.000	–	0.250	0.000	–	–
72	FLOW I GAIN	0.018	–	0.006	0.000	–	–
73	FLOW D GAIN	0.000	–	2.000	0.000	–	–
{75}	FLOW	0.000	PCT	1.000	0.000	–	–
{76}	CTL FLOW MIN	220.000 (103.818)	CFM (LPS)	4.000 (1.888)	0.000	–	–
{77}	CTL FLOW MAX	2200.000 (1038.180)	CFM (LPS)	4.000 (1.888)	0.000	–	–
{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
83	AUX HTG TYPE	HW	–	–	–	ELEC	HW
{84}	DMPR STATUS	CAL	–	–	–	RECAL	CAL

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…

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	–	–

Table 2066-1. Point Database for Application 2066.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
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	–	–
{92}	CTL STPT	74.000 (23.449)	DEG F (DEG C)	0.250 (0.140)	48.000 (8.889)	–	–
{93}	FLOW STPT	0.000	PCT	1.000	0.000	–	–
{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	DUCT 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.