Application 2340 Dual Duct Constant Volume – Two Inlet Sensors with Optional Reheat and Temperature Control Priority

Overview

In Application 2340, the controller provides independent control of the hot duct and cold duct inlet dampers to provide a constant volume of air to the space during occupied periods and a lower constant volume of air during unoccupied periods. In cooling mode, the cold duct damper is modulated to maintain the room temperature set point and the hot duct damper is modulated to maintain the volume set point. In heating mode, the hot duct damper is modulated to maintain the volume set point. In either mode the flow loops operate independently and will not compensate for each other to maintain total flow. Temperature control is given priority over flow control when flow set points cannot be maintained. The controller modulates an optional hot water valve or up to three stages of electric reheat to maintain the room temperature set point. Refer to Figures 2340-1 and 2340-2.

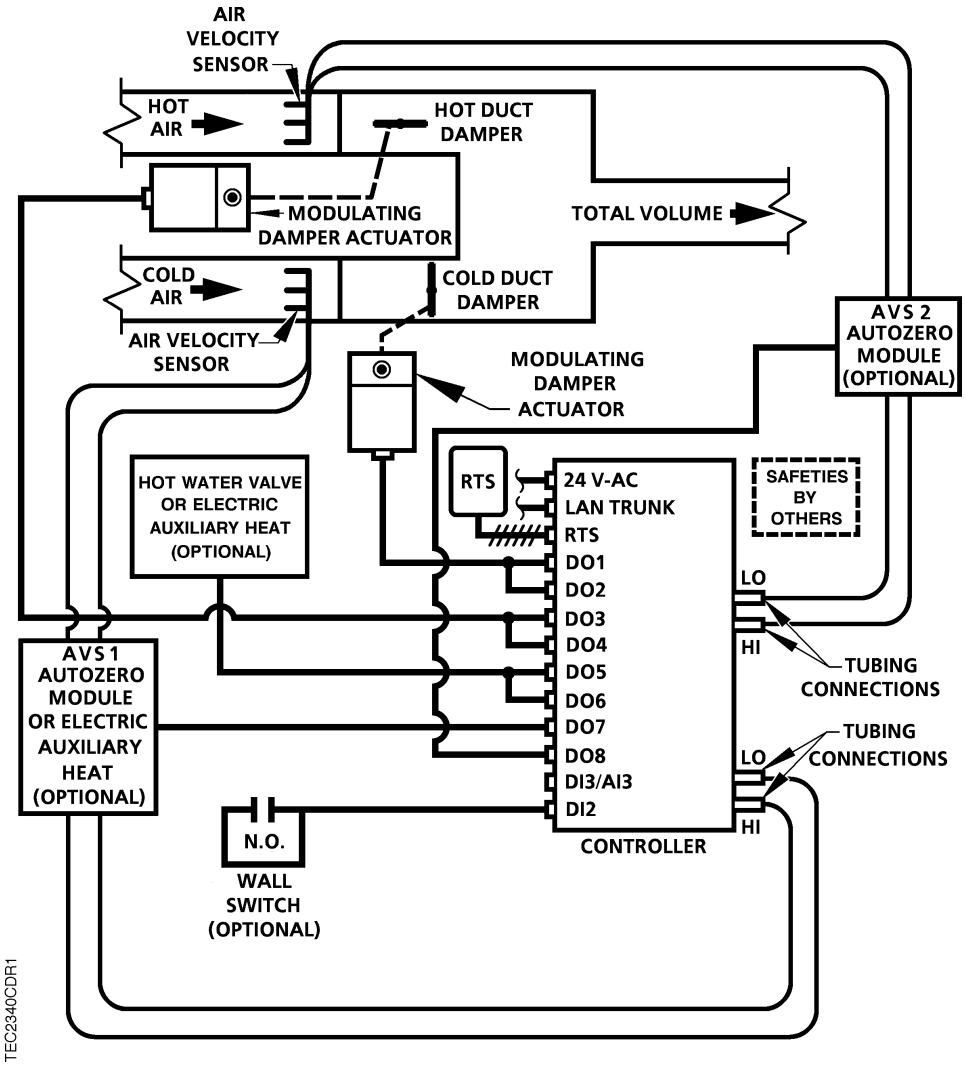
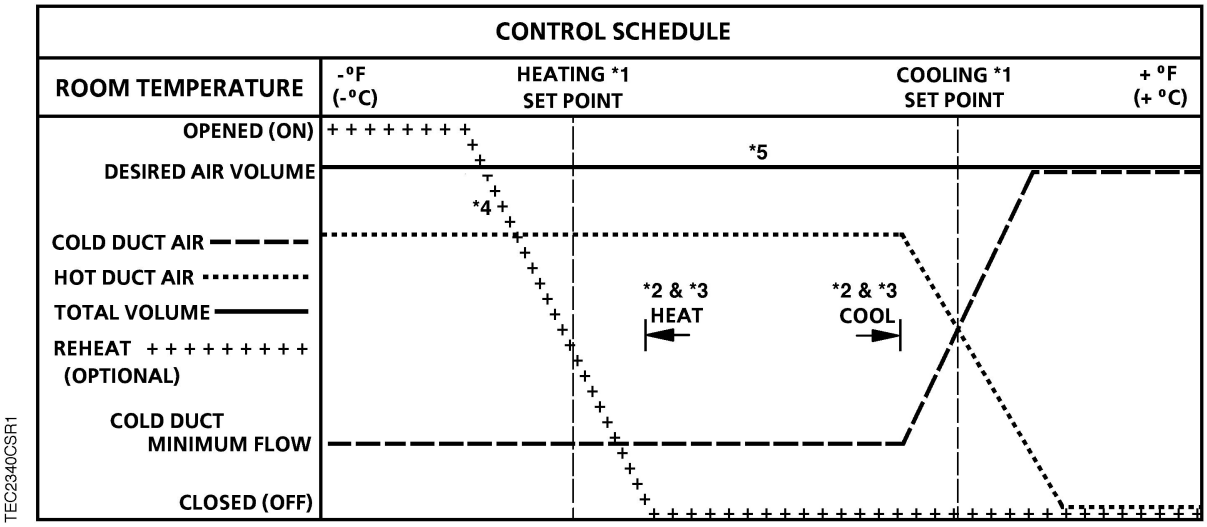


Figure 2340-1. Application 2340 Control Drawing.



NOTES:

1. Refer to Sequence of Operation, “Control temperature set points”.
2. Refer to Sequence of Operation, “Heating/cooling switchover”.
3. If reheat is not used, then this application operates only in cooling mode.
4. The reheat can be either a two-position valve, hot water valve or time modulated electric reheat. Refer to Sequence of Operation, “Optional auxiliary heat”.
5. This application supports two volume set points; one for occupied periods and one for unoccupied periods. Refer to Sequence of Operation, “Control volume set points”.

Figure 2340-2. Application 2340 Control Schedule.

Hardware inputs

analog

- air velocity sensor (2 required)
- room temperature sensor
- room temperature set point dial (optional)

digital

- unoccupied 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 (optional)
- stage 3 electric auxiliary heat (optional) or Autozero Modules (optional)
- valve actuator (optional)

Point database

Table 2340-1 presents the point database information for Application 2340.

Sequence of Operation

The following paragraphs present the sequence of operation for Application 2340, “Dual Duct Constant Volume – Two Inlet Sensors with Optional Reheat and Temperature Control Priority”.

NOTE: The controller first meets the room temperature set point requirement of the space and then it controls to the volume set point requirement. The controller satisfies the temperature control requirements of the dual duct even if doing so causes the total airflow to drift from its set point.

Control volume set points

NOTE: The following guidelines apply to the control volume set points, OCC FLOW (number 32) and UNOCC FLOW (number 31):

- Do not set OCC FLOW to 0 CFM (0 LPS).
- The value of OCC FLOW must be greater than or equal to the value of UNOCC FLOW.
- If desired, the values of OCC FLOW and UNOCC FLOW may be set equal to each other.

Depending on the controller's current operational mode (occupied or unoccupied), the control volume set points are as follows.

Occupied Cooling Mode – In occupied cooling mode, the controller resets the value of the point CLG FLO STPT (number 93) to ensure that the room temperature set point is satisfied, provided that the airflow from cold duct does not exceed the value of OCC FLOW. The controller then resets the value of the point HTG FLO STPT (number 85) to 100% - CLG FLO STPT.

Occupied Heating Mode – The cold duct will provide the air in CLG FLOW MIN (number 91). The controller will then try to provide enough air from the hot duct to ensure that the total air flowing out of the dual duct terminal box equals OCC FLOW. By setting HTG FLO STPT to 100% - CLG FLOW MIN.

Unoccupied Cooling Mode – In unoccupied cooling mode, the controller resets the value of CLG FLO STPT to ensure that the room temperature set point is satisfied, provided that the airflow from the cold duct does not exceed the value of UNOCC FLOW. The controller then resets the value of HTG FLO STPT to the percentage corresponding to UNOCC FLOW - CLG FLO STPT.

Unoccupied Heating Mode – In unoccupied heating mode, the controller provides as much airflow as possible from the hot duct to satisfy the flow requirements of UNOCC FLOW. The cold duct flow set point is set to 0%.

Control temperature set points

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

Occupied Mode – In occupied mode, CTL STPT holds the value of the point OCC HTG STPT (number 7) in heating mode or the point OCC CLG STPT (number 6) in cooling mode. However, 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).

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.

Unoccupied Mode – In unoccupied mode, CTL STPT holds the value of the point UOC HTG STPT (number 9) in heating mode or the point UOC CLG STPT (number 8) in cooling mode.

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

Occupied and unoccupied modes

The occupied/unoccupied status of the space is determined by the status of the point OCC.UNOCC (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 2340-1, 2340-3, and 2340-4), 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), then OCC.UNOCC will be set to OCC indicating that the controller is in occupied mode. When the status of DI 2 is OFF (the switch is open), then OCC.UNOCC will be set to UNOCC indicating that the controller is in unoccupied 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, if the controller is operating stand-alone, then the controller stays in occupied mode all the time. If the controller is operating with centralized control (that is, it is connected to a field panel), then the field panel can send an operator or PPCL command to override the status of OCC.UNOCC. Refer to *Powers Process Control Language (PPCL) User's Manual* (125-1896) and *Field Panel User's Manual* (125-1895) for more information.

Unoccupied 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 occupied operational mode for the time period that is set in OVRD TIME. The status of the point UNOCC OVRD (number 21) changes to OCC. After the override time elapses, the controller returns to unoccupied mode and the status of UNOCC OVRD changes back to UNOCC.

It is only when the controller is in unoccupied 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 the point SWITCH TIME (number 86), then the controller switches from heating to cooling mode by setting the point HEAT.COOL (number 5) to COOL:

- The point HTG LOOPOUT (number 80) is less than 5.2%.
- The point CTL TEMP (number 78) is above the point CTL STPT (number 92) by at least the value set in the point SWITCH DBAND (number 90).
- CTL TEMP is greater than the appropriate cooling set point minus SWITCH DBAND.

If AUX HTG USED (number 82) is set to YES, and the following conditions are met for the length of time set in SWITCH TIME, then the controller switches from cooling to heating mode by setting HEAT.COOL to HEAT:

- The point CLG LOOPOUT (number 79) is less than 5.2%.
- CTL TEMP is below CTL STPT by at least the value set SWITCH DBAND.
- CTL TEMP is less than the appropriate heating set point plus SWITCH DBAND.

Control loops

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

Temperature Loops – The two temperature loops are a cooling loop and a heating loop. The active temperature loop maintains CTL STPT (number 92). Refer to “Control temperature set points”.

In cooling mode, the output of the cooling loop, point CLG LOOPOUT (number 79), resets the point CLG FLO STPT (number 93) to satisfy the space temperature set point, provided that the airflow out of the cold duct does not exceed the value of the point OCC FLOW (number 32) in occupied mode or the point UNOCC FLOW (number 31) in unoccupied mode. The controller then resets the point HTG FLO STPT (number 85) in order to make sure that the airflow out of the box is equal to OCC FLOW in occupied mode or UNOCC FLOW in unoccupied mode.

In heating mode, the output of the heating loop, point HTG LOOPOUT (number 80), controls the auxiliary heat (if used). If auxiliary heat is not used, then this application only operates in cooling mode (that is, the application sets the point HEAT.COOL (number 5) to COOL) and the heating loop is disabled.

During occupancy for heating and cooling modes, the minimum amount of air allowed from the cold duct is CLG FLOW MIN (number 91). During unoccupied periods for these modes, the airflow from the cold duct will be allowed to reach 0 CFM.

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

The cooling flow loop maintains CLG FLO STPT by modulating the cold duct damper point, CLG DMP CMD (number 48). During occupancy, the cooling flow loop maintains the cold duct airflow between the value of the point CLG FLOW MIN and the value of OCC FLOW. During unoccupied periods, the cooling flow loop maintains the cold duct airflow between 0 CFM and the value of UNOCC FLOW.

The point CLG FLOW (number 75) is the input value for the cooling flow loop. It is calculated as a percentage based on where the point CLG VOLUME (number 35) is between 0 CFM and the value of OCC FLOW.

- If CLG VOLUME equals 0 CFM, then CLG FLOW is 0%.
- If CLG VOLUME equals OCC FLOW, then CLG FLOW is 100%.

The heating flow loop maintains HTG FLO STPT by modulating the hot duct damper point, HTG DMP CMD (number 52). During occupancy, the heating flow loop maintains the hot duct airflow between 0 CFM and the value of OCC FLOW. During unoccupied periods, the heating flow loop maintains the hot duct airflow between 0 CFM and UNOCC FLOW.

The point HTG FLOW (number 74) is the input value for the heating flow loop. It is calculated as a percentage based on where the point HTG VOLUME (number 30) is between 0 CFM and the value of OCC FLOW.

- If HTG VOLUME equals 0 CFM, then HTG FLOW is 0%.
- If HTG VOLUME equals OCC FLOW, then HTG FLOW is 100%.

Cooling operation

In occupied cooling mode, the output of the cooling loop, point CLG LOOPOUT (number 79), is used to calculate the set point for the cooling flow loop, point CLG FLO STPT (number 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 the point OCC FLOW (number 32). The minimum airflow from the cold duct will be the point CLG FLOW MIN (number 91) in the occupied cooling mode. The heating flow set point is set so that CLG FLO STPT plus HTG FLO STPT equals 100%, which corresponds to OCC FLOW.

In unoccupied cooling mode, CLG LOOPOUT, multiplied by a scaling factor, becomes the set point for CLG FLO STPT. This flow loop maintains the space temperature. In this mode, the scaling factor, the point UNOCC FLOW (number 31) ÷ OCC FLOW, limits the airflow supplied by the cold duct to the value of UNOCC FLOW. This limit is in effect even if it means that the space gets too warm. The heating flow set point is kept at 0 CFM.

Heating operation

In occupied heating mode, the heating flow loop modulates the hot duct damper point, HTG DMP CMD (number 52), to maintain a set point equal to the value of OCC FLOW (number 32) - CLG FLOW MIN (number 91). The cold duct damper is set to provide the cooling minimum flow.

In unoccupied heating mode, the heating flow loop modulates HTG DMP CMD to maintain a set point equal to the value of UNOCC FLOW (number 31). The point CLG FLO STPT (number 93) is set to 0 CFM.

In heating mode, the output of the heating loop, point HTG LOOPOUT (number 80), controls the auxiliary heat (if used). If auxiliary heat is not used, then the application sets the point HEAT.COOL (number 5) to COOL. The application then operates in cooling mode and the heating loop is disabled. Refer to "Optional auxiliary heat" for more information.

Optional auxiliary heat

If the point AUX HTG USED (number 82) is set to YES, then this application also controls auxiliary heat. The value of the point AUX HTG TYPE (number 83) indicates the type of auxiliary heat control. If AUX HTG USED is set to NO, then no auxiliary heat is used and the point HEAT.COOL (number 5) is automatically set to COOL.

CAUTION:

If using electric heat, then 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 the point UNOCC FLOW (number 31) to zero.

Hot Water Auxiliary Heat – If AUX HTG TYPE is set to HW, then the application controls auxiliary hot water heat. The heating loop modulates the heating valve point, VALVE COMD (number 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 is set to ELEC, then the heating loop controls up to three 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. The point STAGE COUNT (number 88) must be set equal to the number of stages of electric reheat being used.

Example: If the duty cycle is 10 minutes (point STAGE TIME (number 89) is set to 10 minutes) and the heating loop is calling for 60% of heating (point HTG LOOPOUT (number 80) is set to 60%), then 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 stages of electric heat:	10	0	2	8	--	--
With 3 stages of electric heat:	10	0	8	2	0	10

NOTE: If three stages of electric heat are used, Autozero Modules cannot be used. If two or less stages are used, Autozero Modules can be used.

Calibration

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

- For a controller used without Autozero Modules (point CAL MODULE (number 87) = NO), the dampers are commanded closed simultaneously to get zero airflow readings during calibration.
- For a controller used with Autozero Modules (CAL MODULE = YES), calibration occurs without closing the dampers.

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

Hot Water Valve – Calibration of a hot water valve (if used) is performed simultaneously with calibration of the air velocity transducers and is accomplished by commanding the valve closed. Calibration of the valve is not affected by the presence of Autozero Modules.

At the end of a calibration sequence, CAL AIR returns to NO automatically. A value of NO indicates that the controller is not in a calibration sequence.

The Autozero Modules are used during calibration when they are wired to DO 7 and DO 8 and CAL MODULE is set to YES.

Damper status operation

Under normal operation the point DMPR STATUS (number 84) reads "CAL." However, when using Autozero Modules, it is possible after a period of operation for the calculated damper position points, CLG DMP POS (number 49) and HTG DMP POS (number 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 the damper position points.

DMPR STATUS will be set to "RECAL" and the cooling damper will be adjusted if the following conditions are true:

CLG DMP POS and HTG DMP POS = 100%
Cooling air velocity (CLG VOLUME (number 35) ÷ CLGDUCT AREA (number 97)) > 200 FPM (1.016 meters per second)
CLG FLOW (number 75) < CLG FLO STPT (number 93)

- or -

CLG DMP POS and HTG DMP POS = 0%

Cooling air velocity (CLG VOLUME ÷ CLGDUCT AREA)
> 200 FPM (1.016 meters per second)
CLG FLOW > CLG FLO STPT

DMPR STATUS will be set to “RECAL” and the heating damper will be adjusted if the following conditions are true:

CLG DMP POS and HTG DMP POS = 100%
Heating air velocity (HTG VOLUME (number 30) ÷ HTGDUCT AREA (number 60)) > 200 FPM (1.016 meters per second)
HTG FLOW (number 74) < HTG FLO STPT (number 85)

- or -

CLG DMP POS and HTG DMP POS = 0%
Heating air velocity (HTG VOLUME ÷ HTGDUCT AREA)
> 200 FPM (1.016 meters per second)
HTG FLOW > HTG FLO STPT

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

1. If both flows are now being properly controlled, then set DMPR STATUS to “CAL” and release it.
2. If one of the flows is still not being properly controlled (i.e., one of the conditions described above is still present) or if it is important that the damper positions be accurate, then initialize the controller.

If these steps do not fix the problem of maintaining either flow, then a mechanical problem, such as insufficient airflow or static pressure might exist.

Fail-safe operation

If the air velocity sensor points, HTG VOLUME (number 30) and CLG VOLUME (number 35) are failed, then the dampers are controlled in one of two ways:

- If the point FAIL MODE (number 40) is set to OPEN, then the controller sets the points CLG DMP CMD (number 48) and HTG DMP CMD (number 52) to 100% open.
- If FAIL MODE is set to CLOSED, then the controller sets CLG DMP CMD and HTG DMP CMD to 0% open.

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

Application notes

1. 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. If the point CLG FLOW (number 75) is oscillating while the point CLG FLO STPT (number 93) is constant, then the cooling flow loop requires tuning. If the point HTG FLOW (number 74) is oscillating while the point HTG FLO STPT (number 85) is constant, then the heating flow loop requires tuning. Refer to *System*

600 Maintenance and Troubleshooting Manual (125-1855) for more information.

2. The Dual Duct Controller with Temperature Control Priority – Two Air Velocity Sensors – Electronic Output, 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. 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, then you must unbundle the corresponding motor command point.

Wiring diagrams

The point wiring for Application 2340 is shown in Figures 2340-3 and 2340-4.

CAUTION:

The Dual Duct Controller with Temperature Control Priority – Two Air Velocity Sensors – Electronic Output controls 24 Vac loads only. The maximum rating is 12 VA for each DO. For higher VA requirements, 110 or 220 Vac requirements, or DC power requirements, use an interposing 220 V 4-relay module (P/N 540-147).

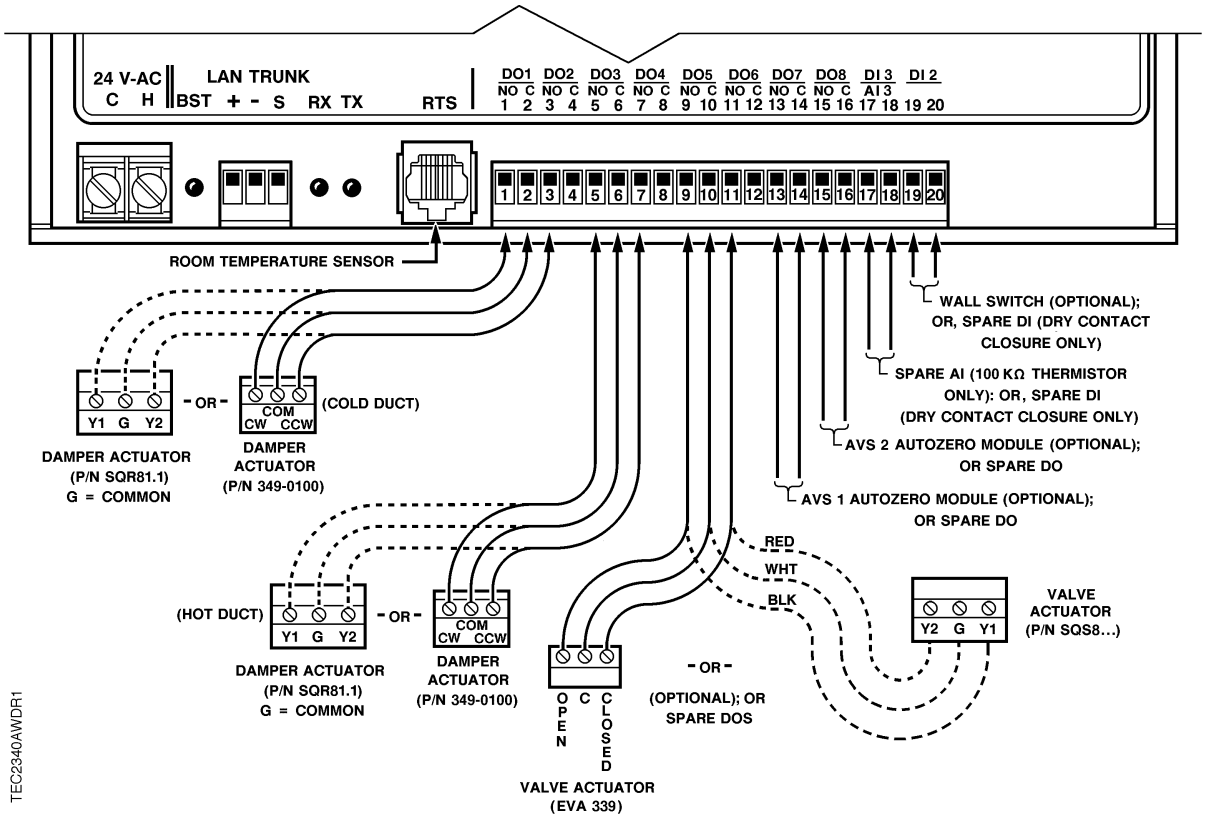


Figure 2340-3. Application 2340 Wiring Diagram with Hot Water Reheat.

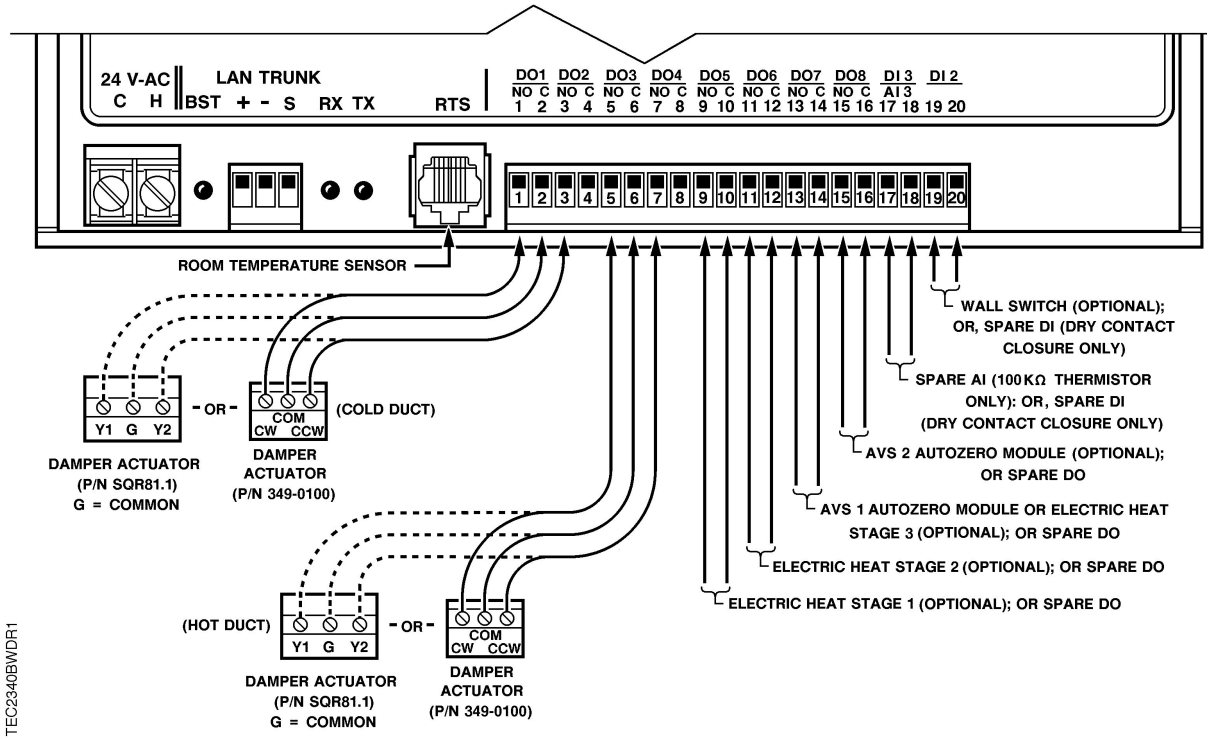


Figure 2340-4. Application 2340 Wiring Diagram with Electric Auxiliary Reheat.

Table 2340-1. Point Database for Application 2340.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	CTLRADDRESS	99	--	1	0	--	--
02	APPLICATION	2293	--	1	0	--	--
{04}	ROOM TEMP	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{05}	HEAT.COOL	COOL	--	--	--	HEAT	COOL
06	OCCCLG STPT	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
07	O	70.00	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--

	CCHTG STPT	70.00 (21.20888)					
08	UOCCLG STPT	82.00 (27.92888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
09	UOCHTG STPT	65.00 (18.40888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
11	RM STPTMIN	55.00 (12.80888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
12	RM STPTMAX	90.00 (32.40888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{13}	RM STPTDIAL	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--

14	STPTDIAL	NO	--	--	--	YES	NO
{15}	AUXTEMP	74.0 (23.495560)	DEG F (DEG C)	0.5 (0.28)	37.5 (3.055556)	--	--
18	WALLSWITCH	NO	--	--	--	YES	NO
{19}	DIOVRDSW	OFF	--	--	--	ON	OFF
20	OVRDTIME	0	HRS	1	0	--	--
{21}	UNOCCCOVRD	UNOCC	--	--	--	UNOCC	OCC
{24}	DI2	OFF	--	--	--	ON	OFF
{25}	DI3	OFF	--	--	--	ON	OFF
26	HTGFLO	0.00	--	0.25	0	--	--

	PGAIN						
27	HTGFLO IGAIN	0.018	--	0.006	0	--	--
28	HTGFLO DGAIN	0	--	2	0	--	--
{29}	OCC. UNOCC	OCC	--	--	--	UNOCC	OCC
{30}	HTG VOLUME	0 (0.0000)	CFM (LPS)	4 (1.8876)	0	--	--
31	UNOCCFLOW	220 (103.8180)	CFM (LPS)	4 (1.8876)	0	--	--
32	OCCFLO	2200 (1038.1800)	CFM (LPS)	4 (1.8876)	0	--	--

	W						
{35}	CLG VOLUME	0 (0.0000)	CFM (LPS)	4 (1.8876)	0	--	--
36	CLG FLO COEF	1.00	--	0.01	0	--	--
{37}	VALVECOMD	0.0	PCT	0.4	0	--	--
{38}	VALVEPOS	0.0	PCT	0.4	0	--	--
39	MTR3TIMING	130	SEC	1	0	--	--
40	FAILMODE	OPEN	--	--	--	CLOSE	OPEN
{41}	DO 1	OFF	--	--	--	ON	OFF

{42}	DO 2	OFF	--	--	--	ON	OFF
{43}	DO 3	OFF	--	--	--	ON	OFF
{44}	DO 4	OFF	--	--	--	ON	OFF

NOTES:
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.

Table 2340-1. Point Database for Application 2340.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
{45}	DO 5	OFF	--	--	--	ON	OFF
{46}	DO 6	OFF	--	--	--	ON	OFF
{47}	DO 7	OFF	--	--	--	ON	OFF
{48}	CLG DMPCMD	0.0	PCT	0.4	0	--	--
{49}	CLG DMPPOS	0.0	PCT	0.4	0	--	--
{50}	DO 8	OFF	--	--	--	ON	OFF
51	MTR1TIMING	95	SEC	1	0	--	--
{52}	HTG D	0.0	PCT	0.4	0	--	--

	MPCMD						
{53}	HTG DMPPOS	0.0	PCT	0.4	0	--	--
54	HTG FLO COEF	1.00	--	0.01	0	--	--
55	MTR2TIMING	95	SEC	1	0	--	--
56	DPR1ROTANG	90	--	1	0	--	--
57	DPR2ROTANG	90	--	1	0	--	--
58	MTRSETU	0	--	1	0	--	--

	P						
59	DO DIR. REV	0	--	1	0	--	--
60	HTG DUCT AREA	1.000 (0.092920)	SQ. FT (SQ M)	0.025 (0.002323)	0	--	--
63	CLG PGAIN	20.00 (36.00)	--	0.25 (0.45)	0	--	--
64	CLG IGAIN	0.012 (0.0216)	--	0.006 (0.0108)	0	--	--
65	CLG DGAIN	0 (0.0)	--	2 (3.6)	0	--	--
66	CLG BIAS	50.0	PCT	0.4	0	--	--
67	HTG PGA	10.00 (18.00)	--	0.25 (0.45)	0	--	--

	IN						
68	HTGIGAIN	0.012 (0.0216)	--	0.006 (0.0108)	0	--	--
69	HTG DGAIN	0 (0.0)	--	2 (3.6)	0	--	--
70	HTG BIAS	50.0	PCT	0.4	0	--	--
71	CLGFLO PGAIN	0.00	--	0.25	0	--	--
72	CLGFLO IGAIN	0.018	--	0.006	0	--	--
73	CLGFLO DGAIN	0	--	2	0	--	--

{74}	HTG FLOW	0	PCT	1	0	--	--
{75}	CLG FLOW	0	PCT	1	0	--	--
{78}	CTLTEMP	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{79}	CLG LOOPOUT	50.0	PCT	0.4	0	--	--
{80}	HTG LOOPOUT	0.0	PCT	0.4	0	--	--
{81}	AVG HEATOUT	0	--	2	0	--	--
82	AUXHTG	NO	--	--	--	YES	NO

	USED						
83	AUXHTG TYPE	ELEC	--	--	--	ELEC	HW
{84}	DMPRSTATUS	CAL	--	--	--	RECAL	CAL

NOTES:
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.

Table 2340-1. Point Database for Application 2340.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
{85}	HTG FLO STPT	0	PCT	1	0	--	--
86	SWITCHTIME	10	MIN	1	0	--	--
87	CALMODULE	NO	--	--	--	YES	NO
88	STAGECOUNT	1	--	1	0	--	--
89	STAGETIME	10	MIN	1	0	--	--
90	SW	1.00 (0.56)	DEG F (DEG C)	0.25 (0.14)	0	--	--

	ITCHDBAND						
{91}	CLG FLOW MIN	220 (103.8180)	CFM (LPS)	4 (1.8876)	0	--	--
{92}	CTLSTPT	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{93}	CLG FLO STPT	0	PCT	1	0	--	--
{94}	CALAIR	NO	--	--	--	YES	NO
95	CALSETUP	4	--	1	0	--	--
96	CALTIMER	12	HRS	1	0	--	--
97	C	1.000	SQ. FT (SQ M)	0.025 (0.002323)	0	--	--

	LGDUCTAREA	(0.092920)					
98	LOOPTIME	5	SEC	1	0	--	--
{99}	ERRORSTATUS	0	--	1	0	--	--

NOTES:
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.