SIEMENS

BACnet PTEC Controller

Terminal Box (VAV) - with Parallel Fan and 3-Stage Electric Heat, Application 6526

Application Note

140-0930
2014-06-12

Restricted

Building Technologies

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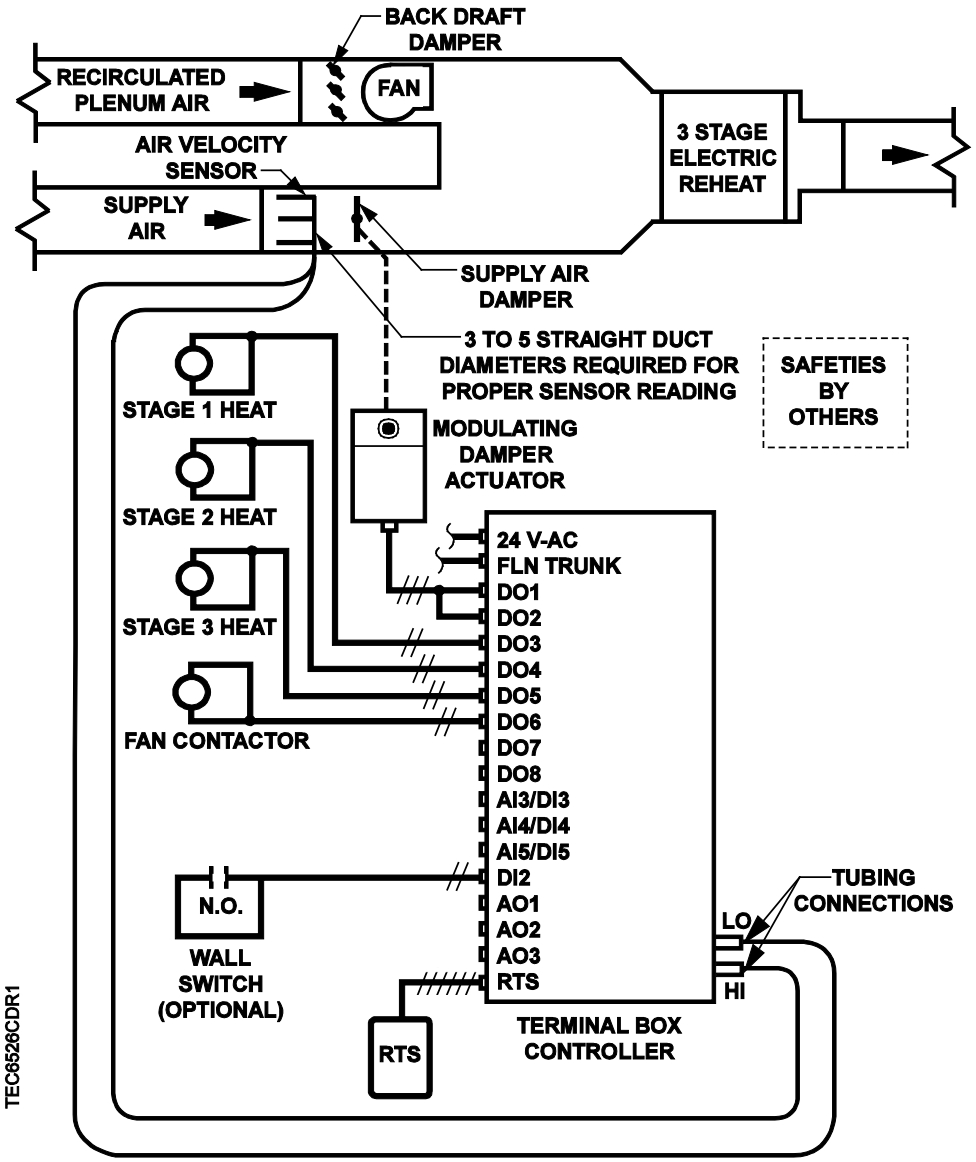
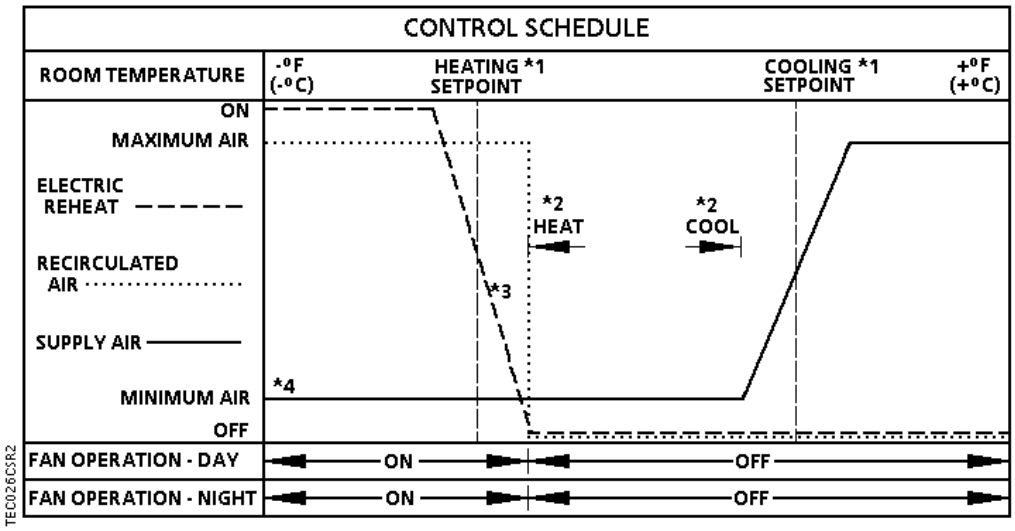
Overview

NOTE:
For information on applications with Firmware Revision B*x*40 or earlier, see InfoLink and/or Asset Portal for documentation.

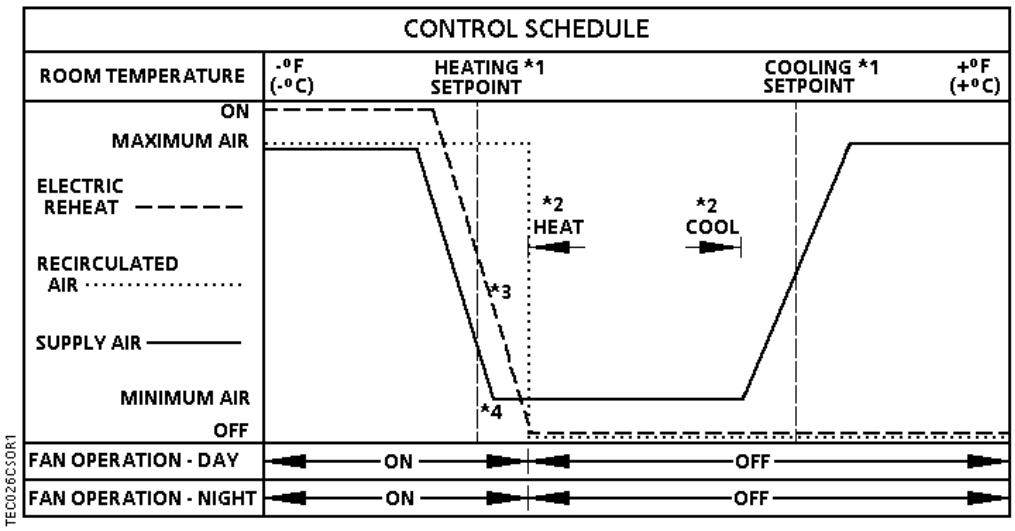
In Application 6526, the controller modulates the supply air damper of the terminal box for cooling and controls stages of electric reheat for heating. When in heating, the terminal box either maintains minimum airflow or modulates the supply air damper. Application 6526 has a parallel fan that re-circulates the room air in heating mode. In order for the terminal box to work properly, the central air-handling unit must provide supply air.



Application 6526 - VAV with Parallel Fan and 3-Stage Electric Heat.



Application 6526 Control Schedule.



Application 6526 Heating Mode Control Schedule.

NOTES:

1. See *Control Temperature Setpoints*.
2. See *Heating/Cooling Switchover*.
3. The electric reheat is time modulated. This allows it to be controlled proportionally rather than with deadbands.
4. The airflow is shown modulating in the entire heating mode. (Default settings must be changed.) The airflow can operate sequenced, parallel, or overlapping with the reheat valve (optional). See *Sequencing Logic*.

NOTE:
The airflow is shown operating parallel with the electric reheat (optional). See Sequencing Logic [→ 12].

BACnet

The controller communicates using BACnet MS/TP protocol for open communications on BACnet MS/TP networks.

Product	Supported BIBBs	BIBB Name
BTEC/PTEC	DS-RP-B B	Data Sharing-Read Property-B
	DS-RPM-B	Data Sharing-Read Property Multiple-B
	DS-WP-B	Data Sharing-Write Property-B
	DM-DDB-B	Device Management-Dynamic Device Binding-B
	DM-DOB-B	Device Management-Dynamic Object Binding-B
	DM-DCC-B	Device Management-Device Communication Control-B
	DM-RD-B	Device Management-Reinitialize Device-B
	DM-BR-B	Device Management-Backup and Restore-B
	DM-OCD-B	Device Management-Object Creation and Deletion-B

Hardware Inputs

Analog

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

Digital

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

Hardware Outputs

Analog

- Spare AO 1, AO 2, and AO 3 (0-10V)

Digital

- Damper actuator (DO 1/DO 2)
- Autozero module (optional)
- Parallel Fan (DO 6)
- Stage 1 electric heat (optional) or Spare DO 3
- Stage 2 electric heat (optional) or Spare DO 4
- Stage 3 electric heat (optional) or Spare DO 5

Ordering Notes

550-495P	Siemens BACnet PTEC VAV/Terminal Box Controller

Sequence of Operation

The following paragraphs present the sequence of operation for Application 6526, VAV with Electric Heat and Parallel Fan.

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 using the 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.

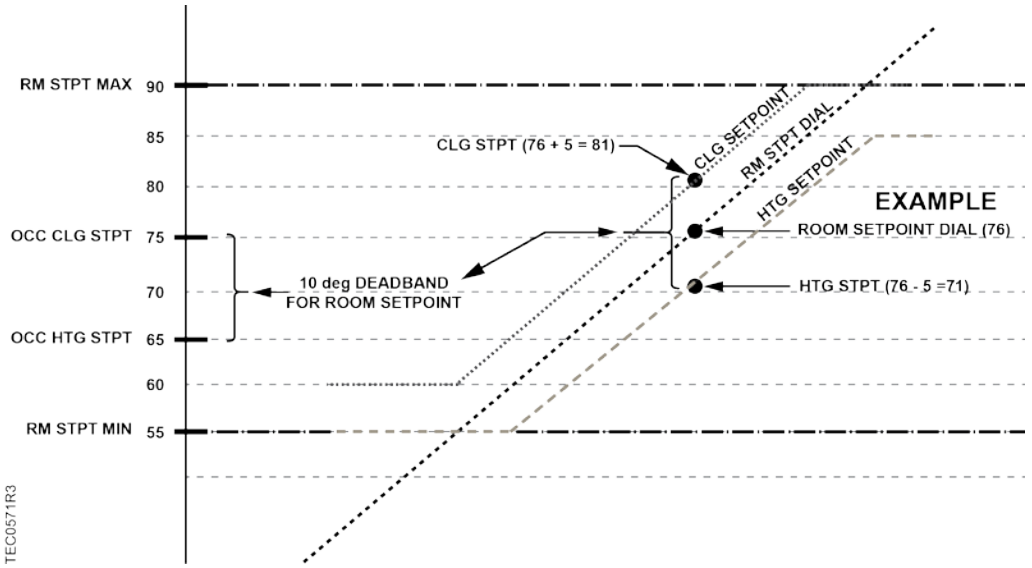
Without setpoint dial:

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.



Room Temperature, Room Temperature Offset and CTL TEMP

ROOM TEMP is the temperature that is being sensed by the room temperature sensor (RTS).

RMTMP OFFSET (or TEMP OFFSET) is a user-adjustable offset that will compensate for deviations between the value of ROOM TEMP and the actual room temperature.

CTL TEMP is the room temperature that is used for control purposes. In other words, what the application is trying to do is to maintain CTL TEMP at the control setpoint.

When CTL TEMP is not overridden, CTL TEMP and ROOM TEMP are related by the following equation:

CTL TEMP = ROOM TEMP + RMTMP OFFSET (or TEMP OFFSET)

If CTL TEMP is not overridden, then:

- The current value of ROOM TEMP (normal or overridden) is used to determine the value of CTL TEMP.
- If ROOM TEMP has a status of Failed, then last known good value of ROOM TEMP is used to determine the value of CTL TEMP.

If CTL TEMP is overridden then:

- CTL TEMP equals its overridden value and the points ROOM TEMP and TEMP (RMTMP) OFFSET have no effect on the value of CTL TEMP. Where CTL TEMP = ROOM TEMP + RMTMP OFFSET.

Day and Night Modes

The day/night status of the space is determined by the status of DAY.NGT. 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 (see the *Control Diagram* in the Overview section), and WALL SWITCH = YES, the controller monitors the status of DI 2 . When the status of DI 2 is ON (the switch is closed), then DAY.NGT will be set to DAY indicating that the controller is in day mode. When the status is OFF (the switch is open), then 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, then the controller stays in day 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 DAY.NGT. See *Powers Process Control Language (PPCL) User's Manual* (125-1896) and the APOGEE P2 ALN Field Panel User's Manual (125-3019) or the APOGEE BACnet ALN Field Panel User's Manual (125-3020) 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, 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 changes to DAY. After the override time elapses, the controller returns to night mode and the status of NGT OVRD changes back to NIGHT.

The override switch on the room sensor will only affect the controller when it is in night mode.

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, the controller switches from heating to cooling mode by setting HEAT.COOL to COOL:

- HTG LOOPOUT < SWITCH LIMIT.
- CTL TEMP > CTL STPT by at least the value set in SWITCH DBAND.
- CTL TEMP > the appropriate (defined in *Control Temperature Setpoints* section) 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 < SWITCH LIMIT.
- CTL TEMP < CTL STPT by at least the value set SWITCH DBAND.
- CTL TEMP < the appropriate (defined in *Control Temperature Setpoints* section) heating setpoint plus SWITCH DBAND.

Control Loops

The controller is controlled by three Proportional, Integral, and Derivative (PID) control loops; two temperature loops and a flow loop.

The two temperature loops are a cooling loop and a heating loop. The active temperature loop maintains room temperature at the value in CTL STPT. See *Control Temperature Setpoints*.

Flow Loop – The flow loop maintains FLOW STPT by modulating the supply air damper, DMPR COMD. The flow loop maintains the airflow between CTL FLOW MIN and CTL FLOW MAX.

To enhance stable flow control, an advanced algorithm is used to calculate a controllable setpoint as the value approaches zero cfm (lps).

When the controller is in cooling mode, CTL FLOW MIN = CLG FLOW MIN, and CTL FLOW MAX = CLG FLOW MAX.

When the controller is in heating mode, CTL FLOW MIN = HTG FLOW MIN, and CTL FLOW MAX = HTG FLOW MAX.

Staged Heating Coil - Terminal Unit

⚠ CAUTION

Verify that the equipment is supplied with safeties by others.

Ensure there is airflow across the heating coils when they are to be energized.

Whenever the stages of electric heat are energized, there must be sufficient airflow across the coils when they are located in the terminal unit. This can be from either the supply airflow (when the heating coils are located in the discharge of the terminal unit) or from the parallel terminal fan (required when the heating coils are in the return/plenum air path). See the section on Sequencing Logic [→ 12] (and Parallel Fan Operation [→ 12]) to see the options for control of the heating coils with the terminal fan.

When the controller is in cooling mode, the electric heat is OFF at all times.

Example

When energized, the heating coils will respond to the heating demand based on the configuration and duty cycle time.

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

AVERAGE HEAT OUT

When the controller is in heating mode, AVG HEAT OUT indicates the percentage of the heating loop that is used for control and cycles the heating stages, independent of the number of stages enabled. The selected range for the heating stages (REHEAT START and REHEAT END) is applied to the HTG LOOPOUT to determine the AVG HEAT OUT.

For example, if REHEAT START = 0, and REHEAT END = 50%, then:

When HTG LOOPOUT = 0%, AVG HEAT OUT = 0%;

HTG LOOPOUT = 25%, AVG HEAT OUT = 50%

HTG LOOPOUT = 50% (or higher), AVG HEAT OUT = 100%

Sequencing Logic

NOTE:
Sufficient airflow across the heating coil is required whenever it is energized. Ensure that the configuration for the parallel fan and for sequencing the supply flow with the heating coil provides the needed airflow.

Calibration

Calibration of the controller's internal air velocity sensor(s) is periodically required to maintain accurate air velocity readings. CAL SETUP 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 = YES, calibration is in progress.

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

Floating Control Actuation Auto-correct

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%.

Parallel Fan Operation

⚠ WARNING

Equipment damage will occur if sufficient airflow across the heating coils is not provided.

When the controller is in heating mode, the fan can be configured to operate two different ways in combination with the staged heating and supply airflow.

1. Fan configured to act as the first stage for heating (using the warmer plenum air). This mode can be applied for mechanical configurations where the heating coils are in the discharge airflow or as part of the return/plenum airflow.
2. Fan configured only to be energized if there is not adequate airflow from the supply air and the heating stages are required (using the supply air for required flow across the heating coils, and the fan to provide air if the supply flow is not sufficient).
   This configuration should **only** be used when the mechanical arrangement is such that the heating coils are in the discharge airflow.

⚠ CAUTION

This fan configuration could cause damage, if the coils are in the return/plenum air path.

FAN CONFIGURED AS FIRST STAGE OF HEAT: (PARALLEL ON > PARALLEL OFF based on heating demand)

In this configuration, in addition to acting as the first stage of heat, the FAN is always energized (or remains energized) whenever stage1 heat is ON.

Configuration for the portions of the heating loop should be set to provide the sequence for fan first, then heating (see Sequencing Logic [→ 12]).

- Set REHEAT START and REHEAT END so that the heating coils are configured as the second stage of heating (for example, START = 50%, END = 100%).
- Set the Fan to sequence as the first part of the heating demand. In this case, the parameters PARALLEL ON and PARALLEL OFF are compared to the HTG LOOPOUT value (for example, set PARALLEL ON = 20% and PARALLEL OFF = 5%).
  - Set PARALLEL ON lower than REHEAT START to provide a portion of the heating demand to be satisfied by the fan alone.
  - When PARALLEL OFF is set above 0% heating demand, it allows the fan to be turned off, on low or no heating demand.
- As the fan ensures flow across the heating coils, the parameters for FLOW START, FLOW END and HTG FLOW MIN, HTG FLOW MAX can be independently set per job requirements (fixed or modulating for selected range of the heating demand).

FAN CONFIGURED TO SUPPLIMENT SUPPLY AIRFLOW FOR THE HEATING COIL. (PARALLEL OFF > PARALLEL ON based on FLOW)

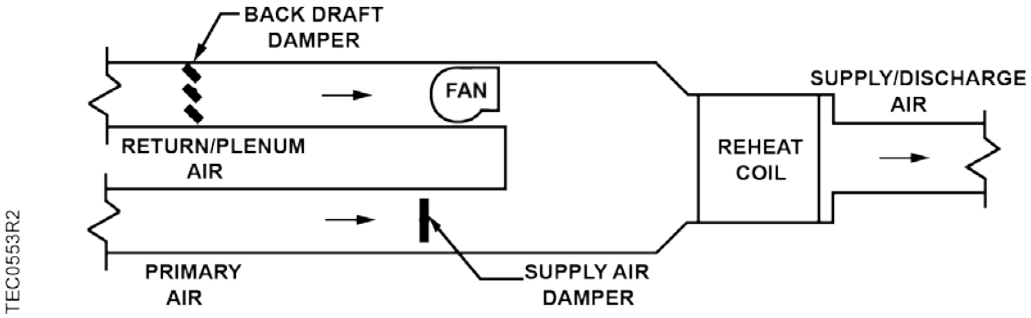
When the location of the heating coils are in the discharge airflow (fan flow is not necessary if there is sufficient supply airflow), this configuration can be used. This will allow the parallel fan to remain off when the air handling unit is supplying enough supply airflow for the heating coils.

Configure the reheat coil and supply flow based on heating demand.

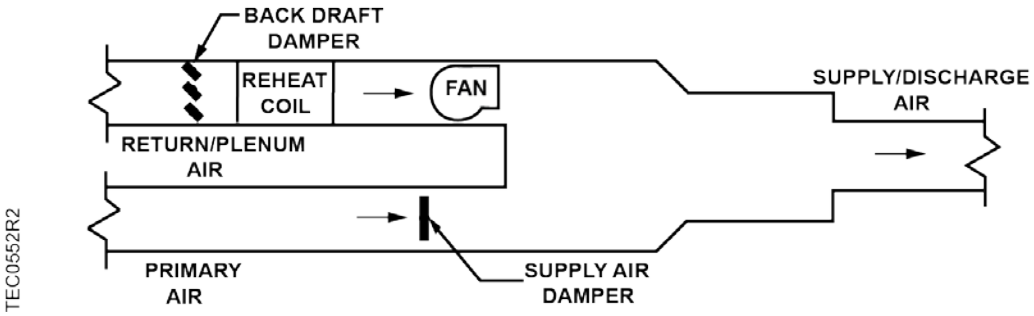
- REHEAT START and REHEAT END (as the only sources of heating) can be configured as specified within the HTG LOOPOUT span (for example, START = 0, END = 100).
- Set the airflow setpoints in the heating mode to ensure the required flow across the coils when the stages are activated.
  - If specified, a fixed value in heating mode can be configured (FLOW START=FLOW END, and HTG FLOW MIN=HTG FLOW MAX).
  - Additional flexibility and potential energy savings could result, if the HTG MIN and MAX were allowed to modulate in response to the heating demand. Along with setting these two flow ranges, the FLOW START and FLOW END should reflect the range of the increased flow in response to heating demand (for example, FLOW START = 0, FLOW END = 40).

Configure the fan based on supply airflow.

- When the parameter PARALLEL ON is less then PARALLEL OFF, the setpoints are in relation to the current supply airflow, where FLOW is from 0 to 100% (HTG FLOW MAX relating to 100%).
- As long as the flow is greater than PARALLEL OFF, the fan will remain off.
- When the flow is less than PARALLEL ON and the application has energized a stage of heat, the fan will be turned on. When all stages are off, the fan will turn off after a time delay (STAGE TIME).



Heating coil located in the supply (discharge) duct.



Heating coil located in the return/plenum air duct.

NOTE:
When a heating coil is external to the terminal unit (perimeter or heated beam/heated floor) the activation of the fan or primary airflow is not a major factor.

AI 4/AI 5 OFFSET (Optional)

AI 4 OFFSET works like RMTMP OFFSET. It can be used to calibrate AI 4 aux temp sensor input if necessary. The actual temperature plus AI 4 OFFSET will equal AI 4 display temperature.

AI 5 OFFSET works the same as AI 4 OFFSET.

Room Unit Operation

Stat Supervision

STAT SUPV is a configurable, enumerated point (values are additive). This point tells the controller how to handle loss of data when used with a digital room unit.

Room Temperature

- When the digital room unit (Series 2200/2300) is used, STAT SUPV enables loss of communication indication:
  - Temperature sensing with a value of 1.
  - Relative humidity sensing with a value of 2.
  - CO2 sensing with a value of 4.
- Communication for Series 2200 sensor baud rate must be set to 1200.
- When the analog room unit (Series 1000/2000) is used, default temperature sensing (0) is enabled (relative humidity and CO2 sensing are not available and should not be selected).

Other Inputs (only available on Digital Room Unit)

- Use the following table to enable communications supervision of room temperature, relative humidity or CO2 for additive values of 2 or 4.

STAT SUPV Value * (additive)	Description (include values to enable feature)
1	Room temperature sensing
2	Relative Humidity (RH) sensing
4	CO_2 sensing

⚠ CAUTION

Digital Room Units that have the RH and/or the CO2 feature will always update the present value and put the associated points (RM TEMP, RM RH, and RM CO2) in override mode, preventing external (or PPCL) commands from being used. STAT SUPV is only provided to allow these points to report a FAIL mode when the room unit fails to update these points.

If an alternative source is selected you must insure that the room unit is not provided with the same sensor option.

See *Sensors and Transducers Configuration and Sizing* for part numbers and ordering information.

Room CO2

RM CO2 displays the CO_2 value in units of parts-per-million (PPM). RM CO2 can be used with PPCL in the PTEC controller or unbundled for control or monitoring purposes.

Room RH

RM RH displays the relative humidity value in percent. RM RH can be used for PPCL in the PTEC or unbundled for control or monitoring purposes.

Fail Mode Operation

If the air velocity sensor fails, the controller uses pressure dependent control. The temperature loop controls the operation of the damper.

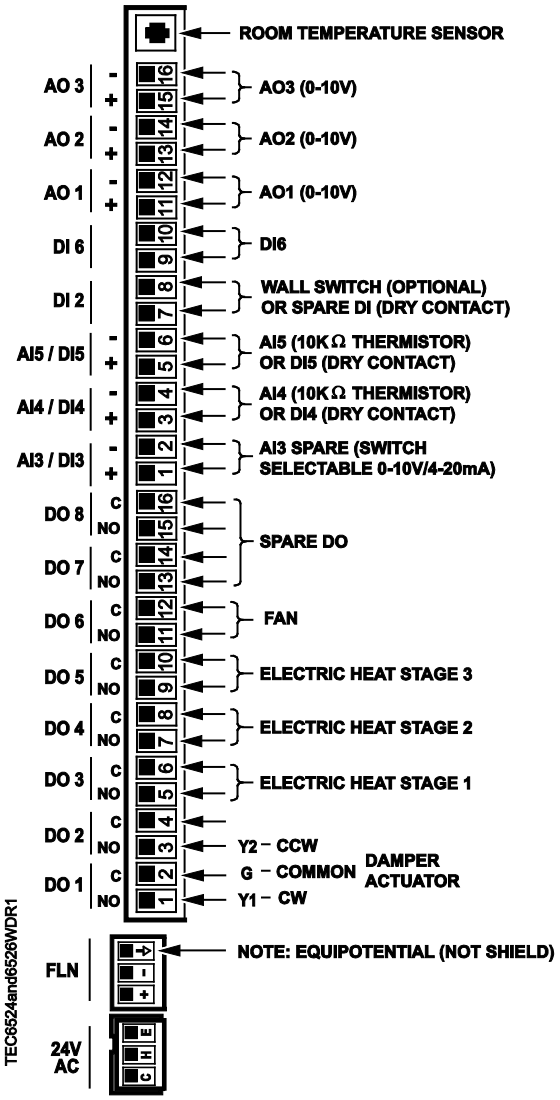
If the room temperature sensor fails, the controller operates using the last known temperature value.

Application Notes

- If temperature swings in the room are excessive or there is trouble maintaining the setpoint, the cooling loop needs to be tuned. If FLOW is oscillating while FLOW STPT is constant, the flow loop requires tuning.
- The controller, as shipped from the factory, keeps all associated equipment OFF. See the appropriate *Start-up Procedures* for information on how to release the controller and its equipment to application control.
- Spare DOs can be used as auxiliary points that are controlled by the field panel after being defined in the field panel's database.

Wiring Diagram

	⚠ CAUTION
	The controller's DOs control 24 Vac loads only. The maximum rating is 12 VA for each DO. An external interposing relay is required 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 (for example part number 540-147, Terminal Equipment Controller Relay Module)



Application 6524 and Application 6526 – Variable Air Volume with Series or Parallel Fan and 3-Stage Electric Heat.

Application 6526 Point Database

Object Type [a]	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units)[b]	Eng Units (SI Units)	Range	Active Text	Inactive Text
AO	1	CTLR ADDRESS	99	--	0-255	--	--
AO	2	APPLICATION	6587	--	0-32767	--	--
AO	3	RMTMP OFFSET	0.0 (0.0)	DEG F (DEG C)	-63.75	--	--
AI	{04}	ROOM TEMP	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
BO	{05}	HEAT.COOL	COOL	--	Binary	HEAT	COOL
AO	6	DAY CLG STPT	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
AO	7	DAY HTG STPT	70.0 (21.20888)	DEG F (DEG C)	48-111.75	--	--
AO	8	NGT CLG STPT	82.0 (27.92888)	DEG F (DEG C)	48-111.75	--	--
AO	9	NGT HTG STPT	65.0 (18.40888)	DEG F (DEG C)	48-111.75	--	--
BI	{10}	DI 6	OFF	--	Binary	ON	OFF
AO	11	RM STPT MIN	55.0 (12.80888)	DEG F (DEG C)	48-111.75	--	--
AO	12	RM STPT MAX	90.0 (32.40888)	DEG F (DEG C)	48-111.75	--	--
AI	{13}	RM STPT DIAL	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
BO	14	STPT DIAL	NO	--	Binary	YES	NO
AI	{15}	AUX TEMP AI5	74.0 (23.495556)	DEG F (DEG C)	37.5-165	--	--
AO	16	FLOW START	0	PCT	0-102	--	--
AO	17	FLOW END	0	PCT	0-102	--	--
BO	18	WALL SWITCH	NO	--	Binary	YES	NO
BI	{19}	DI OVRD SW	OFF	--	Binary	ON	OFF
AO	20	OVRD TIME	0	HRS	0-255	--	--
BO	{21}	NGT OVRD	NIGHT	--	Binary	NIGHT	DAY
AO	22	REHEAT START	0	PCT	0-102	--	--
AO	23	REHEAT END	100	PCT	0-102	--	--
BI	{24}	DI 2	OFF	--	Binary	ON	OFF
BI	{25}	DI 5	OFF	--	Binary	ON	OFF
AO	26	SERIES ON	20	PCT	0-102	--	--
AO	27	SERIES OFF	10	PCT	0-102	--	--

Object Type [a]	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units)[b]	Eng Units (SI Units)	Range	Active Text	Inactive Text
AO	28	PARALLEL ON	20	PCT	0-102	--	--
BO	{29}	DAY.NGT	DAY	--	Binary	NIGHT	DAY
AO	30	PARALLEL OFF	30	PCT	0-102	--	--
AO	31	CLG FLOW MIN	220 (103.818)	CFM (LPS)	0-131068	--	--
AO	32	CLG FLOW MAX	2200 (1038.18)	CFM (LPS)	0-131068	--	--
AO	33	HTG FLOW MIN	220 (103.818)	CFM (LPS)	0-131068	--	--
AO	34	HTG FLOW MAX	2200 (1038.18)	CFM (LPS)	0-131068	--	--
AI	{35}	AIR VOLUME	0 (0.0)	CFM (LPS)	0-131068	--	--
AO	36	FLOW COEFF	1	--	0-2.55	--	--
BI	{40}	DI 4	OFF	--	Binary	ON	OFF
BO	{41}	DO 1	OFF	--	Binary	ON	OFF
BO	{42}	DO 2	OFF	--	Binary	ON	OFF
BO	{43}	HEAT STAGE 1	OFF	--	Binary	ON	OFF
BO	{44}	HEAT STAGE 2	OFF	--	Binary	ON	OFF
BO	{45}	HEAT STAGE 3	OFF	--	Binary	ON	OFF
BO	{46}	FAN	OFF	--	Binary	ON	OFF
BI	{47}	DI 3	OFF	--	Binary	ON	OFF
AO	{48}	DMPR COMD	0	PCT	0-102	--	--
AO	{49}	DMPR POS	0	PCT	0-102	--	--
AI	{50}	AI 4	74.0 (23.495556)	DEG F (DEG C)	37.5-165	--	--
AO	51	MTR1 TIMING	95	SEC	0-511	--	--
AI	{54}	AI3	0	PCT	0-102	--	--
AO	56	DMPR ROT ANG	90	--	0-255	--	--
AO	58	MTR SETUP	0	--	0-255	--	--
AO	59	DO DIR. REV	0	--	0-255	--	--
AO	63	CLG P GAIN	20.0 (36.0)	--	0-63.75	--	--
AO	64	CLG I GAIN	0.01 (0.018)	--	0-1.023	--	--
AO	65	CLG D GAIN	0 (0.0)	--	0-510	--	--
AO	{66}	AOV 1	0	VOLTS	0-10.23	--	--
AO	67	HTG P GAIN	10.0 (18.0)	--	0-63.75	--	--
AO	68	HTG I GAIN	0.01 (0.018)	--	0-1.023	--	--
AO	69	HTG D GAIN	0 (0.0)	--	0-510	--	--
AO	{70}	AOV 2	0	VOLTS	0-10.23	--	--

Object Type [a]	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units)[b]	Eng Units (SI Units)	Range	Active Text	Inactive Text
AO	71	FLOW P GAIN	0	--	0-51.15	--	--
AO	72	FLOW I GAIN	0.01	--	0-1.023	--	--
AO	73	FLOW D GAIN	0	--	0-510	--	--
AO	74	FLOW BIAS	50	PCT	0-102	--	--
AO	{75}	FLOW	0	PCT	0-1023.75	--	--
AO	{76}	CTL FLOW MIN	220 (103.818)	CFM (LPS)	0-131068	--	--
AO	{77}	CTL FLOW MAX	2200 (1038.18)	CFM (LPS)	0-131068	--	--
AO	{78}	CTL TEMP	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
AO	{79}	CLG LOOPOUT	0	PCT	0-102	--	--
AO	{80}	HTG LOOPOUT	0	PCT	0-102	--	--
AO	{81}	AVG HEAT OUT	0	PCT	0-409.2	--	--
AO	82	STAGE MAX	90	PCT	0-102	--	--
AO	83	STAGE MIN	10	PCT	0-102	--	--
AO	85	SWITCH LIMIT	5.2	PCT	0-102	--	--
AO	86	SWITCH TIME	10	MIN	0-255	--	--
AO	88	STAGE COUNT	1	--	0-255	--	--
AO	89	STAGE TIME	10	MIN	0-255	--	--
AO	90	SWITCH DBAND	1.0 (0.56)	DEG F (DEG C)	0-63.75	--	--
AO	{91}	AOV 3	0	VOLTS	0-10.23	--	--
AO	{92}	CTL STPT	74.0 (23.44888)	DEG F (DEG C)	48-111.75	--	--
AO	{93}	FLOW STPT	0	PCT	0-255.75	--	--
BO	{94}	CAL AIR	NO	--	Binary	YES	NO
AO	95	CAL SETUP	4	--	0-255	--	--
AO	96	CAL TIMER	12	HRS	0-255	--	--
AO	97	DUCT AREA	1.0 (0.09292)	SQ. FT (SQ M)	0-6.375	--	--
AO	98	LOOP TIME	5	SEC	0-255	--	--
AO	{99}	ERROR STATUS	0	--	0-255	--	--
BO	{102}	DO 7	OFF	--	Binary	ON	OFF
BO	{103}	DO 8	OFF	--	Binary	ON	OFF
AO	122	AI 4 OFFSET	0.0 (0.0)	DEG F (DEG C)	-63.75	--	--
AO	123	AI 5 OFFSET	0.0 (0.0)	DEG F (DEG C)	-63.75	--	--

Object Type [a)]	Object Instance (Point Number)	Object Name (Descriptor)	Factory Default (SI Units)[b)]	Eng Units (SI Units)	Range	Active Text	Inactive Text
AO	124	STAT SUPV	0	--	0-255	--	--
AI	{125}	RM CO2	1000	PPM	0-8191	--	--
AI	{126}	RM RH	50	PCT	0-102	--	--
BO	{127}	PPCL STATE	EMPTY	--	Binary	LOADED	EMPTY

1) Object Types are; Analog Input (AI), Analog Output (AO), Binary Input (BI) and Binary Output (BO).

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.

Issued by
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Document ID	140-0930	140-0929(CA)
Edition	2014-06-12	Restricted