SIEMENS

BACnet PTEC Controller

BACnet PTEC Dual Duct Start-up

Start-up Procedures

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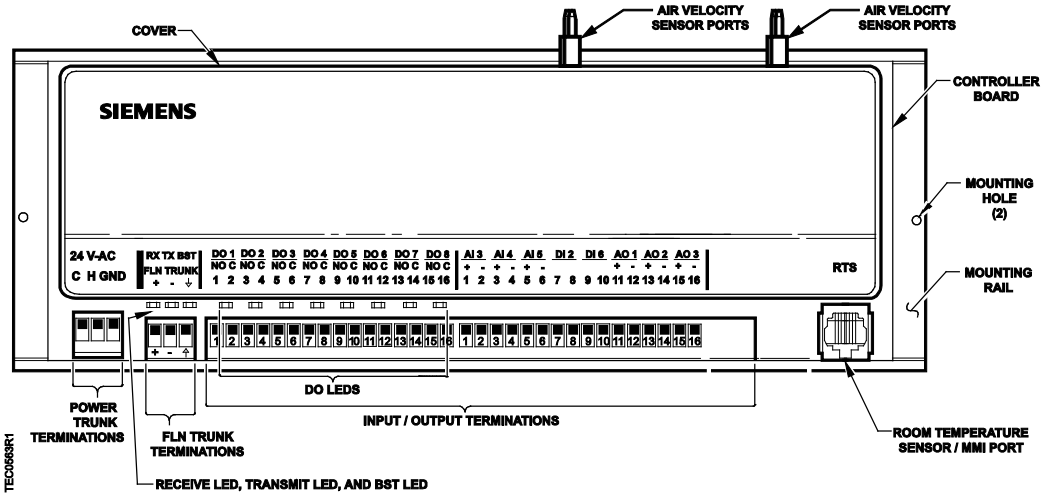
Before You Begin

NOTE:
WCIS version 3.0 or later must be used to configure Siemens BACnet MS/TP Equipment Controllers.
Do not check the Metric check box in the Device Properties dialogue box if the controller is communicating through the MS/TP driver in the field panel. Metric can be checked only if the controller is communicating through a router. If you need metric and the controller is communicating through the MS/TP driver in the field panel, then the Metric check box in the Device Properties dialogue box must be unchecked and the conversion must be handled in the field panel.



Communication and DO Indicators

The Siemens BACnet PTEC Dual Duct Controller has LEDs to indicate communication (yellow) and DO (digital output) status BST (yellow).

The RX LED will flash for data packets received by the actuator from the MS/TP network. The TX LED will flash for data packets sent by the actuator to the MS/TP network. Each DO has an associated LED located above its termination point. This LED point is on when the associated DO is commanded ON; otherwise, it is OFF. The BACnet PTEC will attempt to communicate with other devices as soon as it powers up. The TX LED will start flashing as it attempts to connect and transfer data.

Verifying Power to the Controller

Verify that the controller is powered up. Check that the BST LED on the controller is flashing. If the BST LED does not flash on/off once per second, see the *iKnow Troubleshooting Tool* or contact Field Support for troubleshooting information.

Verifying Slave Mode Application

1. Verify that APPLICATION is set to 6593 for Rev. BD40 or later.
2. Display the STARTUP report.

Enabling Actuators

⚠ CAUTION

The controller's DOs control only 24 Vac loads.
The maximum rating is 12 VA for each DO.

NOTE:
Check with the box manufacturer's local representative and/or the terminal box submittals to confirm the damper actuator rotation angle.

The points that determine actuator run times are:

- MTR 1 TIMING
- MTR 2 TIMING
- MTR 3 TIMING

Your application may not have or use all three points.

1. Use the Table *Damper Actuator Run Time* and/or the Table *Valve Actuator Run Time* to set run time(s) for the actuator(s) used by your application.
2. For damper rotation angles other than 90°, set points to the appropriate value. The names of these points vary. (PTS4 rotation angle is 90°.)

- If Motor 3 is a valve actuator, use the *Valve Actuator Run Time* to set MTR 3 TIMING.

Damper Actuator Run Time		
Damper	**Setting (seconds)**	
Actuator	50 Hz	60 Hz
GDE131.1	125	90
GLB131.1	150	125
PTS4 electronic-to- pneumatic transducer from ACT	-	90

Valve Actuator Run Time		
	Setting (seconds) [1]	
Valve Actuator	50 Hz	60 Hz
SSB81U, floating control fail in place	180	150
SSC81U, floating control fail in place	150	125

Valve Actuator Run Time		
	Setting (seconds) [1]	
SSC81.5U, floating control fail-safe	125	125
SQS85.53U, floating control spring return	35	30

1	Settings given are for Johnson and Honeywell valves with a 3/4" stroke. Stroke may be from 1/2" to 3/4", depending on the model. Consult the manufacturer's valve literature for actual stroke and calculate the setting accordingly.

Specifying Motor Setup

MTR SETUP determines which actuators are controlled by the application and whether they are direct or reverse acting.

Standard Configuration

Set MTR SETUP according to the Table *MTR SETUP Value for Most Common Configurations*.

NOTE:
The assumptions for this table are:
- Dampers are Normally Closed (NC)
- Heating valves are Normally Open (NO)

MTR SETUP Value for Most Common Configurations.				
Applications	Configurations			Value for MTR SETUP
	Motor 1	Motor 2	Motor 3	
all applications with valve	cooling damper (normally closed)	heating damper (normally closed)	heating valve (normally open)	53
all applications without valve	cooling damper (normally closed)	heating damper (normally closed)	spare	5

Non-Standard Configuration

If your application does not use one of the listed actuators in the Table *MTR SETUP Value for Most Common Configurations*, if one of your actuators has a different normal position than that listed in the Table *MTR SETUP Value for Most Common Configurations*, or if you want to use a spare motor, use the Table *Motor Enable/Reverse Value for MTR SETUP* to set MTR SETUP.

Motor Enable/Reverse Values for MTR SETUP.			
	Motor 1 Enabled	Motor 1 Enabled and	Motor 1 Not Used

Motor Enable/Reverse Values for MTR SETUP.									
				Reversed					
	Motor 2 Not Used	Motor 2 Enabled	Motor 2 Enabled and Reversed	Motor 2 Not Used	Motor 2 Enabled	Motor 2 Enabled and Reversed	Motor 2 Not Used	Motor 2 Enabled	Motor 2 Enabled and Reversed
Motor 3 Not Used	1	5	13	3	7	15	0	4	12
Motor 3 Enabled	17	21	29	19	23	31	16	20	28
Motor 3 Enabled and Reversed	49	53	61	51	55	63	48	52	60

Verifying Actuator Setup

1. Command all actuators closed. Verify that they close and remain closed. If not, adjust the setting for MTR SETUP according to Table *MTR SETUP Values*.
2. If any of the actuators still do not close completely, then the actuators have been installed or set up incorrectly. See the installation instructions (550-109), the iKnow Troubleshooting Tool, or contact Field Support.

Setting the Application

Add the TEC to your job database and select Application 6593.

Set APPLICATION to the appropriate Dual Duct Controller application.

Application Description	Revision DD10 or later	Revision BD40 or later
DD Two Inlet Sensors with Optional Reheat	2237	6565
DD One Inlet One Outlet Sensor with Optional Reheat	2238	6566
DD VAV Two Inlet Sensors with Optional Reheat	2267	6567
DD VAV One Inlet One Sensor with Optional Reheat	2268	6568
DD Changeover	2269	6569

Application Description	Revision DD10 or later	Revision BD40 or later
Slave Mode	2293	6593

After you set the application, the controller goes through a shut-down/load sequence as it switches from slave mode to the application selected. After the application loads and the OVERVIEW report appears, continue with the following procedures.

At the start of the calibration cycle, the controller automatically sets CAL AIR to YES. When the cycle is complete, CAL AIR returns to NO.

The air velocity sensor calibration cycle begins within three minutes of an application start-up or initialization, depending on the controller's address. After this delay, the calibration cycle takes from 2 to 5 minutes to complete. The air damper closes during calibration.

NOTE:
You can continue the startup procedure while calibration is underway. However, the controller will ignore commands to control end devices (such as the damper) until calibration of the air velocity sensor is finished.

Setting Auxiliary Heat Options

1. If not using auxiliary heat (hot water or electric), set AUX HTG USED to **NO** and skip to Setting Hot and Cold Duct Temperatures [→ 10].
2. If using auxiliary heat (hot water or electric), set AUX HTG USED to **YES**.
3. If the auxiliary heat is hot water, then set AUX HTG TYPE to **HW** and skip to Setting Hot and Cold Duct Temperatures [→ 10].
4. If the auxiliary heat is electric, set AUX HTG TYPE to **ELEC**.

Setting Stages of Electric Reheat

Check the hardware to verify the number of stages of electric reheat used. Set STAGE COUNT to this value.

⚠ CAUTION

If using electric reheat, do not set TOT FLOW MIN to 0 cfm (0 lps).
Equipment damage may occur if the electric heat is on while the box is controlling at a total flow minimum of 0 cfm (0 lps).

Enabling Autozero Module

If an Autozero Module is used, enable it by setting CAL MODULE to **YES**.

⚠ CAUTION

If an Autozero Module is used,
do not enable MTR3 (valve 2).

NOTE:
For a controller without an Autozero Module, the damper is commanded closed to get a zero airflow reading during calibration. For a controller with an Autozero Module, the damper is closed only for the first calibration after controller initialization or power up.

Selecting Automatic Calibration Option

Using Table *CAL SETUP Options* set CAL SETUP to the value that best meets your job requirements.

If appropriate, change CAL TIMER from the default of 12 hours. This setting applies only if your choice for CAL SETUP includes Option 4.

NOTE:
The air velocity sensor should be calibrated at least once every 24 hours. Make sure that the sensor has been calibrated before balancing takes place, as this will affect the balancer's results.

CAL SETUP Options	
CAL SETUP	**Description**
0	Calibration occurs ONLY when the point CAL AIR is set to YES.
1	Calibration occurs when the field panel commands a day/night mode changeover. Actual calibration is subject to a time delay of 0, 1, 2, or 3 minutes. This delay is determined by the point CTLR ADDRESS divided by 4. The remainder is the time delay in minutes. For example, If CTLR ADDRESS = 11, then the controller will wait 3 minutes (11 ÷ 4 = 2 R3) after it receives the day/night mode changeover command before beginning the calibration routine.
2	Calibration occurs immediately after the override switch is depressed.
4 (factory default value)	Calibration occurs on the time interval set in the point CAL TIMER. For example, if CAL TIMER = 12, then the calibration period is 12 hours. Actual calibration is subject to a time delay based on the value of CTLR ADDRESS. See the example in Option 1.

NOTE:
Options can be combined by summing their numbers. For example, to calibrate as in Options 1 and 2, set CAL SETUP to 3.

Setting Hot and Cold Duct Temperatures

Application 6569: If using temperatures for the hot and cold duct temperatures supply other than the default values, set them as follows:

- Set CLG TEMP to the desired value.
- Set HTG TEMP to the desired value.

Setting Room Temperature Setpoints

If the Controller is to Use a Setpoint Dial

1. If the room temperature sensor has a setpoint dial that will be used, set STPT DIAL to **YES**. Otherwise, set STPT DIAL to **NO.**
   Applications 6565 and 6566:
   NOTE: If STPT DIAL is set to **YES**, OCC CLG STPT and OCC HTG STPT are not used. The value of RM STPT DIAL is used.
   Applications 6567, 6568 and 6569:
   NOTE: If STPT DIAL is set to **YES**, DAY CLG STPT and DAY HTG STPT are not used. The value of RM STPT DIAL is used.
2. Set the unoccupied/night setpoints to the appropriate values:
   - **Applications 6565 and 6566:**
   ⇨ UOC CLG STPT
   ⇨ UOC HTG STPT
   - **Applications 6567, 6568 and 6569:**
   ⇨ NGT CLG STPT
   ⇨ NGT HTG STPT
3. Set RM STPT MIN and RM STPT MAX for the minimum and maximum allowable room temperature setpoint values. Valid values range from 55°F to 95°F (13°C to 35°C).

If No Setpoint Dial is Used

1. Verify that the STPT DIAL is set to **NO**.
2. Set the following points to the appropriate values:
   - **Applications 6565 and 6566:**
   ⇨ OCC CLG STPT

- ⇨ OCC HTG STPT
- ⇨ UOC CLG STPT
- ⇨ UOC HTG STPT

- **Applications 6567, 6568, and 6569:**

- ⇨ DAY CLG STPT
- ⇨ DAY HTG STPT
- ⇨ NGT CLG STPT
- ⇨ NGT HTG STPT

Set the STAT SUPV Subpoint

If the room temperature sensor that is or will be connected to the controller is the Series 1000 model, then set the STAT SUPV point to a value of **0**. If it is a Series 2200 model with temperature only, then set STAT SUPV point to **1**. If it is a Series 2200 model with temperature and humidity, then set STAT SUPV point to **3**. See *Sensors and Transducers Configuration and Sizing* for part numbers and ordering information.

Setting Override Time

If using night/unoccupied override, set OVRD TIME to the number of whole hours that an override should last. If OVRD TIME equals 0 (default), this feature is disabled.

Enabling Wall Switch

If a wall switch is used for day/night (occupied/unoccupied) control, enable it by setting WALL SWITCH to **YES**.

Otherwise, leave WALL SWITCH at its default value of **NO**.

Setting Fail Mode

In the event that either air velocity sensor ceases to function, FAIL MODE causes the dampers to either **OPEN** or **CLOSE**. Set FAIL MODE to the fail-safe position desired for the dampers.

Setting Duct Area

If provided, enter the duct area (sq ft or sq m) into DUCT AREA (and also into HTGDUCT AREA, where applicable) and continue to *Setting Flow Coefficient*.

If you do not know the duct area, use the following table:

Area =	Round Duct	Rectangular Duct
Area in Sq. Ft. (Dimensions in inches)	$(\pi \times R^2)/144$ (where R = radius of duct)	Width x Height/144

Area =	Round Duct	Rectangular Duct
Area in Sq. M (Dimensions in centimeters)	(π x R^2)/10,000 (where R = radius of duct)	Width x Height/10,000

NOTE:
When entering the LCTLR point for a Dual Duct Controller—Two Air Velocity Sensors at the field panel, do not enter a duct area. (When asked for the duct shape, choose **N**, for None.) This controller does not send the value of air volume to the field panel in velocity (fpm). Instead, it uses volume (cfm) so a conversion is not necessary.

Setting Flow Coefficient

1. Set CLG FLO COEFF and HTG FLO COEFF to TOT FLO COEF to the appropriate value found in *Box Manufacturer Flow Coefficients Table*. This value is a starting point for the air balancer.
2. To fine tune the flow coefficient use the following formula:

   ⇨ **new flow coefficient = (actual volume/controller volume) x old flow coefficient**
   The actual volume is the actual value obtained from the balancer's measurements. The controller volume is the value obtained from HTG VOLUME or TOT VOLUME, depending on the application and CLG VOLUME.

- If the controller volume is not within 5% of the actual volume, repeat the procedure until it is within 5%.

Box Manufacturer Flow Coefficients		
Manufacturer	**Sensor Type**	**Value**
Anemostat	2-pipe without orifice 2-pipe with orifice Spider without orifice Spider with orifice	0.79 0.59 0.73 0.39
Carnes	2-pipe Flow cross	0.66 0.59
Carrier		0.59
E.H. Price / Siemens Building Technologies Lab Terminal Boxes		0.78
Environmental Technologies		0.79
Krueger		0.68
Metal Aire		0.72
Nailor Industries		0.69

Box Manufacturer Flow Coefficients		
Manufacturer	**Sensor Type**	**Value**
Titus		0.60
Trane		0.66

Setting Airflow Setpoints

Applications 6565 and 6566

1. Set CLG FLOW MIN to the desired minimum cooling airflow setpoint in occupied mode.
2. Set OCC FLOW to the setpoint for airflow in occupied mode.
3. Set UNOCC FLOW to the setpoint for airflow in unoccupied mode.
4. Set UNOCC FLOW to 0 cfm or to a value that is 10 percent of the value of OCC FLOW for applications that are always in occupied mode.

NOTE:
The controller will not use a setting for UNOCC FLOW that is greater than the setting for OCC FLOW. If UNOCC FLOW is greater than OCC FLOW, the controller uses the setting OCC FLOW at all times.

NOTE:
It is recommended that UNOCC FLOW be set no greater than 0.3 times OCC FLOW. If UNOCC FLOW is set greater than this value, the flow loop becomes less stable. For example, if the controller must maintain a constant volume of 2500 cfm during occupied mode, the UNOCC FLOW should be set to no more than 750 cfm.

Application 6567 and 6569

1. Set CLG FLOW MIN to the desired minimum cooling airflow from the cold duct in daytime cooling mode.
2. Set CLG FLOW MAX to the desired maximum cooling airflow from the cold duct in cooling mode.
3. Set TOT FLOW MIN to the desired minimum airflow needed for ventilation from the dual duct box.
4. Set HTG FLOW MAX to the desired maximum heating airflow from the hot duct in heating mode.

Application 6568

1. Set CLG FLOW MIN to the desired minimum cooling airflow from the cold duct in daytime cooling mode.
2. Set CLG FLOW MAX to the desired maximum cooling airflow from the cold duct.

3. Set TOT FLOW MIN to the desired minimum airflow needed for ventilation from the dual duct box.
4. Set TOT FLOW MAX to the desired maximum airflow from the dual duct box.

NOTE:
It is recommended that TOT FLOW MIN be set no greater than 0.3 times TOT FLOW MAX. If TOT FLOW MIN is set greater than this value, the flow loop becomes less stable. For example, if the maximum flow is to be 2500 cfm, TOT FLOW MIN should be set to no more than 750 cfm.

Setting Controller Address

Set CTLR ADDRESS to the BACnet MS/TP MAC address. (0 through 127 = Master; 128 through 254 = Slave).

NOTE:
Set the controller address and MS/TP network baud rate prior to connecting the controller to the network. See Configuring BACnet Parameters.

NOTE:
If you are going to enter an LCTLR point at the field panel, keep track of the controller address and override time you enter at the portable operator's terminal. You will be required to enter these values again at the field panel.

Set the controller address by setting CTLR ADDRESS to the appropriate number. (Addresses 00 to 98 are valid; 00 to 31 are typically used.)

Update each controller at the field panel immediately after you complete the controller start-up procedures and have made all other changes to the controller's point database (including balancing, tuning, etc.)