



BACnet Heat Pump Controller — Electronic Output

Start-up Procedures

Table of Contents

Before You Begin	2
Enabling Actuators.....	2
Specifying Motor Setup	3
Setting DO DIR.REV	4
Setting Controller Address and Application.....	4
Setting Number of Compressors	5
Setting Compressor Minimum OFF and ON Times.....	5
Setting Stages of Electric Heat and Cooling.....	6
Enabling Night Mixed Air Control.....	6
Setting Room Temperature Setpoints	6
Setting Override Time.....	7
Setting Fan to Cycle with Compressor	7
Enabling Wall Switch	7
Setting Room Temperature Offset (optional)	7
Setting Suggested Point Values	8
Configuring BACnet Parameters	11

Before You Begin



CAUTION:

Do not perform an update command on a BACnet MS/TP TEC from the Field Panel or from within Insight. This feature is not currently supported.



WinCIS version 2.1.4 or later must be used to configure Siemens Building Technologies BACnet TECs.

If WinCIS does not communicate (through the MMI port / RTS sensor), try a different MMI baud rate. The default MMI baud rate is 1200.

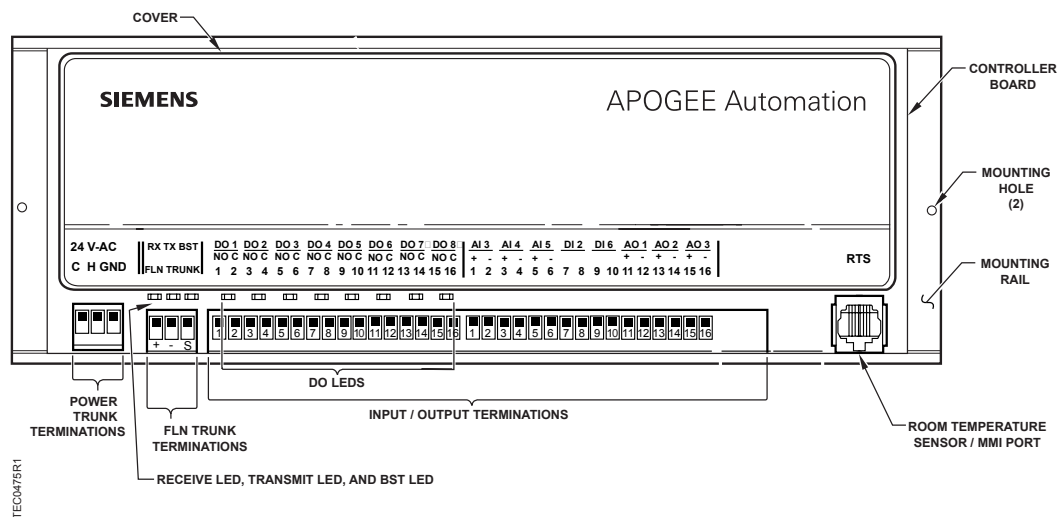


Figure 1. BACnet MS/TP Heat Pump Controller.

Enabling Actuators

For Floating-type Damper



CAUTION:

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

The poin(t)s that determine actuator run times are:

- MTR TIMING (Point 51)

1. Use Table 1 to set run time(s) for the actuator(s) used by your application.

- For damper rotation angles other than 90°, set Point Number 56 to the appropriate value. (PTS4 rotation angle is 90°.)

Table 1. Damper Actuator Run Time.

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

Specifying Motor Setup

MTR SETUP (Point 58) determines which actuators are controlled by the application and whether they are direct or reverse acting.



When MTR SETUP is changed, all enabled actuators will calibrate. Wait until each actuator has completed its calibration before continuing.

Table 2. Motor Enable/Reverse Values for MTR SETUP (Point 58).

	Motor 1 Enabled			Motor 1 Enabled and Reversed			Motor 1 Not Used		
	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

For Spring-Return Damper (0 to 10V)

- Set DAMPER TYPE (Point 38) to **SPRING**.
- Do one of the following:
 - If the damper should open as the voltage increases (normally closed), leave AO DIR.REV (Point 39) at its default value of 0.

- If the spring-return damper should close as the voltage increases (normally open), set AO DIR.REV to 1.

Setting DO DIR.REV

Application 2573:

If the normal (de-energized) state of the reversing valve is cooling, leave DO DIR.REV (Point 59) at its default value of 0.

If the normal (de-energized) state of the reversing valve is heating, set DO DIR.REV to 4.



When REV VALVE (Point 44) is changed from normally cooling to normally heating by setting DO DIR.REV to 4, its value will change to reflect the appropriate state of the reversing valve, HEAT/COOL.



CAUTION:

If any changes are made to DO DIR.REV (Point 59), cycle power/reset the controller.

Setting Controller Address and Application

Set CTRLR ADDRESS (Point 1) to the BACnet MAC address.

Set APPLICATION (Point 2) to the desired number in Table 3.

Table 3. BACnet Heat Pump Controller—Electronic Output Applications.

Application Description	Application Number
Multiple Compressor Heat Pump with Reversing Valve Control and Mixed Air Control	2573
Multiple Heating and Cooling Heat Pump with Mixed Air and Internal Reversing Valve Control	2574
Heat Pump Multi-Stage Slave Mode	2590

After you set the application, the controller goes through a shut-down/load sequence as it switches from slave mode to the application selected. On some controllers a calibration cycle follows the shut-down/load sequence.

Setting Number of Compressors

Application 2573:

If using one compressor, leave CMP TOTL (Point 75) at its default value of 1. Otherwise, set CMP TOTL to the number of compressors used. Valid entries are 0, 1, 2, or 3.

Application 2574:

If using one heating compressor, leave HTG CMP TOTL (Point 75) at its default value of 1. Otherwise, set HTG CMP TOTL to the number of compressors used for heating. Valid entries are 0, 1, or 2.

Setting Compressor Minimum OFF and ON Times

If the default values are not appropriate, display the main application report and set the points for compressor minimum OFF and ON times according to the specifications for the equipment being used:

Application 2573:

Compressor 1	CMP1 MIN OFF	(Point 87), default = 3 min
	CMP1 MIN ON	(Point 88), default = 3 min
Compressor 2	CMP2 MIN OFF	(Point 27), default = 3 min
	CMP2 MIN ON	(Point 28), default = 3 min
Compressor 3	CMP3 MIN OFF	(Point 36), default = 3 min
	CMP3 MIN ON	(Point 37), default = 3 min

Application 2574:

Cooling Compressor 1	CLG1 MIN OFF	(Point 32), default = 3 min
	CLG1 MIN ON	(Point 33), default = 3 min
Cooling Compressor 2	CLG2 MIN OFF	(Point 36), default = 3 min
	CLG2 MIN ON	(Point 37), default = 3 min
Heating Compressor 1	HTG1 MIN OFF	(Point 87), default = 3 min
	HTG1 MIN ON	(Point 88), default = 3 min
Heating Compressor 2	HTG2 MIN OFF	(Point 27), default = 3 min
	HTG2 MIN ON	(Point 28), default = 3 min

Setting Stages of Electric Heat and Cooling

Electric Heat:

Check the hardware to verify the number of electric heat stages wired to the controller and set EHTG STG CNT (Point 76) to this value. (If not using electric heat, set EHTG STG CNT to 0.)



CAUTION:

For installations using electric heat coils, never set min airflow settings to 0. Equipment damage can occur if electric heat is on without airflow.

Cooling (Application 2574):

If using one cooling compressor, leave CLG CMP TOTL (Point 77) at its default value of 1. Otherwise, set CLG CMP TOTL to the number of compressors used for cooling. Valid entries are 0, 1, or 2.

Free Cooling:

If free cooling is not used, leave FREE CLG (Point 23) at its default value of DISABL.

If free cooling is desired, add the appropriate PPCL statements at the field panel to command FREE CLG on when free cooling is available and off when it is not available, and set FREE CLG to ENABLE.

Enabling Night Mixed Air Control

If mixed air control is desired during night mode, enable it by setting NGT MA CTL (Point 91) to YES.

Setting Room Temperature Setpoints

Points 6, 7, 8, and 9 are the room temperature setpoints.

Point 6 – DAY (or OCC) cooling setpoint.

Point 7 – DAY (or OCC) heating setpoint.

Point 8 – NGT (or UOC) cooling setpoint.

Point 9 – NGT (or UOC) heating setpoint.

1. If the room temperature sensor has a setpoint dial that will be used, set STPT DIAL (Point 14) to YES. Otherwise set STPT DIAL to NO.

2. Set points 6 through 9 to desired values. (Points 7 and 9 are not present in certain cooling only applications.)



If STPT DIAL is set to YES, do not set points 6 and 7; the value of RM STPT DIAL (Point 13) will be used for these points.

3. Set RM STPT MIN (Point 11) and RM STPT MAX (Point 12) for the minimum and maximum allowable room temperature setpoint values, respectively. Valid values range from 55° to 95°F (13° to 35°C). Default values are 55°F (13°C) for RM STPT MIN and 90°F (32°C) for RM STPT MAX.

Setting Override Time

If using night/unoccupied override, set OVRD TIME (Point 20) to the number of whole hours that an override should last. If OVRD TIME equals 0 (default), this feature is disabled.

Setting Fan to Cycle with Compressor

If the fan is to cycle during day mode with the compressor(s), set CYCLE FAN (Point 60) to YES. Otherwise, the fan will be on all the time in day mode.

Enabling Wall Switch

If a wall switch is used for day/night (occ/unocc) control, set WALL SWITCH (Point 18) to YES.

Setting Room Temperature Offset (optional)



The Room Temperature Offset feature is optional.

When the room has stabilized to within 5°F, take a precision temperature reading at the room temperature sensor. Record any difference between this reading and the value of ROOM TEMP (Point 4) and set this difference value (to the nearest 0.25°F) into RMTMP OFFSET (Point 22).

EXAMPLE: If the actual room temperature is 72.0°F, and the value of ROOM TEMP is 73.0°F, then the value entered into RMTMP OFFSET is -1.0. In this case, the value of ROOM TEMP would read 73.0°F, but the value of CTL TEMP would read 72.0°F.

CTL TEMP (Point 78) = ROOM TEMP (Point 4) + RMTMP OFFSET (Point 22)

Setting Suggested Point Values

The following are suggested point values for various heat pump configurations. Set these values as appropriate for your configuration.

Table 4. Application 2573: Suggested Point Values for Heat Pump Configurations with 1 Compressor.

Point Number	Descriptor	1 Compressor 0 Elec Heat Stages	1 Compressor 1 Elec Heat Stages	1 Compressor 2 Elec Heat Stages	1 Compressor 3 Elec Heat Stages
61	FREE CLG ON	40%	40%	40%	35%
62	FREE CLG OFF	20%	20%	20%	15%
76	EHTG STG CNT	0	1	2	3
81	EHEAT 1 ON	–	80%	80%	70%
82	CMP1 ON	60%	60%	60%	55%
83	CMP1 OFF	40%	40%	40%	35%
84	RVAL SWITCH	30%	30%	30%	30%
85	SWITCH LIMIT	5%	5%	5%	5%
94	EHEAT 2 ON	–	–	98%	85%
95	EHEAT 3 ON	–	–	–	98%

Table 5. Table 5. Application 2573: Suggested Point Values for Heat Pump Configurations with 2 or 3 Compressors.

Point Number	Descriptor	2 Compressors 0 Elec Heat Stages	2 Compressors 2 Elec Heat Stages	3 Compressors 0 Elec Heat Stages	3 Compressors 1 Elec Heat Stage
16	CMP2 ON	70%	70%	70%	55%
17	CMP2 OFF	50%	50%	50%	40%
34	CMP3 ON	–	–	90%	70%
35	CMP3 OFF	–	–	70%	55%
61	FREE CLG ON	30%	30%	30%	25%
62	FREE CLG OFF	10%	10%	10%	10%
75	CMP TOTL	2	2	3	3
76	EHTG STG CNT	0	2	0	1
81	EHEAT 1 ON	–	85%	–	85%
82	CMP1 ON	50%	50%	50%	40%

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Table 5. Table 5. Application 2573: Suggested Point Values for Heat Pump Configurations with 2 or 3 Compressors. (continued)

Point Number	Descriptor	2 Compressors 0 Elec Heat Stages	2 Compressors 2 Elec Heat Stages	3 Compressors 0 Elec Heat Stages	3 Compressors 1 Elec Heat Stage
83	CMP1 OFF	30%	30%	30%	25%
84	RVAL SWITCH	30%	30%	30%	30%
85	SWITCH LIMIT	5%	5%	5%	5%
94	EHEAT 2 ON	70%	98%	—	—

Table 6. Application 2574: Suggested Point Values for Heat Pump Configurations with 0 or 1 Compressor.

Point Number	Descriptor	0 Heating Compressors 1 Cooling Compressor 1 Electric Heat Stage	0 Heating Compressors 2 Cooling Compressor 1 Electric Heat Stage	1 Heating Compressor 1 Cooling Compressor 0 Electric Heat Stages
30	CLG CMP1 ON	60%	50%	60%
31	CLG CMP1 OFF	40%	30%	40%
34	CLG CMP2 ON	—	70%	—
35	CLG CMP2 OFF	—	50%	—
61	FREE CLG ON	40%	30%	40%
62	FREE CLG OFF	20%	10%	20%
75	HTG CMP TOTL	0	0	1
76	EHTG STG CNT	1	1	0
77	CLG CMP TOTL	1	2	1
81	ELEC HEAT ON	60%	60%	—
82	HTG CMP1 ON	40%	40%	60%
83	HTG CMP1 OFF	20%	20%	40%
85	SWITCH LIMIT	5%	5%	5%

Table 7. Application 2574: Suggested Point Values for Heat Pump Configurations with 1 Heating and 1 or 2 Cooling Compressors.

Point Number	Descriptor	1 Heating Compressor 1 Cooling Compressor 1 Electric Heat Stage	1 Heating Compressor 2 Cooling Compressors 1 Electric Heat Stage	1 Heating Compressor 2 Cooling Compressors 0 Electric Heat Stages
30	CLG CMP1 ON	60%	50%	50%

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Table 7. Application 2574: Suggested Point Values for Heat Pump Configurations with 1 Heating and 1 or 2 Cooling Compressors. (continued)

Point Number	Descriptor	1 Heating Compressor 1 Cooling Compressor 1 Electric Heat Stage	1 Heating Compressor 2 Cooling Compressors 1 Electric Heat Stage	1 Heating Compressor 2 Cooling Compressors 0 Electric Heat Stages
31	CLG CMP1 OFF	40%	30%	30%
34	CLG CMP2 ON	–	70%	70%
35	CLG CMP2 OFF	–	50%	50%
61	FREE CLG ON	40%	30%	30%
62	FREE CLG OFF	20%	10%	10%
81	ELEC HEAT ON	80%	80%	–
82	HTG CMP1 ON	60%	60%	60%
83	HTG CMP1 OFF	40%	40%	40%
85	SWITCH LIMIT	5%	5%	5%

Table 8. Application 2574: Suggested Point Values for Heat Pump Configurations with 2 Heating and 1 or 2 Cooling Compressors.

Point Number	Descriptor	2 Heating Compressors 1 Cooling Compressor 0 Electric Heat Stages	2 Heating Compressors 1 Cooling Compressor 1 Electric Heat Stage	2 Heating Compressors 2 Cooling Compressors 0 Electric Heat Stages
16	HTG CMP2 ON	70%	70%	70%
17	HTG CMP2 OFF	50%	50%	50%
30	CLG CMP1 ON	60%	60%	50%
31	CLG CMP1 OFF	40%	40%	30%
34	CLG CMP2 ON	–	–	70%
35	CLG CMP2 OFF	–	–	50%
61	FREE CLG ON	40%	40%	30%
62	FREE CLG OFF	20%	20%	10%
81	ELEC HEAT ON	–	90%	–

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Table 8. Application 2574: Suggested Point Values for Heat Pump Configurations with 2 Heating and 1 or 2 Cooling Compressors. (continued)

Point Number	Descriptor	2 Heating Compressors 1 Cooling Compressor 0 Electric Heat Stages	2 Heating Compressors 1 Cooling Compressor 1 Electric Heat Stage	2 Heating Compressors 2 Cooling Compressors 0 Electric Heat Stages
82	HTG CMP1 ON	50%	50%	50%
83	HTG CMP1 OFF	30%	30%	30%
85	SWITCH LIMIT	5%	5%	5%

Configuring BACnet Parameters



WinCIS version 2.1.4 or later must be used to configure Siemens Building Technologies BACnet MS/TP TECs.

Do not check the Metric checkbox in the Device Properties dialogue 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 checkbox in the Device Properties dialogue must be unchecked and the conversion must be handled in the Field Panel.

Using WinCIS: From the Device menu, select Device Properties to configure BACnet parameters.

1. **Object Name** — unique to BACnet network, default = H.PUMP CTLR (12 character RAD50 limit).
2. **Object ID** — unique to BACnet network, valid values = 0 to 4,194,303 (represents the Device Instance Number).
3. **Description** — description of controller (60 character limit).
4. **Location** — physical location of controller (60 character limit).
5. **Baud Rate** — options; 9600, 19200, 38400 or 76800, default = 19200.
6. **MSTP Master/Slave** — Do one of the following:
 - Check the Slave checkbox if the controller communicates with a Field Panel using the MS/TP driver.
 - Uncheck the Slave checkbox if the controller is communicating through a router.
7. Press the **'Write'** button — the controller accepts the configuration values and then resets.

The startup is complete upon completion of BACnet parameters configuration.



When the BACnet MS/TP TEC is successfully installed, the RX and TX LEDs flash On/Off very rapidly and *continuously*.