Comfortvu Bacnet standartThermostat TB-C

Guía de Instalación

ComfortVu™
BACnet Thermostat Standard
Model TB (Line voltage model)
Installation and Operation Guide

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Overview

The ComfortVu™ BACnet Thermostat Standard Model TB can be used:

- As a stand-alone thermostat that can control equipment using built-in logic
- As part of an MS/TP network of BACnet Thermostats that can be managed from a BMS front-end system
- As part of a BACnet MS/TP network connected to an Carrier BACnet router in an i-Vu® system. The router's control programs provide trending and alarming of the BACnet Thermostat's data.

The TB thermostat has a white plastic enclosure with an LCD display and buttons for user control. It has on-board temperature sensing, and its on-board inputs and outputs are used to control equipment and optional external sensing devices. Inputs and outputs are configured using DIP switches and jumpers. The TB thermostat requires line voltage.

See also:
ComfortVu™ BACnet Thermostat Points List and Technician Settings

Specifications

Sensing Element:	Range	Accuracy
Temperature	41° F to 95° F (5° C to 35° C)	±1.0° F (0.5° C)

Power	85 to 240 Vac, 50-60Hz, 1.5 VA **NOTE** Devices connected to outputs, such as a fan, will increase VA requirements.
Communication	BACnet MS/TP with baud rates up to 76.8 kbps, detected and set automatically by the BACnet Thermostat. Max 127 devices.

Inputs	T1, 0 – Normally open or normally closed dry contract, or
	      0-10 Vdc analog input, or
	      50 kOhm thermistor @ 25°C
	A, B - Communication +/- (RS485)
	IN1, 0 - Normally open or Normally closed dry contract, or
	      0-10 Vdc analog input, or
	      50 kOhm thermistor @ 25°C
	L, N - Power: 110-220 Vac line voltage

Outputs	11, 12, 13 – Digital outputs, 3A 14. 15. 16 – Digital outputs 0.3A AO1 and AO2 – 0-10 Vdc, 5 mA max., not isolated
Environmental Operating Range	50° to 122°F (10° to 50°C), 10 to 90% relative humidity, non-condensing
Mounting	Wall mount on a standard 4" x 2" electrical box using 6/32 x 1/2" mounting screws

Specifications (cont.)

Weight	4.8 oz (0.14 kg)
Compliance	United States of America: FCC CFR47, Chapter 1, Subchapter A, Part 15, Class B Canada: Industry Canada Compliant, ICES-003, Class B Europe: C€ Mark, Low Voltage Directive: 2014/35/EU RoHS Compliant: 2011/65/EU Australia and New Zealand: C-Tick Mark, AS/NZS 61000-6-3 Title 24 compliant if connected to a BMS with custom programming for economizer fault detection. CA Prop 65 Warning: This product can expose you to chemicals including Styrene and 1,3 - Propane sultone, which are known to the State of California to cause cancer. For more information, go to www.p65warnings.ca.gov.

TB Dimensions

4.65 in.
1.18 cm

3.62 in.
.92 cm

FRONT VIEW

1.04 in.
2.65 cm

1.04 in.
2.65 cm

0.87 in.
2.2 cm

SIDE VIEW

0.67 in.
1.7 cm

3.3 in.
8.4 cm

0.67 in.
1.7 cm

1.81 in.
4.6 cm

1.81 in.
4.6 cm

0.12 in.
.3 cm

0.28 in.
.7 cm

0.12 in.
.3 cm

0.28 in.
.7 cm

BACKPLATE FRONT VIEW

BOTTOM VIEW

3 in.
7.6 cm

2.13 in.
5.4 cm

REAR VIEW
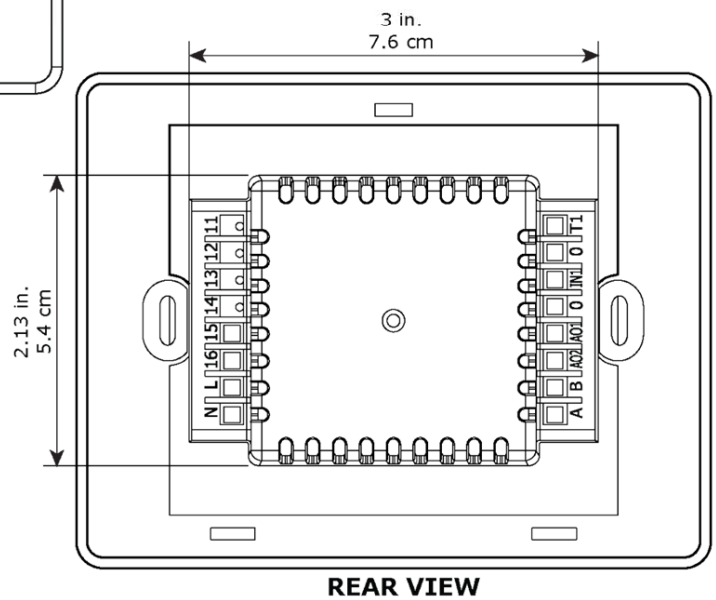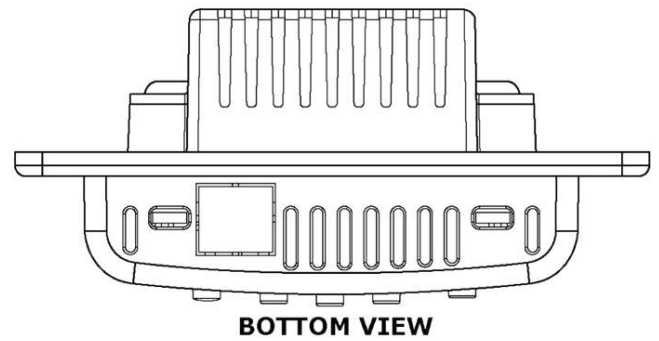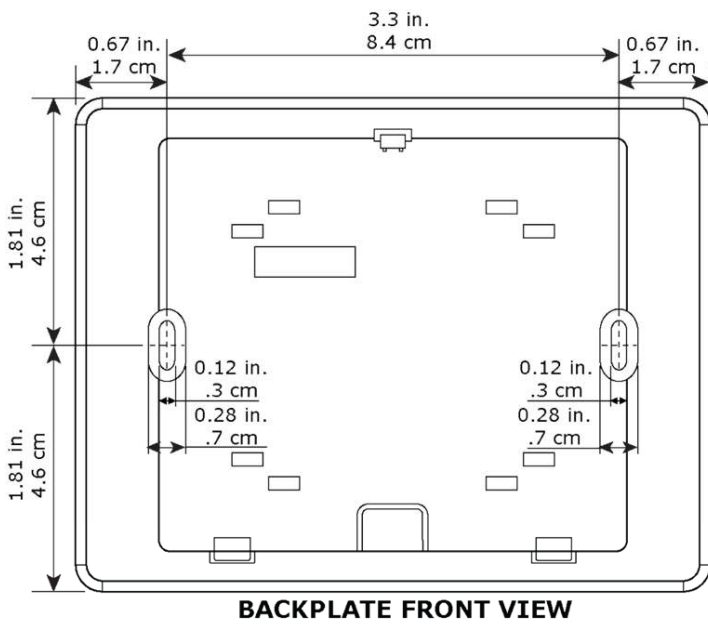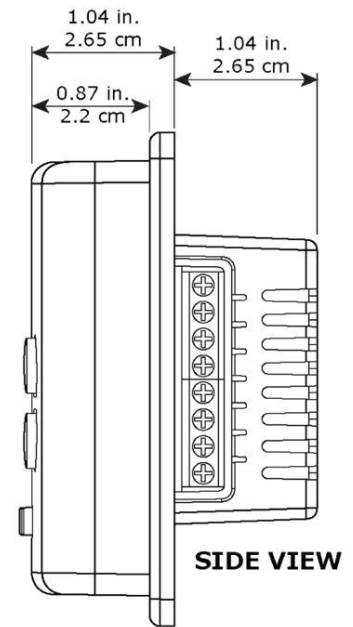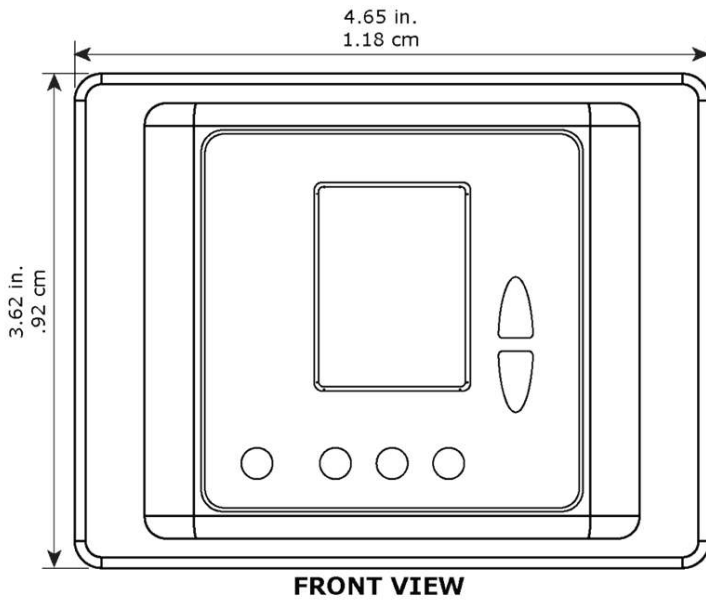
Operating instructions

Quick guide

Temperature indication:
- °C°F -- Temperature scale
- SET -- Setpoint adjust.

Ambient/Setpoint indication temperature

Thermostat On/Off indication

System MODE indication:
- ❄ ----- Fan only
- ❄ ----- Cooling
- 〰 ----- Heating
- ❄〰 ---- Auto mode

Clock / Weekdays

- Press to switch between temperature scales (ºC/ºF)
- Press and hold to enter weekly program settings
- Press and hold to enter Technician Settings (setpoint must be equal to 10ºC/50ºF)
- Press and hold to enter MAC Address settings (setpoint must be equal to 11ºC/52ºF)

Fan speed indication:
- AUTO ------ Auto speed
- ▼ ------ High
- ▼ ------ Medium
- ▼ ------ Low
- AF ------ Fan on demand

Indications:
- 🔔 ------ Alarm
- 🔒 ------ Button locked
- 🕐 ------ Program active

Program events indications:
- Prog1234 -- Event per day
- Start ------ Adjust start time
- Stop ------ Adjust stop time
- Clock ------ Adjust the clock

Setpoint adjustment

- Press to select Fan speed: Low/Medium/High/Auto
- Press and hold to activate fan on demand

- Press to select System Mode: Cool/Heat/Auto

- Press to turn unit On or Off

Display shows: 75.5 °C°F Hu% SET | ON OFF | SuMoTuWeThFrSa Prog1234 | 03:18 AM Start Stop Clock | AF | AUTO

Buttons: C/F Prog | On/Off | Mode | Fan | + | −

Operating instructions (cont.)

Turning the thermostat ON and OFF

Press the [On/Off] button to turn the thermostat ON or OFF.

ON

OFF

ON   **OFF**
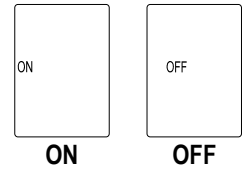
Selecting temperature scale

Press the [C/F] button to switch between temperature scales.

25.0 ℃   73.0 ℉

Celsius   **Fahrenheit**
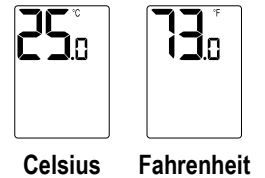
Adjusting the Setpoint temperature

In <u>One</u> setpoint configuration:
1. Press the [+] or [-] buttons once to view the setpoint temperature.
2. Press again to adjust the setpoint.

73.0 ℉

Setpoint

In <u>Two</u> setpoints configuration:
1. Press the [+] or [-] buttons once – "❄" and the setpoint temperature for cooling will appear on display.
2. Use the [+] or [-] button to adjust the setpoint for cooling.
3. Press the [Mode] button or wait 3 seconds – "〰" and the setpoint temperature for heating will appear on display.
4. Use the [+] or [-] button to adjust the setpoint for heating.
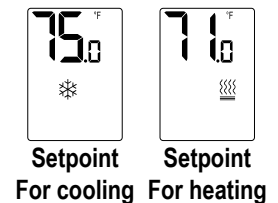
Note: The setpoint for cooling must be higher than the setpoint for heating.

75.0 ℉   71.0 ℉
❄   〰

Setpoint   **Setpoint**
For cooling **For heating**

Operating instructions (cont.)

Selecting system mode

Press the [Mode] button to switch between system modes.

Notes:

- During demand for cooling or heating, the active mode will flash.
- In Auto mode, the active mode icon (Cool or Heat) will appear on display.
- Auto mode is not available in 2-Pipe system configuration.

❄	⧚
Cool	**Heat**
❄ ⧚	❀
Auto	**Fan only**

Selecting Fan speeds (for 2 and 3 fan speeds configuration)

Press the [Fan] button to switch between fan speeds.

Notes:

- In Auto speed, the active fan speed icon will appear on display.
- Medium speed available in 3-speed configuration.

!	!
Low	**Medium**
!	AUTO
High	**Auto**
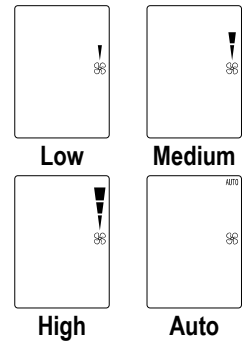
Turning Auto fan ON or OFF (fan on demand)

In 1-speed configuration:

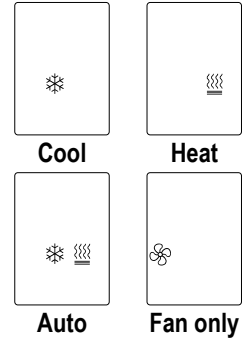Press the [Fan] button to turn Auto fan ON or OFF.

In 2- and 3-speed configurations:

Press and hold the [Fan] button for 7 seconds to turn Auto fan ON or OFF.

- When ON, the fan will run on demand for cooling or heating,
- When OFF, the fan will run continuously.

  Note: Auto fan cannot be selected in Fan only mode.

AF	
Auto fan OFF	**Auto fan ON**
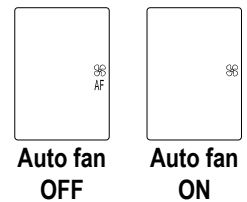
Locking the thermostat buttons

- Press and hold both [-] and [Fan] buttons for 7 seconds to lock or unlock the thermostat buttons.
- When locked, the lock icon will appear on display with any attempt to press the buttons.
- Enable or disable the option to lock different buttons using Technician Settings P4-P7.

⌂
Lock indications

Economy mode

- Activate Economy mode by triggering a window contact, door switch, key-tag, remote economy switch, external PIR sensor (passive infrared sensor), or through communication – binary value "UnoccupiedByNetwork".
- When Economy mode is active, the thermostat will use special economy setpoints for cooling and heating set by technician. *See objects "EconomySetpointinHeat" and "EconomySetpointinCool" in the Technician Settings section of this manual.*

E1	Economy by window contact
E2	Economy by external PIR, by the remote economy switch, or through communication
E4	Economy by door switch
E5	Economy by Key-tag

Freeze Protection

The Freeze protection feature will not allow the room temperature to drop below predefined cut-in temperature. Depending on which configuration the system is operating under (W/WO Heat pump), this feature will force the system to operate in heat mode and activate the fan.

This feature will take effect when the thermostat is either ON or OFF. When the room temperature rises above the predefined cut-out temperature, the thermostat will return to its previous state.

When freeze protection is activated, the display alternates between "AL" and room temperature.
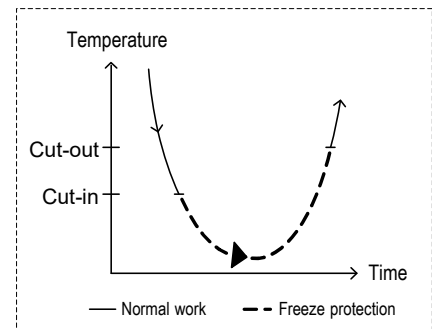
Operating instructions (cont.)

Economizer

Economizer is used to reduce the energy consumed by the cooling systems, by using low external air temperatures to assist in the chilling process. When outdoor temperatures are lower relative to indoor (room) temperatures, the system utilizes the cool outdoor air as a free cooling source.

The outdoor temperature (Teconomizer) triggering the activation of the economizer, can be measured by the temperature sensor connected to T1,0 terminals (technician parameter P08="05") or by setting a temperature value manually through communication - AV#129 "TEconomizerEffective".
When getting the temperature through communication, terminals T1,0 can be used for any other functionality like External sensor/Soft start in heat sensor/Deicing in cool/Door switch/Key tag.

Whenever there is demand for cooling and the outdoor temperature conditions allow the operation of the economizer, it will operate together with the regular cooling system and will not replace it.

Economizer will start when both of the following conditions are satisfied:

1. *Teconomizer temperature < Room temperature -* $\dfrac{\textit{Cool differential band}}{2}$

2. *Room Temperature > Setpoint temperature*

Economizer will stop when the following condition is satisfied:

1. *Room Temperature < Setpoint temperature -* $\dfrac{\textit{Cool differential band}}{2}$
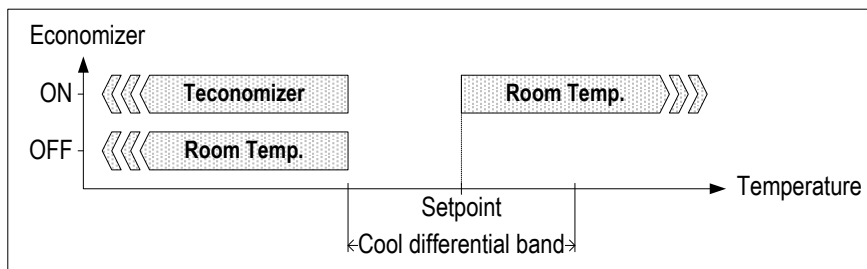
Indication for the Economizer operation:
When Economizer is active, the "Cool" symbol will appear (or flash when active) on display and the "Fan" symbol will flash.
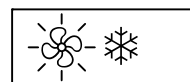
Economizer active

Weekly program

General

Prior to programming, make sure that Technician Settings P107, P108, and P109 are configured correctly.

Program types

The thermostat can be configured to run four different types of weekly programs (set by Technician Setting P107):

- 7-day program with same settings for all days.
- 7- day program with different settings for each day of the week.
- One schedule for the weekdays (Monday to Friday), one for Saturday, and another for Sunday.
- One schedule for the weekdays (Monday to Friday) and another for Saturday and Sunday.

Daily events

Each daily program can use 2 or 4 schedule events per day (set by Technician Setting P108).

There are two options for settings the schedule events (set by Technician Setting P109):

- **"EU Type"** - Start time and Stop time
- **"US Type"** - Start time, setpoint temperatures, system mode, and fan speed

Enabling/Disabling/Overriding the program

Select "00" in Technician Setting P107 to disable programming capabilities.

The occupant can temporarily change the setpoint temperature to be different than the setpoint temperature specified by the program.

Changes will be effective until the next program event begins.

Weekly program (cont.)

Programming procedure

- The detailed programming procedure is described in the next sections. Make sure to follow the right programming procedure, suitable for the program type and features selected by Technician Settings.
- Press the [C/F - Prog] button to enter and proceed through the steps of the real time clock and programming procedure.
- Use the [+] and [-] buttons to select or change value of a flashing icon.
- We recommend that you select programming values prior to the actual programming.

Exit the programming procedure

At anytime during the programming procedure, press the [On/Off] button to exit and return to normal display - any changed values will be saved.

Adjusting the time and day of the week

The BACnet Thermostat will respond to a BACnet time sync, but you can manually set it using the following instructions.

1. Press and hold the [C/F - Prog] button. The word "Clock" will appear on display, and the HOURS will flash.

Hours

2. Use the [+] and [-] buttons to adjust the hours.

Minutes

3. Press the [C/F - Prog] button again. The MINUTES will flash.

4. Use the [+] and [-] buttons to adjust the hours.

Days

5. Press the [C/F - Prog] button again. The DAYS will flash.

6. Use the [+] and [-] buttons to select the day.

7. If Technician Setting P107 is not set to "00" (program is enabled), press the [C/F – Prog] button to enter programming procedure. Make sure to follow the right programming procedure, suitable for the program type and features selected by Technician Settings.

    Section C – "EU Type"

    Section D – "US Type"

Otherwise, press the [C/F - Prog] button to return to normal display.
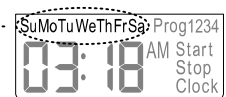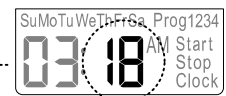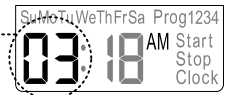
Adjusting "EU type" daily programs – Start time / Stop time

Start time

1. Press the [C/F – Prog] button. The programmed weekday(s), "Prog 1" indicating the

   first program event of the day and the word **"Start"** will appear on display.

   The **HOURS** will flash.
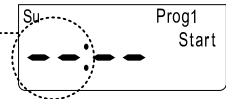
   Note: If this is the first time a program is being set, the symbols "--" will flash.

2. Use the [+] and [-] buttons to adjust the start time hours of the first event.

3. Press the [C/F – Prog] button again. The **MINUTES** will flash.

4. Use the [+] and [-] buttons to adjust the start time minutes of the first event.

Stop time

5. Press the [C/F – Prog] button again. T the word **"Stop"** will appear on display,

   and the **HOURS** will flash.

6. Use the [+] and [-] buttons to adjust the stop time hours of the first event
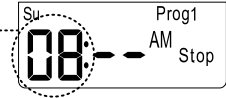
7. Press the [C/F – Prog] button again. The **MINUTES** will flash
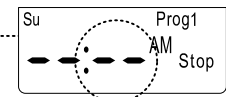
8. Use the [+] and [-] buttons to adjust the stop time minutes of the first event

- **Follow the steps above for the other schedule events of the same day**

  (Prog 2 for two events per day, or Prog 2, 3, and 4 for four events per day).

- **Follow the steps above for all the other days.**

Adjusting "US type" daily programs – Start time / Stop time / Mode / Fan speed / Setpoints
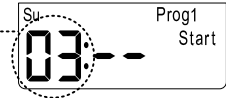
Start time

1. Press the [C/F – Prog] button. The programmed weekday(s), "Prog 1" indicating the

   first program event of the day and the word **"Start"** will appear on display.

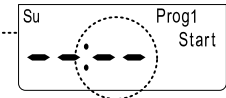   The **HOURS** will flash. ⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺
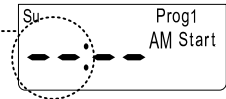
   Note: If this is the first time a program is being set, the symbols "--" will flash.

2. Use the [+] and [-] buttons to adjust the start time hours of the first event.⸺⸺⸺⸺⸺⸺
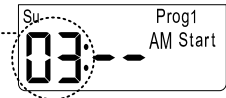
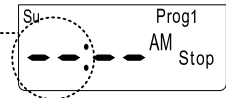3. Press the [C/F – Prog] button again. The **MINUTES** will flash. ⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺
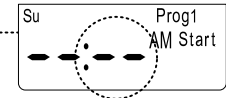
4. Use the [+] and [-] buttons to adjust the start time minutes of the first event. ⸺⸺⸺⸺⸺⸺

System mode

5. Press the [C/F – Prog] button again. The system **MODES** will flash. ⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺

6. Use the [+] and [-] buttons to select the system mode of the first event ⸺⸺⸺⸺⸺⸺⸺⸺⸺

7. Press the [C/F – Prog] button again. The **FAN SPEEDS** will flash. ⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺
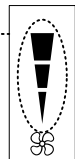
8. Use the [+] and [-] buttons to select the fan speed of the first event.⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺⸺
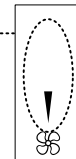
- **Follow the steps above for setpoint temperatures.**
- **Follow the steps above for the other schedule events of the same daily events**

   (Prog 2 for two events per day, or Prog 2, 3 and 4 for four events per day).
- **Follow the steps above for all daily periods.**

Weekly program (cont.)

Setpoint

1. Press the [C/F – Prog] button again. The setpoint will flash.

   Note: If the thermostat is configured to have two setpoints, first adjusts

   the setpoint for cooling and then the setpoint for heating.

2. Use the [+] and [-] buttons to select the system mode of the first event.

- **Follow the steps above for the other schedule events of the same day**

  (Prog 2 for two events per day, or Prog 2, 3 and 4 for four events per day).

- **Follow the steps above for all the other days.**
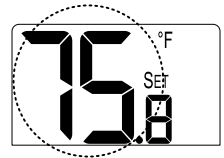
MAC Address and BACnet Device Instance Number

MAC Address

To set the communication MAC Address:

1. Adjust the setpoint temperature to 11ºC or 52ºF.
2. Press and hold the [C/F] button for 10 seconds to enter MAC Address configuration mode.
3. Use the [+] or [-] buttons to define the MAC Address (range 1...127).
4. When finished, press the [On/Off] button and readjust the setpoint.
5. Switch power supply off and on again for the MAC address changes to take effect.
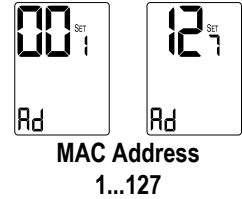
Caution: Do not use the same MAC address for two devices on the same communication line!

**MAC Address
1...127**

BACnet Device Instance Number

By default, the BACnet Device Instance Number is generated automatically by the thermostat (Vendor ID + MAC address).
For example, Carrier's vendor ID is 16, and if the MAC address is 075, the BACnet Device Instance Number is 16075.
Note: If you change the MAC address, you must cycle the thermostat's power to reset the BACnet Device Instance Number.

You can override the automatically-generated BACnet Device Instance Number using the i-Vu application, an Analog Network Output microblock in a control program, or some other BACnet utility. Write the new BACnet Device Instance Number to the present_value property of Analog Value 42 (BACnetDeviceInstanceNumber).

Examples:

<u>In the i-Vu application</u>
1. Use the BACnet Discovery feature to discover the BACnet Thermostat and its BACnet objects.
2. In the navigation tree, select the Analog Value called BacnetDeviceInstanceNumber.
3. Change the Present Value field (shown below) to the desired BACnet Device Instance Number.
4. Click Accept.

Display Name:	BacnetDeviceInstanceNumber
Description:	?
Profile Name:	?
Present Value =	160102 ? ▼ Command priority for writing: ? ▼

<u>In an Analog Network Output microblock</u>
To change the BACnet Device Instance Number to 24113, the microblock's address would be:
bacnet://16075/AV:42/present_value, or
bacnet://16075/BACnetDeviceInstanceNumber

Installation

Mount the BACnet Thermostat on an interior wall in the room to be controlled approximately 1.5 meters (5 feet) from the floor. Locate it where the occupant can easily read the LCD display and use the controls. If the built-in temperature sensor is being used to measure room temperature, place the thermostat where the temperature is representative of the general room conditions. Avoid cold or warm air drafts, radiant heat, and direct sunlight.

Installation procedure

Prerequisite: Disconnect power to the main board before installing the unit.

1. Separate the front panel from the back panel by pressing the tab located in the top of the unit and pulling the back panel off of the two bottom tabs.
2. Connect the wires as shown in the picture below and the wiring diagram on page 20. All terminals accept 1x0.5mm²/24 AWG. Set DIP switch positions as explained in this manual.
3. Place the thermostat in an electrical box and tighten up the two screws.
   Europe – Gewiss Box – GW 24 203 or similar / US – Carlon – B114R or similar
4. Reattach the cover by placing it on the back panel's two bottom tabs and then pushing the cover until the top tab clicks into its slot on the cover.

Wiring terminals

11	T1
12	0
13	IN1
14	0
15	AO1
16	AO2
L	B
N	A

Terminals

For outputs 11-16, see **Wiring and DIP switch/jumper settings** (pages 25 through 31)

Power supply:
110-230 Vac line voltage
CAUTION Do not connect line voltage to a thermostat that does not show the following symbol:

⚠
DANGER
110-230V

For T1,0 inputs:
Dry contact, 10 Vdc input, or 50 kOhm thermistor
See **Technician Setting P8** (page 33).

For IN1,0 inputs:
Dry contact, 10 Vdc input, or 50 kOhm thermistor
See **Technician Setting P9** (page 34).

See options on pages 25 through 31

MS/TP Communication (RS485)
BACnet

DIP switch and jumper configurations
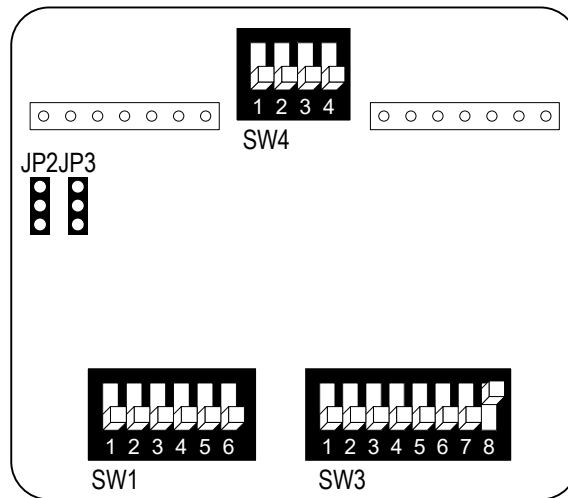
SW4.1 – Without valves control in FC config.

Enable = OFF (Open)

Disable = ON (Closed)

SW4.2 – Not used

Always ON (Closed)

SW4.3 – Not used

Always OFF

SW4.4 - End of line resistor (120Ω)

OFF = Not end of line

ON = End of line
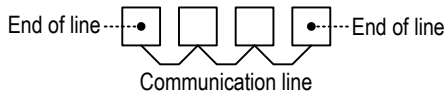
SW1.1 through SW1.6, and SW3.1 through SW3.8
See **Wiring and DIP switch/jumper settings** (pages 25 through 31).

JP2, JP3

Not used

AC configurations

Find the configuration you want in the tables below, then find that configuration number (1 through 9) on the **Wiring and DIP switch/ jumper settings** pages starting on page 25.

AC Configurations

Outputs Configuration:	1	2	3		4		5		6	7	8	9
Heat elements	3	2			1		2			1	2	1
Compressors	2	2	2		1		1		1	1	2	2
Heat pump		●	●		●				●			●
Fan VFS									●	●		
Fan speeds	1	1	2	3	2	3	2	3			1	1
Economizer			○		○		○		○	○	○	○

● **Yes**   ○ **Option**

FC configurations for 2-pipe systems

Find the configuration you want in the tables below, then find that configuration number (10 through 13) on **Wiring and DIP switch/ jumper settings** pages starting on page 28.

FC Configurations for 2-Pipe systems

Outputs Configuration:	10	11	12	13
Cl/Ht valve / Cl/Ht valve PID	●	PID	●	PID
Heat element (2nd stage)	●	●	●	●
Fan VFS			●	●
Fan speeds	1 2 3	1 2 3		
Economizer	○ ○	○ ○	○	○

● **Yes**   ○ **Option**

FC configurations for 4-pipe systems / Floor heating

Find the configuration you want in the tables below, then find that configuration number (14 through 22) on the **Wiring and DIP switch/jumper settings** pages starting on page 29.

FC Configurations for 4-Pipe systems

Outputs \ Configuration:	14	15	16	17	18	19	20	21	22
Cool valve / Cool valve PID	●	●	PID	PID	●	●	●	PID	PID
Heat valve / Heat valve PID	●	●	●	●	●	PID	PID	●	PID
Heat element (2nd stage)	●		●			●			●
Fan VFS					●		●	●	
Fan speeds	1 2 3	1 2 3	1 2 3	1 2 3					1 2 3
Economizer	○ ○	○ ○	○ ○	○ ○	○		○	○	○ ○
Floor heating		●		●					

● **Yes** ○ **Option**

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Wiring and DIP switch/jumper configurations – AC systems

Outputs	Config. 1: HC32 1 Speed fan	Config. 2: HP42 1 Speed fan	Config. 3: HP22 2/3 Speeds fan	Config. 4: HP21 2/3 Speeds fan
11	Heat element 3 (3rd stage heat)	Heat element 2 (4th stage heat)	Fan high	Fan high
12	Heat element 2 (2nd stage heat)	Heat element 1 (3rd stage heat)	Fan medium (or Economizer[5])	Fan medium (or Economizer[5])
13	Fan (1 speed)	Fan (1 speed)	Fan low	Fan low
14	Compressor 2	Compressor 2	Compressor 2	Heat element[2]
15	Compressor 1[3]	Compressor 1[3]	Compressor 1[3]	Compressor[3]
16	Heat element 1[2] (1st stage heat)	Heat pump[2]	Heat pump[2]	Heat pump[2]
AO1	X	X	X	X
AO2	X	X	X	X

SW3	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
SW1	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

[1] SW3.1, SW3.2 – Fan speeds: 　2 speeds (Low and High): 　SW3.1 = OFF, SW3.2 = ON
　　　　　　　　　　　　　　　　3 speeds (Low, Med., and High): 　SW3.1 = OFF, SW3.2 = OFF

[2] SW3.4 – HP (Heat pump): 　ON = Heat pump active in cool, OFF = Heat pump active in heat
　　　　　　HC (not heat pump): 　ON = Electrical heater, OFF = Oil/Gas heater (no fan)

[3] SW3.5 – Compressor delay: 　ON = Disable, OFF = Enable

[5] SW1.6 – Terminal 12 operation: 　ON = Economizer
　　　　　　　　　　　　　　　　OFF = Fan Medium (3 speeds) / Terminal not in use (2 speeds)
　　　　　　　　　　　　　　　　Important: Economizer will not work in 3 fan speeds configuration.
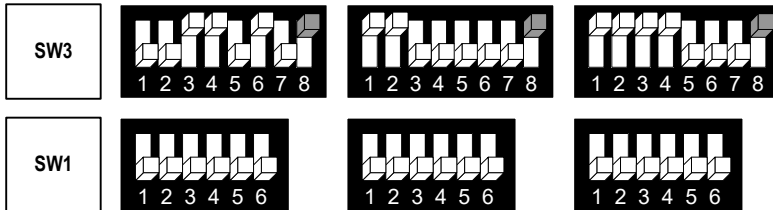
See drawing on page 21 for DIP switch and jumper locations.

Fan on/off: 110-230 Vac, 2.5A max.
Control – Heat elements, Heat pump, Compressors, Economizer: 110-230 Vac, 0.3A max

Wiring and DIP switch/jumper configurations – AC systems

Outputs	Config. 5: HC21 2/3 Speeds fan	Config. 6: HP11 Fan VFS	Config. 7: HC11 Fan VFS
11	Fan high	X	X
12	Fan medium (or Economizer[5])	Economizer[5] (option – SW1.6 ON)	Economizer[5] (option – SW1.6 ON)
13	Fan low	X	X
14	Heat element 2 (2nd stage heat)	Heat pump[2]	Heat element[2]
15	Compressor[3]	Compressor[3]	Compressor[3]
16	Heat element 1[2] (1st stage heat)	X	X
AO1	X	X	X
AO2	X	Fan VFS	Fan VFS

SW3			
	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8

SW1			
	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

[1] SW3.1, SW3.2 – Fan speeds: 2 speeds (Low and High): SW3.1 = OFF, SW3.2 = ON

3 speeds (Low, Med., and High): SW3.1 = OFF, SW3.2 = OFF

[2] SW3.4 – HP (Heat pump): ON = Heat pump active in cool, OFF = Heat pump active in heat

HC (not heat pump): ON = Electrical heater, OFF = Oil/Gas heater (no fan)

[3] SW3.5 – Compressor delay: ON = Disable, OFF = Enable

[5] SW1.6 – Terminal 12 operation: ON = Economizer

OFF = Fan Medium (3 speeds) / Terminal not in use (2 speeds)

Important: Economizer will not work in 3 fan speeds configuration.

See drawing on page 21 for DIP switch and jumper locations.
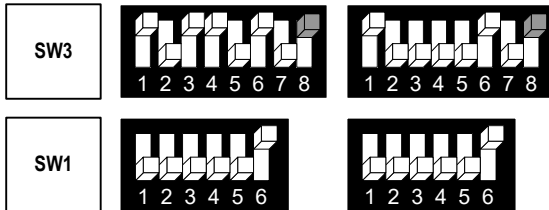
Fan on/off: 110-230 Vac, 2.5A max.

Fan VFS: 0-10 Vdc, 0.5 mA Not isolated

Control – Heat elements, Heat pump, Compressors, Economizer: 110-230 Vac, 0.3A max

Wiring and DIP switch/jumper configurations – AC systems

Outputs	Config. 8: HC22 1 Speed fan, Economizer	Config. 9: HP32 1 Speed fan, Economizer
11	Heat element 2 (2nd stage heat)	Heat element (3rd stage heat)
12	Economizer [5] (option – SW1.6 ON)	Economizer [5] (option – SW1.6 ON)
13	Fan (1 speed)	Fan (1 speed)
14	Compressor 2	Compressor 2
15	Compressor 1 [3]	Compressor 1 [3]
16	Heat element 1 [2] (1st stage heat)	Heat pump [2]
AO1	X	X
AO2	X	X
SW3	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
SW1	1 2 3 4 5 6	1 2 3 4 5 6

[2] SW3.4 – HP (Heat pump):   ON = Heat pump active in cool, OFF = Heat pump active in heat

        HC (not heat pump):   ON = Electrical heater, OFF = Oil/Gas heater (no fan)

[3] SW3.5 – Compressor delay: ON = Disable, OFF = Enable

[5] SW1.6 – Terminal 12 operation: ON = Economizer, OFF = Terminal not in use

Fan on/off: 110-230 Vac, 2.5A max.

Control – Heat elements, Heat pump, Compressors, Economizer: 110-230 Vac, 0.3A max

Wiring and DIP switch/jumper configurations – FC systems – 2-pipe

Outputs	Config. 10: 2-Pipe, 1/2/3 Speeds fan[1]	Config. 11: 2-Pipe, 1/2/3 Speeds fan[1] Cool/Heat PID	Config. 12: 2-Pipe, Fan VFS	Config. 13: 2-Pipe, Fan VFS, Cool/Heat PID
11	Fan high	Fan high	X	X
12	Fan medium (or Economizer[5])	Fan medium (or Economizer[5])	Economizer[5] (option – SW1.6 ON)	Economizer[5] (option – SW1.6 ON)
13	Fan low	Fan low	X	X
14	Heat element[2] (2nd stage heat)	Heat element[2] (2nd stage heat)	Heat element[2] (2nd stage heat)	Heat element[2] (2nd stage heat)
15	Cool/Heat valve[3]	X	Cool/Heat valve[3]	X
16	X	X	X	X
AO1	X	Cooll/Heat valve PID[3]	X	Cooll/Heat valve PID[3]
AO2	X	X	Fan VFS	Fan VFS
SW3	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
SW1	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

[1] SW3.1, SW3.2 – Fan speeds:

1 speed (Low):	SW3.1 = ON, SW3.2 = OFF
2 speeds(Low and High):	SW3.1 = OFF, SW3.2 = ON
3 speeds(Low, Medium, and High):	SW3.1 = OFF, SW3.2 = OFF

[2] SW3.4 – 2nd heating stage: ON = Enable, OFF = Disable

[3] SW3.5 – Chilled beam option: ON = Enable chilled beam (fan will not run with cooling)

[5] SW1.6 – Terminal 12 operation: ON = Economizer

OFF = Fan Medium (3 speeds) / Terminal not in use (1/2 speeds/VFS)

Important: Economizer will not work in 3 fan speeds configuration.

See drawing on page 21 for DIP switch and jumper locations.

Fan on/off: 110-230 Vac, 2.5A max.

Fan VFS, PID valves: 0-10 Vdc, 0.5 mA Not isolated

Control – Heat elements, Cool/Heat valves, Economizer: 110-230 Vac, 0.3A max

Wiring and DIP switch/jumper configurations – FC systems – 4-pipe
w/wo Floor heating

Outputs	Config. 14: 4-Pipe, 1/2/3 Speeds fan[1]	Config. 15: 4-Pipe, 1/2/3 Speeds fan[1], Floor heating	Config. 16: 4-Pipe, 1/2/3 Speeds fan[1], Cool valve PID	Config. 17: 4-Pipe,1/2/3 Speeds fan[1], Cool valve PID, Floor heating
11	Fan high	Fan high	Fan high	Fan high
12	Fan medium (or Economizer[5])	Fan medium (or Economizer[5])	Fan medium (or Economizer[5])	Fan medium (or Economizer[5])
13	Fan low	Fan low	Fan low	Fan low
14	Heat element[2] (2nd stage heat)	Floor heating (1st stage heat – no fan)	Heat element[2] (2nd stage heat)	Floor heating (1st stage heat – no fan)
15	Cool valve[3]	Cool valve[3]	X	X
16	Heat valve (1st stage heat)	Heat valve (2nd stage heat)	Heat valve (1st stage heat)	Heat valve (2nd stage heat)
AO1	X	X	Cool valve PID[3]	Cool valve PID[3]
AO2	X	X	X	X

SW3				
	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8	1 2 3 4 5 6 7 8
SW1				
	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

[1] SW3.1, SW3.2 – Fan speeds:
   1 speed (Low):   SW3.1 = ON, SW3.2 = OFF
   2 speeds(Low and High):   SW3.1 = OFF, SW3.2 = ON
   3 speeds(Low, Medium, and High):   SW3.1 = OFF, SW3.2 = OFF

[2] SW3.4 – 2nd heating stage: ON = Enable, OFF = Disable

[3] SW3.5 – Chilled beam option: ON = Enable chilled beam (fan will not run with cooling)

[5] SW1.6 – Terminal 12 operation: ON = Economizer
   OFF = Fan Medium (3 speeds) / Terminal not in use (1/2 speeds)
   Important: Economizer will not work in 3 fan speeds configuration.

See drawing on page 21 for DIP switch and jumper locations.

Fan on/off: 110-230 Vac, 2.5A max.
Fan VFS, PID valves: 0-10 Vdc, 0.5 mA Not isolated
Control – Heat elements, Cool/Heat valves, Economizer: 110-230 Vac, 0.3A max

Wiring and DIP switch/jumper configurations – FC systems – 4-pipe

Outputs	Config. 18: 4-Pipe, Fan VFS	Config. 19: 4-Pipe, 1/2/3 Speeds fan [1], Heat valve PID	Config. 20: 4-Pipe, Fan VFS, Heat valve PID	Config. 21: 4-Pipe, Fan VFS, Cool valve PID
11	X	Fan high	X	X
12	Economizer [5] (option – SW1.6 ON)	Fan medium (or Economizer [5])	Economizer [5] (option – SW1.6 ON)	Economizer [5] (option – SW1.6 ON)
13	X	Fan low	X	X
14	Heat valve	Heat element [2] (2nd stage heat)	Cool valve [3]	Heat valve
15	Cool valve [3]	Cool valve [3]	X	X
16	X	X	X	X
AO1	X	X	Heat valve PID	Cool valve PID [3]
AO2	Fan VFS	Heat valve PID (1st stage heat)	Fan VFS	Fan VFS

SW3	 1 2 3 4 5 6 7 8	 1 2 3 4 5 6 7 8	 1 2 3 4 5 6 7 8	 1 2 3 4 5 6 7 8
SW1	 1 2 3 4 5 6	 1 2 3 4 5 6	 1 2 3 4 5 6	 1 2 3 4 5 6

[1] SW3.1, SW3.2 – Fan speeds: 1 speed (Low):   SW3.1 = ON, SW3.2 = OFF
                                 2 speeds(Low and High):   SW3.1 = OFF, SW3.2 = ON
                                 3 speeds(Low, Medium, and High):   SW3.1 = OFF, SW3.2 = OFF

[2] SW3.4 – 2nd heating stage: ON = Enable, OFF = Disable

[3] SW3.5 – Chilled beam option: ON = Enable chilled beam (fan will not run with cooling)

[5] SW1.6 – Terminal 12 operation: ON = Economizer
                                      OFF = Fan Medium (3 speeds) / Terminal not in use (1/2 speeds/VFS)
                                      Important: Economizer will not work in 3 fan speeds configuration.

See drawing on page 21 for DIP switch and jumper locations.

Fan on/off: 110-230 Vac, 2.5A max.

Fan VFS, PID valves: 0-10 Vdc, 0.5 mA Not isolated

Control – Heat elements, Cool/Heat valves, Economizer: 110-230 Vac, 0.3A max

Wiring and DIP switch/jumper configurations – FC systems – 4-pipe

Outputs	Config. 22: 4-Pipe, 1/2/3 Speeds fan[1], Heat valve PID, Cool valve PID
11	Fan high
12	Fan medium (or Economizer[5])
13	Fan low
14	Heat element [2] (2nd stage heat)
15	X
16	X
AO1	Cool valve PID[3]
AO2	Heat valve PID (1st stage heat)

SW3	1 2 3 4 5 6 7 8

SW1	1 2 3 4 5 6

[1] SW3.1, SW3.2 – Fan speeds:

1 speed (Low):	SW3.1 = ON, SW3.2 = OFF
2 speeds(Low and High):	SW3.1 = OFF, SW3.2 = ON
3 speeds(Low, Medium, and High):	SW3.1 = OFF, SW3.2 = OFF

[2] SW3.4 – 2nd heating stage: ON = Enable, OFF = Disable

[3] SW3.5 – Chilled beam option: ON = Enable chilled beam (fan will not run with cooling)

[5] SW1.6 – Terminal 12 operation: ON = Economizer

OFF = Fan Medium (3 speeds) / Terminal not in use (1/2 speeds)

Important: Economizer will not work in 3 fan speeds configuration.

See drawing on page 21 for DIP switch and jumper locations.

Fan on/off: 110-230 Vac, 2.5A max.

PID valves: 0-10 Vdc, 0.5 mA Not isolated

Control – Heat elements, Cool/Heat valves, Economizer: 110-230 Vac, 0.3A max

Technician Settings

Enter Technician Settings mode:

1. Adjust the setpoint temperature to 10ºC or 50ºF.
2. Press and hold the [C/F] button for 10 seconds to enter Technician Settings mode. "P01" will appear on display.

View objects and make adjustments:

- Use the [Mode] button to step forward between different settings.
- Use the [Fan] button to step backward between different settings.
- Press the [On/Off] button to exit Technician Settings and return to normal display.
- If no button is pressed for 60 seconds, the thermostat will automatically exit Technician Settings and return to normal display.
- Use the [+] and [-] buttons to make adjustments when required.

P01 – Offset for temperature readings calibration

      Range: -6…+6°C / -9…+9°F.

      Default: 0°C / 0°F.

      Note: The offset will influence both internal
             or external sensors.
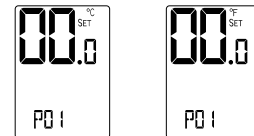
Offset for temperature calibration
     (°C)   **(°F)**

P02 – Setpoint limit for cooling

      Range: 5…35°C / 41…95°F.

      Default: 10°C / 50°F.

      Note: The thermostat will stop cooling regardless of
             the user's setpoint
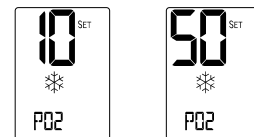
Setpoint limit for cooling
     (°C)   **(°F)**

P03 – Setpoint limit for heating

      Range: 5…35°C / 41…95°F.

      Default: 30°C / 86°F.

      Note: The thermostat will stop heating regardless of
             the user's setpoint
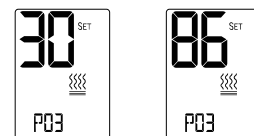
Setpoint limit for heating
     (°C)   **(°F)**

P04 – Enable/Disable the option to lock the [Fan] button

      "LF" + "🔒"   [Fan] button can be locked
      "LF" only   [Fan] button cannot be locked

      Note: When enabled, press and hold both [-] and [Fan] buttons
             for 7 seconds to actually lock the buttons.
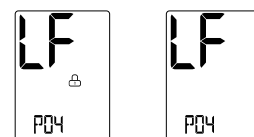
   [Fan]   **[Fan]**
   Can   **Cannot**
 be locked   **be locked**

P05 – Enable/Disable the option to lock the [Mode] button

"L1" + "🔒"   [Mode] button can be locked
"L1" only   [Mode] button cannot be locked

Note: When enabled, press and hold both [-] and [Fan] buttons
for 7 seconds to actually lock the buttons.
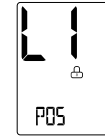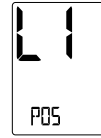
L1 🔒 P05	L1 P05
[Mode] Can be locked	**[Mode] Cannot be locked**

P06 – Enable/Disable the option to lock the [On/Off] button

"L0" + "🔒"   [On/Off] button can be locked
"L0" only   [On/Off] button cannot be locked

Note: When enabled, press and hold both [-] and [Fan] buttons
for 7 seconds to actually lock the buttons.
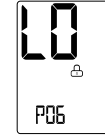
L0 🔒 P06	L0 P06
[On/Off] Can be locked	**[On/Off] Cannot be locked**

P07 – Enable/Disable the option to lock the [+] and [-] buttons (SET)

"LS" + "🔒"   [+] and [-] buttons can be locked
"LS" only   [+] and [-] buttons cannot be locked
Note: When enabled, press and hold both [-] and [Fan] buttons
for 7 seconds to actually lock the buttons.
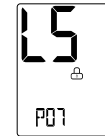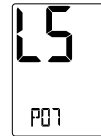
LS 🔒 P07	LS P07
[+] and [-] Can be locked	**[+] and [-] Cannot be locked**

P08 – Functionality of T1 terminals

"00" - T1 terminals are not in use
"01" - External sensor
"02" - T3 Soft start in heat sensor (FC) *
        or De-icing in cool (AC)**
"03" - Door switch
"04" - Key tag
"05" - T Economizer
        (DIP switch SW1.6 must be ON)

*   In heating mode, the fan will not start before there
     is hot water in the coil.
     Note: To view T3 on the BACnet Thermostat,
     see Technician Settings P84.
**   Allow de-icing operation of indoor coil in cooling.
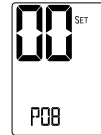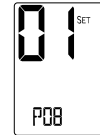
00 SET P08	01 SET P08	02 SET P08
T1 terminals Not in use	**T1 sensor (External sensor)**	**T3 Soft start in heat sensor (FC) or De-icing in cool sensor (AC)**
03 SET P08	04 SET P08	05 SET P08
Door switch	**Key tag**	**T Economizer**
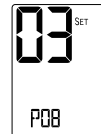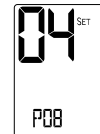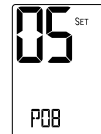
P09 – Functionality of IN1,0 terminals

    "00" -   IN1,0 terminals are not in use

    "01" -   T2 (Change over sensor) *

    "02" -   T3 (Soft start in heat sensor) **

    "03" -   Remote On/Off switch

    "04" -   Remote Economy switch

    "05" -   External Passive Infrared detector ***

    *   In 2-Pipe system, T2 will sense the water temperature in the pipe in order to select/allow effective system mode.
    Note: To view T2 on the BACnet Thermostat, see Technician Settings P83.

    **   Where T1 terminals are used for external sensor, the IN1,0 terminals can be used for T3 sensor.
    Note: To view T3 on the BACnet Thermostat, see Technician Settings P84.
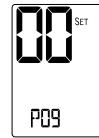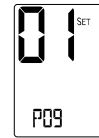
00 SET P09	01 SET P09	02 SET P09
"IN1,0" terminals Not in use	***T2 change over sensor (FC) / De-icing in cool (AC)**	****T3 Soft start in heat sensor (FC) or De-icing in cool sensor (AC)**
03 SET P09	04 SET P09	05 SET P09
Window contact Remote On/Off	**Window contact Remote Economy**	**External PIR sensor**
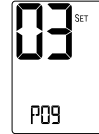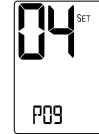
P10 – Window contact (terminals IN1,0) polarity

    "01" -   Normally open

    "00" -   Normally close

00 SET P10	01 SET P10
Win. contact Normally close	**Win. contact Normally open**
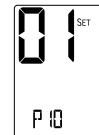
P11 – Window contact delay time

    Range: 0…999 seconds.

    Default: 60 seconds.

60 SET P11
Window contact delay time (sec.)

P12 – Door switch (terminals T1,0) polarity

    "01" -   Normally open

    "00" -   Normally closed
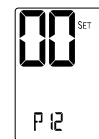
00 SET P12	01 SET P12
Door switch Normally closed	**Door switch Normally open**
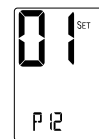
P13 – Door switch delay time

    Range: 0…999 seconds.

    Default: 180 seconds.
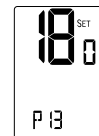
18 SET P13
Door switch delay time (sec.)

P14 – **Enable/Disable Auto change over mode**
    "00" - Disable Auto change over mode
    "01" - Enable Auto change over mode
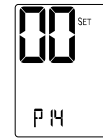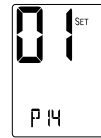
00 SET	01 SET
P 14	P 14
Disable Auto mode	**Enable Auto mode**

P15 – **Motion sensor logic (PIR)**
    "00" - Thermostat turns off when unoccupied and back on when re-occupied.
    "01" - Thermostat turns off when unoccupied and remains off when re-occupied.
    "02" - Thermostat uses economy setpoints.
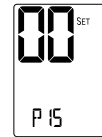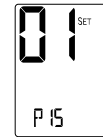
00 SET	01 SET	02 SET
P 15	P 15	P 15
Unocc. – Off Re-occ. - On	**Unocc. – Off Re-occ. - Off**	**Economy setpoints**

P16 – **Enable/Disable Motion sensor**
    "00" - Disable
    "01" - Enable
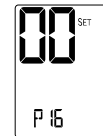
00 SET	01 SET
P 16	P 16
Disable occ. sensor	**Enable occ. sensor**
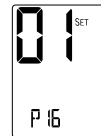
P17 – **PIR (Motion sensor) delay time**
before switching to unoccupied mode (ON delay)
    Range: 0…250 minutes.
    Default: 20 minutes.
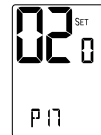
02 SET 0
P 17
PIR ON delay (sec.)

P18 – **Door switch or key tag configuration**
    "00" - Switch On or Off by door switch or key tag
    "01" - Changing the setpoint temperature
    "02" - Switching fan speed to Low
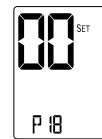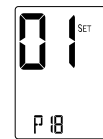
00 SET	01 SET	02 SET
P 18	P 18	P 18
Switch On or Off	**Change setpoints**	**Switch to fan low**

P19 – PIR (Motion sensor) polarity
   "00" -   Normally open
   "01" -   Normally closed

<div align="right">
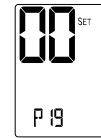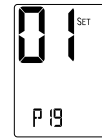
00 SET	01 SET
P 19	P 19
PIR	**PIR**
Normally open	**Normally closed**

</div>

P25 – Economy setpoint for cooling
   Range: 5...35°C / 41...95°F.
   Default: 30°C / 86°F.

<div align="right">

30 °C SET ❄	86 °F SET ❄
P25	P25
EC setpoint in cooling	
(°C)	**(°F)**

</div>

P26 – Economy setpoint for heating
   Range: 5...35°C / 41...95°F.
   Default: 10°C / 50°F.

<div align="right">
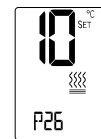
10 °C SET	50 °F SET
P26	P26
EC setpoint in heating	
(°C)	**(°F)**

</div>

P27 – On-delay time between heating stages
   Range: 0....600 seconds
   Default: 5 seconds

<div align="right">

00 5 SET
P27
On delay
heating stages

</div>

P28 – Off-delay time between heating stages
   Range: 0....600 seconds
   Default: 1 second

<div align="right">
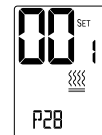
00 1 SET
P28
Off delay
heating stages

</div>

P29 – LCD Backlight ON or OFF
   "00" - LCD Backlight ON
   "01" - LCD Backlight OFF

<div align="right">
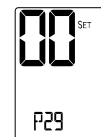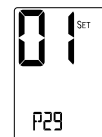
00 SET	01 SET
P29	P29
Backlight	**Backlight**
ON	**OFF**

</div>

Technician Settings (cont.)

P30 – Beeper ON or OFF
"01" - Beeper ON
"00" - Beeper OFF
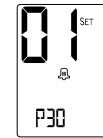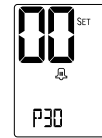
Beeper ON	**Beeper OFF**

P31 – P34
Fan on/off delay
**with fan on demand
(auto fan) active.**

——— Valve
– – Fan

ON

OFF

Time (sec.)

Fan ON delay   Fan OFF delay
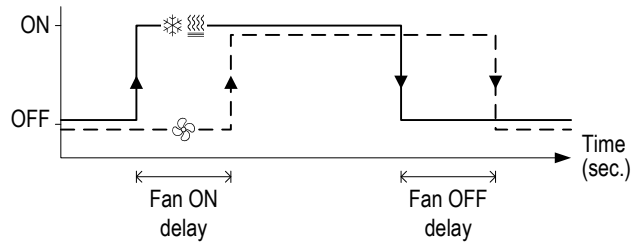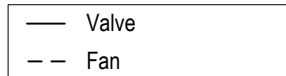
P31 – Fan ON delay in cooling (FC Only!)
Range: 0…120 seconds
Default: 0 seconds (no delay)

**Fan ON delay
in cooling
(seconds)**

P32 – Fan OFF delay in cooling
Range: 0…120 seconds
Default: 0 seconds (no delay)

**Fan OFF delay
in cooling
(seconds)**

P33 – Fan ON delay in heating (FC Only!)
Range: 0…120 seconds
Default: 0 seconds (no delay)
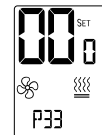
**Fan ON delay
in heating
(seconds)**

P34 – Fan OFF delay in heating
Range: 0…120 seconds
Default: 30 seconds
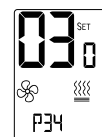
**Fan OFF delay
in heating
(seconds)**

P35 – Enable/Disable Freeze protection
   "00" - Disable Freeze protection
   "01" - Enable Freeze protection

   Note: If enabled, freeze protection will start when the thermostat
       is either ON or OFF and regardless of the current system
       mode.
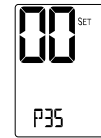
Disable freeze
protection
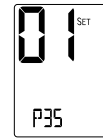
Enable freeze
protection

P36 – Freeze protection cut-in setpoint
   Range: 8...15°C / 46…59°F
   Default: 8°C / 46°F

   The room ambient temperature which will trigger Heating ON.

Freeze protection cut-in setpoint
(°C)   (°F)

P37 – Freeze protection cut-out setpoint
   Range: 10...17°C / 50…63°F
   Default: 10°C / 50°F

   The room ambient temperature which will switch the Heating back OFF.
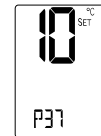
Freeze protection cut-out setpoint
(°C)   (°F)

P40 – View filter counter (hours) – Read only
   Range: 0…999 hours

   The filter counter is related to Fan running time.
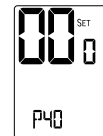
View filter
Counter (hours)

P41 – Reset filter time
   Press the [+] button to reset the filter counter.
   The display will change from "00" to "01" and back to "00".

→
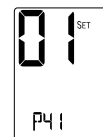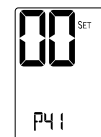
Reset filter
counter

P42 – Adjust filter alarm delay time counter (hours)
   Range: 0…999 hours
   Default: 0 hours (0 = Disable)
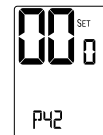
Adjust filter alarm
delay time (hours)

P43 – P44

Soft start in heat
**with fan on demand
(auto fan) active.**

——	Heat valve
– –	Fan
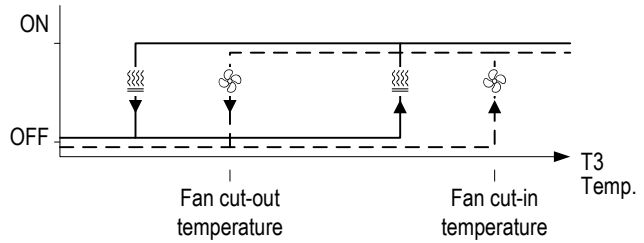
P43 – Soft start in heat – cut-in temperature (FC Only!)
The fan will not start before the temperature
on T3 sensor reaches the cut-in temperature.
See Technician Settings P08/P09.
Range: 14...37°C / 57…99°F
Default: 36°C / 97°F

Soft start heat cut-in temperature
(°C)   (°F)

P44 – Soft start in heat – cut-out temperature (FC Only!)
The fan will stop if the temperature on T3 sensor
drops below the cut-out temperature.
See Technician Settings P08/P09.
Range: 12...35°C / 54…95°F
Default: 32°C / 90°F
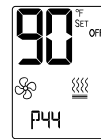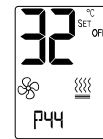
Soft start heat cut-out temperature
(°C)   (°F)

P45 – P46
Cool differential band / offset
(with cool differential band offset = 0)

| —— Compressor / Valve |

ON
OFF ❄
Setpoint
⟵Cool differential band⟶
Room Temp.

P45 – P46
Cool differential band / offset
(with cool differential band offset ≠ 0)

| —— Compressor / Valve |

ON
OFF ❄
Setpoint
⟵Cool differential band⟶
⟵Offset⟶
Room Temp.

P45 – **Cool differential band**
       Range: 0.5...5°C / 1...10°F
       Default: 1°C / 2°F

01.0 ℃ SET ❄ P45   02.0 ℉ SET ❄ P45
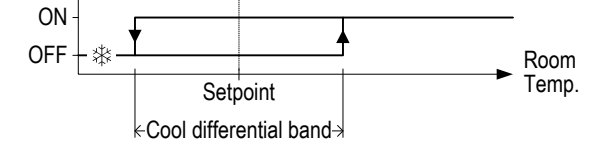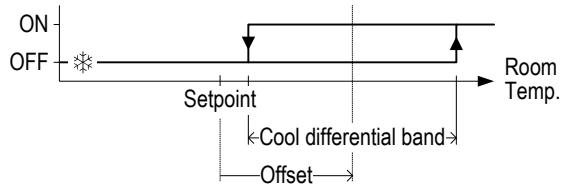
Cool differential band
(°C)   **(°F)**

P46 – **Cool differential band offset**
       Range: -5...+5°C / -9...+9°F
       Default: 0°C / 0°F

00.0 ℃ SET ❄ P46   00.0 ℉ SET ❄ P46

Cool differential band offset
(°C)   **(°F)**

P47-48

Heat differential band / offset
(with heat differential band offset = 0)
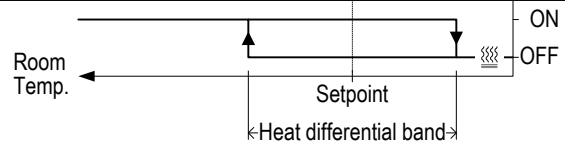
─── Compressor / Valve

P47-48

Heat differential band / offset
(with heat differential band offset ≠ 0)

─── Compressor / Valve
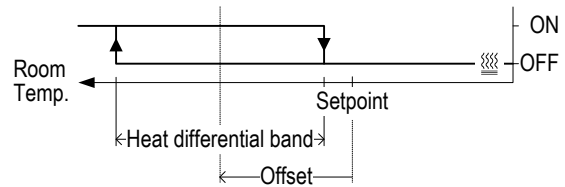
P47 – Heat differential band
      Range: 0.5...5°C / 1…10°F
      Default: 1°C / 2°F
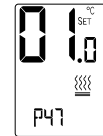
Heat differential band
(°C)   **(°F)**

P48 – Heat differential band offset
      Range: -5…+5°C / -9…+9°F
      Default: 0°C / 0°F

Heat differential band offset
(°C)   **(°F)**

P49
Shift between Cool and Heat
in Auto change over mode
(from cooling to heating)

| —— | Compressor / Valve |
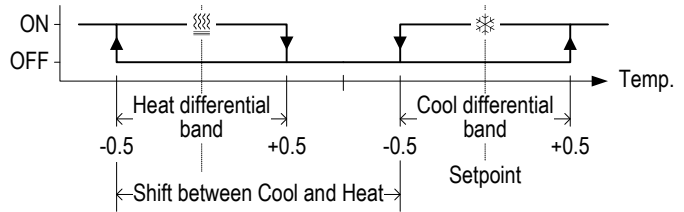
P49
Shift between Cool and Heat
in Auto change over mode
(from heating to cooling)

| —— | Compressor / Valve |
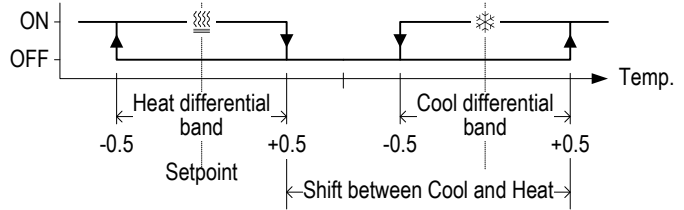
P49 – Shift between Cool and Heat in Auto change over mode
      Range: 0...10°C / 0...20°F
      Default: 2°C / 4°F

Shift between Cool & Heat in Auto mode
      (°C)   **(°F)**

P50 – Shift between Cooling stages (AC only!)
      Range: 0...10°C / 0...20°F
      Default: 2°C / 4°F

Shift between cooling stages
      (°C)   **(°F)**

P51 – Shift between Heating stages
      Range: 0...10°C / 0...20°F
      Default: 2°C / 4°F
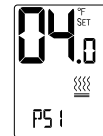
Shift between heating stages
      (°C)   **(°F)**

P52 – **Cool valve proportional band (FC Only!)**
      Range: 2...10°C / 4...20°F
      Default: 2°C / 4°F

      0-10V Valve opening from fully closed to fully open.
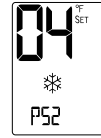
Cool valve proportional band
      (°C)   **(°F)**

P53 – **Cool proportional low limit (FC Only!)**
      Range: 0...100%
      Default: 0%

      Minimum valve opening.

Cool prop.
low limit (%)

P54 – **Cool proportional high limit (FC Only!)**
      Range: 0...100%
      Default: 100%

      Maximum valve opening.

Cool prop.
high limit (%)

P55 – **Heat valve proportional band (FC Only!)**
      Range: 2...10°C / 4...20°F
      Default: 2°C / 4°F

      0-10V Valve opening from fully closed to fully open.
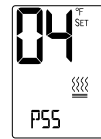
Cool valve proportional band
      (°C)   **(°F)**

P56 – **Heat proportional low limit (FC Only!)**
      Range: 0...100%
      Default: 0%

      Minimum valve opening.
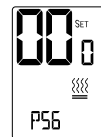
Heat prop.
low limit (%)

P57 – **Heat proportional high limit (FC Only!)**
      Range: 0...100%
      Default: 100%

      Maximum valve opening.
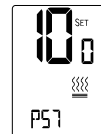
Heat prop.
high limit (%)

P60
Fan turns ON when the Cool
or Heat valve reaches the
"Proportional ON percent"

P61
Fan turns OFF when the Cool
or Heat valve drops below the
"Proportional OFF percent"

Fan

Fan ON

Fan OFF

Cool/Heat
Valve %

10   30

Proportional
OFF percent

Proportional
ON percent
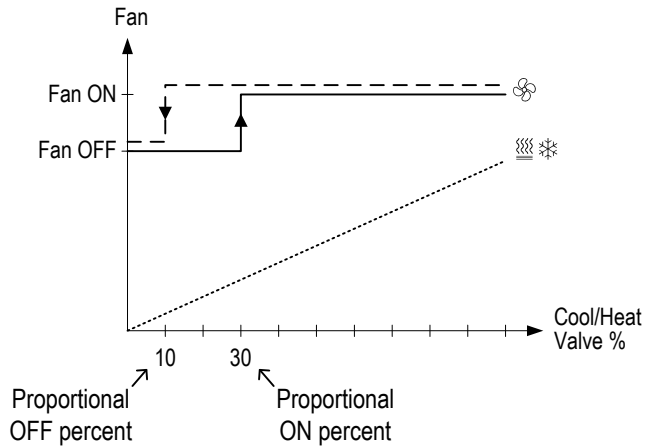
P60 – Proportional ON percent (FC Only!)
      Range: 0...30%
      Default: 30%

**Cool minimum
ON percent (%)**

P61 – Proportional OFF percent (FC Only!)
      Range: 0...100%
      Default: 100%
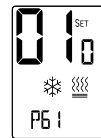
**Heat minimum
ON percent (%)**

P63 – Time on-delay between cooling stages (AC only!)
      Range: 0…600 seconds
      Default: 5 seconds

**On Delay
cooling stages**

P64 – Time off-delay between cooling stages (AC only!)
      Range: 0…600 seconds
      Default: 1 seconds

**Off Delay
cooling stages**

P65 – **Fan VFS proportional band in cooling**
    Range: 2...10°C / 4…20°F
    Default: 2°C / 4°F

    0-10V fan speed from off closed to fully running.

VFS Proportional band in cooling
(°C)   **(°F)**

P66 – **Fan VFS proportional band in heating**
    Range: 2...10°C / 4…20°F
    Default: 2°C / 4°F

    0-10V fan speed from off closed to fully running.

VFS Proportional band in heating
(°C)   **(°F)**

P67 – **Fan VFS Low speed percent in cooling**
    Range: 0...30%
    Default: 20%

VFS Low %
in cooling

P68 – **Fan VFS Medium speed percent in cooling**
    Range: 30...60%
    Default: 50%

VFS Med %
in cooling

P69 – **Fan VFS High speed percent in cooling**
    Range: 60...100%
    Default: 90%

VFS High %
in cooling

P70 – **Fan VFS Low speed percent in heating**
    Range: 0...30%
    Default: 30%
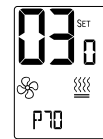
VFS Low %
in heating

P71 – Fan VFS Medium speed percent in heating
      Range: 30...60%
      Default: 50%

VFS Med %
in heating

P72 – Fan VFS High speed percent in heating
      Range: 60...100%
      Default: 80%
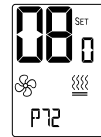
VFS High %
in heating

P74
VFS Medium speed differential
(display from medium to low)

P75
VFS High speed differential
(display from high to medium)
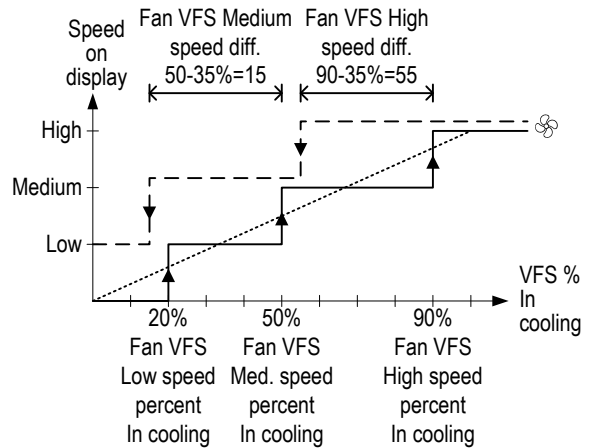
P74 – VFS Medium speed differential
      Range: 10...50%
      Default: 35
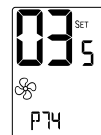
VFS Med speed
differential

P75 – VFS High speed differential
      Range: 10...50%
      Default: 35

VFS High speed
differential

Technician Settings (cont.)

P76 – Fan VFS Low limit in cooling
       Range: 0...100%
       Default: 0%

**VFS low limit
in cooling**

P77 – Fan VFS High limit in cooling
       Range: 0...100%
       Default: 100%
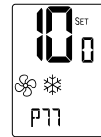
**VFS high limit
in cooling**

P78 – Fan VFS Low limit in heating
       Range: 0...100%
       Default: 0%
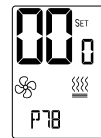
**VFS low limit
in heating**

P79 – Fan VFS High limit in heating
       Range: 0...100%
       Default: 100%
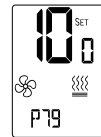
**VFS high limit
in heating**

P83 – View T2 temperature sensor readings

       Note: If T2 is not connected, 0.0 will appear on display.

T2 Sensor Not connected   **T2 Sensor readings (°C)**

P84 – View T3 temperature sensor readings

       Note: If T3 is not connected, 0.0 will appear on display.

T3 Sensor Not connected   **T3 Sensor readings (°C/°F)**

P85 – De-ice in cool – cut-in temperature (AC only!)

       Range: -9.5…+8°C / 15...46°F

       Default: 0°C / 32°F

       The indoor unit coil temperature in which de-icing will start.

De-ice in cool cut-in temperature (°C)   **(°F)**

P86 – De-ice in cool – cut-out temperature (AC only!)

       Range: 2...20°C / 36...68°F

       Default: 8°C / 46°F

       The indoor unit coil temperature in which de-icing will stop.

De-ice in cool cut-out temperature (°C)   **(°F)**

P87 – De-ice in heat time (AC only!)

       Range: 120...420 Seconds

       Default: 300 Seconds

       The length of de-icing procedure.
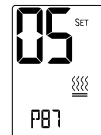
De-ice in heat time

P88 – De-ice in heat break time (AC only!)

       Range: 600...1800 Seconds

       Default: 1500 Seconds

       The time interval between de-icing cycles.
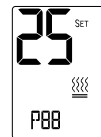
De-ice in heat break time

P89 – **De-ice in heat – cut-in temperature (AC only!)**
      Range: -9.5…+8°C / 15...46°F
      Default: 0°C / 32°F

    The outdoor unit coil temperature in which de-icing will start.

De-ice in heat cut-in temperature
(°C)   **(°F)**

P90 – **De-ice in heat – cut-out temperature (AC only!)**
      Range: 2...20°C / 35...68°F
      Default: 16°C / 61°F

    The outdoor unit coil temperature in which de-icing will stop.
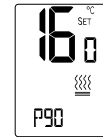
De-ice in heat cut-out temperature
(°C)   **(°F)**

P91 – **Compressor delay (AC only!)**
      Range: 0...360 Seconds
      Default: 240 Seconds

    DIP Switch SW3.5 must be in "OFF" position – compressor delay enabled!

Compressor
delay

P98 – **Display setpoint only (hide room temperature)**
      "00" -   Display both setpoint and room temperatures
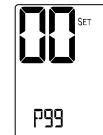   "01" -   Display only the setpoint temperature
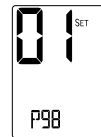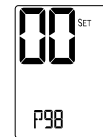
Show room   **Hide room**
temperature   **temperature**

P99 – **One or Two setpoints (for cool and for heat)**
      "00" -   One setpoint for cooling and heating
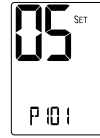   "01" -   Two setpoints – one for cool and one for heat

One   **Two**
setpoint   **setpoints**
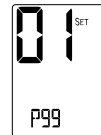
P101 – Screen dimming delay

      Range: 0...99 minutes

      Default: 5 minutes

Screen dimming delay

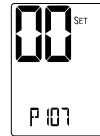**P107 – Weekly program configuration**

      "00" - Disable weekly program

      "01" - 7 days with the same program

      "02" - One program for Monday to Friday and another program for Saturday and Sunday

      "03" - One program for Monday to Friday, one for Saturday, and another for Sunday
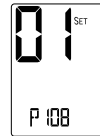
      "04" - 7 days with a different program for each day

Weekly program configuration

P108 – Weekly program - events per day

      "00" - Two different events per day

      "01" - Four different events per day

Weekly program events per day
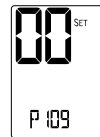

P109 – Weekly program event configuration

      "00" - US Program

           Event start time, Mode, Fan speed, Setpoints (one or two)

      "01" - Eu program

           Event start time, Stop time

Weekly program event configuration

P114 – Cool PID Kp (FC Only!)
    Range: 0...100%
    Default: 100%

Cool PID
Kp

P115 – Heat PID Kp (FC Only!)
    Range: 0...100%
    Default: 100%

Heat PID
Kp

P116 – Cool PID Ki (FC Only!)
    Range: 0...100%
    Default: 0%
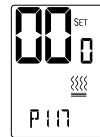
Cool PID
Ki

P117 – Heat PID Ki (FC Only!)
    Range: 0...100%
    Default: 0%

Heat PID
Ki

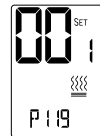
P118 – Cool PID Kd (FC Only!)
    Range: 0...100%
    Default: 1%

Cool PID
Kd

P119 – Heat PID Kd (FC Only!)
    Range: 0...100%
    Default: 1%

Heat PID
Kd

P122 – Cool Proportional output threshold time (seconds) (FC Only!)

      Range: 0...100 seconds

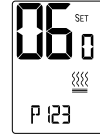   Default: 60 seconds

Cool proportional cooling threshold

P123 – Heat Proportional output threshold time (seconds) (FC Only!)

      Range: 0...100 seconds

      Default: 60 seconds

Heat proportional cooling threshold

P160 – Minimum compressor ON time

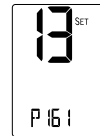   Range: 0...20 minutes

      Default: 2 minutes

Min. compressor ON time

P161 – Minimum compressor OFF time

      Range: 0...20 minutes
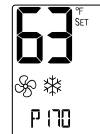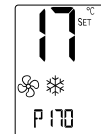
      Default: 13 minutes

Min. Compressor OFF time
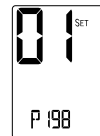

P170 – Economizer low limit temperature

      Range: 9...27ºC / 48...80ºF

      Default: 17ºC / 63ºF

Economizer low limit temperature
(°C)   **(°F)**
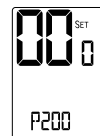

P198 – Not in use

Communication protocol indication

P200 – Restore defaults

- Press the [+] button. The display will change from "00" to "01".
- Press the [On/Off] button to restore default settings.
- The thermostat will turn Off.

Dead zone Hum./Dehum.

Press the [On/Off] button or wait 60 seconds to return to normal display.

Alarms and Indications

F1	T1 Internal sensor or T1 External sensor fault
dC	De-icer in cool indication
dH	De-icer in heat indication
OH	Overheat in heat
OC	Overheat in cool
t2	Teconomizer sensor fault

Document revision history

Important changes to this document are listed below. Minor changes such as typographical or formatting errors are not listed.

Date	Topic	Change description
05/22/19	Technician Settings: P03	Reversed numbers in the Setpoint Limit for Heating graphic
2/19/19	Specifications	Added CE and C-Tick icons to Compliance specification.
2/19/19	BACnet Device Instance Number	Changed 24075 in first paragraph to 16075. Changed both instances of WebCTRL to i-Vu. Changed image to show i-Vu interface with Present Value of 160102.
2/19/19	Technician Settings > P122 and P123	Changed from percent to time (seconds).

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