APPLICATION

Honeywell’s BACnet® Fixed Function Thermostat, BACnet FF, is a configurable device with 19 pre-loaded applications. The thermostat is a communicating, intelligent sensor-controller combination with built-in temperature and humidity sensors used to control applications such as roof top units, fan-coil units and heat pumps. The thermostat communicates over an MS/TP LAN so it operates as a fully-functioning BACnet controller and easily integrates with the building automation system. The two available models are TB3026B and TB3026B-W, which includes a wireless sensor option (wireless sensors sold separately).

More Information

To learn more about these products, visit http://customer.honeywell.com

- BACnet Fixed Function Thermostat Installation Instructions (Form No. 31-00093)
- BACnet Fixed Function Thermostat Specification Data (Form No. 31-00096)
- BACnet Fixed Function Thermostat WEBs-AX Configuration Wizard Guide (Form No. 31-00097)
- BACnet Fixed Function Thermostat System Engineering Guide (Form No. 31-00098)
# QUICK LOOKUP APPLICATION SELECTION TABLES

## Table 1. Fan Coil Unit (4 Pipe) Applications

<table>
<thead>
<tr>
<th>Application</th>
<th>#6</th>
<th>#7</th>
<th>#8</th>
<th>#9</th>
<th>#17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan</td>
<td>On/Off or VFD</td>
<td>On/Off or VFD</td>
<td>Three Speed or VFD</td>
<td>Three Speed or VFD</td>
<td>Three Speed</td>
</tr>
<tr>
<td>Cooling Valve</td>
<td>Three Point Floating</td>
<td>Three Point Floating</td>
<td>Two Position Open/Close</td>
<td>Two Position Open/Close</td>
<td>Analog</td>
</tr>
<tr>
<td>Heating Valve</td>
<td>Three Point Floating</td>
<td>Three Point Floating</td>
<td>Two Position Open/Close</td>
<td>Two Position Open/Close</td>
<td>Analog</td>
</tr>
<tr>
<td>Auxiliary Electric Heater</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Economizer</td>
<td>Analog</td>
<td>Analog</td>
<td>Analog</td>
<td>Analog</td>
<td>Three Point Floating</td>
</tr>
<tr>
<td>Space Sensor (10K Type II Thermistor)</td>
<td>Optional</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Optional</td>
</tr>
<tr>
<td>OAT Sensor (10K Type II Thermistor)</td>
<td>Optional</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Supply Air Temp Sensor (10K Type II Thermistor)</td>
<td>Required for Economizer Control</td>
<td>Required for Economizer Control</td>
<td>Required for Economizer Control</td>
<td>Required for Economizer Control</td>
<td>Optional</td>
</tr>
<tr>
<td>Occupancy Detection</td>
<td>Optional via Standby Switch</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
</tr>
<tr>
<td>Condensate Alarm</td>
<td>Optional</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: If there is no space temperature sensor connected to an input, then DDC within the BACnet FF will default to using the internal sensor stored at AV-104.

Note: For all applications using the TB3026B-W, then additional I/O is available:
- 3 x wireless PIR
- 8 x wireless door/window sensors

## Table 2. Fan Coil Unit (2 Pipe) Applications

<table>
<thead>
<tr>
<th>Application</th>
<th>#11</th>
<th>#12</th>
<th>#13</th>
<th>#14</th>
<th>#15</th>
<th>#16</th>
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<td>Three Speed or VFD</td>
<td>Three Speed or VFD</td>
<td>Three Speed or VFD</td>
<td>Three Speed or VFD</td>
<td>Three Speed or VFD</td>
<td>On/Off or VFD</td>
</tr>
<tr>
<td>Cooling Valve</td>
<td>Three Point Floating or Analog</td>
<td>Three Point Floating or Analog</td>
<td>Three Point Floating or Analog</td>
<td>Three Point Floating or Analog</td>
<td>Two Position Open/Close or Analog</td>
<td>Two Position Open/Close or Analog</td>
<td>Two Position Open/Close or Analog</td>
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<tr>
<td>Heating Valve</td>
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<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Auxiliary Electric Heater</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Economizer</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Space Sensor (10K Type II Thermistor)</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>OAT Sensor (10K Type II Thermistor)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Supply Air Temp Sensor (10K Type II Thermistor)</td>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Optional</td>
</tr>
<tr>
<td>Supply Water Sensor (Strap On 10K Type II Thermistor)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Occupancy Detection</td>
<td>Optional via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td>Optional Via Door, Window Sensors or PIR</td>
</tr>
<tr>
<td>Condensate Alarm</td>
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<td>No</td>
<td>No</td>
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<td>No</td>
<td>No</td>
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Table 3. Heat Pump Applications

<table>
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<tr>
<th>Application</th>
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<th>#2</th>
<th>#3</th>
<th>#10</th>
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</thead>
<tbody>
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<td>Fan</td>
<td>On/Off or VFD</td>
<td>On/Off or VFD</td>
<td>On/Off or VFD</td>
<td>On/Off or VFD</td>
<td>3 speed or VFD</td>
</tr>
<tr>
<td>Compressor</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Reversing Valve</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Air or Water Sourced</td>
<td>Air</td>
<td>Water</td>
<td>Air</td>
<td>Water</td>
<td>Air</td>
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<tr>
<td>Auxiliary Electric Heater</td>
<td>One Stage</td>
<td>One Stage</td>
<td>Two Stage</td>
<td>Two Stage</td>
<td>One Stage</td>
</tr>
<tr>
<td>Economizer</td>
<td>Three Point Floating or Analog</td>
<td>Three Point Floating or Analog</td>
<td>Analog</td>
<td>Analog</td>
<td>Analog</td>
</tr>
<tr>
<td>Space Sensor (10K Type II Thermistor)</td>
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<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>OAT Sensor (10K Type II Thermistor)</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
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<td>Optional</td>
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<td>Required for Economizer Control</td>
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<tr>
<td>Occupancy Detection</td>
<td>Optional Via Door, Window Sensors or PIR</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condensate Alarm</td>
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<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
</tbody>
</table>

Table 4. Air Conditioning Unit Applications

<table>
<thead>
<tr>
<th>Application</th>
<th>#4</th>
<th>#5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan</td>
<td>On/Off or VFD</td>
<td>On/Off or VFD</td>
</tr>
<tr>
<td>Compressor</td>
<td>One</td>
<td>Two</td>
</tr>
<tr>
<td>Auxiliary Electric Heater</td>
<td>One Stage</td>
<td>Two Stages</td>
</tr>
<tr>
<td>Economizer</td>
<td>Three Point Floating or Analog</td>
<td></td>
</tr>
<tr>
<td>Space Sensor (10K Type II Thermistor)</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>OAT Sensor (10K Type II Thermistor)</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>Supply Air Temp Sensor (10K Type II Thermistor)</td>
<td>Required for Economizer Control</td>
<td>Required for Economizer Control</td>
</tr>
<tr>
<td>Occupancy Detection</td>
<td>Optional Via Door, Window Sensors or PIR</td>
<td></td>
</tr>
<tr>
<td>Condensate Alarm</td>
<td>Optional</td>
<td>Optional</td>
</tr>
</tbody>
</table>
**APPLICATION 0 – HEAT PUMP (AIR TO AIR)**

**SINGLE STAGE ELECTRIC HEAT**

**Inputs**
- AI-0: Space Sensor or Outside Air Sensor (optional)
- AI-2: Supply Air Sensor (optional, required for economizer control)
- BI-1: PIR/Door/Window Sensor (optional)
- BI-2: Condensate Sensor (optional)

**Outputs**
- BO-0: Fan
- BO-1: Heat Pump Compressor
- BO-2: Reversing Valve
- BO-3: Electric Heat (optional)
- BO-4: Economizer Open (optional for floating control)
- BO-5: Economizer Close (optional for floating control)
- AO-0: Economizer (optional analog) 0-10V or 4-20mA
- AO-1: Fan Speed Control (optional) 4-20mA VFD/SCR

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.

**Features and Notes**
- Three modes of schedule control set by AV-123 –
  - 0 = Single point with offset during occupancy,
  - 1 = Dual setpoint residential – wake, leave, return & sleep,
  - 2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Standby mode enables power saving if no motion is detected while in occupancy.
- If condensation is detected, the compressor is held off with the optional condensate input.
- By default the economizer control is set for analog. To use three point floating control set a value in AV-63 (Economizer Stroke Time).
- The economizer control requires a supply air sensor connected to AI-2:.
- One stage of auxiliary heating.
- Use 10K Type II Thermistor sensors for analog inputs.
- Electric heat is enabled when heating demand is > 65%.
- To configure AI-0 as a sensor set the following parameters.

<table>
<thead>
<tr>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
</tr>
</tbody>
</table>
APPLICATION 1 – HEAT PUMP (AIR TO WATER)

Features and Notes
• Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
• BACnet MS/TP compliant.
• English or metric units.
• Outputs are disabled if BV-2 is off.
• Disable operator access via the display to the schedule
  by setting BV-102 to off.
• Onboard schedule can be enabled or disabled (BV-40).
• Heating and cooling are disabled if the fan is off.
• Use up and down arrows on the display to force the unit
  into occupancy for four hours.
• Setpoint mode emulates residential thermostat
  operation.
• Standby mode enables power saving if no motion is
  detected while in occupancy.
• If condensation is detected, the compressor is held off
  with the optional condensate input.
• By default the economizer control is set for analog. To
  use three point floating control set a value in AV-63
  (Economizer Stroke Time).
• The economizer control requires a supply air sensor
  connected to Al-2.
• One stage of auxiliary heating.
• Use 10K Type II Thermistor sensors for analog inputs.
• Electric heat is enabled when heating demand is > 65%.
• Set BV-31 to active by the BMS to indicate that there is
  water flow.
• To configure AI-0 as a sensor set the following
  parameters.

<table>
<thead>
<tr>
<th></th>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

Inputs
AI-0:: Space Sensor or Outside Air Sensor (optional)
AI-2:: Supply Air Sensor (optional, required for economizer control)
BI-1:: PIR/Door/Window Sensor (optional)
BI-2:: Condensate Sensor (optional)

Outputs
BO-0:: Fan
BO-1:: Heat Pump Compressor
BO-2:: Reversing Valve
BO-3:: Electric Heat (optional)
BO-4:: Economizer Open (optional for floating control)
BO-5:: Economizer Close (optional for floating control)
AO-0:: Economizer (optional analog) 0-10V or 4-20mA
AO-1:: Fan Speed Control (optional) 4-20mA VFD/SCR

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
APPLICATION 2 – HEAT PUMP (AIR TO AIR)

Features and Notes

- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.

- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Standby mode enables power saving if no motion is detected while in occupancy.
- If condensation is detected, the compressor is held off with the optional condensate input.
- By default the economizer control is set for analog. To use three point floating control set a value in AV-63 (Economizer Stroke Time).
- The economizer control requires a supply air sensor connected to AI-2.
- Two stages of auxiliary heating.
- Use 10K Type II Thermistor sensors for analog inputs.
- First stage of electric heat is enabled when heating demand is > 65%.
- Second stage of electric heat is enabled when heating demand is > 75%.
- To configure AI-0 as a sensor set the following parameters.

<table>
<thead>
<tr>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
</tr>
</tbody>
</table>
APPLICATION 3 – HEAT PUMP (AIR TO WATER)

TWO STAGES ELECTRIC HEAT

Features and Notes
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule
  by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit
  into occupancy for four hours.
- Setpoint mode emulates residential thermostat
  operation.
- Standby mode enables power saving if no motion is
  detected while in occupancy.
- If condensation is detected, the compressor is held off
  with the optional condensate input.
- By default the economizer control is set for analog. To
  use three point floating control set a value in AV-63
  (Economizer Stroke Time).
- The economizer control requires a supply air sensor
  connected to AI-2.
- Two stages of auxiliary heating.
- Use 10K Type II Thermistor sensors for analog inputs.
- First stage of electric heat is enabled when heating
  demand is > 65%.
- Second stage of electric heat is enabled when heating
  demand is > 75%.
- Set BV-31 to active by the BMS to indicate that there is
  water flow.

To configure AI-0 as a sensor set the following parameters.

<table>
<thead>
<tr>
<th></th>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

Inputs
- AI-0: Space Sensor or Outside Air Sensor (optional)
- AI-2: Supply Air Sensor (optional, required for economizer control)
- BI-1: PIR/Door/Window Sensor (optional)
- BI-2: Condensate Sensor (optional)

Outputs
- BO-0: Fan
- BO-1: Heat Pump Compressor
- BO-2: Reversing Valve
- BO-3: Electric Heat Stage 1
- BO-4: Electric Heat Stage 2
- BO-5: Not used
- AO-0: Economizer (optional analog)
  0-10V or 4-20mA
- AO-1: Fan Speed Control (optional)
  4-20mA VFD/SCR

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
**APPLICATION 4 – AIR CONDITIONING UNIT**

**COMPRESSOR, SINGLE STAGE ELECTRIC HEAT**

**Inputs**
- AI-0: Space Sensor or Outside Air Sensor (optional)
- AI-2: Supply Air Sensor (optional, required for economizer control)
- BI-1: PIR/Door/Window Sensor (optional)
- BI-2: Condensate Sensor (optional)

**Outputs**
- BO-0: Fan
- BO-1: Compressor
- BO-2: Not used
- BO-3: Electric Heat (optional)
- BO-4: Economizer Open (optional for floating control)
- BO-5: Economizer Close (optional for floating control)
- AO-0: Economizer (optional analog) 0–10V or 4–20mA
- AO-1: Fan Speed Control (optional) 4–20mA

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.

**Features and Notes**
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Standby mode enables power saving if no motion is detected while in occupancy.
- If condensation is detected, the compressor is held off with the optional condensate input.
- By default the economizer control is set for analog. To use three point floating control set a value in AV-63 (Economizer Stroke Time).
- The economizer control requires a supply air sensor connected to AI-2:
- One stage of auxiliary heating.
- Use 10K Type II Thermistor sensors for analog inputs.
- Electric heat is enabled when heating demand is > 65%.
- To configure AI-0 as a sensor set the following parameters.

<table>
<thead>
<tr>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
</tr>
</tbody>
</table>

*Optional space or outside temperature sensor.
**APPLICATION 5 – AIR CONDITIONING UNIT**

**TWO STAGE COMPRESSOR, TWO STAGE ELECTRIC HEAT**

**Features and Notes**
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Standby mode enables power saving if no motion is detected while in occupancy.
- If condensation is detected, the compressor is held off with the optional condensate input.
- By default the economizer control is set for analog. To use three point floating control set a value in AV-63 (Economizer Stroke Time).
- The economizer control requires a supply air sensor connected to AI-2.
- Two stages of auxiliary heating.
- Use 10K Type II Thermistor sensors for analog inputs.
- First stage of electric heat is enabled when heating demand is > 65%.
- Second stage of electric heat is enabled when heating demand is > 75%.
- Set BV-31 to active by the BMS to indicate that there is water flow.

**To configure AI-0 as a sensor set the following parameters.**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

**Controller Terminations**

- AZH2 AP 5

**Inputs**
- AI-0: Space Sensor or Outside Air Sensor (optional)
- AI-2: Supply Air Sensor (optional, required for economizer control)
- BI-1: PIR/Door/Window Sensor (optional)
- BI-2: Condensate Sensor (optional)

**Outputs**
- BO-0: Fan
- BO-1: Compressor Stage 1
- BO-2: Compressor Stage 2
- BO-3: Electric Heat Stage 1 (optional)
- BO-4: Electric Heat Stage 2 (optional)
- BO-5: Not used
- AO-0: Economizer (optional analog)
  0-10V or 4-20mA
- AO-1: Fan Speed Control (optional)
  4-20mA

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
APPLICATION 6 – FAN COIL UNIT – 4 PIPE

THREE POINT FLOATING COOLING AND HEATING

Features and Notes
- Three modes of schedule control set by AV-123 – 0 = Single point with offset during occupancy, 1 = Dual setpoint residential – wake, leave, return & sleep, 2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan can be either on/off or analog variable speed control.
- Analog economizer control is defaulted to disabled.
- Economizer requires a supply air sensor connected to AI-2.
- The cooling and heating valves can be controlled by either a cooling and heating signal or via the supply air temperature (BV-15).
- AI-0 Can be configured for either Space or Outside Temp sensor.
- Humidity control can be enabled for un-occupancy (BV-12 & BV-53).
- Use a 10K Type II Thermistor Sensor for AI-0 and AI-2 Inputs.

To configure AI-0 as a sensor set the following parameters.

<table>
<thead>
<tr>
<th></th>
<th>BV-47 (PS)</th>
<th>BV-32 (5r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

Controller Terminations

* Optional space or outside temperature sensor.
APPLICATION 7 – FAN COIL UNIT – 4 PIPE

DOOR SENSOR, THREE POINT FLOATING COOLING AND HEATING

Features and Notes
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan can be either on/off or analog variable speed control.
- Analog economizer control is defaulted to disabled.
- Economizer requires a supply air sensor connected to AI-2.
- The cooling and heating valves can be controlled by either a cooling and heating signal or via the supply air temperature (BV-15).
- Humidity control can be enabled for un-occupancy (BV-12 & BV-53).
- Use a 10K Type II Thermistor Sensor for AI-2 Input.
- If the BACnet FF detects that the door or window contact is open during occupancy for a period longer than what is defined in the standby delay (AV-20) it will put the unit into standby mode.

Inputs
- AI-2: Supply Air Sensor (optional, required for Economizer control)
- BI-0: PIR Motion Sensor (optional)
- BI-1: Door/Window Sensor (optional)
- BI-2: Main Door Sensor (optional)

Outputs
- BO-0: Fan
- BO-1: Cooling Valve Open
- BO-2: Cooling Valve Close
- BO-3: Heating Valve Open
- BO-4: Heating Valve Close
- BO-5: Not used
- AO-0: Economizer (optional analog)
  0-10V or 4-20mA
- AO-1: Fan Speed Control (optional)
  4-20mA VFD/SCR

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
BACNET® FIXED FUNCTION THERMOSTAT

APPLICATION 8 – FAN COIL UNIT – 4 PIPE

DOOR SENSOR, LOW/MEDIUM/HIGH SPEED FAN. TWO POSITION COOLING AND HEATING

Features and Notes

- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan speed will ramp between 0-100% depending on cooling and heating demands.
- Fan speed selected upon the following settings –
  Low Speed – at 20% demand (adjustable in AV-46);
  Medium Speed – at 40% demand (adjustable in AV-85);
  High Speed – at 70% demand (adjustable in AV-89);
  Fan speed deadband set at 2%.
- Analog economizer control is defaulted to disabled.
- Economizer requires a supply air sensor connected to AI-2.
- The cooling and heating valves can be controlled by either a cooling and heating signal or via the supply air temperature (BV-15).
- Humidity control can be enabled for un-occupancy (BV-12 & BV-53).
- Use a 10K Type II Thermistor Sensor for AI-2 Input.

Inputs

- AI-2: Supply Air Sensor (optional, required for Economizer control)
- BI-0: PIR Motion Sensor (optional)
- BI-1: Door/Window Sensor (optional)
- BI-2: Main Door Sensor (optional)

Outputs

- BO-0: Fan Low Speed
- BO-1: Fan Medium Speed
- BO-2: Fan High Speed
- BO-3: Cooling 2 Position Valve
- BO-4: Heating 2 Position Valve
- BO-5: Not used
- AO-0: Economizer (optional analog) 0-10V or 4-20mA
- AO-1: Fan Speed Control (optional) 4-20mA VFD/SCR

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.

If the BACnet FF detects that the door or window contact is open during occupancy for a period longer than what is defined in the standby delay (AV-20) it will put the unit into standby mode.
APPLICATION 9 – FAN COIL UNIT – 4 PIPE

Features and Notes
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule
  by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit
  into occupancy for four hours.
- Setpoint mode emulates residential thermostat
  operation.
- Fan can be set to run continuously or cycle on and off for
  heating or cooling demands while in Occupancy mode
  (AV-17).
- Fan speed will ramp between 0-100% depending on
  cooling and heating demands
- Fan speed selected upon the following settings –
  Low Speed – at 20% demand (adjustable in AV-46)
  Medium Speed – at 40% demand (adjustable in AV-85)
  High Speed – at 70% demand (adjustable in AV-89)
  Fan speed deadband set at 2%
- Analog economizer control is defaulted to disabled.
- Economizer requires a supply air sensor connected to AI-2.
- The cooling and heating valves can be controlled by
  either a cooling and heating signal or via the supply air
  temperature (BV-15).
- Electric heater is enabled if heating demand exceeds 75%.
- Humidity control can be enabled for un-occupancy
  (BV-12 & BV-53).
- Use a 10K Type II Thermistor Sensor for AI-2 Input.
- If the BACnet FF detects that the door or window contact
  is open during occupancy for a period longer than what is
  defined in the standby delay (AV-20) it will put the unit
  into standby mode.

Inputs
AI-2:: Supply Air Sensor (optional, required for Economizer control)
BI-0:: PIR Motion Sensor (optional)
BI-1:: Door/Window Sensor (optional)
BI-2:: Main Door Sensor (optional)

Outputs
BO-0:: Fan Low Speed
BO-1:: Fan Medium Speed
BO-2:: Fan High Speed
BO-3:: Cooling 2 Position Valve
BO-4:: Heating 2 Position Valve
BO-5:: Auxiliary Heat
AO-0:: Economizer (optional analog)
        0-10V or 4-20mA
AO-1:: Fan Speed Control (optional)
        4-20mA VFD/SCR

Note: Any I/O listed as “optional” will
require a BV to be set. Refer to the
sequence of operations outlined in
the BACnet FF Thermostat System
APPLICATION 10 – HEAT PUMP (AIR TO AIR)

SINGLE STAGE ELECTRIC HEAT AND 3 SPEED FAN

Features and Notes
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule
  by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit
  into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off
  for heating or cooling demands while in Occupancy mode
  (AV-17).
- Fan speed will ramp between 0-100% depending on
  cooling and heating demands
- Fan speed selected upon the following settings –
  Low Speed – at 20% demand (adjustable in AV-46)
  Medium Speed – at 40% demand (adjustable in AV-85)
  High Speed – at 70% demand (adjustable in AV-89)
  Fan speed deadband set at 2%
- Analog economizer control is defaulted to disabled.
- Economizer requires a supply air sensor connected to AI-2.
- The cooling and heating valves can be controlled by
  either a cooling and heating signal or via the supply air
  temperature (BV-15).
- Electric heater is enabled if heating demand exceeds 75%.
- Humidity control can be enabled for un-occupancy
  (BV-12 & BV-53).
- Use a 10K Type II Thermistor Sensor for AI-2 Input.
- If the BACnet FF detects that the door or window contact
  is open during occupancy for a period longer than what
  is defined in the standby delay (AV-20) it will put the unit
  into standby mode.

To configure AI-0 as a sensor set the following parameters.

<table>
<thead>
<tr>
<th></th>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
<td>Off</td>
</tr>
</tbody>
</table>

Controller Terminations

Note: Any I/O listed as “optional” will
require a BV to be set. Refer to the
sequence of operations outlined in
the BACnet FF Thermostat System
APPLICATION 11 – FAN COIL UNIT – 2 PIPE

LOW/MEDIUM/HIGH SPEED FAN. THREE POINT FLOATING OR ANALOG COOLING OR HEATING, REMOTE SPACE TEMPERATURE SENSOR

Features and Notes
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Cooling or heating is disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan speed will ramp between 0-100% depending on cooling and heating demands.
- Fan speed selected upon the following settings -
  - Low Speed – at 20% demand (adjustable in AV-46)
  - Medium Speed – at 40% demand (adjustable in AV-85)
  - High Speed – at 70% demand (adjustable in AV-89)
- Fan speed deadband set at 2%.
- Humidity control can be enabled for un-occupancy (BV-53).
- Use a 10K Type II Thermistor Sensor for AI-2 Input.
- If the BACnet FF detects that the door or window contact is open during occupancy for a period longer than what is defined in the standby delay (AV-20) it will put the unit into standby mode.

Inputs
- AI-2: Space Temp Sensor (optional)
- BI-0: Motion Detector PIR (optional)
- BI-1: Door/Window Sensor (optional)

Outputs
- BO-0: Fan Low Speed
- BO-1: Fan Medium Speed
- BO-2: Fan High Speed
- BO-3: Cooling or Heating Valve Open
- BO-4: Cooling or Heating Valve Close
- BO-5: Not Used
- AO-0: Analog Modulating Cooling or Heating Valve 0-10V or 4-20mA
- AO-1: Fan Speed Control (optional) 4-20mA VFD

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
Applications and Notes

- Three modes of schedule control set by AV-123 –
  - 0 = Single point with offset during occupancy,
  - 1 = Dual setpoint residential – wake, leave, return & sleep,
  - 2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Cooling or heating is disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan speed will ramp between 0-100% depending on cooling and heating demands.
- Fan speed selected upon the following settings –
  - Low Speed – at 20% demand (adjustable in AV-46)
  - Medium Speed – at 40% demand (adjustable in AV-85)
  - High Speed – at 70% demand (adjustable in AV-89)
  - Fan speed deadband set at 2%
- Humidity control can be enabled for un-occupancy (BV-53).
- If the BACnet FF detects that the door or window contact is open during occupancy for a period longer than what is defined in the standby delay (AV-20) it will put the unit into standby mode.

Inputs

- BI-0: Motion Detector PIR (optional)
- BI-1: Door/Window Sensor (optional)
- BI-2: Main Door Sensor (optional)

Outputs

- BO-0: Fan Low Speed
- BO-1: Fan Medium Speed
- BO-2: Fan High Speed
- BO-3: Cooling or Heating Valve Open
- BO-4: Cooling or Heating Valve Close
- BO-5: Not Used
- AO-0: Analog Modulating Cooling or Heating Valve 0-10V or 4-20mA
- AO-1: Fan Speed Control (optional) 4-20mA VFD

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
APPLICATION 13 – FAN COIL UNIT – 2 PIPE

DOOR SENSOR, LOW/MEDIUM/HIGH SPEED FAN. THREE POINT FLOATING OR ANALOG COOLING OR HEATING AND ELECTRIC HEATER

Features and Notes
• Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
• BACnet MS/TP compliant.
• English or metric units.
• Outputs are disabled if BV-2 is off.
• Disable operator access via the display to the schedule by setting BV-102 to off.
• Onboard schedule can be enabled or disabled (BV-40).
• Cooling or heating is disabled if the fan is off.
• Use up and down arrows on the display to force the unit into occupancy for four hours.
• Setpoint mode emulates residential thermostat operation.
• Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
• Fan speed will ramp between 0-100% depending on cooling and heating demands.
• Electric heater is enabled if the heating demand is > 70%.
• Fan speed selected upon the following settings –
  Low Speed – at 20% demand (adjustable in AV-46)
  Medium Speed – at 40% demand (adjustable in AV-85)
  High Speed – at 70% demand (adjustable in AV-89)
  Fan speed deadband set at 2%
• Humidity control can be enabled for un-occupancy (BV-53).
• Use a 10K Type II Thermistor sensor for the strap on water supply temperature.

Inputs
BI-0: Motion Detector PIR (optional)
BI-1: Door/Window Sensor (optional)
AI-2: Supply Water Temperature Sensor

Outputs
BO-0: Fan Low Speed
BO-1: Fan Medium Speed
BO-2: Fan High Speed
BO-3: Cooling or Heating Valve Open
BO-4: Cooling or Heating Valve Close
BO-5: Auxiliary Heating
AO-0: Analog Modulating Cooling or Heating Valve 0-10V or 4-20mA
AO-1: Fan Speed Control (optional) 4-20mA VFD

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
APPLICATION 14 – FAN COIL UNIT – 2 PIPE

WATER TEMP SENSOR, LOW/MEDIUM/HIGH SPEED FAN. TWO POSITION OR ANALOG COOLING OR HEATING

Features and Notes
- Three modes of schedule control set by AV-123 – 0 = Single point with offset during occupancy, 1 = Dual setpoint residential – wake, leave, return & sleep, 2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Cooling or heating is disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan speed will ramp between 0-100% depending on cooling and heating demands.
- Fan speed selected upon the following settings – Low Speed – at 20% demand (adjustable in AV-46), Medium Speed – at 40% demand (adjustable in AV-85), High Speed – at 70% demand (adjustable in AV-89), Fan speed deadband set at 2%.
- Humidity control can be enabled for un-occupancy (BV-53).
- Use a 10K Type II Thermistor sensor for the strap on water supply temperature.

Inputs
- BI-0: Motion Detector PIR (optional)
- BI-1: Door/Window Sensor (optional)
- AI-2: Supply Water Temperature Sensor

Outputs
- BO-0: Fan Low Speed
- BO-1: Fan Medium Speed
- BO-2: Fan High Speed
- BO-3: 2 Position Open/Close Cooling/Heating Valve
- BO-4: Not used
- BO-5: Not used
- AO-0: Analog Modulating Cooling or Heating Valve 0-10V or 4-20mA
- AO-1: Fan Speed Control (optional) 4-20mA VFD

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
APPLICATION 15 – FAN COIL UNIT – 2 PIPE

LOW/MEDIUM/HIGH SPEED FAN. 2 POSITION OR ANALOG COOLING OR HEATING

Features and Notes
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Cooling or heating is disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan speed will ramp between 0-100% depending on cooling and heating demands
  - Fan speed selected upon the following settings -
    Low Speed – at 20% demand (adjustable in AV-46)
    Medium Speed – at 40% demand (adjustable in AV-85)
    High Speed – at 70% demand (adjustable in AV-89)
    Fan speed deadband set at 2%
- Humidity control can be enabled for un-occupancy (BV-53).
- AV-23 is used to determine if the water temperature sensor (AV-15 sourced from the BMS) is to be utilized
  0 = No,
  1 = cooling,
  2 = heating.

Inputs
BI-0: Motion Detector PIR (optional)
BI-1: Door/Window Sensor (optional)
BI-2: Main Door Sensor (optional)

Outputs
BO-0: Fan Low Speed
BO-1: Fan Medium Speed
BO-2: Fan High Speed
BO-3: 2 Position Open/Close Cooling/Heating Valve
BO-4: Not used
BO-5: Not used
AO-0: Analog Modulating Cooling or Heating Valve 0-10V or 4-20mA
AO-1: Fan Speed Control (optional) 4-20mA VFD

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
**Features and Notes**

- **Three modes of schedule control set by AV-123**
  - 0 = Single point with offset during occupancy,
  - 1 = Dual setpoint residential – wake, leave, return & sleep,
  - 2 = Dual setpoint with offset occupancy.

- **BACnet MS/TP compliant.**
- **English or metric units.**
- **Outputs are disabled if BV-2 is off.**
- **Disable operator access via the display to the schedule by setting BV-102 to off.**
- **Onboard schedule can be enabled or disabled (BV-40).**
- **Cooling or heating is disabled if the fan is off.**
- **Use up and down arrows on the display to force the unit into occupancy for four hours.**
- **Setpoint mode emulates residential thermostat operation.**
- **Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).**
- **Fan speed will ramp between 0-100% depending on cooling and heating demands**
- **Electric heater is enabled if the heating demand is > 70%.**
- **Fan speed selected upon the following settings**
  - Low Speed – at 20% demand (adjustable in AV-46)
  - Medium Speed – at 40% demand (adjustable in AV-85)
  - High Speed – at 70% demand (adjustable in AV-89)
  - Fan speed deadband set at 2%
- **Humidity control can be enabled for un-occupancy (BV-53).**
- **Use a 10K Type II Thermistor sensor for the strap on water supply temperature.**

**Inputs**

- BI-0: Motion Detector PIR (optional)
- BI-1: Door/Window Sensor (optional)
- Al-2: Supply Water Temperature Sensor

**Outputs**

- BO-0: Fan Low Speed
- BO-1: Fan Medium Speed
- BO-2: Fan High Speed
- BO-3: 2 Position Open/Close Cooling/Heating Valve
- BO-4: Not used
- BO-5: Electric Auxiliary Heating
- AO-0: Analog Modulating Cooling or Heating Valve 0-10V or 4-20mA (optional)
- AO-1: Fan Speed Control (optional) 4-20mA VFD

**Note:** Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
APPLICATION 17 – FAN COIL UNIT – 4 PIPE

Features and Notes
- Three modes of schedule control set by AV-123 –
  0 = Single point with offset during occupancy,
  1 = Dual setpoint residential – wake, leave, return & sleep,
  2 = Dual setpoint with offset occupancy.
- BACnet MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in Occupancy mode (AV-17).
- Fan speed will ramp between 0-100% depending on cooling and heating demands
- Fan speed selected upon the following settings -
  Low Speed – at 20% demand (adjustable in AV-46)
  Medium Speed – at 40% demand (adjustable in AV-85)
  High Speed – at 70% demand (adjustable in AV-89)
- Fan speed deadband set at 2%
- Economizer requires a supply air sensor connected to AI-2.
- The cooling and heating valves can be controlled by either a cooling and heating signal or via the supply air temperature (BV-15).
- Humidity control can be enabled for un-occupancy (BV-12 & BV-53).
- Use a 10K Type II Thermistor Sensor for AI-2 Input.

To configure AI-2 as a sensor set the following parameters.

<table>
<thead>
<tr>
<th>BV-47 (PS)</th>
<th>BV-32 (Sr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Temperature</td>
<td>Off</td>
</tr>
<tr>
<td>Outside Temperature</td>
<td>On</td>
</tr>
</tbody>
</table>

Inputs
AI-2: Space Temperature Sensor
(Optional, or could be a Supply Air Temperature Sensor, required for economizer control).

BI-0: PIR Motion Sensor (optional)
BI-1: Door/Window Sensor (optional)

Outputs
BO-0: Fan Low Speed
BO-1: Fan Medium Speed
BO-2: Fan High Speed
BO-3: Not used
BO-4: Economizer Open
BO-5: Economizer Close
AO-0: Analog Modulating Cooling Valve 0-10V or 4-20mA (optional)
AO-1: Analog Modulating Heating Valve 0-10V or 4-20mA (optional)

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
## APPLICATION 18 – FAN COIL UNIT – 2 PIPE

### Features and Notes
- **BACnet** MS/TP compliant.
- English or metric units.
- Outputs are disabled if BV-2 is off.
- Disable operator access via the display to the schedule by setting BV-102 to off.
- Onboard Schedule can be enabled or disabled (BV-40).
- Heating and cooling are disabled if the fan is off.
- Use up and down arrows on the display to force the unit into occupancy for four hours.
- Setpoint mode emulates residential thermostat operation.
- Fan can be set to run continuously or cycle on and off for heating or cooling demands while in occupancy mode (AV-17).
- Fan control is either start/stop or variable speed control.
- The cooling or heating valve can be controlled by either a cooling or heating signal or via the supply air temperature (BV-15).
- Humidity control can be enabled for un-occupancy (BV-53).
- If door or window contacts are open longer than the delay time (AV-20) the unit goes into standby mode.
- Humidity control can be enabled for un-occupancy (BV-12 & BV-53).
- Use 10K Type II Thermistor sensors for the water and supply air temperature sensors.

### Inputs
- BI-1: PIR/Door/Window Sensor (optional)
- AI-0: Supply Air Temperature
- AI-2: Supply Water Temperature Sensor

### Outputs
- BO-0: Fan On/Off
- BO-1: Not Used
- BO-2: Cooling/Heating Valve 2 Position Open/Close
- BO-3: Cooling/Heating Valve Open 3 Point Floating
- BO-4: Cooling/Heating Valve Close 3 Point Floating
- BO-5: Auxiliary Electric Heating Coil
- AO-0: Analog Modulating Cooling or Heating Valve 0-10V or 4-20mA (optional)
- AO-1: Fan Speed Control (optional) 4-20mA

Note: Any I/O listed as “optional” will require a BV to be set. Refer to the sequence of operations outlined in the BACnet FF Thermostat System Engineering Guide, 31-00098.
FIELD SERVICE MODE SETTINGS

Items listed below are in order of display via the "Field Service Mode" on the BACnet FF Screen.

<table>
<thead>
<tr>
<th>Service Code</th>
<th>Object Instance</th>
<th>Default Value</th>
<th>Range</th>
<th>Purpose/Function</th>
<th>Applications parameter applies to.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UC</td>
<td>AV-95</td>
<td>85</td>
<td>45.0 to 99.0</td>
<td>Unoccupied Cooling Setpoint</td>
<td>All</td>
</tr>
<tr>
<td>UH</td>
<td>AV-96</td>
<td>55</td>
<td>45.0 to 84.5</td>
<td>Unoccupied Heating Setpoint</td>
<td>All</td>
</tr>
<tr>
<td>CO</td>
<td>AV-93</td>
<td>2</td>
<td>0.0 to 20.0</td>
<td>Cooling Offset</td>
<td>All</td>
</tr>
<tr>
<td>HO</td>
<td>AV-94</td>
<td>1</td>
<td>0.0 to 20.0</td>
<td>Heating Offset</td>
<td>All</td>
</tr>
<tr>
<td>CS</td>
<td>AV-99</td>
<td>Calculated From AV-90</td>
<td>Occupied Cooling Setpoint</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>HS</td>
<td>AV-100</td>
<td>Calculated From AV-90</td>
<td>Occupied Heating Setpoint</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>AL</td>
<td>AV-97</td>
<td>4</td>
<td>0 to 9.5</td>
<td>Override Limit (hours)</td>
<td>All</td>
</tr>
<tr>
<td>HI</td>
<td>AV-91</td>
<td>78</td>
<td>0.0 to 127.0</td>
<td>Setpoint High Limit</td>
<td>All</td>
</tr>
<tr>
<td>LO</td>
<td>AV-92</td>
<td>62</td>
<td>0.0 to 89.5</td>
<td>Setpoint Low Limit</td>
<td>All</td>
</tr>
<tr>
<td>SP</td>
<td>AV-90</td>
<td>70</td>
<td>Restricted to range set by AV-92 &amp; AV-91.</td>
<td>Occupant Selected Space Temperature Setpoint.</td>
<td>All</td>
</tr>
<tr>
<td>AP</td>
<td>AV-49</td>
<td>Set this to select the required Application</td>
<td>Application Selection range 0 to 18</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>OE</td>
<td>BV-2</td>
<td>Off</td>
<td>Set to On after completing all other settings.</td>
<td>Enable Outputs</td>
<td>All</td>
</tr>
<tr>
<td>HC</td>
<td>BV-21</td>
<td>Off</td>
<td>On = Heating, Off = Cooling.</td>
<td>Reversing Valve Action Heating-Cooling.</td>
<td>0-3,10</td>
</tr>
<tr>
<td>FC</td>
<td>AV-17</td>
<td>1</td>
<td>On = Fan runs continuous, 2 = Fan Cycles with Heating, 3 = Fan Cycles with Cooling.</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>CC</td>
<td>AV-26</td>
<td>12</td>
<td>1 to 1440</td>
<td>AC-HP Compressor Cycle Time (mins)</td>
<td>0-3,10</td>
</tr>
<tr>
<td>CO</td>
<td>AV-27</td>
<td>3</td>
<td>AC-HP Compressor Minimum On Runtime (mins)</td>
<td>0-3,10</td>
<td></td>
</tr>
<tr>
<td>CF</td>
<td>AV-18</td>
<td>3</td>
<td>AC-HP Compressor Minimum Off Runtime (mins)</td>
<td>0-3,10</td>
<td></td>
</tr>
<tr>
<td>Hc</td>
<td>AV-28</td>
<td>3</td>
<td>1 to 1440</td>
<td>Heating Stages Cycle Time (mins) (if set to 0 or less this will disable heating)</td>
<td>0-5,9,10,13,16,18</td>
</tr>
<tr>
<td>h0</td>
<td>AV-29</td>
<td>1</td>
<td>Heating Stages Minimum runtime (mins)</td>
<td>0-5,9,10,13,16,18</td>
<td></td>
</tr>
<tr>
<td>hF</td>
<td>AV-80</td>
<td>1</td>
<td>Heating Stages Minimum Off runtime (minutes)</td>
<td>0-5,9,10,13,16,18</td>
<td></td>
</tr>
<tr>
<td>ZC</td>
<td>AV-37</td>
<td>3</td>
<td>1 to 1440</td>
<td>2 Position Valve Cycle Times (mins)</td>
<td>8,9,14-16,18</td>
</tr>
<tr>
<td>Zc</td>
<td>AV-38</td>
<td>1</td>
<td>2 Position Valves Minimum runtime (mins)</td>
<td>8,9,14-16,18</td>
<td></td>
</tr>
<tr>
<td>cS</td>
<td>AV-64</td>
<td>0</td>
<td>0 to 180</td>
<td>Cooling Valve Stroke Time. (seconds)</td>
<td>6-9,11-18</td>
</tr>
<tr>
<td>hS</td>
<td>AV-65</td>
<td>0</td>
<td>0 to 180</td>
<td>Heating Valve Stroke Time. (seconds)</td>
<td>6-9,11-18</td>
</tr>
<tr>
<td>2P</td>
<td>AV-34</td>
<td>1</td>
<td>1=On/Off, 2=Analog to Binary</td>
<td>2 Position Valve Mode</td>
<td>8,9,14-16,18</td>
</tr>
<tr>
<td>FA</td>
<td>BV-55</td>
<td>Off</td>
<td>On/Off</td>
<td>Enable Fan Control display</td>
<td>All</td>
</tr>
<tr>
<td>cL</td>
<td>AV-70</td>
<td>55</td>
<td>Cooling Lockout Temp</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>hL</td>
<td>AV-72</td>
<td>62</td>
<td>Heating Lockout Temp</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>P5</td>
<td>BV-47</td>
<td>Off</td>
<td>On/Off</td>
<td>Off = Enable AI-0 input as a Space Temperature Sensor, On = use the internal BACnet FF sensor (AV-104).</td>
<td>0-6,10,17</td>
</tr>
<tr>
<td>Sr</td>
<td>AV-32</td>
<td>Off</td>
<td>On/Off</td>
<td>On = Enable AI-0 input as Space Temperature, Off = OAT</td>
<td>0-6,11,17</td>
</tr>
<tr>
<td>FL</td>
<td>AV-46</td>
<td>20</td>
<td>Set by DDC AV-80 minus 2%</td>
<td>Auto Fan Start Demand %</td>
<td>All</td>
</tr>
<tr>
<td>FS</td>
<td>AV-5</td>
<td>0</td>
<td>Fan stop delay (seconds)</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>AV-85</td>
<td>0</td>
<td>Medium Speed Fan Setpoint</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>AV-89</td>
<td>0</td>
<td>High Speed Fan Setpoint</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>uL</td>
<td>BV-3</td>
<td>Off</td>
<td>On/Off</td>
<td>Reverse Standby Logic.</td>
<td>All</td>
</tr>
<tr>
<td>S0</td>
<td>AV-19</td>
<td>4</td>
<td>0 to 12</td>
<td>Standby Heating SetPoint</td>
<td>All</td>
</tr>
</tbody>
</table>
**LIST OF MAIN DEVICE OBJECTS**

Not accessed via the touchscreen. These are set up with default values.

<table>
<thead>
<tr>
<th>Fan Control</th>
<th>Zone Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device Object</strong></td>
<td><strong>Label</strong></td>
</tr>
<tr>
<td>AV-39</td>
<td>Fan Speed Demand (Analog) %</td>
</tr>
<tr>
<td>AV-5</td>
<td>Fan Stop Delay (Sec)</td>
</tr>
<tr>
<td>AV-82</td>
<td>Fan Runtime</td>
</tr>
<tr>
<td>AV-85</td>
<td>Medium Speed Fan Start SP</td>
</tr>
<tr>
<td>AV-86</td>
<td>Filter Runtime</td>
</tr>
<tr>
<td>AV-89</td>
<td>High Speed Fan Start SP</td>
</tr>
<tr>
<td>BV-16</td>
<td>Filter Alarm</td>
</tr>
<tr>
<td>BV-5</td>
<td>Fan Status</td>
</tr>
<tr>
<td>BV-59</td>
<td>Fan Auto - On</td>
</tr>
<tr>
<td>BV-72</td>
<td>Fan 3 speed - Low</td>
</tr>
<tr>
<td>BV-73</td>
<td>Fan 3 speed - Medium</td>
</tr>
<tr>
<td>BV-74</td>
<td>Fan 3 speed - High</td>
</tr>
<tr>
<td>BV-80</td>
<td>Enable Fan Speed Control</td>
</tr>
<tr>
<td><strong>Compressor Control</strong></td>
<td></td>
</tr>
<tr>
<td>AV-21</td>
<td>Compressor 1 Starts</td>
</tr>
<tr>
<td>AV-22</td>
<td>Compressor 2 Starts</td>
</tr>
<tr>
<td>AV-40</td>
<td>AC HP Mode Control</td>
</tr>
<tr>
<td>AV-68</td>
<td>AC HP Compr Start Demand %</td>
</tr>
<tr>
<td>AV-69</td>
<td>AC HP Compr Stop Demand %</td>
</tr>
<tr>
<td>AV-81</td>
<td>Runtime HP Compressor (App 10)</td>
</tr>
<tr>
<td>AV-87</td>
<td>Runtime Cooling Stage 1</td>
</tr>
<tr>
<td>AV-88</td>
<td>Runtime Cooling Stage 2</td>
</tr>
<tr>
<td>BV-21</td>
<td>Reverse Valve Action, 1 = cool</td>
</tr>
<tr>
<td>BV-22</td>
<td>1 = Cooling Locked Out</td>
</tr>
<tr>
<td>BV-27</td>
<td>1 = Heating Locked Out</td>
</tr>
<tr>
<td>BV-6</td>
<td>HP Fun Request</td>
</tr>
<tr>
<td>BV-7</td>
<td>Fan Request (AC Cooling)</td>
</tr>
<tr>
<td>BV-31</td>
<td>WS HP Water Loop OK</td>
</tr>
<tr>
<td><strong>Econimizer Control</strong></td>
<td></td>
</tr>
<tr>
<td>AV-10</td>
<td>Econimizer Position</td>
</tr>
<tr>
<td>AV-63</td>
<td>Econ. Damper Stroke Time</td>
</tr>
<tr>
<td>AV-60</td>
<td>Supply Air Low temp Limit</td>
</tr>
<tr>
<td>AV-66</td>
<td>Econ. Min. Position</td>
</tr>
<tr>
<td>AV-11</td>
<td>Float Point Econ. Position</td>
</tr>
<tr>
<td>BV-20</td>
<td>Supply Air Low Limit Alarm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupancy/Standby</th>
<th>Residential Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BV-4</strong></td>
<td>In Standby Mode</td>
</tr>
<tr>
<td><strong>BV-63</strong></td>
<td>Door Open</td>
</tr>
<tr>
<td><strong>BV-62</strong></td>
<td>No Motion Since Door Closed</td>
</tr>
<tr>
<td><strong>BV-149</strong></td>
<td>Wireless Installed</td>
</tr>
<tr>
<td><strong>BV-67</strong></td>
<td>Occupied</td>
</tr>
<tr>
<td><strong>BV-60</strong></td>
<td>Window/Door Open (Wireless)</td>
</tr>
<tr>
<td><strong>BV-61</strong></td>
<td>No Motion Since Dr Clsd (Wireless)</td>
</tr>
<tr>
<td><strong>AV-20</strong></td>
<td>Standby Delay (Sec)</td>
</tr>
<tr>
<td><strong>BV-81</strong></td>
<td>Hotel Mode</td>
</tr>
</tbody>
</table>