CONTROLLER INSTALLATION OPERATION & QUICK START

Controller: 8403-066
ECU Series Controller

Manual: 2100-559
Supersedes: ***NEW***
File: Tab 19
Date: 05-02-11

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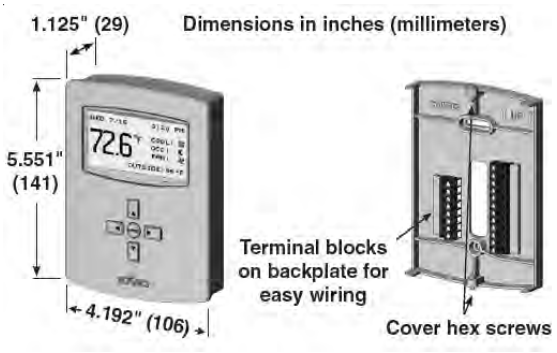
***INSTALL NOTE:** For optimum temperature sensor performance, the Bard ECU-Series Controller must be mounted on an interior wall and away from any heat sources, sunlight, windows, air vents, air circulation obstructions, and/or any other cause of erratic or false temperature sensing.

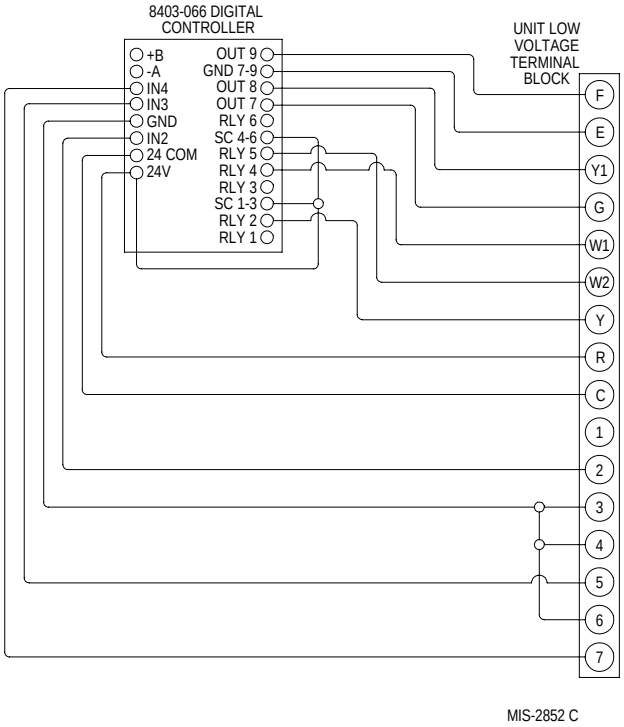


Controller Installation: Mounting controller

1. Complete rough-in wiring using a minimum 18 AWG control wiring, see **Controller Connections**: **Control Wiring** for exact number of conductors.
2. Turn the hex screws in the bottom and top of Controller clockwise (inward) until they clear the cover. Remove Base Plate from controller.
3. Route completed wiring through Base Plate.
4. With the embossed "UP" arrows of the Base Plate pointing to the ceiling, fasten the Base Plate to the desired wall location or vertical 2x4 wall handybox.
5. Make appropriate control wire connections (see **Controller Connections**: **Control Wiring**) to the terminal blocks.
6. Replace Controller over Base Plate, being careful not to pinch/dislodge connections.
7. Turn hex screws in bottom/top of Controller counter-clockwise (outward) to secure cover.

Controller Connections: Control Wiring

Attach control wiring per control wiring diagram/terminal legend below.



MIS-2852 C

Terminal	Function	Type	Form
+B	MSTP + (not used)	Communications	
-A	MSTP - (not used)	Communications	
IN4	Outdoor Temperature Sensor	Input	10K OHM Type 3
IN3	Pressure Transducer	Input	0-5 VDC, 0-700 PSIG
GND	Sensor Grounds	Input	
IN2	Lockout Alarm	Input	Relay Closure
24 COM	24VAC Com	Power	
24V	24VAC	Power	
OUT 9	Fan Motor Control	Analog Output	0-10VDC
GND7-9	Control Ground	Analog Output	
OUT 8	Unloader Solenoid Control	Analog Output	0 or 5VDC PWM
OUT 7	Blower Motor Control	Analog Output	0-10VDC
RLY 4	Heater Contactor #1	Relay Output	Relay
SC 4-6	24VAC to Relay Outputs 4-6	Power	
RLY 5	Heater Contactor #2	Relay Output	Relay
RLY 6	(not used)		
RLY 3	(not used)		
SC1-3	24VAC to Relay Outputs 1-3	Power	
RLY 2	Compressor Contactor	Relay Output	Relay
RLY 1	(not used)		

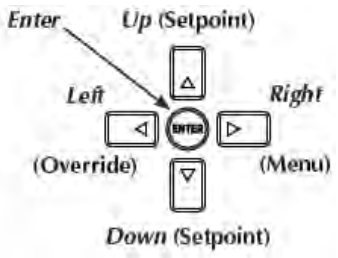
START-UP NOTE: Upon initial power-up, indoor fan will cycle on for approx. 30 seconds, and then shut off. System will be in the "OFF" position. Default time and date will be 12:00 a.m., Jan. 1, 2000.

- In order for the system to operate in either heating or cooling mode(s), the controller must be initially programmed with specific HVAC model number, specific System Enabling, and appropriate temperature Setpoints.

<u>Basic Operation</u>: Home, Main Menu, and Override Screens

Navigate the menus and change settings by pressing a combination of various arrow buttons and the Enter button. Push the:

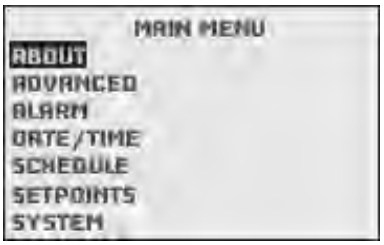
- ***Enter*** button to select and/or exit value editing
- ***Up*** or ***Down*** button to move among entries
- ***Right*** or ***Left*** button to move among value fields
- ***Left*** button to return to the home screen



<u>Quick-Start Programming</u>: Model Selection, System Enabling, and Temperature Setpoints

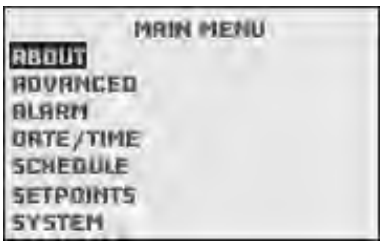
Model Selection – to select specific HVAC unit model from the **Home Screen**, press:

1. ***Right*** button to access the **Main Menu** Screen
2. ***Down*** button through entries to highlight **Advanced**
3. ***Enter*** button to select **Advanced** and enter **Advanced** Screen
4. ***Enter*** button again to select/enter **Applications Screen**
5. Controller will ask for **Admin Level Password**
   Factory Default **Admin Level Password**: **BARD**
6. ***Down*** button to highlight **Additional Setup**
7. ***Enter*** button to select/enter **Additional Setup** Screen
8. ***Enter*** button again to select/enter **Unit Model** Screen
9. ***Enter*** button again to highlight current model
10. ***Up/Down*** buttons to choose from available models:
    - **W3*V** Model – Wall Mount 3-Ton Variable Capacity System (Factory Default)
    - **W5/6*V** Models – Wall Mount 4/5-Ton Variable Capacity Systems
    - **P60/72*V** Models – Packaged 5/6-Ton Variable Capacity Systems
11. ***Enter*** button to select/save appropriate model
12. ***Left*** button (5x) to navigate back to Home Page

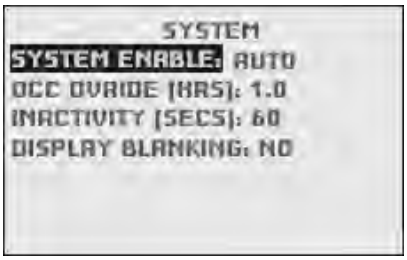


System Enabling – to access system types from the **Home Screen**, press:

1. ***Right*** button to access the **Main Menu** Screen
2. ***Down*** button through entries to highlight **System**
3. ***Enter*** button to select **System** and enter **System Screen**
4. ***Enter*** button again to select **System Enable**
5. ***Up/Down*** buttons to choose between six (6) options.



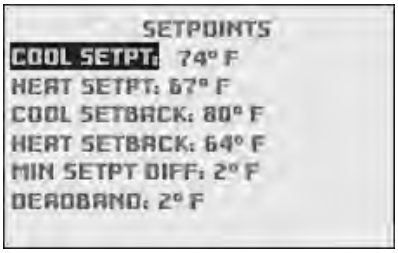
System Enabling (Cont'd.)



Auto: Conventional System in "Auto-Changeover" mode. HVAC system will cycle heating and cooling automatically to stay within preset heating and cooling Setpoints.
Heating: Conventional System in "Heating-Only" mode. HVAC system will cycle heating in reference to Heating Setpoint only. Unit will not activate cooling sequence.
Cooling: Conventional System in "Cooling-Only" mode. Setpoint only. Unit will not activate heating sequence. HVAC system will cycle cooling in reference to Cooling
Off: HVAC system is inactive.
CCVC: "Continuous Compressor, Variable Capacity" application in auto-changeover mode. HVAC system will cycle heating and cooling automatically to stay within preset heating and cooling setpoints. Compressor will modulate from 100% to 20%, but will not shut off. Typically used for applications where cycling of compressor is not allowable due to use of on-site generators – an MRI Mobile Trailer, for instance.
CCFC: "Continuous Compressor, Full Capacity" Application in auto-changeover mode. HVAC system will cycle heating and cooling automatically to stay within preset heating and cooling setpoints. Compressor will not modulate, but will stay at 100% capacity and will not shut off. Typically, this mode is selected for testing purposes only.

***NOTE**: Upon initial start-up of any system-enable utilizing compressor, the unit may undergo a series of self-diagnostics, wherein a series of audible "clicks" are heard. This may delay compressor function for up to 5-minutes.

6. ***Enter*** button to select chosen operational mode
7. ***Left*** button to navigate back to **Main Menu** Screen
8. ***Left*** button to navigate back to **Home Page**



Temperature Setpoints – to access Setpoints from Home Screen, press:

1. ***Right*** button to access **Main Menu** Screen
2. ***Down*** button through entries to highlight **Setpoints**
3. ***Enter*** button to select **Setpoints** and enter **Setpoints** Screen
   - Use the ***Up/Down*** buttons to scroll through setpoints
     Cool Setpt / Heat Setpt are for occupied periods
     Cool Setback / Heat Setback are for unoccupied periods, and will only be used if scheduling is enabled (see the **Advanced Programming** section)
     Min Setpt Diff is the closest the Heating and Cooling setpoints can come to one another. (3°F is recommended minimum)
     Deadband is the space in degrees from setpoint in which the Cooling and/or Heating sequence will modulate to 100% capacity (2°F is recommended minimum).
4. ***Enter*** button to select specific Setpoint option
5. ***Up/Down*** button to enter specific degree amount for setpoint
6. ***Enter*** button to save new setpoint.
7. ***Left*** button to navigate back to **Main Menu** Screen
8. ***Left*** button to navigate back to **Home Page**

*NOTE: Although the cooling/heating setpoints can be accessed by simply pressing the arrow keys during normal operation, any changes made in this fashion will be for a specific length-of-time as an "override" feature only. This temperature change will not be permanent. See the **Advanced Programming** section for further information.

<u>NOTE</u>: Any system start-up conducted with indoor ambient temperatures lower than 56°F or above 86°F will experience an internal Low-Temperature or High-Temperature alarm. This will not affect normal operation, and can be cleared easily. See the **Advanced Programming section for further information. Start-up procedures conducted with extreme temperatures indoors/outdoors may cause a "SERVICE" warning flashing on the face of the controller. This also will not affect normal operation, and should clear itself once interior temperatures and refrigerant pressures normalize.

***<u>NOTE</u>: ECU-Series Controller will become sluggish/inoperable at extremely low temperatures (< 20°F). Care should be taken to warm controller before initial start-up.

ECU-Series Controller should be fully operational at this point. For further controller enhancement or operation detail, please consult the **Advanced Programming** section.