eco-Air Series

EVAPCO Controller Quick Start Guide

AIR COOLED · ADIABATIC · FLUID COOLERS · CO_2 GAS COOLERS · REFRIGERANT CONDENSERS



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Product Preparation

After rigging, piping, and wiring the unit the next step is to perform the initial start-up and verify basic functionality. All products supplied with capacity control equipment (Variable Frequency Drive, EC motor controllers, adiabatic air precooling systems) are 'turn-key' products and have been factory tested and temperature/pressure setpoints have been pre-programmed with the submitted design criteria.

WARNING: If unit is equipped with a VFD, the capacitors must be restored to their full performance before the motor is started. Failure to follow the instructions below can result in equipment damage.

To restore the capacitor in the VFD:

1. Close and secure the enclosure door and rotate the disconnect into the 'ON' position to apply mains voltage to the drive. Leave the drive energized for an hour. During this hour, the unit must not be run under any circumstance:
    a. When the HMI powers on, ensure unit status is set to 'OFF by HMI', shown on the bottom of the screen.
    b. Do not turn the unit on in manual mode in the service screen.
        - To check if manual mode is off, navigate to 'Menu', login to 'Service', select the 'Manual' button, and ensure the 'Manual Mode:' toggle is disabled.
    c. Do not run the unit through the IO testing in the service screen.
        - To check if IO testing is off, navigate to 'Menu', login to 'Service', select the 'I/O Test' button, and ensure the 'Enable I/O Test:' toggle is set to off.
2. After an hour has passed, power off the unit and continue with the following instructions.

1. Install Temperature/Pressure Sensors

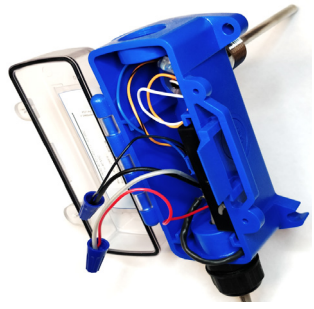
Temperature Sensor for Dry Coolers

The dry cooler temperature sensor and thermowell are supplied loose (located in the control panel) and should be installed by the customer into the common return pipework running back to the process. The thermowell has 1/2" NPT threads.

Note: The thermowell should be orientated vertically and a small amount of thermal paste added to the thermowell before the sensor is inserted. The thermal paste ensures a more accurate fluid temperature measurement. For units equipped with a mounted control panel, a small junction box is located on the coil connection end and will be factory wired from the main control panel. **Wire the temperature sensor to this junction box.** For units equipped with a common terminal box and a remotely mounted control panel, **the wiring should be made directly to the remote mounted control panel.** The recommended cabling for this connection is 2C-Shielded equivalent to Belden 3076F *(refer to wiring diagram provided with submittal)*

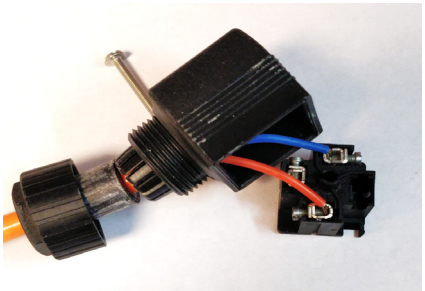
Pressure Transducer for Air Cooled Condensers

The air-cooled condenser pressure transducer is supplied loose (located in the control panel) and should be installed in the common hot gas inlet pipework for the unit. The pressure transducer has 1/4"-18 NPT threads. For units equipped with a mounted control panel, a small junction box is located on the coil connection end and will be factory wired from the main control panel. **Wire the pressure transducer to this junction box.** For units equipped with a common terminal box and a remotely mounted control panel, **the wiring should be made directly to the remote mounted control panel**. The pressure transducer is equipped with a DIN style connector. Ensure that the wiring is connected to the correct pins by referencing the leaflet provided with the transducer. The recommended cabling for this connection is 2C-Shielded equivalent to Belden 3076F *(refer to wiring diagram provided with submittal)*



Temperature Sensor (Fluid Cooler)

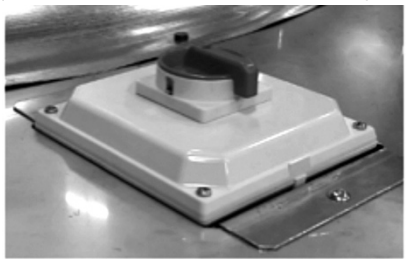




Pressure Transducer (Condenser)

2. Turn Power On

Ensure all disconnect switches (optional) at each fan motor are in the 'ON' position.



Fan Motor Disconnect (optional)

Ensure that all Manual Motor Protectors (MMP) and Circuit Breakers are in the 'ON' position.



MMP in Control Panel



Off Position



On Position

Close and secure all latches on the control panel door and turn 'ON' the main disconnect switch on the outside of the panel.



Main Disconnect in OFF Position

Once power is turned on, the EVAPCO Controller will initialize by going through a sequence of start-up procedures. Wait until after the EVAPCO logo has been displayed on Human Machine Interface (HMI) indicating a successful start-up. (approx. 30 seconds)

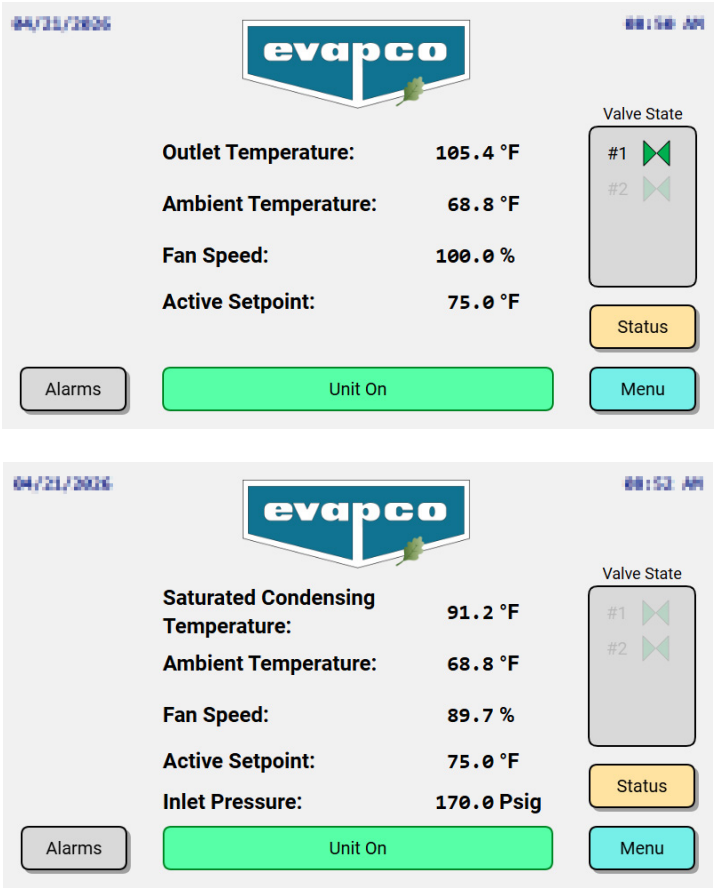
If the red fault lamp illuminates after controller is started, refer to the Controller User's Manual for instruction on accessing the alarms screen and what the potential problem is.



EVAPCO Controller Loading Screen

3. Verify Proper Sensor Reading

The eco-Air EVAPCO Controller is equipped to monitor two sensors for operation. Fluid coolers utilize an immersion temperature probe and thermowell, while the air-cooled condenser uses a pressure transducer. Both applications use an ambient temperature sensor. The EVAPCO Controller is configured prior to shipment based on the sensors provided. After the controller boots up, the Home screen will be displayed and both sensors will be viewable. The reading of the *Ambient Temperature* sensor should reflect the current temperature around the control panel enclosure. The *Outlet Temperature* for the fluid cooler will reflect the temperature reading of the process fluid through the unit, or the ambient temperature if no process fluid is yet present in the coils. The *Saturated Condensing Temperature* is a calculation based on the *Inlet Pressure* reading of the condenser. The *Inlet Pressure* reading should be compared to the current pressure of the refrigerant charge in the system. If there is no charge, the pressure reading will read near zero Psig.



Home screen for dry coolers and air-cooled condensers

If the temperature and/or the pressure sensor readings do not reflect the current state of the unit check the wiring diagram to ensure the sensors have been connected properly. Refer to the Controller User's Manual for instructions on applying a linear offset to a sensor or calibrating the 4-20mA signal with a meter.

4. Verify Fan Rotation (NEMA Style Motors Only)

Note: EC motors do not have a Bypass/Off/Auto switch and do not require this step.

Verify correct fan rotation **(NEMA motors only).** Bump test fan motors by turning Bypass/Off/Auto switch to Bypass for 5-10 seconds. Verify fan rotation matches direction of indicator arrows on fan cowl. If fans rotate in the opposite direction, switch phasing of main power connection. When complete, turn switch to AUTO position.



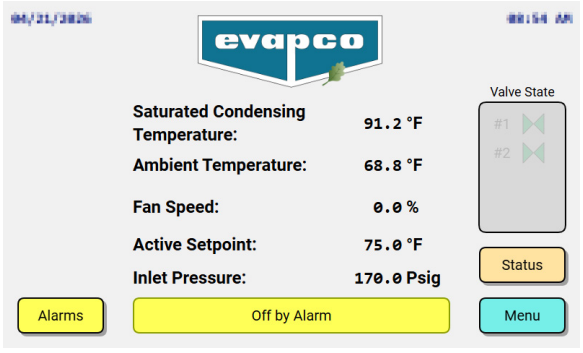
HMI, VFD and Bypass/ Off/Auto Switch for NEMA Motors

5. Turn Unit On

On the HMI you will see the home screen below.

Note: The controller's setpoint is factory set to the design temperature/pressure.

Note: If the Alarms button is highlighted yellow, there is an active alarm. Press the Alarms button to go directly to the alarm menu.



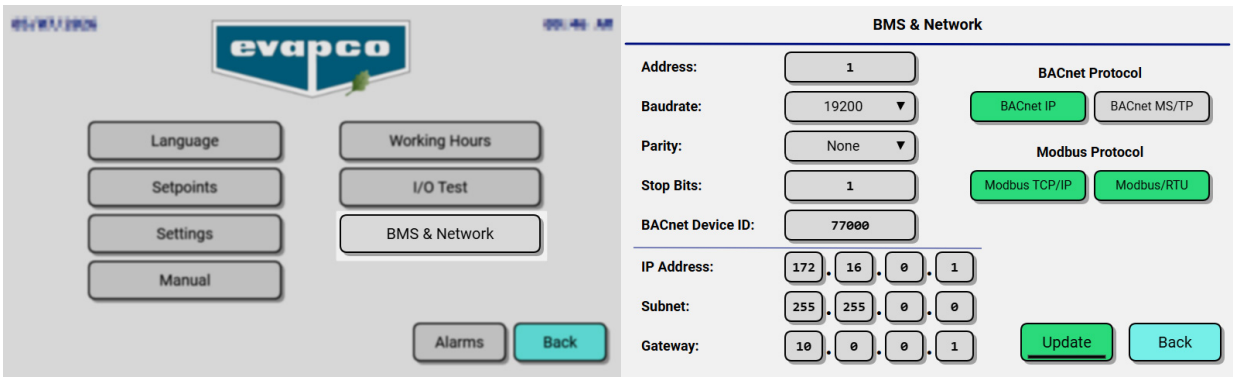
EVAPCO Controller Home Screen

The fan motors are turned off in the controller as default. This is to prevent unexpected fan start up during commissioning.

Navigate to the Main Menu by pressing the Menu button.

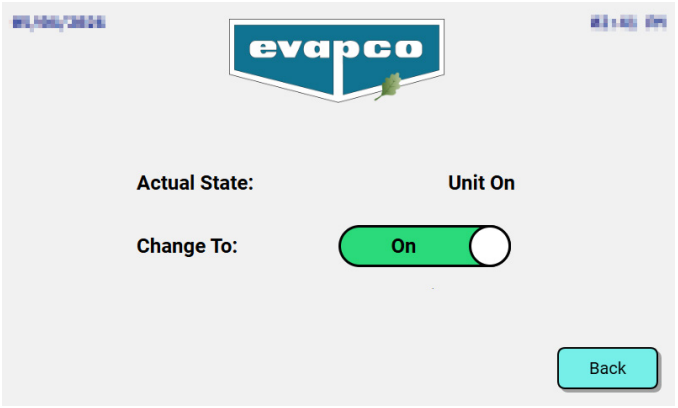
Caution: The following step has the potential to cause the fans to rotate. Please be sure that the fans are unobstructed and may be operated safely.

In the Main Menu, press the On/Off Control. On the following screen, press the toggle switch to turn the unit on.



Unit Main Menu and On/Off screens

After selecting the toggle switch, the unit state will turn on. If the measured process temperature is greater than the current setpoint, the fans will begin to rotate.

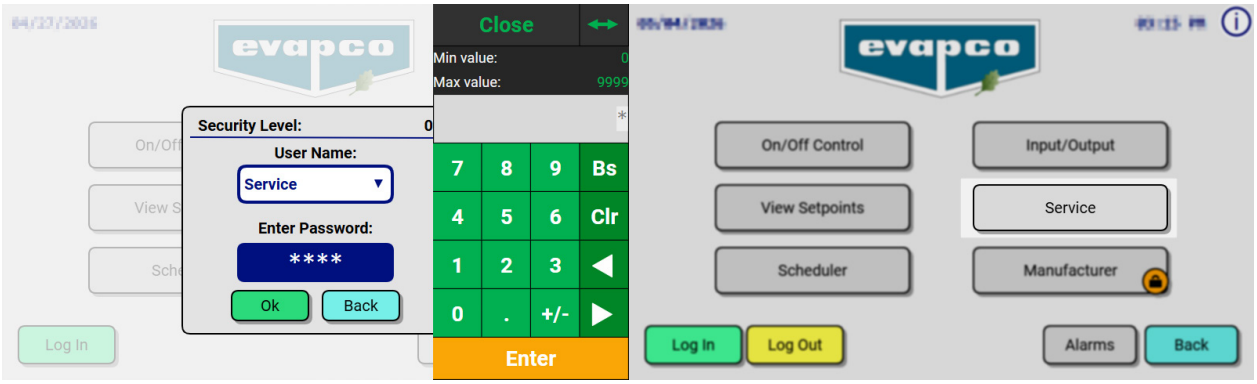


eco-Air Unit Turned On Locally

6. Verify Operation/Manual Mode

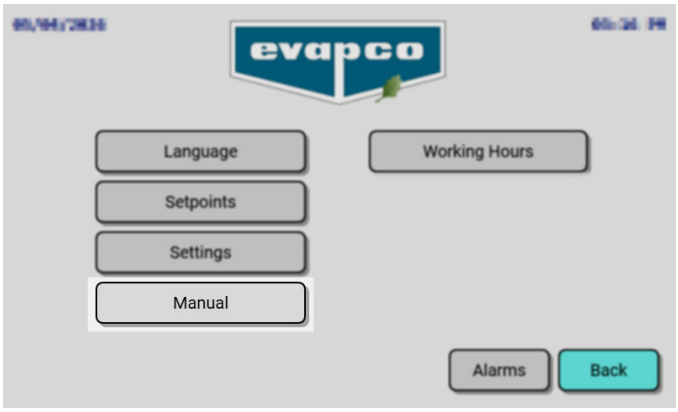
The operation of the fan speed may be done manually through the Service screen. To test whether the controller is functioning properly, and the motors are connected correctly, the fans should be run manually.

From the Main Menu, press the Log In button and enter password 1234 to unlock the Service button.



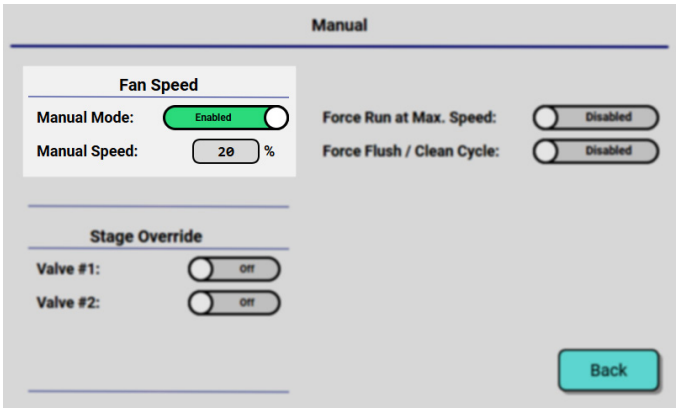
Service Menu Login

While in the Service menu, select the Manual button:



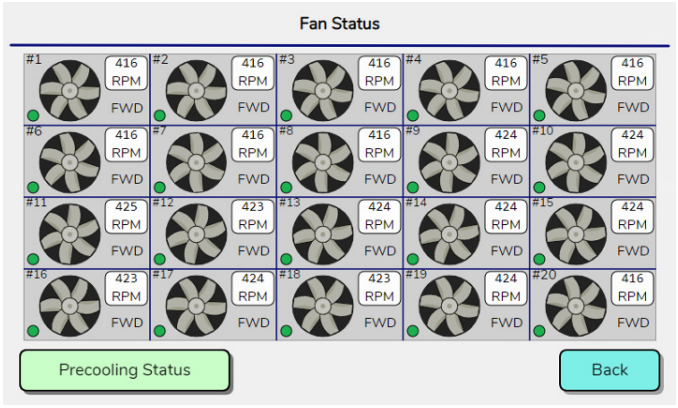
Service Submenu Manual Button

Set the Manual Speed percentage to the lowest advisable value; for NEMA motors 20% and EC type motors 10%. Press the enable button for Manual Mode to take effect and the reference fan speed to be set as the Manual Speed percentage. Various other speeds can be tested by changing the value of the manual speed percentage.



Manual Fan Speed Control Enabled

For units equipped with EC type fans, the Status button on the Home screen will direct the user to the Fan Status screen. From this screen the communication status of the fan and the RPM feedback can be read to determine proper functionality. Reference the Controller User's Manual for more information on the Status Screen.



Fan Status Screen

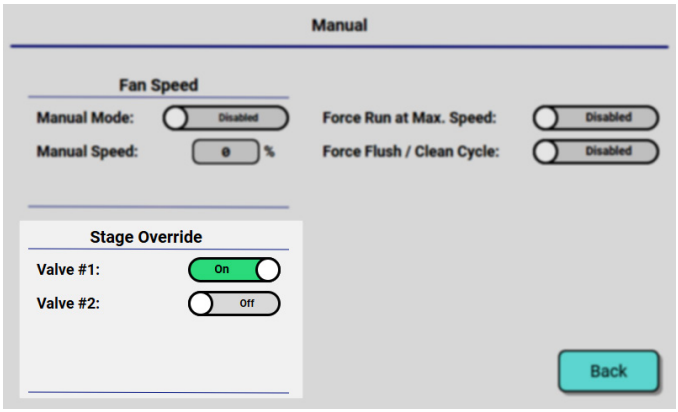
Be sure to disable the manual speed control after testing is complete.

7. Verify Adiabatic Operation

(Adiabatic models only) Products incorporating adiabatic air precooling systems are fitted with a solenoid valve to control adiabatic operation. During normal operation, the adiabatic system is not triggered until the fans are running at 100% speed and the set point is not satisfied.

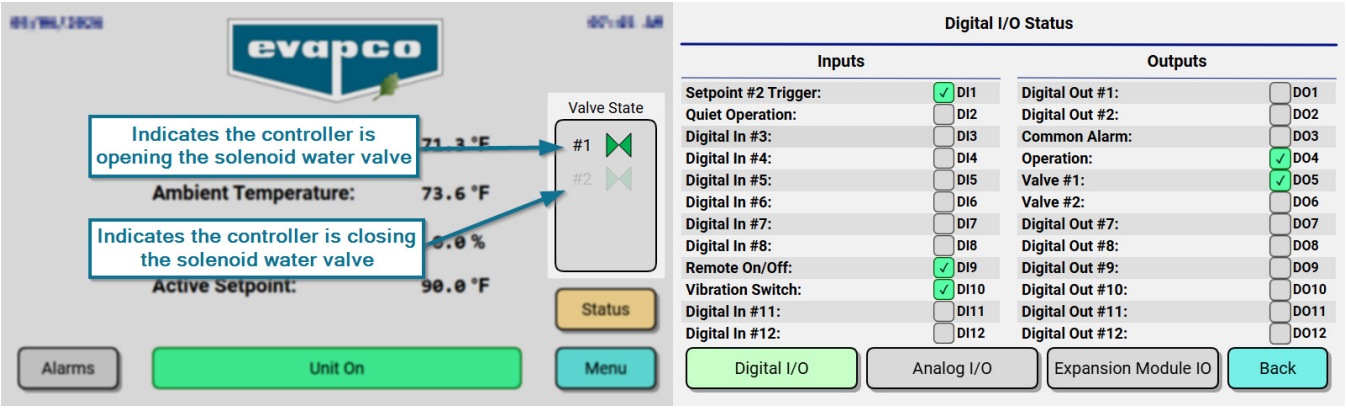
During the testing phase, confirm that the isolation valve is open, and water is flowing sufficiently through the system to either wet the adiabatic pads or provide a uniform spray pattern depending on which precooling system has been attached to the unit. For units equipped with the PuRe-JET adiabatic system, each override will control a side of the unit. That will include the main feed and makeup solenoids.

To manually force the operation of a valve, navigate to the Manual screen in the Service submenu and turn each valve on. Only the number of valves the unit is equipped with need testing.



Manual Valve Opening Enabled

The state of the valve output can either be verified on the Home screen or on the Digital I/O Status screen via the Main Menu and Input/Output section.



State of Valve Output on Home Screen and Digital I/O Status Screen

Note: The default ambient temperature cut off for adiabatic system operation is **below 40°F.**

Be sure to turn Off the Stage Override for all of the valves after testing is complete.

General Comments

Typically, the only parameter requiring adjustment is the setpoint, which is the temperature or pressure that the controller is maintaining by varying the air volume via adjusting the fan speed, or adiabatic system solenoid (if equipped).

Each controller has its own set of programmable parameters. Should there be a need to adjust or fine tune the behavior of the unit, consult the Controller User's Manual.

If connecting to a Centralized Control System or Building Management System, consult the Controller User's Manual and the Communication Guide.

EVAPCO PRODUCTS ARE MANUFACTURED WORLDWIDE.

Notes

Notes

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