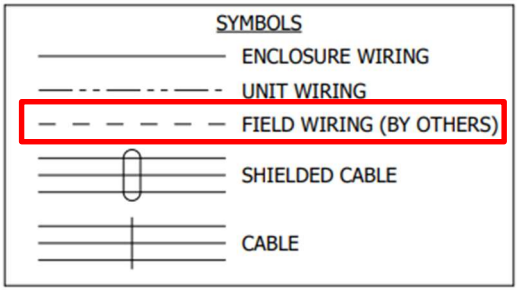
Product Preparation

After rigging and piping the unit, the next step is to check field wiring and perform the initial start-up to verify basic functionality.

1. Field Wiring

Field Wiring Information

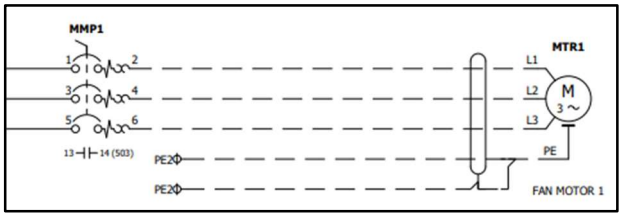
The wiring schematic for the Sage Control Panel is located on the inside of the door in the drawing pocket. All field wiring is to be provided by others, any dashed line on the schematic signifies a wire that needs to be provided by others. Please follow the checklist below to verify all field wiring has been completed.



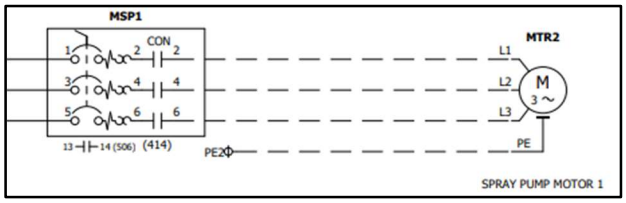
Field Wiring Symbol.

High Voltage, 3 Phase Field Wiring

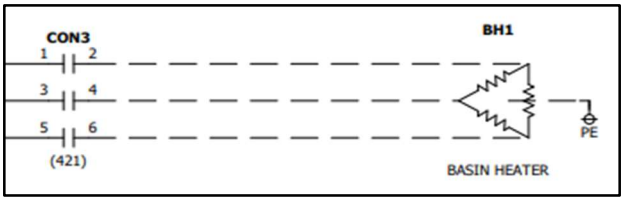
- ○ Fan Motor (up to 4 per unit)



- ○ Spray Pump Motor (1 per cell)

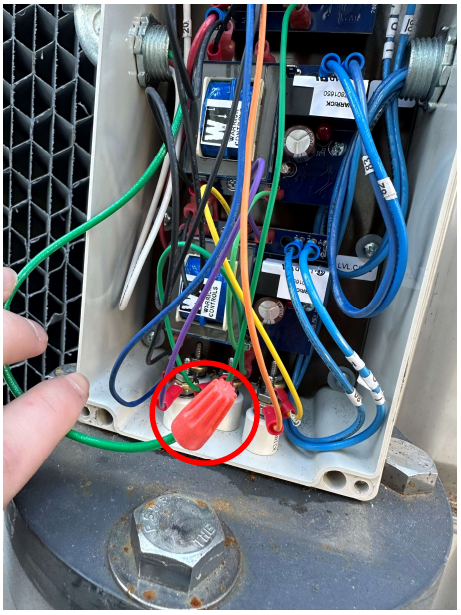


- ○ Basin Heater (up to 2 per cell)



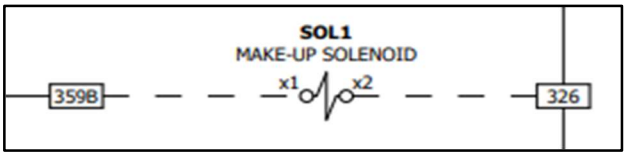
120 VAC Field Wiring

Note: The Electronic Water Level Controller (EWLC) contains a floating ground, no electrical ground is required. If a ground wire is run to the EWLC simply cap the wire, **DO NOT PLACE IT ON A TERMINAL.** If the ground wire is placed on one of the terminals it will affect the functionality of the EWLC. Only run wiring to the terminals listed in the wiring schematic.

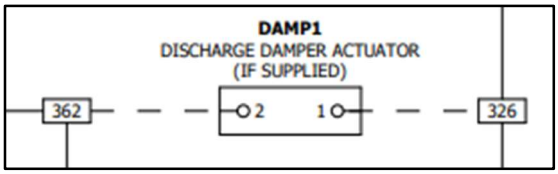


Wire Nut Applied to Ground Wire.

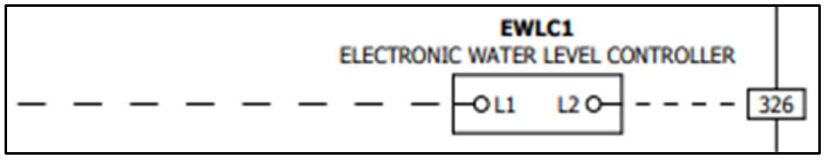
- ○ Make-up Solenoid (1 per cell)



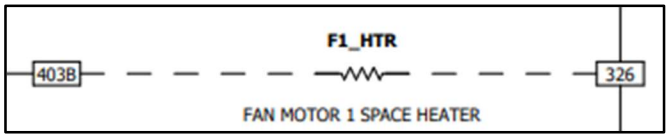
- ○ Discharge Damper Actuator (if supplied: 1-2 per fan)



- ○ Electronic Water Level Controller (1 per basin)

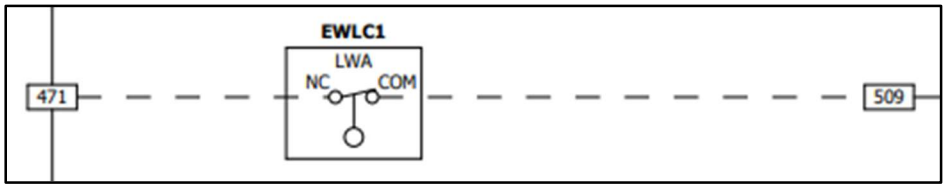


- ○ Fan Space Heater (1 per fan)

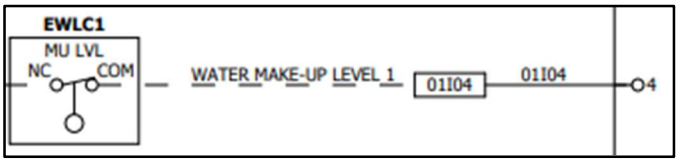


24 VDC Field Wiring

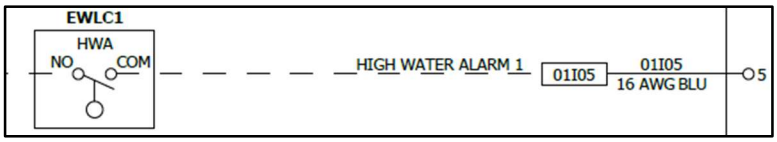
- ○ Low Water Alarm Signal (1 per EWLC)



- ○ Make-up Level Signal (1 per EWLC)

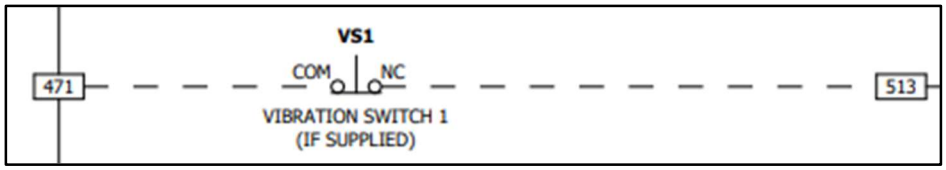


- ○ High Water Alarm Signal (1 per EWLC)

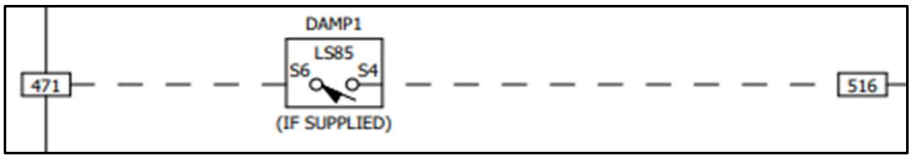


- ○ Flow Switch Signal (1 per pump)

- ○ Vibration Switch Signal (if supplied: 1 per fan)



- ○ Discharge Damper Signal (if supplied: 1 per fan)



- ○ Analog Input Sensors

  Note: For every fluid temperature RTD there is a thermowell. Install the correct length thermowell for the corresponding RTD. Reference the sensor layout in the submittal for proper sensor location. For multiple-cell configurations, be sure to place the common water temperature sensor at a location where **ALL** units leaving fluids meet. **DO NOT** place the common outlet sensor in the unit's leaving fluid piping of just one cell. In situations where there are multiple Sage systems, do not place the common leaving temperature probe of one system where it meets the fluid of another system.

  - ○ Leaving Fluid Temperature (1 per cell)
  - ○ Entering Fluid Temperature (1 per cell)
  - ○ Common Leaving Fluid Temperature (if multiple cell configuration: 1 per unit)
  - ○ Basin Water Temperature (1 per basin)

- Ambient Temperature (1 per system)

⚠Caution: The following step will likely cause the fan(s) and pump(s) to rotate. Ensure that the fan(s) and pump(s) are unobstructed and may be operated safely. Verify water is provided in the unit's basin so pump(s) may be operated safely.

2. Turn Power On

For each MMP, locate the motor it is protecting and the motor's nameplate. On the motor nameplate, note the FLA of the motor. Use a screwdriver to rotate the highlighted dial in the figure below to the FLA value read from the motor nameplate.

MMP Trip Setting Dial.

Ensure all Manual Motor Protectors (MMP) are in the ON position in the control panel.

MMP in the OFF ("O") Position.

MMP in the ON ("I") Position.

Ensure all circuit breakers **OTHER THAN THE MAIN CIRCUIT BREAKER** are in the ON position.

Circuit Breakers are in the up position, shows “ON” or “I” symbol.

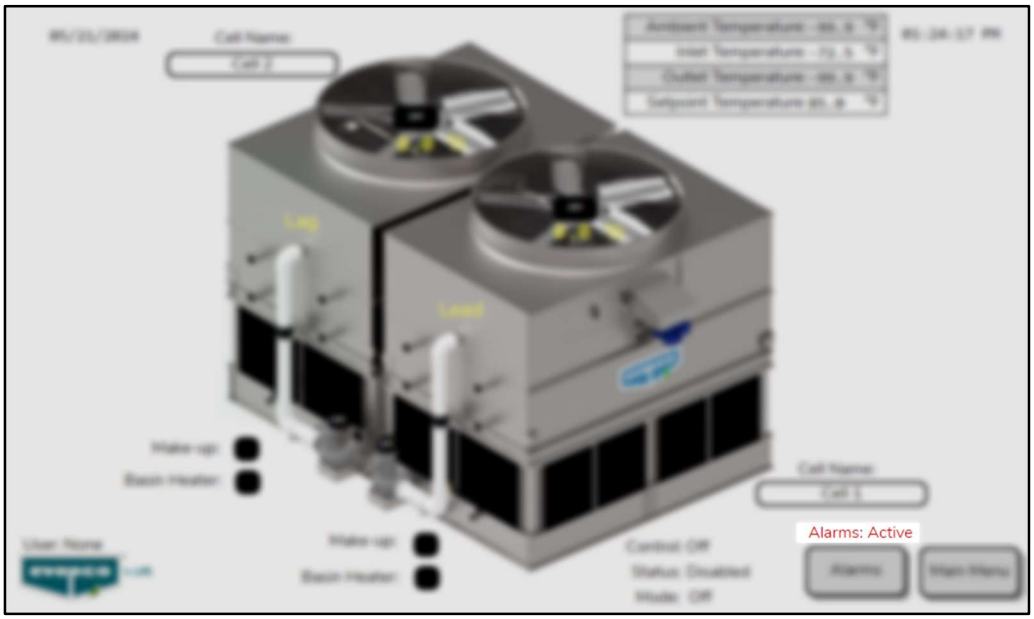
Close and secure all latches on the control panel door, turn ‘ON’ the main disconnect switch on the outside of the panel.

Main Disconnect in the “OFF” Position.

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

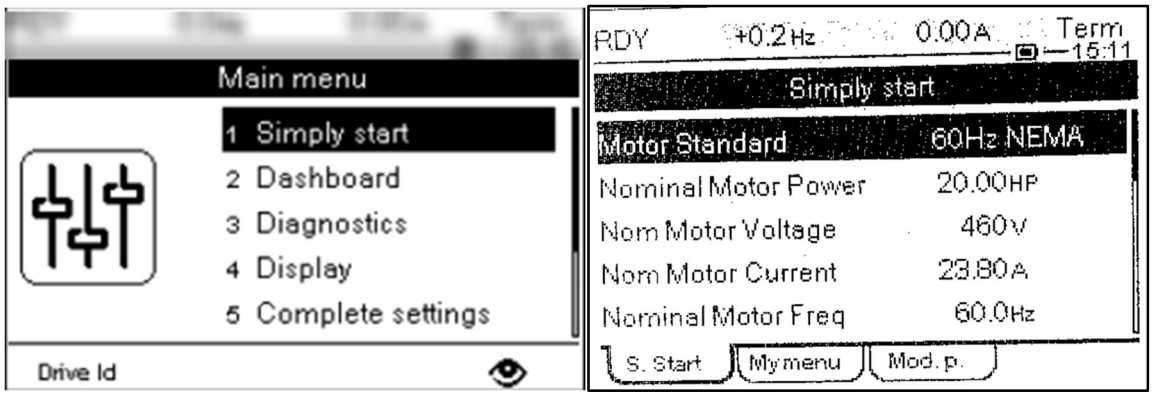
Welcome Screen

If the red flashing **Alarms: Active** message is displayed on the **Home Screen** after the controller is started, refer to the Evapco Sage Controller O&M Manual for instructions on accessing the **Alarms** screen.



Active Alarms Message

Next to the HMI in the outer enclosure of the control panel is the VFD HIM Display. Press the ESC button on the VFD HIM Display to reach the **Main Menu** screen. Select the **1 Simply Start.**



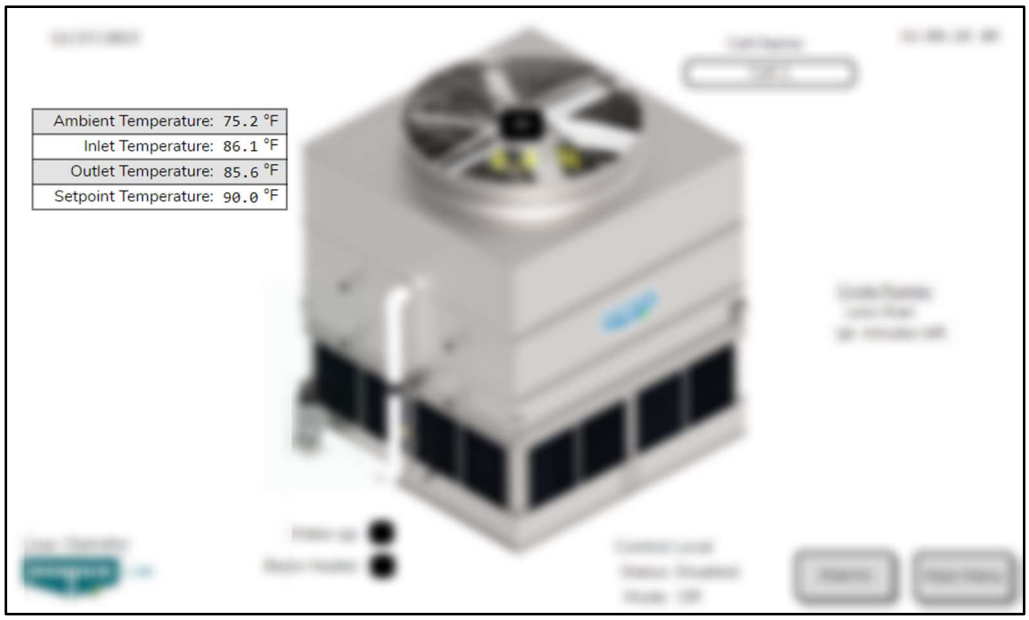
VFD HIM Display Screens

Within the **Simply Start** menu, update the following parameters to match what is listed on the motor nameplate. After updating parameters, power cycle the control panel.

- Motor Standard
- Nominal Motor Power
- Nom Motor Voltage
- Nom Motor Current
- Nom Motor Freq
- Nominal Motor Speed

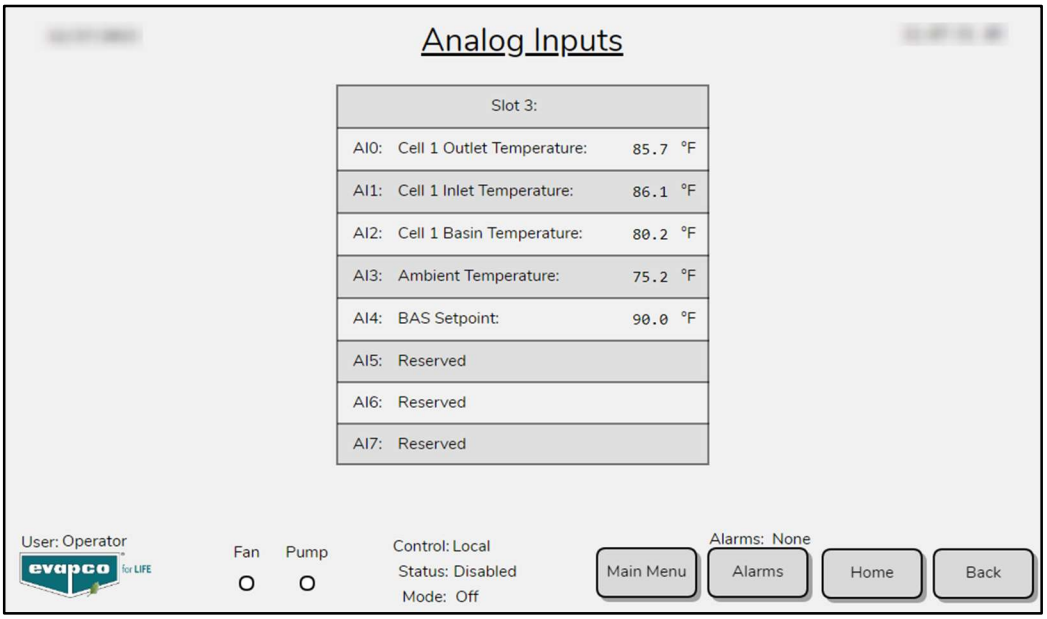
3. Verify Proper Sensor Readings

There are three temperature sensor readings on the **Home Screen**: Ambient, Inlet, and Outlet temperatures. For multi-cell configurations, the Common Outlet Temperature will be displayed as the Outlet Temperature.



Home Screen Temperatures and Setpoints

For a list of all temperature sensor readings, navigate to the **Analog Inputs** screen on the **Main Menu**.

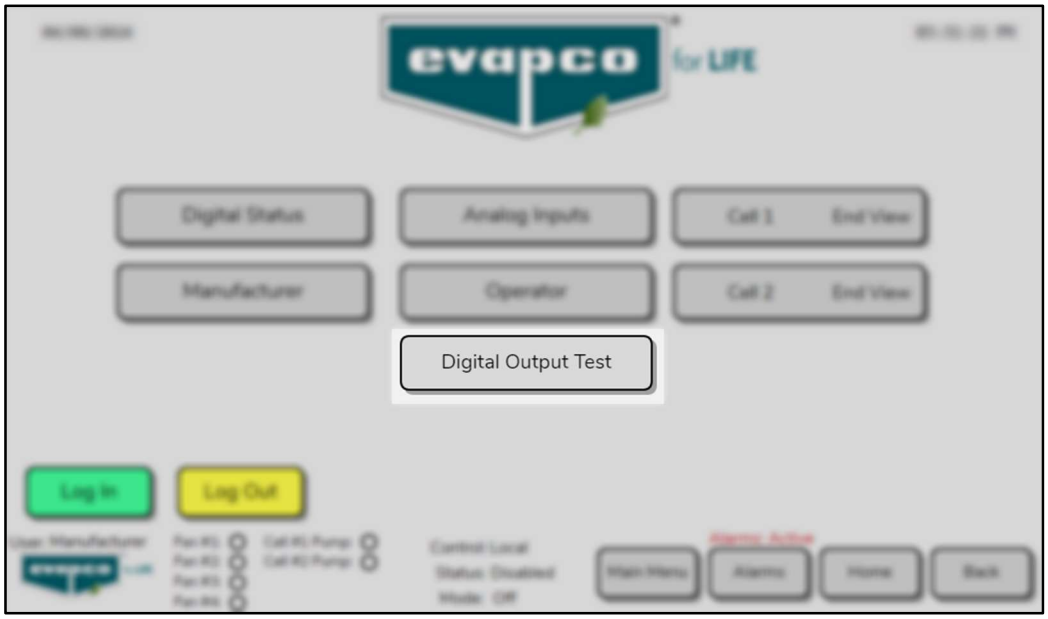


Analog Input Temperature Readings

If the temperature readings do not reflect the current state of the unit, check the wiring diagram to ensure the sensors have been wired properly. Refer to the Evapco Sage Controller O&M Manual on how to apply an offset to a sensor or calibrating the 4-20mA signal with a meter.

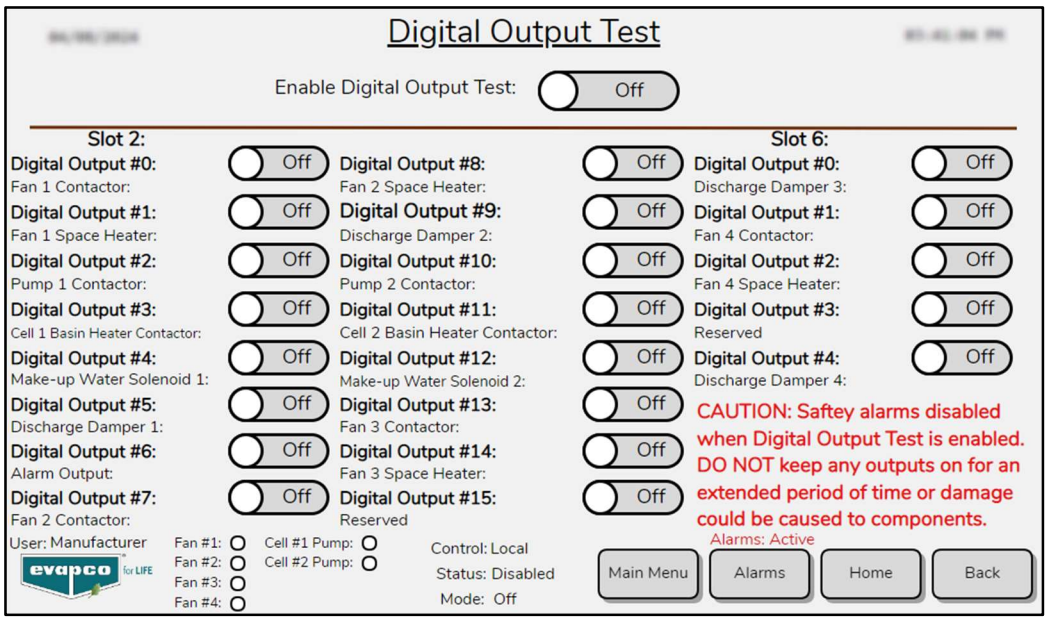
4. Verify Component Functionality Using the Digital Output Test.

Login to the Service level at the **Main Menu** and make sure the Sage System is not enabled in the **Setup Options** screen. After logging in, navigate to the **Digital Output Test** screen on the **Main Menu**.



Digital Output Test Screen Location

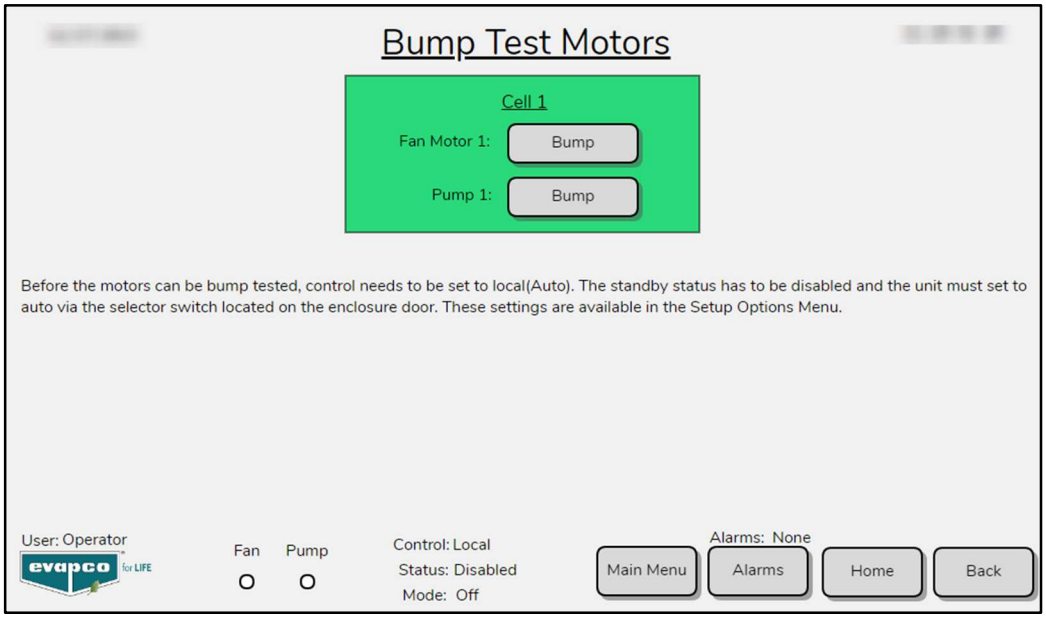
First, enable the **Digital Output Test**, then turn on/off each digital output to check that the system responds correctly. **DO NOT** leave digital outputs on for an extended period as this could cause damage to components. Also, remember to **TURN OFF THE DIGITAL OUTPUT TEST** when testing is complete.



Digital Output Test Screen

5. Verify Fan and Pump Rotation

Navigate to the **Bump Test** screen from the **Operator Menu** to verify the fan(s) and pump(s) are rotating in the correct direction. Reference the instructions on the screen to verify that the correct parameters are set to perform the bump test. The following steps may require two people to perform, one operator and one observer at the device. When the fan motor is bump tested it will run at 50% fan speed for five seconds. Verify fan rotation matches direction of indicator arrows on fan cowl. When the pump is bump tested it will also run for five seconds. Verify the pump rotation matches the direction indicated on the pump housing. If fan(s) or pump(s) rotate in the incorrect direction, switch two legs of the power connection at the output of the respective pump or fan motor MMP in the control panel.

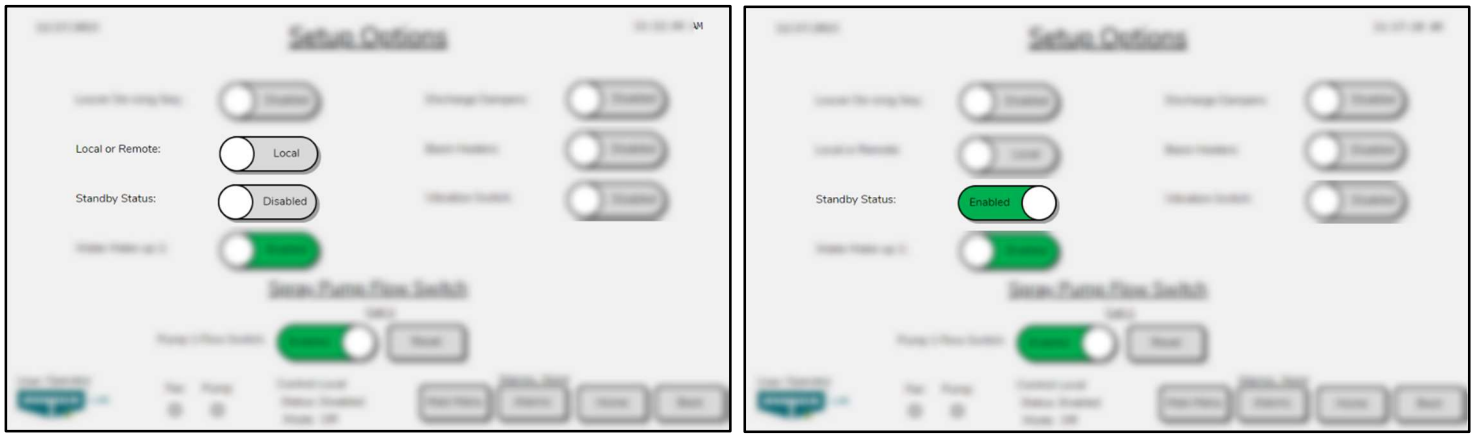


Bump Test Screen

6. Manual Operation Testing

By default, the unit status is disabled to prevent unexpected fan(s) or pump(s) energization during commissioning. Be sure there are no alarms for the pump(s) or fan(s) before energizing them. Active alarms must be resolved before running the fan(s) or pump(s). Navigate to the **Setup Options** screen, check the unit is in Local control and enable the Standby Status toggle switch.

Note: In Auto, the controller's Control Temperature Setpoint is factory set to the design temperature given for unit selection.



Enabling the Standby Status

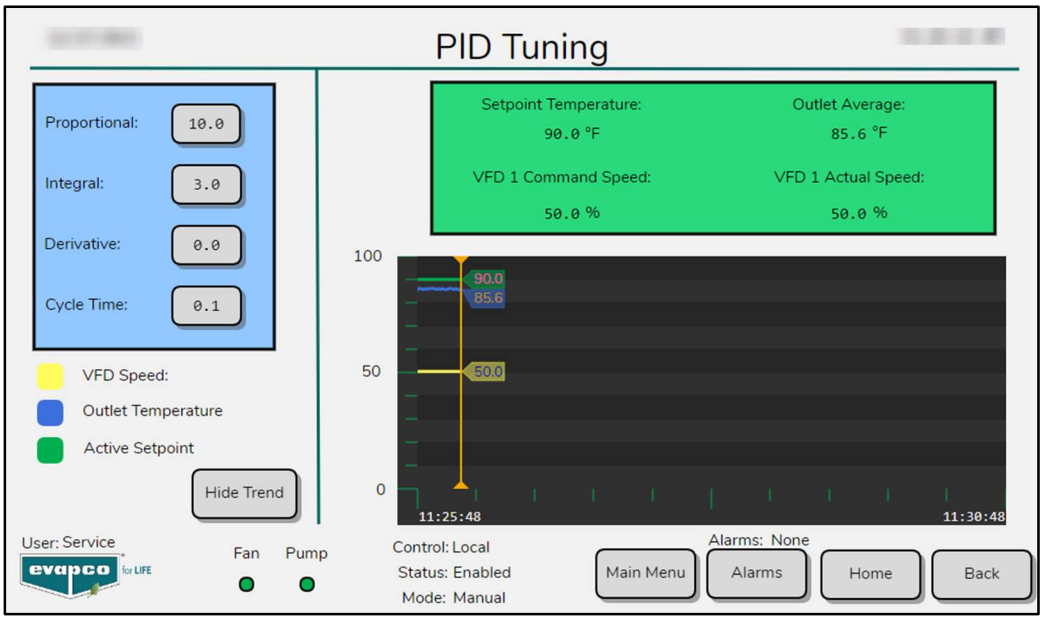
Navigate to the **Unit Operation** screen in the **Operator** menu and toggle the **Current Operation** selector to Manual.

Changing the Current Operation to Manual

After setting the current operation to Manual, the fan(s) and pump(s) can be enabled, and a speed can be sent to the fan. To check the fan(s) are pump(s) are running properly, navigate to the **End View** of the cell being tested. Check the status of the fan(s), VFD(s) and pump(s) on the screen and visually inspect correct operation at the unit. **Be sure to disable the fan(s) and pump(s) and put the current operation back into Auto when testing is complete.**

7. PID Tuning (Requires Load)

Navigate to the **Advanced Unit Setup** screen which is located in the **Operator Menu** (must be logged in at Service level). Select Show Trend to see a trend graph of the VFD speed, Outlet Temperature and the Active Setpoint. Adjust the PID values as desired. Reference the Evapco Sage O&M manual to save the PID settings.



General Comments

There are many parameters that can be adjusted to fine tune the behavior of the unit. Reference the Evapco Sage Controller O&M when adjusting any parameters.

If connecting to a Centralized Control System (CCS) or Building Management System (BMS), consult the Evapco Sage O&M manual and the Evapco Sage Communication Guide.

EVAPCO PRODUCTS ARE MANUFACTURED WORLDWIDE.