Flō i-Controller

Visograph Navigation for Version 201.05

Table of Contents

IMPORTANT: Read Before Continuing

i-Controller Unit Types: Some unit types such as Water-Source Heat Pumps and Chilled Water Units have screens that are specific to that unit type. Refer to the 'Additional Unit Types' section for these specialized screens.

Working with Building Management Systems: Once an i-Controller Modbus or BACnet connection is established to the Building Management System (BMS) and the controller is ONLINE, the BMS is the Master controller. All set point and schedule changes are to be made at the BMS. Changes can be made on the i-Controller but are temporary and will be overwritten by the BMS.

To make a temporary setting change perform the following steps:

1. Unplug the RS485 Connector from the i-Controller.

2. Wait at least 90 seconds, until the BMS Status on the Network Info screen on the Visograph reads Offline.

3. Adjust the necessary settings for testing or change the desired variable. (For instructions on how to navigate the Visograph, please refer to the instructions below).

4. When testing/changes are complete, plug the RS485 Connector back into the RS485 port.

5. Once the Modbus/BACnet connection has been re-established and the controller shows Online on the Network Info screen, double check the changed variable to ensure that it is correct.

6. If the changed variable has been over-written, then the variable change needs to be made at the BMS.

Introduction Screens

Introduction screens are displayed during controller startup.
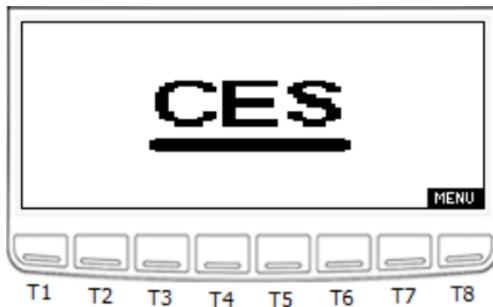
Figure 1. Introduction Splash screen

T8: Go to Main Menu
T2 + T3: Go to Version Info
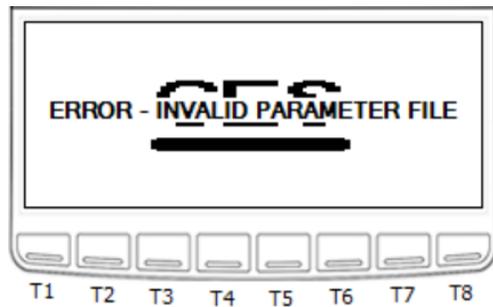
Figure 2. Invalid Parameter File Message
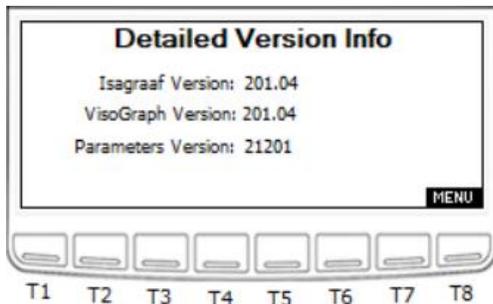
Figure 3. Version Information screen

T2: Go to Overrides
T8: Go to Main Menu

File Descriptions

These are the base files used for the firmware and controller parameters.

1. **ISaGRAF Version:** The version of the base program inside the i-Controller. This field should match the CRM field "Revision #" for a given unit.

2. **VisoGraph Version:** The version of the screens shown on the Visograph.

3. **Parameters Version:** The version of the parameters file loaded into the i-Controller.

Main Menu

The Main Menu provides easy access to controller information. When an alarm is present, the Alarm Bell indicator is displayed. When one or more overrides are present, the Warning indicator is displayed. The Main Menu also displays the Date and Time and will indicate when the unit is in a Test Mode.

To navigate the menu options, press the corresponding key on the Visograph below the menu item number.

1. **Schedule** – Set weekly schedule for "Occupied" and "Unoccupied" times.

2. **Set Points** – Define set points for cooling, heating, and dehumidification modes during occupied and unoccupied modes of operation.

3. **Status** – View temperature, compressor, and operation mode status.

4. **Alarms** – View alarm status, sensor status, and alarm resets.

5. **Network Info** – View controller IP settings and run time, change controller Modbus address, and change the Flō i-Controller date and time.

6. **Field Technician Options** – Parameters to be set by a certified field technician only (password protected). Press the (T1-T7) keys to access the menu item.
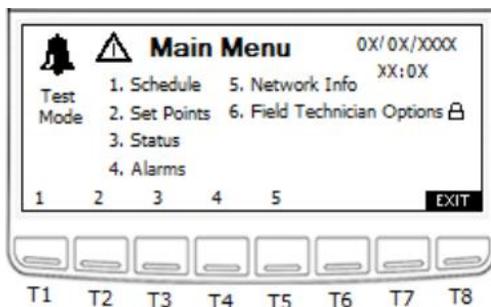

Figure 4. Main Menu

T1: Go to Schedule

T2: Go to Set Points

T3: Go to Status

T4: Go to Alarms

T5: Go to Network Info

T8: Go to Logo screen

Schedules

A schedule is used to activate/ deactivate an event on a specified day/ time. To create a scheduled event, use the arrow and enter keys to select the day of the week of the occurrence. Select the occupied or unoccupied period and enter the hours and minutes for the event.

NOTE: See Important notice on page 5 before modifying schedules.

Each day of the week is listed next to a corresponding occupied time "Occ-Time" and unoccupied time "UnOcc-Time". The Flō unit will operate in "Occupied Mode" in between the "Occ-Time" and "UnOcc-Time" listed for the day of the week.

Each time on the schedule should correspond with the store hours. All hours should be set in military time on a 24hr basis. (For Example: on Mondays, the occupied time starts at 8:00am and the unoccupied time begins at 10:00pm. The above screen should read next to the "M" 8:00 under the "Occ-Time" and 22:00 under the "UnOcc-Time".) *See Figure 5*.
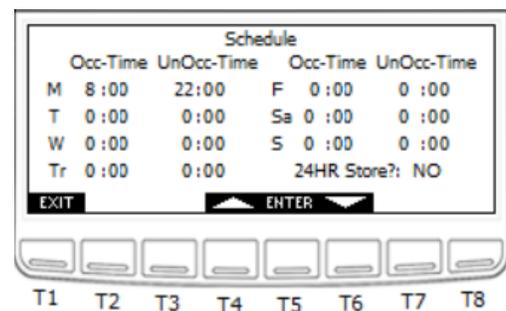

Figure 5. Monday 8am to 10pm Schedule

To change the occupied and unoccupied times:

1. Using the ▲ and ▼ buttons (T4 and T6, respectively) navigate to the hour or minute that you wish to change.

2. Press the ENTER (T5) button and the value should blink.

3. Using the ▲ and ▼ buttons increase and decrease the value as desired.

4. Once the desired value has been reached press the **ENTER** button to set the value.

5. Repeat steps 1-4 until all values in the schedule have been updated.

6. Once all changes have been completed, press the **EXIT** (T1) button to return to the Main Menu.
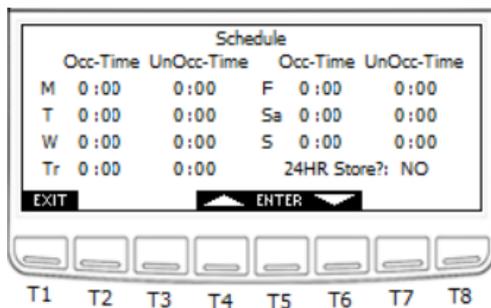

Figure 6. Schedule Configuration screen

    T1: Go to Main Menu
    T4: Scroll Up/Increase Value
    T5: Enter (Select and Set Value)
    T6: Scroll Down/Decrease Value

Zone Thermostat Control

Units configured to use a 2-Stage zone thermostat have the option to use internal schedule or an external source for an occupancy schedule. If internal schedule is used, see above to set schedule. If the schedule is from an external source, the display will be noted as shown below and the schedule will need to be set from the external source.
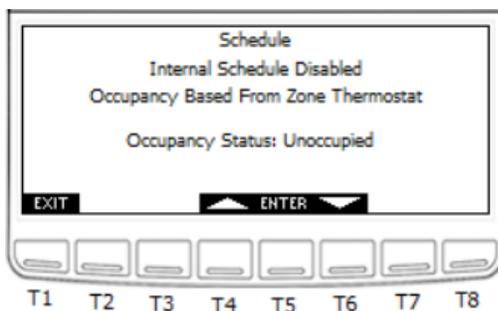

Figure 7. External Schedule Configuration screen

Set points

Set points are used as the cut in/ out for various i-controller functions. The i-Controller Set Point configuration section has 3 navigation screens.

The "Set Points" option should only be used if operation set points **are not** being communicated to the Flō i-Controller from a Building Management System (BMS).

If the Flō i-Controller is connected to a BMS over Modbus, the set points shown on this screen will be automatically updated with the set points entered in the BMS. The VAV Set Points will only appear if VAV controls are connected to the Flō unit. The set points limitations are as follows:

Cool SP: 60 - 85F
Heat SP: 50-80F
Dew Point SP: 48-60F

There must be a minimum of 4-degrees between the heating and cooling set points. If set points are inputted too close together, the program will automatically adjust the set points per the following rules:

Outdoor Air Temp > 60 ˚F: Heating Set Point = Cooling Set Point - 4 ˚F
Outdoor Air Temp < 50 ˚F: Cooling Set Point = Heating Set Point + 4 ˚F

1. If the Flō i-Controller is **not** connected to a BMS, perform the following steps to modify the set points.

2. Using the ▲ and ▼ buttons (T4 and T6, respectively) navigate to the "Occupied" set points that you wish to change.

3. Press the **ENTER** (T5) button and the value should blink.

4. Using the ▲ and ▼ buttons increase and decrease the value as desired.

5. Once the desired value has been reached press the **ENTER** button to set the value.

6. Repeat steps 1-4 until all "Occupied" values have been set.

7. Press the ▶ (T8) button to view the "Unoccupied" set points.

8. Repeat steps 1-4 until all "Unoccupied" values have been set.

9. Once all changes have been completed, press the ◀ (T7) to return to the "Occupied" set points screen or press the EXIT (T1) button to return to the Main Menu.
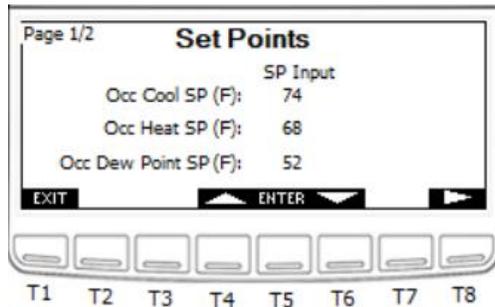

Figure 8. Occupied Set Points - screen 1

T1: Go to Main Menu
T4: Scroll Up/Increase Value
T5: Enter (Select and Set Value)
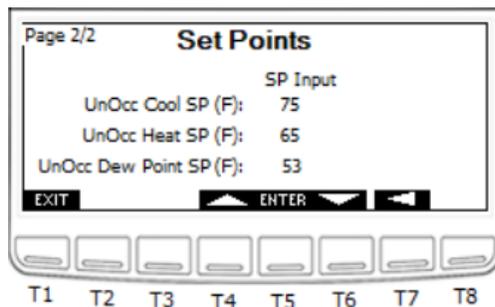T6: Scroll Down/Decrease Value
T7: Go to Previous Page
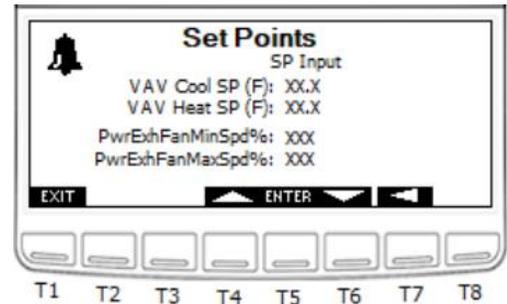T8: Go to Next Page

Figure 9. Unoccupied Set Points - screen 2

Figure 10. VAV & Power Exhaust Fan Set Points - screen 3

Zone Thermostat Control

Units configured to use 2-Stage zone thermostats have the internal heating and cooling setpoints disabled for both Occupied and Unoccupied modes. However, the internal Dew Point set point is still active for both modes.
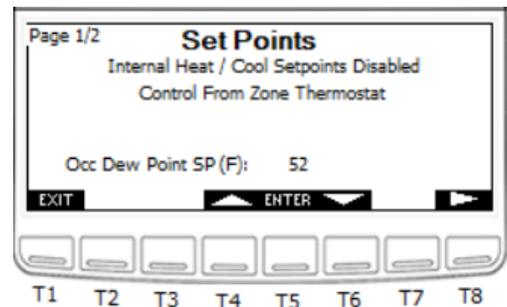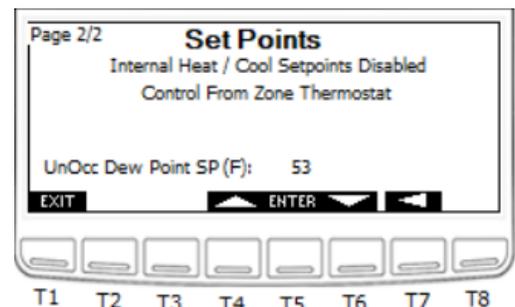

Figure 11. Occupied Set Point screen 1 with TSTAT active

Figure 12. Unoccupied Set Point screen 2 with TSTAT active

System Status

To navigate to the System Status menu options, press the corresponding key on the Visograph below the menu item number. Press the **EXIT** (T1) button to return to the Main Menu.

1. **Temperature Status** – View the current temperature in the treated space, space dew point, supply duct temperature, return air temperature, or outdoor conditions.

2. **Compressor Status** – View the current compressor and suction pressure status.

3. **Operation Mode Status** – View the current operation mode (Dehumidification, cooling, or heating), reheat or reclaim status, current occupancy, and other key system parameters.

4. **Condenser Status** – View the current condenser fan status.

5. **Heat Status –** View the current heating operation mode and stage status.

6. **Optional Eq Status**** – View current status of optional connected equipment. This includes VAV zones, ERV wheels, Power Exhaust, or Zone thermostat inputs. Status will only appear if optional equipment is present.

7. **Energy Meter** – View current power consumption.
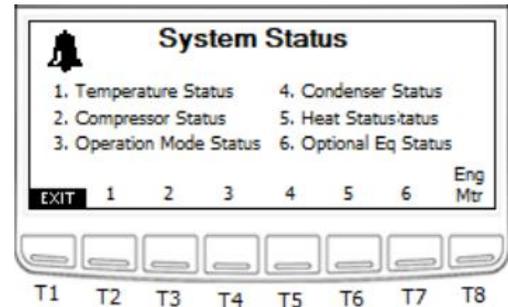
   ** If Equipped

Figure 13. System Status screen

T1: Go to Main Menu
T2: Go to Temperature Status
T3: Go to Compressor Status
T4: Go to Operation Mode
T5: Go to Condenser Status
T6: Go to Heat Status
T7: Go to Optional Equipment Status**
T8: Go to Energy Meter**

Temperature Status

There are 2 temperature status screens that display the reading of various temperature sensors throughout the unit. NOTE: when an asterisk (*) is displayed to the right of the value, the value is in override.

Use the ◄ (T7) and ► (T8) buttons to navigate between the two "Temperature Status" pages. Press **EXIT** (T1) to return to the System Status Menu.

1. **Space Temperature:** Temperature reading from temperature probe mounted in the space.

2. **Space Dew Point:** Dew point calculated from the temperature and humidity probe readings mounted in the space.

3. **Supply Temperature:** Temperature reading from temperature probe mounted in the supply air duct.

4. **Return Air Temperature:** Temperature reading from temperature probe mounted in the return air duct.

5. **Outdoor Air Temperature:** Temperature reading from temperature probe mounted in underneath the rain hood on the Flō unit.

6. **Reheat/Reclaim In Temp:** Temperature reading from temperature probe mounted in the Reheat/Reclaim Stage 1 inlet.

7. **Reheat/Reclaim In 2 Temp**:** Temperature reading from temperature probe mounted in the Reheat/Reclaim Stage 2 inlet.

8. **Outdoor Dew Point**:** Dew point calculated from the temperature and humidity probe readings mounted underneath the rain hood of the Flō unit. ** If Equipped
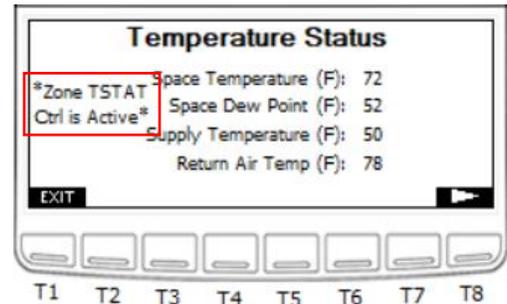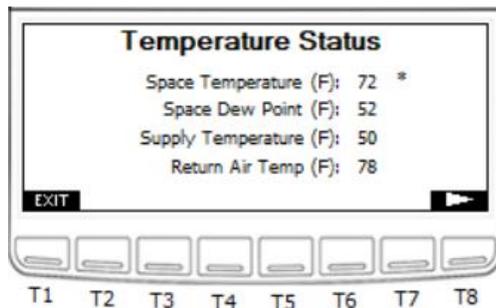

Figure 14. Temperature Status screen 1 with Overrides Present

T1: Go to System Status Menu
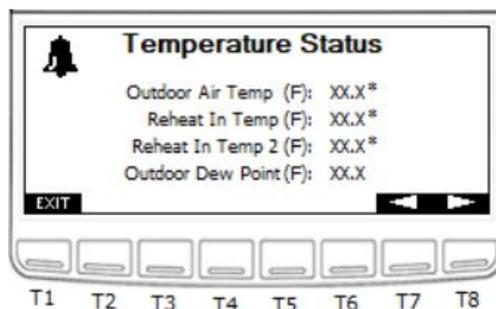T7: Previous Page
T8: Next Page

Figure 15. Temperature Status screen 2 with Overrides Present

Zone Thermostat Control

Units configured to use 2-Stage zone thermostats note the control option on the Temperature Status screen.

Figure 16. Temperature Status screen 3 with TSTAT active

Compressor Status

There are 4 Compressor Status screens; however, Status screens are only displayed for compressors equipped in the unit. The Suction Pressure Status will only appear if Compressor 2 is a digital scroll compressor (when 4 compressors are present), Compressor Status screens 3 and 4 will only be displayed when the unit is equipped with a third and fourth compressor.

Use the ◀ (T7) and ▶ (T8) buttons to navigate between the two "Compressor Status" pages. The second "Compressor Status" page is only available if the Flō unit contains more than two compressors. Press **EXIT** (T1) to return to the System Status Menu.

1. **Dig Comp # Operating Capacity:** Digital Compressor operating percentage.

2. **Fixed Compressor # Status:** Fixed Compressor operating status; "ON" or "OFF".

3. **Suction Pressure for Comp #:** Suction pressure reading from the pressure transducer located on the denoted Digital Compressor.

4. **Suction Pressure Set Point:** Suction pressure set point set based on the current control strategy.

5. **Compressor # Status:** This will display the status of each compressor. Possible status values include:
   o **OK:** Compressor is running properly.
   o **Comp High Dis Trip:** Activated when a compressor's discharge pressure has exceeded the safety limit (550PSI by default). Compressor will instantly shut

down and lock out until discharge drops to an acceptable level.

o **Comp Low Suction Trip:** Activated when a compressor's suction pressure dropped below the safety limit (75PSI by default). Compressor will instantly shut down and lock out until suction rises to an acceptable level.

o **No Comp Proof:** Activated when the compressor signal is on, but suction pressure and discharge pressure are within 20PSI of each other.

o **Low Suct Press:** Activated when the suction pressure decreases below the lower pressure limit (80PSI).

o **High Suct. Press:** Activated when the suction pressure increases above the upper pressure limit (varies per mode) during dehumidification or cooling call.

o **High Dis Press Alarm:** Activated when the suction pressure increases above the upper pressure limit (500PSI).

o **Suct. Trans Fail:** Activated when the suction transducer reading is out of range.

o **Dis Trans Fail:** Activated when the discharge transducer is out of range.

o **Gradual Shutdown:** Activated when the discharge pressure of a digital compressor is above the warning limit. Digital compressor will gradually reduce capacity in 20% increments until discharge pressure drops to an acceptable level.

o **OA Temp Comp Lockout:** Activated when the outdoor air temperature is too cold to allow compressors to run.

o **Economizer Lockout*:** Activated when economizer mode is active.
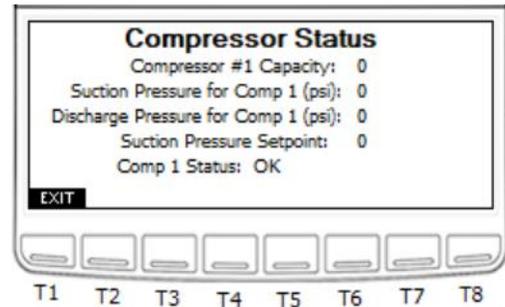
Figure 17. Compressor Status screen 1

T1: Go to System Status Menu
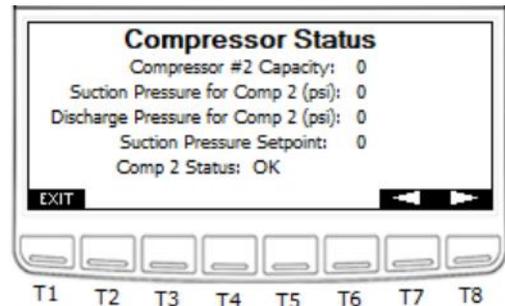T7: Previous Page
T8: Next Page

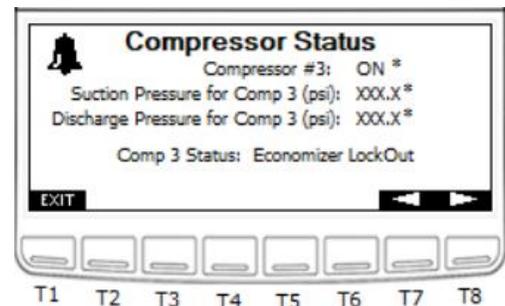Figure 18. Compressor Status screen 2

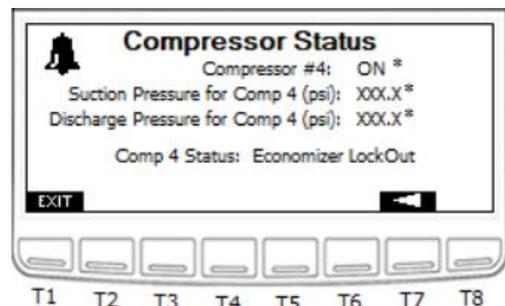Figure 19. Compressor Status screen 3

Figure 20. Compressor Status screen 4

Chilled Water Status

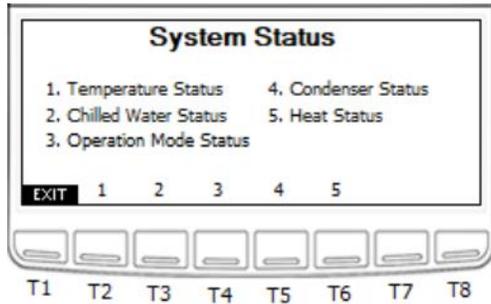Chilled Water Units will have a Chilled water status screen in place of the Compressor status screen.
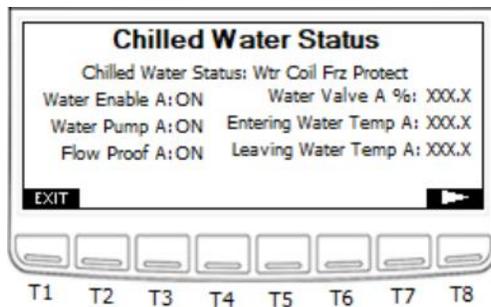

Figure 21. System Status screen
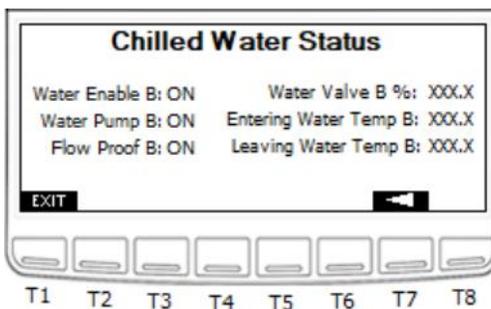

Figure 22. Chilled Water Status screen

Figure 23. Chilled Water Status screen 2

Water Source Heat Pump (WSHP)

When the unit is a WSHP the 'Suction Pressure Setpoint' will be replaced 'Discharge Pressure Setpoint' while the unit is heating operation.
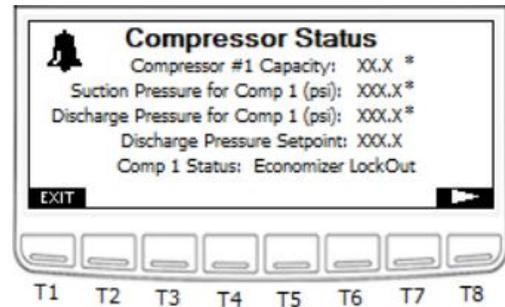

Figure 24. WSHP Compressor Status while in Heating

Operation Mode Status

From the System Status Menu Press T4 to enter the Operation Mode Status page.

1. **Occupancy Mode:** "Occupied" or "Unoccupied" Mode will display based on the occupancy schedule.

2. **Current Mode:** The second line will display the unit's operation mode. One of the following will appear, based on the unit's operation.

   o Standby
   o Fan-Only
   o Heat
   o Cool
   o Dehum
   o Dehum + Heat
   o Dehum + Cool
   o Pre-Emptive Dehum
   o Shutdown
   o Net Disable
   o Return Temp Control**
   o Econ Mode**
   o Hydronic Freeze Protection Heat (only on units with Hydronic Heat equipped)

3. **Amp Draw:** Amperage reading from the 1-phase current transducer.

4. **Supply Fan Status:** Status of the supply fan operation will a value from 0-100%.

5. **Compressor Capacity:** Total compressor capacity will display a value from 0-100%.

6. **Heat Capacity:** Total heat capacity will display a value from 0-100%.

7. **Reheat/Reclaim Status:** Reheat or Reclaim Stage 1 "ON" or "OFF" when the coil is activated and deactivated.

8. **Reheat/Reclaim 2 Status**:** Reheat or Reclaim Stage 1 "ON" or "OFF" when the coil is activated and deactivated.

9. **Pre-Heat Status:** If the pre-heat option is selected, the pre-heat status will display "ON" or "OFF".

10. **CO2 Level (ppm)**:** If a CO_2 sensor option is chosen, the CO_2 level will be displayed in parts per million (ppm). This is the CO_2 control value. If more than one CO_2 sensor is being used, this value represents the max CO_2 value.
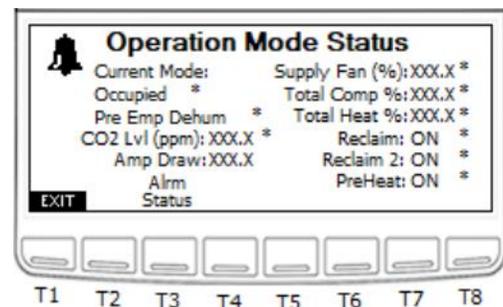
** If Equipped

Figure 25. Operation Mode Status screen

T1: Go to System Status Menu
T3: Go to Alarm Status

Condenser Status

The Condenser Status screen shows the status of all condenser fans present on the unit.
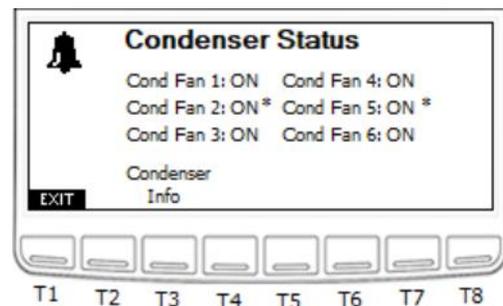

Figure 26. Condenser Status screen

T1: Go to Status Menu
T3: Condenser Info

Water Source Heat Pump

When the unit is a WSHP the Condenser Status screen will display information for the water source condenser.
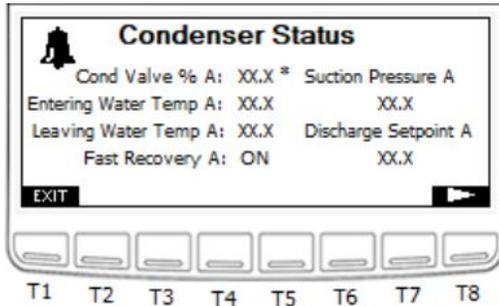

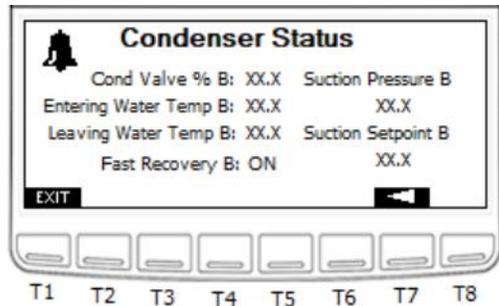*Figure 27. Condenser Status screen 1 when WSHP*

Figure 28. Condenser Status screen 2 when WSHP

Condenser Information

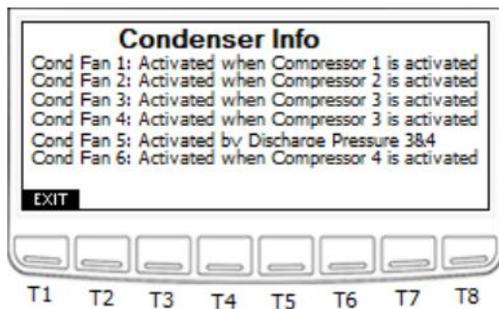The Condenser Info describes the condenser fan sequence and operation.

Figure 29. Condenser Info screen

T1: Go to Condenser Status Menu

Optional Equipment Status

To view current status of optional connected equipment, press T7 from the System Status Menu. Optional equipment includes VAV zones, ERV wheels, Power Exhaust, or Zone thermostat inputs. Status will only appear if optional equipment is present.
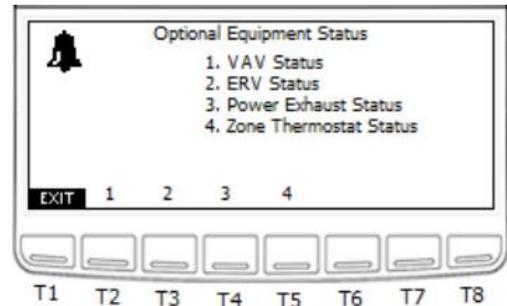
Figure 30. Optional Equipment Status screen

T1: Go to Status Menu

T2: Go to VAV Status Menu
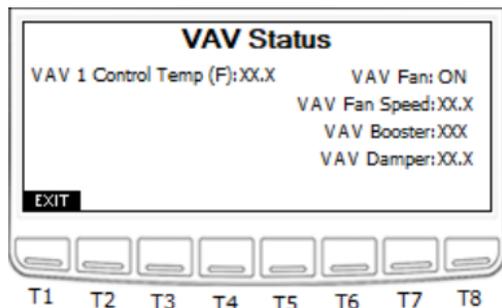
T3: Go to ERV Status Menu

T4: Go to Power Exhaust Status Menu

T5: Go to Zone Tstat Status Menu

VAV Status

From the System Status Menu press the T7 button to enter the Optional Equipment Status Menu page and then T2 for VAV Status page.

1. **VAV # Control Temp:** The calculated control temperature for the associated zone. If more than one temperature sensor is being used for the associated zone, this value represents the calculated average of the temperature readings.

2. **VAV Fan #:** VAV Fan Status for associated zone. Value will be "ON" or "OFF."

3. **VAV Fan Speed #:** VAV Fan Speed for associated zone. Value will be 0-100%.

4. **VAV Booster #:** VAV Booster Heater status for associated zone. Value will be "ON" or "OFF." If modulate heat is being used, the value will be 0-100%.

5. **VAV Damper #:** VAV Damper position for associated zone. Value will be 0-100%.

The VAV Status screen displays state of VAV inputs and outputs.

Figure 31. VAV Status screen

T1: Go to Status Menu

ERV Status

From the System Status Menu press the T7 button to enter the Optional Equipment Status Menu page and then T3 for ERV Status page.

The ERV Status screen displays state of ERV inputs and outputs.
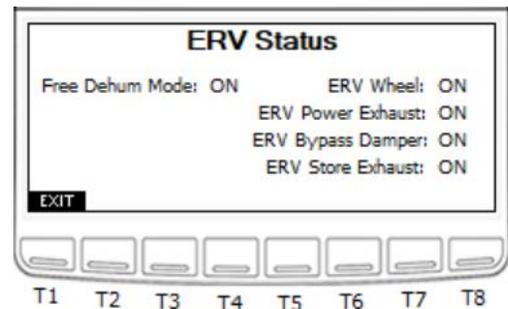
Figure 32. ERV Status screen

T1: Go to Status Menu

1. **Free Dehum Mode:** Displays whether the unit is in "Free Dehum" Mode.

2. **ERV Wheel:** ERV Wheel Status. Value will be "ON" or "OFF."

3. **ERV Power Exhaust:** ERV Power Exhaust Status. Value will be "ON" or "OFF."

4. **ERV Bypass Damper:** ERV Bypass Damper Position. Value will be "ON" if the damper is open, or "OFF" if the damper is closed.

5. **ERV Store Exhaust:** ERV Store Exhaust Status. Value will be "ON" or "OFF."

Power Exhaust Status

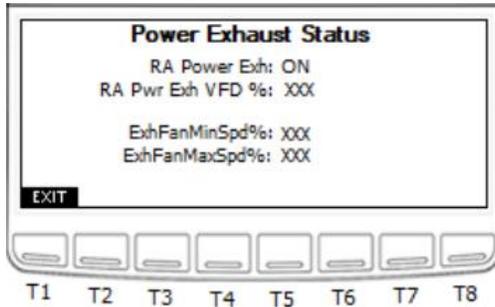The Power Exhaust Status screen shows the exhaust fan output status and current minimum and maximum speed set points.

Figure 33. Power Exhaust Status screen

T1: Go to Optional Equipment Menu

Zone Thermostat Status

The Zone Thermostat Status screen shows the input status of the 2-stage zone thermostat.

Figure 34. Zone Thermostat Status screen
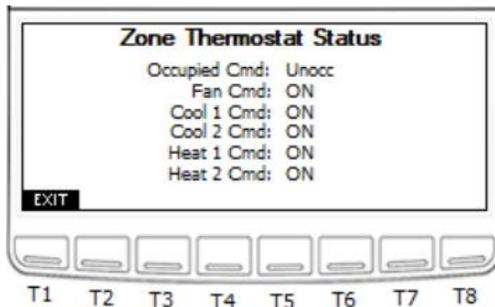
T1: Go to Optional Equipment Menu

Energy Meter Status

When the unit is equipped to monitor energy conception, the Energy Meter Status will display the unit consumption and power factor.

Figure 35. Energy Meter Status screen

T1: Go to Status Menu

1. **Real Energy (kWh):** Displays the Real Energy usage, in kilowatt-hours.

2. **Real Power (kW):** Displays the Real Power usage, in kilowatts.

3. **Power Factor:** Displays the power factor.

Alarms

To navigate to the following menu options, from the Main Menu press T4 to enter the Alarms Menu page.

1. **Alarm Status** – View the status of alarms. Navigate to this page when the bell in the upper left corner appears to view which alarm has been activated.

2. **Sensor Status** – View the status readings of sensors. If a sensor failure is the cause for an alarm, this page will show which sensor has failed.

3. **Alarm History** – Displays a list of alarms and the last time they transitioned from OFF to ON.

4. **Alarm Reset** – Contains necessary resets for certain alarms. If a fan fail occurs, once the problem has been resolved this page contains the reset necessary to continue operation.
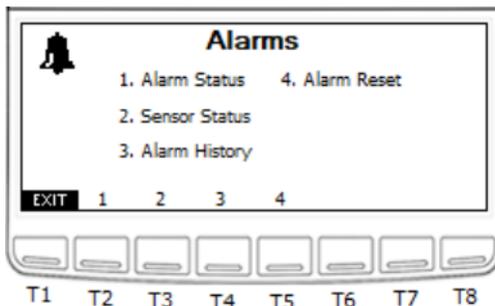
Figure 36. Alarms screen

T1: Go to Main Menu
T2: Go to Alarm Status
T3: Go to Sensor Status
T4: Go to Alarm History
T5: Go to Alarm Reset

Alarm Status

Press T1 to return to the Alarms Menu. Each alarm will display "ALARM" when an alarm is present and "OK" when no alarm is present.

1. **Clogged Filter Alarm:** Alarm activated when the filters in the unit need to be replaced.

2. **Fan Status:** Alarm activated when a fan fail occurs.

3. **Overflow Alarm:** Alarm activated when a smoke detection signal is sent from the space. This alarm will cause the unit to shut down.

4. **Phase Loss Alarm:** Alarm activated when improper voltage is supplied to the unit. This alarm will cause the unit to shut down.

5. **Smoke Det. Alarm:** Alarm activated when a smoke detection signal is sent from the space. This alarm will cause the unit to shut down.

6. **CO2 Level Status*:** Alarm is activated when the CO2 level in the space increases above the specified ppm limit.

7. **Ref Lk Status*:** Alarm is activated if there is a leak in the store's refrigeration system. A digital signal is received from the refrigeration rack controller that signifies a leak has been detected. Once the signal is received, the OAD of the Flō unit will open to 100% to flush the store.

8. **Heat Status:** Alarm is activated if a temperature increase has not occurred after heat mode has been activated for a certain period of time.

9. **Sensor Failure:** Displays "YES" when a sensor failure is present.

10. **Reclaim Status*:** Notice is activated if the reheat/reclaim inlet temperature has not increased at least 5 ˚F, after heat reclaim has been enabled for 15-minutes. Notice is automatically reset upon heat reclaim disable. This notice will not trigger an alarm in the unit.

11. **Comp Status:** This will display the status of each compressor. Possible status values include:

If multiple alarms are present, only the highest priority alarm will appear. Alarms are listed top-to-bottom by priority (with 'Suct Trans Fail' being the highest priority, and 'OK' being the lowest).

- o **Suct Trans Fail**: Activated when the suction transducer reading is out of range.
- o **Dis Trans Fail**: Activated when the discharge transducer is out of range.
- o **Comp High Dis Trip**: Activated when a Comp Proof Fail and High Dis Pressure alarm activate together.
- o **No Comp Proof**: Activated when the compressor signal is on, but suction pressure and discharge pressure are within 20PSI of each other.
- o **High Suct. Press**: Activated when the suction pressure increases above the upper pressure limit (varies per mode) during dehumidification or cooling call.
- o **Low Suct Press**: Activated when the suction pressure decreases below the lower pressure limit (80PSI).
- o **High Dis Press Alarm**: Activated when the suction pressure increases above the upper pressure limit (500PSI).
- o **OK**: Compressor is running properly.
- o **Comp Low Suction Trip**: Activated when a compressor's suction pressure drops below the safety limit (75PSI by default). Compressor will instantly shut down and lock out until suction rises to an acceptable level.
- o **Gradual Shutdown**: Activated when the discharge pressure of a digital compressor is above the warning limit.

Digital compressor will gradually reduce capacity in 20% increments until discharge pressure drops to an acceptable level.

- o **OA Temp Comp Lockout**: Activated when the outdoor air temperature is too cold to allow compressors to run.
- o **Economizer Lockout***: Activated when the economizer is active.

*If Equipped.
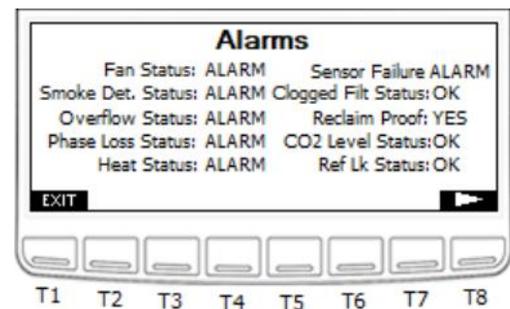
Figure 37. Alarm Status screen 1

T1: Go to Alarm Menu
T8: Go to Next Page
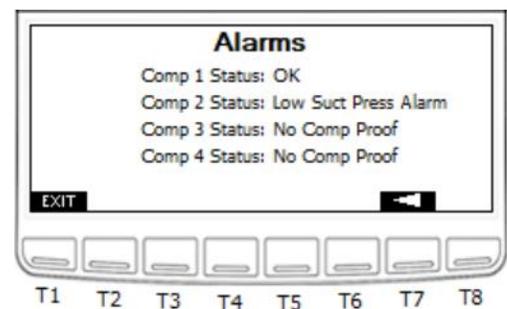
Figure 38. Alarm Status screen 2

T1: Go to Alarm Menu
T7: Go to Previous Page

Alarm History

The Alarm History will display a timestamp next to each alarm indicating the last alarm occurrence.

Figure 39. Alarm History screen 1
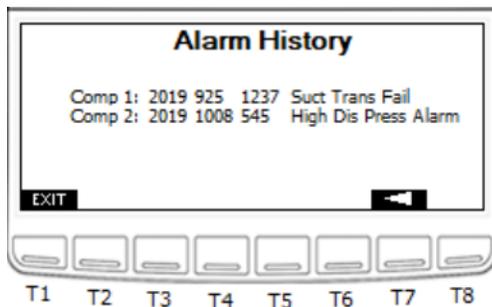
Figure 40. Alarm History screen 2

Alarm Resets

Press T1 to return to the Alarms Menu. If a fan fail occurs and the problem has been resolved, the fan fail alarm needs to be reset to start normal operation. To reset the fan, fail alarm, perform the following steps:

1. Using the ▲ and ▼ buttons (T4 and T6, respectively) ensure that the "OFF" value is highlighted.

2. Press the ENTER (T5) button and the value should blink.

3. Using the ▲ and ▼ buttons increase and decrease the value until "ON" appears.

4. Once the desired value has been reached press the ENTER button to set the value.

5. Once the value has been set to "ON" the fan fail alarm has been reset and the fan is ready for operation.

6. The value will automatically reset to "OFF" after 5 seconds. Values will display as "ON/OFF" for Fan Fail Reset, or "YES/NO" for Clear Alarms.
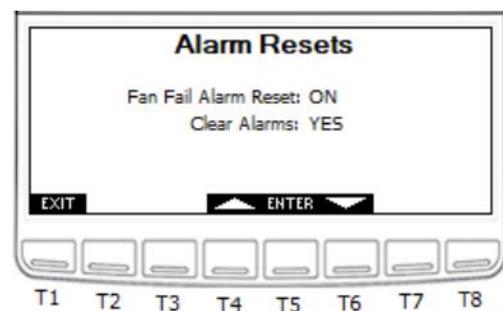
Figure 41. Alarm Resets screen

T1: Go to Alarms Menu
T4: Change value to ON
T5: Enter (Select and Set Value)
T6: Change value to OFF

Sensor Status

Press T1 to return to the Alarms Menu. Each sensor status will display "FAIL" if the sensor has failed and "OK" when the sensor is still operational. Use the ◄ (T7) and ► (T8) buttons to navigate between the two "Sensor Status" pages.

The Outdoor Humidity and CO_2 sensors on the first page are optional and will not appear on the screen if these options are not included on the unit.

There are three Sensor Status screens. Screen 3 is only visible if the unit contains VAV, a hydronic heating coil, a second space Temp, or a 2nd Dehum Probe.
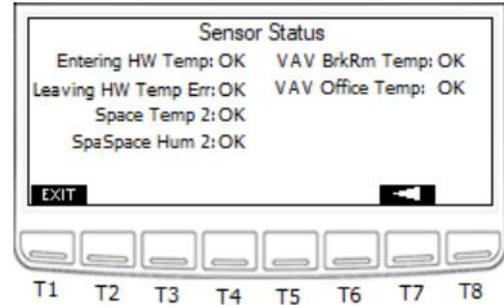
Figure 44. Sensor Status screen 3
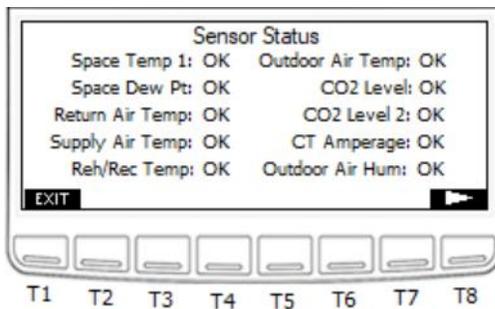
Figure 42. Sensor Status screen 1

T1: Go to Alarms Menu
T7: Previous Page
T8: Next Page
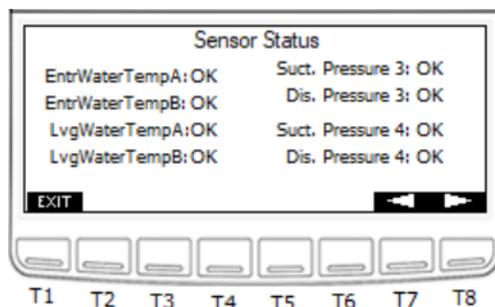
Figure 43. Sensor Status screen 2

Network Information

The Network Information screens to display the Firmware Version, Expansion Board status (Online/ Offline), Building controller status (Online/ Offline), i-Controller Address (Modbus or BACnet), Baud Rate, IP Address, and Parameter File version.

The Network Information screen displays the Flō i-Controller IP address, and status of the connection to the Building Management System (BMS). If the Flō i-Controller is connected to the BMS the status will show "Online", otherwise, it will show "Offline" if the BMS is offline or the i-Controller is not connected.

For units on a Modbus network, this screen displays the Modbus address (configurable), and the Modbus baud rate. To change the Modbus address:

1. Using the 🔼 and 🔽 buttons (T4 and T6 respectively) navigate to the value that you wish to change.

2. Once the value is highlighted, press the ENTER (T5) button and the value should blink.

3. Using the 🔼 and 🔽 buttons increase and decrease the value as desired.

4. Once the desired value has been reached press the ENTER button to set the value.

5. Once all changes have been completed, press the EXIT (T1) button to return to the Main Menu.

Modbus Network

The Modbus and BACnet Network information screens display the communication status, address and parameter version.
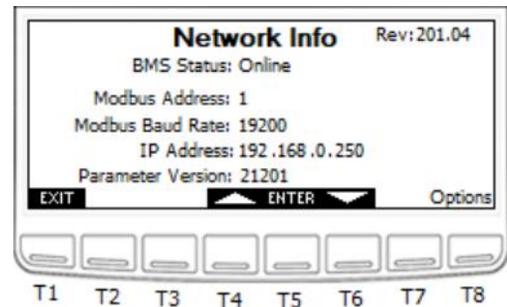
Figure 45. Modbus Network Information screen 1

> T1: Go to Main Menu
> T4: Scroll Up/Increase Value
> T5: Enter (Select and Set Value)
> T6: Scroll Down/Decrease Value
> T8: Network Options

BACnet Network
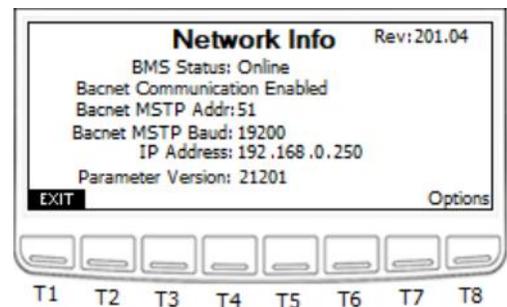
Figure 46. BACnet Network Information screen 1

Network Options

The Network Options screen is used to view controller run-time information, configure the Controller Clock and Date, reset the Network Gateway to its default value, configure BACnet network address, and to manually reboot the i-Controller. NOTE: The controller must run for a minimum of 5-minutes between reboots.

1. Using the ▲ and ▼ buttons (T4 and T6, respectively) navigate to the value that you wish to change.

2. Once the value is highlighted, press the ENTER (T5) button and the value should blink.

3. Using the ▲ and ▼ buttons increase and decrease the value as desired.

4. Once the desired value has been reached press the ENTER button to set the value.

5. Use the ◄ (T7) and ► (T8) buttons to navigate to the date and time screen.

6. Repeat steps 1-4 until all desired values have been updated.

7. Once all changes have been completed, press the EXIT (T1) button to return to the Network Information page.
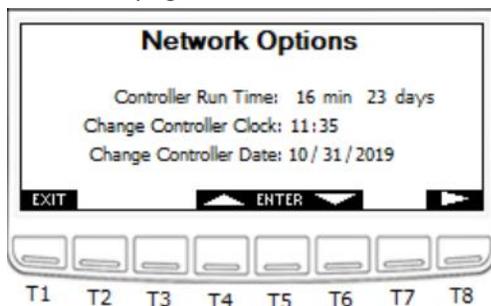
Figure 47. Network Options screen 1

T1: Go to Network Info Screen

T4: Scroll Up/Increase Value

T5: Enter (Select and Set Value)

T6: Scroll Down/Decrease Value

T7: Previous Page

T8: Next Page
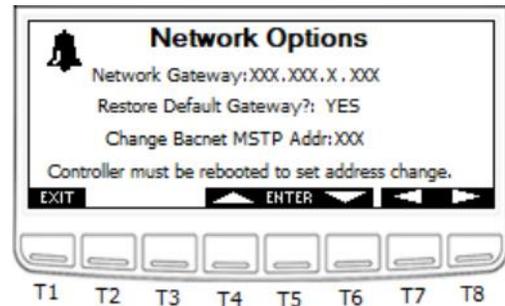
Figure 48. Network Options – Restore Gateway
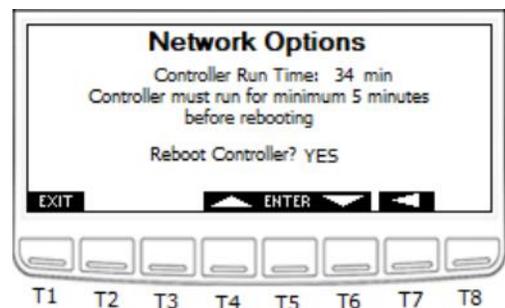
Figure 49. Network Options – Reboot Controller
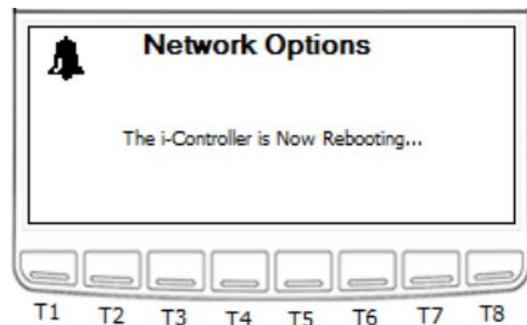
Figure 50. Network Options - Controller Reboot Status

Field Tech Menu

To access the Field Tech Menu, on the "Main Menu" screen press the T1 and T7 buttons simultaneously.

The "Field Tech Options" menu, is used to set sensor offsets, activate test modes, change sensor settings, set damper positions, and view Input/ Output status. To navigate to the menu options, press the corresponding key on the Visograph below the menu item number. Press the MENU (T8) button to return to the Main Menu.

1. **Sensor Offsets** – Set sensor offsets for all available sensors.

2. **Test Modes**– Activate test modes for dehumidification, comfort cooling, heating, occupancy mode, and gas pressure check.

3. **Sensor Settings** – Set limits for dew point sensors, suction transducers, and discharge transducers.

4. **Set Damper Positions and Exhaust Interlocks** – Set the Outdoor damper operating percentage and damper percent increases for any available exhaust fan interlocks.

5. **Current Damper Positions** – View the positions of the outdoor, return, and bypass dampers.

6. **I/O Status** – View the readings for all the inputs and outputs.

7. **DCV Settings** – If unit contains a CO_2 sensor, access this menu to adjust the ventilation settings/limits for CO_2 level control.

Figure 52. Field Tech Options screen

T1: Go to Sensor Offsets
T2: Go to Test Modes
T3: Go to Sensor Settings
T4: Go to Set Damper Positions
T5: Go to Current Damper Position
T6: Go to I/O Status
T7: Go to DCV Settings
T8: Go to Main Menu
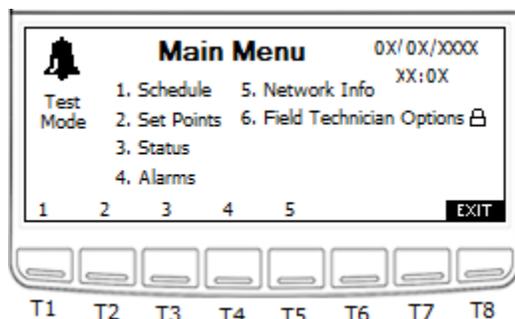
Figure 51. Main Menu

Sensor Offsets

Sensor Offsets are used to calibrate devices for their unique environment. Each sensor reading can be adjusted (+/-) a small amount to refine the sensor reading. The default Offset is 0.0. When an Offset is used, the Sensor Reading value will include the Offset amount. NOTE: The order of pages may vary based on number of sensors and options present.

Sensor offsets are available for all Flō unit sensors. Sensor offsets are to be set when an installed sensor is reading differently from a calibrated device. **Maximum offset values for each sensor type are as follows:**

Temperature Sensors: +/- 3 ˚F
Pressure Transducers: +/- 5PSI
Humidity Sensor: +/- 3%
Dew Point Sensor: +/- 2 ˚F
CO_2 Sensor: +/- 50ppm

If the sensor requires a larger offset than listed above, then the sensor should be evaluated and replaced if necessary.

The CO_2 sensor will only appear if the Flō unit contains the CO_2 option. The second suction/discharge pressure transducers will only appear if the Flō unit has more than two compressors. And the VAV sensor offsets will only appear if the unit is connected to a VAV zone. Next to each offset is the actual sensor reading including the offset.

To adjust the sensor offset:

1. Using the ⬗ and ⬖ buttons (T4 and T6) navigate and highlight the "-" next to the sensor you wish to adjust.

2. Once the value is highlighted, press the [ENTER] (T5) button and the value should blink.

3. Using the ⬗ and ⬖ buttons change the value to "+" or "- "depending on if the offset is intended to increase or decrease the sensor reading.

4. Once the desired value has been reached press the [ENTER] button to set the value.

5. Repeat steps 1-4 to adjust the value of the Offset for the sensor you wish to adjust.

6. Use the [◀] (T7) and [▶] (T8) buttons to navigate to the next page for additional sensors that require offsets.

7. Once all changes have been completed, press the [EXIT] (T1) button to the Field Tech Options Menu.
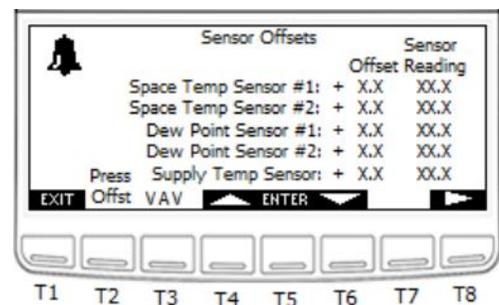
Figure 53. Sensor Offsets screen 1

T1: Go to Field Tech Menu
T2: Go to Pressure Offset Menu
T3: Go to VAV Offset Menu
T4: Scroll Up/Increase Value
T5: Enter (Select and Set Value)
T6: Scroll Down/Decrease Value
T7: Previous Page
T8: Next Page
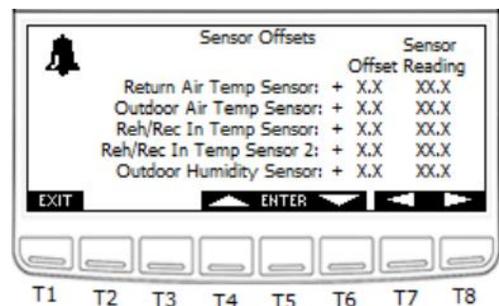
Figure 54. Sensor Offsets screen 2
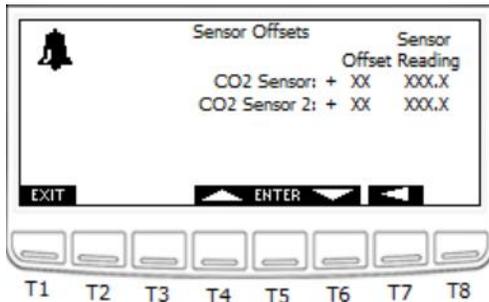
Figure 55. Sensor Offsets screen 3

Pressure Sensors Offsets
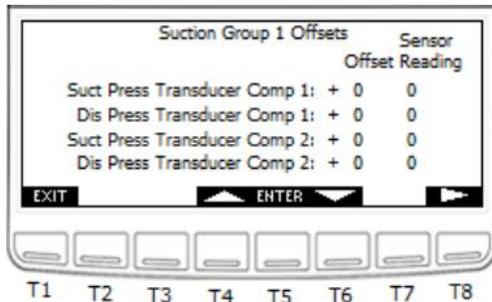
Figure 56. Pressure Sensor Offsets screen 1
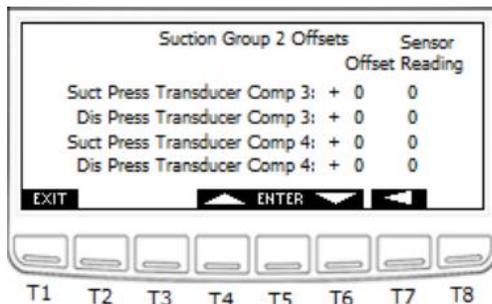
Figure 57. Pressure Sensor Offsets screen 2

VAV Offsets
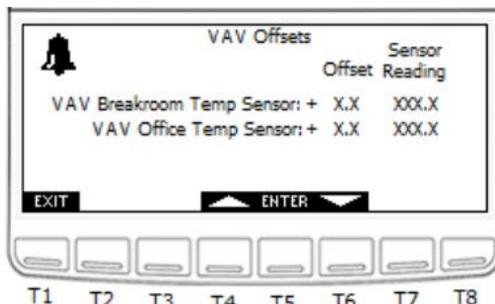
Figure 58. VAV Sensor Offsets screen 1

Test Mode Descriptions

Test modes are available for testing dehumidification mode, cooling mode, heating mode, occupancy, and a gas pressure check mode for verifying gas flow. **All test modes will time out after 30-minutes**.

Air Balance Mode: Is used to place the dampers in the proper location for air balancing. The Air Balance mode will time out after 2 hours.

Supply Fan Balance Mode: When turned to "ON", the Outdoor Air Damper will completely close, the Return Air Damper will be set to 100%, and the Bypass Damper will be set to 30%. This allows for the total airflow requirements to be set with the VFD. The Outdoor, Return, and Bypass are adjustable via the "Override Val" if necessary. Toggle Supply Fan Balance Completed to 'YES' when completed.

OAD Balance Mode: When turned "ON", the Outdoor Air Damper will open to its default operating position, the Return Air Damper will be set to 65%, and the Bypass Damper will be set to 30%. This allows the total outdoor airflow requirements to be set with the Outdoor Air Damper position.

The OAD Input Val can be changed to achieve the desired outdoor air flow. Toggle Supply Fan Balance Completed to 'YES' when completed.

Current OAD Position: The Outdoor Air Damper position in use.

OAD Input Val: Displays during OAD Balance Mode and is used to adjust the Outdoor Air Damper position when balancing the outdoor airflow requirement.

Balancing Completed?: Set to "YES," when each balancing is complete. This will save the inputted "OAD Input Val" setting as the default outdoor air damper position, and the unit will revert to normal operation.

To activate any of the test modes, navigate to the Test Modes Menu.

1. From the Visograph Main screen, access the Field Tech Menu (press the T1 and T7 buttons simultaneously).

2. Select Test Modes (T2).
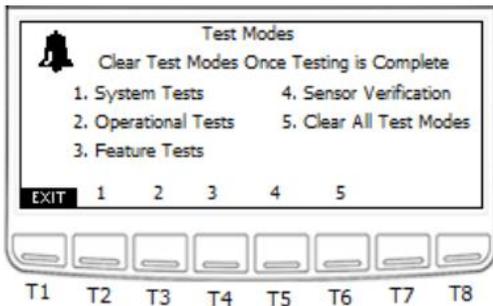
Figure 59. Test Modes Main Menu

T1: Go to Field Tech Menu
T2: Go to System Tests Menu
T3: Go to Operational Tests Menu
T4: Go to Feature Tests Menu
T5: Go to Sensor Verification
T6: Go to Clear All Test Modes

System Test Modes

System Test modes are used to evaluate physical unit components. System tests include Air Balancing, Heat Exchanger, Compressors, Condenser Fans and Dampers. **System test modes will time out after 30-minutes.**
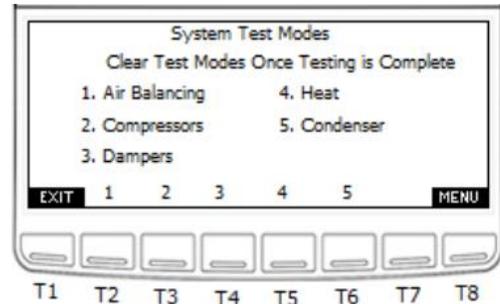
Figure 60. System Test Modes screen

T1: Go to Test Mode Menu
T2: Go to Air Balancing Test
T3: Go to Compressors Test
T4: Go to Dampers Test
T5: Go to Heat Test
T6: Go to Condenser Test
T8: Go to Field Tech Menu

Water-Cooled Condenser

A unit equipped with Water-Cooled Condenser, will have a Water Balance test on the System Test screen to set the minimum and maximum flow rate on the water valves.
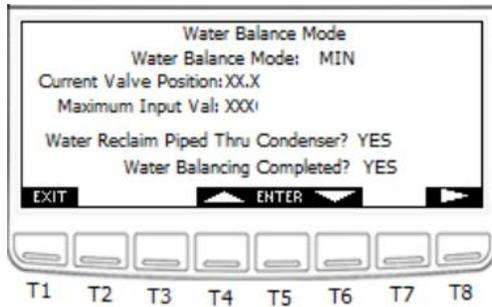
Figure 61. Water Balance Mode screen 1
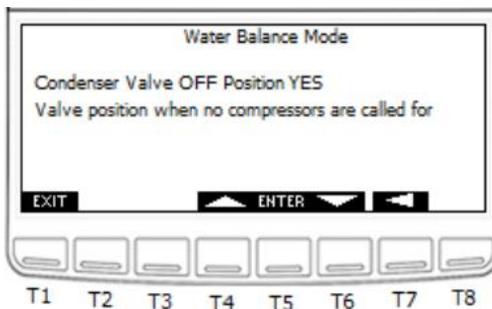
Figure 62. Water Balance Mode screen 2

Chilled Water Unit

Chilled Water units will have a Chilled Water test in place of Compressors. From this screen, the user will be able to perform various override functions
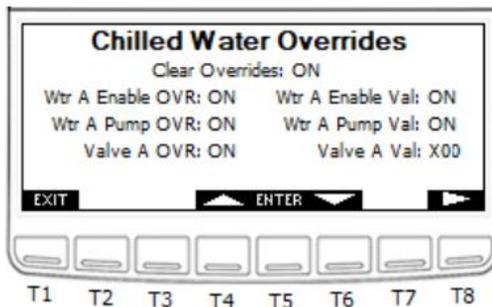
Figure 63. Chilled Water Overrides screen

Air Balancing

Air Balancing Mode aids the air balancer in the balancing process. Refer to AF-IC1-01 i-Controller Air Balancing Mode for additional instructions.
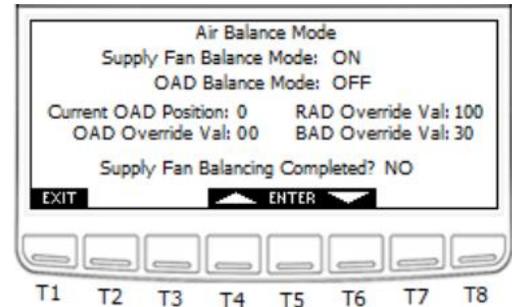
Figure 64. Air Balance Mode screen

T1: Go to System Test Menu
T4: Scroll Up/Increase Value
T5: Enter (Select and Set Value)
T6: Scroll Down/Decrease Value

Compressor Test Mode

Compressor Test Mode is used to ensure operation of each compressor. The compressor test mode will turn each compressor ON to full capacity.
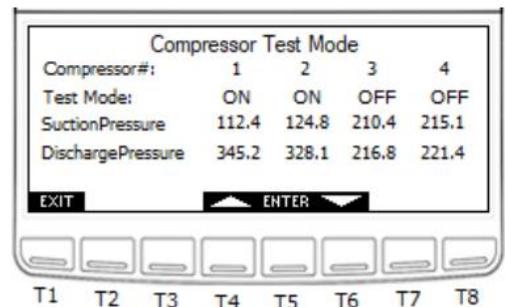
Figure 65. Compressor Test Mode screen

Damper Test Mode

Damper Test Mode is used to open dampers to the user specified position.
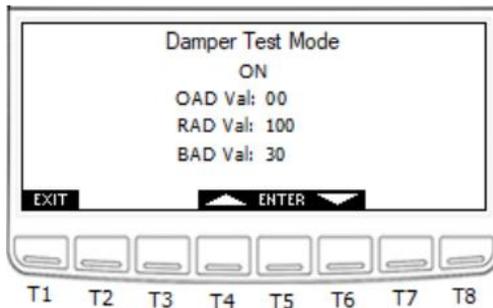
Figure 66. Damper Test Mode screen

Condenser Fan Test Mode

The Condenser Fan Test Mode is used to verify condenser fan operation. NOTE: Some condenser fans are wired directly to compressor outputs – this mode will activate the associated compressor to activate the chosen condenser fan.
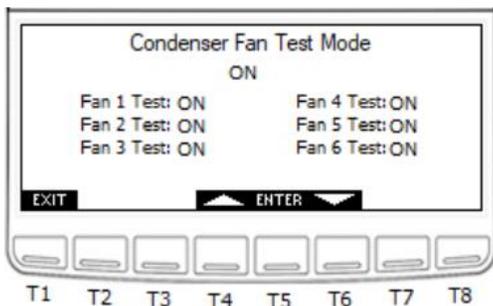
Figure 67. Condenser Fan Test Mode screen

Heat Test Mode

Figure 68.Heat Test Modes screen

Full capacity heat test mode turns ON all heating stages. Staged heat test mode is used to turn ON each stage of heat individually.

Reheat/ Reclaim Test

Energizes the Reheat/ Reclaim output. During a Reheat test, heat will only be available if the compressor is running.

Operational Test Modes

Operational test modes are a variety of tests used to evaluate different modes of operation. Operational tests include Dehumidification, Comfort Cooling Heating and Fan Only modes. **Operation test modes will time out after 30-minutes.**
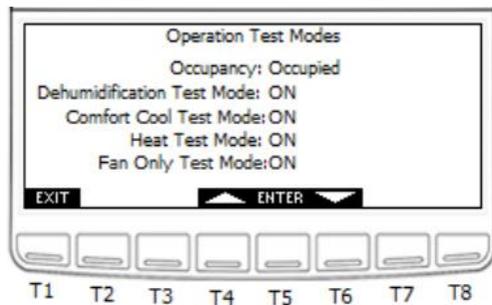
Figure 69. Operational Test Modes

T1: Go to Test Modes Menu
T4: Scroll Up/Increase Value
T5: Enter (Select and Set Value)
T6: Scroll Down/Decrease Value

Occupancy

Occupancy: This input can be toggled between OCCUPIED, UNOCCUPIED, and OFF. OCCUPIED forces the unit into an occupied state. UNOCCUPIED forces the unit into an unoccupied state. OFF allows the occupancy function to perform as normal.

Dehumidification

Dehumidification Test Mode: This mode is used to test unit response to a call for space dehumidification. When activated the space temperature and humidity will be overridden to 72˚F and 70%, resulting in a dew point reading of 70˚F. To ensure the compressors initiate, the suction pressure will be overridden to 200PSI, if ambient conditions are above compressor lockout conditions.

Comfort Cooling

Comfort Cooling Test Mode: This mode is used to test unit response to a call for space cooling. When activated the space temperature and humidity will be overridden to 81.5˚F and 15%. To ensure the compressors initiate, the suction pressure will be overridden to 170PSI, if ambient conditions are above compressor lockout conditions.

Heat Test Mode

Heating Test Mode: This mode is used to test unit response to a call for space heating. When activated the space temperature and humidity will be overridden to 58.5˚F and 15%.

Fan Only Test Mode

Fan Only Test Mode: This mode is used to test unit response to no call. When activated, the space temperature will be set to the cooling setpoint minus the cooling cut out value and the space humidity will be overridden to 15%.

Feature Tests Modes

Feature test modes are used to test sequences related to optional features included in a unit. These features include Return temp control (for units equipped with a return temp sensor), CO2 control (for units equipped with a CO2 sensor), and Load Shed (for units with a load shed input wired to the controller).
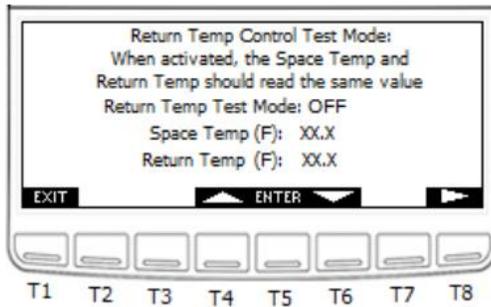
Figure 70. Feature Test Mode screen 1
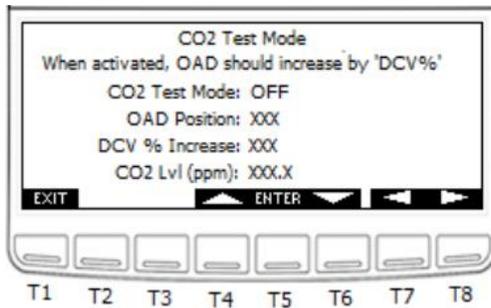
Figure 71. Features Test Mode screen 2
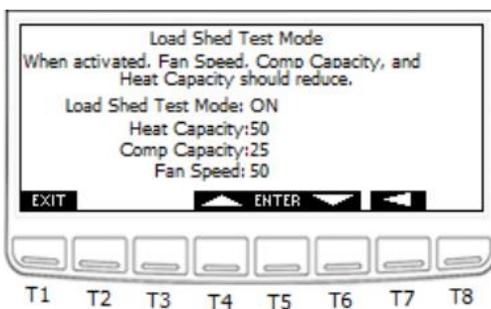
Figure 72. Features Test Mode screen 3

Sensor Verification
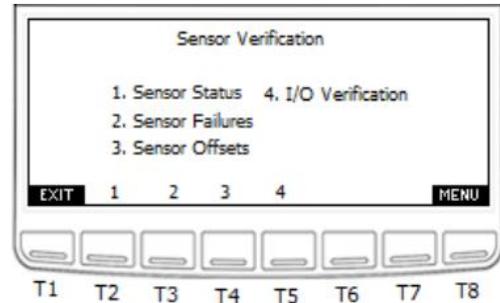
Figure 73. Sensor Verification screen

T1: Go to Test Modes Menu

T2: Go to Sensor Status Screen

T3: Go to Sensor Failure Screen

T4: Go to Sensor Offsets

T5: Go to I/O Verification

T8: Go to Field Tech Menu

I/O Verification

The I/O Verification screen is used to verify the input and output voltages and resistances. The temperature value is displayed in degrees Celsius. For powered sensors and analog outputs, the voltage is displayed. For digital inputs and outputs, a value of 0 (OFF) or 1 (ON) will be displayed.
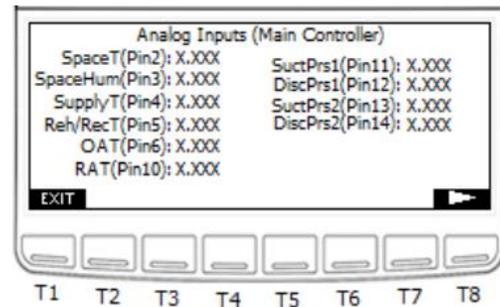
Figure 74. I/O Verification screen 1

T1: Go to Sensor Verification Menu

T7: Go to Previous Page

T8: Go to Next Page
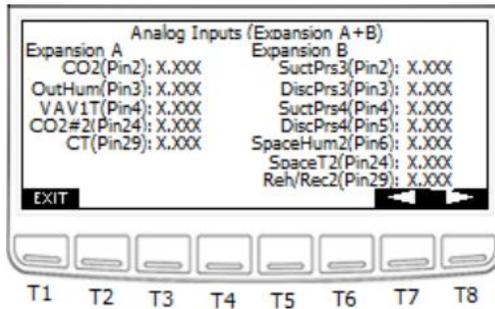
Figure 75. I/O Verification – Analog Inputs 1
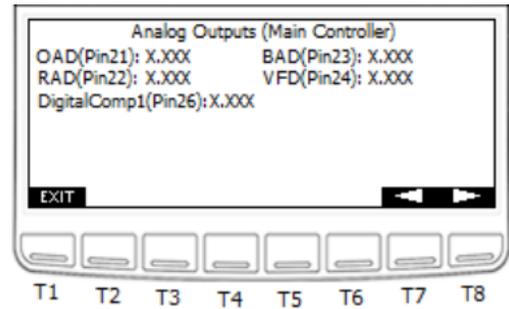
Figure 79. I/O Verification – Analog Outputs 1
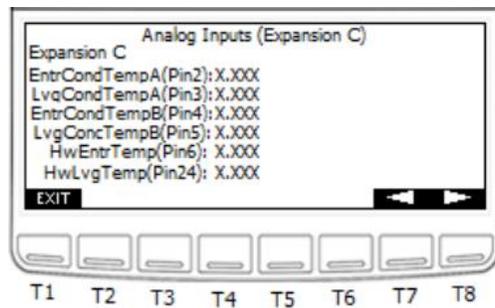
Figure 76. I/O Verification – Analog Inputs 2
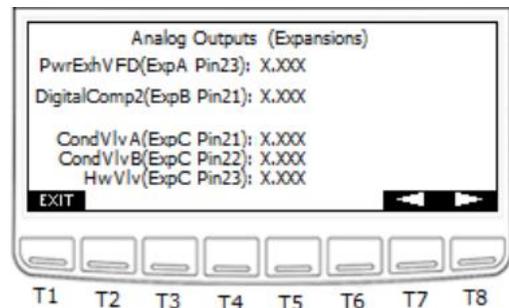
Figure 80. I/O Verification – Analog Outputs 2
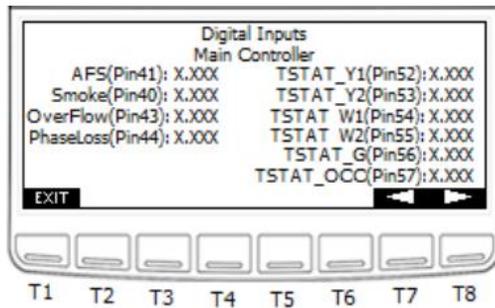
Figure 77. I/O Verification – Digital Inputs 1
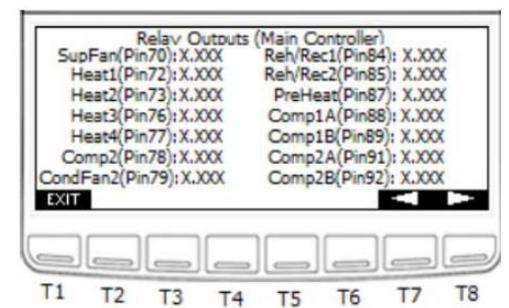
Figure 81. I/O Verification – Relay Outputs 1
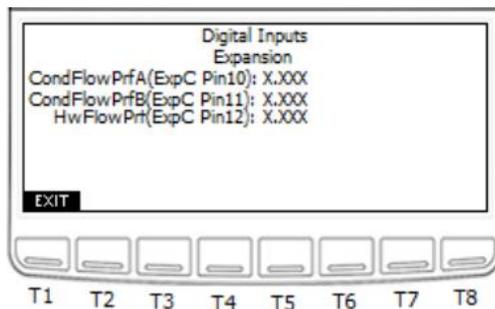
Figure 78. I/O Verification – Digital Inputs 2
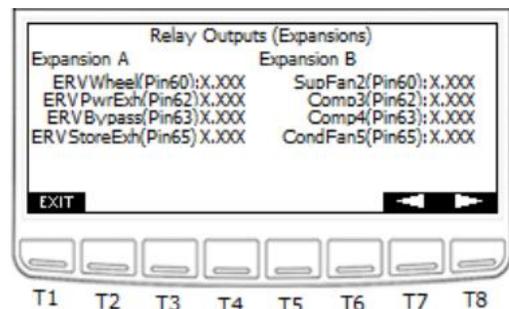
Figure 82. I/O Verification - Expansion Relay Outputs 2
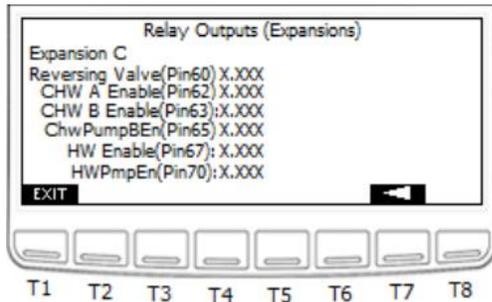
Figure 83. I/O Verification - Expansion Relay Outputs 3

Clear All Test Modes

Once testing is complete, turn the Clear Test Modes input ON to disable all test modes.
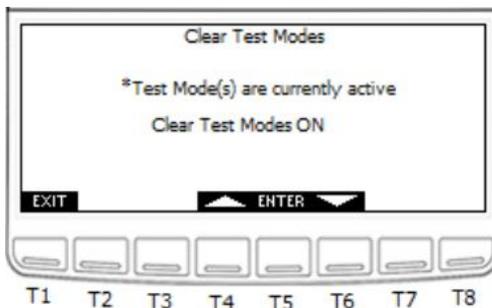
Figure 84. Clear Test Modes screen

Sensor Settings

The "Sensor Settings" screen is used to set the maximum pressure of the pressure transducers if it is different from the default value, VAV options, and hydronic valve action. The default pressure values are 500PSI for the max suction pressure and 667PSI for the max discharge pressure. The default action for chilled water valves is direct (0-10VDC). The default action for hot water valves is reverse (10-0VDC).

The second discharge and suction transducers options will only be available if the Flō unit has more than two compressors. For stores equipped with a VAV controlled by the Flō i-Controller, the number and location of temperature sensors used for VAV Zone 1 can be adjusted in this screen (either 1 or 2 sensors are permitted). Mark "YES" next to the sensors that have been installed. To change the sensor settings, perform the following steps:

1. Using the [▲] and [▼] buttons (T4 and T6, respectively) navigate to the value that you wish to change.

2. Once the value is highlighted, press the [ENTER] (T5) button and the value should blink.

3. Using the [▲] and [▼] buttons increase and decrease the value as desired.

4. Once the desired value has been reached press the [ENTER] button to set the value.

5. Repeat steps 1-4 until all desired values have been updated.

6. Once all changes have been completed, press the [EXIT] (T1) to return to the Field Tech Options Menu.
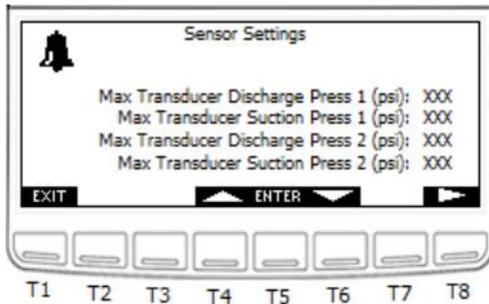
Figure 85. Sensor Settings screen 1

T1: Go to Field Tech Menu

T4: Scroll Up/Increase Value

T5: Enter (Select and Set Value)

T6: Scroll Down/Decrease Value

T7: Go to Previous Page

T8: Go to Next Page
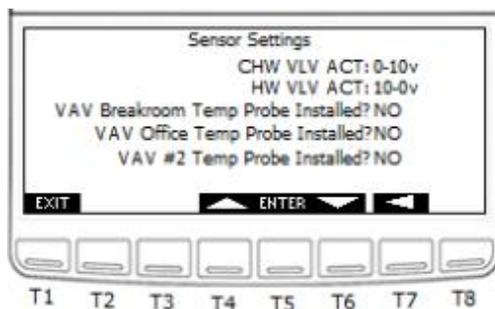
Figure 86. Sensor Settings screen 2
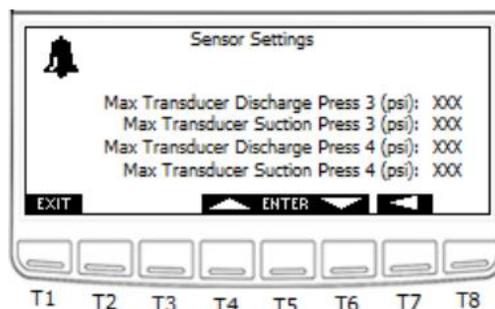
Figure 87. Sensor Settings screen 3

Set Damper Positions and Exhaust Fan Interlocks

The "Set Damper Position and Exhaust Interlocks" screen is used to set the min/max percentage of the return air damper, the min position for the bypass damper, and additional outdoor air damper opening for exhaust fan interlocks. The Exhaust fan interlock options will not be visible if none are available. If exhaust fan interlocks exist on the Flō unit, only the number of interlocks for the unit will appear on the screen. An asterisk will appear to the right of the damper percentage if the damper position is in override.

To adjust the outdoor damper opening or exhaust interlock opening:

1. Using the ▲ and ▼ buttons (T4 and T6, respectively) navigate to the value that you wish to change.

2. Once the value is highlighted, press the ENTER (T5) button and the value should blink.

3. Using the ▲ and ▼ buttons increase and decrease the value as desired.

4. Once the desired value has been reached press the ENTER button to set the value.

5. Use the ◄ (T7) and ► (T8) buttons to navigate to the second page if more than 4 exhaust fan interlocks exist on the unit.

6. Repeat steps 1-4 until all desired values have been updated.

7. Once all changes have been completed, press the EXIT (T1) to return to the Field Tech Options Menu.
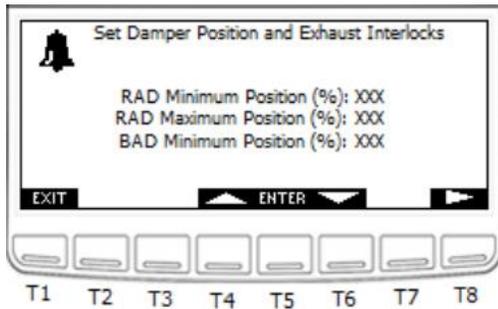
Figure 88. Set Damper Position and Exhaust Interlocks 1

T1: Go to Field Tech Menu

T4: Scroll Up/Increase Value

T5: Enter (Select and Set Value)

T6: Scroll Down/Decrease Value

T7: Previous Page

T8: Next Page
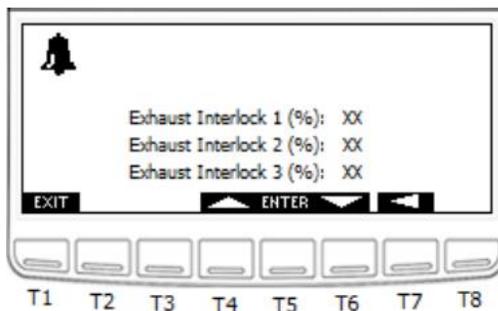
Figure 89. Exhaust Interlocks

Damper Positions

The "Damper Positions" screen is used to view the position of each dampers. Press T1 to return to the Field Tech Menu and press T5 to enter Current Damper Positions page.
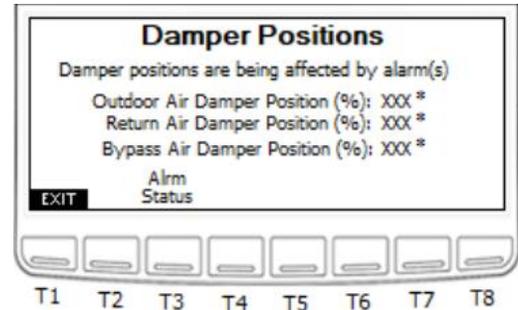
Figure 90. Damper Positions screen

T1: Go to Field Tech Menu

T3: Go to Alarm Status

Input and Output Status

The "I/O Status" screens are used to view the reading for each input and output. Only the inputs and outputs specific to the Flō unit will be visible on the screens.

1. Use the ◀ (T7) and ▶ (T8) buttons to navigate in between the input and output pages.

2. Press EXIT (T1) to return to the previous menu.
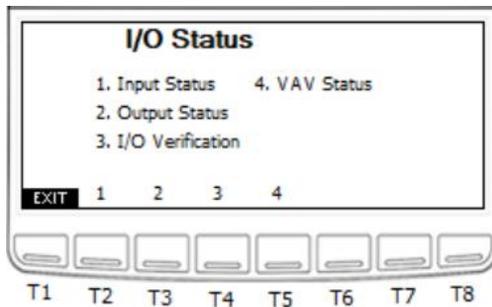
Figure 91. I/O Status screen

T1: Go to Field Tech Menu / Back
T2: Go to Input Status
T3: Go to Output Status
T4. Go to I/O Verification
T4: Go to VAV Status

Input Status
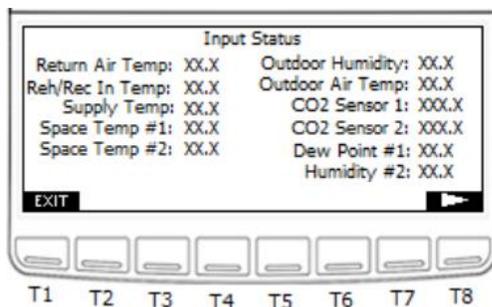
Figure 92. Input Status screen 1

T1: Go to I/O Status Menu
T7: Previous Page
T8: Next Page
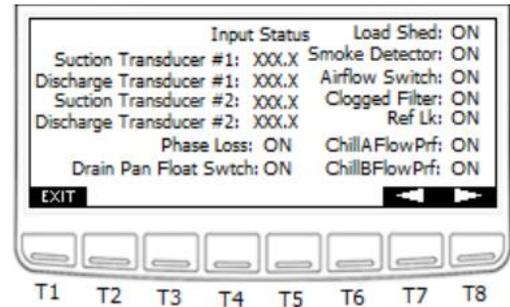
Figure 93. Input Status screen 2
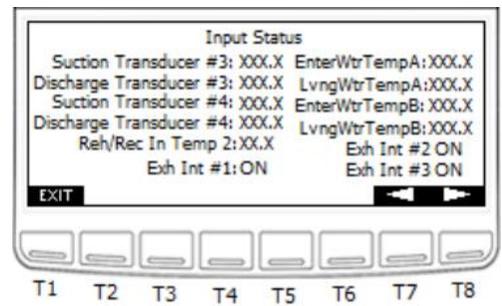
Figure 94. Input Status screen 3
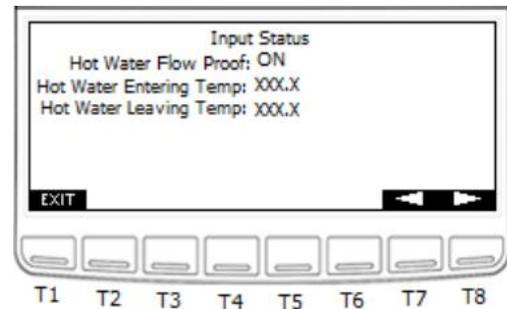
Figure 95. Input Status screen 4
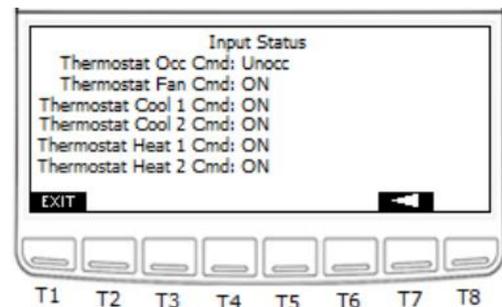
Figure 96. Input Status screen 5

Output Status
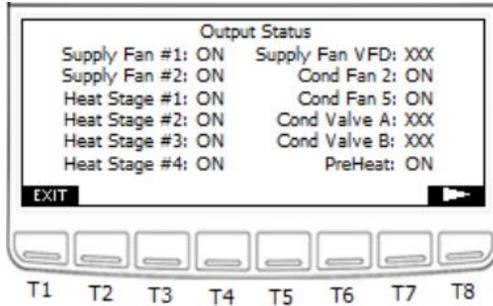
Figure 97. Output Status screen 1
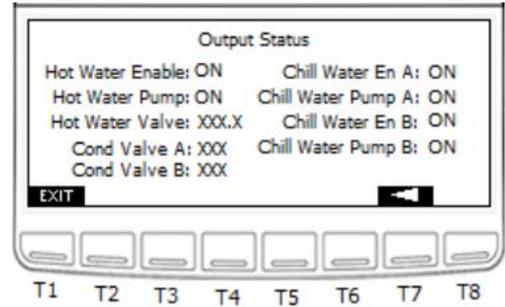
Figure 1001. Output Status screen 4
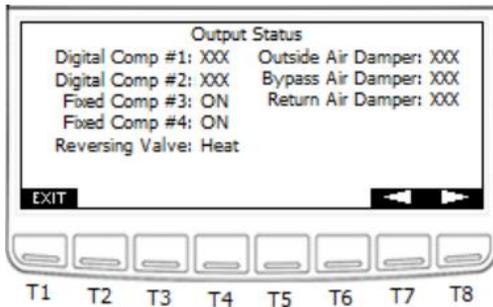
Figure 98. Output Status screen 2A
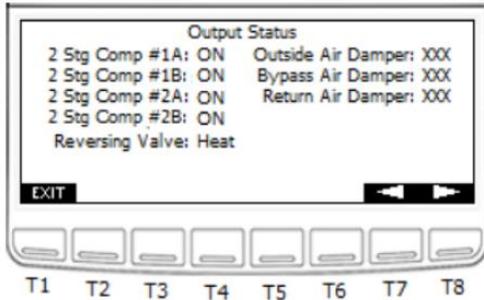
Figure 999. Output Status screen 2B
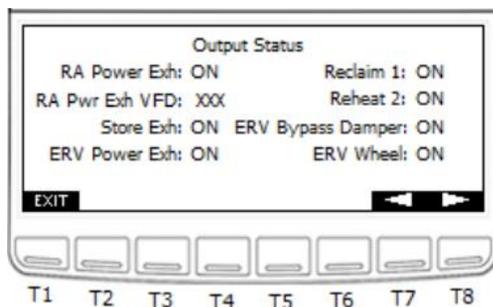
Figure 100. Output Status screen 3

VAV Status
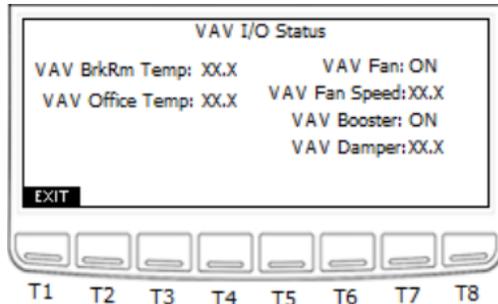
Figure 1012. VAV I/O Status screen

Demand Control Ventilation (DCV)

The "DCV Settings" screen is used to set ventilation parameters for units equipped with a CO_2 Sensor. The beginning ventilation CO_2 level, the max ventilation CO_2 level, and alarm parameter can be adjusted in this screen. To adjust the CO_2 ventilation parameters, perform the following steps:

1. Using the ⬆ and ⬇ buttons (T4 and T6, respectively) navigate to the value that you wish to change.

2. Once the value is highlighted, press the **ENTER** (T5) button and the value should blink.

3. Using the ⬆ and ⬇ buttons increase and decrease the value as desired.

4. Once the desired value has been reached press the **ENTER** button to set the value.

5. Once all changes have been completed, press the **EXIT** (T1) to return to the Field Tech Options Menu.
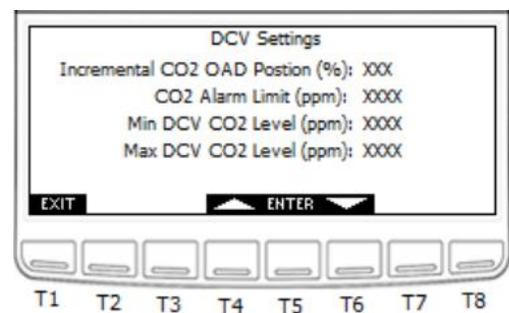
Figure 1023. DCV Settings screen

T1: Go to FT Menu
T4: Increase Value
T5: Enter
T6: Decrease Value

Overrides

If the i-Controller is connected to a BMS, remove RS485 connection before proceeding with Overrides.

Before proceeding to the override options, please note that the overrides are not timed and must be manually removed once your task is complete. All overrides will be reset in the event of a power cycle.

1. To access the Override menu, press T2 on the Field Tech Options Menu to access the Test Modes Menu.

2. From the Test Modes menu, press T6 and T7 simultaneously to access the QA Options.

3. Then press T2, T3, or T4 to access the Override options.

Figure 1034. Field Tech Options screen
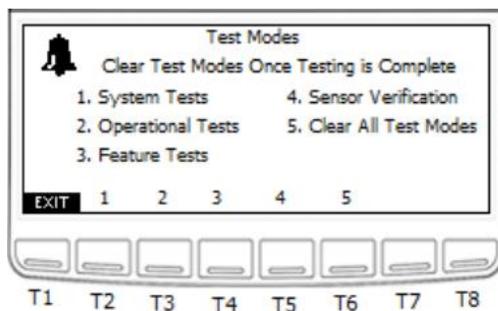
Figure 1045. Test Modes screen

Figure 1056. QA Options screen

T1: Go to Test Mode Menu
T2: Go to Input Overrides
T3: Go to Output Overrides
T4: Go to Other Overrides
T5: Go to I/O Status
T8: Go to Field Tech Menu
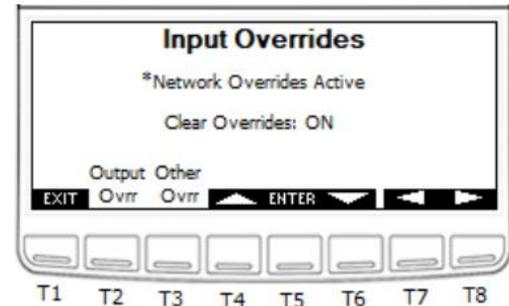
Input Overrides:

Figure 1067. Input Overrides screen 1

T1: Go to QA Options
T2: Go to Output Overrides
T3: Go to Other Overrides
T4: Increase
T5: Enter
T6: Decrease
T7: Previous Page
T8: Next Page
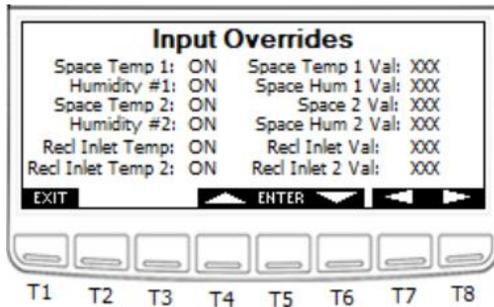
Figure 1078. Input Overrides screen 2
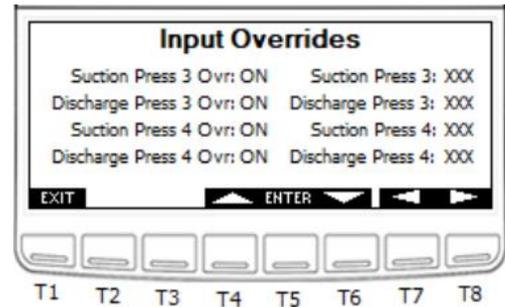
Figure 1102. Input Overrides screen 6
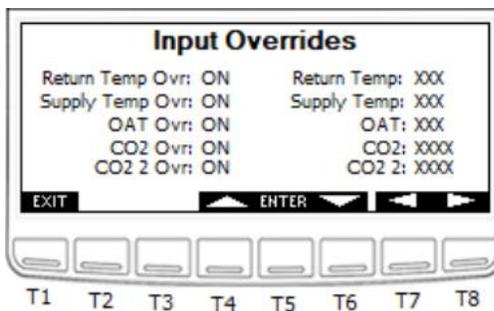
Output Overrides:

Figure 1089. Input Overrides screen 3

Figure 1113. Output Overrides screen 1
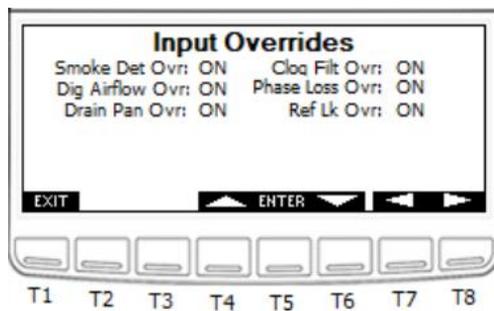
Figure 110. Input Overrides screen 4

T1: Go to QA Options
T2: Go to Compressor Overrides
T3: Go to Condenser Overrides
T4: Increase
T5: Enter
T6: Decrease
T7: Previous Page
T8: Next Page
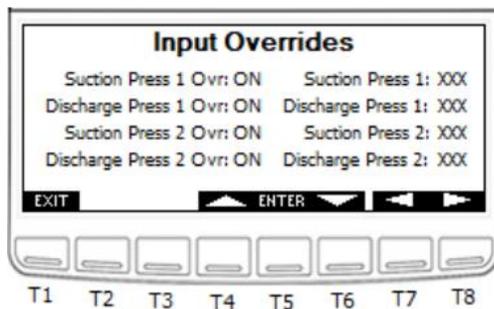
Figure 1091. Input Overrides screen 5
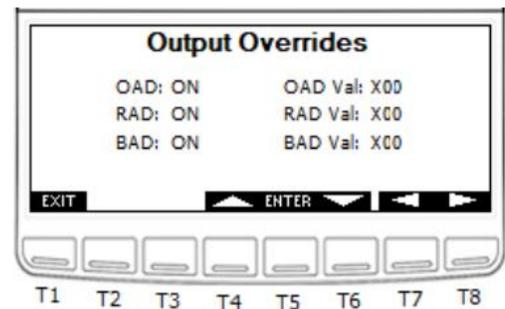
Figure 1124. Output Overrides screen 2
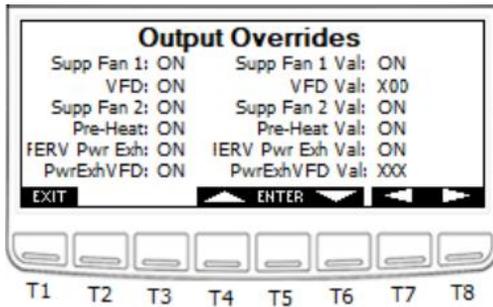
Figure 1135. Output Overrides screen 3

Figure 1146. Output Overrides screen 4

Compressor Overrides:
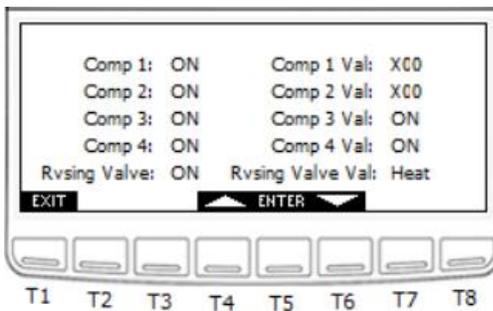
Figure 1157. Compressor Overrides screen
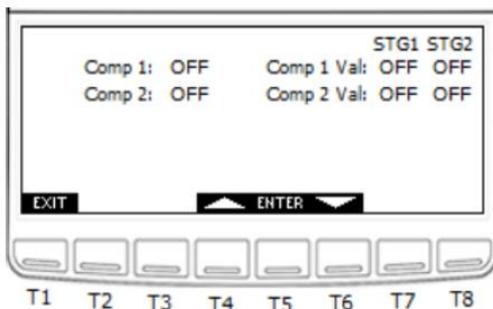
Figure 1168. Compressor Overrides screen 1B Two Stage Compressors

Condenser Overrides:

Figure 1179. Condenser Overrides screen

Other Overrides

From the either the Input or Output Overrides screen, press T3 Other Ovrr to access 'Other Overrides'.

The "Other Overrides" screen is used to set specific input and output values for diagnostic testing. To place an override on a specific variable, first the override needs to be turned on and then the desired value is adjusted (i.e. Cond Fan 1: ON, Cond Fan 1 Val: ON will force Condenser Fan 1 ON).

These overrides are not timed and will remain in the controller until they are manually removed.

To override an input or output value:

1. Using the ⬆ and ⬇ buttons (T4 and T6, respectively) navigate to the value that you wish to change.

2. Once the value is highlighted, press the ENTER (T5) button and the value should blink.

3. Using the ⬆ and ⬇ buttons increase and decrease the value as desired.

4. Once the desired value has been reached press the ENTER button to set the value.

5. Use the ◀ (T7) and ▶ (T8) buttons to navigate to the second page if more than 4 exhaust fan interlocks exist on the unit.

6. Repeat steps 1-4 until all desired values have been updated.

7. Once testing is complete and you would like to clear all overrides, turn the "Clear All Overrides:" value located on page 1 ON. This value will automatically turn OFF after a specified time.

8. Once all changes have been completed, press the EXIT (T1) button to return to the QA Menu.
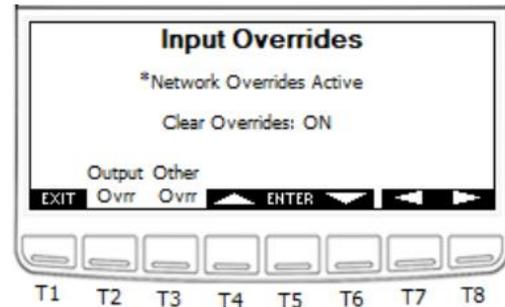
Figure 11820. Overrides screen
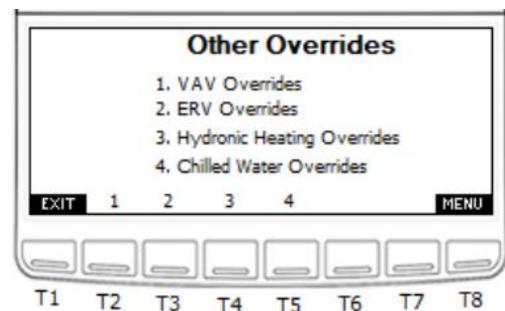
Figure 11921. Other Overrides screen 1

T1: Go to QA Menu
T2: Go to VAV Overrides
T3: Go to ERV Overrides
T4: Go to Hydronic Heating Overrides
T5: Go to Chilled Water Overrides
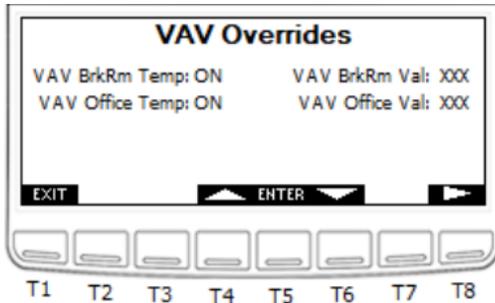T8: Go to Field Tech Menu

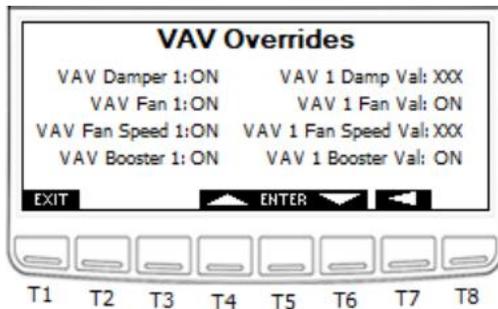## VAV Overrides

Figure 1202. VAV Overrides screen 1

Figure 1213. VAV Overrides screen 2
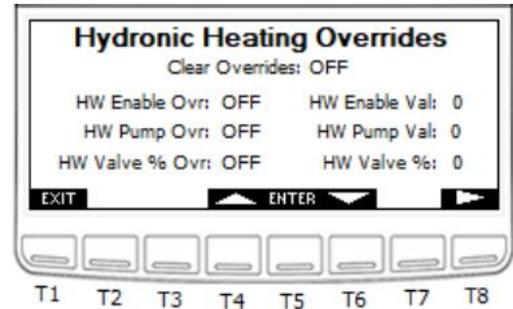
Hydronic Heating Overrides

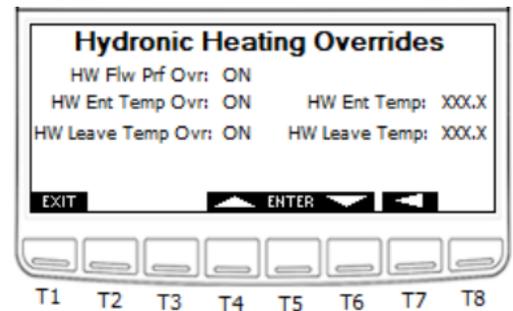*Figure 1235. Hydronic Heating Overrides screen 1*

Figure 1246. Hydronic Heating Overrides screen 2

Energy Recovery Wheel (ERV) Overrides

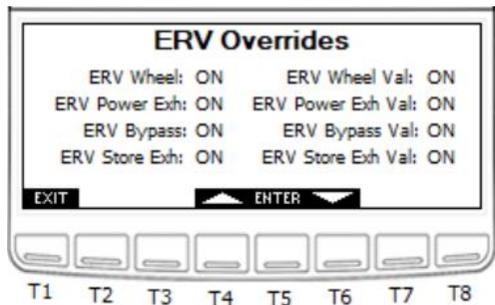1. From the Main Overrides screen, press T3 ERV Ovrr to access the ERV Overrides.

Figure 1224. ERV Overrides screen 1

Chilled Water Overrides

When the unit is equipped with a chilled water coil, the 'Other Overrides' screen will display 'Chilled Water Overrides'.
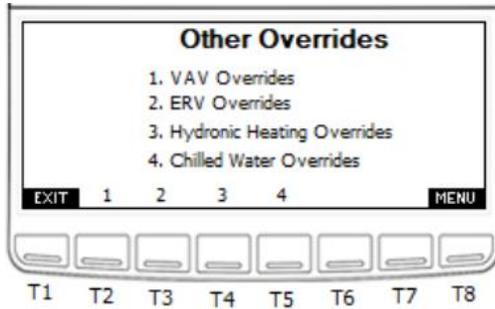
Figure 1257. Other Overrides when Equipped with Chilled Water
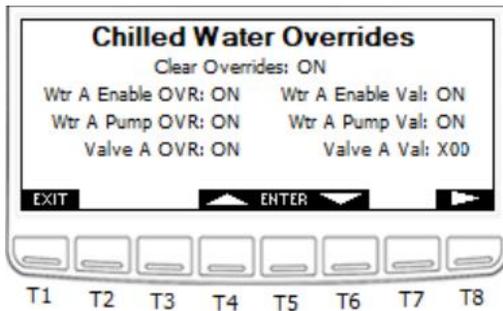
Figure 1268. Chilled Water Override screen 1
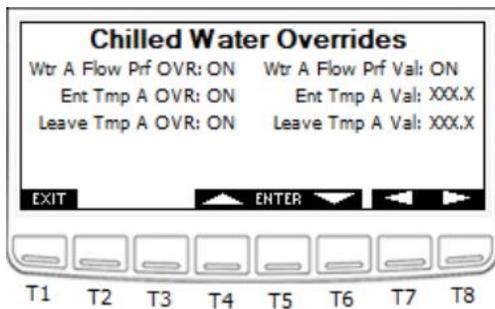
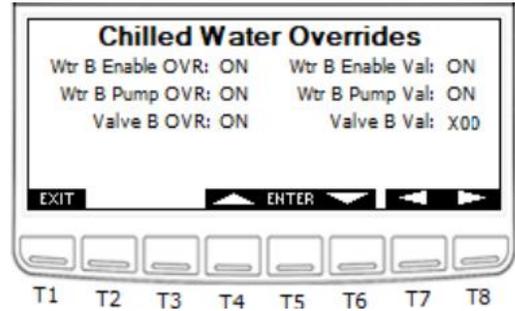Figure 1279. Chilled Water Override screen 2

Figure 12830. Chilled Water Override screen 3

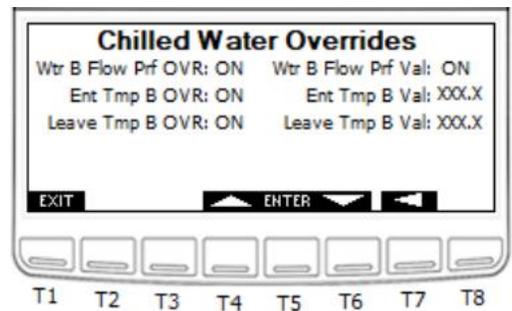Figure 12931. Chilled Water Override screen 4

Water Condenser

When the unit is equipped with a water condenser, the 'Other Overrides' screen will display 'Water Condenser Overrides'.
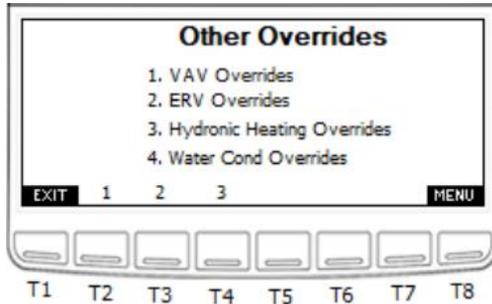

Figure 1302. Other Overrides when Equipped with Water Condenser
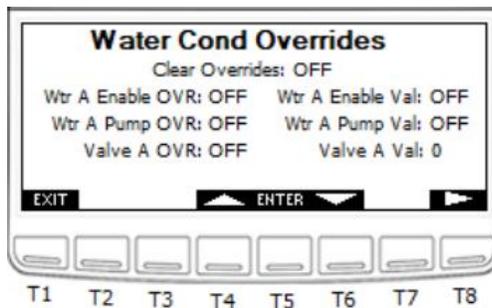

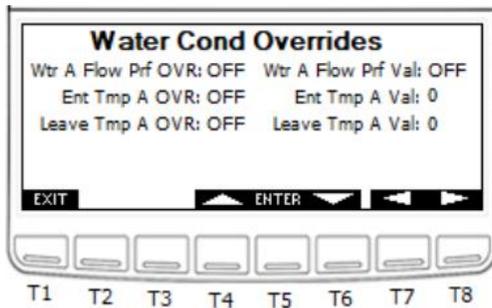Figure 1313. Water Condenser Overrides screen 1

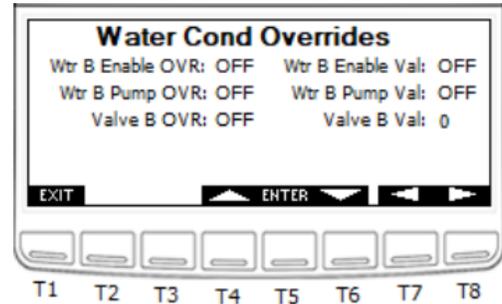Figure 1324. Water Condenser Overrides screen 2
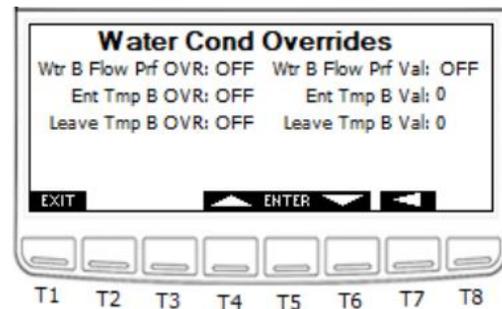

Figure 1335. Water Condenser Overrides screen 3

Figure 1346. Water Condenser Overrides screen 4