

# Programming and Operation Manual for R513A Heat Pumps

Software version v1.505



For R513A units produced from 5/1/26 to :

POM-C1505-L260528

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## Purpose

This manual is intended to provide all the information needed to successfully program and operate Lochinvar's R513A commercial heat pump water heaters.

## Before Using This Manual

Confirm your heat pump is using software version 1.505. This can be verified by holding down on the clock icon on the main page for 3 seconds, and then pressing the **"System Info"** button on the page that pops up.

### NOTICE

If your heat pump does not pop up a screen upon long pressing the clock, you are NOT currently using version 1.505. If your heat pump is not using this version of the software, either download the manual appropriate for your software version, or update the software to this version.

**Note:** If updating is required, refer to the **"Update Information"** section at the end of this manual.

## Navigation Screen Overview

Lochinvar heat pumps come with a full color touchscreen mounted on the front of the cabinet, under a weatherproof enclosure. Whenever 120v power is available from the heat pump's internal transformer, the controller will be active. These are the screens that may be used during installation and typical operation.

**Home Screen:** This is the default display screen, and features a variety of indicators related to the current operation of the unit. It also includes navigation to the other screens.

**Config Screens:** There are two configuration screens called **Config Page 1** and **Config Page 2**. Most user-configurable options are available on these screens. However, a service password is required to access the configuration pages. The service password is 6947.

**Diag Screen:** Operating information specific to troubleshooting and diagnostics are available here, as well as selected diagnostic and/or commissioning tools. More detail on the **"Diagnose"** screen is available in the Troubleshooting section of this manual.

**Alarms Screen:** This set of screens display the currently active alarms, and provides access to the error log history. More detail on alarms is available in the Troubleshooting section of this manual.

**System Information Screen:** This screen is accessed by long-pressing the **"clock"** icon on the main screen. It gives access to unit information, software versions, networking settings and more.

**Error Log Screen:** This screen is a historical list of alarms and notable errors or faults. Each entry has a descriptive name, a time of occurrence, and a time of resolution.

**Factory Screen:** Settings on the factory screens should not be adjusted without direct supervision by Lochinvar's controls engineers. Accessing this page requires a password that changes daily.

More detailed information on individual screens can be found in the relevant sections of this manual.

## Parameters

This section details all of the essential parameters that can be set to govern the heat pump's operating characteristics. While the parameters are described in some detail in the table, it is best to use the table as a reference in conjunction with the **"Programming"** instructions in the next section of this manual.

Parameters are set on the **"Config"** screen, or a second page accessible from the main config screen. Access to the configuration page requires entering a service password when prompted. The service password is 6947. Entering the password will provide service mode access for 8 hours.

Parameters are divided into **"Universal"** parameters, that are available for all heat pumps, and **"Conditional"** parameters that may or may not be present dependent on heat pump model or mode selections. **"Universal"** parameters are typically on **"Config Page 2"**, while specific parameters are typically on the primary config screen.

### Config Page 1 Parameters

This set of operating parameters may or may not be available, depending on the unit type and operating mode. Again, **"typical"** settings assume a standard 140 °F storage DHW system:

| Parameter                 | Default       | Range               | Typ           | Description                                                                                                                                                                                                                                                                        | Visible For:           |
|---------------------------|---------------|---------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>Demand Mode</b>        | <b>Remote</b> | <b>Tank, Remote</b> | <b>Varies</b> | Demand mode determines how the unit receives heat demands:<br>- Tank Mode: The heat pump creates a demand based on the tank temperature probes.<br>- Remote: heat demands can com dry contact closure on the <b>"Remote Enable"</b> terminals, a BMS system, or an MCP Controller. | All Heat Pumps         |
| <b>Tank Cut-In</b>        | <b>95</b>     | <b>50-160</b>       | <b>95</b>     | When the tank sensor temperature falls below <b>Tank Cut-In</b> demand begins.                                                                                                                                                                                                     | Tank Mode, SP          |
| <b>Target Cond LWT</b>    | <b>120</b>    | <b>100-160</b>      | <b>140</b>    | The target DHW leaving water temperature setpoint of the heat pump.                                                                                                                                                                                                                | SP (Not used with MCP) |
| <b>Cold Sensor Cut In</b> | <b>100</b>    | <b>50-135</b>       | <b>105</b>    | When the cold tank sensor falls below this temperature, heat demand begins.                                                                                                                                                                                                        | Tank Mode, MP          |
| <b>Warm Sensor Cut In</b> | <b>115</b>    | <b>80-120</b>       | <b>125</b>    | When the warm tank sensor falls below this temperature, heat demand begins.                                                                                                                                                                                                        | Tank Mode, MP          |
| <b>Target Tank Temp</b>   | <b>120</b>    | <b>100-140</b>      | <b>140</b>    | The target DHW storage temperature of the tank.                                                                                                                                                                                                                                    | Tank Mode, MP          |

## Config Page 2 Parameters

The following parameters are applicable to all operating modes and types. “**Typical**” settings assume a standard 140°F storage DHW system. These parameters are found on the config page 2 screen.

| Parameter                        | Default          | Range            | Typ.             | Description                                                                                                                                                                                                                                                             |
|----------------------------------|------------------|------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EWT Cut-Out                      | SP 115<br>MP 145 | 50-160           | SP 115<br>MP 145 | If the heat pump detects DHW loop water hotter than this setting entering the heat pump, compressor operation is stopped, without ending the heat demand. In single-pass operation, this will end the heat demand if the source of the heat demand is no longer active. |
| Flow Verification Timer (Cond)   | 60               | 60-90            | 60               | The amount of seconds the unit will wait to verify flow for the condenser. This is adjustable to accommodate external control devices with variable motor times.                                                                                                        |
| Flow Verification Timer (Evap)   | 10               | 10-300           | Varies           | The amount of seconds the unit will wait to verify flow for the evaporator. This is adjustable to accommodate external control devices with variable motor times.                                                                                                       |
| Max Purge Time                   | 60               | 10-300           | 60               | After a heat demand ends, the circulator will continue a post purge to remove heat from the heat pump and attached piping. If the Purge Cut Out temperature is not reached, the post purge will stop after this many seconds.                                           |
| Purge Cut Out                    | 120              | 100-140          | 120              | After a heat demand ends, the circulator will continue a post purge to remove heat from the heat pump and attached piping. If the leaving water temperature falls below this value, post purge will stop.                                                               |
| Source Fluid (Water Source Only) | Water            | Water/<br>Glycol | By Temp<br>Loop  | Selector for whether the source loop is water or a glycol mixture to resist freezing. This affects the lowest operable source temperatures of the heat pump. “ <b>Water</b> ” will stop operation below approximately 45 Deg F.                                         |
| Idle Flow Valve Position         | Closed           | Closed/<br>Open  | Closed           | Whether the internal DHW flow control valve is open or closed when the heat pump is not actively heating.                                                                                                                                                               |

## Programming Instructions

Heat pump configuration is done on the “**Config**” pages. Configurable parameters are listed in the “**Parameters**” section of this manual.

Access to the configuration pages requires the entry of a service password when prompted. The service password is 6947. Entering the password will provide service mode access for 8 hours.

When programming your heat pump, the two most important considerations are:

1. **Determine the proper Demand Mode**, which sets how the heat pump calculates or receives demands for heat, and
2. **Determine whether the heat pump is a “Single-pass” or “Multi-Pass” model**. For most heat pumps this is set in the factory, but it is important to know what type of operation your heat pump is set for to program it properly.

Each of these considerations are discussed in the following sections.

## Demand Modes

Heat pumps can configure a “**Demand Mode**”, either “**Tank Mode**”, or “**Remote Mode**”. Heat pumps will default to remote mode “**Remote Mode**” from the factory. Each mode changes operation and configuration in several ways:

**In Tank mode**, the heat pump expects to have its own sensors wired directly to the storage tanks. In this mode, the heat pump’s internal software determines when heat demands should start and stop based on those sensor readings and the heat pump’s configuration settings.

In Tank mode the Remote Enable terminals will enable or disable the heat demand function of the heat pump. If there is an open circuit between the Remote Enable terminals, no heat demands will be processed, and the heat pump will not operate.

BMS systems, if connected through an optional BMS gateway, can monitor heat pumps in tank mode. However, they are restricted to read-only access.

**Remote mode** enables operation when an external device determines when heat is needed, and passes a heat demand to the heat pump.

In remote mode, the heat pump responds to external heat demands and monitors the entering and leaving water temperatures with its own internal sensors. The heat pump is not involved directly with the tank temperature logic, and does not have its own sensors wired to the tank.

Remote modes enables the following sources of incoming heat demands:

**If connected to a proprietary central controller**, all other heat demand inputs will be ignored. This is automatic upon connecting to the central controller via ethernet cable and establishing a successful connection. When this occurs, the controller will display a Demand Mode of “**MCP**”

**If not connected to a central controller**, external demands can be initiated by:

1. a dry contact closure to the “**Remote Enable**” terminals on the heat pump,
2. or through an optional BMS gateway accessory using BACnet IP/MSTP.

## Single-pass Configuration

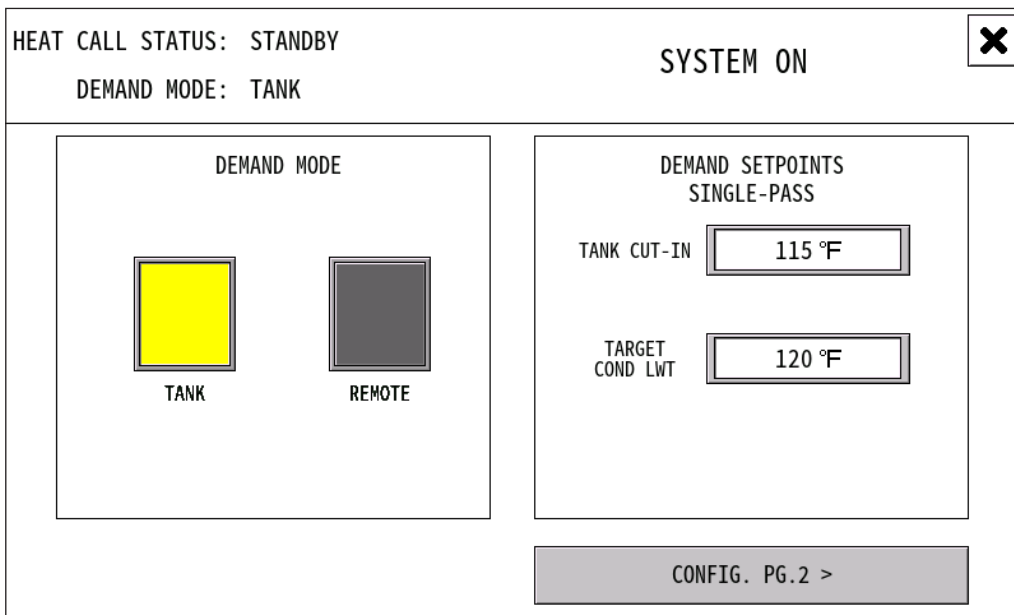
Single-pass heat pumps are designed to modulate their flow rates or capacity to maintain a specific target leaving water temperature at usable temperature in one pass. They are piped so that the hot water from the heat pump goes to the top of the storage tank.

### CAUTION

It is very important to ensure that the heat pump operating type matches the installation requirements and is configured correctly to ensure proper operation. Incorrect piping or configuration will result in poor performance and can damage the heat pump.

To configure a single-pass heat pump, on the “**Config**” screens:

**Figure 1: Single-pass configuration page 1**



On the “**Config**” page 1 screen:

1. Set the (**Demand Mode**) to “**Tank**” or “**Remote**”, as appropriate.
2. Tank Mode Only:
  - a. Set the (**Tank Cut-In**). When the tank temperature falls below this value, a heat demand begins. Typically, it should be set to 115 Deg F or lower.
3. Set (**Target Cond LWT**) to the desired target water temperature from the heat pump. In some piping and tank systems, a small amount of temperature drop can occur from the heat pump outlet to the tank sensor, which may require raising the heat pump (**Target Cond LWT**) slightly to reach desired storage temperatures.

On the “**Config**” page 2 screen:

1. Set the (**Condenser Flow Verification Timer**), if necessary to accommodate external devices in the DHW flow stream that may impede flow.
2. Set the (**Evaporator Flow Verification Timer**), if necessary, to accommodate external devices in the evaporator/source flow stream that may impede flow.

3. Set (**EWT Cut-Out**). This is the temperature which will stop the heat pump compressor, and end the heat demand if the tank sensor is satisfied. Typically, it must be set to 115 Deg F. or lower.
4. Set (**Purge Cut Out**). This should be set no lower than the minimum usable water temperature for the system, and do not set it below the (**EWT Cut-Out**) value. Typically for single-pass systems, this is set to 120 Deg F.
5. Set (**Max Purge Time**). Ideally, this will be enough time for the heat pump to clear the piping from the heat pump to the storage tank of hot water. Determining the optimum setting may require adjustment during unit operation, taking into account the water content of the supply pipe and the prevailing after cycle flow rate of the heat pump.

## Multi-pass Configuration

Multi-pass heat pumps do not modulate their flow rates or capacity to maintain a specific target leaving water temperature. They are piped so that the hot water from the heat pump goes to the bottom half of the storage tank.

### CAUTION

It is very important to ensure that the heat pump operating type matches the installation requirements and is configured correctly to ensure proper operation. Incorrect piping or configuration will result in poor performance and can damage the heat pump.

To configure a multi-pass heat pump, on the “**Config**” screens:

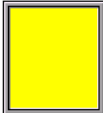
**Figure 2: Multi-pass configuration page 1**

HEAT CALL STATUS: STANDBY

DEMAND MODE: TANK

SYSTEM ON 

DEMAND MODE



TANK



REMOTE

DEMAND SETPOINTS  
MULTI-PASS

COLD SENSOR CUT-IN 90 °F

WARM SENSOR CUT-IN 100 °F

TARGET TANK TEMP 120 °F

CONFIG. PG.2 >

On the “**Config**” page 1 screen:

1. Set the (**Demand Mode**) to “**Tank**” or “**Remote**”, as appropriate.
2. Tank Mode Only:
  - a. Set the (**Target Tank Temp**) value to the desired storage temperature. In commercial systems, this is typically 140 Deg F. 140 Deg F is the maximum supported tank temperature for multi-pass systems.
  - b. Set the (**Cold Sensor Cut In**). This is the temperature that will initiate a heat demand at the cold (low) sensor position. It should be set BELOW the expected recirculation loop return water temperature. Typically, 105 deg F. or lower is recommended.
  - c. Set the (**Warm Sensor Cut-In**). This is the temperature that will initiate a heat demand at the warm (high) sensor position. It should be set ABOVE the expected recirculation loop return water temperature for single tank configuration. Typically, 125 deg F is recommended.

On the “**Config**” page 2 screen:

1. Set the (**Condenser Flow Verification Timer**), if necessary to accommodate external devices in the DHW flow stream that may impede flow.
2. Set the (**Evaporator Flow Verification Timer**), if necessary, to accommodate external devices in the evaporator/source flow stream that may impede flow.
3. Set (**EWT Cut-Out**). This is the temperature which will stop the heat pump compressor. Multi-pass systems must set this ABOVE the desired tank storage temperature. 142 Deg F is recommended.
4. Set (**Purge Cut Out**). In multi-pass systems, post purge is limited. Setting this equal to the (**Target Tank Temp**) is recommended.
5. Set (**Max Purge Time**). In multi-pass systems, post purge is generally limited by temperature. 120 seconds is a recommended setting.

## Heat Pump Operational Screens

Two screens are generally used during regular operation to monitor the heat pump's status and key indicators; the Home screen, and the Diag screen. All typically desired real-time information is available on these screens.

In addition, there are screens to show currently active alarms and the unit's error history.

### Home Screen

The home screen is a quick reference to the overall current status of the heat pump. The home screen also provides the start/stop buttons to allow the unit to operate or force it into standby mode.

**Note:** "Stop" will normally persist until "Start" is pressed. However, when connected to an external main controller, this "local stop" will time out after 8 hours. To permanently stop a heat pump from being called by an external controller, unplug the ethernet cable connection to the external controller.

**Figure 1: Home Screen Example**

|                                                                                             |       |                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |       |  |
|---------------------------------------------------------------------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|--|
| HEAT CALL STATUS: TANK                                                                      |       | <div style="background-color: yellow; padding: 2px;">WARNING ALARM</div> <div style="background-color: red; padding: 2px;">LOCKOUT ALARM</div>                                                   |        | SYSTEM ON                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | 09:32 |  |
| DEMAND MODE: TANK                                                                           |       |                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |       |  |
| LWT TARGET 120 °F<br>COND LWT 112 °F                                                        |       | TANK TARGET 120 °F<br>TANK 112 °F                                                                                                                                                                |        | PUMP <br>FAN <br>COMP <br>HGBV <br>DEFROST  |  |       |  |
| COND FLOW 9.6 GPM                                                                           |       | <div style="background-color: green; color: white; text-align: center; padding: 5px;">START</div> <div style="background-color: red; color: white; text-align: center; padding: 5px;">STOP</div> |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |       |  |
| COND EWT 94 °F                                                                              |       |                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |       |  |
| AMBIENT AIR 80 °F                                                                           |       |                                                                                                                                                                                                  |        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |       |  |
| CONFIG.  | DIAG. | FACTORY                                                                                                       | ALARMS | ERROR LOG                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |       |  |

### Screenshot Index:

- Heat Call Status:** The current heat call status on the machine. Tank, EXTERNAL, MCP, Standby, Holding. "Standby" indicates no active heat call.
- Demand Mode:** The currently configured demand mode on the machine. Tank, Remote, MCP.
- Alarm Indicators:** When alarms are present, a yellow (soft) or red (lockout) indicator will appear here.
- On/Off Indicator:** Pressing start/stop buttons will change toggle On/Off.
- Clock:** Current system time. Long press for 3 seconds to access "system info" pages.
- LWT Indicators:** DHW leaving water temperature target and actual data is shown here.
- Tank Indicators:** Tank target and actual data is shown here. This is not available in "Remote" mode (see configuration sections for details).
- System Indicators:** Major subsystem's on/off indication is shown here (On is green).
- Cond Flow:** Current DHW flow rate through the heat pump
- Cond EWT:** Heat pump entering water temp on the DHW loop.
- Source Temp:** Either ambient air (air source) or source loop EWT (water source) temp.
- Start/Stop Buttons:** To toggle the heat pump between system on and off.
- Navigation Bar:** Buttons to access other pages.

## Diag Screen

The diag screen is a more detailed view, intended to facilitate a more technical review of the current status of the heat pump.

**Figure 2: Diag Screen**

|                                                                                                          |          |                                                                                              |           |
|----------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------|-----------|
| DEMAND MODE: TANK                                                                                        |          | SYSTEM OFF <span style="float: right; border: 1px solid black; padding: 2px;">X</span>       |           |
| REMOTE ENABLE                                                                                            |          |                                                                                              |           |
| COMPRESSOR                                                                                               |          |                                                                                              |           |
| RUN TIME                                                                                                 | 123 hrs  | START DELAY                                                                                  | 345 s     |
|                         |          | SLP                                                                                          | 30 psig   |
|                                                                                                          |          | DLP                                                                                          | 266 psig  |
| CONDENSER                                                                                                |          | EVAPORATOR                                                                                   |           |
| PUMP                    | FLOW     | 9.6 GPM                                                                                      |           |
| COND HEAT               | VALVE    | 41 %                                                                                         |           |
| COND FREEZE PROTECTION  | COND EWT | 94 °F                                                                                        |           |
| 109 s                                                                                                    | COND LWT | 112 °F                                                                                       |           |
| MAX PUMP ON                                                                                              |          |                                                                                              |           |
|                                                                                                          |          | FAN        | AMB AIR   |
|                                                                                                          |          | LLSV       | 80 °F     |
|                                                                                                          |          | HGBV       | EVAP      |
|                                                                                                          |          | EVAP HEAT  | 72 °F     |
|                                                                                                          |          | 300 s                                                                                        | SSLT      |
|                                                                                                          |          |                                                                                              | 50 °F     |
|                                                                                                          |          | FAN OFF                                                                                      | SLT       |
|                                                                                                          |          |                                                                                              | 60 °F     |
|                                                                                                          |          |                                                                                              | SUPERHEAT |
|                                                                                                          |          |                                                                                              | 10 °F     |

### Diag Screen Index:

1. **Heat Call Status:** The current heat call status on the machine. Tank, Remote, MCP, Standby, Holding. **“Standby”** indicates no active heat call.
2. **Demand Mode:** The currently configured demand mode on the machine. Tank, Remote, MCP.
3. **Alarm Indicators:** When alarms are present, a yellow (soft) or red (lockout) indicator will appear here.
4. **On/Off Indicator:** Pressing start/stop buttons will change toggle On/Off.
5. **Exit Screen:** Pressing the X in the corner will close this screen and return to the main page.
6. **Remote Enable Indicator:** If there is a closed circuit on the remote enable terminals, an indicator will appear here.
7. **Run Time:** The total, cumulative compressor run time for this heat pump.
8. **Start Delay:** A timer indicating the remaining time delay before compressor start is allowed.
9. **Compressor Indicator:** Green when compressor is on.
10. **Pressure Readings:** Current suction and discharge pressure readings.
11. **Condenser SubSystems:** Indicators for major subsystems (Green is on).
12. **Flow:** Current DHW flow rate through the heat pump
13. **Valve:** Current open percentage of the DHW loop flow control valve.
14. **Cond EWT:** Heat pump entering water temp on the DHW loop.
15. **Cond LWT:** Heat pump leaving water temp on the DHW loop.
16. **Max Pump Button:** When system is **“off”**, this button will trigger 100% pump for a specified amount of time (60 seconds to 1800. This will also trigger the **“Run Signal”** contacts.

## Diag Screen Index (continued)

- 17. **Evaporator Subsystems:** Indicators for major subsystems (Green is on).
- 18. **Ambient Air/Evap EWT:** Either ambient air (air source) or source loop EWT (water source) temp.
- 19. **Evap/Evap LWT:** Either evaporator sensor temp (air source) or source loop LWT (water source) temp.
- 20. **SLT:** Suction line temperature
- 21. **SSLT:** Saturated suction line temperature. ***Note: for EEV equipped heat pumps, this indicator becomes current EEV position.***
- 22. **Superheat:** Current superheat across the evaporator.
- 23. **Manual Fan Button/Manual Source Flow:** When system is “off”, this button will trigger the fans (air source), or closes the “Source Pump” contacts (water source), for a specified amount of time (60 seconds to 1800 seconds).

## Alarms Screen

The alarms screens show currently active alarms. At the end of this manual, there is a complete list of available alarms, their trigger conditions and reset conditions, and more. For more detail on specific alarms, refer to the “**Alarms List**” section of this manual.

There are three alarm pages:

**Soft/Warning Alarms:** Pressing the alarm button on the main screen navigation bar will take you to this page. This page shows only alarms that can reset themselves if conditions change, or “**soft**” alarms. When soft alarms are active, a yellow “**warning**” indicator lights up on all pages. Pressing a yellow indicator will also take you to this screen.

From this page, if lockout or sensor alarms are present, a button will appear to allow access to those pages.

**Lockout Alarms:** Another page shows only alarms that require a manual reset for the unit to resume operation, or “**lockout**” alarms. When these alarms are active, a red “**warning**” indicator lights up on all pages. Pressing a red indicator takes you to directly this alarm screen, or it can be accessed through the “**soft**” alarm page, if there are active lockout alarms.

Hard alarms will show a “**reset**” button next to them when they are active. Pressing the reset button will clear the alarm from currently active status.

**Sensor Alarms:** A final alarms page indicates all “**sensor**” based alarms. This is accessible through the soft alarm page. Sensor alarms will clear themselves if the sensor condition is rectified, but they cannot be manually reset or ignored.

## Error Log Screen

This screen provides a list of previously logged alarms, and their timestamps for initiation and resolution. They can also be acknowledged by service personnel on this page, which will time stamp the alarm with the time of acknowledgement.

**Figure 3: Error Log Screen**

X

DEMAND MODE: REMOTE
SYSTEM OFF

| OCCURENCE         | EVENT                       | RECOVER        | CONFIRM        |
|-------------------|-----------------------------|----------------|----------------|
| 05/05/25 13:54:46 | High Pressure Lockout Alarm |                |                |
| 05/05/25 13:54:39 | High Pressure Warning Alarm | 05/05 13:54:41 |                |
| 05/05/25 13:54:23 | High Pressure Warning Alarm | 05/05 13:54:36 |                |
| 05/05/25 13:53:33 | Low Pressure Warning Alarm  | 05/05 13:53:52 | 05/05 13:53:44 |
| 05/05/25 13:53:24 | High Pressure Warning Alarm | 05/05 13:53:39 |                |

Select

▲

▼

Check

Delete

### Error Log Screen Index:

1. **Occurrence:** The time the alarm was triggered.
2. **Event:** Alarm or event name.
3. **Recover:** The time the alarm was resolved.
4. **Confirm:** Timestamp of when “**check**” button was pressed, while this alarm was selected.
5. **Navigation Arrows**
6. **Check:** Pressing this with a “**selected**” alarm stamps the alarm with a “**confirm**” timestamp.
7. **Delete:** A selected and recovered alarm can be deleted from this screen.

## System Information Screens

In this set of screens network settings, serial numbers, and other rarely needed information is available. Accessing these screens requires long pressing the clock icon on the main screen for 3 seconds: this will take you to the Date and Time page, which has buttons to the other pages in this section.

**Figure 4: Date and Time Screen**

DEMAND MODE: REMOTE
SYSTEM OFF ✕

**CURRENT DATE & TIME:**  

SYSTEM INFO

2025/04/14 Mon. 11:56:42

NETWORK

**YEAR**  

70

(20##)

**MONTH**  

1

**DAY**  

1

**HOUR**  

0

(24HR)

**MINUTE**  

0

**SECOND**  

0

PRESS AND HOLD  
TO SET DATE AND TIME



*\*Service Mode Required\**

### Date and Time Screen Index:

1. **System Info Button:** Navigates to the System Information page.
2. **Network Button:** Navigates to the Network page.
3. **Date/Time Fields:** When unlocked, allows changing of date/time values.
4. **Date/Time Edit Button:** Holding this button unlocks the date/time fields to allow editing. This is locked unless service mode is active by entering the “**config**” page password.

**Figure 5: System Information Screen**

|                                                                                                                                                                                              |                                                                                                                                                                                              |                                                                                                  |                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEMAND MODE: TANK                                                                                                                                                                            |                                                                                                                                                                                              | SYSTEM OFF                                                                                       | <div style="border: 1px solid black; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">X</div> |
| <b>SYSTEM INFORMATION</b>                                                                                                                                                                    |                                                                                                                                                                                              |                                                                                                  |                                                                                                                                                       |
| <b>PROGRAM VERSIONS</b>                                                                                                                                                                      | <b>UNIT MODEL</b>                                                                                                                                                                            | <b>SERIAL NUMBER</b>                                                                             |                                                                                                                                                       |
| PLC: v1.500<br>HMI: v1.500                                                                                                                                                                   | C185A                                                                                                                                                                                        | NHP <div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">901760</div> |                                                                                                                                                       |
| <b>DLOG STATUS</b>                                                                                                                                                                           | <b>SPLOG STATUS</b>                                                                                                                                                                          |                                                                                                  |                                                                                                                                                       |
|  <div style="border: 1px solid black; display: inline-block; padding: 2px 10px; margin-left: 5px;">00</div> |  <div style="border: 1px solid black; display: inline-block; padding: 2px 10px; margin-left: 5px;">00</div> |                                                                                                  |                                                                                                                                                       |

**System Information Screen Index:**

1. **Program Versions:** The currently installed software versions for the PLC (logic controller) and HMI (interface screen).
2. **Unit Model:** The current model heat pump the software is configured for.
3. **Serial Number:** The serial number of the heat pump.
4. **Dlog Status:** A health indicator and status code box for the Data logs.
5. **SPlog Status:** A health indicator and error code box for the Setpoint logs.

**Figure 6: Network Screen**

DEMAND MODE: REMOTE
SYSTEM OFF ✕

---

MCP - 6

UNIT NUMBER 1

MCP IP: 192 168 1 50

---

ETH PORT 1

DHCP

STATIC IP

PORT 1 IP: 0 0 0 0

PORT 1 SUBNET IP: 0 0 0 0

#### Network Screen Index:

1. **Unit Number:** This number sets the **“Static”** IP address of the heat pump for systems requiring static IPs (original MCP controllers)
2. **MCP IP:** The IP address of MCP PLC port 1
3. **Port 1 IP:** Shows the IP address of port 1
4. **Port 1 subnet IP:** Shows the subnet for port 1
5. **Network Mode Buttons:** Sets whether IP address is **“Static”** or set by DHCP

## BMS Integration

Integration into BMS systems using BACnet IP/MSTP protocols is possible with an optional **“BMS Gateway”** accessory. If that accessory is installed in your heat pump, you have two options for BMS Integration:

**Tank Mode:** If the heat pump is configured for **“Tank Mode”**, the heat pump will still control all heat demand logic and will still require its own sensors to be wired to the storage tank(s). BMS will be able to turn the heat pump on and off, set leaving water temperature setpoints, tank setpoints, and view heat pump internal data, but will not be able to place heat demands directly.

**Remote Mode:** If the heat pump is configured for **“Remote Mode”**, no tank sensors should be wired to the heat pump, and the BMS system will be responsible for placing heat demands on the heat pump, in addition to having access to the capabilities in **“Tank Mode”**.

**For details on BMS integration, including BMS gateway setup and available data points, see the BMS gateway manual.**

## Alarm List

The following are tables of all visible alarms, whether they are “**lockout**” or “**soft**”, their trigger conditions, reset conditions, and whether the alarm triggers a normal shutdown or an immediate hard stop condition.

Each table is for an alarm “**Register**”, which references how the alarm shows up in data logs (**Alarm Register 1, 2 or 3**). The alarm’s “**Log Value**” in the data logs is also given. Contact the factory if alarm information in data logs is required.

**Table 1: Alarms in Register 1 (Soft Alarms)**

| Alarm Name            | Type | Log Value |                   | Details                                                                                                          |
|-----------------------|------|-----------|-------------------|------------------------------------------------------------------------------------------------------------------|
| High Pressure Alarm   | Soft | 1         | <b>Trigger1:</b>  | Discharge Line Pressure sensor above High Limit.                                                                 |
|                       |      |           | <b>Reset:</b>     | DLP > 10PSI or DLP < High Limit for 10 seconds.                                                                  |
|                       |      |           | <b>Stop:</b>      | Hard Stop                                                                                                        |
|                       |      |           | <b>Notes:</b>     | High Limit is model specific.                                                                                    |
| Power Fault Alarm     | Soft | 2         | <b>Trigger:</b>   | Voltage Monitor Input is open for 1 second.                                                                      |
|                       |      |           | <b>Reset:</b>     | Voltage Monitor input is closed indicating good voltage and phase.                                               |
|                       |      |           | <b>Stop:</b>      | Hard Stop                                                                                                        |
|                       |      |           | <b>Notes:</b>     | Input is digital on/off signal from hardware monitor on primary power circuit. Trips for voltage/phase mismatch. |
| Condenser Flow Alarm  | Soft | 4         | <b>Trigger 1:</b> | During startup: GPM < (Startup Flow) for (Cond Flow Verification Timer) seconds.                                 |
|                       |      |           | <b>Trigger 2:</b> | During operation, GPM < (Flow Low Limit) for 3 seconds.                                                          |
|                       |      |           | <b>Reset:</b>     | Trigger condition resolves                                                                                       |
|                       |      |           | <b>Stop:</b>      | Normal Stop                                                                                                      |
|                       |      |           | <b>Notes:</b>     |                                                                                                                  |
| Evaporator Flow Alarm | Soft | 8         | <b>Trigger 1:</b> | Evap flow input true for (Evap Flow Verification Timer) seconds.                                                 |
|                       |      |           | <b>Trigger 2:</b> | Water Source HP Operation: Evap flow input true for 3 seconds.                                                   |
|                       |      |           | <b>Trigger 3:</b> | Air Source HP: MMP or Fan Contactor input False for 3 seconds.                                                   |
|                       |      |           | <b>Trigger 4:</b> | Damper prove switch open on HP's with this input.                                                                |
|                       |      |           | <b>Reset:</b>     | Trigger condition resolved.                                                                                      |
|                       |      |           | <b>Stop:</b>      | Normal Stop                                                                                                      |
|                       |      |           | <b>Notes:</b>     | Evap flow input is digital on/off signal from source loop flow sensor, target flow set on sensor.                |
| Modbus Alarm          | Soft | 16        | <b>Notes:</b>     | Triggers if communication is lost to a modbus device.                                                            |
| AOTS Alarm            | Soft | 32        | <b>Trigger:</b>   | Air Over Temperature Sensor input open while in defrost                                                          |
|                       |      |           | <b>Reset:</b>     | Air Over Temperature Sensor input closed.                                                                        |
|                       |      |           | <b>Stop:</b>      | Does not stop operation, disables defrost elements only.                                                         |
|                       |      |           | <b>Notes:</b>     | AOTS sensor at top of evap opens at 120 Deg F. Fan defrost available only while active.                          |
| Defrost Alarm         | Soft | 64        |                   | Defrost alarm is active whenever heat pump is in defrost mode.                                                   |
| Remote Lockout Alarm  | Soft | 128       | <b>Trigger 1:</b> | Software recipe fails to load properly.                                                                          |
|                       |      |           | <b>Trigger 2:</b> | Main Controller “ <b>Hard Stop</b> ” command is active.                                                          |
|                       |      |           | <b>Reset:</b>     | Trigger condition resolved.                                                                                      |
|                       |      |           | <b>Stop:</b>      | Hard Stop                                                                                                        |
| Ambient Range Alarm   | Soft | 256       | <b>Trigger 1:</b> | Ambient or source loop temperature is out of range for the heat pump for 30 seconds.                             |
|                       |      |           | <b>Trigger 2:</b> | Ambient air temp is above Warm Weather Shutdown setting for 30 seconds.                                          |
|                       |      |           | <b>Reset:</b>     | Ambient or source loop temperature is in range for the heat pump and/or below WWSD setting.                      |
|                       |      |           | <b>Stop:</b>      | Normal Stop                                                                                                      |
|                       |      |           | <b>Notes:</b>     | Operational ranges are model specific.                                                                           |

**Table 1: Alarms in Register 1 (Soft Alarms) Continued**

|                                      |      |       |                   |                                                                                                   |
|--------------------------------------|------|-------|-------------------|---------------------------------------------------------------------------------------------------|
| Condenser Freeze Protection Alarm    | Soft | 512   | <b>Trigger:</b>   | Condenser LWT or EWT sensed temp < (Cond Freeze Prot 2) for 2 seconds.                            |
|                                      |      |       | <b>Reset:</b>     | Both condenser LWT and EWT sensed temp > (Cond Freeze Prot 2) for 2 seconds.                      |
|                                      |      |       | <b>Stop:</b>      | Normal Stop                                                                                       |
|                                      |      |       | <b>Notes:</b>     | This alarm triggers circulator operation for emergency freeze protection.                         |
| Evaporator Freeze Protection Alarm   | Soft | 1024  | <b>Trigger:</b>   | Water Source HP Only: Source EWT or LWT below freeze prot limit AND HP is in "Water" source mode. |
|                                      |      |       | <b>Reset:</b>     | Source EWT or LWT above freeze protection limit for 2 seconds.                                    |
|                                      |      |       | <b>Stop:</b>      | Normal Stop                                                                                       |
| Low Pressure Alarm                   | Soft | 2048  | <b>Trigger 1:</b> | SLP < low pressure limit while compressor is operating and LLSV is open.                          |
|                                      |      |       | <b>Trigger 2:</b> | DLP < 10 PSI for 3 seconds while compressor is on.                                                |
|                                      |      |       | <b>Reset:</b>     | 10 seconds after compressor stop.                                                                 |
|                                      |      |       | <b>Stop:</b>      | Hard Stop                                                                                         |
| High Leaving Water Temperature Alarm | Soft | 4096  | <b>Trigger:</b>   | Condenser LWT > 170 (C-Series), 175(e-15HP), 180 (HPB) for 30 seconds.                            |
|                                      |      |       | <b>Reset:</b>     | On compressor stop.                                                                               |
|                                      |      |       | <b>Stop:</b>      | Normal Stop                                                                                       |
|                                      |      |       | <b>Notes:</b>     |                                                                                                   |
| System Error Alarm                   | Soft | 8192  | <b>Trigger:</b>   | Serial Number or Data Logging error.                                                              |
|                                      |      |       | <b>Reset:</b>     | Clears when condition is resolved.                                                                |
|                                      |      |       | <b>Stop:</b>      | Normal Stop                                                                                       |
| Sensor Alarm                         | Soft | 16384 |                   | This indicates a sensor alarm in register 3 is active.                                            |
| Lockout Alarm                        | Soft | 32768 |                   | This indicates a lockout alarm in register 2 is active.                                           |

**Table 2: Alarms in Register 2 (Lockout Alarms)**

| Alarm Name                               | Type    | Log Value |                   | Details                                                                                                 |
|------------------------------------------|---------|-----------|-------------------|---------------------------------------------------------------------------------------------------------|
| High Pressure Lockout Alarm              | Lockout | 1         | <b>Trigger:</b>   | High Pressure Alarm tripped 3 times in 2 hours.                                                         |
| Power Fault Lockout Alarm                | Lockout | 2         | <b>Trigger:</b>   | Power Fault Alarm tripped 3 times in 24 hours.                                                          |
| Condenser Flow Lockout Alarm             | Lockout | 4         | <b>Trigger 1:</b> | During start up: Condenser flow alarm trips 3 times in a row without successful verification.           |
|                                          |         |           | <b>Trigger 2:</b> | During operation: Condenser flow alarm trips 3 times in 1 hour.                                         |
| Evaporator Flow Lockout Alarm            | Lockout | 8         | <b>Trigger 1:</b> | During start up: Evaporator flow alarm trips 3 times in a row without successful verification.          |
|                                          |         |           | <b>Trigger 2:</b> | During operation: Evaporator flow alarm trips 3 times in 1 hour.                                        |
| Oil Pressure Safety Switch Lockout Alarm | Soft    | 16        | <b>Trigger:</b>   | Oil pressure safety switch registers a fault                                                            |
|                                          |         |           | <b>Stop:</b>      | Hard Stop                                                                                               |
| Low Pressure Lockout Alarm               | Lockout | 32        | <b>Trigger 1:</b> | During start up: SLP does not exceed 10 PSI after LLSV open, for ten seconds.                           |
|                                          |         |           | <b>Trigger 2:</b> | During operation: low pressure alarms trips 3 times in 1 hour.                                          |
| Defrost Lockout Alarm                    | Lockout | 128       | <b>Trigger:</b>   | Air Source/CWP models only: defrost did not complete before max defrost timer times out.                |
| Motor Protection Module Lockout Alarm    | Lockout | 256       | <b>Trigger:</b>   | Compressor is being called, but no feedback received                                                    |
| Local Stop Lockout Alarm                 | Lockout | 512       | <b>Trigger:</b>   | Heat pump has a live connection with an MCP that is "On", and the heat pump's "Stop" button is pressed. |
| Compressor VFD Alarm (VFD HPs Only)      | Soft    | 2048      | <b>Trigger:</b>   | VFD generates an error code.                                                                            |
|                                          |         |           | <b>Reset:</b>     | Variable: some VFD alarms clear automatically, some require reset on VFD diagnostic page.               |
|                                          |         |           | <b>Stop:</b>      | Normal Stop, however, some VFD alarms stop the compressor immediately.                                  |

**Note:** All lockout alarms are "Normal Stop" unless noted.

**Table 3: Alarms in Register 3 (Sensor Alarms)**

| Alarm Name                                       | Type | Log Value |                 | Details                                                                               |
|--------------------------------------------------|------|-----------|-----------------|---------------------------------------------------------------------------------------|
| Tank Temperature Probe (Cold) Alarm              | Soft | 1         | <b>Trigger:</b> | Heat Pump's "Cold" sensor fails in tank mode                                          |
| Tank Temperature Probe (Hot) Alarm               | Soft | 2         | <b>Trigger:</b> | Heat Pump's "Warm" sensor fails in tank mode for Multipass or RTP mode.               |
|                                                  |      |           | <b>Stop:</b>    | Does not stop operation                                                               |
| Condenser Leaving Water Temperature Probe Alarm  | Soft | 4         | <b>Trigger:</b> | Heat Pump's Condenser LWT sensor is faulted.                                          |
| Condenser Entering Water Temperature Probe Alarm | Soft | 8         | <b>Trigger:</b> | Heat Pump's Condenser EWT sensor is faulted.                                          |
| Evaporator Temperature Probe Alarm               | Soft | 16        | <b>Trigger:</b> | Heat Pump's Evap sensor (Air Source) or Evap LWT sensor (Water Source) is faulted.    |
| Ambient Air Temperature Probe Alarm              | Soft | 32        | <b>Trigger:</b> | Heat Pump's Ambient sensor (Air Source) or Evap EWT sensor (Water Source) is faulted. |
| Suction Line Temperature Probe Alarm             | Soft | 64        | <b>Trigger:</b> | Heat pump does not have a superheat controller, and SLT sensor is faulted.            |
|                                                  |      |           | <b>Stop:</b>    | Does not stop operation                                                               |
|                                                  |      |           | <b>Notes:</b>   | This will make the superheat calculation fail.                                        |
| High Pressure Transducer Alarm                   | Soft | 128       | <b>Trigger:</b> | DLP Sensor is faulted.                                                                |
| Low Pressure Transducer Alarm                    | Soft | 256       | <b>Trigger:</b> | Heat pump does not have a superheat controller, and SLP sensor is faulted.            |
| Flow Meter Alarm                                 | Soft | 512       | <b>Trigger:</b> | Condenser flow sensor is faulted                                                      |

**Note:** All Sensor alarms are "Normal Stop" unless noted.

## Sequences of Operation

### Defrost

#### Hot Gas Bypass Valve (HGBV) Anti-Frost operation (HGBV Heat Pumps Only)

- During compressor operation, HGBV opens and closes based on suction line pressure cut-in and cut-out setpoints.
- If HGBV stays open longer than the HGBV Defrost Enable Time parameter, and HGBV Defrost is enabled, the evaporator temperature will trigger HGBV Defrost below 32 Deg F.
- If HGBV defrost is triggered:
  - The heat pump will stop responding to a heat call, shut down normally, and trigger fan operation until the Post HGBV Fan Timer times out.
  - At Post HGBV Fan Timer timeout, if the evaporator is now above freezing, normal operation will resume. If not, a standard defrost sequence is started.

#### Defrost is triggered if ALL of the following conditions are met:

- The compressor is running for longer than the defrost enable time parameter.
- The suction line pressure is below the defrost cut-in setpoint parameter, for longer than the defrost enable time parameter.

#### Defrost Sequence:

- The heat pump will stop responding to heat demands and will perform a normal shut down.
- After the compressor stops, defrosting will engage.
- Defrosting continues until the evaporator temperature reaches the defrost cut-out setpoint parameter.

### Defrost Sequence (continued)

4. If cut-out is not reached by the defrost duration time setpoint parameter, a defrost fault lockout alarm will be triggered.
5. If cut-out is reached before the duration expires, the fan will run for the post defrost fan duration parameter time.
6. Normal operation resumes.

## Freeze Protection

### Freeze Protection 1 (Air source heat pumps only)

1. Energize condenser circuit heat tape when EWT OR LWT are below (**Freeze Protection 1 Cut-In**).
2. De-energize Heat tape when EWT AND LWT are above (**Freeze Protection 1 Cut-Out**).

### Freeze Protection 2 (All heat pumps)

1. Run load pump if condenser EWT OR LWT are below (**Freeze Protection 2 Cut-In**).
2. Stop load pump if condenser EWT OR LWT are above (**Freeze Protection 2 Cut-Out**).

### Evaporator Freeze Protection (Water source heat pumps only)

1. This is disabled if the heat pump (**Source Fluid**) parameter is set to “**Glycol**”.
2. Enable source pump relay if Evaporator EWT OR LWT are below (**Freeze Protection 2 Cut-In**).
3. Disable source pump relay if Evaporator EWT AND LWT are greater than or equal to (**Freeze Protection 2 Cut-Out**).

## Heat Demand

1. Heat pump begins with a heat call status of “**Standby**”.
2. A heat demand is present when **ONE** of the following conditions are met:
  - a. Tank Mode Single-Pass:
    - i. The tank sensor detects a water temperature below (**Tank Cut-In**).
  - b. Tank Mode Multi-Pass:
    - i. The “**cold**” tank sensor detects a water temperature below (**Cold Sensor Cut-In**) OR the “**warm**” tank sensor detects a water temperature below (**Warm Sensor Cut-In**).
  - c. Remote modes:
    - i. External demand is present
3. Startup sequence begins when **ALL** of the following conditions are met:
  - a. A heat demand is present.
  - b. There is a closed circuit between the “**Remote Enable**” terminals.
  - c. There is no blocking alarm condition.

### Startup Sequence Begins:

4. Heat pump displays a **“Tank”**, **“Remote”**, **“MCP”**, or **“BMS”** heat call status, depending on the source of the demand.
5. Heat pump closes its **“Run Signal”** contacts and triggers its internal circulator.
6. Compressor operation begins when ALL following conditions are met:
  - a. Condenser flow exceeds startup flow limit before (**Condenser Flow Verification Timer**) times out.
  - b. Evaporator flow proves before (**Evaporator Flow Verification Timer**) times out.
  - c. Internal safety checks are passed.
  - d. Compressor Time Delay reaches zero.

### Compressor Operation Begins:

7. Compressor starts.
8. The heat pump begins modulating its output water temperature
  - a. Single-pass:
    - i. Output water temperature modulates to (**Target Condenser LWT**).
  - b. Multi-pass:
    - i. If output water temp is below 100 Deg F, water temperature will be modulated to a minimum outlet water temp. Otherwise, no water temperature modulation will occur.
9. If (**EWT Cut-Out**) is reached at the heat pump’s entering water temperature sensor before the tank sensor reaches (**Tank Cut-In**), the compressor will stop, and the status **“Holding”** will be displayed until the entering water temperature sensor falls below (**EWT Cut-Out**) or the tank sensor rises above (**Tank Cut-In**).
10. Shutdown sequence begins when the following conditions are met:
  - a. Single-pass Tank Mode
    - i. The tank sensor temperature is above (**Tank Cut-In**)
    - ii. The heat pump entering water temperature is at or above (**EWT Cut-Out**).
  - b. Multi-pass Tank Mode
    - i. The cold tank sensor detects water at (**Target Tank Temp**).
  - c. All Remote Modes
    - i. External heat demand is removed.

### Shutdown Sequence Begins:

11. Heat Pump will display a **“Standby”** heat call status.
12. Compressor will stop.
13. The internal circulator will continue to run until leaving water reaches (**Purge Cut Out**) temperature, or until (**Max Purge Time**) is reached, whichever comes first.
14. **“Run Signal”** contacts open when the circulator stops.

## Output Contacts

Your heat pump has several dry contact outputs for various purposes. Not all contacts exist on all machines.

**Alarm Contact:** Closes when any alarm is present.

**Defrost Contact:** Closes when defrost operation is initiated.

**Run Signal Contact:** Closes when internal DHW circulator is triggered.

**Source Pump Contact:** Closes ahead of compressor start during a heat demand.

## Update Information

To update to this software version from a previous version, you will need to access the software download tool through your rep portal, or contact the factory to obtain a software update package. Different model heat pumps have additional and unique configuration files, so software update packages are specific for each model heat pump.

The software download tool only provides access to the most current recommended software for each heat pump, so if you are attempting to roll back to a previous software version from the version currently available through the download tool, you will need to contact the factory for assistance.

Installing this update will require both a USB flash drive and an SD card to be loaded with the software files, so you will need hardware capable of writing to USB and SD media to prepare for a software update. Specific update procedures are included in the software update package for your heat pump.

## Compatibility

Only R513A heat pumps may use this software version. In general, Lochinvar recommends using the most current available software version for your heat pump, available through the software download tool.

Do NOT install this software on R134a heat pumps or e360s.

## Release Notes

### New Version: 1.505

**Previous production version:** 1.403

### Configuration Changes v1.505:

Single-Pass configuration changes

- a. Target Tank Temp set point and Demand Differential removed
- b. Tank Cut In set point added

### Significant Operational Changes v1.505:

1. Single-pass demand now triggers on tank cut in instead of tank temp and differential.
2. AOTS alarm now only triggers when defrost mode is active.
3. Water source units have 99 PSI Pumpdown cutout, which will prevent pumpdown.

### Full Change List v1.505:

1. Single-Pass Target Tank Temp set point and Demand Differential removed.
2. Single-pass Tank Cut In set point added.
3. Single-pass demand now triggers on tank cut in instead of tank temp and differential.
4. AOTS alarm now only triggers when defrost mode is active.

5. Error log entries added
  - a.. Evap flow prove failed
  - b. Cond flow prove failed
6. Additional hp sensor fault safety.
7. Manual valve control in factory settings made adjustable at all times.
8. Default pump down pressure changed for water source units.
9. Low discharge pressure now triggers low pressure alarm instead of high pressure alarm.
10. Water source units updated to 99 PSI pumpdown cutout to stop pumpdown.

## **New Version: 1.403**

**Previous production version: 1.308**

### **Configuration Changes v1.403:**

1. Service mode jumpers have been eliminated. Access to configuration now requires password 6947.

### **Significant Operational Changes v1.403: None**

### **Full Change List v1.403:**

1. MCP lock bug fix. If MCP is locked out of connecting because of previous connection to a different controller, it will now allow connection if network setting is re-set to "Static IP".
2. Added heat pump boiler functions. (Not covered in this manual)
3. Service mode display flag on diag page, and jumper requirement, removed.
4. Configuration page password 6947 added.
5. Cleaned up tank information portion of main screen when in remote mode to be clear that data is not available.
6. Misc error log adjustments.
7. Reorganized sequence of operation sections in POM.

## **New Version: 1.308**

**Previous production version: 1.0 (initial version)**

### **Configuration Changes v1.308:**

1. All modes now have "EWT Cut Out" on config page 2. This is the EWT blocking temp in all modes, and it is also the termination temp for single-pass standalone heat pumps.

### **Significant Operational Changes v1.308:**

1. EWT blocking now available in all modes and behaves the same in all modes: block on configurable temp, show "holding", if there is still an active demand condition.
2. EWT blocking is also single pass heat demand termination temp, if the tank sensors are satisfied.
3. Single-pass demand diff is now only used to cut IN heat demands from tank sensor.
4. Local stop now available when on MCP. It will time out after 8 hours.
5. New "system info" page to access by long pressing "clock" icon on main page.
6. Software/HMI version now available on "clock" page.
7. Pump-down alarm is no longer active.
8. High pressure alarm raised to 395 PSI on ZH compressor units (185 and 270).
9. Serial number is now critical to operation.
10. STARTING valve position is now calculated in a range, from min to max position, at min to max ambient, accessed through the clock page.

## Full Change List v1.308:

1. Added "system info" page accessed by long pressing on the main page clock.
2. Fixed bug where changing unit number would not change unit address for MCPs.
3. Fixed bug in Remote mode showing tank sensor errors for sensors that should not be connected.
4. Fixed an invisible alarm bug that could silently prevent operation in MCP mode.
5. "Local Stop" capability added to heat pumps when in MCP mode, so heat pump can be turned "off" at the heat pump, and will show as "alarmed" on MCP.
6. Cleaned up several indicators on heat pump (Tank set, LWT Set, etc) when connected to MCP, to be clear that the information is on/set by the MCP.
7. SD card detection improved to eliminate some serial number mismatch errors.
8. Alarm "race condition" bugs that could present at startup in some conditions are fixed.
9. Removed pump down alarms.
10. High pressure alarm raised to 395 PSI for 185, 250, 270 series heat pumps.
11. DHCP/Static IP switching now does not require a hard reboot, and defaults to DHCP.
12. Multipass flow alarms greatly improved.
13. Water source units now detect and soft alarm for high source water temp conditions.
14. Significant configuration screen cleanup for various modes to remove unnecessary items.
15. All modes now have configurable "EWT Cut Out" to suspend compressor operation at high EWT without stopping heat demands.
16. Startup sequence adjusted to eliminate potential alarm conditions.
17. Starting valve position now calculated by ambient/source temperatures.
18. Min valve position now specific to each unit.
19. Valve control now faster to get to target LWT in all modes.
20. Various log file reordering and cleanup.

## Service Log

| Issue Description | Date | Service |
|-------------------|------|---------|
|                   |      |         |
|                   |      |         |
|                   |      |         |
|                   |      |         |
|                   |      |         |
|                   |      |         |
|                   |      |         |
|                   |      |         |

