AquaSnap®
30RC 065-152 Air-Cooled Chillers and 30RC 065-152 Air-Cooled Chillers with Greenspeed® Technology and Carrier Controller

Controls, Start-Up, Operation, Service and Troubleshooting

CONTENTS

SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location (roof, elevated structures, etc.). Only trained, qualified installers and service technicians should install, start up, and service this equipment. When working on this equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment, as well as any other safety precautions that apply.

Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting this equipment and in handling all electrical components.

Use quenching cloth for unbrazing operations. Have fire extinguisher available for all brazing operations.

It is important to recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

⚠ WARNING

DO NOT USE TORCH to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

a. Shut off electrical power to unit.

b. Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.

c. Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.

d. Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gage for how much oil to add to the system.

e. Carefully un-sweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

⚠ WARNING

DO NOT VENT refrigerant relief valves within a building. Outlet from relief valves must be vented outdoors in accordance with the latest edition of ANSI/ASHRAE (American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers) 15 (Safety Code for Mechanical Refrigeration). The accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation. Provide adequate ventilation in enclosed or low overhead areas. Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness or death. Misuse can be fatal. Vapor is heavier than air and reduces the amount of oxygen available for breathing. Product causes eye and skin irritation. Decomposition products are hazardous.

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

This system uses either Puron® refrigerant (R-410A) or an A2L refrigerant (R-32), both of which operate at higher pressures than R-22 and other refrigerants. No other refrigerant can be used in this system. Failure to use gauge set, hoses, and recovery systems designed to handle Puron refrigerant (R-410A) or R-32 may result in equipment damage or personal injury. Reference UL 60335-2-40 Annex DD for guidelines on proper A2L refrigerant handling and equipment used for A2L refrigerant. If unsure about equipment, consult the equipment manufacturer.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation and service. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

⚠CAUTION

This unit uses a microprocessor control system. Do not short or jumper between terminations on circuit boards or modules; control or board failure may result.

Be aware of electrostatic discharge (static electricity) when handling or making contact with circuit boards or module connections. Always touch a chassis (grounded) part to dissipate body electrostatic charge before working inside control center.

Use extreme care when handling tools near boards and when connecting or disconnecting terminal plugs. Circuit boards can easily be damaged. Always hold boards by the edges and avoid touching components and connections.

This equipment uses, and can radiate, radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to International Standard in North America EN 61000-2/3 which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Always store and transport replacement or defective boards in anti-static shipping bag.

⚠CAUTION

To prevent potential damage to heat exchanger, always run fluid through heat exchanger when adding or removing refrigerant charge. Use appropriate brine solutions in cooler fluid loop to prevent the freezing of heat exchanger, optional hydronic section and/or interconnecting piping when the equipment is exposed to temperatures below 32°F (0°C). Proof of flow switch and strainer are factory installed on all models. Do NOT remove power from this chiller during winter shutdown periods without taking precaution to remove all water from heat exchanger and optional hydronic system. Failure to properly protect the system from freezing may constitute abuse and may void warranty.

⚠CAUTION

Compressors and optional hydronic system pumps require specific rotation. Check reverse rotation board. If lower (red) LED is blinking, the phase sequence is incorrect. Swap any 2 incoming power leads to correct condenser fan rotation before starting any other motors. Operating the unit without verifying proper phasing could result in equipment damage.

⚠CAUTION

Refrigerant charge must be removed slowly to prevent loss of compressor oil that could result in compressor failure.

⚠CAUTION

DO NOT re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. DO NOT leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment.

A2L Refrigerant Safety Measures

The 30RC air-cooled chillers have the option of being equipped with R-32, an A2L refrigerant with a low GWP (global warming potential). R-32 is available for all capacities and is designated in Position 8 of the unit model number as “2” for 70 ton to 150 ton capacities or “7” for the 60 ton capacity. Units equipped with R-410A are designated in Position 8 by a “0” for 70 to 150 ton capacities or “5” for the 60 ton capacity. Additional measures are required for units installed with R-32 to ensure safe installation, start-up, and servicing of the air-cooled chiller. Refer to UL 60355-2-40 for comprehensive guidelines beyond the following sections.

QUALIFICATION OF WORKERS

Qualified installers and service technicians are required to have been trained on the following topics when installing and servicing air-conditioning equipment with A2L refrigerant such as R-32:

1. explosive potential of A2L refrigerants
2. potential ignition sources
3. safety measures for unventilated and ventilated rooms or enclosures
4. refrigerant detectors
5. concept of sealed components and sealed enclosures according to IEC 60079-15:2010
6. correct work procedures for the following:
   a. commissioning
   b. maintenance
   c. repair
   d. decommissioning
   e. disposal

Reference UL 60335-2-40 Annex HH for complete guidelines for qualifications.

SAFETY CHECKS

Prior to beginning work on air-conditioning equipment containing A2L refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the air-conditioning equipment, the following must be completed prior to conducting work on the system:

1. Work shall be undertaken under a controlled procedure to minimize the risk of a flammable gas or vapor being present while the work is being performed.
2. All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
3. The area shall be checked with an appropriate refrigerant detector prior to and during work to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants.
4. If any hot work is to be conducted on the refrigerating equipment or any associated parts, then appropriate fire extinguishing equipment shall be available to hand. Have

a dry powder or CO_2 fire extinguisher adjacent to the charging area.

5. No person carrying out work in relation to refrigerating equipment that involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removal, and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.
6. Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
7. The following checks to the air-conditioning equipment shall also apply when using A2L refrigerants:
   a. The chilled water circuit shall be checked for the presence of A2L refrigerant via the vent, drain, or pipe plug ports at the inlet and outlet water piping connections.
   b. Markings to the equipment shall continue to be visible and legible. Markings and signs that are illegible shall be corrected.
   c. Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance that may corrode refrigerant-containing components, unless the components are constructed of materials that are inherently resistant to being corroded or are suitably protected against being corroded.
   d. Upon completing equipment work, check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

COMPONENT REPAIR

During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked up prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

Particular attention shall be paid to the following to ensure that, by working on electrical components, the casing is not altered in such a way that the level of protection is affected:

1. Ensure that the apparatus is mounted securely.
2. Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.

Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.

Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

NOTE: The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

Guidelines for A2L refrigerant detection, evacuation, charging procedures, and proper recovery equipment are presented in the Service section.

GENERAL

This publication contains Controls, Operation, Start-Up, Service, and Troubleshooting information for the 30RC 065-150 and 30RC 067-152 air-cooled liquid chillers with Greenspeed® Intelligence and electronic controls. (See Table 1.) 30RC 065-150 air-cooled chillers are supplied with R-410A refrigerant, and 30RC 067-152 air-cooled chillers are supplied with R-32 refrigerant. The 30RC chillers are equipped with the Carrier Controller controls, electronic expansion valves, and optional variable speed fans.

Conventions Used in This Manual

This manual uses following conventions for discussing configuration points for the Carrier Controller display. The menu items are shown in this document as they appear on the Carrier Controller display. A path name for each item will show the user how to navigate through the Carrier Controller display to reach the desired configuration. The arrow symbol (→) in the path name represents pressing the menu item on the screen of the Carrier Controller display. The path will be shown in ***bold and italics***. See Appendix A for a complete list of Carrier Controller menu items and descriptions. The Carrier Comfort Network® (CCN) and Building Automation and Controls Network (BACnet)[1] point names are shown in **bold**. See Appendix B for a list of CCN points and Appendix D for a list of BACnet points. See Appendix E for a list of Modbus[2] points.

Table 1 — Unit Sizes

UNIT	NOMINAL CAPACITY (TONS)
30RC 065/30RC 067	60
30RC 070/30RC 072	70
30RC 080/30RC 082	80
30RC 090/30RC 092	90
30RC 100/30RC 102	100
30RC 110/30RC 112	110
30RC 120/30RC 122	120
30RC 130/30RC 132	130
30RC 150/30RC 152	150

1. BACnet is a trademark of ASHRAE.
2. Modbus is a registered trademark of Schneider Electric.

Abbreviations Used in This Manual

The following abbreviations are used in this manual:

AMA	— Automatic Motor Adaptation
ANSI	— American National Standards Institute
ASHRAE	— American Society of Heating, Refrigeration, and Air-Conditioning Engineers
AUX	— Auxiliary (Board)
AV	— Analog Value
AWG	— American Wire Gauge
BACnet	— Building Automation and Controls Network
BMS	— Building Management System
BPHE	— Brazed Plate Heat Exchanger
BUS TER	— Bus Termination
BV	— Binary Value
CB	— Circuit Breaker
CCN	— Carrier Comfort Network®
CEM	— Controls Expansion Module
CMD	— Command
CO	— Discrete Output (Coil)
COM	— Communications
CSR	— Current Sensing Relay
CWFS	— Chilled Water Flow Switch
DC	— Direct Current
DGT	— Discharge Gas Temperature
DI	— Digital Input OR Discrete Input
DNS	— Domain Name Server
DPT	— Discharge Pressure Transducer
ECO	— Economizer
ECT	— Economizer Temperature
EEPROM	— Electronically Erasable Programmable Read-Only Memory
EHS	— Electric Heat Stage
EMM	— Energy Management Module
EOR	— Enable-Off-Remote
EPT	— Economizer Pressure Transducer
EWT	— Entering Water Temperature
EWTO	— Entering Water Temperature Offset
EXV	— Electronic Expansion Valve
FC	— Fan Contactor
FM	— Fan Motor
HMI	— Human Machine Interface
HPS	— High Pressure Switch
HR	— Heat Reclaim or Holding Register
HSM	— Hydronic System Manager
HVAC	— Heating, Ventilation, and Air-Conditioning
IGBT	— Insulated Gate Bipolar Transistor
IP	— Internet Protocol
IR	— Input Register or Intrinsic Reporting
LCD	— Liquid Crystal Display
LCP	— Local Control Panel
LED	— Light-Emitting Diode
LEN	— Local Equipment Network
LPT	— Liquid Pressure Transducer
LWT	— Leaving Water Temperature
MCHX	— Microchannel Heat Exchanger
MLC	— Minimum Load Control
MOP	— Maximum Operating Pressure
N/A	— Not Applicable
NA Unit	— North America unit
OAT	— Outdoor Air Temperature
OPT	— Oil Pressure Transducer
PCB	— Printed Circuit Board
PID	— Proportional, Integral, Derivative Control
PTC	— Positive Temperature Coefficient
RCD	— Replacement Components Division
RFI	— Radio Frequency Interference
RNET	— Communication Protocol
RO	— Read Only
RTN	— Return to Normal
RTPF	— Round Tube Plate Fin
RTU	— Remote Terminal Unit
RW	— Read/Write
SCT*	— Saturated Condensing Temperature*
SDT*	— Saturated Discharge Temperature*
SGT	— Suction Gas Temperature
SH	— Sensible Heat
SHD	— Shield Wire on Shielded Cable
SIOB	— Standard Input/Output Board
SLT	— Saturated Liquid Temperature
SM	— System Manager
SNVT	— Standard Network Variable Test
SP	— Suction Pressure
Spt	— Setpoint
SPT	— Suction Pressure Transducer
SST	— Saturated Suction Temperature
ST	— Space Temperature
TCP	— Transmission Control Protocol
TL	— Trend Log
UI	— User Interface
USB	— Universal Serial Bus
VFD	— Variable Frequency Drive
Vlv	— Valve
VPN	— Virtual Private Network
WAN	— Wide Area Network

* SCT and SDT are used interchangeably by software points.

CONTROLS

The 30RC Air-Cooled Liquid Chillers contain the Carrier Controller electronic control system that controls and monitors all operations of the chiller. The control system is composed of several components, as listed in the following sections. All machines have a Carrier Controller module, Standard Input/Output boards, and an Emergency On/Off switch. Table 2 lists power schematics by unit size.

Carrier Controller Display

The Carrier Controller module is the HMI (Human Machine Interface) and core of the control system. It contains the major portion of operating software and controls the operation of the machine. See the Web and Network Interface section on page 17.

The Carrier Controller module continuously monitors input/output channel information received from the SIOB (Standard Input/Output Board) and AUX (Auxiliary) board. The Carrier Controller module receives inputs from status and feedback switches, pressure transducers, and thermistors. The Carrier Controller module, through the communications bus, also controls outputs on the SIOB and AUX boards. All inputs and outputs that control the chiller are located on other boards. Information is transmitted between modules via a 3-wire communication bus or LEN (Local Equipment Network).

The CCN bus is also supported.

Connections to both LEN and CCN buses are made at terminal board TB3, located within the control box enclosure. See Fig. 1 and 2 for component layout showing the display with field connections.

Carrier Controller Display User Interface

The Carrier Controller display is the standard user interface on all 30RC chillers. The display includes either the standard 4.3 in. or optional large 7 in. LCD (Liquid Crystal Display) touch screen for display and user configuration. A stylus is recommended for use on the touch screen.

HOME SCREEN

The Home screen provides an overview of system controls, allowing the user to monitor the vapor-refrigeration cycle. The screen indicates the current status of the unit, giving information on the unit capacity, the entering and leaving water temperatures, the active setpoint, and the outside air temperature. (See Fig. 3.) The optional 7 in. screen provides an additional feature from the Home screen that allows the user to view circuit details. (See Fig. 4.)

Table 2 — Control and Power Drawings

UNIT	DESCRIPTION	LOCATION
30RC 065-102	Typical Field Connections Wiring Schematic	Fig. 71, page 118
	Power Wiring Schematic (Without Greenspeed)	Fig. 72, page 121
	Power Wiring Schematic (With Greenspeed)	Fig. 73, page 122
	Communication Wiring	Fig. 76, page 125
	Control Wiring Schematics	Fig. 77, page 126
	Component Arrangement (Small Main)	Fig. 78, page 130
	Component Arrangement (Large Main)	Fig. 79, page 131
30RC 110-152	Typical Field Connections Wiring Schematic	Fig. 71, page 118
	Power Wiring Schematic (Without Greenspeed)	Fig. 74, page 123
	Power Wiring Schematic (With Greenspeed)	Fig. 75, page 124
	Communication Wiring	Fig. 76, page 125
	Control Wiring Schematics	Fig. 77, page 126
	Component Arrangement (Small Main)	Fig. 78, page 130
	Component Arrangement (Large Main)	Fig. 79, page 131

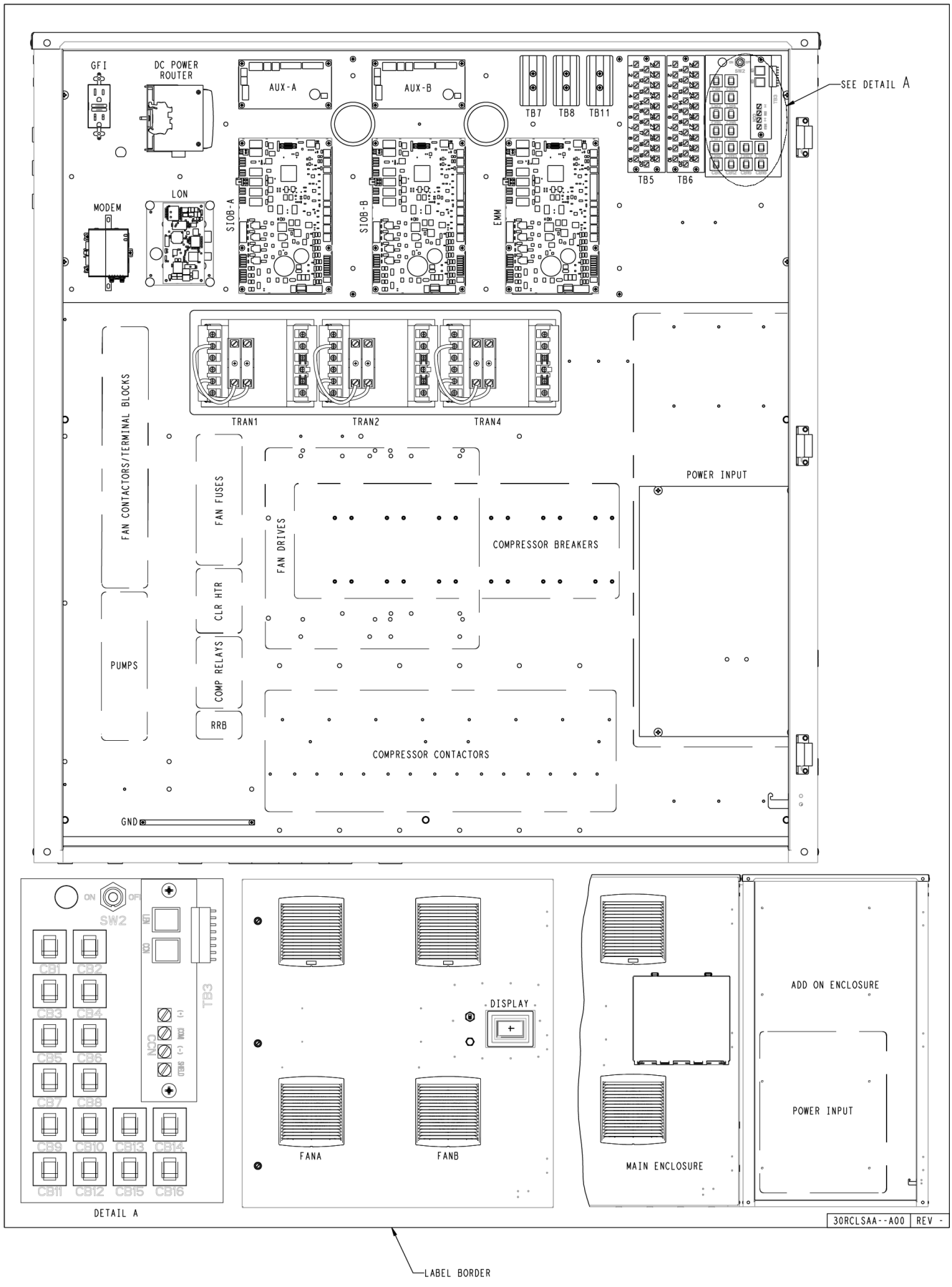


Fig. 1 — Component Layout Drawing (30RC 065-152 — Small Main)

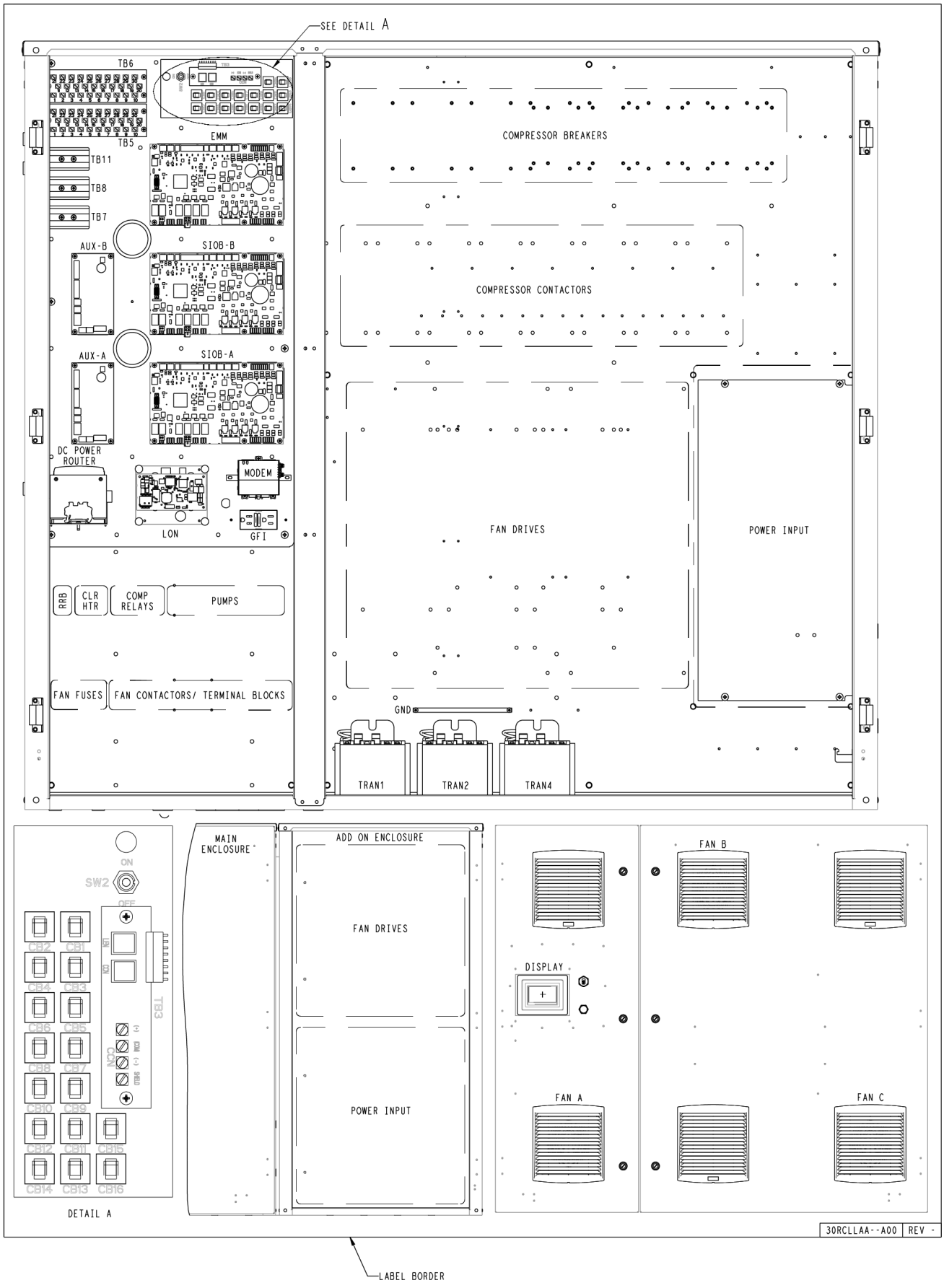
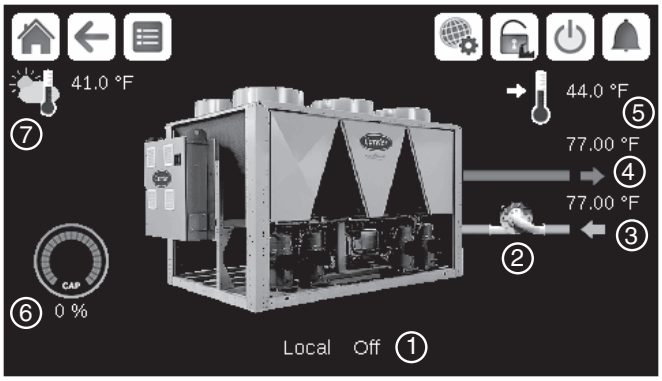
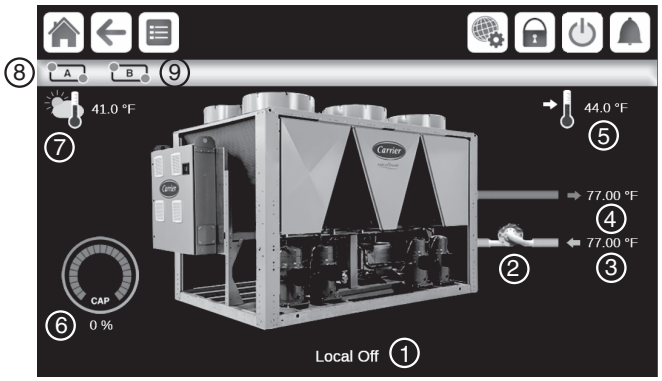


Fig. 2 — Component Layout Drawing (30RC 065-152 — Large Main)

4.3 in. Screen



7 in. Screen



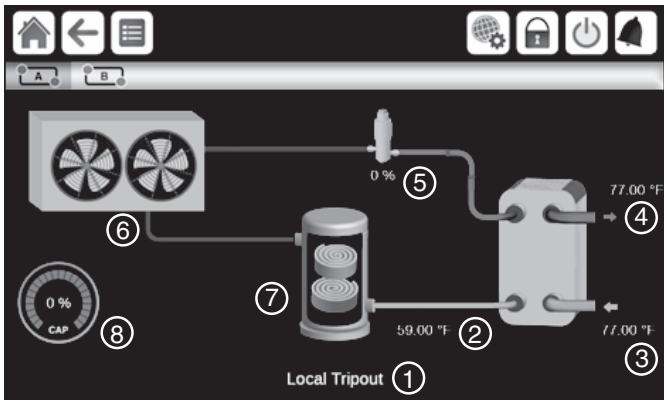
LEGEND

1 — Unit Status Message
2 — Link to Pump Status
3 — Evaporator Entering Fluid Temperature
4 — Evaporator Leaving Fluid Temperature
5 — Active Setpoint and Link to Setpoint Table
6 — Current Total Chiller Capacity
7 — Outside Air Temperature
8 — Link to Circuit A Screen*
9 — Link to Circuit B Screen*

* Feature only available on 7 in. screen. Refer to Fig. 4.

Fig. 3 — Home Screen

7 in. Circuit Screen



LEGEND

1 — Unit Status Message
2 — Saturated Suction Temperature for Selected Circuit
3 — Evaporator Entering Fluid Temperature
4 — Evaporator Leaving Fluid Temperature
5 — EXV Percent Open for Selected Circuit
6 — Fan Status for Selected Circuit*
7 — Compressor Status for Selected Circuit

* Fan speed in percentage of max value shown here if unit equipped with variable speed fans.

Fig. 4 — Circuit Screen

The circuit screen displays details for the selected circuit. The selected circuit is identified by a dark grey icon,  . To view details of the other circuit, tap the icon of the circuit desired. For example, from Fig. 4, if the user wanted to view Circuit B details, they would tap  . The circuit icons also identify whether the circuit is running. If the circuit icon dots are green  , then the circuit is running. Grey dots signify that the circuit is not running.

The following buttons appear on the top panel of the home screen. See Table 3 for more general screen buttons.


Main Menu — Press to access all unit functions. See Main Menu Screen on page 16 for details.


Login — Press to enter passwords. See page 13 for login details. The icon is shown when the user is not logged in; it changes based on access level. Available access levels are Basic, User, Service, and Factory.


System Menu — Press to configure system parameters and provide the end user information on the running system.


Start/Stop — Press to access the unit start/stop screen. See page 35 for details on available operating modes.


Alarm — The alarm icon will display gray when not in alarm, yellow when in alert, and red when in alarm. See page 100 for details on system alarms and alerts.

UNIT STATUS MESSAGE BOX

Messages may be displayed in the status bar at the bottom of the screen relevant to the current user action. See Table 4.

Table 3 — Screen Buttons

BUTTON	FUNCTION
Top Left Panel — General Navigation	
	Home button: Goes back to the home screen (default screen). Button always present.
	Menu button: Goes to the Main Menu screen. Button present on the Home Screen only. See page 9.
	Back button: Goes to the previous screen. Button not present on the Main Menu screen, since it is redundant with the Home button.
Top Right Panel — Special Navigation	
	System Menu button: Goes to the System Menu screen. Button always present except on Login screens.
	Login button: Goes to the Login screen. Button always present and active on Default and Menu screens. Icon shows: - a gray closed lock when the user is not logged in - a green open lock when the user is logged in as User - a green open lock with a tool key when user is logged in as Service - a green open lock with a factory when user is logged in as Factory See the Login section on page 13.
	Start/Stop button: Goes to the chiller start/stop screen. Button always present. When the Start/Stop button is pressed, the current screen is exited immediately, without saving changes. The icon can be blue, green, or blinking between blue and green. See the Machine Control Methods section on page 35.
	Alarm button: Goes to the Alarm Menu screen.Button always present. The icon can be gray (no alarm), yellow (alert), or red (alarm). See the Alarms and Alerts section on page 100.
Bottom Left Panel — Actions Specific to Current Screen Operation	
	Login screen: Login/Logout. Login button validates the currently-entered user level (basic, user, service, or factory) and jumpsback to the Home screen. Logout button resets the user level and jumps to the Home screen.
	Save/Cancel buttons: Save button  saves the values currently displayed. Cancel  discards changes.
Bottom Right Panel — Up/Down Scrolling Inside Screen	
	Up/Down arrows: Scroll within screen content (i.e., next or previous page). Buttons present when there are more items to be displayed than the screen can show. A page indicator shows what page is being viewed and the total number of pages.

Table 4 — Unit Status Messages

SCREEN	MESSAGE	FUNCTION
Email Configuration	This is a test!	
	New Alarm(s):	
	No alarm is currently active on the unit.	
Date/Time	Invalid time zone settings	
	Platform error in setting time zone	
	Time set error	
	Date set error	
Network	Error, IP address is blank	
	IP address is invalid	
	Error, IP address is zero	
	Error in setting IP address	
	Error, subnet mask is blank	
	Subnet mask is invalid	
	Error, subnet mask is zero	
	Error in setting subnet mask	
	Failed to execute gateway_wrapper script	
	Incorrect arguments to gateway_wrapper	
	Invalid gateway IP	
	Invalid gateway mask	
	Invalid option passed to gateway_wrapper	
	Invalid argument to route command	
	Network is unreachable	
	Gateway exists	
	Bogus netmask	
	Netmask and route address conflict	
	No such gateway IP present	
	Gateway deleted	
	Gateway_wrapper.sh not found	
	Cannot execute gateway_wrapper.sh	
	System call failed	
	DNS IP invalid	
CCN Messages	SUCCESS	CCN Table successfully saved to system.
	COMMUNICATION FAILURE!	Equipment Controller did not respond while reading table content.
	LOW LIMIT EXCEEDED!	Value was written outside the lower bounds of the data point.
	HIGH LIMIT EXCEEDED!	Value was written outside the upper bounds of the data point.
	HIGH FORCE IN EFFECT!	Equipment controller rejects Force or Auto command due to a higher level force present.
	ACCESS DENIED!	A read-only data point or table was accessed and the request was denied.
	TABLE NOT FOUND!	
	Your recent changes haven't been saved. Click Okay to continue. Click Cancel to stay in current screen.	
	Warning	
	Set	
	Relinquish	
Trending	Unable to fetch Trend Configuration Parameters	
	Please Select a Maximum of 10 Trends for Display	
	Please select at least one point	
	Information	
	Max Zoom-In Reached	
	Please Click on Update Data	
	Maximum Zoom Out Reached	
	End Date should be greater than Start Date	
	Maximum Limit is Set for 7 days	
	Start time is greater than system time	
	End time is greater than system time	
	Out of range	
	Max Range must be greater than Min Range	
	Trend point range is out of bounds	
	Please select not more than 4 points	

Table 4 — Unit Status Messages (cont)

SCREEN	MESSAGE	FUNCTION
Alarms	Alarms not found	
	Alarm	
	Alert	
	RTN	
Login	The User, Service, or Factory permission level is required to access the requested screen. Please log in.	
	The Service or Factory permission level is required to access the requested screen. Please log in.	
	The Service permission level is required to access the requested screen. Please log in.	
	The User or Service permission level is required to access the requested screen. Please log in.	
	Password Required	
	Login Failed	
	The password entered does not match any stored passwords.	
	LOSS OF COMMUNICATION	
	The Factory permission level is required to access the requested screen. Please log in.	
	Please select not more than 10 points	
	Trend parameters configured more than the limit in trend config file	
	Change password failed	
	The new password and confirmation password do not match	
	The user password changed successfully	
	The user password change failed	
	The new user password is invalid	
	The user is not authorized	
	Please enter new user password	
	Please enter confirm password	
	Please enter your login password	
	Change password	

LEGEND

DNS — Domain Name Server

IP — Internet Protocol

RTN — Return to Normal

CARRIER CONTROLLER LOGIN AND DISPLAY SETUP

Certain control functions and navigation menus are password protected. There are multiple levels of user access on the Carrier Controller display, each with independent password protection:

- Basic — At initial start-up and after a timeout period, the access type defaults to All. In this mode, the user can view system operating conditions.
- User — The User access level authorizes access to modify the Setpoint Configuration and some Configuration Menu parameters, as well as access to all menus accessible with the Basic mode. See menu structure on page 16. The default password for User level access is 11. To change the User access password, the user must first be logged in to User or higher level and go to ***Login Menu → User Login → Change User Password***, then enter the old password and the new password. Confirm the new password, then press the Save button. After pressing the Save button, a pop-up window will indicate that the user password was changed successfully. Press OK to continue. (See Fig. 5.)
- Service — The Service access level authorizes access to all menus and parameters needed for operation and service of the machine, including Quick Test and Maintenance Menus, as well as additional Configuration Menus. See menu structure on page 16. When logged in under Service access, the service icon will appear on the Home Screen in the upper right corner. To acquire Service access, a rolling password is required. See next section.
- Factory — The Factory access level authorizes access to all menus and parameters for the unit, including factory settings. See menu structure on page 16. When logged in under Factory access, the Factory icon will appear on the Home Screen in the upper right corner. To acquire Factory access, a rolling password is required. See next section.

To log in to the Carrier Controller display, press the Login button on the Home screen and select the desired access level. If User access is denied, input the required password on the User Login screen and then press the Unlock button on the bottom left of the User Login screen. To acquire service or factory access, a rolling password is required. See next section. Upon successful login, the Login icon will change to one of 3 icons denoting the access level: User, Service, or Factory. Once logged in to the controller, after 15 minutes of inactivity, the controller will revert back to Basic Access Level. To log out of the controller, press the Login icon and select any of the 3 access levels. From any of the 3 access level login screens, press the Lock button at the bottom left of the screen to log out.

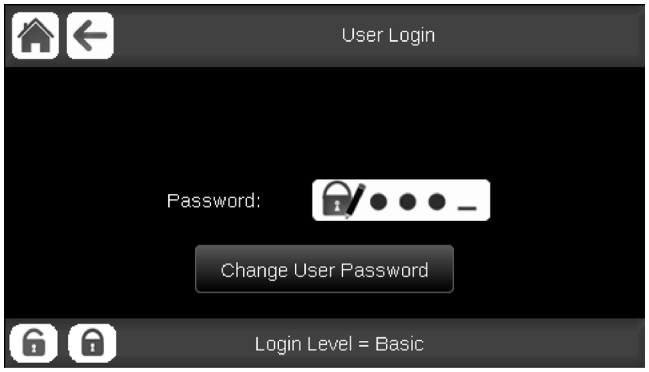


Fig. 5 — User Login Screen

Rolling Password

To access the Rolling Password Login Screen, press the Login button on the Home screen. Rolling password authentication is applicable only for Service and Factory level logins. See Fig. 6-8 for rolling password screen examples.

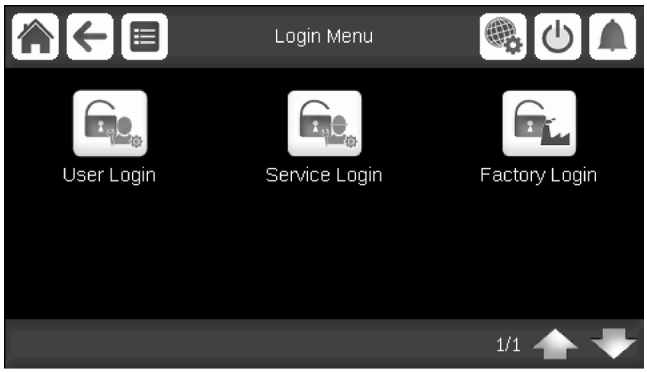


Fig. 6 — Rolling Password Login Screen

Fig. 7 — Factory Login Level Screen

Fig. 8 — Service Login Level Screen

Service and factory access require QR code verification. The QR code image and QR code string QR Code: e2uz i5hb l2c7 5d2c for Service and Factory login are available on the Service login and Factory login screens.

QR code (rolling password) functionality is enabled only if the following conditions are met:

1. The unit must be electrically supplied for at least 48 hours (continuously/without interruption).
2. Power-on reset must be performed on the controller (after being powered for 48 hours — see step 1 above).

NOTE: It is NOT possible to use QR codes (rolling password functionality) before the conditions given above are met. Prior to the 48 hour period and power-on reset, the service-level and factory-level authorization can be accessed via passwords 88 and 113, respectively.

Once the unit has been powered for at least 48 hours and power-on reset is done, service and factory password will change automatically, and users trying to log in to the controller will have to use QR codes and the SmartService application to have their new passwords generated. Scanning the QR code will generate the password via the SMARTService mobile application. The SMARTService mobile application can be downloaded from the Google Play app store or the Apple App store. A new QR code can be generated by pressing the button. Alternatively, the password can be generated by entering the QR code string into the SMARTService web application at the following web address: https://smartservice.carrier.com. Once the password is generated, this password is valid until the expiration period is over (default 7 days).

Verify login level Login Level = Basic at the Factory or Service level login screen.

Changing the Carrier Controller Display Language

To change the Carrier Controller Display language, go to ***System Menu → Language & Unit***. The Language & Unit screen offers 9 language selections for the Carrier Controller Display: English, Spanish, French, German, Dutch, Mandarin, Italian, Portuguese, or a custom language. The factory default language is English. The current language is shown between the arrows ▶ ◀. To make a change, simply press the desired language icon and then press the Home button on the Language & Unit screen. The language can be changed without being logged in to the controller. (See Fig. 9.)

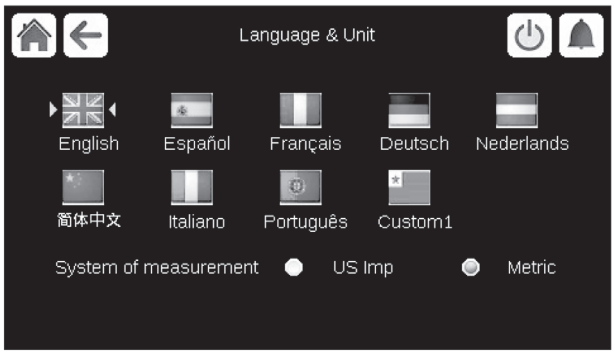


Fig. 9 — Language and Unit Screen

Changing the Units of Measurement

The Language & Unit Screen offers 2 choices for units of measurement: US Imperial or Metric. The factory default is US Imperial. The current selection is denoted by a blue button. To change the measurement system, press the appropriate system on the Language & Unit screen, then press any other button or icon on the Language & Unit screen. The units can be changed without being logged in to the controller. (See Fig. 9.)

MAIN MENU SCREEN

The Main Menu provides access to the main control parameters, including general parameters, temperatures and pressures, input and output status, and others. Press the Main Menu button on the Home screen to access the Main Menu. The Main Menu displayed will depend upon what access level the user is logged in as. Figure 10 shows the Main Menu. To navigate through the pages, press the arrows at the lower right corner of the screen.

To view or modify system parameters, press the appropriate icon on the Main Menu. For example, to access the General Parameters table, press the General Parameters button .

Figure 11 shows the first page of the General Parameters table if logged in with Service access. Use the arrows at the bottom right corner to navigate the General Parameters table.

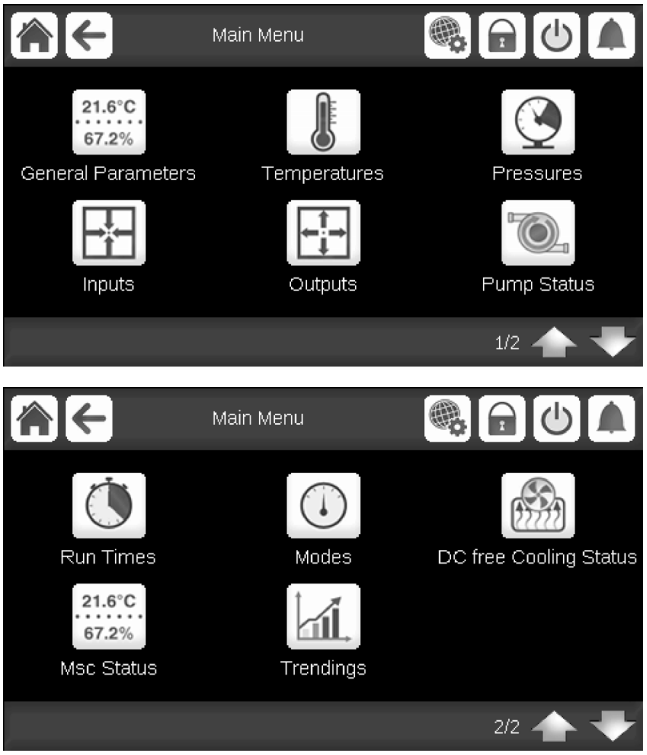


Fig. 10 — Main Menu, Page 1 and Page 2

Points that can be changed with the current level of user access are outlined with a box. For example, to modify the setpoint select parameter, select the current setpoint select value as shown on page 2 of the General Parameters table and enter the desired parameter.

A data entry screen will be displayed. For alphanumeric responses, such as the password screen, a QWERTY keyboard is displayed. (See Fig. 12.) Enter the data required and press the Check Mark button to accept the change. If required, Save and Cancel icons will appear in the Unit Status Line to confirm the changes.

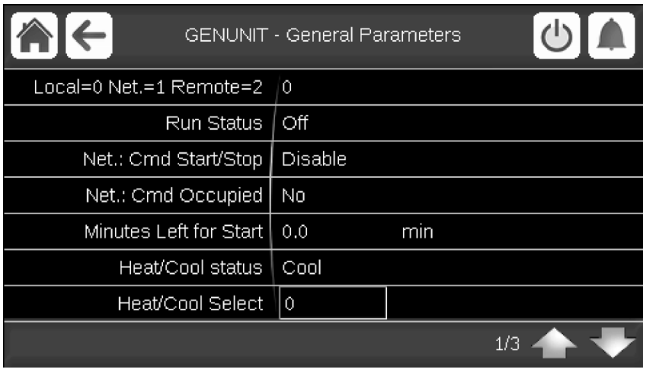


Fig. 11 — General Parameters, Page 1

Fig. 12 — Data Entry Keyboard

If a numeric response is required, either a numeric keypad (see Fig. 13) or a force/relinquish keypad (see Fig. 14) will be displayed. Use the numeric keypad to enter the value and press the Check Mark button . Once complete, Cancel and Save buttons will appear in the lower left section of the Unit Status Line. To accept the change, press the Save button . To cancel, press the Cancel button . The force/relinquish keypad allows a technician to force (or override) a status parameter by pressing the Flash button or to automate (or release) a status parameter by pressing the crossed-out Flash button .

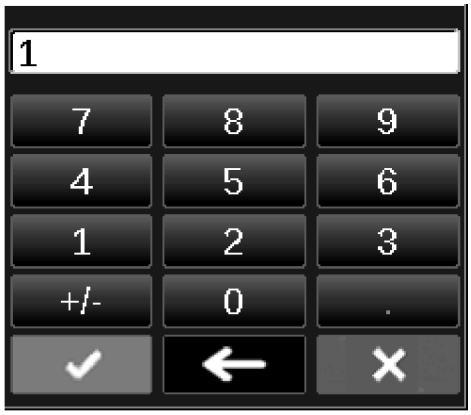


Fig. 13 — Numeric Keypad

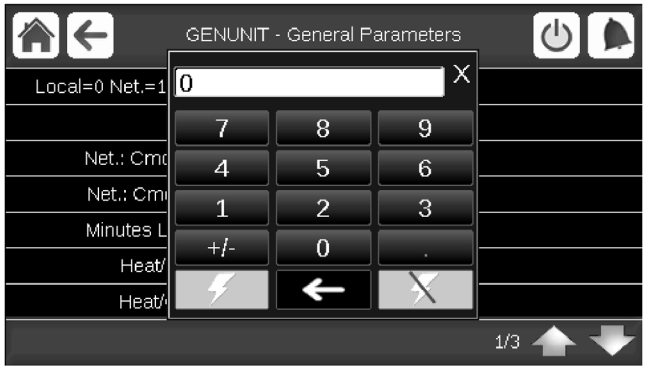


Fig. 14 — Force/Relinquish Keypad

GENERAL CONFIGURATION TABLE

This table contains configuration settings for the unit. Select ***Main Menu → Configuration Menu → General Configuration*** to access the table (Fig. 15).

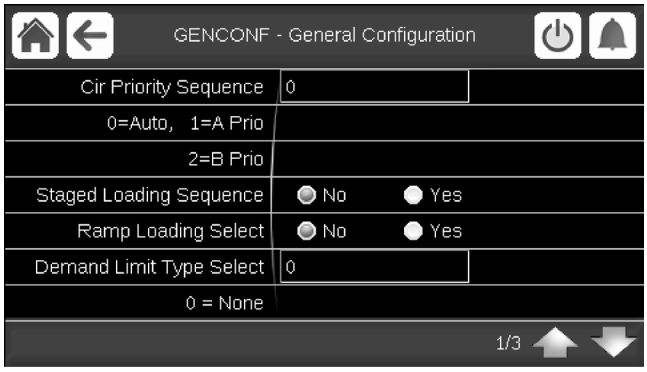


Fig. 15 — General Configuration

Press the field corresponding to the parameter to be modified and make the necessary changes. When all necessary changes have been made, press the Save button to confirm or the Cancel button to cancel changes. For a complete list of general parameters, see page 133 in Appendix A.

TRENDINGS SCREEN

The Trendings Display screen allows for easy monitoring of parameters selected by the user. To access the Trendings Display screen, select Trendings on the Main Menu. See Fig. 16.

Select the parameters to be displayed by pressing the box to the left of the parameter name. The scroll bar on the right of the screen can be used to see all possible selections; to save a selection, press the Save Trend Display Options button. Once the parameters to be trended are selected and saved, press the Display Trend Log button, and the trend graph will be displayed. (See Fig. 17.)

Use the following buttons to adjust the Trendings display:

Navigate across the time line.

Go to beginning or end of selected period.

Zoom in to magnify the view.

Zoom out to expand the viewed area.

Refresh (reload) data.

Fig. 16 — Trendings Display Screen

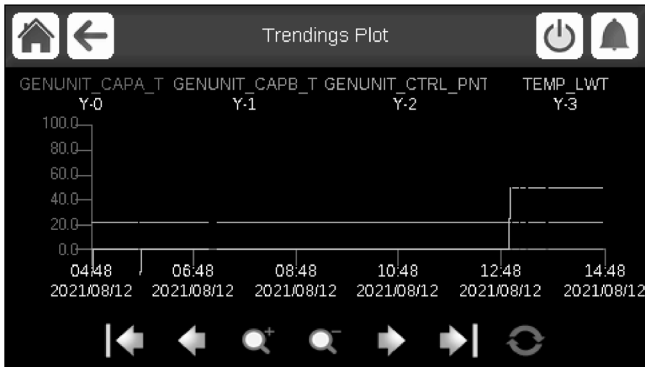


Fig. 17 — Trendings Configuration Screen

MENU ARCHITECTURE

See Fig. 18-21 for Carrier Controller menu structure. The options displayed depend on the user's access level, as shown in the figures. The user can navigate through the Carrier Controller display screens by pressing the buttons that appear on the screen. When a button is pressed, either a submenu or a list of parameters and values will be shown. If the list of parameters and values is shown, the top line of the display will show either the menu item name (if sub-menu items appear) or the table name (if points and values are displayed). Pressing an item will cause a Point Data dialog box to appear. For a complete list of tables and points with display names and CCN point names, see Appendixes A and B, starting on pages 132 and 181, respectively.

SETTING TIME AND DATE

The date and time for the controls can be set by opening the ***System Menu → Date & Time***. The Date & Time screen allows the user to configure the Time Zone and set the date, time, daylight saving time, and whether today or tomorrow is a holiday. See Fig. 21 for details.

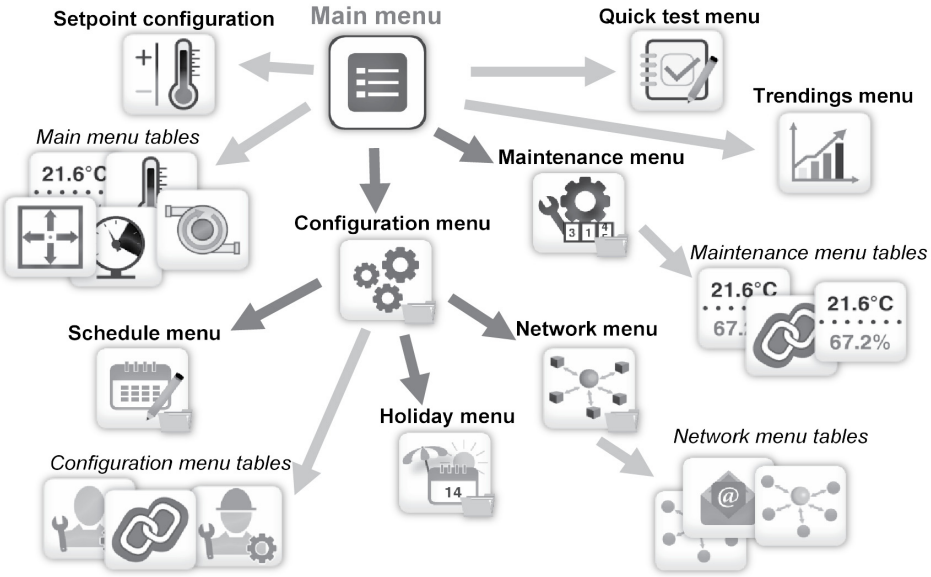


Fig. 18 — Main Menu

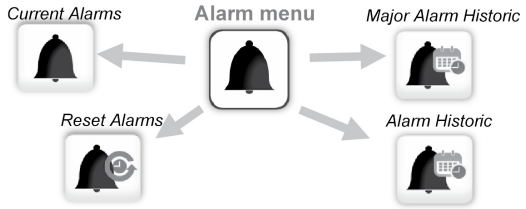


Fig. 19 — Alarm Menu

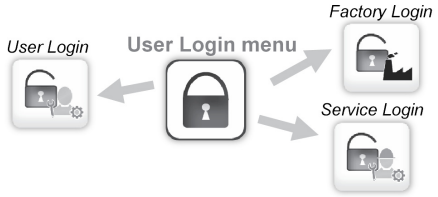


Fig. 20 — Login Menu

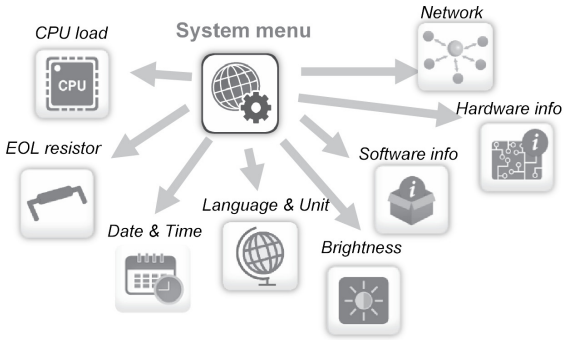


Fig. 21 — System Menu

WEB AND NETWORK INTERFACE

The Carrier Controller control can be configured to allow access via a standard, java-enabled web browser or over a network. See the appendix for the Carrier Controller Web and Network Interface Parameters on page 241 for detailed information on setting up and accessing the Carrier Controller via the web or network interface. See Table 5 for 4.3 in. screen port connections and Fig. 22 for interface and connectors. See Table 6 for 7 in. screen port connections and Fig. 23 for interface and connectors.

Table 5 — Carrier Controller Display Port Connections, 4.3 in. Screen

CONNECTOR	TYPE/ PINOUT	FUNCTION
J4	+	24 vac Power
	G	
J6	–	RS485: LEN System Internal I/O Boards
	C	
	+	
J7	–	RS485: CCN
	C	
	+	
J8	–	RS485: Unused
	C	
	+	
J10	–	RS485: ModBus RTU (Slave)
	C	
	+	
J9	TYPE-A	USB-1: Firmware Upgrade
J5	RJ45	ETH0: BMS Interface, BACnet, Modbus TCP, WAN (connectivity)

LEGEND

BMS — Building Management System
CCN — Carrier Comfort Network
LEN — Local Equipment Network
RTU — Remote Terminal Unit
USB — Universal Serial Bus
WAN — Wide Area Network

NOTE: PINOUT is listed as viewed from back of PIC6 (Product Integrated Control) from left to right on connector.

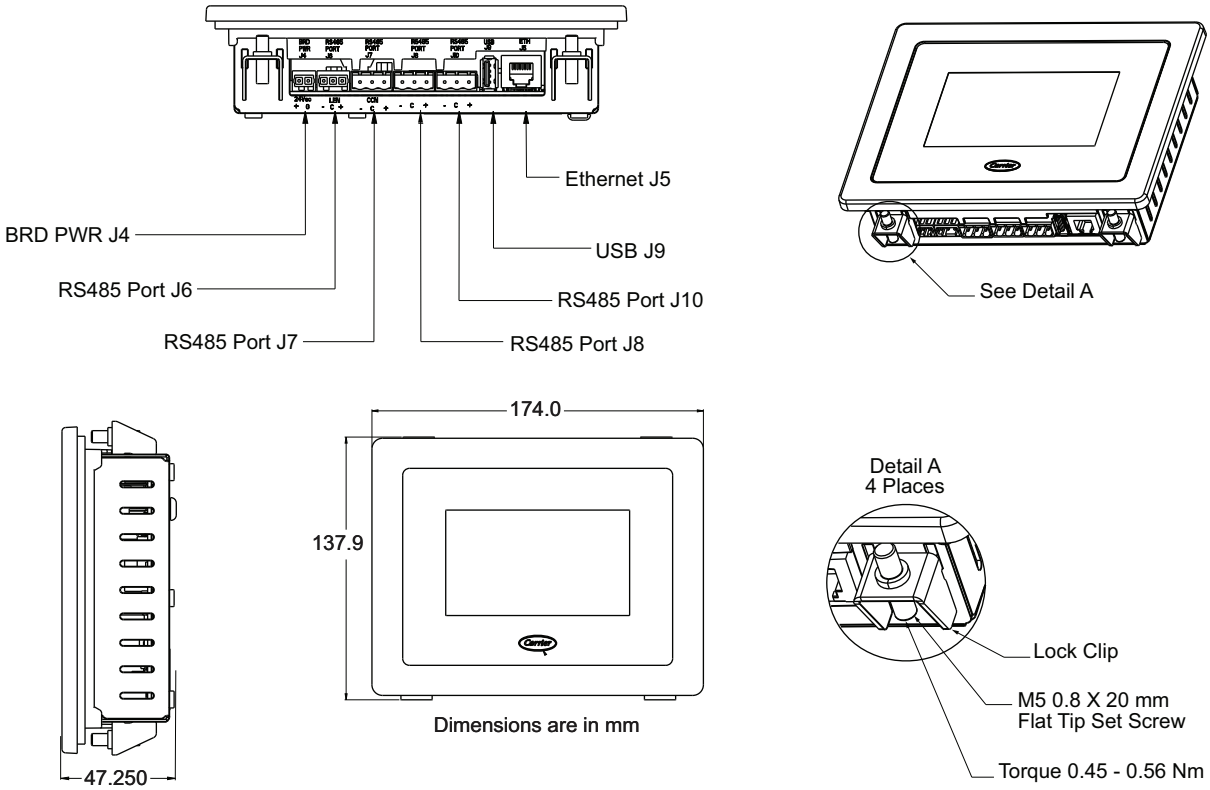


Fig. 22 — Carrier Controller Display Interface and Connectors, 4.3 in. Screen

Table 6 — Carrier Controller Display Port Connections, 7 in. Screen

CONNECTOR	TYPE/ PINOUT	FUNCTION
J14	+	24 vac Power
	G	
J6	–	RS485-1: LEN System Internal I/O Board
	C	
	+	
J7	–	RS485-2: CCN
	C	
	+	
J16	RJ45	Ethernet-1: WAN (connectivity)
J5	TYPE-A	USB-1: Firmware/Software Upgrade
J10	+	RS485: ModBus RTU (Slave)
	C	
	SHD	
	–	
J8	+	RS485: Not used
	C	
	SHD	
	–	

Table 6 — Carrier Controller Display Port Connections, 7 in. Screen (cont)

CONNECTOR	TYPE/ PINOUT	FUNCTION
J9	G	RNET Port to Support RNET Devices
	+	
	–	
	12-v	
J15	RJ45	ETH0: Service Tool, BMS Interface, BACnet, ModBus TCP, WAN (connectivity)
J11	TYPE-A	USB-2: Firmware/Software Upgrade
J1	TYPE-A	USB-3: Firmware/Software Upgrade

LEGEND

BMS — Building Management System
CCN — Carrier Comfort Network
LEN — Local Equipment Network
RNET — Communication Protocol
USB — Universal Serial Bus
WAN — Wide Area Network

NOTES:

1. For more information about password access, see Carrier Controller Login and Display Setup on page 13.
2. PINOUT is listed as viewed from the back and side of the connector, left to right.

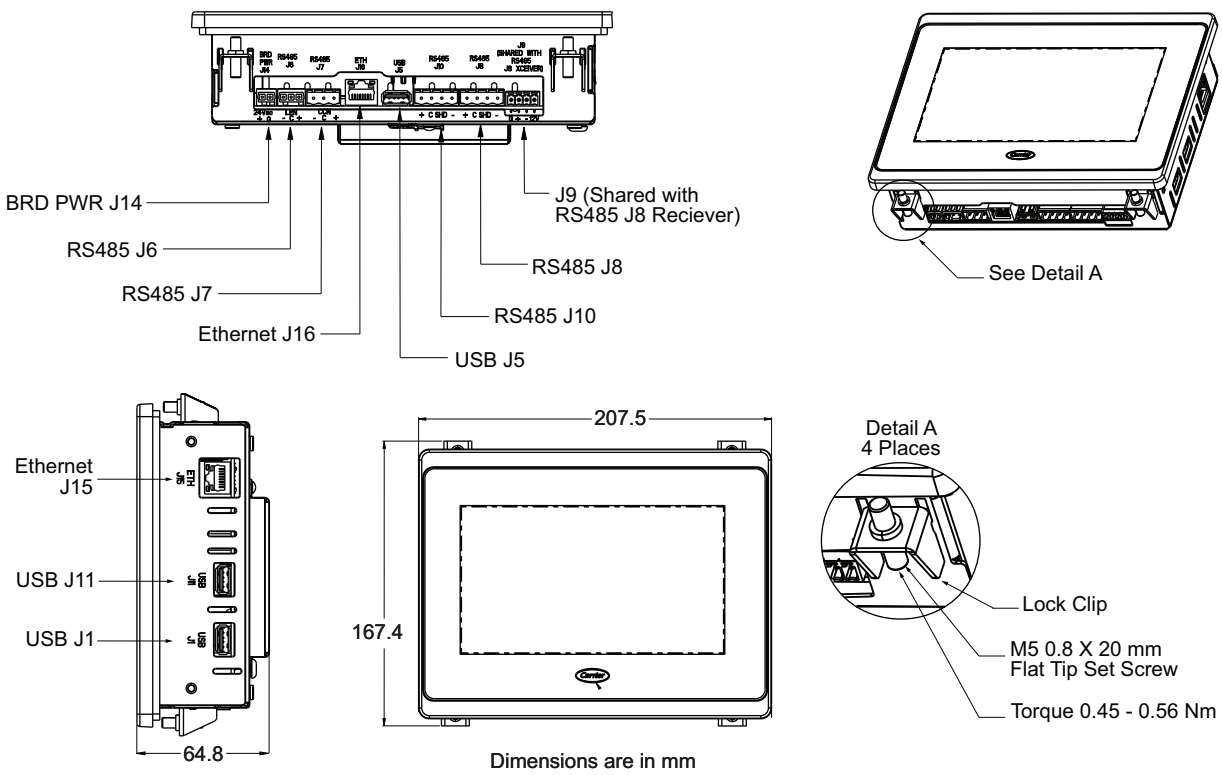


Fig. 23 — Carrier Controller Display Interface and Connectors, 7 in. Screen

Input/Output (SIOB) Boards

There are 2 Standard Input/Output Boards (SIOBs) for each unit, SIOB-A (address 49) for Circuit A and SIOB-B (address 50) for Circuit B. (See Fig. 24.) These boards receive inputs from the thermistors, transducers, demand limit switch, dual setpoint switch, remote on/off switch, chilled water flow switch, desuperheater demand switch, pump interlock contact, compressor failure contact, and high pressure switch. They provide output control to the expansion valves, evaporator heater contactor, isolation valves, compressor oil heater, customer-supplied pump relays, compressor contactor relays, and customer-supplied alarm and running relays. Information is transmitted between the SIOBs and the Carrier Controller module via a 3-wire communication bus or LEN (Local Equipment Network) bus. Connections for the LEN bus are J12 and J13. Each SIOB has a 4-position DIP (dual in-line package) switch bank used for addressing of the board. SIOB-A is at address 49 and SIOB-B is at address 50. See Table 7 for SIOB DIP switch settings. See Tables 8 and 9 for a list of inputs and outputs for the 2 SIOBs.

Table 7 — SIOB A and B DIP Switch Settings

SIOB-A DIP Switch	1	2	3	4
Position	OFF	OFF	OFF	OFF
SIOB-B DIP Switch	**1**	**2**	**3**	**4**
Position	ON	OFF	OFF	OFF

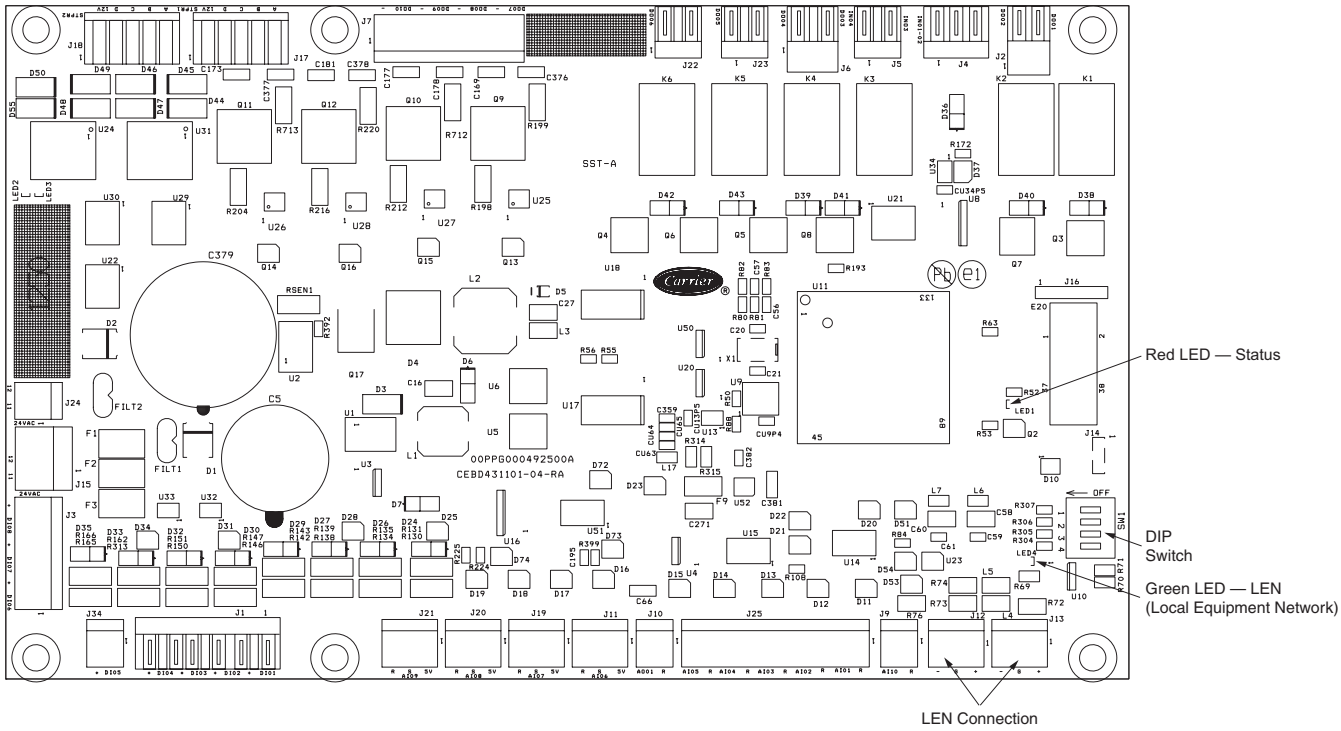


Fig. 24 — SIOB / Energy Management Module

Table 8 — SIOB-A Inputs and Outputs

POINT DESCRIPTION	I/O POINT NAME	BOARD CONNECTOR	IN/OUT TYPE	CCN POINT NAME
Inputs				
Remote Contact	DI-01	J1	Dry Contact	ONOFF_SW
Dual Setpoint Switch	DI-02	J1	Dry Contact	SETP_SW
Demand Limit Switch No. 1 On/Off	DI-03	J1	Dry Contact	LIM_SW1
Heat/Cool Select Switch	DI-04	J1	Dry Contact	HC_SEL
Compressor A1 Failure	DI-05	J34	Dry Contact	cp_a1_f
Compressor A2 Failure	DI-06	J3	Dry Contact	cp_a2_f
Compressor A3 Failure	DI-07	J3	Dry Contact	cp_a3_f
Compressor A4 Failure	DI-08	J3	Dry Contact	cp_a4_f
High Pressure Switch Circuit A	DI-09/J4/IN01-02	—	Dry Contact	HP_SW_A
Entering Water Temperature (EWT)	AI-01	J25	5K Thermistor	EWT
Leaving Water Temperature (LWT)	AI-02	J25	5K Thermistor	LWT
Outdoor Air Temperature (OAT)	AI-03	J25	5K Thermistor	OAT
Circuit A Suction Temperature (SGTA)	AI-04	J25	5K Thermistor	SUCT_A
Defrost Temperature Circuit A (Heat Pump Only)	AI-05	J25	5K Thermistor	DEFR_T_A
Circuit A Discharge Pressure (DPTA)	AI-06	J11	Pressure	DP_A
Circuit A Suction Pressure (SPTA)	AI-07	J19	Pressure	SP_A
Unused	AI-08	J20	Pressure	—
Unused	AI-09	J21	Pressure	—
Setpoint Reset Control (4-20 mA) (When no EMM board is present)	AI-10	J9	4-20 mA	SP_RESET
Outputs				
Compressor Contactor A1	DO-01	J2	Relay	CP_A1
Compressor Contactor A2	DO-02	J2	Relay	CP_A2
Compressor Contactor A3	DO-03	J6	Relay	CP_A3
Compressor Contactor A4	DO-04	J6	Relay	CP_A4
Alarm Relay	DO-05	J23	Relay	ALARM
Running Relay	DO-06	J22	Relay	RUNNING
4 Way Refrigerant Valve (Heat Pump Only)	DO-07	J7	Triac	RV_A
—	—	J7	Triac	—
MLV-A (Hot Gas Bypass Option)	DO-09	J7	Triac	HGBP_V_A
Evaporator Heater Contactor	DO-10	J7	Triac	EXCH_HTR
—	IN-01	J4	—	—
—	IN-02	J4	—	—
—	IN-03	J5	—	—
—	IN-04	J5	—	—
External Variable Speed Pump Control	AO-01	J10	0-10VdC	EVSP
EXV-A	STPR1	J17	—	EXV_A
Unused	STPR2	J18	—	—

LEGEND

CCN — Carrier Comfort Network®

EMM — Energy Management Module

PCB — Printed Circuit Board

Table 9 — SIOB-B Inputs and Outputs

POINT DESCRIPTION	I/O POINT NAME	BOARD CONNECTOR	IN/OUT TYPE	CCN POINT NAME
Inputs				
RRB1/RRB2	DI-01	J1	Dry Contact	REV_ROT
Pump Interlock (Customer Supplied)(CWFS2)	DI-02	J1	Dry Contact	LOCK_SW
Flow Switch (CWFS)	DI-03	J1	Dry Contact	FLOW_SW
Desuperheater Demand	DI-04	J1	Dry Contact	DSHTR_SW
Compressor B1 Failure	DI-05	J34	Dry Contact	cp_b1_f
Compressor B2 Failure	DI-06	J3	Dry Contact	cp_b2_f
Compressor B3 Failure	DI-07	J3	Dry Contact	cp_b3_f
Compressor B4 Failure	DI-08	J3	Dry Contact	cp_b4_f
Circuit B High Pressure Switch	DI-09/J4/IN01-02	—	Dry Contact	HP_SW_B
Chilled Water System Temperature (Dual Chiller)	AI-01	J25	10K Thermistor	CHWSTEMP
Discharge Gas Temperature Circuit A (DGTA)	AI-02	J25	100K Thermistor	DGT_A
Discharge Gas Temperature Circuit B (DGTB)	AI-03	J25	100K Thermistor	DGT_B
Circuit B Suction Temperature (SGTB)	AI-04	J25	5K Thermistor	SUCT_B
Defrost Temperature Circuit B (Heat Pump Only)	AI-05	J25	5K Thermistor	DEFR_T_B
Circuit B Discharge Pressure (DPTB)	AI-06	J11	Pressure	DP_B
Circuit B Suction Pressure (SPTB)	AI-07	J19	Pressure	SP_B
Unused	AI-08	J20	Pressure	—
Unused	AI-09	J21	Pressure	—
Unused	AI-10	J9	4-20 mA	—
Outputs				
Compressor Contactor B1	DO-01	J2	Relay	CP_B1
Compressor Contactor B2	DO-02	J2	Relay	CP_B2
Compressor Contactor B3	DO-03	J6	Relay	CP_B3
Compressor Contactor B4	DO-04	J6	Relay	CP_B4
Pump No. 1 Relay	DO-05	J23	Relay	PUMP1
Pump No. 2 Relay	DO-06	J22	Relay	PUMP2
4 Way Refrigerant Valve Circuit B (Heat Pump Only)	DO-07	J7	Triac	RV_B
—	DO-08	J7	Triac	—
Unused	DO-09	J7	Triac	—
Unused	DO-10	J7	Triac	—
—	IN-01	J4	—	—
—	IN-02	J4	—	—
—	IN-03	J5	—	—
—	IN-04	J5	—	—
Unused	AO-01	J10	0-10VdC	—
EXV-B	STPR1	J17	—	EXV_B
Unused	STPR2	J18	—	—

LEGEND

CCN — Carrier Comfort Network®

PCB — Printed Circuit Board

Reverse Rotation Board

Reverse rotation boards are only applicable for 60 and 70 ton capacity 30RC units. The reverse rotation board monitors the 3-phase electrical system to provide phase reversal, phase loss, and under-voltage protection. (See Fig. 25.) The reverse rotation board has 2 LEDs (light-emitting diodes) and 2 adjustable dial settings. Under normal conditions, the upper LED will light up green. The lower LED is red and will flash (phase reversal) or turn on solid (phase loss and under-voltage) according to the conditions sensed.

DIAL SETTINGS

The reverse rotation board has 2 dials. (See Fig. 25.) The upper dial should be set to match the incoming 3-phase voltage to the chiller with no compressors running. This dial must be adjusted for 208/230-v chillers operating on 208-v power supply. The dial should be adjusted to a 200-v minimum setting for this case. The lower dial is used for trip delay and should be set fully counter-clockwise to the minimum 0.1 second setting.

PHASE REVERSAL PROTECTION

The control monitors the 3-phase power sequence supplied at terminals L1, L2, and L3. If the control senses an incorrect phase relationship, the relay contacts (11/14) on the board will open. The relay contacts will automatically reset when the correct phase sequence is applied.

PHASE LOSS AND UNDER-VOLTAGE PROTECTION

If the reverse rotation board senses that any one of the 3 phase inputs has no AC voltage or that any one phase has dropped more than 20% below the voltage dial setting, the relay contacts (11/14) on the board will open. Contacts will reset automatically when all 3 phases are present, in the correct sequence, and within the limits of the voltage dial setting.

LED STATUS	FUNCTION
Upper (green) LED on continuously	Relay contacts closed (normal operation)
Lower (red) LED flashing	Relay contacts open (phase reversal has occurred)
Lower (red) LED on continuously	Relay contacts open (phase loss or under-voltage has occurred)
Upper (green) LED off	Power not present at L1, L2, L3 (off)

NOTE: Normal operation of the reverse rotation board (for example, no faults are detected) results in a closed contact being applied to SIOB-B (DI-01) input through the closed 11/14 relay contact.

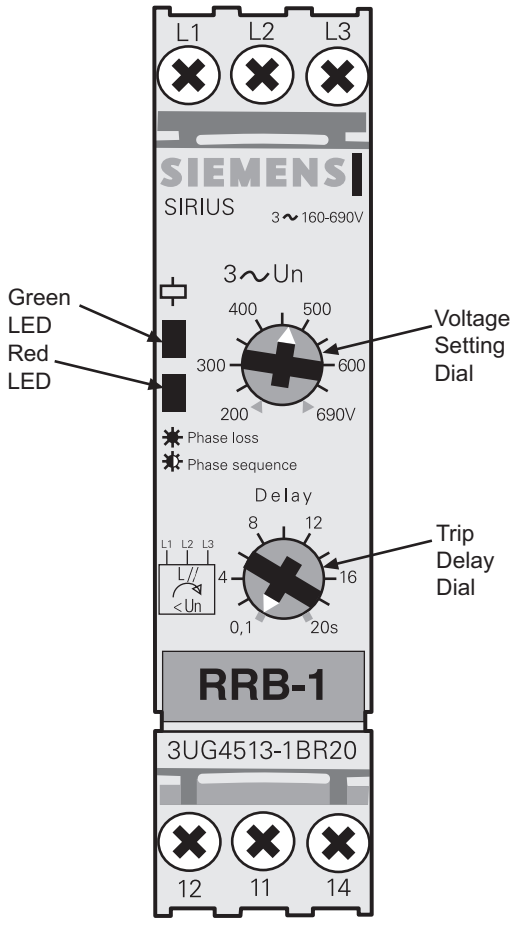


Fig. 25 — Reverse Rotation Board (RRB)

Compressor Protection Module

Compressor models 240-295-300-485 are delivered with a pre-installed motor protection module inside the terminal box. (See Fig. 26.) This device provides for efficient and reliable protection against overheating and overloading, as well as protection against phase loss/reversal.

OVERHEATING AND OVERLOADING

The motor protector comprises a control module and PTC (positive temperature coefficient) sensors embedded in the motor winding. The close contact between the thermistors and windings ensures a very low level of thermal inertia.

The motor temperature is constantly measured by a PTC thermistor loop connected on S1-S2. If any thermistor exceeds its response temperature, its resistance increases above the trip level (4500Ω) and the output relay then trips (i.e., contacts M1-M2 are open). After cooling to below the response temperature (resistance < 2750Ω), a 5-minute time delay is activated.

After this delay has elapsed, the relay is once again pulled in (i.e., contacts M1-M2 are closed). The time delay may be canceled by means of resetting the mains power (L-N disconnect) for approximately 5 sec. A red/green twin LED is visible on the module. A solid green LED denotes a fault-free condition. A blinking red LED indicates an identifiable fault condition.

PHASE REVERSAL/LOSS

The circuit should be thoroughly checked in order to determine the cause of the phase problem before re-energizing the control circuit.

The phase sequencing and phase loss monitoring functions are active during a 5-second window, 1 second after compressor start-up (power on L1-L2-L3).

Should one of these parameters be incorrect, the relay would lock out (contacts M1-M2 open). The lockout may be canceled by resetting the mains power (L-N disconnect) for approximately 5 seconds.

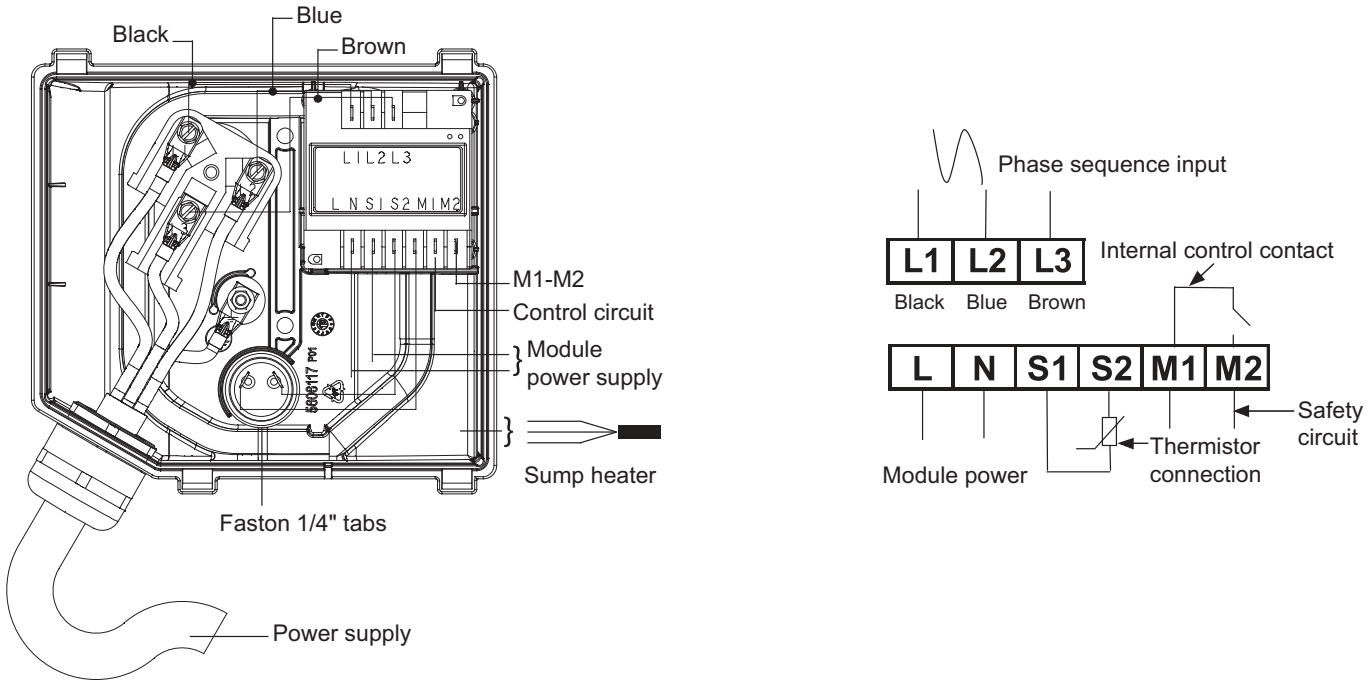


Fig. 26 — Compressor Protection Module

Auxiliary Boards

For units with fixed speed fans, the AUX 2 Board (address 83) will be installed. The AUX 2 board has a set of jumpers, JP1 and JP2, which must be placed on either the "P" terminal for pressure or the "T" terminal for temperature, as shown in Fig. 27. The AUX 2 board responds to commands from the Carrier Controller module and sends the Carrier Controller module the results of the channels they monitor via the LEN. See Table 10 for AUX 2 Board DIP switch settings. See Table 11 for a list of outputs for the AUX 2 board.

Table 10 — AUX 2 Board DIP Switch Settings

AUX 2 BOARD DIP SWITCH	1	2	3	4	5	6	7	8
Address	ON	ON	OFF	OFF	ON	OFF	ON	OFF

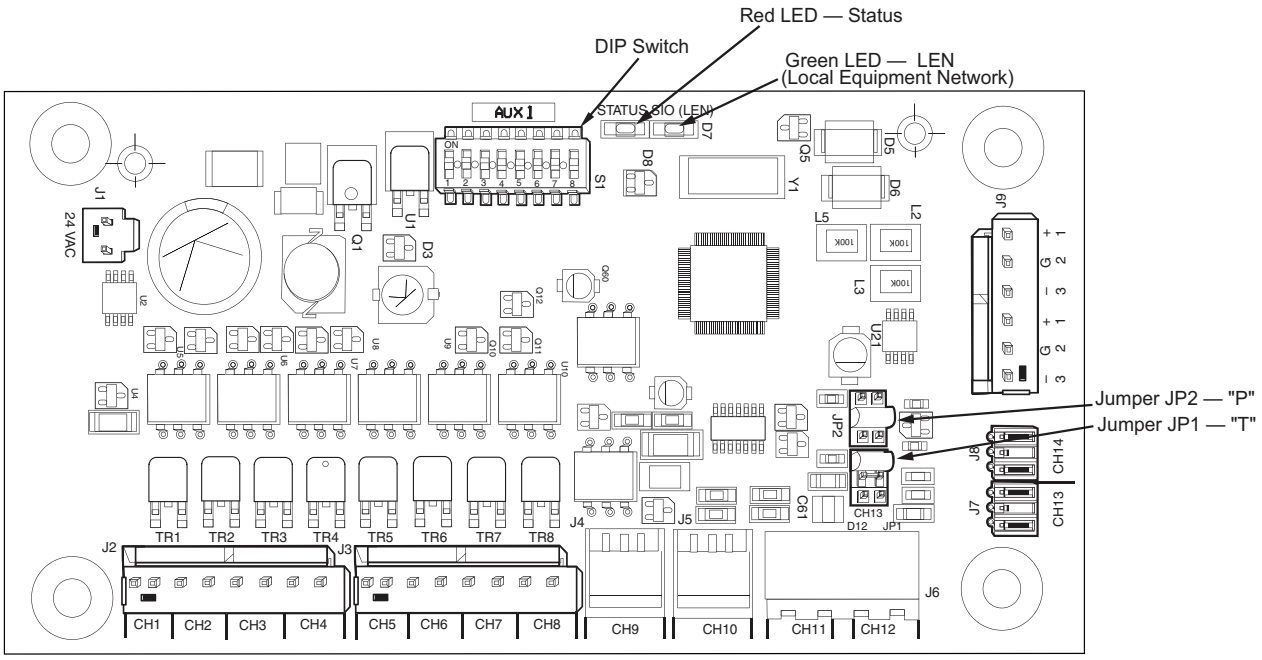


Fig. 27 — AUX Board

Table 11 — AUX 2 Board Outputs

POINT DESCRIPTION	I/O POINT NAME	BOARD CONNECTOR	IN/OUT TYPE	CHANNEL	CCN POINT NAME
Outputs					
Fan Contactor (FC)	DO 1	J2	Triac	CH1	FAN_A1
	DO 2		Triac	CH2	FAN_A2
	DO 3		Triac	CH3	FAN_A3
	DO 4		Triac	CH4	FAN_A4
	DO 5	J3	Triac	CH5	FAN_B1
	DO 6		Triac	CH6	FAN_B2
	DO 7		Triac	CH7	FAN_B3
	DO 8		Triac	CH8	FAN_B4

LEGEND

CCN — Carrier Comfort Network®

Emergency On/Off Switch (SW2)

This switch is installed in all units. The Emergency On/Off switch should only be used when it is required to shut the chiller off immediately. Power to all modules is interrupted when this switch is off, and all outputs from these modules will be turned off.

Energy Management Module (EMM)

The EMM (address 54) is available as a factory-installed option or as a field-installed accessory. (See Fig. 24 on page 20.) When the EMM module is field-installed, the Carrier Controller must be set up to communicate with the EMM module (***Main Menu → Configuration Menu → Factory Configuration → Energy Management Module*** = **Yes**). The Energy Management Module allows the following functions:

- Chilled Water Temperature Reset — Resets the chilled water setpoint by the following method:
  a. Space Temperature: A field-supplied space temperature sensor is required.
- Demand Limit — Limits the capacity of the machine from unit capacity by the following methods:
  a. 4 to 20 mA Input: A field-supplied signal generator and 1/2-watt, 250-ohm resistor are required.
  b. 2 or 3-Step Switch Control: A field-supplied dry contact switch is required. (One-Step Demand Limit does not require the EMM.)
- Occupancy Override — Extends the occupied period for machine operation. A field-supplied dry contact switch is required.
- Remote Chiller Lockout — Disables the chiller when closed. A field-supplied dry contact switch is required.
- Ice Done Control Switch — Signals the machine to exit the Ice Build mode and enter an unoccupied time period. A field-supplied dry contact switch is required.

The following status functions are available with the EMM board:

- Capacity Output Signal — A 0 to10 vdc analog output signal indicating chiller capacity is available.
- Shutdown Status Relay — A 24 vac output signal indicating that the machine is shutting down.
- Alert Relay — A 24 vac output signal indicating the unit has an active alert.

The EMM communicates the status of all inputs with the Carrier Controller module, and the controls adjust the outputs and control point, capacity limit, and other functions according to the information received. See Tables 12-13 for EMM dip switch settings and EMM board inputs and outputs.

⚠ CAUTION

Care should be taken when interfacing with other manufacturer's control systems due to possible power supply differences, full wave bridge versus half wave rectification, which could lead to equipment damage. The 2 different power supplies cannot be mixed. Carrier Controller controls use half wave rectification. A signal isolation device should be utilized if a full wave bridge rectifier signal generating device is used.

Table 12 — EMM Dip Switch Settings

EMM BOARD DIP SWITCH	1	2	3	4
ADDRESS	On	Off	On	Off

Table 13 — EMM Board Inputs and Outputs

POINT DESCRIPTION	I/O POINT NAME	BOARD CONNECTOR	IN/OUT TYPE	CCN POINT NAME
Inputs				
Occupancy Override Switch	cDI-01	J1	Dry Contact	OCC_OVSW
Capacity Limit Switch Input No. 2	cDI-02	J1	Dry Contact	LIM_SW2
Remote Lockout Switch	cDI-03	J1	Dry Contact	REM_LOCK
Ice Done Contact	cDI-04	J1	Dry Contact	ICE_SW
Unused	DI-05	J34	Dry Contact	—
Unused	DI-06	J3	Dry Contact	—
Unused	DI-07	J3	Dry Contact	—
Unused	DI-08	J3	Dry Contact	—
Unused	DI-09	—	Dry Contact	—
Space Temperature for Reset Control	AI-01	J25	5K Thermistor	SPACETMP
Unused	AI-02	J25	5K Thermistor	—
Unused	AI-03	J25	5K Thermistor	—
Unused	AI-04	J25	5K Thermistor	—
Unused	AI-05	J25	5K Thermistor	—
Unused	AI-06	J11	Pressure	—
Unused	AI-07	J19	Pressure	—
Unused	AI-08	J20	Pressure	—
Unused	AI-09	J21	Pressure	—
Capacity Limit Control	AI-10	J9	4-20 mA	LIM_4_20
Outputs				
Desuperheater Customer Pump	DO-01	J2	Relay	DSH_PUMP
Unused	DO-02	J2	Relay	—
Unused	DO-03	J6	Relay	—
Unused	DO-04	J6	Relay	—
Alert Relay	DO-05	J23	Relay	ALERT
Shutdown Relay	DO-06	J22	Relay	SHUTDOWN
Electric Heat Stage No. 1 (Heat Pump Only) or Boiler	DO-07	J7	Triac	EHS_1/BOILER
Electric Heat Stage No. 2 (Heat Pump Only)	DO-08	J7	Triac	EHS_2
Electric Heat Stage No. 3 (Heat Pump Only)	DO-09	J7	Triac	EHS_3
Electric Heat Stage No. 4 (Heat Pump Only)	DO-10	J7	Triac	EHS_4
—	IN-01	J4	—	—
—	IN-02	J4	—	—
—	IN-03	J5	—	—
—	IN-04	J5	—	—
Chiller Capacity Running %	AO-01	J10	0-10VdC	CAPT_010
Unused	STPR1	J17	—	—
Unused	STPR2	J18	—	—

Local Equipment Network

Information is transmitted between modules via a 3-wire communication bus or LEN.

Board Addresses

All boards (except the Carrier Controller display) have DIP switches to set the address.

Control Module Communication

RED LED

Proper operation of the control boards can be visually checked by looking at the red status LEDs. When operating correctly, the red status LEDs will blink in unison at a rate of once every 2 seconds. If the red LEDs are not blinking in unison, verify that correct power is being supplied to all modules and that all communication wiring is connected securely. Confirm current version of software installed on Carrier Controller display by navigating to the Software Info screen (***System Menu → Software Info***). If a newer version of the software exists, contact your Carrier service representative to reload current software. If the problem still persists, replace the Carrier Controller module. A red LED that is lit continuously or blinking at a rate of once per second or faster indicates that the board should be replaced.

GREEN LED

All boards have a green LEN LED that should be blinking whenever power is on. If the LEDs are not blinking as described, check LEN connections for potential communication errors at the board connectors. A 3-wire bus accomplishes communication between modules. These 3 wires run in parallel from module to module. They connect to J9 on AUX boards and to J12 or J13 on SIOBs and EMM. A valid unit configuration must be in the Carrier Controller module for proper LEN communication.

Carrier Comfort Network® Interface

All 30RC units can be connected to the Carrier Comfort Network (CCN), if desired. The communication bus wiring is RS-485 Communication Wiring, CM or CMP rated, consisting of a shielded, 3-conductor cable with drain wire, and is field supplied and installed. The system elements are connected to the communication bus in a daisy chain arrangement. The positive pin of each system element communication connector must be wired to the positive pins of the system elements on either side of it. The negative and signal ground pins of each system element must also be wired in the same manner. Wiring connections for CCN should be made at TB3. (See Fig. 28.) For noise consideration, communication wiring must be separate and not run in parallel with other wiring.

NOTE: Conductors and drain wire must be 20 AWG (American Wire Gauge) minimum stranded, tinned copper. Individual conductors must be insulated with PVC (Polyvinyl Chloride), PVC/nylon, vinyl, Teflon[1], or polyethylene. An aluminum/polyester 100% foil shield and an outer jacket of PVC, PVC/nylon, chrome vinyl, or Teflon with a minimum operating temperature range of –4 to 140°F (–20 to 60°C) is required. High temperature applications may require a higher temperature range. Plenum applications will require plenum-rated cable. Cable voltage requirements must match the application.

When connecting to a CCN communication bus, it is important that a color-coding scheme be used for the entire network to simplify the installation. It is recommended that red be used for the signal positive, black for the signal negative, and white for the signal ground. Use a similar scheme for cables containing different colored wires.

At each system element, the shields of its communication bus cables must be tied together. If the communication bus is entirely within one building, the resulting continuous shield must be connected to a ground at one point only. If the communication bus cable exits from one building and enters another, the shields must be connected to grounds at the lightning suppressor in each building where the cable enters or exits the building (one point per building only). To connect the unit to the network:

1. Turn off power to the control box.
2. Cut the CCN wire and strip the ends of the red (+), white (ground), and black (–) conductors. (Substitute appropriate colors for different colored cables.)
3. Connect the red wire to (+) terminal on TB3 of the plug, the white wire to COM terminal, and the black wire to the (–) terminal.
4. The RJ14 CCN connector on TB3 can also be used but is only intended for temporary connection (for example, a laptop computer running Network Service Tool).

IMPORTANT: A shorted CCN bus cable will prevent some routines from running and may prevent the unit from starting. If abnormal conditions occur, disconnect the CCN bus. If conditions return to normal, check the CCN connector and cable. Run new cable if necessary. A short in one section of the bus can cause problems with all system elements on the bus.

1. Teflon is a registered trademark of DuPont.

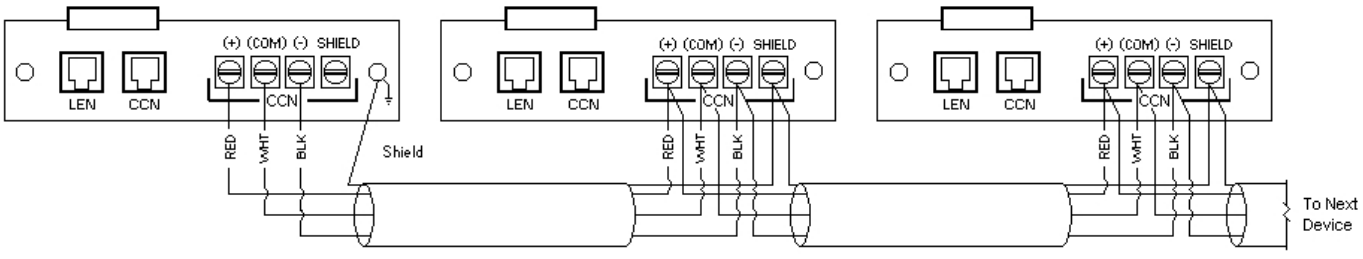


Fig. 28 — Carrier Controller CCN Communication Wiring

External Sensor Wiring

External sensors, such as a Space Temperature Sensor, must be wired to the unit if values are not communicated. The wiring should be CM or CMP rated depending on the application. Wiring is field supplied and installed. For wiring runs of less than 100 ft (30.5 m), 2-conductor, twisted pair, unshielded wire is acceptable. For wiring runs of 100 ft (30.5 m) or more, 2-conductor, twisted pair, shielded wire is recommended. For noise consideration, sensor wiring must be separate and not run in parallel with other wiring.

NOTE: Conductors and drain wire must be 20 AWG stranded, tinned copper. Individual conductors must be insulated with PVC, PVC/nylon, vinyl, Teflon, or polyethylene. An aluminum/polyester 100% foil shield and an outer jacket of PVC, PVC/nylon, chrome vinyl, or Teflon with a minimum operating temperature range of –4 to 140°F (–20 to 60°C) is required. High temperature applications may require a higher temperature range. Plenum applications will require plenum-rated cable. Cable voltage requirements must match the application.

Remote Alarm and Alert Relays

The 30RC chiller can be equipped with remote alert and remote alarm annunciator contacts. Both relays connected to these contacts must be rated for a maximum power draw of 10 va sealed, 25 va inrush at 24 volts.

The remote alarm annunciator relay, indicating that one circuit or the complete unit has been shut down, can be connected to TB5-12 and TB5-13. Refer to unit wiring diagrams. For the remote alert annunciator relay, indicating that an alert is active but neither circuit is shut down, a field-supplied and installed relay must be connected between TB6-11 and TB6-16. The Energy Management Module is required for this feature. The unit configuration must have the Energy Management Module enabled (***Main Menu → Configuration Menu → Factory Configuration***, set EMM to **YES**[1]).

CONFIGURATION (SOFTWARE)

Carrier Controller Operation Configuration Table

The Carrier Controller control system can be configured for a range of operating conditions and equipment arrangements. The following parameters should be configured based on unique system layout and operating requirements.

The system parameters may be configured through the Carrier Controller interface or remotely through the CCN. Table 14 shows the Carrier Controller configuration required to access the unit on the CCN. Fig. 29 shows the CCN configuration screen.

Table 14 — Carrier Controller Identification Configuration Table

PATH	DISPLAY NAME	VALUE
Main Menu → Configuration Menu → Control Identification	CCN Element Number	Default = 1
	CCN Bus Number	Default = 0
	CCN Baud Rate	Default = 9600

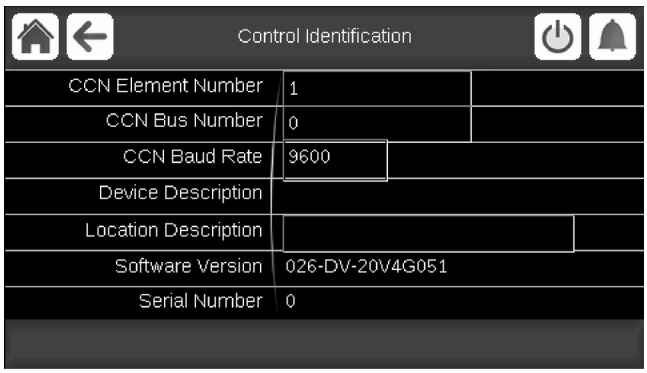


Fig. 29 — CCN Control Identification Screen

Carrier Controller Menu Tables

Carrier Controller operation is controlled by configuration information entered in the configuration tables listed in Tables 15-22. Access to different parameters may be available to all users (BASIC) or password-protected (USER, SERVICE, FACTORY). See Appendix A on page 132 for detailed descriptions of all control tables and parameters.

Table 15 — Main Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	GENUNIT	BASIC, USER, SERVICE, FACTORY*	General Parameters	
2	TEMP	BASIC, USER, SERVICE, FACTORY*	Temperatures	
3	PRESSURE	BASIC, USER, SERVICE, FACTORY*	Pressures	
4	INPUTS	BASIC, USER, SERVICE, FACTORY*	Inputs Status	
5	OUTPUTS	BASIC, USER, SERVICE, FACTORY*	Outputs Status	
6	PUMPSTAT	BASIC, USER, SERVICE, FACTORY*	Pump Status	
7	RUNTIME	BASIC, USER, SERVICE, FACTORY*	Run Times	
8	MODES	BASIC, USER, SERVICE, FACTORY*	Modes	
9	DCFC_STA	BASIC, USER, SERVICE, FACTORY*	DC Free Cooling Status	
10	MSC_STAT	BASIC, USER, SERVICE, FACTORY*	Msc Status	
11	RECLAIM	USER, SERVICE, FACTORY†	Heat Reclaim	
12	HYD_FC	USER, SERVICE, FACTORY†	Hydraulic Free Cooling	
13	TRENDING	BASIC, USER, SERVICE, FACTORY*	Trendings	
14	SETPOINT	USER, SERVICE, FACTORY†	Setpoint Configuration	
15	CONFIG	USER, SERVICE, FACTORY†	Configuration Menu	
16	ENERGY	USER, SERVICE, FACTORY†	Energy Monitoring	
17	OPT_STA	USER, SERVICE, FACTORY†	Software Options	
18	QCK_TST1	USER, SERVICE, FACTORY†	Quick Test #1	
19	QCK_TST2	SERVICE, FACTORY**	Quick Test #2	
20	MAINTAIN	SERVICE, FACTORY**	Maintenance Menu	

Minimum Access Level Required
* Basic (no password required)
† User
** Service

Table 16 — Configuration Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	GENCONF	USER, SERVICE, FACTORY†	General Configuration	
2	PUMPCONF	USER, SERVICE, FACTORY†	Pump Configuration	
3	RESETCFG	USER, SERVICE, FACTORY†	Reset Configuration	
4	BACKUP	USER, SERVICE, FACTORY†	Backup Configuration	
5	USERCONF	USER, SERVICE, FACTORY†	User Configuration	
6	HR_CFG	USER, SERVICE, FACTORY†	Heat Reclaim Config	
7	SCHEDULE	USER, SERVICE, FACTORY†	Schedule Menu	
8	HOLIDAY	USER, SERVICE, FACTORY†	Holiday Menu	
9	DATETIME	USER, SERVICE, FACTORY†	Date/Time	
10	NETWORK	USER, SERVICE, FACTORY†	Network Menu	
11	CTRLID	USER, SERVICE, FACTORY†	Control Identification	
12	FACTORY	FACTORY††	Factory Configurations	
13	FACTORY2	FACTORY††	Factory2 Configuration	
14	DCFC_CFG	SERVICE, FACTORY**	DC Free Cooling Config	
15	H_FC_CFG	SERVICE, FACTORY**	Hyd Free Cooling Config	
16	OPT_SEL	SERVICE, FACTORY**	Option Selection	
17	SERVICE1	SERVICE, FACTORY**	Service Configuration	
18	SERVICE2	SERVICE, FACTORY**	Service2 Configuration	
19	UPDTHOUR	SERVICE, FACTORY**	Running Hour Configuration	
20	MST_SLV	SERVICE, FACTORY**	Master Slave Config	
21	CP_UNABL	SERVICE, FACTORY**	Comp Disabled Cfg	

Table 16 — Configuration Menu (cont)

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
22	MSC_SERV	SERVICE, FACTORY**	Msc Configuration	
23	ADD_OPT	USER, SERVICE, FACTORY†	Add Options	

Minimum Access Level Required
† User
** Service
†† Factory

Table 17 — Holiday Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	HOLDY_01	USER, SERVICE, FACTORY†	Holiday — HOLDY_01	
2	HOLDY_02	USER, SERVICE, FACTORY†	Holiday — HOLDY_02	
...	...	...	...	...
16	HOLDY_16	USER, SERVICE, FACTORY†	Holiday — HOLDY_16	

Minimum Access Level Required
† User

Table 18 — Schedule Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	OCCPC01S	USER, SERVICE, FACTORY†	OCCPC01S — Schedule Menu	
2	OCCPC02S	USER, SERVICE, FACTORY†	OCCPC02S — Schedule Menu	

Minimum Access Level Required
† User

Table 19 — Network Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	EMAILCFG	USER, SERVICE, FACTORY†	Email Configuration	
2	MODBUSRS	USER, SERVICE, FACTORY†	ModbusRTU Config.	
3	MODBUSIP	USER, SERVICE, FACTORY†	ModbusTCP/IP Config.	
4	BACNET	USER, SERVICE, FACTORY†	BACNet Standard Conf.	

Minimum Access Level Required
† User

Table 20 — Maintenance Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	LOADFACT	SERVICE, FACTORY**	Capacity Control	
2	DRV_CTRL	SERVICE, FACTORY**	Drive Maintenance	
3	DRV_CTL2	SERVICE, FACTORY**	Drive Maintenance 2	
4	LAST_POR	SERVICE, FACTORY**	Last PowerOn Reset	
5	M_MSTSLV	SERVICE, FACTORY**	Master Slave Control	
6	SYSVER	SERVICE, FACTORY**	System Version	
7	SERMAINT	SERVICE, FACTORY**	Service Maintenance	
8	DEFROST	Access via Service Tool	Defrost	—
9	MAINTCFG	Access via Service Tool	Maintenance Configuration	—

Minimum Access Level Required
** Service

Table 21 — System Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	CPULOAD	USER, SERVICE, FACTORY†	CPU Load	
2	EOLRES	USER, SERVICE, FACTORY†	EOL Resistor	
3	NETWORK	USER, SERVICE, FACTORY†	Network	
4	DATETIME	USER, SERVICE, FACTORY†	Date/Time	
5	LANGUNIT	USER, SERVICE, FACTORY†	Language & Unit System	
6	BRIGHTNS	USER, SERVICE, FACTORY†	Brightness	
7	SWINFO	USER, SERVICE, FACTORY†	Software Info	
8	HWINFO	USER, SERVICE, FACTORY†	Hardware Info	
9	USB_LOG	SERVICE, FACTORY**	USB Log	

Minimum Access Level Required
† User
** Service

Table 22 — Alarm Menu

ITEM	CCN MENU NAME	ACCESS	MENU TEXT DESCRIPTION	MENU ICON
1	ALARMRST	USER, SERVICE, FACTORY†	Reset Alarms	
2	CUR_ALM	BASIC, USER, SERVICE, FACTORY*	Current Alarms	
3	ALMHIST1	BASIC, USER, SERVICE, FACTORY*	Alarm Historic	
4	ALMHIST2	BASIC, USER, SERVICE, FACTORY*	Major Alarm Historic	

Minimum Access Level Required
* Basic (no password required)
† User

Machine Control Methods

This term refers to how the machine is started and stopped. Several Machine Control Methods are available.

- Local On
- Local Schedule
- Network
- Remote
- Master

The Carrier Controller Start/Stop button is used to select one of the above control types; see Fig. 30. Once the Start/Stop button is pressed, and assuming the unit is not running, the current start method will be indicated with a cursor. If the unit is running, then the only option available will be to switch to "Local Off." See Fig. 30 for details. In addition, when the unit is Off, the Local control type can be turned to "Local On" or "Local Schedule." If the Start/Stop button is green, then the unit is running. If the Start/Stop button is blue, then the unit is not running. If the button is flashing between green and blue, then the unit is preparing to start.

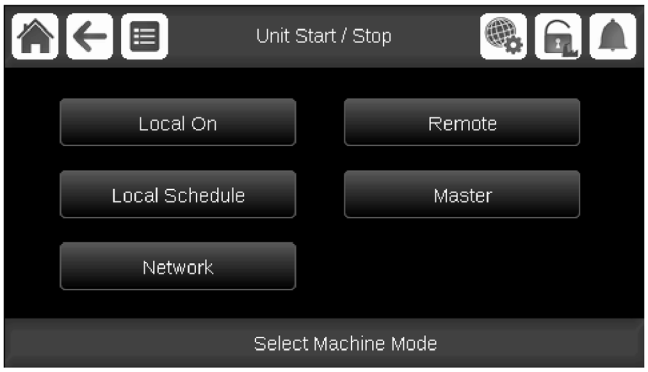


Fig. 30 — Machine Control Methods

LOCAL ON

With this mode selected, the unit is under local control and will be allowed to start. The unit will ignore the Remote Control Contacts and any network commands except Emergency Stop. Use this method if the unit is to run all the time without direction from a Building Management System or network.

LOCAL SCHEDULE

With this mode selected, the unit is under local control and will be allowed to start if Occupancy Schedule 1 (***Configuration Menu → Schedule Menu → OCCPC01S***) indicates the current time is within an occupied period. Otherwise, the unit will remain off. See Defining Occupancy Schedule on page 38 for details on configuring a local schedule. The unit will ignore the Remote Control Contacts and any network commands except Emergency Stop. Use this method if the unit is to run based on an occupancy schedule without direction from a Building Management System or network.

NETWORK

With this mode selected, the unit is under CCN, BACnet (if enabled), or ModBus (if enabled) control and will be controlled by CCN, BACnet (if enabled), or ModBus (if enabled) commands. The unit will ignore the Remote Control Contacts. Use this method if the unit is to run based on a Building Management System or network.

REMOTE

With this mode selected, the unit is under remote control and will be allowed to start if the Remote Contacts (TB5-9 and 10) are closed. The unit will ignore any network commands except Emergency Stop. Use this method if the unit is to operate the chiller via a contact closure from a Building Management System. The remote contacts are field-installed dry contacts that can be used to start and stop the chiller. The contacts must be capable of handling a 24 vac, 50 mA load. In Remote Unit Control Type and with the Remote Contact closed, the chiller is allowed to operate and respond to the scheduling configuration and setpoint data.

MASTER

With this mode selected, the unit is operating as the Master unit of a 2-unit Master Slave Chiller Plant. The Master unit can be started under Local On, Local Schedule, Network, or Remote. The exceptions noted for each of the control methods will still apply. Use this method if the unit is to run as the Master unit.

Table 23 summarizes the available operating types.

MACHINE CONTROL METHOD SELECTION

The Machine Control Method is selected through the Carrier Controller by pressing the Start/Stop button.

Start/Stop Selection Screen

The Carrier Controller Start/Stop button is a hotkey, and when pressed, opens the Start/Stop selection screen. and displays the list of Machine Control Methods if the unit is off (Fig. 30), or Confirm Stop if the unit is on (Fig. 31).

Start a Stopped Machine

If the unit is off, the Start/Stop button will be blue. Press the icon to display the list of operating modes and select the required mode. Once the unit has been started, the display will return to the home screen.

Stop a Running Machine

To stop a running unit, press the green Start/Stop button. For Machine Control Methods Local On or Master, confirm the unit shutdown by pressing Confirm Stop or cancel by pressing the Back button (Fig. 31).

Table 23 — Operating Types

MACHINE CONTROL TYPE	OPERATING TYPE	DESCRIPTION
Local Off	Local	The unit is under Local control method. It will remain halted and will ignore all CCN network commands and remote switch contacts.
Local On	Local	The unit is under Local control method and will be allowed to start. The control will ignore all remote control contacts and all CCN network force commands (except the Emergency Stop Command).
Local Schedule	Local	The unit is under Local control method and will be allowed to start if the schedule no. 1 is occupied (**CHIL_OCC**). Otherwise, the unit will remain off. The control will ignore all remote control contacts and all CCN network force commands (except the Emergency Stop Command).
Network	CCN	The unit is under CCN, BACnet, or ModBus control method and will be controlled by CCN, BACnet, or ModBus force commands. The control will ignore all remote control contacts.
Remote	Remote	The unit is under Remote control method and will be controlled by the start/stop. In this mode, no CCN force command can affect the unit control except the Emergency Stop Command.
Master	Master	The unit is configured as the master unit in a 2-unit master/slave plant. The master unit control method can be done locally, remotely, or through CCN commands upon the master/slave configuration.

Fig. 31 — Confirm Stop

For Machine Control Method Local Schedule, press the Confirm Stop button to stop the machine or Back button to cancel (Fig. 31).

For Machine Control Method Network, press the Confirm Stop button to stop the machine or Back button to cancel (Fig. 31).

Once the unit has been stopped, the Home screen is displayed.

If the unit is running, then pressing the Start/Stop button displays a screen with a Confirm Stop button (see Fig. 31), which when pressed changes the chiller to Local Off mode. If the unit is Off, pressing the Start/Stop button shows a list of operating types with the currently selected type corresponding to the last running operating type (Fig. 30).

MACHINE ON/OFF FUNCTION

The machine operating state can be viewed by going to ***Main Menu → General Parameters → Run Status***. Table 24 summarizes possible unit states.

Table 24 — Unit States

STATE	DESCRIPTION
Off	Unit is commanded to be off.
Stopping	Unit is currently stopping (after a manual, emergency, or shutdown request). Next state will be Off.
Delay	Unit is in delay at start-up (waiting for the end of the On/Off delay to be reached). Next state will be Running.
Running	Unit compressor capacity is more that 0% (unit has started running).
Ready	Unit compressor capacity is 0%. Unit is ready to start.
Override	The compressor cannot start because of an override (SST, SCT, etc.).
Tripout	Unit is Off due to an alarm.
Test	Unit is in Quick Test.

LEGEND

Delay	—	Unit is in delay at start-up
Off	—	Unit is stopped manually
Override	—	Unit compressor cannot start due to the override
Ready	—	Unit is ready to start
Running	—	Unit compressor capacity is more than 0%
Stopping	—	Unit is currently stopping
Test	—	Unit is in quick test mode
Tripout	—	Unit is down due to an alarm
Unit State	—	The control type and the unit state determine the actual running state of the unit

Table 25 summarizes the unit control method and stop or go status with regard to the following parameters set in the Carrier Controller module:

- Machine Control Method: Machine Control Method as selected on the unit Start/Stop screen.
- **CHIL_S_S**: Current CCN chiller start/stop force command (enable/disable) (***Main Menu → General Parameters → Net:Cmd Start/Stop***)
- **ONOFF_SW**: Start-stop contact status when unit is under remote operating type (***Main Menu → Inputs → Remote On/Off Switch***).
- **CHIL_OCC**: Chiller occupied state. If the occupancy override input switch is closed, then the chiller remains occupied regardless of the setpoint scheduled selection (***Main Menu → General Parameters → Net:Cmd Occupied***).
- **MS_CTRL**: Master control type. This parameter status will determine if the master unit is going to be controlled locally, remotely, or through Network (***Main Menu → Maintenance Menu → Master Slave Control,* 0 = Disabled, 1 = Master, 2 = Slave**).
- **EMSTOP**: CCN emergency stop command (enable/disable) (***Main Menu → General Parameters → Emergency Stop***).
- Alarm shutdown: Unit is totally stopped due to alarm.

The Machine Control Method and Parameter Status combinations listed in Table 25 will determine the actual unit running state.

NOTE: When changing from one Machine Control Method (Local On, Local Schedule, Network, Remote, or Master) to another, the unit will observe a transition through the Off state before being allowed to start again. At this time the on-to-off delay is always applied.

Chilled Water Setpoint Configuration

The chilled water setpoint and fluid type configuration will determine the chiller operating conditions.

FLUID SETPOINT CONTROL LOCATION

The factory default for the chilled water fluid setpoint is to control to the leaving water temperature. An option to configure the machine for entering water control is available. To configure this option go to ***Main Menu → Configuration Menu → General Configuration***. The default for Entering Fluid Control is No (leaving fluid control is the default condition). To enable Entering Water Control, change Entering Fluid Control to Yes. Entering Water Control is recommended for constant flow applications only.

COOLING SETPOINT SELECTION

The Control Point (shown in the upper right corner of the Home Screen, or ***Main Menu → General Parameters → Control Point***) represents the water temperature that the unit must produce. The unit will vary the capacity depending on the load conditions in order to satisfy the setpoint. The Control Point (**CTRL_PNT**) is calculated based on the Active Setpoint (***Main Menu→ General Parameters***) and the reset calculation, where Control Point = Current Setpoint + Temperature Reset. (See Temperature Reset on page 53.) Control Point can be written to by the Building Management System, instead of the setpoint calculation, only if Network is selected as the Machine Control Method for the unit. See ***Main Menu → General Parameters,* Local = 0, Net. = 1, Remote = 2** to verify operating type.

DEFINING SETPOINTS

The cooling setpoints are set via the Setpoint Table (***Main Menu → Setpoint Configuration***). Cooling Setpoint 1, Cooling Setpoint 2, and Cooling Ice Setpoint are temperature setpoints that are available as the Current Setpoint for unit operation. These setpoints are limited by the type of fluid in the system (see Table 26).

See the Ice Storage Operation section on page 59 for more details about the Cooling Ice Setpoint.

All default setpoints are based on Leaving Water Control (Entering Fluid Control, EWTO [Entering Water Temperature Offset] set to No). Values must be confirmed for the individual setpoints. Limits for the setpoints are listed in Table 26. These values depend on the Evaporator Fluid Type and the Brine Freeze Setpoint (see Chilled Water Fluid Type Selection on page 39).

Table 25 — Start/Stop Control

ACTIVE OPERATING TYPE						PARAMETERS STATUS						CONTROL TYPE	UNIT STATE
Local Off	Local On	Local Schedule	Remote	Network	Master Unit	Start/Stop Force Command	Remote Start/Stop Contact	Master Control Type	Start/Stop Time Schedule	Network Emergency Shutdown	General Alarm		
—	—	—	—	—	—	—	—	—	—	Enabled	—	—	Off
—	—	—	—	—	—	—	—	—	—	—	Yes	—	Off
Active	—	—	—	—	—	—	—	—	—	—	—	Local	Off
—	—	Active	—	—	—	—	—	—	Unoccupied	—	—	Local	Off
—	—	—	Active	—	—	—	Open	—	—	—	—	Remote	Off
—	—	—	Active	—	—	—	—	—	Unoccupied	—	—	Remote	Off
—	—	—	—	Active	—	Disabled	—	—	—	—	—	Network	Off
—	—	—	—	Active	—	—	—	—	Unoccupied	—	—	Network	Off
—	—	—	—	—	Active	—	—	Local	Unoccupied	—	—	Local	Off
—	—	—	—	—	Active	—	Open	Remote	—	—	—	Remote	Off
—	—	—	—	—	Active	—	—	Remote	Unoccupied	—	—	Remote	Off
—	—	—	—	—	Active	Disabled	—	Network	—	—	—	Network	Off
—	—	—	—	—	Active	—	—	Network	Unoccupied	—	—	Network	Off
—	Active	—	—	—	—	—	—	—	—	Disabled	No	Local	On
—	—	Active	—	—	—	—	—	—	Occupied	Disabled	No	Local	On
—	—	—	Active	—	—	—	Closed	—	Occupied	Disabled	No	Remote	On
—	—	—	—	Active	—	Enabled	—	—	Occupied	Disabled	No	Network	On
—	—	—	—	—	Active	—	—	Local	Occupied	Disabled	No	Local	On
—	—	—	—	—	Active	—	Closed	Remote	Occupied	Disabled	No	Remote	On
—	—	—	—	—	Active	Enabled	—	Network	Occupied	Disabled	No	Network	On

Table 26 — Evaporator Fluid Setpoint Limits

SETPOINT LIMITS	EVAPORATOR FLUID TYPE (flui_typ)	
	1 = Water*	3 = Low Brine
Minimum†	40°F (4.4°C)	R-410A: 15°F (–9.4°C) R-32: 20°F (–6.7°C)
Maximum	78.8°F (26°C)	78.8°F (26°C)

* The minimum cooling setpoint may be lowered to 38°F (3.3°C) for Fluid Type 1 if the parameter Glycol in Loop (***Main Menu*** → ***Configuration Menu*** → ***Service Configuration*** → ***Glycol in Loop***) is set to Yes. The Glycol in Loop parameter should only be set to Yes when the chiller is used in comfort cooling applications and there is a suitable inhibited antifreeze solution present in the chilled water loop.
† The minimum setpoint for brine applications is related to the brine freeze setpoint. The setpoint is limited to be no less than the brine freeze setpoint + 4°F (2.2°C).

CURRENT OPERATING SETPOINT

Depending on the current operation type, the active setpoint can be selected manually in the Main Menu, with the dry user contacts or with network commands (CCN, BACnet, or ModBus) or automatically with the setpoint time schedule (Occupancy Schedule 2).

Setpoints can be selected manually through the main interface when the unit is in Local operating type, through contacts when the unit is in Remote operating type, or through the RS485 bus when unit is in CCN mode.

Setpoints can also be selected automatically through a setpoint time schedule: when the period is occupied, Cooling Setpoint 1 will be activated, and when the period is Unoccupied, Cooling Setpoint 2 will be active. When in local operating type, time schedule is available if the Setpoint Select Variable is set to AUTO (see below). In remote operating type, the AUTO mode will be available unless the dual setpoint control through contacts has already been selected. In Network mode, the setpoint can be forced through the **SP_OCC** CCN point (0 = Occupied = Cooling Setpoint 1, 1 = Unoccupied = Cooling Setpoint 2).

Setpoint selection offers 3 different control options (***Main Menu → General Parameters → Setpoint Select***): Auto, Setpoint 1, and Setpoint 2.

- 0 = Auto: The active cooling setpoint will be determined by the configured Occupancy Schedules. See the Defining Occupancy Schedule section for details on setting the schedules. Depending on the Ice Storage configuration and ice contact state, the active setpoint may alternately be set to the Cooling Ice Setpoint.
- 1 = Setpoint 1: The active cooling setpoint will be Cooling Setpoint 1 defined in the setpoint table.
- 2 = Setpoint 2: The active cooling setpoint will be Cooling Setpoint 2 defined in the setpoint table. Depending on the Ice Storage configuration and ice contact state, the active setpoint may alternately be set to the Cooling Ice Setpoint.

SETPOINT OCCUPANCY

Setpoint Occupancy is the default configuration for the Setpoint Select variable. When Setpoint Select (***Main Menu → General Parameters → Setpoint Select***) is configured to 0 (Auto), the unit's active setpoint is based on the programmed occupancy schedules. Under Time Schedule 1 (**OCCPC01S**), the unit controls to Cooling Setpoint 1 (**CSP1**) during the occupied periods. If the Time Schedule 2 (**OCCPC02S**) is in use, the unit's active setpoint is based on Cooling Setpoint 1 (**CSP1**) (***Main Menu → Setpoint Configuration → Cooling Setpoint 1***) during the occupied period and Cooling Setpoint 2 (**CSP2**) (***Main Menu → Setpoint Configuration → Cooling Setpoint 2***) during the unoccupied period. The 2 schedules are used together to determine periods when the chiller will be controlling to Setpoint 1, Setpoint 2, or Off. See Table 27 for details on how the active cooling setpoint is determined based on unit operating type and parameter settings.

DEFINING OCCUPANCY SCHEDULE

Two internal Time Schedules are available and must be field programmed. Occupancy Schedule 1 (**OCCPC01S**) is used for single setpoint On/Off control. Occupancy Schedule 2 (**OCCPC02S**) is used in combination with **OCCPC01S** for dual setpoint On/Off and Occupied/Unoccupied setpoint control. To access the Schedule screens, go to ***Main Menu → Configuration Menu → Schedule Menu***.

If the chiller is to be controlled to a single setpoint, use Schedule 1 (**OCCPC01S**). This type of schedule will start and stop the machine only. During the unoccupied times, the chiller will be off. The unit start/stop schedule **OCCPC01S** has a default setting of always occupied. If the chiller is to be controlled to 2 setpoints, occupied and unoccupied, also use Schedule 2 (**OCCPC02S**). Cooling Setpoint 1 will be active during occupied periods, and Cooling Setpoint 2 will be active during unoccupied periods.

To set the occupancy schedules, select **OCCPC01S** or **OCCPC02S** and select the applicable days for the displayed time schedule period. The selected period will be displayed as a green band on the timeline. Press the Save button to confirm or the Cancel button to cancel changes. See Fig. 32.

Table 27 — Active Cooling Setpoint Parameters

Operating Type	Setpoint Selection	Ice Storage Configuration	Ice Done Contact	Setpoint Switch	Schedule 2 Status	Active Setpoint
Local/ Local Schedule	sp-1	Default	Any configuration	Any configuration	Default	csp1
	sp-2	No	Any configuration	Any configuration	Default	csp2
	sp-2	Yes	Close	Any configuration	—	csp2
	sp-2	Yes	Open	Any configuration	—	Ice_sp
	Auto	Default	Any configuration	Any configuration	Occupied	csp1
	Auto	No	Any configuration	Any configuration	Unoccupied	csp2
	Auto	Yes	Close	Any configuration	Unoccupied	csp2
	Auto	Yes	Open	Any configuration	Unoccupied	Ice_sp
Remote	Default	Default	Any configuration	Open	Default	csp1
	Default	No	Any configuration	Close	Default	csp2
	—	Yes	Close	Close	—	csp2
	Default	Yes	Open	Close	Default	Ice_sp
Network	Default	Default	Any configuration	Any configuration	Occupied	csp1
	Default	No	Any configuration	Any configuration	Unoccupied	csp2
	Default	Yes	Close	Any configuration	Unoccupied	csp2
	Default	Yes	Open	Any configuration	Unoccupied	Ice_sp

LEGEND

csp1 — Cooling Setpoint 1
csp2 — Cooling Setpoint 2
Ice_sp — Cooling Ice Setpoint

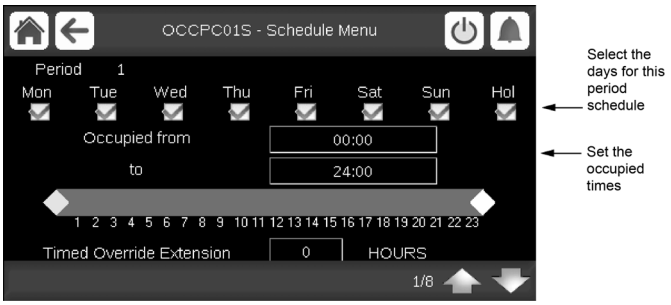


Fig. 32 — Schedule Menu

The schedules consist of 8 user-configurable occupied time periods. The control supports time schedules for local control, remote control, and ice building. These time periods can be flagged to be in effect or not in effect on each day of the week. The day begins at 00:00 and ends at 24:00. The machine is in unoccupied mode unless a scheduled time period is in effect. If an occupied period is to extend past midnight, the occupied period must end at 24:00 hours (midnight) and a new occupied period must be programmed to begin at 00:00 hours.

In the example in Table 28, an early morning pulldown time period is scheduled for Monday morning from 12:00 AM to 3:00 AM. The occupied period starts at 7:00 AM, Monday through Saturday. The occupied time ends at 6:00 PM on Monday and Tuesday, 9:30 PM on Wednesday, 5:00 PM on Thursday and Friday, and 12:00 PM on Saturday.

NOTE: This example schedule was designed to illustrate the programming of the schedule function and is not intended as a recommended schedule for chiller operation.

Holiday Schedule

The unit control allows up to 16 holiday periods. Each holiday period is defined by 3 parameters: the month, the start day, and the duration of the holiday period. During the holiday periods, the controller will be in occupied or unoccupied mode, depending on the periods validated as holidays. The Holiday Configuration Table is accessed by ***Main Menu → Configuration Menu → Holiday Menu***. Select one of the 16 available Holiday periods (**HOLDY_01** through **HOLDY_16**) to define the holiday.

Table 28 — Configuring Schedules (Example)

ITEM	PATH	VALUE
Period 1		
Occupied from	***Main Menu → Configuration Menu → Schedule Menu → OCCPC01S or OCCPC02S → Page 1***	00:00
Occupied to		03:00
Monday Select		Yes
Tuesday Select		No
Wednesday Select		No
Thursday Select		No
Friday Select		No
Saturday Select		No
Sunday Select		No
Holiday Select		No
Period 2		
Occupied from	***Main Menu → Configuration Menu → Schedule Menu → OCCPC01S or OCCPC02S → Page 2***	07:00
Occupied to		18:00
Monday Select		Yes
Tuesday Select		Yes
Wednesday Select		No
Thursday Select		No
Friday Select		No
Saturday Select		No
Sunday Select		No
Holiday Select		No

Table 28 — Configuring Schedules (Example) (cont)

ITEM	PATH	VALUE
Period 3		
Occupied from	***Main Menu → Configuration Menu → Schedule Menu → OCCPC01S or OCCPC02S → Page 3***	07:00
Occupied to		21:30
Monday Select		No
Tuesday Select		No
Wednesday Select		Yes
Thursday Select		No
Friday Select		No
Saturday Select		No
Sunday Select		No
Holiday Select		No
Period 4		
Occupied from	***Main Menu → Configuration Menu → Schedule Menu → OCCPC01S or OCCPC02S → Page 4***	07:00
Occupied to		17:00
Monday Select		No
Tuesday Select		No
Wednesday Select		No
Thursday Select		Yes
Friday Select		Yes
Saturday Select		No
Sunday Select		No
Holiday Select		No
Period 5		
Occupied from	***Main Menu → Configuration Menu → Schedule Menu → OCCPC01S or OCCPC02S → Page 5***	07:00
Occupied to		12:00
Monday Select		No
Tuesday Select		No
Wednesday Select		No
Thursday Select		No
Friday Select		No
Saturday Select		Yes
Sunday Select		No
Holiday Select		No

CARRIER COMFORT NETWORK® (CCN) CONTROL

To operate under this control, Network must be selected under the Select Machine Mode accessed by pressing the Start/Stop button (see Machine Control Methods on page 35). An external CCN device, such as ChillerVu™, controls the On/Off state of the machine. Careful evaluation of Chilled Water Plant control is necessary. In the event Local Control is established, be sure that all pumps, valves, and other devices are capable of operating properly. In the event of a loss of communication with the network, the machine will start and be controlled locally. The CCN device forces the variable **CHIL_S_S** to control the chiller. The Unit Run Status (***Main Menu → General Parameters → Run Status***) will indicate the current status of the machine (OFF, RUNNING, STOPPING, or DELAY), depending on the CCN command. The unit Occupied status (***Main Menu → General Parameters***) will indicate the current occupied state according to the CCN command and will be displayed as either NO or YES. The Unit Control Type (**CTRL_TYP**) will be LOCAL OFF when the Start/Stop button is Off. If the unit is in Network mode, the Unit Control Type will be Network when the **CHIL_S_S** variable is Stop or Start. For dual chiller control applications, the slave chiller must be enabled using the Network control option.

CHILLED WATER FLUID TYPE SELECTION

The chilled water fluid type must be configured to obtain the proper leaving water setpoint control range and freeze protection. The Evaporator Fluid Type (**FLUI_TYP**) (***Main Menu***

→ ***Configuration Menu → Factory Configuration → Exchanger Fluid Type***) can be set to Water or Low Brine.

To configure this option:

DISPLAY NAME	PATH	VALUE	SETPOINT RANGE
Evaporator Fluid Type	***Main Menu → Configuration Menu → Factory Configuration***	1 = Water	40 to 78.8°F (4.4 to 26°C)
		3 = Low Brine	R-410A: 15 to 78.8°F (–9.4 to 26°C)
			R-32: 20 to 78.8°F (–6.7 to 26°C)

Comfort Cooling Application

Configure the unit Evaporator Fluid Type to Water for units without brine or glycol installed in the chilled water loop. The factory default fluid type is Water. This option will allow for a water temperature setpoint range of 40 to 78.8°F (4.4 to 26°C). With Water as the selection, the freeze point is fixed at 34°F (1.1°C).

The cooling setpoint and freeze point may be lowered to 38°F (3.3°C) and 32°F (0°C), respectively, for Fluid Type 1 if the parameter Glycol in Loop (***Main Menu → Configuration Menu → Service Configuration → Glycol in Loop***) is set to Yes. The Glycol in Loop parameter should only be set to Yes when the chiller is used in comfort cooling applications and there is a suitable inhibited antifreeze solution present in the chilled water loop.

Process Cooling Application

For units intended for process cooling and low leaving water temperatures, configure the unit Evaporator Fluid Type to Low Brine. These units are factory equipped with lower refrigerant charge and must have brine or glycol added to the chilled water loop. The Low Brine option will allow for a setpoint temperature down to 15°F (–9.4°C) for R-410A units and 20°F (–6.7°C) for R-32 units.

See prior chart for temperature limits for brine options.

Before making this selection, confirm suitable antifreeze has been added and is of sufficient concentration to protect the loop. In addition, the Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) must be set for proper freeze protection operation. Set the Brine Freeze Setpoint to the freeze protection provided by the antifreeze concentration. This value will be the freeze point of the fluid.

Evaporator Pump Control

Evaporator pump control is required on all units unless the chilled water pump runs continuously or the chilled water system contains a suitable antifreeze solution. For units supplied with the pump option, this is set up from the factory. Internal pumps can be configured using ***Main Menu → Configuration Menu → Factory Configuration → Pump Type***. The 30RC units can be configured for single or dual external evaporator pump control with the standard controls. In addition to the pumps, all wiring, including connections to the pump contactor and a feedback circuit from the contactor, must be field supplied. Table 29 summarizes evaporator pump configuration parameters. Fig. 33 shows the wiring.

Table 29 — Evaporator Pump Configuration Parameters

DISPLAY NAME	PATH	VALUE
Evaporator Pumps Sequence	***Main Menu→ Configuration Menu→ Pump Configuration***	0 = No Pump (Default) 1 = One Pump Only 2 = Two Pumps Auto 3 = Pump no. 1 Manual 4 = Pump no. 2 Manual
Pump Auto Rotation Delay		Default: 48 hrs. (Range 24 to 3000 hrs.)
Pump Sticking Protection		Default: No
Stop Pump During Standby		Default: No
Flow Checked If Pump Off		Default: Yes

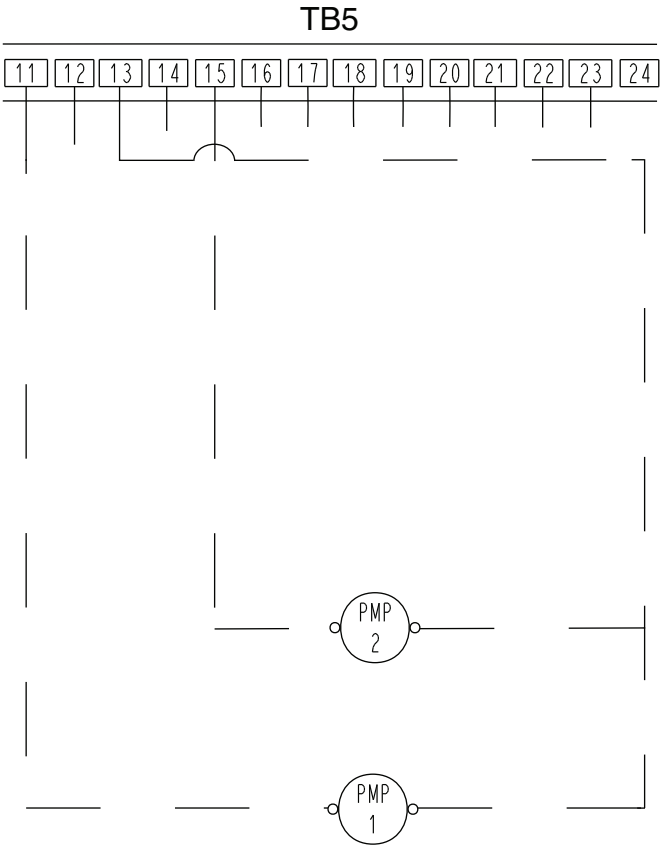


Fig. 33 — Wiring for Evaporator Pump Control

PUMP SELECTION

The Evaporator Pump Sequence mode can be reached by following ***Main Menu → Configuration Menu → Pump Configuration***. The available settings are:

- 0 = No Pump: The evaporator pump will not be controlled by the chiller. Default setting for units without factory-installed hydronic package.
- 1 = One Pump Only: Single factory-supplied pump or single remote pump. Default setting for units with single factory-installed pump.
- 2 = Two Pump Auto: When 2 pumps are selected in auto mode, only one pump will be allowed to run at a time and the control will determine the On/Off state of each pump. Default setting for units with dual factory-installed pumps. The control will start the pumps and automatically alternate their operation to even the wear on them, based on the hours configured under Pump Auto Rotation Delay (***Main Menu → Configuration Menu → Pump Configuration → Pump Auto Rotation Delay***). If the difference between the operating hours of the 2 pumps exceeds the Pump Auto Rotation Delay, then the lead pump will change. If a flow failure is detected, the other pump will attempt to start. If the unit is in the Network control type and pump rotation (***Main Menu → Pump Status → Rotate Water Pumps Now?***) is set to "yes" in the Pump Status menu, then the pump changeover will take place when no compressor is running, including slave units. Please remember that 2 pumps cannot be forced at the same time.
- 3 = Pump No. 1 Manual: Pump No. 1 will be the active pump.
- 4 = Pump No. 2 Manual: Pump No. 2 will be the active pump.

For all Evaporator Pumps Sequence settings (including 0 = No Pump), proof of flow from the chilled water flow switch (CWFS) and closure of the pump interlock contact (connected across TB-5 terminals 1 and 2) are required. When the Evaporator Pumps Sequence is configured, the evaporator pump output will be energized when the chiller enters an ON state. The evaporator pump output is also energized when certain alarms are generated. The evaporator pump output should be used as an override to the external pump control if evaporator pump control is not utilized. The evaporator pump output is energized if a 10001 Water Exchanger Freeze Protection alarm is generated, which provides additional freeze protection if the system is not protected with a suitable antifreeze solution.

If the Master/Slave function is not active for the chiller, or if the Master/Slave function is active and the unit is the lead, then the pump will be turned on when the unit is in the On, Stopping, or Delay state, as well as in the case of the quick test request. In addition, when the unit is turned off, the pump will continue operating for 1 minute after the last compressor is turned off. The pump will be turned on when requested by the evaporator heater function (see the Freeze Protection section on page 85).

Regardless of the evaporator pump control option selected, if the chilled water flow switch does not close within the MINUTES OFF TIME (***Main Menu → Configuration Menu → General Configuration → Unit Off to On Delay***) period after the unit is enabled and in an ON mode, alarm 10051 will be generated. Other conditions which will trigger this alarm include:

- Chilled water flow switch is open for at least 40 seconds during chiller operation.
- Evaporator pump control is enabled and the chilled water flow switch is closed for more than 1 minute following a command to shut down the pump.

The last alarm criterion can be disabled. If Flow Checked if Pump Off (***Main Menu → Configuration Menu → Pump Configuration → Flow Checked if Pump Off***) is set to NO, then the control will ignore the chilled water flow switch input if the evaporator pump output is OFF.

FACTORY-SUPPLIED PUMPS

Pumps supplied by the factory are piped in a parallel arrangement. Dual pump hydronic packages have the option to be driven by variable speed drives, one VFD per pump. Otherwise, factory supplied pumps will be fixed speed. For the dual pump hydronic package with VFD, the sensorless control based in the VFD is used to determine the speed of the active pump. The chiller control treats the pump assembly as a single pump with regard to starting and stopping the pump system.

PERIODIC PUMP QUICK START

The control system has the ability to start the pumps periodically to maintain bearing lubrication and seal integrity. This function will be used when the unit is stopped for a long time period (e.g., during the winter season). If Pump Sticking Protection (***Main Menu → Configuration Menu → Pump Configuration → Pump Sticking Protection***) is set to YES, and if the unit is off at 2:00 PM, then a pump will be started once each day for 2 seconds. If the unit has 2 pumps, then Pump 1 will be started on even days (such as day 2, 4, or 6 of the month); Pump 2 will be started on odd days (such as day 1, 3 or 5 of the month). The default for this option is NO.

MASTER/SLAVE CHILLER PUMP OPERATION

If the Master/Slave function is active, and if the chiller is the lag unit, then the pump will be turned on when the unit is in On mode and if the unit active lag demand limit is greater than 1%. Otherwise, the pump will be stopped 30 seconds after the last compressor is turned off. However, if the lag unit pump has been configured to run even if the unit is commanded to stop (***Main Menu → Configuration Menu → Master/Slave Config → Lag Unit Pump Control* = 1, Run if Unit Stops**) then the above condition will be ignored and the lag pump will run all the time.

CHILLED WATER FLOW SWITCH STATUS

If Flow Checked if Pump Off (***Main Menu → Configuration Menu → Pump Configuration → Flow Checked if Pump Off***) is set to YES, then the control will monitor the chilled water flow switch status and will send an alarm if the pump is commanded off and the chilled water flow switch is closed. This can provide the user with information about a faulty evaporator pump contactor or a failed chilled water flow switch. This parameter should be set to NO for series flow machines. The factory default for this item is YES.

MANUAL OPERATION

The evaporator pumps can be forced ON through the CCN when the chiller is off. This allows the unit to run with no delay and for an unlimited length of time for flow rate calculations when the unit is installed on site. Manual operation of the pumps is controlled through CCN points PUMPSTAT_PUMP_1 (***Main Menu → Pump Status → Water Pump #1 Command***) and PUMPSTAT_PUMP_2 (***Main Menu → Pump Status → Water Pump #2 Command)***. If equipped with dual pumps, it is not possible to force both pumps ON at the same time.

Capacity Control

The control system cycles compressors and minimum load valve solenoid (if equipped) to maintain the user-configured leaving chilled fluid temperature setpoint. The optional minimum load control is only available on Circuit A. Entering fluid temperature is used by the SIOB-A board to determine the temperature drop across the evaporator and is used in determining the optimum time to add or subtract capacity stages. Entering fluid temperature, space temperature (requires additional sensor), or outdoor-air temperature reset features can

automatically reset the leaving chilled fluid temperature setpoint. It can also be reset from an external 4 to 20-mA signal.

The control has an automatic lead-lag feature built in for circuit and compressor starts. If enabled, the control will determine which circuit (***Main Menu→ Configuration Menu→ General Configuration→ Cir Priority Sequence***) and compressor to start to even the wear. The compressor wear factor (combination of starts and run hours) is used to determine which compressor starts.

$$\text{Compressor Wear Factor} = \left(\text{Compressor Starts}\right) + 0.1\left(\text{Compressor Run Hours}\right)$$

In this case, the circuit with the lowest average compressor wear factor (the average of the wear factors of all available compressors in the circuit) is the circuit that starts first. The compressor within the circuit with the lowest wear factor is the first to start. If the automatic lead-lag function for the circuit is not enabled (***Main Menu→ Configuration Menu→ General Configuration→ Cir Priority Sequence* = 1** [Circuit A leads] or **2** [Circuit B leads]), then the selected circuit will be the first to start. Again, the compressor with the lowest wear factor within the circuit will be the first to start. If Minimum Load Control is enabled (***Main Menu→ Configuration Menu→ Factory Configuration→ Hot Gas Bypass Selection* = Yes**), then the valve will be operational only during the last stage of cooling.

Once the lead compressor has been started, the lag compressors will be determined by the wear factor and loading sequence selected. If equal loading is selected, (***Main Menu→ Configuration Menu→ General Configuration→ Staged Loading Sequence* = No**), then the remaining circuit will start next, with the compressor with the lowest wear factor starting. The control will attempt to keep both circuits at approximately the same number of compressors ON. For this option to function properly, both circuits must have the same number of compressors available. If a circuit compressor is not available due to an alarm condition or demand limit, then the capacity staging will change to staged. If staged loading is selected, (***Main Menu→ Configuration Menu→ General Configuration→ Stage Loading Sequence* = Yes**), the started circuit will continue to turn on compressors according to the lowest wear factor until all are on, then start the remaining circuit(s).

The electronic expansion valves provide a controlled start-up. During start-up, the low pressure logic in the lead circuit will be ignored for 30 seconds to allow for the transient changes during start-up. As additional stages of compression are required, the processor control will add them. The following example is based on a 30RC 150 machine, which has three 25 ton compressors in each circuit. See Table 30.

Each example below has different configurations and is intended to illustrate the loading sequences possible for normal operation.

In Example 1 (Table 31), assume the following configurations are in place:

- ***Main Menu → Configuration Menu → Factory Configuration→ Hot Gas Bypass Selection* = Yes**
- Minimum Load Control installed and enabled before turning off the last Circuit A compressor only
- ***Main Menu → Configuration Menu → General Configuration → Staged Loading Sequence* = No**
- Equal Circuit Loading
- ***Main Menu → Configuration Menu → General Configuration → Cir Priority Sequence* = 1**
- Circuit A Leads

Since Minimum Load Control is enabled and Hot Gas Bypass Selection (HGBP) is only available on Circuit A, it will be the lead circuit. Within the circuit, compressor A3 has the lowest wear factor and will start first with Minimum Load Control OFF. Stage 2 will start Circuit B because of the Equal Circuit Loading configuration, and the compressor with the lowest wear factor is B2. The next stage will be a Circuit A compressor. The process continues until all compressors are ON. (See Table 31.) If the circuit capacity is to be reduced, the compressor with the highest wear factor will be shut off first (in most cases). With Equal Circuit Loading, stages will be removed from each circuit, following the same criteria used in the loading sequence but in the opposite order. With Minimum Load Control enabled, the last stage will be only one compressor with HGBP.

In Example 2 (Table 32), assume the compressor starts and run hours are the same as in the previous example and the following configurations are in place:

- ***Main Menu → Configuration Menu → Factory Configuration → Hot Gas Bypass Selection* = Yes**
- Minimum Load Control installed and enabled before turning off the last Circuit A compressor only
- ***Main Menu → Configuration Menu → General Configuration → Staged Loading Sequence* = Yes**
- Staged Circuit Loading
- ***Main Menu → Configuration Menu → General Configuration → Cir Priority Sequence* = 1**
- Circuit A Leads

Since Minimum Load Control is enabled and HGBP is only available on Circuit A, it will be the lead circuit. Within the circuit, compressor A3 has the lowest wear factor and will start first with Minimum Load Control OFF. Stage 2 will start a compressor in the same circuit because of the Staged Circuit Loading configuration. Compressor A2 has the next lowest wear factor and will be started next. After that, compressor A1 will be next to start. Since all compressors in Circuit A are ON, the next stage will start Circuit B, and the compressor with the lowest wear factor is B2. All of the Circuit B compressors will be started in the same manner as Circuit A. The process continues until all compressors are ON. (See Table 32.) If the circuit capacity is to be reduced, the compressor with the highest wear factor in the lag circuit will be shut off first (in most cases). With Staged Circuit Loading, stages will be removed from the same circuit, following the same criteria used in the loading sequence but in the opposite order. With Minimum Load Control enabled, the last stage will be only one compressor with HGBP.

Table 30 — Compressor Starts and Run Hours

COMPRESSOR	STARTS	RUN HOURS	WEAR FACTOR	CIRCUIT AVERAGE WEAR FACTOR
A1	25	249	49.9	44.8
A2	22	237	45.7	44.8
A3	26	128	38.8	44.8
B1	41	453	86.3	67.6
B2	38	138	51.8	67.6
B3	35	297	64.7	67.6

Table 31 — Compressor Stages and Circuit Cycling, Example 1

STAGE	TOTAL CAP.	CIRCUIT A					CIRCUIT B			
		Cir. Cap.	MLC*	A1	A2	A3	Cir. Cap.	B1	B2	B3
0	0	0	—	—	—	—	0	—	—	—
LAST	12	24	X*	—	—	X	0	—	—	—
1	16	33	—	—	—	X	0	—	—	—
2	33	33	—	—	—	X	33	—	X	—
3	49	66	—	—	X	X	33	—	X	—
4	66	66	—	—	X	X	66	—	X	X
5	83	100	—	X	X	X	66	—	X	X
6	100	100	—	X	X	X	100	X	X	X

LEGEND

MLC — Minimum Load Control

* Minimum load control is only available as last stage of capacity during de-staging. Minimum load control bypassed during chiller start-up.

NOTES:

1. Total Cap. (Total Unit Capacity) and Cir. Cap. (Circuit Capacity) are approximate percentage values.
2. Example is to determine minimum load control, equal circuit loading, and Circuit A leads select.

Table 32 — Compressor Stages and Circuit Cycling, Example 2

STAGE	TOTAL CAP.	CIRCUIT A					CIRCUIT B			
		Cir. Cap.	MLC*	A1	A2	A3	Cir. Cap.	B1	B2	B3
0	0	0	—	—	—	—	0	—	—	—
LAST	12	24	X*	—	—	X	0	—	—	—
1	17	33	—	—	—	X	0	—	—	—
2	33	66	—	—	X	X	0	—	—	—
3	49	100	—	X	X	X	0	—	—	—
4	66	100	—	X	X	X	33	—	X	—
5	83	100	—	X	X	X	66	—	X	X
6	100	100	—	X	X	X	100	X	X	X

LEGEND

MLC — Minimum Load Control

* Minimum load control is only available as last stage of capacity during de-staging. Minimum load control bypassed during chiller start-up.

NOTES:

1. Total Cap. (Total Unit Capacity) and Cir. Cap. (Circuit Capacity) are approximate percentage values.
2. Example is to determine minimum load control, staged circuit loading, and Circuit A leads select.

In Example 3 (see Table 33), assume the following configurations are in place:

- ***Main Menu → Configuration Menu → Factory Configuration → Hot Gas Bypass Selection*** = **No**
- Minimum Load Control disabled
- ***Main Menu → Configuration Menu → General Configuration → Staged Loading Sequence*** = **No**
- Equal Circuit Loading
- ***Main Menu → Configuration Menu → General Configuration → Cir Priority Sequence*** = **0**
- Automatic Circuit Select

Since Circuit A has the lowest average wear factor, it will be the lead circuit. Within the circuit, compressor A3 has the lowest wear factor and will start first. Stage 2 will start Circuit B because of the Equal Circuit Loading configuration, and the compressor with the lowest wear factor is B2. The next stage will be a Circuit A compressor. The process continues until all compressors are ON. (See Table 33.) If the circuit capacity is to be reduced, then the compressor with the highest wear factor will be shut off first (in most cases). With Equal Circuit Loading, stages will be removed from each circuit, following the same criteria used in the loading sequence but in the opposite order.

In Example 4 (see Table 34), assume the compressor starts and run hours are the same as in the first example and the following configurations are in place:

- ***Main Menu → Configuration Menu → Factory Configuration → Hot Gas Bypass Selection*** = **No**
- Minimum Load Control disabled
- ***Main Menu → Configuration Menu → General Configuration → Staged Loading Sequence*** = **Yes**
- Staged Circuit Loading
- ***Main Menu → Configuration Menu → General Configuration → Cir Priority Sequence*** = **2**
- Circuit B Leads

Since Circuit B has been selected, it will be the lead circuit. Within the circuit, compressor B2 has the lowest wear factor and will start first. Stage 2 will start a compressor in the same circuit because of the Staged Circuit Loading configuration. Compressor B3 has the next lowest wear factor and will be started next. After that, compressor B1 will be next to start. Since all compressors in Circuit B are ON, the next stage will start Circuit B, and the compressor with the lowest wear factor is A3. All of the Circuit A compressors will be started in the same manner as Circuit B. The process continues until all compressors are ON. (See Table 34.)

If the circuit capacity is to be reduced, the compressor with the highest wear factor in the lag circuit will be shut off first (in most cases). With Staged Circuit Loading, stages will be removed from the same circuit, following the same criteria used in the loading sequence but in the opposite order.

The capacity control algorithm runs every 30 seconds. The algorithm attempts to maintain the Control Point at the desired setpoint. Each time it runs, the control reads the entering and leaving fluid temperatures. The control determines the rate at which conditions are changing and calculates 2 variables based on these conditions. Next, a capacity ratio (SMZ) is calculated using the 2 variables to determine whether or not to make any changes to the current stages of capacity. This ratio value ranges from –100 to +100%. If the next stage of capacity is a compressor, then the control starts (stops) a compressor when the ratio reaches +100% (–100%).

If the next stage of capacity is the Minimum Load Control, then the control energizes (de-energizes) the Minimum Load Control when the ratio reaches +60% (–60%). The control will only use the minimum load valve solenoid as the last stage of capacity before turning off the last compressor. A delay of 1 minute and 30 seconds occurs after each compressor capacity step change.

Table 33 — Compressor Stage and Circuit Cycling, Example 3

STAGE	TOTAL CAP.	CIRCUIT A					CIRCUIT B			
		Cir. Cap.	MLC	A1	A2	A3	Cir. Cap.	B1	B2	B3
0	0	0	—	—	—	—	0	—	—	—
1	16	33	—	—	—	X	0	—	—	—
2	33	33	—	—	—	X	33	—	X	—
3	49	66	—	—	X	X	33	—	X	—
4	66	66	—	—	X	X	66	—	X	X
5	83	100	—	X	X	X	66	—	X	X
6	100	100	—	X	X	X	100	X	X	X

LEGEND

MLC — Minimum Load Control

NOTES:

1. Total Cap. (Total Unit Capacity) and Cir. Cap. (Circuit Capacity) are approximate percentage values.
2. Example is to determine equal circuit loading and automatic circuit select.

Table 34 — Compressor Stage and Circuit Cycling, Example 4

STAGE	TOTAL CAP.	CIRCUIT A					CIRCUIT B			
		Cir. Cap.	MLC	A1	A2	A3	Cir. Cap.	B1	B2	B3
0	0	0	—	—	—	—	0	—	—	—
1	16	0	—	—	—	—	33	—	X	—
2	33	0	—	—	—	—	66	—	X	X
3	49	0	—	—	—	—	100	X	X	X
4	66	33	—	—	—	X	100	X	X	X
5	83	66	—	—	X	X	100	X	X	X
6	100	100	—	X	X	X	100	X	X	X

LEGEND

MLC — Minimum Load Control

NOTES:

1. Total Cap. (Total Unit Capacity) and Cir. Cap. (Circuit Capacity) are approximate percentage values.
2. Example is to determine staged circuit loading and Circuit B leads select.

CAPACITY CONTROL OVERRIDES

The following capacity control overrides (***Main Menu → Maintenance Menu → Capacity Control***) will modify the normal operation routine. If any of the following override conditions listed below is satisfied, it will determine the capacity change instead of the normal control.

Override No. 1: Cooler Freeze Protection

This override attempts to avoid the freeze protection alarm. If the Leaving Water Temperature is less than Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) + 2.0°F (1.1°C), then remove a stage of capacity.

NOTE: The freeze setpoint is 34°F (1.1°C) for comfort cooling units with fresh water or 32°F (0°C) for comfort cooling units with glycol (***Main Menu → Configuration Menu → Service Configuration → Glycol in Loop*** = **Yes**). The Exchanger Fluid Type (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type***) set to 1 for both of the above. The freeze setpoint is Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Point***) for Low Temperature Brine (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type*** = **3**).

Override No. 2: Circuit A Low Saturated Suction Temperature in Cooling

Override No. 3: Circuit B Low Saturated Suction Temperature in Cooling

These overrides attempt to avoid the low suction temperature alarms. This override is active only when more than one compressor in a circuit is ON. If the Saturated Suction Temperature is less than Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) –18.0°F (–10°C) for 90 seconds, or the Saturated Suction Temperature is less than –4°F (–20°C), then a compressor in the affected circuit will be turned off.

Override No. 5: Low Temperature Cooling

This override removes one stage of capacity when the difference between the Control Point (***Main Menu → General Parameters → Control Point***) and the Leaving Water Temperature (***Main Menu → Temperatures → Leaving Fluid Temp***) reaches a predetermined limit and the rate of change of the water is 0 or still decreasing.

Override No. 6: EWT Below Control Point

This override removes 2 stages of capacity when the Entering Water Temperature (***Main Menu → Temperature → Entering Fluid Temp***) is less than the Control Point (***Main Menu → General Parameters → Control Point***.)

Override No. 7: Ramp Loading

If the unit is configured for ramp loading (***Main Menu → Configuration Menu → General Configuration → Ramp Loading Select*** = **Yes**), and if the difference between the Leaving Water Temperature and the Control Point is greater than 4º F (2.2º C) and the rate of change of the leaving water is greater than Cool Ramp Loading Rate (***Main Menu → Setpoints → Setpoint Configuration → Cooling Ramp Loading***), then no capacity stage increase will be made. Operating modes 2 and 3 will be in effect.

Override No. 8 Compressor Contactor Welded

When a welded contactor situation is detected, the alarms 6001 and 6002 (for circuit A and circuit B respectively) will be set. This override performs the following steps to manage the welded contactor:

1. Set EXV and fan control to normal operation.
2. The affected circuit will be forbidden to increase capacity.
3. Unit shall be shut down and remain at 0% capacity.
4. Chilled water pump shall be controlled to ON.

The welded contactor management is canceled if one of following alarms occurs:

- 10051 — Water Exchanger Flow Switch Failure
- 10001 — Water Exchanger Freeze Protection
- 10063 — Circuit A High Pressure Switch Failure
- 10064 — Circuit B High Pressure Switch Failure

When the welded contactor management is canceled, the EXV is closed in an effort to stall the affected compressor and prevent damage to other components.

Resetting the welded contactor alarms (6001 and 6002) can only be done manually after power cycle.

Override No. 9: Demand Limit

This override mode is active when a command to limit capacity is received. If the current unit capacity is greater than the active capacity limit value, a stage is removed. If the current capacity is lower than the capacity limit value, the control will not add a stage that will result in the new capacity being greater than the capacity limit value. Operating mode 4 will be in effect.

Override No. 10: Water Loop Override

This override prohibits compressor operation until the chilled water flow switch (CWFS) is closed. This override has been added for master/slave control and assures that no compressor can be started until the water flow is established, since the lag chiller evaporator pump start/stop is commanded upon lag demand limit value. It shall also prevent evaporator from freezing due to pump failure.

Override No. 11: High Temperature Cooling

This override algorithm runs once when the unit is switched to ON. If the difference between the Leaving Water Temperature (***Main Menu → Temperatures → Leaving Water Temp***) and the Control Point (***Main Menu → General Parameters → Control Point***) exceeds a calculated value and the rate of change of the water temperature is greater than –0.1°F/min, then a stage will be added.

Override No. 13: Minimum On/Off and Off/On Time Delay

Whenever a capacity step change has been made, either with Minimum Load Control or a compressor, the control will remain at this capacity stage for the next 90 seconds. During this time, no capacity control algorithm calculations will be made. If the capacity step is a compressor, an additional 2 minute delay is added to the previous hold time (see Override No. 22). This override allows the system to stabilize before another capacity stage is added or removed. If a condition of a higher priority override occurs, the higher priority override will take precedence.

Override No. 14: Slow Change Override

This override prevents compressor stage changes when the leaving temperature is close to the control point and slowly moving towards the control point.

Override No. 15: System Manager Capacity Control

If a ChillerVu™ module is controlling the unit, and the ChillerVu module is controlling multiple chillers, then the unit will add a stage to attempt to load to the demand limited value.

Override No. 16: Circuit A High Pressure Override

Override No. 17: Circuit B High Pressure Override

These overrides attempt to avoid a high pressure failure. The algorithm is run every 1 seconds. At least one compressor must be on in the circuit. If the Discharge Pressure for the circuit is above the High Pressure Threshold (***Main Menu → Configuration Menu → Service Configuration → High Pressure Threshold***), then a compressor for that circuit will be removed.

Override No. 19: Standby Mode

This override algorithm will not allow a compressor to run if the unit is in Standby mode.

Override No. 22: Minimum On Time Delay

In addition to Override No. 13, Minimum On/Off and Off/On Time Delay, for compressor capacity changes, an additional 2 minute delay will be added to Override No. 13 delay. No compressor will be de-energized until 3.5 minutes have elapsed since the last compressor has been turned ON. When this override is active, the capacity control algorithm calculations will be performed, but no capacity reduction will be made until the timer has expired. A control with higher precedence will override the Minimum On Time Delay.

Override No. 23: Circuit A Low Saturated Suction Temperature in Cooling

Override No. 24: Circuit B Low Saturated Suction Temperature in Cooling

If the circuit is operating in an area close to the operational limit of the compressor, then the circuit capacity will remain at the same point or unload to raise the saturated suction temperature. This algorithm will be active if at least one compressor in the circuit is on and one of the following conditions is true:

1. Saturated Suction Temperature is less than Brine Freeze (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) –3.8ºF (–19.9ºC).
2. Saturated Suction Temperature is less than Brine Freeze (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***), and the circuit approach (Leaving Water Temperature – Saturated Suction Temperature) is greater than 15ºF (8.3ºC) and the Circuit Superheat (Return Gas Temperature – Saturated Suction Temperature) is greater than 15ºF (8.3ºC).
   NOTE: The freeze setpoint is 34ºF (1.1ºC) for comfort cooling units with fresh water or 32°F (0°C) for comfort cooling units with glycol (***Main Menu → Configuration Menu → Service Configuration → Glycol in Loop* = Yes**). The Exchanger Fluid Type (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type***) is 1 for both of the above. The freeze setpoint is Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***), for Low Temperature Brine systems (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type* = 3**).

If any of these conditions are met, then the appropriate operating mode, 23 (Circuit A) or 24 (Circuit B), will be in effect.

Override No. 26: Circuit A Operation Outside Compressor Operating Envelope — High SCT

Override No. 27: Circuit B Operation Outside Compressor Operating Envelope — High SCT

This override prevents compressor operation outside of its operating envelope.

1. If the current SCT is more than the SCT instant limit minus 3.6°F (–15.8°C), then the circuit will be unloaded immediately.
2. If the mean SCT over a 2 minute period is more than the SCT permanent limit minus 6.3°F (–14.3°C), then the circuit will be unloaded after a 90 second delay.
3. If the mean DGT over a 30 second period is more than the limit, then the circuit will be unloaded after a 60 second delay.

Override No. 29: Circuit A Low SST for 3 Minutes in Cooling

Override No. 30: Circuit B Low SST for 3 Minutes in Cooling

This capacity override avoids having low SST for too long a period of time. If the SST is lower than Brine Freeze (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) –3.8°F (–19.9°C) for more than 3 minutes, then the capacity shall be decreased.

Override No. 34: Circuit A Low Refrigerant Charge

Override No. 35: Circuit B Low Refrigerant Charge

The capacity override attempts to protect the compressor from starting with no refrigerant in the circuit. This algorithm runs only when the circuit is not operational, (no compressors ON). There are several criteria that will enable this override:

1. The Saturated Suction Temperature is less than –13°F (–25°C).
2. All of these conditions must be true:
   a. The Saturated Suction Temperature is less than Leaving Water Temperature by more than 5.4ºF (3.0ºC).

b. Saturated Suction Temperature is less than 41°F (5°C).
c. Outdoor Air Temperature is less than 32°F (0ºC).
d. Saturated Suction Temperature is less than the Outdoor Air Temperature by more than 5.4º F (3.0ºC).

3. All of these conditions must be true:
   a. The Saturated Suction Temperature is less than Leaving Water Temperature by more than 5.4ºF (3.0ºC).
   b. Saturated Suction Temperature is less than 41ºF (5ºC).
   c. Saturated Suction Temperature is less than the Brine Freeze Point (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) by more than 6ºF (3.3ºC).

   NOTE: The freeze setpoint is 34ºF (1.1ºC) for comfort cooling units with fresh water or 32°F (0°C) for comfort cooling units with glycol (***Main Menu → Configuration Menu → Service Configuration → Glycol in Loop*** = **Yes**). The Exchanger Fluid Type (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type***) is 1 for both of the above. The freeze setpoint is Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) for Low Temperature Brine systems (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type*** = **3**).
4. All of these conditions must be true:
   a. The Saturated Suction Temperature is less than Leaving Water Temperature by more than 5.4ºF (3.0ºC).
   b. Saturated Suction Temperature is less than 41ºF (5ºC).
   c. Saturated Suction Temperature is less than the Outdoor Air Temperature by more than 9ºF (5ºC).

If any of these conditions (1, 2, 3 or 4) are met, then the appropriate operating mode, 34 (Circuit A) or 35 (Circuit B), will be in effect.

Override No. 37: Circuit A High Superheat

Override No. 38: Circuit B High Superheat

This override attempts to prevent the high superheat that may introduce compressor failures due to low SST. No capacity steps will be added to the affected circuit while the superheat is greater than 45ºF (25ºC). If the capacity of the machine must be increased, the control will look to another circuit for additional capacity.

Override No. 47: Circuit A Oil Return Protection

Override No. 49: Circuit B Oil Return Protection

Only applicable to units with 3 compressors in a single circuit: 30RC 110-112 Circuit A, 30RC 120-122 Circuit B, 30RC 130-150 Circuits A and B, and 30RC 152 Circuit A. If the circuit is running with either 1 or 2 of the 3 compressors for more than 40 minutes, then the controls will alternate which compressors are running to ensure proper oil return. For instance, if compressors A1 and A2 are running on circuit A for more than the time limitation, then the controls will add A3 and may attempt to remove either compressor A1 or A2.

Override No. 58: Circuit A Operation Outside Compressor Operating Envelope — Low SCT

Override No. 59: Circuit B Operation Outside Compressor Operating Envelope — Low SCT

This override prevents compressor operation outside of its operating envelope. If the current SCT is lower than one or more SCT limits for a defined period of time, then a compressor will be started every 30 seconds. The defined period of time ranges from 8 minutes to immediate action depending on which SCT limits are surpassed. Alarms 10210/10211 will be raised if the current SCT remains below one or more SCT limits after all compressors for a given circuit have been started.

Override No. 60: Pump Rotation

This override freezes the chiller capacity during water pump rotation.

Override No. 61: Circuit A Low Delta Pressure

Override No. 62: Circuit B Low Delta Pressure

This override shall stop their compressors if the delta pressure (discharge pressure[cir] – suction pressure[cir]) is too low.

Two different limits are set:

1. The compressor shall be stopped if the delta pressure is below 43.5 psi (300 kPa) for more than 15 minutes. The timer is reset to 0 if the delta pressure gets above 44.96 psi (310 kPa).
2. The compressor shall be stopped if the delta pressure is below 29.0 psi (200 kPa) for more than 5 minutes. The timer is reset to 0 if the delta pressure gets above 30.45 psi (210 kPa).

Override No. 67: Eco Pump

This override is activated when the capacity is frozen because:

1. the pump is in eco mode (stopped) or
2. the pump has left the eco mode but its activation time is still below the Unit Off to On Delay (***Main Menu → Configuration Menu → General Configuration → Unit Off to On Delay***), which is needed to stabilize the water loop.

Override 71: Circuit A EXV Boost Locked — Capacity Increase

Override 72: Circuit B EXV Boost Locked — Capacity Increase

Override 73: Circuit A EXV Boost Locked — Capacity Decrease

Override 74: Circuit B EXV Boost Locked — Capacity Decrease

The goal of EXV boost is to periodically open the EXV to ensure proper oil return. If the maximum number of EXV boosts per hour is achieved, then the controls will try to start an additional compressor (Overrides 71 and 72). If an additional compressor cannot be added, then one compressor shall be stopped (Overrides 73 and 74). The controls may be unable to add a compressor due to the following reasons:

1. capacity overrides that freeze or decrease the capacity (Low SST, High SCT)
2. no available compressor (number of compressor starts per hour achieved, compressor failure/alarm, compressor disabled)
3. the control point is achieved

Dual Chiller Control

The dual chiller function allows for master/slave control of 2 units installed in parallel or series arrangement supplying chilled fluid on a common loop. The chillers must be linked by the Carrier Comfort Network® network and operate on the same bus.

When the units are installed for parallel operation and chilled water control is done on the outlet side of the units, the dual chiller accessory kit (P/N 00EFN900044000A) is required. The kit includes additional leaving fluid temperature thermistors that must be installed on the common chilled water leaving piping as described in the installation instructions for the kit. The leaving fluid temperature sensors will be connected to each chiller as described in the installation instructions. When the chilled water control is done on the inlet side of the parallel units, no additional temperature sensor is required. See the Field Control Wiring and Dual Chiller Control Option sections in the 30RC Installation Instructions for dual chiller LWT sensor control wiring. When chillers are configured to operate in series mode, no additional chilled water temperature sensor is required.

The master chiller will monitor all external commands, such as start/stop, demand limiting, and setpoint select, and needs to be started in Master operating type. The commands are transmitted

automatically to the slave unit, which must operate in CCN (Network) mode. The slave chiller has no action in the master/slave operations; it will only verify that CCN communication with the master chiller is correct. If the master chiller is turned off while the master/slave function is active, then the slave chiller will be stopped. Under certain circumstances, the slave unit may be started first to balance the run times of the 2 units. In the event of a communication failure between the 2 units, each unit will return to an autonomous operating mode until the fault is cleared. If the master unit is stopped due to an alarm, the slave unit is authorized to start, and therefore the slave unit configurations should be verified with desired setpoints.

The CCN communication port for the master and slave chillers must be joined using a shielded cable in order to avoid communication issues.

The master/slave linkage will not be allowed to operate if any one of the slave chiller **CHIL_S_S**, **HC_SEL**, **CTRL_PNT**, **DEM_LIM**, **LAG_LIM**, or **LCW_STPT** variables has a force priority higher than a control force. In that case, the master/slave operations will not be allowed or will be disabled.

The control algorithm relies on several parameters that must be field configured for operation. Both chillers must be on the same CCN bus with different addresses. On both chillers, Master/Slave Select (***Main Menu → Configuration Menu → Master/Slave Config → Master/Slave Select*, 1 = Master 2 = Slave**) must be enabled. The water piping arrangement must be specified with the Chiller in Series variable (***Main Menu → Configuration Menu → Master/Slave Config → Chiller in Series***), where **No** equates to parallel arrangement and **Yes** equates to a series arrangement. The Master chiller must be programmed with the Slave Address (***Main Menu → Configuration Menu → Master/Slave Config → Slave Address***). Additional optional programming parameters may be configured to meet application requirements.

The Lead Lag Select variable (***Main Menu → Configuration Menu → Master/Slave Config → Lead Lag Select***) determines which chiller is the lead machine. The options are: Always Lead, Lag Once Failed Only, and Lead/Lag Runtime Select. Under Runtime Select control, the lead chiller will change based on the time increment selected in the Lead/Lag Balance Delta configuration (***Main Menu → Configuration Menu → Master/Slave Config → Lead/Lag Balance Delta***). If the run hour difference between the master and the slave remains less than the Lead/ Lag Balance Delta, then the chiller designated as the lead will remain the lead chiller. The Lead/Lag changeover between the master and the slave chiller due to hour balance will occur during chiller operating odd days, such as day 1, 3, and 5 of the month, at 11:00 p.m. If a lead chiller is not designated, the master chiller will always be designated the lead chiller.

The dual chiller control algorithm has the ability to delay the start of the lag chiller in 2 ways. The Lead Pulldown Time parameter (***Main Menu → Configuration Menu → Master/Slave Config → Lead Pulldown Time***) is a one-time delay initiated after starting the lead chiller, before checking whether to start an additional chiller. This time delay gives the lead chiller a chance to remove the heat that the chilled water loop picked up while inactive during an unoccupied period. The second time delay, Lead/Lag Start Timer (***Main Menu → Configuration Menu → Master/Slave Config → Lead/Lag Start Timer***) is a time delay imposed between the last stage of the lead chiller and the start of the lag chiller. This prevents enabling the lag chiller until the lead/lag delay timer has expired.

A minimum on time for the lag chiller can be programmed with the Lag Minimum Running Time configuration (***Main Menu → Configuration Menu → Master/Slave Config → Lag Minimum Running Time***). This parameter causes the control to run the lag chiller for the programmed minimum on time.

The Lag Unit Pump Control (***Main Menu → Configuration Menu → Master/Slave Config → Lag Unit Pump Control***) can be configured such that the pump can be on or off while the chiller is off. This parameter is only active in Parallel Chiller Operation.

The lead chiller is started first and the lag chiller will be maintained at 0% capacity through master forcing the lag demand limit value (**LAG_LIM**) to 0%. The lag water pump will be maintained off. When the lead chiller cannot be loaded anymore (because it is loaded at its full available capacity or at the master demand limit value), then the lag start timer is started. When the lag start time has elapsed, if the error on the master controlled setpoint is greater than the dead band (**start_dt**), and if the pulldown time is elapsed, then the lag chiller water pump will be turned on (if required by configuration) and the lag chiller will be allowed to start through the master chiller forcing the lag chiller demand limit value (**LAG_LIM**) to its own demand limit value. To ensure that the lag chiller will be unloaded first in case of water load decrease, the lead chiller setpoint error will be reset downwards by 4°F (2.2°C), provided that the lead capacity is not zero. If a Lead/Lag changeover occurs, then the new lead unit's **LAG_LIM** will be set to the master unit's demand limit, and the new lag unit will reduce in capacity by 25% every 5 minutes. Once the lead unit's capacity is at maximum available capacity, or the lag unit's capacity is 0%, then the lag start timer will start.

Each dual chiller application, parallel and series, is described separately below.

MASTER/SLAVE ASSEMBLY ERROR

Errors that emerge during the master/slave operation may affect the whole system. In the event of a master/slave error (**ms_error**), an error code will be displayed in the Master Slave Control menu in the Maintenance menu (***Main Menu → Maintenance Menu → Master/Slave Error***). See Table 35 for descriptions of assembly error codes.

Table 35 — Master/Slave Assembly Error Codes

ERROR CODE	DESCRIPTION
1	The master or slave water pump is not configured (**pump_seq = 0**), while the control of the lag unit pump is required (**lag_pump = 0**).
2	Master and slave units have the same network address.
3	There is no slave configured at the slave address (**lagstat = 0, M_MSTSLV**).
4	Slave pump sequence configuration incorrect.
5	There is a conflict between the master and the slave LWT option: The master is configured for EWT control, while the slave is configured for LWT control.
6	There is a conflict between the master and the slave EWT option: The master is configured for LWT control, while the slave is configured for EWT control.
7	There is a conflict between the master and the slave pump option: The master is configured for lag pump control, while the slave is not configured. (**lag_pump**, Lag Unit Pump Control, **MST_SLV)**
8	There is a conflict between the master and the slave pump option: The master is not configured for lag pump control, while the slave is configured for lag pump control.
9	The slave chiller is in Local or Remote control (**chilstat = 3**).
10	The slave chiller is down due to fault (**chilstat = 5**).
11	The master chiller operating type is not Master.
12	No communication with the slave unit.
13	Heat/Cool status for Master is different than the Heat/Cool status for Slave.
14	Master and slave serial/parallel configurations are different.
15	Master using entering fluid control while in series mode.
16	Slave using entering fluid control while in series mode.

DUAL CHILLER CONTROL FOR PARALLEL APPLICATIONS

To configure the master chiller for parallel applications, see Table 36. To configure the slave chiller for parallel applications, see Table 37.

Table 36 — Dual Master Chiller Control Parameters for Parallel Applications

DISPLAY NAME	PATH	VALUE
Master/Slave Select	***Main Menu→ Configuration Menu → Master/Slave Config***	1 (Master) Default: 0 (Disable)
Master Control Type		1 = Local Control 2 = Remote Control 3 = Network Control Default: 1(Local) Configure for proper control type.
Slave Address		Must be set to the Slave Chiller's address. The Master and Slave chiller must have different addresses and be on the same Bus Number Default: 2
Lead Lag Select		0 (Master Always Leads) 1 (Lag Once Failed Only) 2 (Lead/Lag Runtime Select) Default: 0 (Master Always Leads)
Lead/Lag Balance Delta		Range: 40 to 400 hours Default: 168 hours
Lead/Lag Start Timer		Range: 2 to 30 minutes Default: 10 minutes
Lead Pulldown Time		Range: 0 to 60 minutes Default: 0 minutes
Start If Error Higher		Range: 3 to 18°F (1.7 to 10.0°C) Default: 4°F (2.2°C)
Lag Minimum Running Time		Range: 0 to 150 minutes Default: 0 minutes
Lag Unit Pump Control		0 (Stop If Unit Stops) 1 (Run If Unit Stops) Default: 0 (Stop If Unit Stops)
Chiller In Series		No (Not in Series) Default: No
Legacy Compatibility?		No = No message adaptation (the other unit of the master/slave assembly has PIC6 hardware) Default: No

Table 37 — Dual Slave Chiller Control Parameters for Parallel Applications

DISPLAY NAME	PATH	VALUE
Master/Slave Select	***Main Menu → Configuration Menu → Master/Slave Config***	2 (Slave) Default: 0 (Disable)
Master Control Type		1 = Local Control 2 = Remote Control 3 = Network Control Default: 1(Local) Configure for proper control type.
Slave Address		Must be set to the Slave Chiller's address. The Master and Slave chiller must have different addresses and be on the same Bus Number Default: 2
Lead Lag Select		0 (Master Always Leads) 1 (Lag Once Failed Only) 2 (Lead/Lag Runtime Select) Default: 0 (Master Always Leads)
Lead/Lag Balance Delta		Range: 40 to 400 hours Default: 168 hours
Lead/Lag Start Timer		Range: 2 to 30 minutes Default: 10 minutes
Lead Pulldown Time		Range: 0 to 60 minutes Default: 0 minutes
Start If Error Higher		Range: 3 to 18°F (1.7 to 10.0°C) Default: 4°F (2.2°C)
Lag Minimum Running Time		Range: 0 to 150 minutes Default: 0 minutes
Lag Unit Pump Control		0 (Stop If Unit Stops) 1 (Run If Unit Stops) Default: 0 (Stop If Unit Stops)
Chiller In Series		No (Not in Series) Default: No
Legacy Compatibility?		No = No message adaptation (the other unit of the master/slave assembly has PIC6 hardware) Default: No

DUAL CHILLER PUMP CONTROL FOR PARALLEL CHILLER APPLICATIONS

Parallel chiller control with dedicated pumps is recommended. The chiller must start and stop its own water pump located in its own piping. If pumps are not dedicated for each chiller's piping, chiller isolation valves are required; each chiller must open and close its own isolation valve through the control. Figures 34-37 show typical pump arrangements for dual chiller parallel applications.

In constant water flow applications, the master chiller should be the primary control source for the chilled water pump. The slave chiller should have override capability. In the event of a communication failure between the master and slave chillers, the slave chiller will operate as a stand-alone machine and therefore must be able to enable the chilled water pump.

DUAL CHILLER CONTROL FOR SERIES CHILLER APPLICATIONS

When chillers are configured to work in series mode, no additional chilled water supply sensor is required. The master chiller will be installed downstream of the slave chiller (the slave chiller outlet fluid is the master inlet fluid). If pump control is required, it will be controlled by the master chiller.

To configure the master chiller for series applications, see Table 38. To configure the slave chiller for series applications, see Table 39.

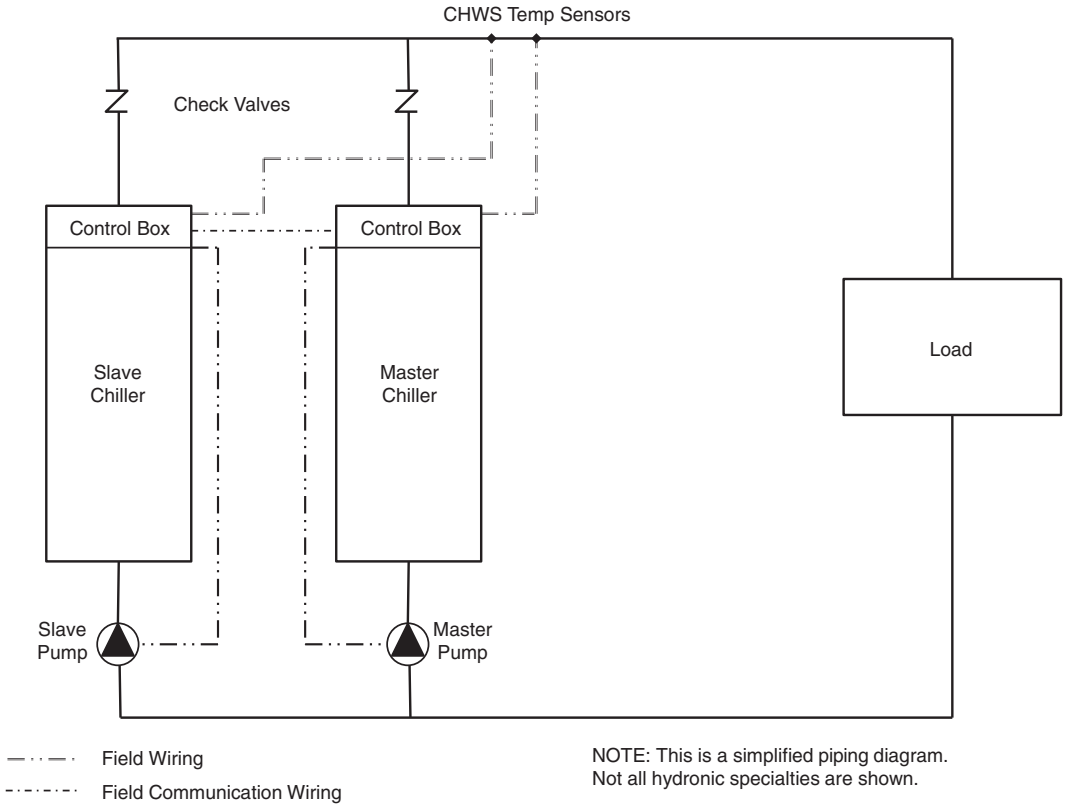


Fig. 34 — Typical Parallel Master/Slave Chillers Dedicated Primary Pumping, Variable Flow, Leaving Water Control

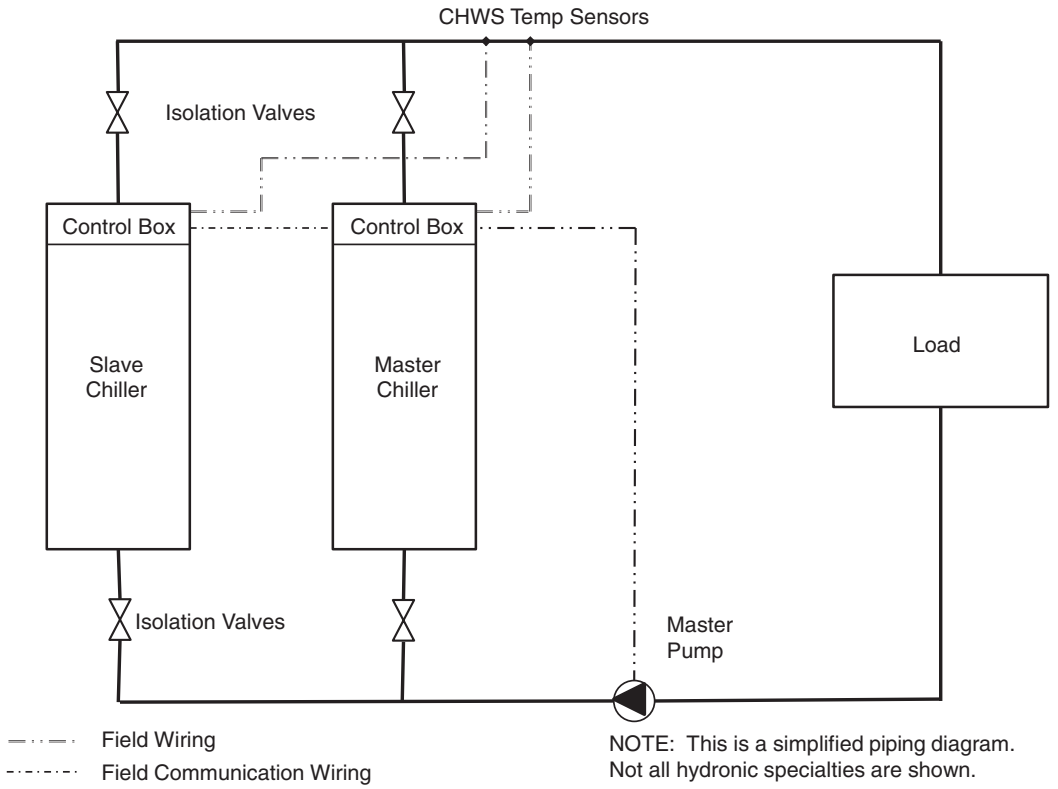


Fig. 35 — Typical Parallel Master/Slave Chillers
Common Primary Pumping, Constant Flow, Leaving Water Control

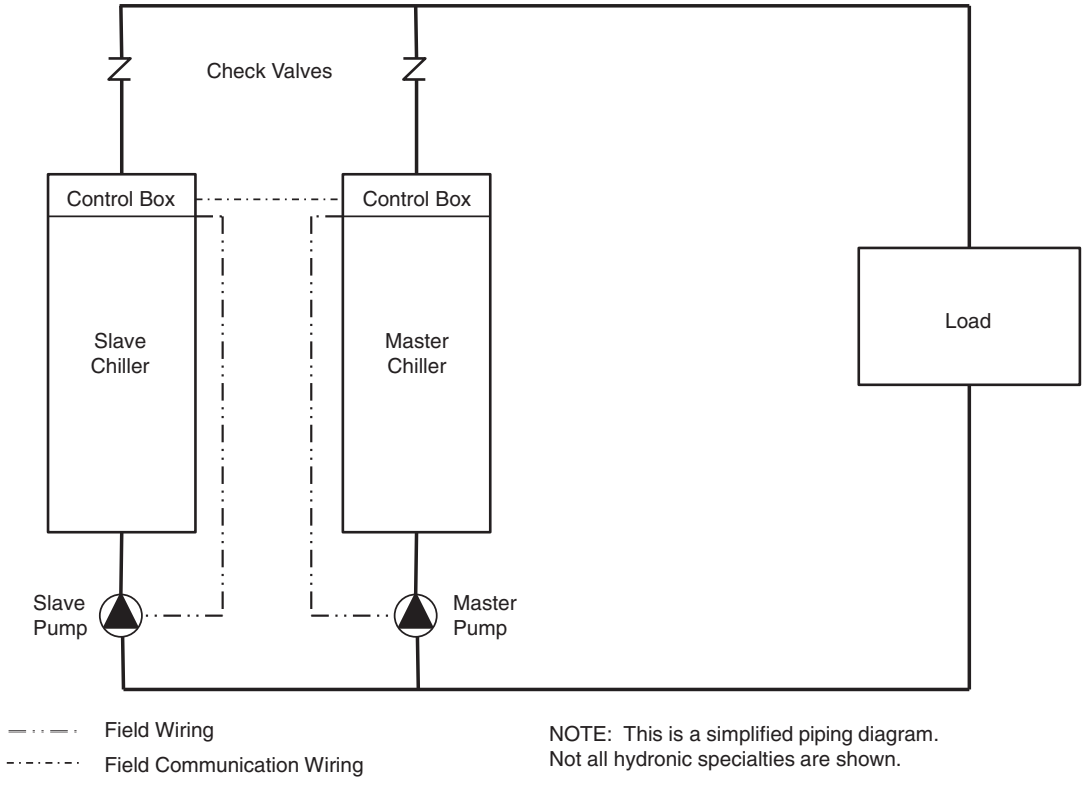


Fig. 36 — Typical Parallel Master/Slave Chillers
Dedicated Primary Pumping, Variable Flow, Entering Water Control

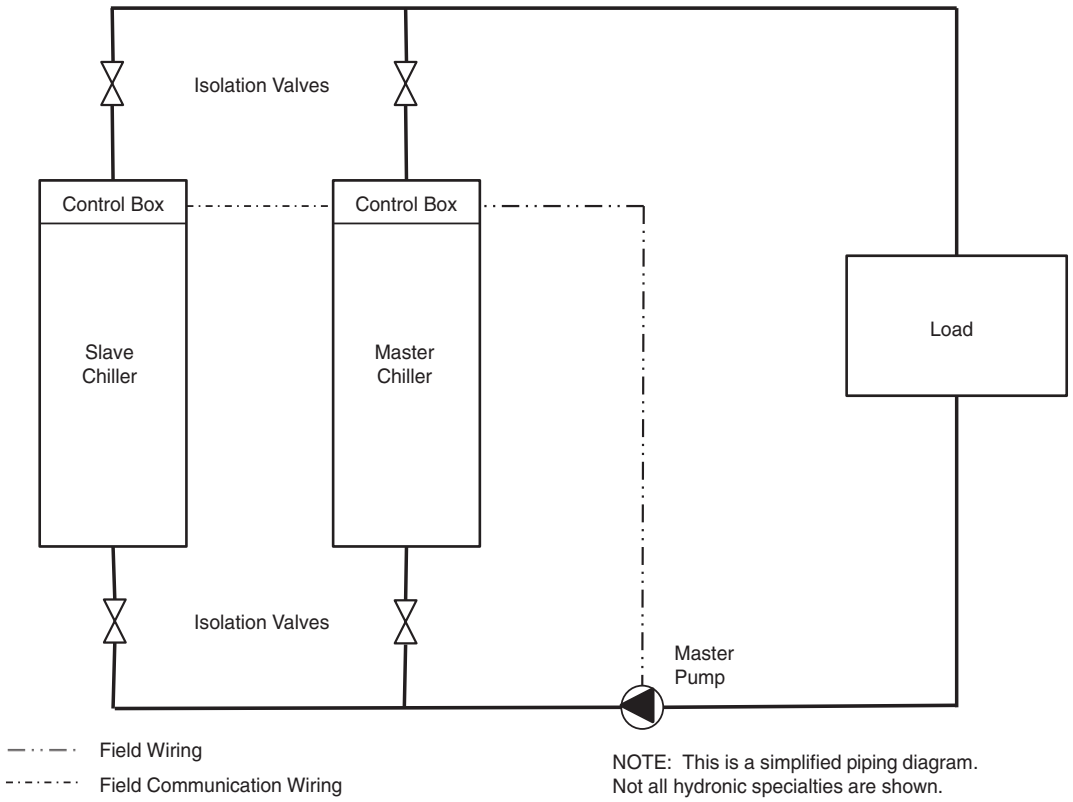


Fig. 37 — Typical Parallel Master/Slave Chillers
Common Primary Pumping, Variable Flow, Entering Water Control

Table 38 — Master Chiller Configuration in Series Applications

DISPLAY NAME	PATH	VALUE
Master/Slave Select	***Main Menu → Configuration Menu → Master/Slave Config***	1 (Master) Default: 0 (Disable)
Master Control Type		1 = Local Control 2 = Remote Control 3 = Network Control Default: 1(Local) Configure for proper control type.
Slave Address		Must be set to the slave chiller's address. The master and slave chiller must have different addresses and be on the same Bus Number Default: 2
Lead Lag Select		0 (Master Always Leads) 1 (Lag Once Failed Only) 2 (Lead/Lag Runtime Select) Default: 0 (Master Always Leads)
Lead/Lag Balance Delta		Range: 40 to 400 hours Default: 168 hours
Lead/Lag Start Timer		Range: 2 to 30 minutes Default: 10 minutes
Lead Pulldown Time		Range: 0 to 60 minutes Default: 0 minutes
Start If Error Higher		Range: 3 to 18°F (1.7 to 10.0°C) Default: 4°F (2.2°C)
Lag Minimum Running Time		Range: 0 to 150 minutes Default: 0 minutes
Lag Unit Pump Control		0 (Stop If Unit Stops) 1 (Run If Unit Stops) Default: 0 (Stop If Unit Stops)
Chiller In Series		Yes (In Series) Default: No
Legacy Compatibility?		No = No message adaptation (the other unit of the master/slave assembly has PIC6 hardware) Default: No

Table 39 — Slave Chiller Configuration in Series Applications

DISPLAY NAME	PATH	VALUE
Master/Slave Select	***Main Menu → Configuration Menu → Master/Slave Config***	2 (Slave) Default: 0 (Disable)
Master Control Type		1 = Local Control 2 = Remote Control 3 = Network Control Default: 1(Local) Configure for proper control type.
Slave Address		Must be set to the slave chiller's address. The master and slave chiller must have different addresses and be on the same Bus Number Default: 2
Lead Lag Select		0 (Master Always Leads) 1 (Lag Once Failed Only) 2 (Lead/Lag Runtime Select) Default: 0 (Master Always Leads)
Lead/Lag Balance Delta		Range: 40 to 400 hours Default: 168 hours
Lead/Lag Start Timer		Range: 2 to 30 minutes Default: 10 minutes
Lead Pulldown Time		Range: 0 to 60 minutes Default: 0 minutes
Start If Error Higher		Range: 3 to 18°F (1.7 to 10.0°C) Default: 4°F (2.2°C)
Lag Minimum Running Time		Range: 0 to 150 minutes Default: 0 minutes
Lag Unit Pump Control		0 (Stop If Unit Stops) 1 (Run If Unit Stops) Default: 0 (Stop If Unit Stops)
Chiller In Series		Yes (In Series) Default: No
Legacy Compatibility?		No = No message adaptation (the other unit of the master/slave assembly has PIC6 hardware) Default: No

NOTES:
1. For Master/Slave Series Chiller Application, Master Chiller should always be downstream of Slave.

DUAL CHILLER PUMP CONTROL FOR SERIES CHILLER APPLICATIONS

Pump control for series chiller applications is controlled by the master chiller only. The control of the slave chiller is directed through commands transmitted by the master chiller. The slave chiller has no action in master/slave operations. The slave chiller only verifies that CCN communication with the master chiller is present. See the Dual Chiller Sequence of Operation section on page 66. Figure 38 shows a typical pump arrangement for dual chiller series applications.

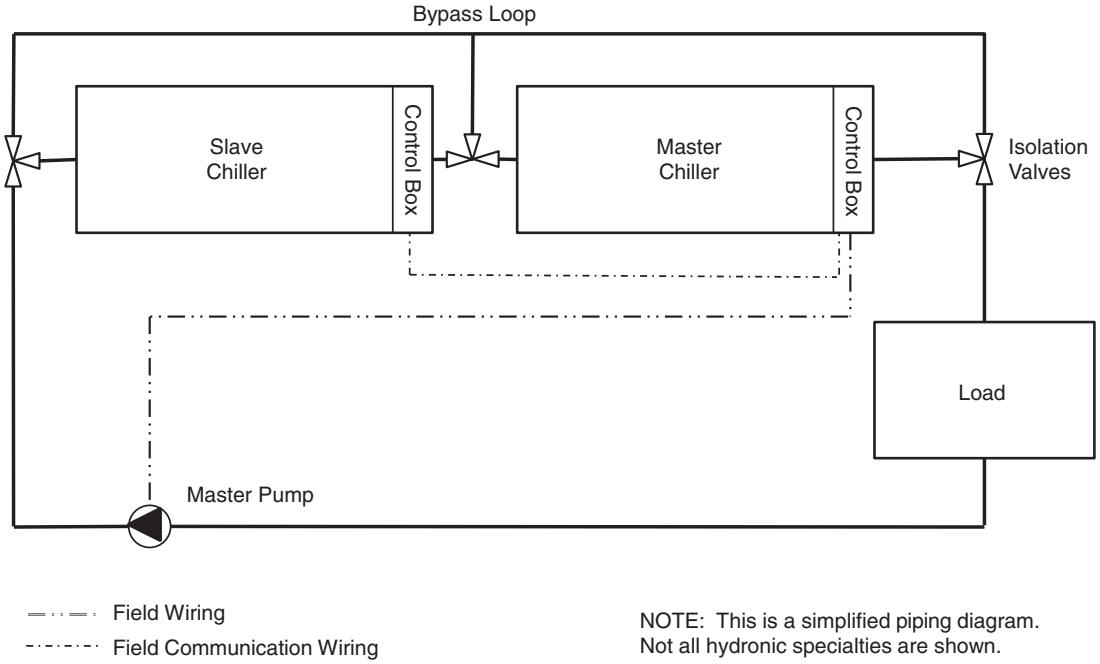


Fig. 38 — Typical Series Master/Slave Chillers Dedicated Primary Pumping, Constant Flow, Leaving Water Control

Ramp Loading

The Ramp Loading function limits the rate of change of the leaving water temperature. When leaving water temperature reaches the ramp loading setpoint, the control slows down the process at which the compressor loads or unloads. To enable the Ramp Loading sequence:

DISPLAY NAME	PATH	VALUE
Ramp Loading Select	***Main Menu → Configuration Menu → General Configuration***	Yes
Cooling Ramp Loading	***Main Menu → Setpoint Configuration***	Range: 0.2 to 2.0°F/min (0.1 to 1.1°C/min) Default: 1.0°F/min (0.5°C/min)

Temperature Reset

The temperature reset function will determine the cooling control point. This control point is the active setpoint adjusted with the current reset value:

$$\text{Control Point} = \text{Setpoint} + \text{Reset}$$

The purpose of this reset value is to decrease the required capacity if it is allowed by unit load operating conditions. When a non-zero temperature reset is applied, the chiller controls to the new control point instead of the setpoint. The type of temperature reset is configured with the Cooling Reset Select variable.

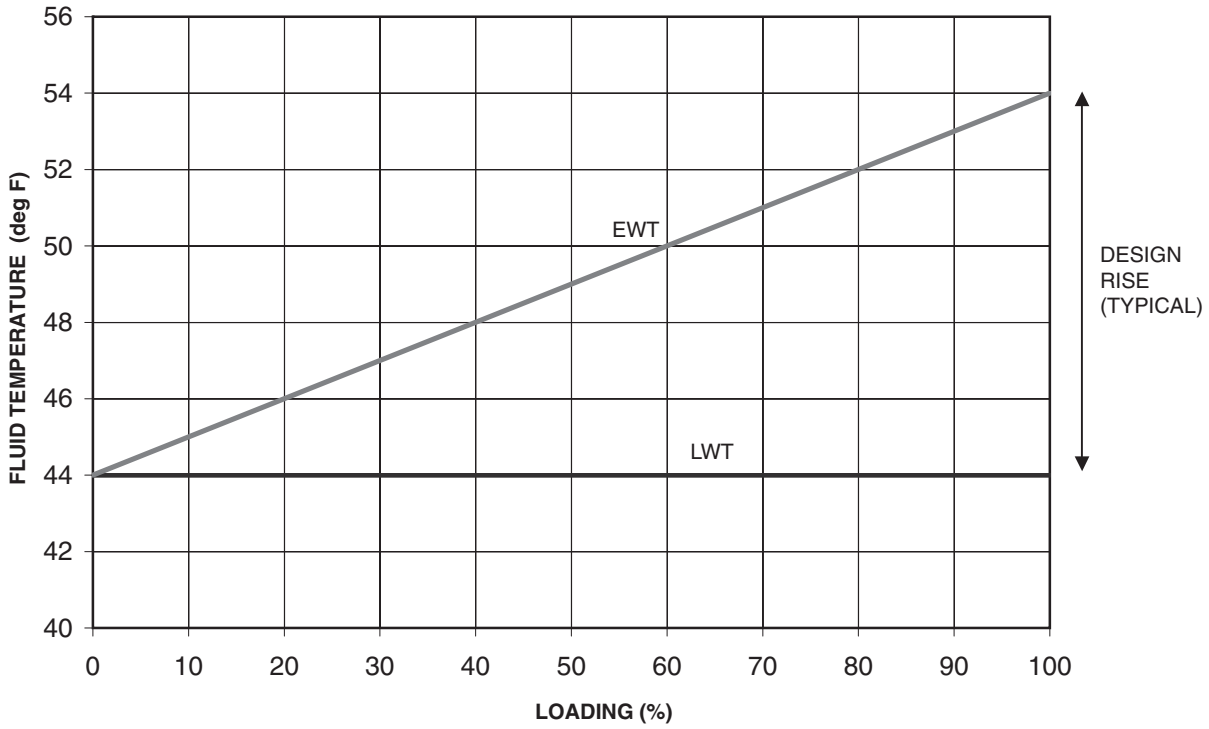
Four types of temperature reset are available: Outdoor Air Temperature, Return Water Reset (Delta T), 4 to 20 mA control, and Space Temperature control. To select a temperature reset configuration:

DISPLAY NAME	PATH	VALUE
Cooling Reset Select	***Main Menu → Configuration Menu → Reset Configuration***	0 = None 1 = OAT 2 = Delta T 3 = 4 to 20 mA Control 4 = Space Temp

Under normal operation, the chiller will maintain a constant entering or leaving fluid temperature, based on the configuration, approximately equal to the chilled fluid setpoint. As the evaporator load varies, the evaporator fluid temperature difference will change in proportion to the load. For example, if the chiller was selected for an entering to leaving water temperature difference of 10°F (5.5°C) at full load, then at 50% load, the temperature difference would be 5°F (2.2°C). (See Fig. 39.) Because the change in temperature through the evaporator is a measure of the building load, the temperature difference reset is the average building load. Usually the chiller size and fluid temperature setpoint are selected based on a full load condition. At part load, the fluid temperature setpoint may be lower than required. When the fluid temperature is allowed to increase at part load, the efficiency of the machine will increase. The chiller can also be set for return water temperature control. (See Fig. 40.)

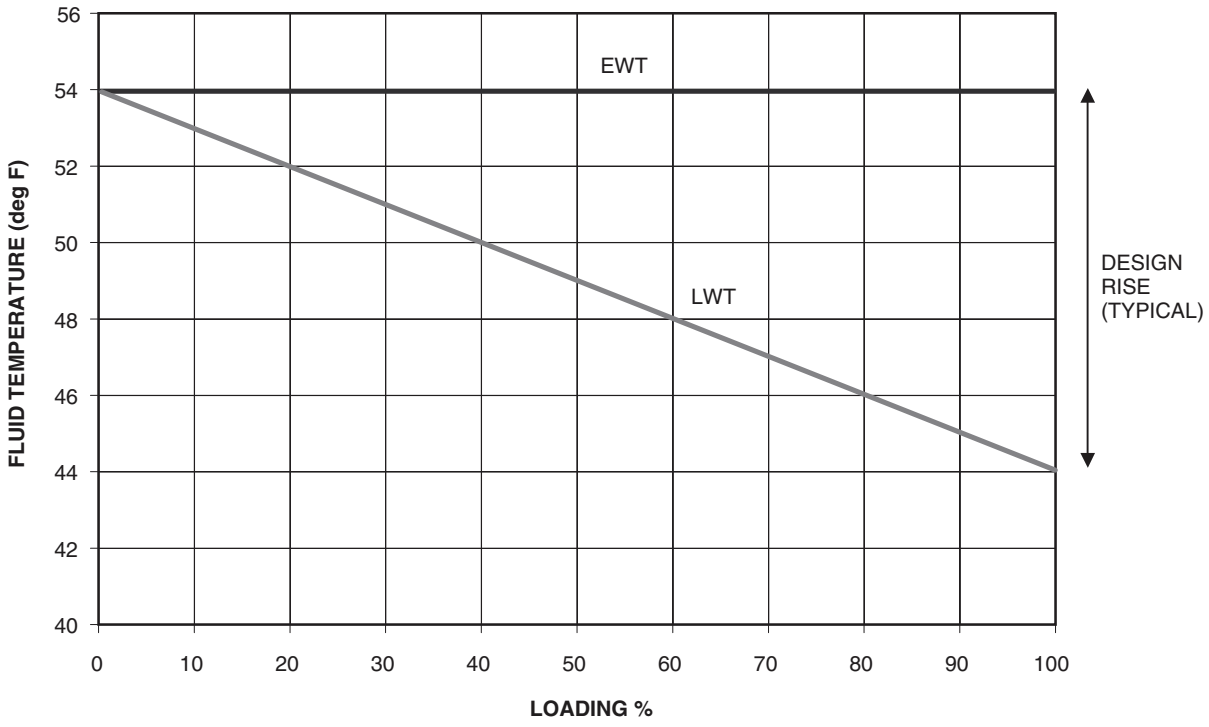
Other indirect means of estimating building load and controlling temperature reset are also available and are discussed below.

To verify that reset is functioning correctly, subtract the Current Setpoint (***Main Menu → General Parameters → Current Setpoint***) from the Control Point (***Main Menu → General Parameters → Control Point***) to determine the degrees reset.



LEGEND
EWT — Entering Water Temperature
LWT — Leaving Water Temperature

Fig. 39 — Leaving Chilled Water Temperature Control



LEGEND
EWT — Entering Water Temperature
LWT — Leaving Water Temperature

Fig. 40 — Return Water Temperature Control Load Profile

OUTSIDE AIR TEMPERATURE RESET

The control system is capable of temperature reset based on OAT. Typically, as the outdoor temperature decreases, so does building cooling load. The chilled water temperature can be increased to lower energy usage while still meeting load demand.

To use OAT Reset, 4 variables must be configured: Cooling Reset Select, OAT No Reset Value (outdoor temperature at which no reset is required), OAT Full Reset Value (outdoor temperature at which full reset is required), and Cooling Reset Deg Value (the amount of temperature reset desired).

To configure this option with the Carrier Controller display:

DISPLAY NAME	PATH	VALUE
Cooling Reset Select	***Main Menu → Configuration Menu → Reset Configuration***	Default = 1 0 = None, 1 = OAT 2 = Delta T, 3 = 4 to 20 mA control 4 = Space Temp
OAT No Reset Value		Default = 14°F (7.8°C) Range 14 to 125°F (7.8 to 69.4°C)
OAT Full Reset Value		Default = 14°F (7.8°C) Range 14 to 125°F (7.8 to 69.4°C)
Cooling Reset Deg. Value		Default = 0°F (0°C) Range –30 to 30°F (–16.7 to 16.6°C)

In the example in Fig. 41, the OAT reset provides 0°F (0°C) chilled water setpoint reset at 85°F (29.4°C) OAT and 15°F (8.3°C) reset at 55°F (12.8°C) OAT.

DELTA T RESET (RETURN WATER RESET)

The control system is also capable of performing fluid temperature reset based on evaporator fluid temperature difference (Delta T), sometimes called return water reset. Because the change in temperature through the evaporator is a measure of the building load, the temperature difference reset is, in effect, an average building load reset method.

Delta T Reset allows for the chilled water temperature setpoint to be reset upward as a function of the fluid temperature difference (building load).

NOTE: Delta T (Return Water) Temperature Reset should not be used with variable evaporator flow rate systems.

To use Delta T Reset, 4 variables must be configured: Cooling Reset Select, Delta T No Reset Value (evaporator temperature difference at which no chilled water temperature reset should occur), Delta T Full Reset Value (evaporator temperature difference at which the maximum chilled water temperature reset should occur), and Cooling Reset Deg Value (the maximum amount of temperature reset desired).

To configure this option with the Carrier Controller display:

DISPLAY NAME	PATH	VALUE
Cooling Reset Select	***Main Menu→ Configuration Menu→ Reset Configuration***	Default = 2 0 = None, 1 = OAT 2 = Delta T, 3 = 4 to 20 mA control 4 = Space Temp
Delta T No Reset Value		Default = 0°F (0°C) Range 0°F to 25°F (0°C to 13.8°C)
Delta T Full Reset Value		Default = 0°F (0°C) Range 0°F to 25°F (0°C to 13.8°C)
Cooling Reset Deg Value		Default = 0°F (0°C) Range –30 to 30°F (–16.7 to 16.6°C)

In the example in Fig. 42, using Return Water Temperature Reset, the chilled water temperature will be reset by 5°F (2.8°C) when the Fluid Temperature Difference is 2°F (1.1°C) and 0°F (0°C) reset when the Temperature Difference is 10°F (5.6°C).

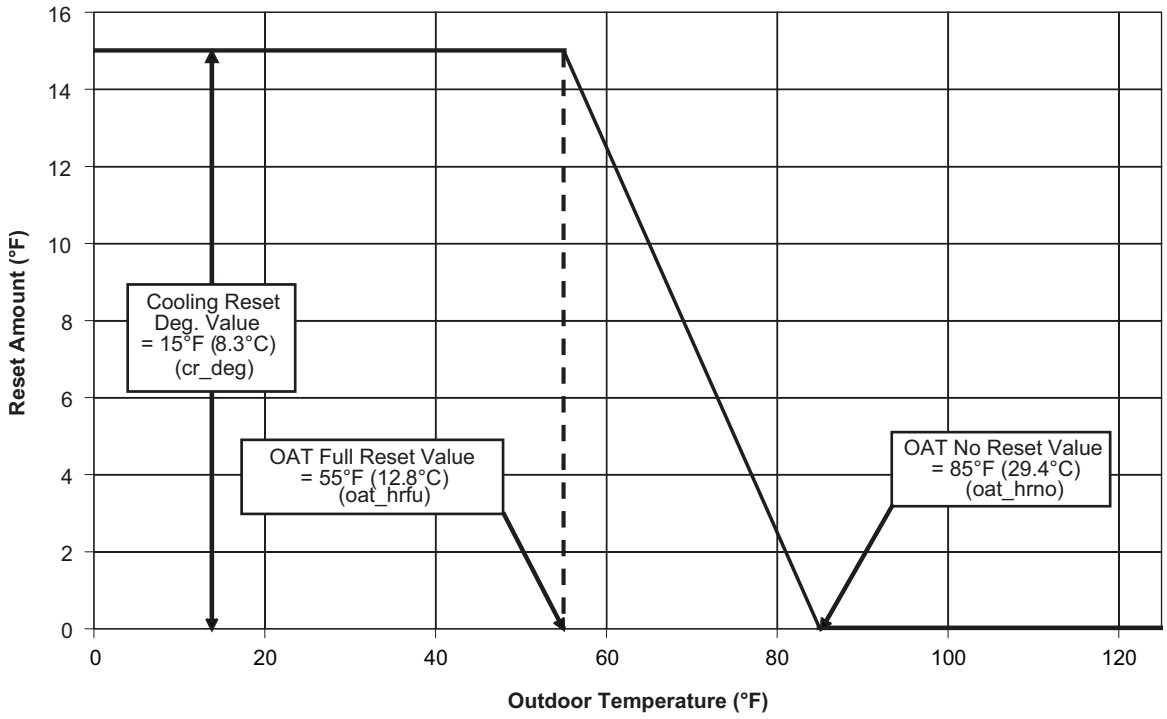


Fig. 41 — Example: OAT Reset

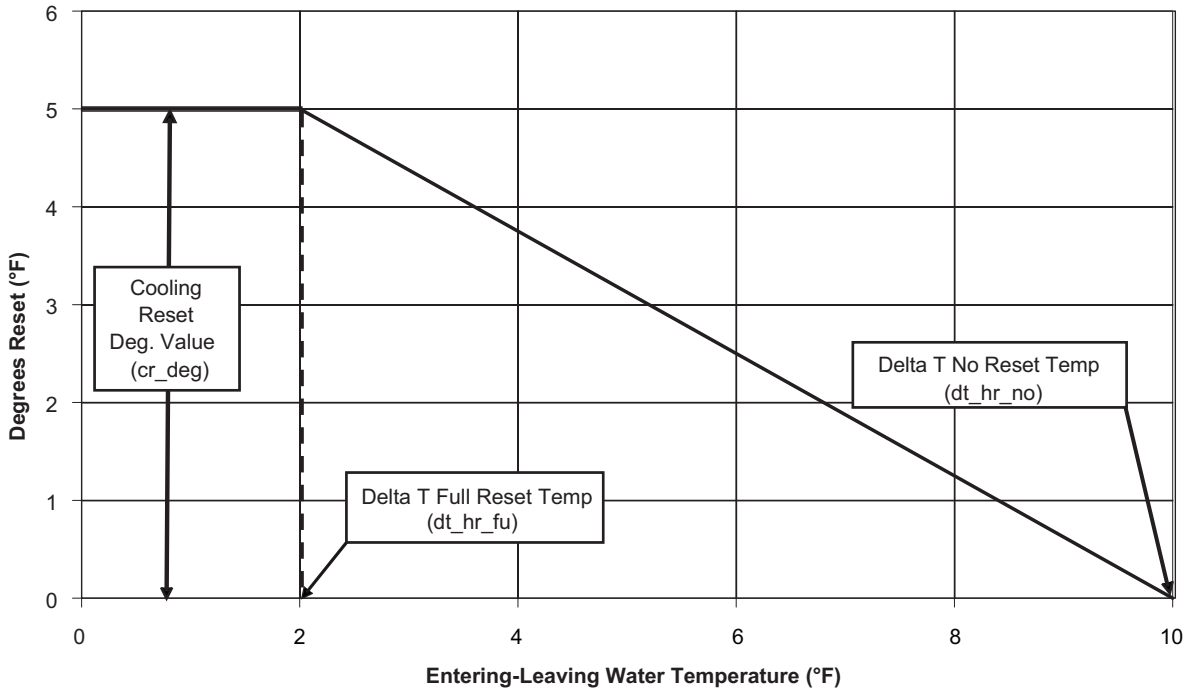


Fig. 42 — Example: Return Water Reset

4 TO 20 MA TEMPERATURE RESET

The control system is also capable of temperature reset based on an externally powered 4 to 20 mA signal.

To use 4 to 20 mA Temperature Reset, 4 variables must be configured: Cooling Reset Select, Current No Reset Value (milliamp signal at which no temperature reset is required), Current Full Reset Value (milliamp signal at which full temperature reset is required), and Cooling Reset Deg Value (the maximum amount of temperature reset desired).

⚠ CAUTION

Care should be taken when interfacing with other control systems due to possible power supply differences, such as a full wave bridge versus a half wave rectification. Connection of control devices with different power supplies may result in permanent damage. Carrier Controller controls incorporate power supplies with half wave rectification. A signal isolation device should be utilized if the signal generator incorporates a full wave bridge rectifier.

To configure this option with the Carrier Controller display:

DISPLAY NAME	PATH	VALUE
Cooling Reset Select	***Main Menu→ Configuration Menu→ Reset Configuration***	Default = 3 0 = None, 1 = OAT 2 = Delta T, 3 = 4 to 20 mA control 4 = Space Temp
Current No Reset Value		Default = 0 mA Range 0 to 20 mA
Current Full Reset Value		Default = 0 mA Range 0 to 20 mA
Cooling Reset Deg Value		Default = 0°F (0°C) Range –30 to 30°F (–16.7 to 16.6°C)

In the example in Fig. 43, at 4 mA, no reset takes place, and at 20 mA, 5°F (2.8°C) chilled water setpoint reset is required.

SPACE TEMPERATURE RESET

The control system is also capable of temperature reset based on space temperature. The EMM and accessory sensor (P/N 33ZCT55SPT) are required for temperature reset using space temperature. This sensor measures the space (room) temperature for the purpose of setpoint reset. Only units with the optional energy management module are fitted with this sensor.

To use Space Temperature Reset, 4 variables must be configured: Cooling Reset Select, Space T No Reset Value (space temperature at which no temperature reset is required), Space T Full Reset Value (space temperature at which full temperature reset is required), and Cooling Reset Deg Value (the maximum amount of temperature reset desired).

To configure this option with the Carrier Controller display:

DISPLAY NAME	PATH	VALUE
Cooling Reset Select	***Main Menu→ Configuration Menu→ Reset Configuration***	Default = 4 0 = None, 1 = OAT 2 = Delta T, 3 = 4 to 20 mA control 4 = Space Temp
Space T No Reset Value		Default = 14°F (7.8°C) Range 14 to 125°F (7.8 to 69.4°C)
Space T Full Reset Value		Default = 14°F (7.8°C) Range 14 to 125°F (7.8 to 69.4°C)
Cooling Reset Deg Value		Default = 0°F (0°C) Range –30 to 30°F (–16.7 to 16.6°C)

In the space temperature reset example in Fig. 44, a reset of 6°F (3.3°C) is applied when the space temperature is 68°F (20.0°C), and no reset takes place when the space temperature is 72°F (22.2°C).

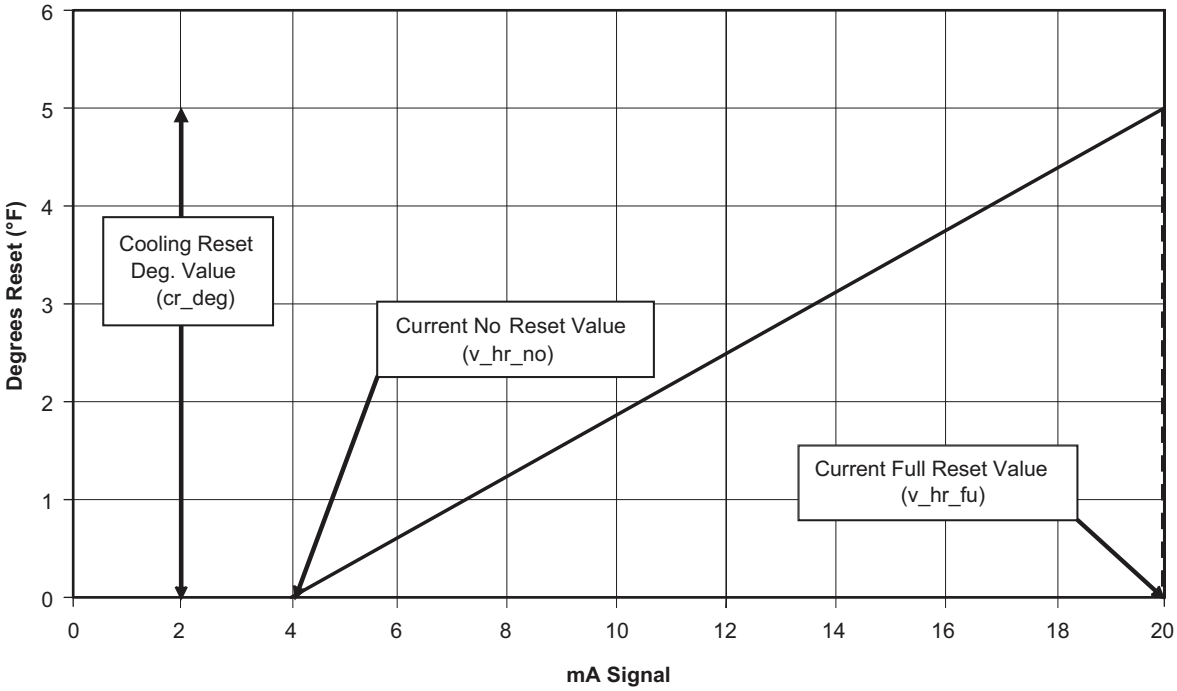


Fig. 43 — Example: 4 to 20 mA Temperature Reset

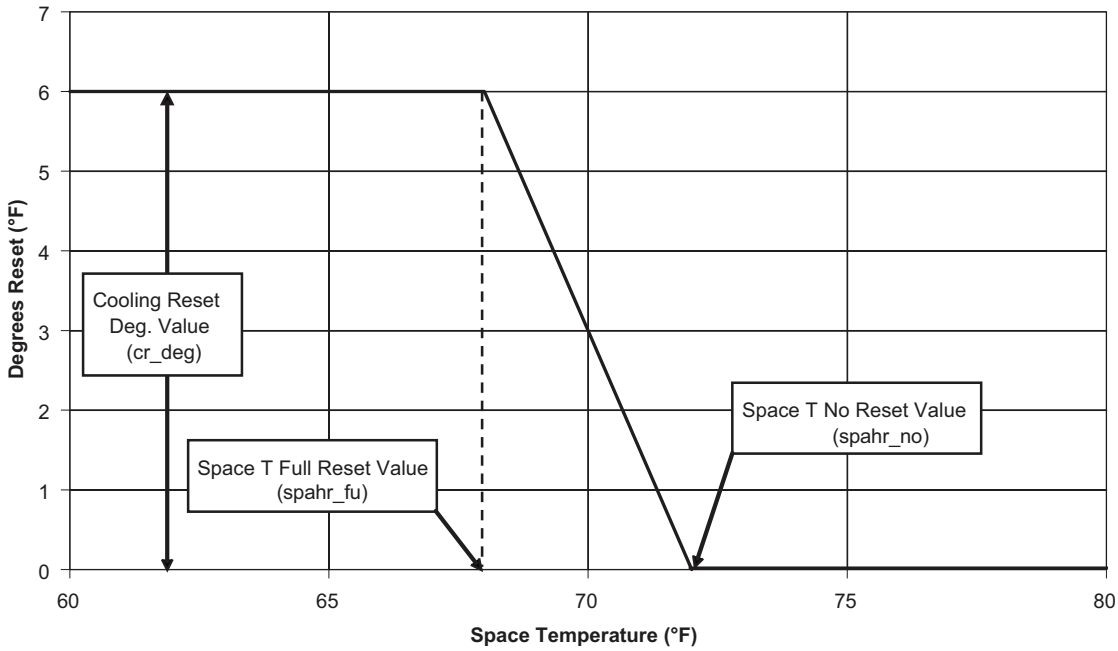


Fig. 44 — Example: Space Temperature Reset

Demand Limit

There are 3 types of demand limiting that can be configured. The first type is through switch control, which will reduce the maximum capacity to up to 3 user-configurable percentages. The second type is by 4 to 20 mA signal input which will reduce the maximum capacity linearly between 100% at a 4 mA input signal (no reduction) down to 0% at a 20 mA input signal. The third type uses CCN, ModBus, or BACnet communication to an external loadshed device and has the ability to limit the current operating capacity to maximum and further reduce the capacity if required. Demand limit control can be based on a calculated capacity level. If the Demand Limit is enabled and the current capacity requirement meets or exceeds the current Demand Limit level, the unit will unload and display Override No. 9: Demand Limit section on page 45.

SWITCH CONTROLLED DEMAND LIMIT

The control system is capable of demand limit based on a field-supplied switch for 1-step demand limit or 2 switches for 3-step demand limit. One-step demand limit is standard. The 2 or 3-step switch control of demand limiting requires the EMM. Demand limit steps are controlled by 2 relay switch inputs field wired to TB5-5 and TB5-14 for Switch 1 (**LIM_SW1**) and TB6-14 and TB6-15 for Switch 2 (**LIM_SW2**).

For demand limit by switch control, closing the first demand limit contact (**LIM_SW1**) will put the unit on the first demand limit (**LIMIT 1**) by capacity. The unit will not exceed the percentage of

capacity entered as Demand Limit Switch 1 setpoint. Closing contacts on the second demand limit switch (**LIM_SW2**) and opening the Demand Limit Switch 1 prevents the unit from exceeding the demand limit (**LIMIT 2**) entered as Demand Limit Switch 2 setpoint. If both demand limit switch (**LIM_SW1** and **LIM_SW2**) contacts are closed, then the unit will not exceed the limit (**LIMIT 3**) set by the switch limit setpoint 3. See the table below.

CONTACT	ACTIVE DEMAND LIMIT			
	NONE	LIMIT 1	LIMIT 2	LIMIT 3
LIM_SW1	Open	Close	Open	Close
LIM_SW2	Open	Open	Close	Close

To use demand limit, select the type of demand limiting to use by configuring the Demand Limit Select variable (***Main Menu → Configuration Menu → General Configuration → Demand Limit Type Select***) to Switch. Configure the demand limit setpoints based on the type selected.

If using 2 or 3-step demand limit control, an energy management module must be installed. The energy management module must be enabled in the controls. To enable the EMM, navigate to Factory Configuration menu ***(Main Menu → Configuration Menu → Factory Configuration)*** and set Energy Management Module to YES (1). One-step demand limit control does not require the EMM. To configure demand limit for switch control, 3 parameters for 1-step switch control must be configured. For 2 or 3-step control, additional setpoint parameters must be configured. The parameters are: the type of Demand Limit Selection, the setting for Switch Limit Setpoint 1, the setting for Switch Limit Setpoint 2 (if required), and the setting for Switch Limit Setpoint 3 (if required).

To configure this option with the Carrier Controller display:

DISPLAY NAME	PATH	VALUE
Demand Limit Type Select	***Main Menu → Configuration Menu → General Configuration***	Default = 0 (None) Range None = 0 Switch = 1 4 to 20 mA = 2
Switch Limit Setpoint 1	***Main Menu → Setpoint Configuration***	Default = 100% Range 0 to 100%
Switch Limit Setpoint 2	***Main Menu → Setpoint Configuration***	Default = 100% Range 0 to 100% (Not required for 1-Step Control)
Switch Limit Setpoint 3	***Main Menu → Setpoint Configuration***	Default = 100% Range 0 to 100% (Not required for 1 or 2-Step Control)

In the following example, 2-step demand limit based on capacity is desired, with the first switch closure limiting the capacity to 60%. The second switch closure is to limit the capacity to 40%. Demand Limit Switch 1 is 60% and Demand Limit Switch 2 is 40%. Since no third-step demand limit is required, Switch Limit Setpoint 3 is set at 0%.

DISPLAY NAME	VALUE
Demand Limit Type Select	1
Switch Limit Setpoint 1	60%
Switch Limit Setpoint 2	40%
Switch Limit Setpoint 3	0%

EXTERNALLY POWERED (4 TO 20 MA) DEMAND LIMIT

The energy management module is required for 4 to 20 mA demand limit control. An externally powered 4 to 20 mA signal must be connected to TB6-1 and TB6-2.

⚠ CAUTION

Care should be taken when interfacing with other control systems due to possible power supply differences, such as a full wave bridge versus a half wave rectification. Connection of control devices with different power supplies may result in permanent damage. Carrier Controller controls incorporate power supplies with half wave rectification. A signal isolation device should be utilized if the signal generator incorporates a full wave bridge rectifier.

To configure demand limit for 4 to 20 mA control based on unit capacity, one parameter must be configured. The parameter is Demand Limit Type Select. The value of the capacity limit will vary linearly for 0% to 100% based on the input signal, where 4 mA is 100% and 20 mA is 0% of total unit capacity.

To configure this option with the Carrier Controller display:

DISPLAY NAME	PATH	VALUE
Demand Limit Type Select	***Main Menu → Configuration Menu → General Configuration***	Default = 0 (None) 4 to 20 mA Control = 2

In the example in Fig. 45, a 4 mA signal is Demand Limit 100%, and a 20 mA Demand Limit signal is 0%. The 4 to 20 mA signal is connected to TB6-1 and TB6-2. The demand limit is a linear interpolation between the 2 values entered. If the machine receives a 12 mA signal, the machine controls will limit the capacity to 50%.

CCN LOADSHED CONTROLLED DEMAND LIMIT

To configure Demand Limit for CCN Loadshed control, the unit Operating Type Control must be in Network control. With the Carrier Controller display, the machine must be started in Network Mode. Network control can be verified from the GENUNIT table.

The unit must be controlled by an external loadshed device. The device shall be able to force the demand limit variable and directly control the capacity of the machine. Additionally, the unit's setpoint will be artificially lowered to force the chiller to load to the demand limit value.

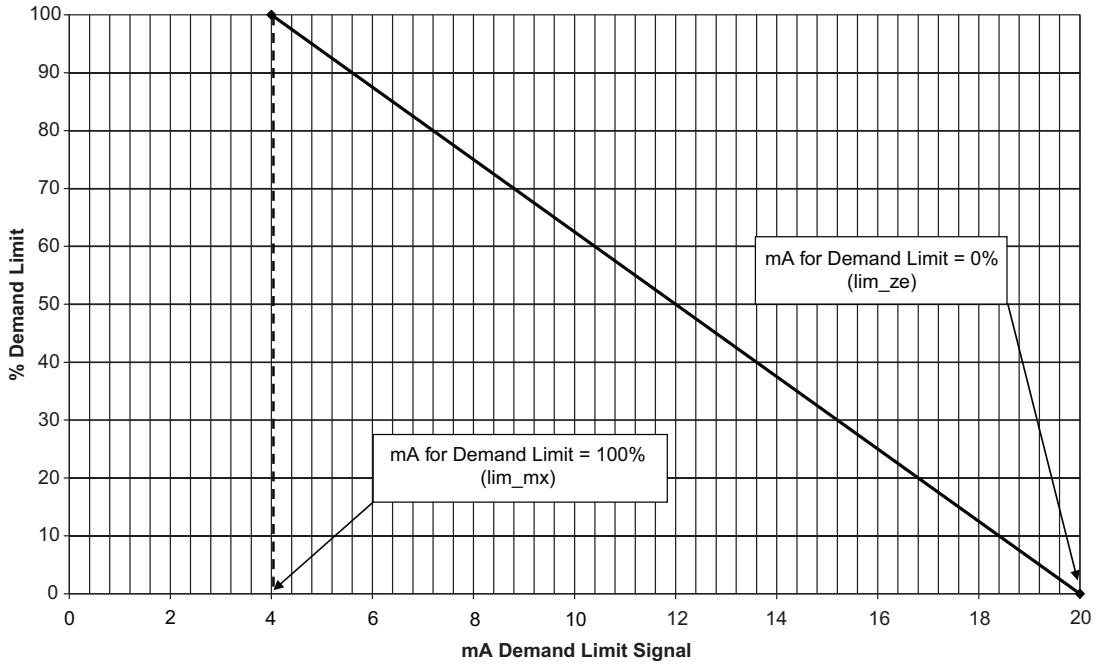


Fig. 45 — Example: 4 to 20 mA Demand Limit

Machine Start Delay

An option to delay the start of the machine is available. This parameter is useful in keeping multiple machines from starting at the same time in case of a power failure. The parameter has a factory default of 1 minute. This parameter also has a role in the timing for a chilled water flow switch alarm. To configure this option with the Carrier Controller display, select ***Main Menu → Configuration Menu → General Configuration*** and select Unit Off to On Delay.

Fast Loading

The Fast Capacity Recovery function allows for an accelerated unit start-up following brief power outages of less than 3 minutes. This is especially useful in data center applications where constant loading is expected and rapid restart will help keep the data center operating. Fast Capacity Recovery is only available on units configured with variable speed fans and the 7 in. display. To activate the Fast Capacity Recovery, go to ***Main Menu → Configuration Menu → Service Configuration*** and set Fast Capacity Recovery to Yes. The available options are as follows:

- Disabled (normal loading sequence): Follows the set delays for unit and circuit start-up.
- Enabled (Fast Capacity Recovery): After controller initialization (90 seconds for 7 in. display) and with flow established, Carrier Controller ignores Capacity Control Override No. 13 (Minimum On/Off and Off/On Time Delay) and allows time between compressor starts on the same circuit to be reduced to 30 seconds. As all chiller protections are active, the controller may delay the compressor start if there is risk to damaging the unit.

NOTE: Unit cannot operate with Ramp Loading enabled if Fast Capacity Recovery is set to Yes.

Ice Storage Operation

Chiller operation can be configured to make and store ice. The energy management module (EMM), an Ice Done Switch, and micro-channel heat exchanger (MCHX) condenser coils are required for operation in the Ice Mode. In this configuration, the machine can operate with up to 3 cooling setpoints: Cooling Setpoint 1 is used during the Occupied period, Cooling Setpoint 2 is used during the Unoccupied period when the ice build is complete (Ice Done Switch is closed), and Cooling Ice Setpoint is used during the unoccupied period while ice is building (Ice Done Switch is open). Refer to the 30RC Typical Field Wiring Schematic figure on page 118 for Ice Done Switch wiring.

To configure this option with the Carrier Controller display:

DISPLAY NAME	PATH	VALUE
Ice Mode Enable	***Main Menu → Configuration Menu General Configuration***	Drop Down Selection (YES/NO) Default = No
Cooling Ice Setpoint	***Main Menu → Setpoint Configuration***	Default = 44°F (6.7°C) Range = –20 to 78.8°F (–29 to 26°C)

Optional Partial Heat Recovery

Standard tier 30RC units may be fitted with one desuperheater per circuit to provide partial heat recovery. The desuperheater is a brazed plate heat exchanger mounted between the compressor(s) and air-cooled condenser. With water flow to the device, heat is transferred from the discharge gas to the water loop. Heat is only available if there is a cooling load.

For chillers with the partial heat recovery option, the Desuperheater Select setting (***Main Menu → Configuration Menu → Factory Configuration → Desuperheater Select***) should be set to Yes. The chiller will enter Desuperheater Mode when the desuperheat demand switch closes. The desuperheat demand switch is connected to terminals 23 and 24 of TB5, and the contacts must be rated for dry circuit application capable of handling a 24 vac load up to 24 mA. Desuperheat demand switch status can be accessed through the Inputs menu (***Main Menu → Inputs → Desuperheater Demand***). The desuperheat demand switch is to be controlled by the customer's field-installed controls, or BMS (building management system), and to be commanded to open or close based on the hot water needs of the building.

When the unit is in Desuperheater Mode, the minimum condensing setpoint is raised to the Desuperheater Min SCT (***Main Menu → Setpoint Configuration → Desuperheat Min SCT***), where the default value is 104°F (40°C) and the maximum condensing threshold is raised to 122°F (50°C). The Desuperheater Min SCT can be set to a minimum of 75°F (23.9°C) and a maximum of 122°F (50°C).

A field-supplied desuperheater pump can be connected to the dedicated output, which requires the installation of the optional Energy Management Module (EMM). This board allows control of the components shown in Table 13. The desuperheater pump output is connected to terminals 20 and 21 of TB6, and the maximum load for the desuperheater pump relay is 5 VA sealed, 10 VA Inrush at 24 vac. The desuperheater pump shall be commanded ON immediately after the desuperheater demand switch is commanded closed and at least one compressor is running. The desuperheater pumps shall be commanded OFF 2 minutes after the switch is commanded open or if there are no compressors running. Desuperheater pump status can be accessed through the Outputs Menu (***Main Menu → Outputs → Desuperheater Pump***).

Alarm Control

ALARM ROUTING CONTROL

Alarms recorded on the chiller can be routed through the CCN. To configure this option, the Carrier Controller controls must be configured to determine which CCN elements will receive and process alarms. Input for the decision consists of 8 digits, each of which can be set to either 0 or 1. Setting a digit to 1 specifies that alarms will be sent to the system element that corresponds to that digit. Setting all digits to 0 disables alarm processing. The factory default is 00000000. See Fig. 46. The default setting is based on the assumption that the unit will not be connected to a network. If the network does not contain a ComfortVIEW™, ComfortWORKS™, TeLink, DataLINK™, or BACLink module, then enabling this feature will only add unnecessary activity to the CCN communication bus.

Typical configuration of the Alarm Routing variable is 11010000. This Alarm Routing status will transmit alarms to ComfortVIEW™ software, TeLink, BACLink, and DataLINK.

This option cannot be configured with the Carrier Controller display. To change the alarm control routing through the Network Service Tool, navigate to point **ALRM_CNT** in table **ALARMDEF**.

ALARM EQUIPMENT PRIORITY

The ComfortVIEW software uses the equipment priority value when sorting alarms by level. The purpose of the equipment priority value is to determine the order in which to sort alarms that have the same level. A priority of 0 is the highest and would appear first when sorted. A priority of 7 would appear last when sorted. For example, if 2 chillers send out identical alarms, the chiller with the higher priority would be listed first. The default is 4. This variable can only be changed when using the ComfortVIEW software or Network Service Tool. This variable cannot be changed with the Carrier Controller display. To configure this option with the Network Service Tool, navigate to point **EQP_TYP** in table **ALARMDEF**.

COMMUNICATION FAILURE RETRY TIME

This variable specifies the amount of time that will be allowed to elapse between alarm retries. Retries occur when an alarm is not acknowledged by a network alarm acknowledger, which may use either ComfortVIEW software or TeLink. If acknowledgment is not received, the alarm will be re-transmitted after the number of minutes specified in this decision. This variable can only be changed when using the ComfortVIEW software or Network Service Tool. This variable cannot be changed with the Carrier Controller display. To configure this option with the Network Service Tool, navigate to point **RETRY_TM** in table **ALARMDEF**.

RE-ALARM TIME

This variable specifies the amount of time that will be allowed to elapse between re-alarms. A re-alarm occurs when the conditions that caused the initial alarm continue to persist for the number of minutes specified in this decision. Re-alarming will continue to occur at the specified interval until the condition causing the alarm is corrected. This variable can only be changed when using the ComfortVIEW software or Network Service Tool. This variable cannot be changed with the Carrier Controller display. To configure this option with the Network Service Tool, navigate to point **RE_ALARM** in table **ALARMDEF**.

ALARM SYSTEM NAME

This variable specifies the system element name that will appear in the alarms generated by the unit control. The name can be up to 8 alphanumeric characters in length. This variable can only be changed when using the ComfortVIEW™ software or Network Service Tool. This variable cannot be changed with the Carrier Controller display. To configure this option with the Network Service Tool, navigate to point **ALRM_NAM** in table **ALARMDEF**.

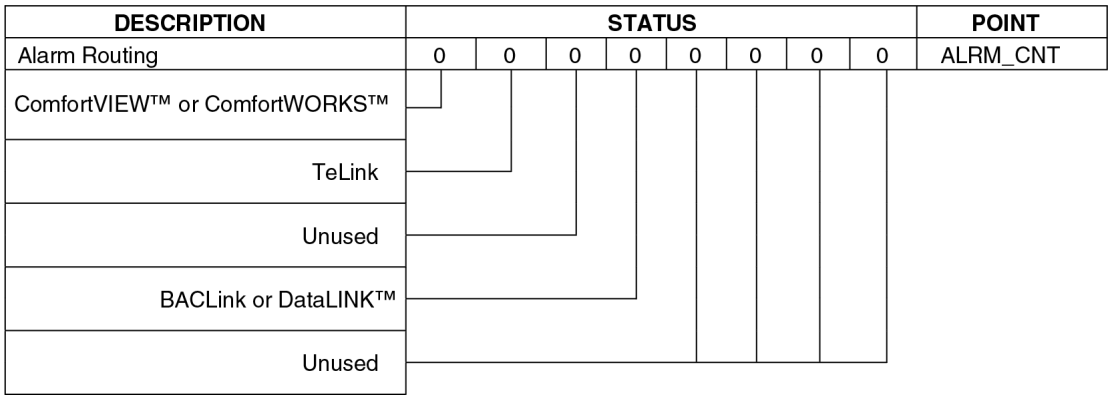


Fig. 46 — Alarm Routing Control

Head Pressure Control

STANDARD UNIT

The Carrier Controller controls the condenser fans to maintain the lowest condensing temperature possible and thus the highest unit efficiency. The Carrier Controller uses the saturated condensing temperature input from the discharge pressure transducer to control the fans. Head pressure control is maintained through a calculated setpoint which is automatically adjusted based on actual saturated condensing and saturated suction temperatures so that the compressor(s) is (are) always operating within the manufacturer's specified envelope (see Fig. 47 and 48). Each time a fan is added, the calculated head pressure setpoint will be raised 30°F (16.6°C) for 35 seconds to allow the system to stabilize. The control will automatically reduce the unit capacity as the saturated condensing temperature approaches an upper limit. See capacity overrides 16-17. The control will indicate through an operating mode that high ambient unloading is in effect. If the saturated condensing temperature in a circuit exceeds the calculated maximum, then the circuit will be stopped. For these reasons, there are no head pressure control methods or setpoints to enter. The control will turn off a fan stage when the condensing temperature is below the minimum head pressure requirement for the compressor. Fan sequences are shown in Table 40.

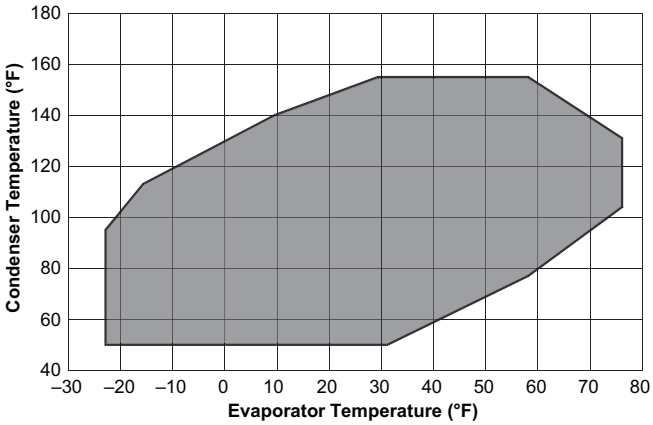


Fig. 47 — Operating Envelope in Cooling Mode R410a

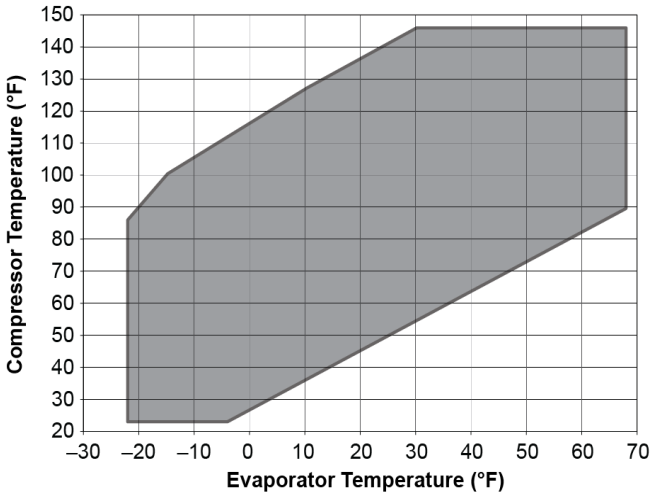
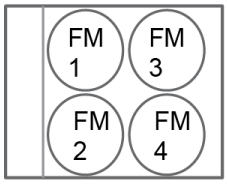
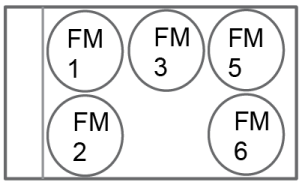
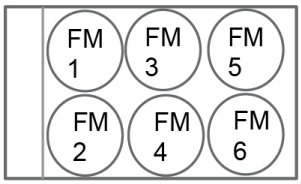
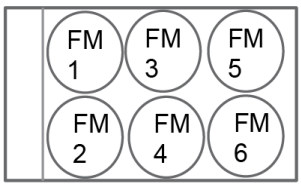
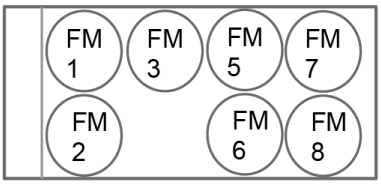
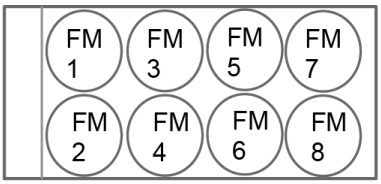


Fig. 48 — Operating Envelope in Cooling Mode R32

Table 40 — Fixed Speed Fan Sequence

FANS	CKT	065/067, 070/072, 080C, 082, 092C, 102C				
	A	Fan Stage A	1	2		
		Contactor No.	FC-1	FC-2		
		Fan Position	FM1	FM2		
		Fan Stage B	1	2		
	B	Contactor No.	FC-3	FC-4		
		Fan Position	FM3	FM4		
	080					
	A	Fan Stage A	1	2	3	
		Contactor No.	FC-1	FC-2	FC-3	
		Fan Position	FM1	FM2	FM3	
	B	Fan Stage B	1	2		
		Contactor No.	FC-5	FC-6		
		Fan Position	FM5	FM6		
	090/092, 100/102, 110/112, 132C, 152C					
	A	Fan Stage A	1	2	3	
		Contactor No.	FC-1	FC-2	FC-3	
		Fan Position	FM1	FM2	FM3	
	B	Fan Stage B	1	2	3	
		Contactor No.	FC-5	FC-6	FC-4	
		Fan Position	FM5	FM6	FM4	
	120C/122C					
	A	Fan Stage A	1	2		
		Contactor No.	FC-1	FC-2		
		Fan Position	FM1	FM2		
	B	Fan Stage B	1	2	3	4
		Contactor No.	FC-3	FC-4	FC-5	FC-6
		Fan Position	FM3	FM4	FM5	FM6
	120/122					
	A	Fan Stage A	1	2	3	
		Contactor No.	FC-1	FC-2	FC-3	
		Fan Position	FM1	FM2	FM3	
	B	Fan Stage B	1	2	3	4
		Contactor No.	FC-5	FC-6	FC-7	FC-8
		Fan Position	FM5	FM6	FM7	FM8
	130/132, 150/152					
	A	Fan Stage A	1	2	3	4
		Contactor No.	FC-1	FC-2	FC-3	FC-4
		Fan Position	FM1	FM2	FM3	FM4
	B	Fan Stage B	1	2	3	4
		Contactor No.	FC-5	FC-6	FC-7	FC-8
		Fan Position	FM5	FM6	FM7	FM8

High-Efficiency Variable Condenser Fans (HEVCF) (30RC 065-150 and 30RC 067-152 with Greenspeed® Intelligence)

This option controls the speed of all fans for improvement in part load efficiency and sound levels. All fans on a circuit are controlled by a VFD and run at the same speed.

FAN DRIVE OPERATION

The HEVCF option uses Danfoss VLT[1] 101 variable frequency drives. Drives are connected to the LEN communication bus. Fan speed is determined by the chiller controller and communicated to the drive. Table 41 lists required configurations for the Danfoss VLT HEVCF option. Fan Type, Fan Speed, Factory Country Code, and Supply Voltage are configured in the Factory Configuration screen (***Main Menu → Configuration Menu → Factory Configuration***).

Fan speed is controlled to maintain SCT setpoint. The setpoint is calculated from conditions and adjusted to the most efficient operating point. Fixed setpoints are also used at low ambient and transition conditions. If the unit is operated in Greenspeed Charging Mode (see the Refrigerant Charge section on page 90 for more information), then the SCT setpoint is fixed at 121°F (49.4°C) for adjusting charge.

Table 41 — Danfoss VLT Required Configurations, HEVCF Option

POINT NAME	DESCRIPTION	VALUE
fan_typ	Fan Type	1
fan_spd	Fan Speed	1 (1150 RPM)
country	Factory Country Code	1
Voltage	Supply Voltage	Nameplate voltage (208,380,460,575)*

*208/230-v units should be configured for 208-v.

1. VLT is a registered trademark of Danfoss Group Global.

PRE-START-UP

Complete the Start-Up Checklist for 30RC Liquid Chillers at the end of this publication. The checklist assures proper start-up of a unit and provides a record of unit condition, application requirements, system information, and operation at initial start-up.

Do not attempt to start the chiller until the following checks have been completed.

System Check

1. Check that auxiliary components, such as the chilled fluid circulating pump, air-handling equipment, or other equipment to which the chiller supplies liquid are operational. Consult manufacturer's instructions. If the unit has field-installed accessories, be sure all are properly installed and wired correctly. Refer to unit wiring diagrams.
2. Open compressor suction and discharge service valves (if equipped).
3. Open liquid line service valves.
4. Fill the chiller fluid circuit with clean water (with recommended inhibitor added) or other non-corrosive fluid to be cooled. Bleed all air out of high points of system. If outdoor temperatures are expected to be below 32°F (0°C), sufficient inhibited propylene glycol or other suitable corrosion inhibited antifreeze should be added to the chiller water circuit to prevent possible freeze-up.
   The chilled water loop must be cleaned before the unit is connected. For units equipped with the DX Cooler and Hydronic Package options, it is recommended that the chiller pumps be equipped with a start-up filter screen to remove particulates from the loop. The start-up filter should be replaced after 24 hours of operation.
5. Check tightness of all electrical connections.
6. Oil should be visible in the compressor sight glass. An acceptable oil level in the compressor is from 3/4 to 7/8 full sight glass. Adjust the oil level as required. No oil should be removed unless the crankcase heater has been energized for at least 24 hours. See Oil Charge section for Carrier-approved oils.
7. Electrical power source must agree with unit nameplate.
8. Crankcase heaters must be firmly seated under the compressor and must be energized for 24 hours prior to start-up.
9. Verify power supply phase sequence. Check reverse rotation board. If lower (red) LED is blinking, the phase sequence is incorrect. Reverse 2 of the power wires at the main terminal block. Units with dual power point connection utilize 2 reverse rotation boards. Check both for proper phase sequence.

START-UP

Actual Start-Up

Actual start-up should be done only under supervision of a qualified refrigeration technician.

1. Be sure all suction valves, discharge valves (if equipped), and liquid line service valves are open.
2. Using the Carrier Controller control, set leaving-fluid setpoint (***Main Menu → Setpoint Configuration → Cooling Setpoint 1***). No cooling range adjustment is necessary.
3. If optional control functions or accessories are being used, then the unit must be properly configured. Refer to Configuration Options section for details.
4. Start the chilled fluid pump if unit is not configured for pump control (***Main Menu → Configuration Menu → Pump Configuration → Evaporator Pumps Sequence*** = **No Pumps (0)**).
5. Complete the Start-Up Checklist to verify all components are operating properly.
6. Press the Start/Stop button located in the upper right corner of the Carrier Controller display and then select Local On.
7. Allow unit to operate and confirm that everything is functioning properly. After unit operation stabilizes, check to see that leaving setpoint Control Point (***Main Menu → Setpoint Configuration → Cooling Setpoint 1***) agrees with leaving fluid temperature (***Main Menu → Temperatures → Leaving Fluid***).

Operating Limitations

TEMPERATURES

Unit operating temperature limits are listed in the table below.

TEMPERATURE	°F	°C
Maximum Ambient Temperature	125	51.7
Minimum Ambient Temperature*	32	0
Maximum Evaporator EWT†	95	35
Maximum Evaporator LWT	70	21.1
Minimum Evaporator LWT	40**	4.4
Maximum Evaporator Glycol EWT†	95	35
Minimum Evaporator Glycol LWT (R-410A)	15††	–9.4
Minimum Evaporator Glycol LWT (R-32)	20††	–6.7

LEGEND

EWT — Entering Fluid (Water) Temperature

LWT — Leaving Fluid (Water) Temperature

* Lowest allowable ambient temperature for the standard unit to start and operate is 32°F (0°C). With the inclusion of wind baffles and variable speed fans (field fabricated and installed), the unit is capable of starting as low as 0°F (–17.8°C) and operating as low as –20°F (–29°C) ambient temperature.

† For sustained operation, EWT should not exceed 80°F (26.7°C).

** Unit requires brine fluid for operation below this temperature.

†† Only applicable to standard tier units equipped with BPHE and MCHX. Standard tier units equipped with DX cooler and MCHX allow a Minimum Evaporator Glycol LWT of 30°F (–1.1°C). Compact tier units or standard tier units equipped with RTPF condenser coils allow a Minimum Evaporator Glycol LWT of 38°F (3.3°C).

Low Ambient Temperature Operation

If unit operating temperatures below 32°F (0°C) are expected, the following measures are recommended:

- Consider higher loop volumes, 6 to 10 gallons per nominal ton.
- Loop freeze protection with glycol is strongly recommended to a minimum of 15°F (8.3°C) below lowest anticipated ambient temperature.
- Chilled water pump control is required.
- If wind velocity is expected to be greater than 5 mph (8 km/h), then the wind baffle accessory must be installed. See the 30RC Installation Instructions for more information.

VOLTAGE

Main Power Supply

Minimum and maximum acceptable supply voltages are listed in the Installation Instructions.

Unbalanced 3-Phase Supply Voltage

Never operate a motor where a phase imbalance between phases is greater than 2%.

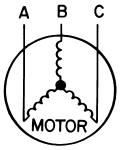
To determine percent voltage imbalance:

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

The maximum voltage deviation is the largest difference between a voltage measurement across 2 legs and the average across all 3 legs.

Example: Supply voltage is 240-3-60.

AB = 243-v
BC = 236-v
AC = 238-v



Corner Grounded Delta Supply

The optional Fan VFDs used on 30RC units are automatically compatible with a Corner Grounded Delta Power Supply to the system. No changes are required to be made to the VFDs.

1. Determine average voltage:

$$\text{Average voltage} = \frac{243 + 236 + 238}{3} = \frac{717}{3} = 239$$

2. Determine maximum deviation from average voltage:
   (AB) 243 – 239 = 4-v
   (BC) 239 – 236 = 3-v
   (AC) 239 – 238 = 1-v
   Maximum deviation is 4-v.
3. Determine percent voltage imbalance:

$$\% \text{ Voltage Imbalance} = 100 \times \frac{4}{239} = 1.7\%$$

This voltage imbalance is satisfactory as it is below the maximum allowable of 2%.

IMPORTANT: If the supply voltage phase imbalance is more than 2%, contact the local electric utility company immediately. Do not operate unit until imbalance condition is corrected.

MINIMUM FLUID LOOP VOLUME

To obtain proper temperature control, chilled water loop fluid volume must be at least 3 gallons per ton (3.25 L per kW) of chiller nominal capacity for air conditioning and at least 6 gallons per ton (6.5 L per kW) for process applications or systems that must operate at low ambient temperatures (below 32°F [0°C]). For units with partial heat recovery option, the volume of the heat recovery water loop must be as low as possible to rapidly increase the temperature at start-up. To stabilize the entering water temperature, the installation of a hot water buffer tank may be required. Refer to application information in Product Data literature for details.

FLOW RATE REQUIREMENTS

Standard chillers should be applied with nominal flow rates within those listed in the Minimum and Maximum Evaporator Flow Rates table. Higher or lower flow rates are permissible to obtain lower or higher temperature rises. Minimum flow rates must be exceeded to assure turbulent flow and proper heat transfer in the evaporator and partial heat recovery desuperheaters, if equipped. Maximum flow rates should not be exceeded so as to not fall below the minimum fluid temperature change across the heat exchangers, 5°F (2.8°C) for the evaporators and 10°F (5.6°C) for the desuperheaters. See Tables 42 and 43. See Fig. 49-53 for evaporator and partial heat recovery pressure drop curves.

⚠CAUTION

Operation below minimum flow rate could generate alarms, which could result in damage to the heat exchangers.

Consult application data section in the Product Data literature and job design requirements to determine flow rate requirements for a particular installation.

Table 42 — Minimum and Maximum Evaporator Flow Rates

UNIT SIZE	MINIMUM FLOW RATE (gpm)	MAXIMUM FLOW RATE (gpm)	MINIMUM FLOW RATE (l/s)	MAXIMUM FLOW RATE (l/s)
30RC 065/30RC 067	72	288	5	18
30RC 070/30RC 072	84	336	5	21
30RC 080/30RC 082	96	384	6	24
30RC 090/30RC 092	108	432	7	27
30RC 100/30RC 102	120	480	8	30
30RC 110/30RC 112	132	528	8	33
30RC 120/30RC 122	144	576	9	36
30RC 130/30RC 132	156	624	10	39
30RC 150/30RC 152	180	720	11	45

Table 43 — Minimum and Maximum Desuperheater Flow Rates

UNIT SIZE	MINIMUM FLOW RATE (gpm)	MAXIMUM FLOW RATE (gpm)	MINIMUM FLOW RATE (l/s)	MAXIMUM FLOW RATE (l/s)
30RC 065/30RC 067	14	72	0.9	4.5
30RC 070/30RC 072	17	84	1.1	5.3
30RC 080/30RC 082	19	96	1.2	6.1
30RC 090/30RC 092	22	108	1.4	6.8
30RC 100/30RC 102	24	120	1.5	7.6
30RC 110/30RC 112	26	132	1.7	8.3
30RC 120/30RC 122	29	144	1.8	9.1
30RC 130/30RC 132	31	156	2.0	9.8
30RC 150/30RC 152	36	180	2.3	11.4

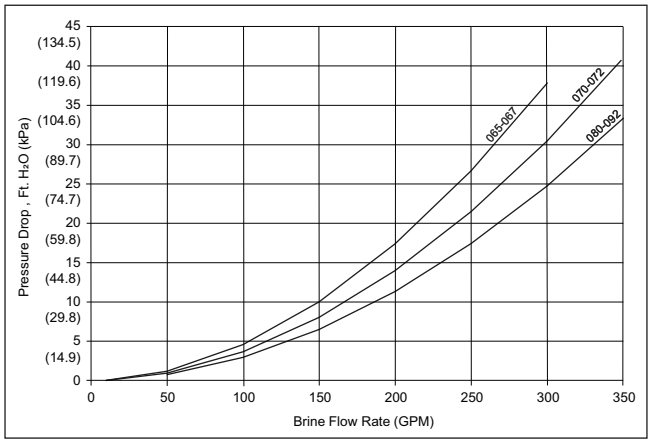


Fig. 49 — 30RC 065-092
BPHE Pressure Drop Curves

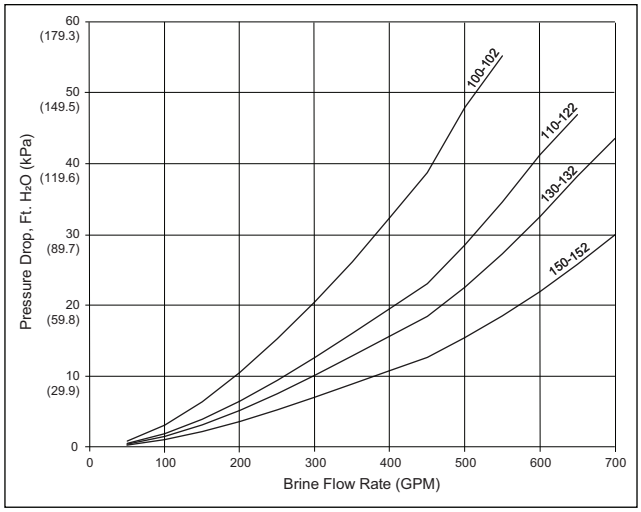


Fig. 50 — 30RC 100-152
BPHE Pressure Drop Curves

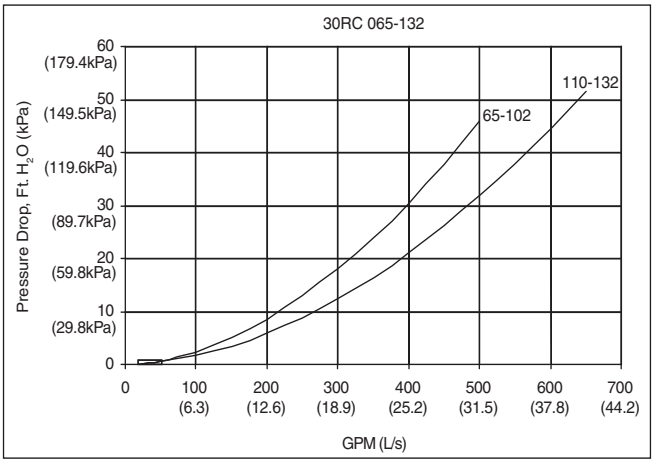


Fig. 51 — 30RC 065-132
DX Cooler Pressure Drop Curves

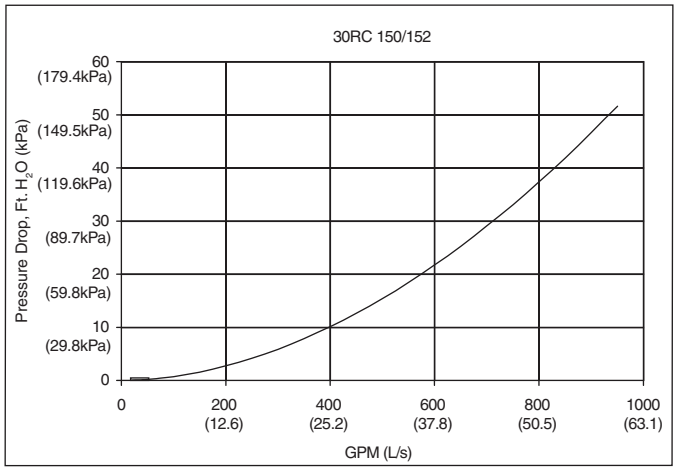


Fig. 52 — 30RC 150/152
DX Cooler Pressure Drop Curve

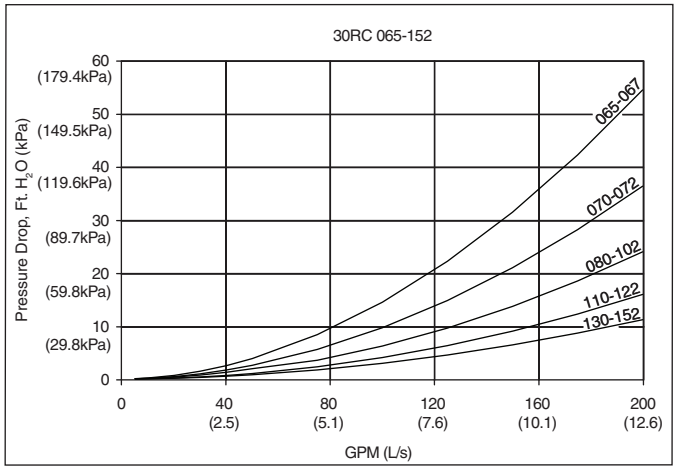


Fig. 53 — 30RC 065-152
Partial Heat Recovery Pressure Drop Curves

OPERATION

Sequence of Operation

With a command to start the chiller, the evaporator pump will start. After verifying water flow, the control will monitor the entering and leaving water temperature. At any time that a compressor is not operating, its crankcase heater is active. If the need for mechanical cooling is determined, the control decides which circuit and compressor to start. The compressor will de-energize the crankcase heater as it starts. Compressors will be staged to maintain LWT setpoint. Minimum load control (if equipped and configured) can be utilized as last stage to maintain LWT setpoint.

Shutdown of each circuit under normal conditions occurs sequentially. One compressor will be shut down every 8 to 16 seconds until all compressors have been de-energized. If minimum load control is equipped, then minimum load control will be the last stage before shutdown. The EXV will close completely 40 seconds after the last compressor has shut down. There are several abnormal conditions that, if detected, will shut down the circuit immediately. In this case, minimum load control and all compressors are turned off without an 8-second interval between them. The evaporator pump will remain ON for 1 minute after the last compressor has been turned OFF.

Dual Chiller Sequence of Operation

With a command to start the chiller, the master chiller determines which chiller will become the lead chiller based on the configuration of Lead Lag Select (**lead_sel**) and Lead/Lag Balance Delta (**ll_bal_d**). The lead chiller is always started first and the lag chiller is held at 0% capacity by the master chiller, forcing the lag demand limit value to 0%. If Lead Pulldown Time (**lead_pul**) has been configured, the lead chiller will continue to operate alone for that specified time. After the Lead Pulldown Time timer has elapsed, and when the lead chiller is fully loaded, either all available compression is on or at the master demand limit value, then the lag start timer (**lstr_tim**) is initiated.

When the pulldown time and lag start time have elapsed and the combined leaving chilled water temperature is more than 4°F (–2.2°C) above the setpoint, then the lag chiller is started. If the lag chiller's water pump was not started when the machines went into occupied mode, then the lag chiller water pump will be started. The lag chiller will start with the master chiller forcing the lag chiller demand limit value (**LAG_LIM**) to the master's demand limit value. The master will then be responsible for water loop capacity calculation and will determine which chiller (lead or lag) will increase or decrease capacity. When the load reduces, the lag chiller will be the first chiller to unload. To accomplish this, the lead chiller setpoint is decreased by 4°F (–2.2°C) until the lag chiller unloads.

PUMP OPERATION

For parallel chiller pump operation, the master chiller's water pump will be started. The lag chiller's water pump will be maintained off if Lag Unit Pump Control = 0 (***Main Menu → Configuration Menu → Master/Slave Config → Lag Unit Pump Control***). The internal algorithm of the lead chiller will control capacity of the lead chiller.

Operating Modes

Operating modes are override modes that affect normal operation of the equipment. More than one operating mode can be in effect at the same time. Some operating modes have corresponding capacity control overrides (see the Capacity Control Overrides section on page 44).

For the Carrier Controller display, the status of the operating modes can be found by accessing the Modes Menu (***Main Menu → Modes***). Each operating mode and its status (Yes = active, No = inactive) is listed. See Table 44 for a list of operating modes.

Table 44 — 30RC Operating Modes

OPERATING MODE NUMBER	DESCRIPTION	STATUS
1	Start Up Delay in Effect	Yes/No
2	Second Setpoint in Use	Yes/No
3	Reset in Effect	Yes/No
4	Demand Limit Active	Yes/No
5	Ramp Loading Active	Yes/No
6	Water Exchanger Heater	Yes/No
7	Water Pump Rotation	Yes/No
8	Pump Periodic Start	Yes/No
9	Low Suction Circuit A	Yes/No
10	Low Suction Circuit B	Yes/No
11	High DGT Circuit A	Yes/No
12	High DGT Circuit B	Yes/No
13	High Press Override CirA	Yes/No
14	High Press Override CirB	Yes/No
15	Low Delta Press Cir A	Yes/No
16	Low Delta Press Cir B	Yes/No
17	Night Low Noise Active	Yes/No
18	System Manager Active	Yes/No
19	Master Slave Active	Yes/No
20	Auto Changeover Active	Yes/No
21	Defrost Active Circuit A	Yes/No
22	Defrost Active Circuit B	Yes/No
23	Boiler Active	Yes/No
24	Electric Heater Active	Yes/No
25	Heating Low EWT Lockout	Yes/No
26	Ice Mode in Effect	Yes/No
27	Fast Capacity Recovery	Yes/No

STARTUP DELAY IN EFFECT

This mode is checked for when the unit is started. This mode is active when the Minutes Off Time (***Main Menu → Configuration Menu → General Configuration → Unit Off to On Delay***) timer is active. The unit will not start until the timer has expired. The mode will terminate when the timer expires.

SECOND SETPOINT IN USE

This mode is checked for when the unit is ON. The mode is active when Cooling Setpoint 2 (***Main Menu → Setpoint Configuration → Cooling Setpoint 2***) or Cooling Ice Setpoint (***Main Menu → Setpoint Configuration → Cooling Ice Setpoint***) is in use. While in this mode, the Current Setpoint (***Main Menu → General Parameters → Current Setpoint***) will show the Cooling Setpoint 2 or Cooling Ice Setpoint value.

While in this mode, the unit will operate to the Cooling Setpoint 2 or Cooling Ice Setpoint. The mode will terminate when the second setpoint is no longer in use.

RESET IN EFFECT

This mode is checked for when the unit is ON. The mode will be active when Cooling Reset Select (***Main Menu → Configuration Menu → Reset Configuration → Cooling Reset Select***) is enabled by setting the value (1 = Outside Air Temperature, 2 = Fluid Delta T, 3 = 4 to 20 mA Input, 4 = Space Temperature) and reset is active.

While in this mode, the Current Setpoint (***Main Menu → General Parameters → Current Setpoint***) will be modified according to the programmed information and will be displayed as the Control Point (***Main Menu → General Parameters → Control Point***). The mode will terminate when the Temperature Reset is not modifying the active leaving water setpoint, causing the Current Setpoint to equal the Control Point.

DEMAND LIMIT ACTIVE

This mode is checked for when the unit is ON. The mode is active when Demand Limit Type Select (***Main Menu → Configuration Menu → General Configuration → Demand Limit Type Select***) is enabled, either by setting the value to 1 = Switch Control or 2 = 4 to 20 mA Control or setting the Night Capacity Limit (***Main Menu → Configuration Menu → General Configuration → Night Capacity Limit***). The Active Demand Limit Value (***Main Menu → General Parameters → Active Demand Limit Value***) will display the current demand limit according to the programmed information, and the unit's capacity will be reduced to the amount shown or lower. The mode will terminate when the Demand Limit command has been removed.

RAMP LOADING ACTIVE

This mode is tested when the unit is ON. This mode is active when Ramp Loading (***Main Menu → Configuration Menu → General Configuration → Ramp Loading Select***) is enabled and the following conditions are met:

1. The leaving water temperature is more than 4°F (2.2°C) from the Control Point (***Main Menu → General Parameters → Control Point***), and
2. The rate of change of the leaving water temperature is greater than the Cool Ramp Loading (***Main Menu → Setpoint Configuration → Cooling Ramp Loading***).

The control will limit the capacity step increase until one of the 2 conditions is no longer true. This mode will terminate once both conditions are no longer true. This mode is in effect only when capacity is being limited by the ramp loading function.

WATER EXCHANGER HEATER

This mode is tested when unit is ON or OFF. This mode is active when the water exchanger heater is energized, if the Outdoor Air Temperature (***Main Menu → Temperatures → Outdoor Air Temp***) is less than the calculated value (Freeze Setpoint + Water Exchanger Heater Delta T Setpoint [***Main Menu → Configuration Menu → Service Configuration → Exch. Heater Delta Spt***] default – 3.4°F [1.9°C]) and either the Leaving Water Temperature (***Main Menu → Temperatures → Leaving Fluid Temp***) or the Entering Water Temperature (***Main Menu → Temperatures → Entering Fluid Temp***) are less than or equal to the Freeze Setpoint + Water Exchanger Heater Delta T Setpoint.

The Freeze Setpoint is 34°F (1.1°C) for comfort cooling units with fresh water or 32°F (0°C) for comfort cooling units with glycol (***Main Menu → Configuration Menu → Service Configuration → Glycol in Loop* = Yes**). The Exchanger Fluid Type (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type***) is 1 for both of the above. The Freeze Setpoint is the Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) for Low Temperature Brine systems (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type* = 3**).

The water exchanger heater will be de-energized when both the Entering Water Temperature (EWT) and Leaving Water Temperature (LWT) are above the Freeze Setpoint + Water Exchanger Heater Delta T Setpoint. This mode will be enabled for freeze protection. If the temperatures are not as described above, check the accuracy of the outside air, entering, and leaving water thermistors

WATER PUMP ROTATION

This mode is always checked. The mode is active when the Evaporator Pump Sequence (***Main Menu → Configuration Menu → Pump Configuration → Evaporator Pumps Sequence***) value is set to 2 = Two Pumps Automatic Changeover and the Pump Auto Rotation Delay (***Main Menu → Configuration Menu → Pump Configuration → Pump Auto Rotation Delay)*** has expired. The control will switch the operation of the pumps. The lead pump will operate normally. The lag pump will be started, becoming the lead, and then the original lead pump will be shut down. This mode will terminate when the pump operation has been completed.

PUMP PERIODIC START

This mode is active when the evaporator pump is started due to the periodic pump start configuration (***Main Menu → Configuration Menu → Pump Configuration → Pump Sticking Protection* = YES**). If the pump has not run that day, a pump will be started and will run for 2 seconds at 2:00 PM. If the machine is configured for dual pumps, Pump 1 will run on even days (such as day 2, 4, and 6 of the month). Pump 2 will run on odd days (such as day 1, 3, and 5 of the month). The mode will terminate when the pump shuts down.

LOW SUCTION CIRCUIT A

LOW SUCTION CIRCUIT B

The criteria are tested when the circuit is ON. The appropriate circuit mode will be active if one of the following conditions is true:

1. The circuit's Saturated Suction Temperature (SST) is more than 6°F (3.3°C) less than the freeze point and both the cooler approach (Leaving Water Temperature SST) and superheat (Suction Gas Temperature SST) are greater than 15°F (8.3°C).
2. There is more than one compressor ON in the circuit and the circuit's SST is greater than 18°F (10.0°C) below the freeze point for more than 90 seconds.
3. There is more than one compressor ON in the circuit, the circuit's SST is greater than –4°F (–20.0°C), and the SST 30 seconds ago was 18°F (10.0°C) below the freeze point.
4. The circuit's saturated suction temperature is greater than 6°F (3.3°C) below the freeze point for more than 3 minutes.

The freeze setpoint is 34°F (1.1°C) for comfort cooling units with fresh water or 32°F (0°C) for comfort cooling units with glycol (***Main Menu → Configuration Menu → Service Configuration → Glycol in Loop* = Yes**). The Exchanger Fluid Type (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type***) is 1 for both of the above. For low temperature brine systems, (***Main Menu → Configuration Menu → Factory Configuration → Exchanger Fluid Type* = 3**), the freeze point is Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***).

For criterion 1, no additional stages will be added. For criteria 2, 3 and 4, one stage of capacity will be removed.

The mode will terminate when the circuit's Saturated Suction Temperature is greater than the freeze point minus 6°F (3.3°C) or the circuit has alarmed.

HIGH DGT CIRCUIT A

HIGH DGT CIRCUIT B

This mode is tested for when any circuit is running. The circuit saturated condensing and suction temperatures are monitored to ensure that the compressors always operate within their allowed "map." Operation at conditions at or outside the "map" boundaries will cause this mode to be in effect. Operation at extremely low suction pressures and high condensing temperatures will cause the mode to be generated. The circuit will not be allowed to increase capacity and may be automatically unloaded or stopped.

This mode will terminate when or if the circuit refrigerant conditions return to within the compressor "map."

This mode could be in effect due to a low fluid flow rate, overcharge of oil in a circuit, dirty condenser coils, refrigerant overcharge, or excessive brine concentration.

HIGH PRESS OVERRIDE CIR A

HIGH PRESS OVERRIDE CIR B

Tested when the circuit is ON. The appropriate circuit mode will be active if the discharge pressure for the circuit, Discharge Pressure Circuit A (***Main Menu → Pressures → Discharge Pressure A***) or Discharge Pressure Circuit B (***Main Menu → Pressures → Discharge Pressure B***), is greater than the High Pressure Threshold (***Main Menu → Configuration Menu → Service Configuration → High Pressure Threshold***).

The capacity of the affected circuit will be reduced. Two minutes after the capacity reduction, the circuit's saturated condensing temperature (SCT) is calculated and stored. The affected circuit will not be allowed to add capacity for at least 5 minutes following the capacity reduction. If, after 5 minutes, the circuit's saturated condensing temperature is less than SCT minus 3°F (1.7°C), then if required, another stage of capacity will be added. If additional steps of capacity are required, then the control will look for other circuits to add capacity. This mode will terminate once the circuit's saturated condensing temperature is less than SCT minus 3°F (1.7°C).

LOW DELTA PRESS CIR A

LOW DELTA PRESS CIR B

Tested when the circuit is ON. The appropriate circuit mode will be active when the difference between the suction pressure for the circuit, Main Suction Pressure Circuit A (***Main Menu → Pressures → Main Suction Pressure A***) or Main Suction Pressure Circuit B (***Main Menu → Pressures → Main Suction Pressure B***), and the discharge pressure for the circuit, Discharge Pressure A (***Main Menu → Pressures → Discharge Pressure A***) or Discharge Pressure Circuit B (***Main Menu → Pressures → Discharge Pressure B***), meets one of the following conditions:

1. The pressure difference is below 43.5 psi (300 kPa) for more than 15 consecutive minutes.
2. The pressure difference is below 29.0 psi (200 kPa) for more than 5 consecutive minutes.

In either condition, the affected circuit compressors will be stopped.

This mode is terminated when the timer is reset to 0 minutes. For condition 1, the timer is reset to 0 when the pressure difference rises above 44.96 psi. For condition 2, the timer resets to 0 when the pressure difference rises above 30.45 psi.

NIGHT LOW NOISE ACTIVE

This mode is active when the Night Time Low Noise Option has been configured and the time is within the configured time. Programming a Night Low Noise Start Time (***Main Menu → Configuration Menu → General Configuration → Night Mode Start Hour***) and a Night Low Noise End Time (***Main Menu → Configuration Menu → General Configuration → Night Mode End Hour***) configures the option. The control will raise the head pressure setpoint to reduce the number of condenser fans on, thereby reducing the sound of the machine. Additionally, if the Night Time Low Sound Capacity Limit (***Main Menu → Configuration Menu → General Configuration → Night Capacity Limit***) has been configured, the unit capacity will be limited to the programmed level. This mode will terminate once the Night Low Noise End Time has been reached. This mode is in effect only due to programming options.

SYSTEM MANAGER ACTIVE

Tested when the unit is ON or OFF. This mode is active if a System Manager, such as Building Supervisor, ChillerVu System Manager, or another CCN device, is controlling the machine. The machine will respond to the specific command received from the System Manager. The mode will be terminated if the System Manager control is released. This mode is in effect only due to programming options.

MASTER SLAVE ACTIVE

This mode is checked for if the machine is ON. This mode is active if Master Slave Control has been enabled. This occurs when 2 machines are programmed, one as the master (***Main Menu → Configuration Menu → Master/Slave Config → Master/Slave Select*** **= Master [1])** and the other as a slave (***Main Menu → Configuration Menu → Master/Slave Config → Master/Slave Select*** **= Slave [2]**). Both the master and slave machines will respond to the capacity control commands issued by the master controller. This may include control point changes and demand limit commands. This mode will terminate when Master Slave Control has been disabled (***Main Menu → Configuration Menu → Master Slave Config → Master/Slave Select*** **= Disable [0]**).

AUTOCHANGEOVER ACTIVE

This mode is not supported for Cooling Only units. This mode is in effect only due to programming options.

DEFROST ACTIVE CIRCUIT A

DEFROST ACTIVE CIRCUIT B

This mode is not supported for Cooling Only units. This mode is in effect only due to programming options.

BOILER ACTIVE

This mode is not supported for Cooling Only units. This mode is in effect only due to programming options.

ELECTRIC HEAT ACTIVE

This mode is not supported for Cooling Only units. This mode is in effect only due to programming options.

HEATING LOW EWT LOCKOUT

This mode is not supported for Cooling Only units. This mode is in effect only due to programming options.

ICE MODE IN EFFECT

This mode is checked for when the unit is ON. This mode is active when the Cooling Ice Setpoint (***Main Menu → Setpoint Configuration → Cooling Ice Setpoint***) is in use. While in this mode, the Current Setpoint (***Main Menu → General Parameters → Current Setpoint***) will show the Cooling Ice Setpoint value, and the unit will operate to that value. This mode will terminate when the Cooling Ice Setpoint is no longer in use (ICE DONE switch is closed).

FAST CAPACITY RECOVERY

This mode is checked for when the unit is started. This mode is active when the Fast Capacity Recovery function (***Main Menu → Configuration Menu → Service Configuration → Fast Capacity Recovery***) is active. The unit will bypass the Minimum On/Off and Off/On Time Delay override and reduce time between compressor starts.

Sensors

The electronic control uses up to 11 thermistors to sense temperatures and up to 4 transducers to sense pressure for controlling chiller operation. These sensors are outlined below.

THERMISTORS

See Tables 45-49. Thermistors that monitor the chiller's operation include: evaporator entering water, evaporator leaving water, dual chiller leaving water, compressor suction gas temperature, compressor discharge gas temperature, and Outdoor Air Temperature thermistors. These thermistors, except for the compressor discharge gas temperature, are 5,000 ohms at 77°F (25°C) and are identical in temperature versus resistance. The compressor discharge gas temperature thermistor is 100,000 ohms at 77°F (25°C) and has a different temperature vs. resistance. Additionally, the space temperature thermistor is 10,000 ohms at 77°F (25°C) and has a different temperature vs. resistance. See Fig. 54 for thermistor locations.

Evaporator Leaving Water Sensor (LWT)

On all sizes, this thermistor is installed in a threaded well in the leaving water nozzle of the evaporator. See Fig. 55.

Evaporator Entering Water Sensor (EWT)

On all sizes, this thermistor is factory installed in a threaded well in the entering water nozzle of the evaporator.

Suction Gas Temperature (SGT)

On all sizes, this thermistor is factory installed in a threaded well located on the compressor of each circuit. There is one thermistor for each circuit.

Compressor Discharge Gas Temperature (DGT)

On all sizes, this thermistor is factory installed in a threaded well located in the discharge end of the compressor for the circuit. There is one thermistor for each circuit.

Outdoor Air Temperature (OAT)

This sensor is factory installed to the back of the control box.

Space Temperature

This sensor (part no. 33ZCT55SPT) is a field-installed accessory mounted in the indoor space and is used for water temperature reset. The sensor should be installed as a wall-mounted thermostat would be (in the conditioned space where it will not be subjected to either a cooling or heating source or direct exposure to sunlight, and 4 to 5 ft above the floor).

Space temperature sensor wires are to be connected to terminals in the unit main control box. See Fig. 56. The space temperature sensor includes a terminal block (SEN) and a RJ11 female connector. The RJ11 connector is used as access into the Carrier Comfort Network® at the sensor.

To connect the space temperature sensor (see Fig. 56):

1. Using a 20 AWG twisted pair conductor cable rated for the application, connect one wire of the twisted pair to one SEN terminal and connect the other wire to the other SEN terminal located under the cover of the space temperature sensor.
2. Connect the other ends of the wires to terminals 7 and 8 on TB6 located in the unit control box.

Units on the CCN can be monitored from the space at the sensor through the RJ11 connector, if desired. To wire the RJ11 connector into the CCN:

1. Cut the CCN wire and strip ends of the red (+), white (ground), and black (–) conductors. (If another wire color scheme is used, strip ends of appropriate wires.)
2. Insert and secure the red (+) wire to terminal 5 of the space temperature sensor terminal block.
3. Insert and secure the white (ground) wire to terminal 4 of the space temperature sensor.
4. Insert and secure the black (–) wire to terminal 2 of the space temperature sensor.
5. Connect the other end of the communication bus cable to the remainder of the CCN communication bus.

NOTE: The EMM is required for this accessory.

Table 45 — Thermistor Identification

THERMISTOR ID	DESCRIPTION	RESISTANCE AT 77°F (25°C)	CONNECTION POINT
EWT	Entering Water Temperature Thermistor	5k Ω	SIOBA-J25-AI01
LWT	Leaving Water Temperature Thermistor	5k Ω	SIOBA-J25-AI02
OAT	Outdoor Air Temperature Thermistor	5k Ω	SIOBA-J25-AI03
SGTA	Circuit A Suction Gas Temperature Thermistor	5k Ω	SIOBA-J25-AI04
SGTB	Circuit B Suction Gas Temperature Thermistor	5k Ω	SIOBB-J25-AI04
DGTA*	Circuit A Discharge Gas Temperature Thermistor	100k Ω	SIOBB-J25-AI02
DGTB*	Circuit B Discharge Gas Temperature Thermistor	100k Ω	SIOBB-J25-AI03
DUAL CHILLER	Dual Chiller Leaving Water Temperature Thermistor	5k Ω	SIOBB-J25-AI01
SPT	Space Temperature Thermistor	10k Ω	EMM-J25-AI01

* Only applicable for units equipped with R-32 refrigerant.

Table 46 — 5K Thermistor Temperature vs. Resistance

°F	°C	RESISTANCE (Ohms)
–40	–40	166,781
–38	–39	156,158
–36	–38	146,275
–35	–37	137,078
–33	–36	128,514
–31	–35	120,536
–29	–34	113,101
–27	–33	106,170
–26	–32	99,705
–24	–31	93,672
–22	–30	88,041
–20	–29	82,781
–18	–28	77,868
–17	–27	73,275
–15	–26	68,980
–13	–25	64,963
–11	–24	61,203
–9	–23	57,683
–8	–22	54,387
–6	–21	51,299
–4	–20	48,404
–2	–19	45,689
0	–18	43,143
1	–17	40,754
3	–16	38,511
5	–15	36,404
7	–14	34,426
9	–13	32,566
10	–12	30,818
12	–11	29,173
14	–10	27,626
16	–9	26,171
18	–8	24,800
19	–7	23,509
21	–6	22,292
23	–5	21,146
25	–4	20,065
27	–3	19,045
28	–2	18,084
30	–1	17,177
32	0	16,320
34	1	15,511
36	2	14,746
37	3	14,024
39	4	13,341
41	5	12,695
43	6	12,084
45	7	11,506
46	8	10,959
48	9	10,441
50	10	9,951
52	11	9,486
54	12	9,046
55	13	8,628
57	14	8,232
59	15	7,857
61	16	7,500
63	17	7,152
64	18	6,841
66	19	6,536
68	20	6,247
70	21	5,972
72	22	5,710
73	23	5,461

Table 46 — 5K Thermistor Temperature vs. Resistance (cont)

°F	°C	RESISTANCE (Ohms)
75	24	5,225
77	25	5,000
79	26	4,786
81	27	4,582
82	28	4,389
84	29	4,204
86	30	4,028
88	31	3,860
90	32	3,701
91	33	3,549
93	34	3,403
95	35	3,265
97	36	3,133
99	37	3,007
100	38	2,887
102	39	2,772
104	40	2,662
106	41	2,558
108	42	2,458
109	43	2,362
111	44	2,271
113	45	2,183
115	46	2,100
117	47	2,020
118	48	1,943
120	49	1,870
122	50	1,800
124	51	1,733
126	52	1,669
127	53	1,608
129	54	1,549
131	55	1,492
133	56	1,438
135	57	1,386
136	58	1,337
138	59	1,289
140	60	1,243
142	61	1,199
144	62	1,157
145	63	1,117
147	64	1,078
149	65	1,041
151	66	1,005
153	67	971
154	68	938
156	69	906
158	70	876
160	71	846
162	72	818
163	73	791
165	74	765
167	75	740
169	76	716
171	77	692
172	78	670
174	79	649
176	80	628
178	81	608
180	82	589
181	83	570
183	84	552
185	85	535
187	86	518
189	87	502

Table 46 — 5K Thermistor Temperature vs. Resistance (cont)

°F	°C	RESISTANCE (Ohms)
190	88	487
192	89	472
194	90	458
196	91	444
198	92	431
199	93	418
201	94	405
203	95	393
205	96	382
207	97	370
208	98	360
210	99	349
212	100	339
214	101	329
216	102	320
217	103	311
219	104	302
221	105	293
223	106	285
225	107	277
226	108	269
228	109	262
230	110	255
232	111	248
234	112	241
235	113	234
237	114	228
239	115	222
241	116	216
243	117	210
244	118	205
246	119	199
248	120	194
250	121	189
252	122	184
253	123	179
255	124	175
257	125	170
259	126	166
261	127	162
262	128	157
264	129	154
266	130	150
268	131	146
270	132	142
271	133	139
273	134	135
275	135	132
277	136	129
279	137	126
280	138	123
282	139	120
284	140	117
286	141	114
288	142	111
289	143	109
291	144	106
293	145	104
295	146	101
297	147	99
298	148	97
300	149	94
302	150	92

Table 47 — 10K Thermistor Temperature (°F) vs Resistance

TEMP (°F)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
–25	4.758	196,453
–24	4.750	189,692
–23	4.741	183,300
–22	4.733	177,000
–21	4.724	171,079
–20	4.715	165,238
–19	4.705	159,717
–18	4.696	154,344
–17	4.686	149,194
–16	4.676	144,250
–15	4.665	139,443
–14	4.655	134,891
–13	4.644	130,402
–12	4.633	126,183
–11	4.621	122,018
–10	4.609	118,076
–9	4.597	114,236
–8	4.585	110,549
–7	4.572	107,006
–6	4.560	103,558
–5	4.546	100,287
–4	4.533	97,060
–3	4.519	94,020
–2	4.505	91,019
–1	4.490	88,171
0	4.476	85,396
1	4.461	82,729
2	4.445	80,162
3	4.429	77,662
4	4.413	75,286
5	4.397	72,940
6	4.380	70,727
7	4.363	68,542
8	4.346	66,465
9	4.328	64,439
10	4.310	62,491
11	4.292	60,612
12	4.273	58,781
13	4.254	57,039
14	4.235	55,319
15	4.215	53,693
16	4.195	52,086
17	4.174	50,557
18	4.153	49,065
19	4.132	47,627
20	4.111	46,240
21	4.089	44,888
22	4.067	43,598
23	4.044	42,324
24	4.021	41,118
25	3.998	39,926
26	3.975	38,790
27	3.951	37,681
28	3.927	36,610
29	3.903	35,577
30	3.878	34,569
31	3.853	33,606
32	3.828	32,654
33	3.802	31,752
34	3.776	30,860
35	3.750	30,009
36	3.723	29,177

Table 47 — 10K Thermistor Temperature (°F) vs Resistance (cont)

TEMP (°F)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
37	3.697	28,373
38	3.670	27,597
39	3.654	26,838
40	3.615	26,113
41	3.587	25,396
42	3.559	24,715
43	3.531	24,042
44	3.503	23,399
45	3.474	22,770
46	3.445	22,161
47	3.416	21,573
48	3.387	20,998
49	3.357	20,447
50	3.328	19,903
51	3.298	19,386
52	3.268	18,874
53	3.238	18,384
54	3.208	17,904
55	3.178	17,441
56	3.147	16,991
57	3.117	16,552
61	2.994	14,925
62	2.963	14,549
63	2.932	14,180
64	2.901	13,824
65	2.870	13,478
66	2.839	13,139
67	2.808	12,814
68	2.777	12,493
69	2.746	12,187
70	2.715	11,884
71	2.684	11,593
72	2.653	11,308
73	2.622	11,031
74	2.592	10,764
75	2.561	10,501
76	2.530	10,249
77	2.500	10,000
78	2.470	9,762
79	2.439	9,526
80	2.409	9,300
81	2.379	9,078
82	2.349	8,862
83	2.319	8,653
84	2.290	8,448
85	2.260	8,251
86	2.231	8,056
87	2.202	7,869
88	2.173	7,685
89	2.144	7,507
90	2.115	7,333
91	2.087	7,165
92	2.059	6,999
93	2.030	6,838
94	2.003	6,683
95	1.975	6,530
96	1.948	6,383
97	1.921	6,238
98	1.894	6,098
99	1.867	5,961
100	1.841	5,827
101	1.815	5,698
102	1.789	5,571

Table 47 — 10K Thermistor Temperature (°F) vs Resistance (cont)

TEMP (°F)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
103	1.763	5,449
104	1.738	5,327
105	1.713	5,210
106	1.688	5,095
107	1.663	4,984
108	1.639	4,876
109	1.615	4,769
110	1.591	4,666
111	1.567	4,564
112	1.544	4,467
113	1.521	4,370
114	1.498	4,277
115	1.475	4,185
116	1.453	4,096
117	1.431	4,008
118	1.409	3,923
119	1.387	3,840
120	1.366	3,759
121	1.345	3,681
122	1.324	3,603
123	1.304	3,529
124	1.284	3,455
125	1.264	3,383
126	1.244	3,313
127	1.225	3,244
128	1.206	3,178
129	1.187	3,112
130	1.168	3,049
131	1.150	2,986
132	1.132	2,926
133	1.114	2,866
134	1.096	2,809
135	1.079	2,752
136	1.062	2,697
137	1.045	2,643
138	1.028	2,590
139	1.012	2,539
140	0.996	2,488
141	0.980	2,439
142	0.965	2,391
143	0.949	2,343
147	0.890	2,166
148	0.876	2,124
149	0.862	2,083
150	0.848	2,043
151	0.835	2,003
152	0.821	1,966
153	0.808	1,928
154	0.795	1,891
155	0.782	1,855
156	0.770	1,820
157	0.758	1,786
158	0.745	1,752
159	0.733	1,719
160	0.722	1,687
161	0.710	1,656
162	0.699	1,625
163	0.687	1,594
164	0.676	1,565
165	0.666	1,536
166	0.655	1,508
167	0.645	1,480
168	0.634	1,453

Table 47 — 10K Thermistor Temperature (°F) vs Resistance (cont)

TEMP (°F)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
169	0.624	1,426
170	0.614	1,400
171	0.604	1,375
172	0.595	1,350
173	0.585	1,326
174	0.576	1,302
175	0.567	1,278
176	0.558	1,255
177	0.549	1,233
178	0.540	1,211
179	0.532	1,190
180	0.523	1,169
181	0.515	1,148
182	0.507	1,128
183	0.499	1,108
184	0.491	1,089
185	0.483	1,070
186	0.476	1,052
187	0.468	1,033

Table 47 — 10K Thermistor Temperature (°F) vs Resistance (cont)

TEMP (°F)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
188	0.461	1,016
189	0.454	998
190	0.447	981
191	0.440	964
192	0.433	947
193	0.426	931
194	0.419	915
195	0.413	900
196	0.407	885
197	0.400	870
198	0.394	855
199	0.388	841
200	0.382	827
201	0.376	814
202	0.370	800
203	0.365	787
204	0.359	774
205	0.354	762
206	0.349	749

Table 47 — 10K Thermistor Temperature (°F) vs Resistance (cont)

TEMP (°F)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
207	0.343	737
208	0.338	725
209	0.333	714
210	0.328	702
211	0.323	691
212	0.318	680
213	0.314	670
214	0.309	659
215	0.305	649
216	0.300	639
217	0.296	629
218	0.292	620
219	0.288	610
220	0.284	601
221	0.279	592
222	0.275	583
223	0.272	574
224	0.268	566
225	0.264	557

Table 48 — 10K Thermistor Temperature (°C) vs Resistance

TEMP (°C)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
–32	4.762	200,510
–31	4.748	188,340
–30	4.733	177,000
–29	4.716	166,342
–28	4.700	156,404
–27	4.682	147,134
–26	4.663	138,482
–25	4.644	130,402
–24	4.624	122,807
–23	4.602	115,710
–22	4.580	109,075
–21	4.557	102,868
–20	4.533	97,060
–19	4.508	91,588
–18	4.482	86,463
–17	4.455	81,662
–16	4.426	77,162
–15	4.397	72,940
–14	4.367	68,957
–13	4.335	65,219
–12	4.303	61,711
–11	4.269	58,415
–10	4.235	55,319
–9	4.199	52,392
–8	4.162	49,640
–7	4.124	47,052
–6	4.085	44,617
–5	4.044	42,324
–4	4.003	40,153
–3	3.961	38,109
–2	3.917	36,182
–1	3.873	34,367
0	3.828	32,654
1	3.781	31,030
2	3.734	29,498
3	3.686	28,052
4	3.637	26,686
5	3.587	25,396
6	3.537	24,171
7	3.485	23,013
8	3.433	21,918
9	3.381	20,883
10	3.328	19,903
11	3.274	18,972
12	3.220	18,090
13	3.165	17,255
14	3.111	16,464

Table 48 — 10K Thermistor Temperature (°C) vs Resistance (cont)

TEMP (°C)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
15	3.056	15,714
16	3.000	15,000
17	2.944	14,323
18	2.889	13,681
19	2.833	13,071
20	2.777	12,493
21	2.721	11,942
22	2.666	11,418
23	2.610	10,921
24	2.555	10,449
25	2.500	10,000
26	2.445	9,571
27	2.391	9,164
28	2.337	8,776
29	2.284	8,407
30	2.231	8,056
31	2.178	7,720
32	2.127	7,401
33	2.075	7,096
34	2.025	6,806
35	1.975	6,530
36	1.926	6,266
37	1.878	6,014
38	1.830	5,774
39	1.784	5,546
40	1.738	5,327
41	1.692	5,117
42	1.648	4,918
43	1.605	4,727
44	1.562	4,544
45	1.521	4,370
46	1.480	4,203
47	1.439	4,042
48	1.400	3,889
49	1.362	3,743
50	1.324	3,603
51	1.288	3,469
52	1.252	3,340
53	1.217	3,217
54	1.183	3,099
55	1.150	2,986
56	1.117	2,878
57	1.086	2,774
58	1.055	2,675
59	1.025	2,579
60	0.996	2,488
61	0.968	2,400

Table 48 — 10K Thermistor Temperature (°C) vs Resistance (cont)

TEMP (°C)	VOLTAGE DROP (V)	RESISTANCE (Ohms)
62	0.940	2,315
63	0.913	2,235
64	0.887	2,157
65	0.862	2,083
66	0.837	2,011
67	0.813	1,943
68	0.790	1,876
69	0.767	1,813
70	0.745	1,752
71	0.724	1,693
72	0.703	1,637
73	0.683	1,582
74	0.663	1,530
75	0.645	1,480
76	0.626	1,431
77	0.608	1,385
78	0.591	1,340
79	0.574	1,297
80	0.558	1,255
81	0.542	1,215
82	0.527	1,177
83	0.512	1,140
84	0.497	1,104
85	0.483	1,070
86	0.470	1,037
87	0.457	1,005
88	0.444	974
89	0.431	944
90	0.419	915
91	0.408	889
92	0.396	861
93	0.386	836
94	0.375	811
95	0.365	787
96	0.355	764
97	0.345	742
98	0.336	721
99	0.327	700
100	0.318	680
101	0.310	661
102	0.302	643
103	0.294	626
104	0.287	609
105	0.279	592
106	0.272	576
107	0.265	561

Table 49 — 100K Thermistor Temperature (°F and °C) vs Resistance

TEMP (°F)	TEMP (°C)	RESISTANCE (KOhms)
–40.0	–40	3216
–38.2	–39	3016
–36.4	–38	2829
–34.6	–37	2655
–32.8	–36	2493
–31.0	–35	2342
–29.2	–34	2200
–27.4	–33	2068
–25.6	–32	1944
–23.8	–31	1829
–22.0	–30	1721
–20.2	–29	1620
–18.4	–28	1526
–16.6	–27	1437
–14.8	–26	1354
–13.0	–25	1277
–11.2	–24	1204
–9.4	–23	1136
–7.6	–22	1072
–5.8	–21	1012
–4.0	–20	955.4
–2.2	–19	902.5
–0.4	–18	852.8
1.4	–17	806.2
3.2	–16	762.3
5.0	–15	721.1
6.8	–14	682.4
8.6	–13	645.9
10.4	–12	611.6
12.2	–11	579.3
14.0	–10	548.8
15.8	–9	520.2
17.6	–8	493.2
19.4	–7	467.7
21.2	–6	443.7
23.0	–5	421.1
24.8	–4	399.7
26.6	–3	379.5
28.4	–2	360.5
30.2	–1	342.5
32.0	0	325.5
33.8	1	309.5
35.6	2	294.3
37.4	3	280
39.2	4	266.4
41.0	5	253.6
42.8	6	241.4
44.6	7	229.9
46.4	8	219
48.2	9	208.7
50.0	10	198.9
51.8	11	189.7
53.6	12	180.9
55.4	13	172.5
57.2	14	164.6
59.0	15	157.1
60.8	16	150
62.6	17	143.3
64.4	18	136.8
66.2	19	130.7
68.0	20	125
69.8	21	119.4
71.6	22	114.2

Table 49 — 100K Thermistor Temperature (°F and °C) vs Resistance (cont)

TEMP (°F)	TEMP (°C)	RESISTANCE (KOhms)
73.4	23	109.2
75.2	24	104.5
77.0	25	100
78.8	26	95.71
80.6	27	91.63
82.4	28	87.75
84.2	29	84.05
86.0	30	80.53
87.8	31	77.17
89.6	32	73.97
91.4	33	70.92
93.2	34	68.01
95.0	35	65.23
96.8	36	62.58
98.6	37	60.06
100.4	38	57.65
102.2	39	55.34
104.0	40	53.14
105.8	41	51.04
107.6	42	49.04
109.4	43	47.12
111.2	44	45.29
113.0	45	43.54
114.8	46	41.86
116.6	47	40.26
118.4	48	38.73
120.2	49	37.26
122.0	50	35.86
123.8	51	34.51
125.6	52	33.23
127.4	53	31.99
129.2	54	30.81
131.0	55	29.68
132.8	56	28.6
134.6	57	27.56
136.4	58	26.56
138.2	59	25.61
140.0	60	24.69
141.8	61	23.82
143.6	62	22.97
145.4	63	22.16
147.2	64	21.39
149.0	65	20.64
150.8	66	19.93
152.6	67	19.24
154.4	68	18.58
156.2	69	17.94
158.0	70	17.33
159.8	71	16.75
161.6	72	16.18
163.4	73	15.64
165.2	74	15.12
167.0	75	14.62
168.8	76	14.14
170.6	77	13.67
172.4	78	13.23
174.2	79	12.8
176.0	80	12.38
177.8	81	11.99
179.6	82	11.6
181.4	83	11.23
183.2	84	10.88
185.0	85	10.53

Table 49 — 100K Thermistor Temperature (°F and °C) vs Resistance (cont)

TEMP (°F)	TEMP (°C)	RESISTANCE (KOhms)
186.8	86	10.2
188.6	87	9.885
190.4	88	9.578
192.2	89	9.282
194.0	90	8.996
195.8	91	8.72
197.6	92	8.455
199.4	93	8.198
201.2	94	7.951
203.0	95	7.712
204.8	96	7.481
206.6	97	7.259
208.4	98	7.044
210.2	99	6.836
212.0	100	6.636
213.8	101	6.442
215.6	102	6.255
217.4	103	6.074
219.2	104	5.899
221.0	105	5.73
222.8	106	5.567
224.6	107	5.409
226.4	108	5.256
228.2	109	5.109
230.0	110	4.966
231.8	111	4.827
233.6	112	4.694
235.4	113	4.564
237.2	114	4.439
239.0	115	4.317
240.8	116	4.2
242.6	117	4.086
244.4	118	3.976
246.2	119	3.869
248.0	120	3.766
249.8	121	3.666
251.6	122	3.569
253.4	123	3.475
255.2	124	3.384
257.0	125	3.295
258.8	126	3.21
260.6	127	3.127
262.4	128	3.046
264.2	129	2.968
266.0	130	2.892
267.8	131	2.819
269.6	132	2.747
271.4	133	2.678
273.2	134	2.611
275.0	135	2.546
276.8	136	2.483
278.6	137	2.421
280.4	138	2.362
282.2	139	2.304
284.0	140	2.247
285.8	141	2.193
287.6	142	2.14
289.4	143	2.088
291.2	144	2.038
293.0	145	1.989
294.8	146	1.942
296.6	147	1.896
298.4	148	1.851

Table 49 — 100K Thermistor Temperature (°F and °C) vs Resistance (cont)

TEMP (°F)	TEMP (°C)	RESISTANCE (KOhms)
300.2	149	1.808
302.0	150	1.766
303.8	151	1.725
305.6	152	1.685
307.4	153	1.646
309.2	154	1.608
311.0	155	1.571
312.8	156	1.535
314.6	157	1.5
316.4	158	1.467
318.2	159	1.434
320.0	160	1.402
321.8	161	1.37
323.6	162	1.34
325.4	163	1.31
327.2	164	1.281
329.0	165	1.253
330.8	166	1.226
332.6	167	1.199
334.4	168	1.173
336.2	169	1.148
338.0	170	1.123
339.8	171	1.099
341.6	172	1.076
343.4	173	1.053
345.2	174	1.031
347.0	175	1.009
348.8	176	0.988
350.6	177	0.9674
352.4	178	0.9473
354.2	179	0.9277
356.0	180	0.9086
357.8	181	0.89
359.6	182	0.8718
361.4	183	0.854

Table 49 — 100K Thermistor Temperature (°F and °C) vs Resistance (cont)

TEMP (°F)	TEMP (°C)	RESISTANCE (KOhms)
363.2	184	0.8367
365.0	185	0.8198
366.8	186	0.8034
368.6	187	0.7873
370.4	188	0.7716
372.2	189	0.7562
374.0	190	0.7413
375.8	191	0.7267
377.6	192	0.7124
379.4	193	0.6985
381.2	194	0.6849
383.0	195	0.6716
384.8	196	0.6586
386.6	197	0.6459
388.4	198	0.6336
390.2	199	0.6215
392.0	200	0.6097
393.8	201	0.5981
395.6	202	0.5868
397.4	203	0.5758
399.2	204	0.565
401.0	205	0.5545
402.8	206	0.5442
404.6	207	0.5341
406.4	208	0.5243
408.2	209	0.5147
410.0	210	0.5052
411.8	211	0.496
413.6	212	0.487
415.4	213	0.4782
417.2	214	0.4696
419.0	215	0.4612
420.8	216	0.453
422.6	217	0.4449
424.4	218	0.437

Table 49 — 100K Thermistor Temperature (°F and °C) vs Resistance (cont)

TEMP (°F)	TEMP (°C)	RESISTANCE (KOhms)
426.2	219	0.4293
428.0	220	0.4217
429.8	221	0.4143
431.6	222	0.4071
433.4	223	0.4
435.2	224	0.3931
437.0	225	0.3863
438.8	226	0.3797
440.6	227	0.3731
442.4	228	0.3668
444.2	229	0.3605
446.0	230	0.3544
447.8	231	0.3484
449.6	232	0.3426
451.4	233	0.3368
453.2	234	0.3312
455	235	0.3257
456.8	236	0.3203
458.6	237	0.315
460.4	238	0.3098
462.2	239	0.3048
464.0	240	0.2998
465.8	241	0.2949
467.6	242	0.2901
469.4	243	0.2854
471.2	244	0.2808
473.0	245	0.2763
474.8	246	0.2719
476.6	247	0.2676
478.4	248	0.2634
480.2	249	0.2592
482.0	250	0.2551

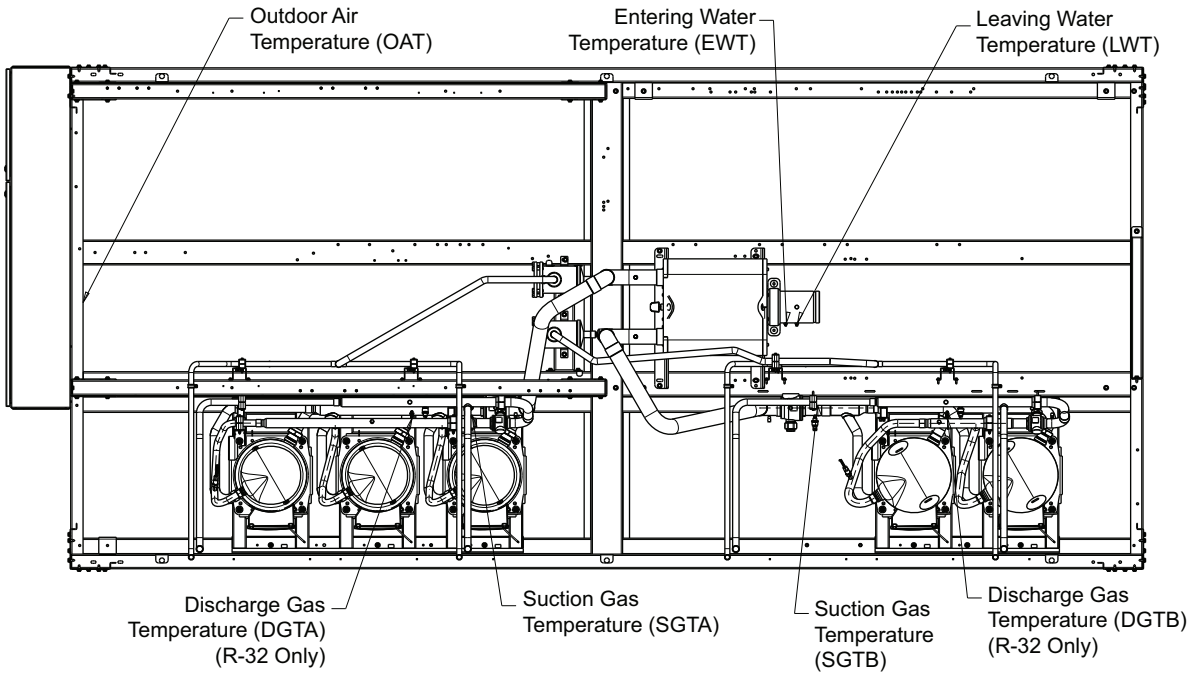


Fig. 54 — Thermistor Locations

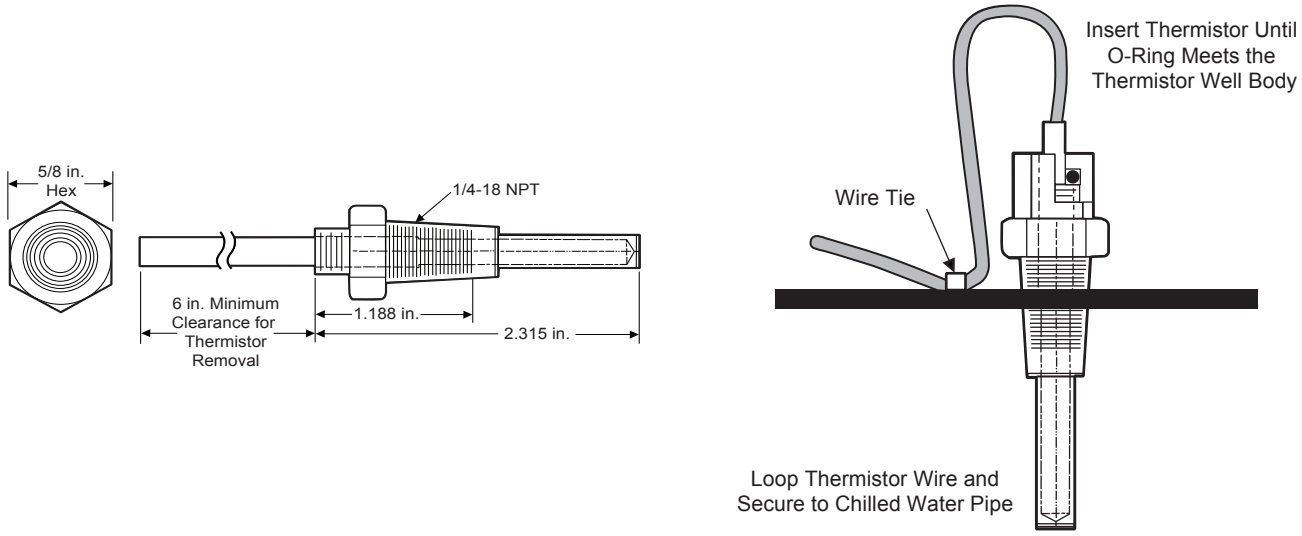


Fig. 55 — Dual Chiller Accessory Kit Leaving Water Thermistor and Well (P/N 00EFN900044000A)

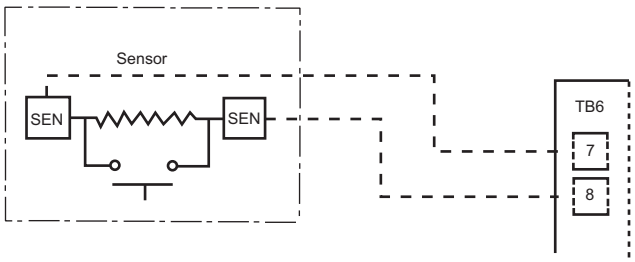


Fig. 56 — Typical Space Temperature Sensor (33ZCT55SPT) Wiring

TRANSDUCERS

There are 2 pressure transducers per circuit and 2 different types of transducers: low pressure (green connector) and high pressure (black connector).

Low Pressure Type: Suction Pressure Transducer (SPT).

High Pressure Type: Discharge Pressure Transducer (DPT). Table 50 lists pressure transducers for controlling chiller operation. See Fig. 57 for transducer locations.

Table 50 — Pressure Transducers

TRANSDUCER ID	DESCRIPTION	PART NUMBER	CONNECTION POINT
DPTA	Ckt. A Discharge Pressure Transducer	00PPG000568300A*	SIOBA-J11-AI06
SPTA	Ckt. A Suction Pressure Transducer	00PPG000569700A†	SIOBA-J19-AI07
DPTB	Ckt. B Discharge Pressure Transducer	00PPG000568300A*	SIOBB-J11-AI06
SPTB	Ckt. B Suction Pressure Transducer	00PPG000569700A†	SIOBB-J19-AI07

* High Pressure
† Low Pressure

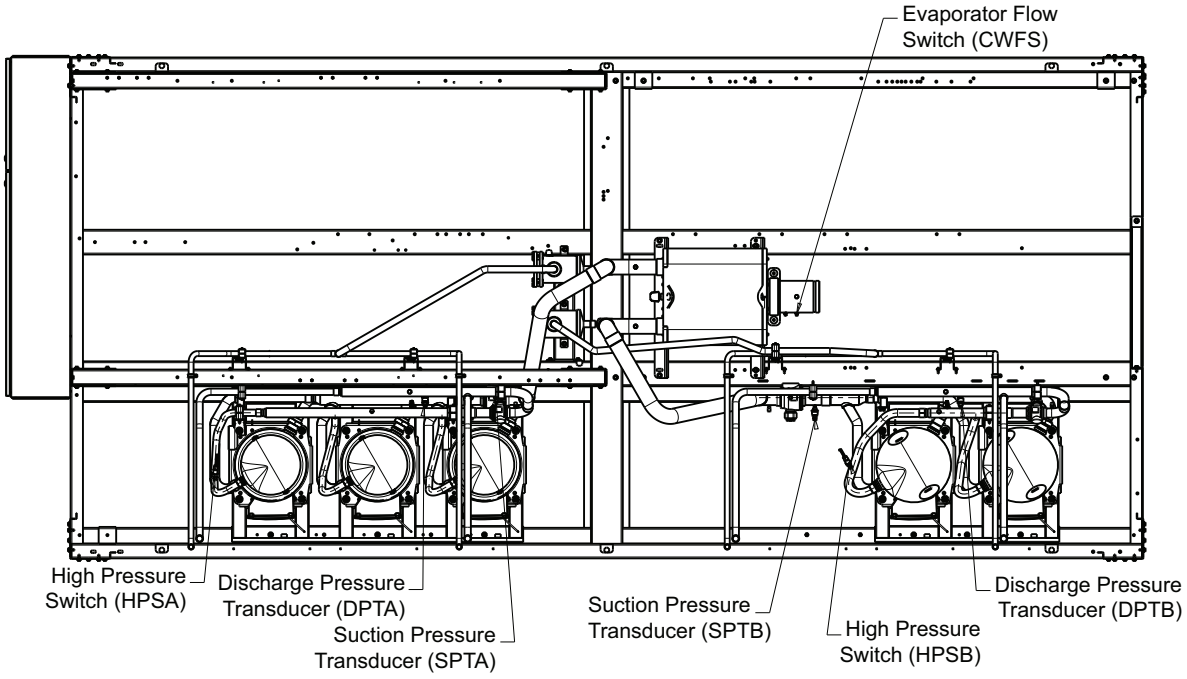


Fig. 57 — Transducer and Switch Locations

SERVICE

Electronic Expansion Valve

See Fig. 58 for a cutaway view of the electronic expansion valve (EXV). High-pressure liquid refrigerant enters the valve through the top. As refrigerant passes through the orifice, pressure drops and refrigerant changes to a 2-phase condition (liquid and vapor). The electronic expansion valve operates through an electronically controlled activation of a stepper motor. The stepper motor stays in position unless power pulses initiate the 2 discrete sets of motor stator windings for rotation in either direction. The direction depends on the phase relationship of the power pulses.

The motor directly operates the spindle, which has rotating movements that are transformed into linear motion by the transmission in the cage assembly. There are 2 different EXVs, ETS25C on 30RC 065-092 and ETS50C on 30RC 100-152. The total number of steps for both EXVs is 600. The EXV motor moves at 50 steps per second. Commanding the valve to 0% will add an extra 60 steps to the move to ensure the valve is closed completely. Overdriving in the open position is not allowed.

The EXV is controlled by the SIOB (J17-STPR1). Each circuit has a thermistor located in a well in the suction manifold before the compressor. Suction pressure, as measured by the suction pressure transducer, is converted to a saturated suction temperature. The thermistor measures the temperature of the superheated gas entering the compressor, and the pressure transducer determines the saturated temperature of suction gas. The difference between the temperature of the superheated gas and the saturated suction temperature is the superheat. The SIOB module controls the position of the electronic expansion valve stepper motor to maintain the superheat setpoint.

The SIOB controls the superheat leaving evaporator to approximately 9.0°F (5.0°C). Because EXV status is communicated to the Carrier Controller and is controlled by the SIOB, it is possible to track the valve position. The unit is then protected against loss of charge and a faulty valve. During initial start-up, the EXV is fully closed. After the initialization period, the valve position is tracked by the SIOB by constantly monitoring the amount of valve movement.

The EXV is also used to limit the evaporator saturated suction temperature to 68°F (20°C). This makes it possible for the chiller to start at higher evaporator fluid temperatures without overloading the compressor. This is commonly referred to as MOP (maximum operating pressure).

The position of the EXV may vary depending on the active override. EXV overrides can be verified in the Capacity Control menu (***Main Menu → Maintenance Menu → Capacity Control → EXV Override Circuit A*** or ***EXV Override Circuit B***). Refer to Table 51 for list of EXV overrides.

If it appears that the EXV module is not properly controlling circuit operation to maintain correct superheat, there are a number of checks that can be made using test functions and initialization features built into the microprocessor control. See the EXV Troubleshooting Procedure section on page 80 to test EXVs.

1 — Valve body in stainless steel
2 — Connections in bi-metal
3 — Sight glass with moisture indicator
4 — M12 electrical connection
5 — Stepper motor
6 — Cage and slider

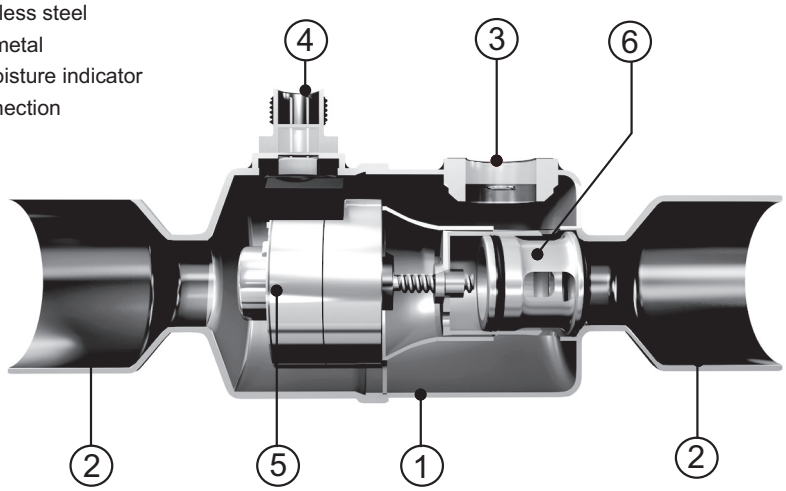


Fig. 58 — Cutaway View of the Electronic Expansion Valve

Table 51 — EXV Overrides

OVERRIDE NO.	OVERRIDE NAME	OVERRIDE DESCRIPTION
–1	EXV_NO_OWNER	Default value when variable is not set or EXV command has no owner!
0	EXV_PI_CTRL	Standard EXV control with PI correction.
1	EXV_VERY_LOW_SST_IN_COOLING	Very Low Saturated Suction Temperature in cooling — EXV opening.
2	EXV_LOW_SST_IN_COOLING	Low Saturated Suction Temperature in cooling — EXV closing.
3	EXV_LOW_SH_PREDICTION	Low superheat temperature prediction — EXV closing.
4	EXV_LOW_SH	Low superheat temperature — EXV closing.
5	EXV_HIGH_SH_IN_HEATING	High superheat in heating mode — EXV opening.
8	EXV_VERY_HIGH_SH_IN_HEATING	Very high superheat in heating mode — EXV opening.
9	EXV_CLOSE_TO_MOP_SP	SST close to the MOP setpoint — EXV closing.
10	EXV_OVER_MOP_SP	SST over the MOP setpoint — EXV closing.
11	EXV_UNLOADING_OF_LAST_CMP	Unloading of the last compressor — EXV closing at least 20%.
12	EXV_PRE_OPENING_BFR_CMP_START	Pre-opening of EXV before the compressor starts.
13	EXV_LOADING_AT_FIRST_FAN	EXV boost at first fan start when OAT is below 15°C (59.0°F).
		Not applicable to brine application.
14	EXV_UNLOADING_AT_LAST_FAN	EXV reducing at last fan stop.
		Not applicable to brine application.
15	EXV_BRINE_FAN_LOADING	Opening EXV after the loading of fan in brine application.
20	EXV_DEFROST_SESSION_DELTA_P_TOO_LOW	Pressure delta too low on compressor in defrost — EXV closing.
21	EXV_DEFROST_SESSION_STOP	Defrost session stop — EXV closing.
		(Returning to the position before defrost).
22	EXV_DEFROST_SESSION_START	Defrost session start — EXV opening.
		(Returning to the position before defrost).
34	EXV_BOOST_IN_COOLING_ON_HEATPUMP	Boost EXV for oil return in cooling mode on heat pump.
55	EXV_HP_TEST	HP test start — EXV closing to avoid liquid slugging when all fans are stopped.
78	EXV_MANUAL_CONTROL	Manual control of EXV.
79	EXV_BOOST_CONTROL	EXV Boost Control for coil decongestion in Cooling only units — EXV opening.
100	EXV_INIT	EXV total closing at the initialisation of unit.
102	EXV_QUICKTEST	EXV control in quick test.
103	EXV_TOTAL_CLOSING_BFR_START	Total closing of EXV before the circuit starts – Calibration.
104	EXV_PRESSURE_EQUALIZATION_WELDED_CONTACTOR	EXV closing just after 40 sec of welded contactor checking.
105	EXV_START_PRESSURE_EQUALIZATION	EXV opening for pressure equalisation before circuit start.
106	EXV_OVR_CIR_OFF	EXV total closing or maintained close because circuit is OFF.
107	EXV_CLOSE__CIRCUIT_START_NO_ALLOWED	EXV closing — Circuit is not authorized to start because EXV is not opened yet.
109	EXV_WELDED_CONTACTOR	Specific EXV management when contactor is welded.

EXV TROUBLESHOOTING PROCEDURE

⚠ CAUTION

Do not remove EXV cables from the SIOB with power applied to the board. Damage to the board may occur.

Follow the steps below to diagnose and correct EXV problems. Check EXV motor operation first. Switch the Enable-Off-Remote (EOR) Contact switch to the Off position. Check the appropriate circuit EXV, EXV Position Circuit A % Open (***Main Menu → Quick Test #1→ EXV Position Circuit A***) or EXV Position Circuit B % Open (***Main Menu → Quick Test #1 → EXV Position Circuit B***). Use the Quick Test procedure on page 117. The current value of 0 will be displayed. Increase the EXV position to select 100% valve position. The actuator should be felt moving through the EXV. To close the valve, select 0%. The actuator should knock when it reaches the bottom of its stroke.

If the valve is not working properly, continue with the following test procedure:

1. Check the EXV output signals at appropriate terminals on SIOB-A (J17-STPR1) and SIOB-B (J17-STPR1). Refer to Tables 8 and 9 for additional information.
2. Connect positive test lead to SIOB(X)-J17 terminal 12-v for EXV(X). Using the Quick Test procedure on page 117, move the valve output under Test to 100%. DO NOT short meter leads together or pin 12-v to any other pin, as board damage will occur. During the next several seconds, carefully connect the negative test lead to pins A, B, C, and D in succession. Digital voltmeters will average this signal and display approximately 6 vdc. If the output remains at a constant voltage other than 6 vdc, or shows 0 volts, then remove the connector to the valve and recheck.
3. Select 0% to close the valve.

NOTE: The output is 12 vdc from the SIOB when the valve is stationary.

If a problem still exists, replace the SIOB. If the reading is correct, then the expansion valve and EXV wiring should be checked. Check the EXV connector and interconnecting wiring.

1. Check color coding and wire connections. Make sure they are connected to the correct terminals at the SIOB and EXV plug and that the cables are not crossed.
2. Check for continuity and tight connections at all pin terminals.

   Check the resistance between Coil A and Coil B of the EXV. Remove the EXV module plug SIOB(X)-J17. Check the resistance of the 2 coils between pins 1 (brown wire) and 2 (white wire) for one coil and pins 3 (blue wire) and 4 (black wire) for the other coil. The resistance should be 10 ohms (± 1.0 ohms). Also check pins 1-4 for any shorts to ground. (See Fig 59.)

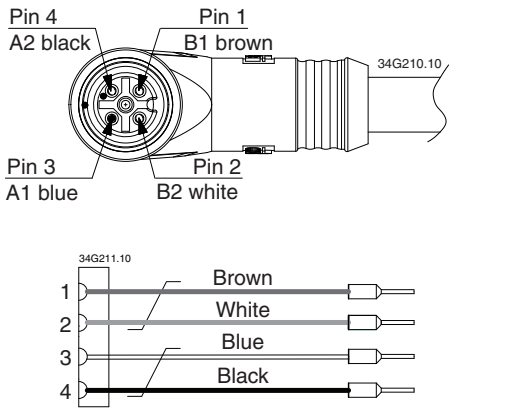


Fig. 59 — EXV Pins and Wiring Connections

REPLACING ELECTRONIC EXPANSION VALVES

The stepper motor cannot be replaced without unbrazing and changing the whole valve. It is not possible to change only the orifice; the defective EXV must be removed and replaced with a new one. To remove a defective EXV, the refrigerant must first be removed from the affected circuit or isolated within the chiller while remaining low side charge is recovered. Closing the valves will minimize the amount of refrigerant that will need to be removed. To isolate charge, perform the following steps.

1. Close the liquid line shutoff valve directly above the filter drier. Enable Quick Test mode by following Quick Test procedure on page 117. Under the Quick Test No. 2 screen (***Main Menu → Quick Test #2***), enable one of the compressors on the affected circuit. Let the compressor run until the gauge on the suction pressure port reads 10 psig. Disable the compressor from the Quick Test No. 2 screen and, immediately after compressor shut off, close the discharge valve or the suction service valve, if equipped.
2. Safely remove any remaining refrigerant from the system low side, making sure to follow any local or national regulations. The refrigerant shall be recovered into the correct recovery cylinders if venting is not allowed by local or national code. Reference UL60335-2-40 Annex DD clause 13 for proper recovery guidelines regarding R-32.
3. Turn off the line voltage power supply to the compressors.

The EXV may now be disconnected. Before unbrazing, any remaining oil must be drained from the surrounding piping and the circuit must be purged with nitrogen. For chillers with R-32, the system must be purged with oxygen-free nitrogen to render the chiller safe. Compressed air or oxygen must not be used for purging. To drain the oil, drill a hole in the low point of the piping and ensure that no oil is left inside the piping. The defective EXV may now be unbrazed and replaced. For brazing temperature and recommended mounting method for the new EXV, refer to Fig 60.

Moisture Liquid Indicator

Clear flow of liquid refrigerant indicates there is sufficient charge in the system. Bubbles in the sight glass indicate an undercharged system or the presence of non-condensables. Moisture in system, measured in parts per million (ppm), changes the color of the indicator. See Table 52 for units with R-410A and Table 53 for units with R-32. Change the filter drier at the first sign of moisture in the system.

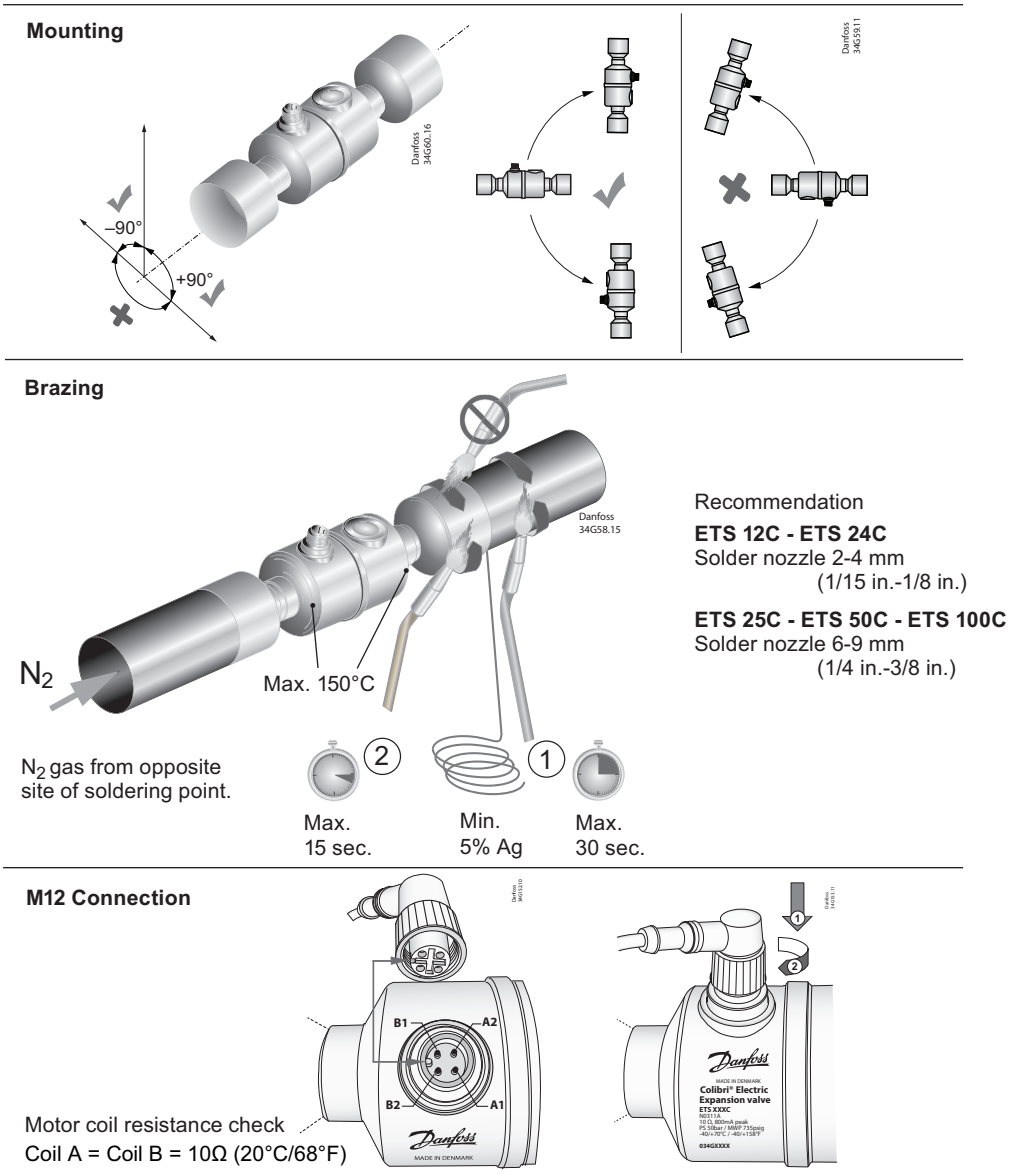


Fig. 60 — EXV Mounting, Brazing, and Connection Methods

Table 52 — Color Indicators When Moisture Is Present in R-410A Refrigerant

COLOR INDICATOR	R410-A, 77°F (25°C) (ppm)	R410-A, 109°F (43°C) (ppm)
Green — Dry	<66	<135
Yellow-Green — Caution	66-266	135-540
Yellow — Wet	>266	>540

Table 53 — Color Indicators When Moisture Is Present in R-32 Refrigerant

COLOR INDICATOR	R-32, 77°F (25°C) (ppm)	R-32, 109°F (43°C) (ppm)
Green — Dry	<64	<116
Yellow-Green — Caution	64-289	116-459
Yellow — Wet	>289	>459

IMPORTANT: Unit must be in operation for at least 12 hours before the moisture indicator can give an accurate reading.

With the unit running, the indicating element must be in contact with liquid refrigerant to give a true reading.

Filter Drier

Whenever the moisture-liquid indicator shows the presence of moisture, replace the filter drier(s). There is one filter drier assembly on each circuit. Refer to the Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants, for details on servicing filter driers.

Liquid Line Service Valve

This valve is located immediately ahead of filter drier and has a 1/4 in. access connection for field charging. In combination with the compressor discharge service valve, each circuit can be pumped down into the high side for servicing with plate fin coils. Microchannel Heat Exchanger (MCHX) coils have a much smaller volume and cannot accommodate the entire circuit charge.

Compressors

⚠ WARNING

Do not supply power to unit with compressor cover removed. Failure to follow this warning can cause a fire, resulting in personal injury or death

⚠ WARNING

Exercise extreme caution when reading compressor currents when high-voltage power is on. Correct any of the problems described below before installing and running a replacement compressor. Wear safety glasses and gloves when handling refrigerants. Failure to follow this warning can cause a fire, resulting personal injury or death.

⚠ CAUTION

Do not manually operate contactors. Serious damage to the machine may result.

COMPRESSOR REPLACEMENT

To change out a faulty compressor, refer to the compressor replacement procedure included with the new compressor.

Compressor oil equalization line fittings use rotolock fittings. If a leak is detected at these fittings, tighten fitting to 110 lb-ft (149 N•m). If leak persists, open system and inspect gasket surface for foreign material or damage. If debris is found, clean the surface and install a new gasket. If the gasket surface is damaged, replace the compressor. Do not reuse gaskets.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that A2L refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

OIL CHARGE

All units are factory charged with polyolester (POE) oil. At a full load, acceptable oil level for each compressor is 3/4 to 7/8 full in the sight glass. Refer to installation instructions for oil quantity.

⚠ CAUTION

The compressor in an R-32 or Puron® system uses a polyolester (POE) oil. This oil is extremely hygroscopic, meaning it absorbs water readily. POE oils can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Take all necessary precautions to avoid exposure of the oil to the atmosphere.

When additional oil or a complete charge is required, it must meet the following specifications:

Refrigerant	R-410A	R-32
Type	Inhibited polyolester -based synthetic compressor lubricant	
Supplier	Lubrizol	Danfoss
Oil	Emkarate RL 32H	185 SL
ISO Viscosity Grade	32	40

Do not reuse drained oil or any oil that has been exposed to the atmosphere.

SYSTEM BURNOUT CLEANUP PROCEDURE

Some compressor electrical failures can cause the motor to burn. When this occurs, byproducts such as sludge, carbon, and acids contaminate the system. There are 2 classifications of motor burnouts: mild and severe. Test the oil for acidity using a POE oil acid test kit to determine the severity of the burnout.

In a mild burnout, there is little or no detectable odor. Compressor oil is clear or slightly discolored. An acid test of the oil will be negative. This type of failure is treated the same as a mechanical failure. The liquid line filter drier or core should be replaced.

In a severe burnout, there is a strong, pungent rotten egg odor. Compressor oil is very dark. Evidence of burning may be present in the tubing connected to the compressor. An acid test of the oil will be positive. The following steps should be taken before restarting any compressors in the circuit.

1. Isolate compressors and recover refrigerant from compressor section.
2. Remove oil from all compressors in the circuit. An oil drain fitting is provided on each compressor. Pressurize the low side of the compressor circuit with nitrogen. Less than 10 psig (68.9 kPa) should be adequate. This will help in the removal of the oil from the compressor sump. Dispose of contaminated oil as per local codes and regulations.
3. Replace failed compressor as outlined under compressor replacement procedure.
4. Recharge the circuit with fresh oil. The circuit oil charge information is supplied in the 30RC Installation Instructions. Oil level should be approximately 7/8 sight glass.
5. Install activated carbon (burnout) filter drier/core.
6. Leak check, evacuate, and recharge refrigerant circuit.
7. Operate compressors. Check filter drier pressure drop periodically. Replace cores if pressure drop exceeds 4 psig (27.6 kPa).

Perform additional acid test after 24 hours of operation. Change liquid line filter drier/core if necessary. Replace with standard filter drier/core once circuit is clean. Use the Carrier Standard Service Techniques Manual as a reference source.

DX (Direct Expansion) Cooler

TUBE PLUGGING

A leaky tube can be plugged until retubing can be done. The number of tubes plugged determines how soon the cooler *must* be retubed. If several tubes require plugging, check with a local Carrier representative to find out how the number and location of tubes can affect unit capacity. Up to 10% of the tubes per refrigerant pass can be plugged. Fig. 61 shows an Elliott tube plug and a cross-sectional view of a plug in place. See Tables 54 and 55 for plug components.

⚠ CAUTION

Use extreme care when installing plugs to prevent damage to the tube sheet section between the holes.

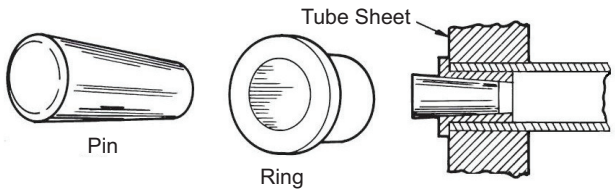


Fig. 61 — Elliot Tube Plug

Table 54 — Plug Component Part Numbers

COMPONENTS FOR PLUGGING	PART NUMBER
For Tubes	
Brass Pin	853103-312*
Brass Ring	853002-322*
For Holes without Tubes	
Brass Pin	853103-375
Brass Ring	853002-377
Loctite	No. 675†
LocQuic	"N"†

* Order directly from Elliot Tube Company, Dayton, OH or Replacement Components Division (RCD). Loctite is a registered trademark and No. 675 is a trademark of Henkel IP & Holding GMBH.
† Can be obtained locally. LocQuic is a trademark of Henkel IP & Holding GMBH.

Table 55 — Plug Component Dimensions

PLUG COMPONENT	SIZE	
	in.	mm
Tube Sheet Hole Diameter	0.377-0.382	9.58-9.70
Tube OD	0.373-0.377	9.47-9.58
Tube ID After Rolling (includes expansion due to clearance)	0.328	8.33

NOTE: Tubes next to gasket webs must be flush with tube sheet (both ends).

For the 30RC 065-150 and 30RC 067-152 coolers, the pass partition has a perforated distribution plate in the inlet pass to more uniformly distribute the refrigerant as it enters the first pass tubes of the cooler. The perforated distribution plate is on the tube sheet side of the pass partition. A tube plug in a first pass tube will interfere with the installation of the pass partition. The tube plug must be flush with the tube sheet to prevent this interference. The pass partition is symmetrical, meaning the partition plate can be rotated 180 degrees, however, the performance of the machine will be affected if the pass partition is installed incorrectly.

RETUBING

When retubing is required, obtain the services of qualified personnel experienced in boiler maintenance and repair. Most standard procedures can be followed when retubing the coolers. An 8% crush is recommended when rolling replacement tubes into the tube sheet.

The following Elliott Tool Technologies tube rolling tools are required:

- expander assembly
- cage
- mandrel
- rolls

Place one drop of LOCTITE No. 609[1] or equivalent on top of tube prior to rolling. This material is intended to "wick" into the area of the tube that is not rolled into the tube sheet and prevent fluid from accumulating between the tube and the tube sheet.

TIGHTENING COOLER HEAD BOLTS

For bolt tightening sequences, see Fig. 62-64.

Gasket Preparation

When reassembling cooler heads, always use new gaskets. Gaskets are neoprene-based and are brushed with a light film of compressor oil. Do not soak gasket or gasket deterioration will result. Use new gaskets within 30 minutes to prevent deterioration. Reassemble cooler nozzle end or plain end cover of the cooler with the gaskets. Torque all cooler bolts to the following specification and sequence:

5/8 in. Diameter Perimeter Bolts (Grade 5)

- 150 to 170 ft-lb (203 to 231 N•m)

1/2 in. Diameter Flange Bolts (Grade 5)

- 70 to 90 ft-lb (95 to 122 N•m)

1/2 in. Diameter Center Stud (Grade 5)

- 70 to 90 ft-lb (95 to 122 N•m)

1. Install all bolts finger tight, except for the suction flange bolts. Installing these flanges will interfere with tightening the center stud nuts.
2. The bolt tightening sequence is outlined in Fig. 62-64. Follow the numbering or lettering sequence so that pressure is evenly applied to gasket.
3. Apply torque in one-third steps until required torque is reached. Load *all* bolts to each one-third step before proceeding to next one-third step.
4. No less than one hour later, retighten all bolts to required torque values.
5. After refrigerant is restored to system, check for refrigerant leaks using recommended industry practices.
6. Replace cooler insulation.

1. LOCTITE is a registered trademark and No. 609 is a trademark of Henkel IP & Holding GMBH.

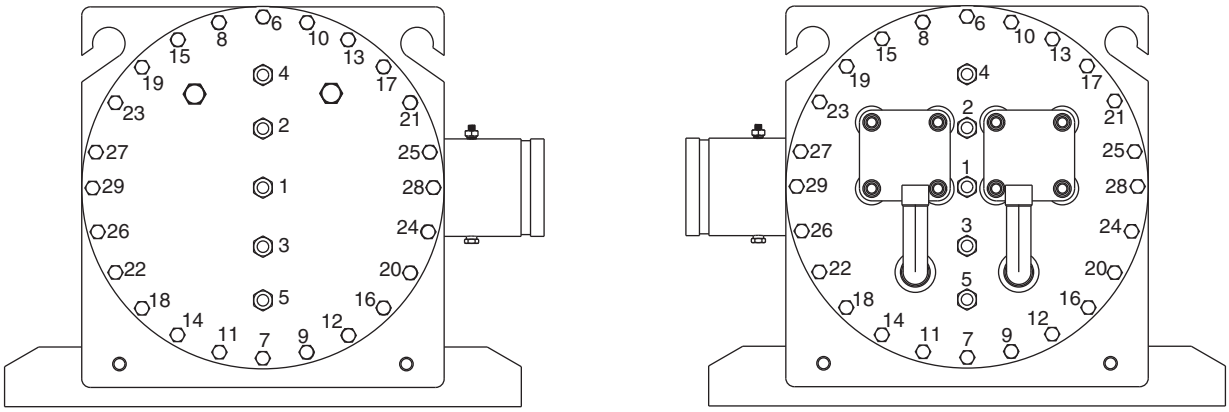


Fig. 62 — Bolt Tightening Sequence, 30RC 065-102

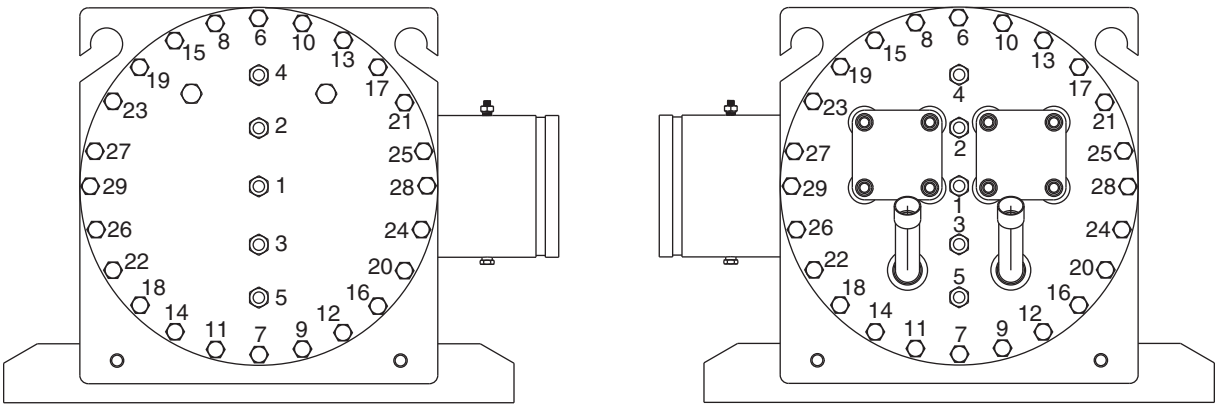


Fig. 63 — Bolt Tightening Sequence, 30RC 110-132

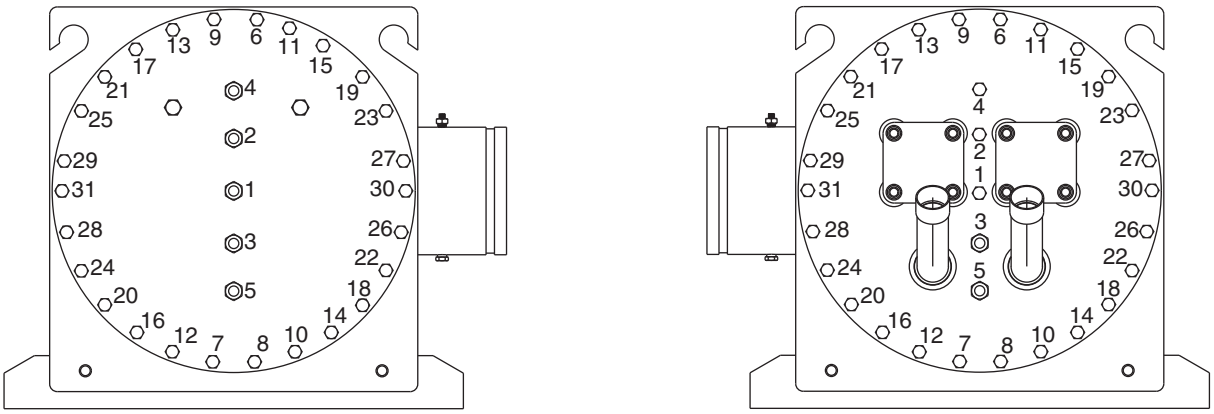


Fig. 64 — Bolt Tightening Sequence, 30RC 152

BPHE (Brazed Plate Heat Exchanger)

BRAZED-PLATE HEAT EXCHANGER REPLACEMENT

Brazed-plate heat exchangers (BPHE) cannot be repaired if they develop a leak. This applies to both the BPHE evaporator and the optional desuperheaters. If a leak (refrigerant or water) develops, then the heat exchanger **must be** replaced. To replace a brazed-plate heat exchanger:

1. Check that the replacement heat exchanger is the same as the original heat exchanger. The BPHE evaporator insulation covers the manufacturer's part number. Optional desuperheaters are not factory installed with insulation. Make sure the depths of the replacement and original heat exchangers are the same.
2. Disconnect the liquid-in and liquid-out connections at the heat exchanger.
3. Recover the refrigerant from the system, and unsolder the refrigerant-in and refrigerant-out connections.
4. Remove the old heat exchanger. Save the mounting hardware for use with the replacement heat exchanger. The replacement BPHE evaporator is supplied fully insulated. It also includes an evaporator heater. Use of the heater is not required unless the original evaporator contained a factory-installed heater. Replacement desuperheaters will not be supplied with any form of freeze protection.
5. Install the replacement heat exchanger in the unit and attach the mounting bracket hardware to the bottom bracket using the hardware removed in Step 4. For the BPHE evaporator, if the original evaporator was supplied with an evaporator heater, then reconnect the new evaporator heater.Torque the bolts to 30 to 50 ft-lb (40.6 to 67.7 N•m).
6. *Carefully* braze the refrigerant lines to the connections on the heat exchanger. Lines should be soldered using silver as the soldering material, with a minimum of 45% silver. Keep the temperature below 1472°F (800°C) under normal soldering conditions (no vacuum) to prevent the copper solder of the brazed plate heat exchanger from changing its structure. Failure to do so can result in internal or external leakage at the connections, which cannot be repaired. Braze the liquid lines with a heat sink around the expansion valve to protect it from excess heat.
7. Reconnect the water/brine lines.
8. Dehydrate and recharge the unit. Check for leaks.

BRAZED-PLATE HEAT EXCHANGER CLEANING

Brazed-plate heat exchangers must be cleaned chemically. This applies to both the BPHE evaporators and the optional desuperheaters. A professional cleaning service skilled in chemical cleaning should be used. Use a weak acid (5% phosphoric acid or, if the heat exchanger is cleaned frequently, 5% oxalic acid). Pump the cleaning solution through the exchanger, preferably in a backflush mode. After cleaning, rinse with large amounts of fresh water to dispose of all the acid. Cleaning materials must be disposed of properly.

The strainer screen in front of the water/brine inlets of the heat exchangers should be cleaned periodically, depending on the condition of the water/brine. The BPHE evaporators are factory installed with the strainer screen, whereas the strainers for the optional desuperheaters must be field supplied and installed.

All Units

EVAPORATOR/DESUPERHEATER WATER TREATMENT

Untreated or improperly treated water may result in corrosion, scaling, erosion, or algae. The services of a qualified water treatment specialist should be obtained to develop and monitor a treatment program.

⚠CAUTION

Water must be within design flow limits, clean, and treated to ensure proper machine performance and reduce the potential of evaporator/desuperheater damage due to corrosion, scaling, and algae. Carrier assumes no responsibility for evaporator/desuperheater damage resulting from untreated or improperly treated water.

PREPARATION FOR WINTER SHUTDOWN

If the unit is not operational during the winter months, at the end of the cooling season, complete the following steps.

⚠CAUTION

Failure to remove power before draining heater-equipped evaporators, heat recovery desuperheaters, and hydronic packages can result in heater, tape, and insulation damage..

Evaporator Preparation for Winter Shutdown

1. To prepare the system for winter shutdown, draining the fluid from the system is highly recommended. Isolate the evaporator from the rest of the system with water shutoff valves. Be sure to de-energize heaters (if installed) by opening the fuse for the heaters (FU-9) or shut off power to the chiller to prevent damage if the evaporator is drained.
2. Remove the evaporator drain plug. If the unit is equipped with a hydronic package, then there are additional drains in the pump housing, as well as the strainer housing for DX cooler-equipped units, that must be opened to allow for all of the water to drain. Follow all local codes and regulations regarding the fluid disposal.
3. Once fully drained, replace the drain plug(s) and completely fill the evaporator, and hydronic package if equipped, with suitable corrosion-inhibited antifreeze solution, such as propylene glycol. The concentration should be adequate to provide freeze protection to 15°F (8.3°C) below the expected low ambient temperature conditions. Antifreeze can be added through the vent on top of the evaporator head. Evaporator fluid volumes can be found in the Installation Instructions for the unit.
4. Leave the evaporator filled with the antifreeze solution for the winter to provide corrosion protection during the off season. The evaporator may be drained if desired. Follow all local codes and regulations regarding the fluid disposal.
5. At the beginning of the next cooling season, be sure that there is refrigerant pressure in each circuit before refilling the evaporator, adding recommended inhibitor, and resetting the fuse for the heater (FU-9), if opened, or restoring power.

Evaporator to Remain Filled for Winter Shutdown

1. If the evaporator will not be drained, do not shut off power disconnect during off-season shutdown.
2. If the chilled water loop is not protected with a suitable corrosion-inhibited antifreeze solution, such as propylene glycol, the unit must have evaporator pump control. In the event of a power failure with sub-freezing temperatures, the unit will not have any evaporator freeze protection and may be subject to damage.

⚠CAUTION

Operation or winter shutdown with fresh water is not fail-safe should there be a loss of power to the chiller or to the circulating pump. Freeze damage due to power loss or disabling chiller pump control in fresh water systems will impair or otherwise negatively affect the warranty.

3. It is recommended that the loop be protected with a suitable corrosion-inhibited antifreeze solution such as propylene glycol. The concentration should be adequate to provide freeze protection to 15°F (8.3°C) below the expected low ambient temperature conditions. Evaporator heaters will not protect the evaporator from freeze-up in the event of power loss.

Partial Heat Recovery System Preparation

1. If the partial heat recovery loop will not be drained, do not shut off power disconnect during off-season shutdown. If the partial heat recovery loop will be drained, and field-supplied heat trace was added, then de-energize the heat trace to prevent damage and possible safety hazards when draining or when there is no liquid in the system.
2. If field-supplied service valves were installed, isolate the partial heat recovery system from the rest of the system and drain the fluid from the partial heat recovery system.
3. Replace drain plug(s) and add sufficient inhibited glycol (or other suitable inhibited antifreeze) solution to partial heat recovery system to prevent freezing of residual water. Do not drain the solution. Leaving the solution in the system will aid in preventing corrosion in exposed parts (piping and desuperheaters).
4. At the beginning of the next cooling season, be sure that there is refrigerant pressure on each circuit before refilling the desuperheaters and adding recommended inhibitor.

FREEZE PROTECTION

Both BPHE and DX coolers can be ordered with factory-installed heaters. If equipped, the Carrier Controller controls the evaporator heater(s) based on the outdoor-air temperature and the entering and leaving water thermistors. The Heater Trip Point is the sum of the freeze point and Water Exchanger Heater Delta Setpoint (***Main Menu → Configuration Menu → Service Configuration → Exch. Heater Delta Spt***).

If the outdoor air temperature is below the heater trip point, or the water exchanger's entering or leaving temperature is below the Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***), then the heater shall be activated.

If the outdoor air temperature is above the heater trip point + 1.8°F (1.1°C) and both the water exchanger entering and leaving temperatures are higher than the Brine Freeze Setpoint + 3.6°F (2°C) (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***), then the heater shall be de-energized.

The entire evaporator is covered with closed-cell insulation applied over the heater. The heater(s) and insulation protect the evaporator against low ambient temperature freeze-up to –20°F (–28°C).

IMPORTANT: If the unit is installed in an area where ambient temperatures fall below 32°F (0°C), it is recommended that a suitable corrosion-inhibited antifreeze solution be used in chilled water circuit.

LOW FLUID TEMPERATURE

The Carrier Controller is programmed to shut the chiller down if leaving fluid temperature drops below 34°F (1.1°C) for comfort cooling units with water, 32°F (0°C) for comfort cooling units with glycol, or below Brine Freeze Setpoint (***Main Menu → Configuration Menu → Service Configuration → Brine Freeze Setpoint***) for low brine units. The unit will shut down, but the pump will continue to run. When fluid temperature rises to 3.6°F (2°C) above the leaving fluid setpoint, safety resets and chiller restarts. Reset is automatic as long as this is the first occurrence.

LOSS OF FLUID FLOW PROTECTION

All 30RC machines include an integral flow switch that protects the chiller against loss of cooler flow.

CHILLED WATER FLOW SWITCH

A factory-installed flow switch is installed in the leaving fluid piping for all units. (See Fig. 65.)

This is a thermal dispersion flow switch with field adjustments. The switch is set for approximately 0.66 ft/s (20 cm/s) of flow. The sensor tip houses 2 thermistors and a heater element. One thermistor is located in the sensor tip, closest to the flowing fluid. This thermistor is used to detect changes in the flow velocity of the liquid. The second thermistor is bonded to the cylindrical wall and is affected only by changes in the temperature of the liquid. The thermistors are positioned to be in close contact with the wall of the sensor probe and, at the same time, to be kept separated from each other within the confines of the probe.

In order to sense flow, it is necessary to heat one of the thermistors in the probe. When power is applied, the tip of the probe is heated. As the fluid starts to flow, heat will be carried away from the sensor tip. Cooling of the first thermistor is a function of how fast heat is conducted away by the flowing liquid.

The difference in temperature between the 2 thermistors provides a measurement of fluid velocity past the sensor probe.

When fluid velocity is high, more heat will be carried away from the heated thermistor and the temperature differential will be small. As fluid velocity decreases, less heat will be taken from the heated thermistor and there will be an increase in temperature differential.

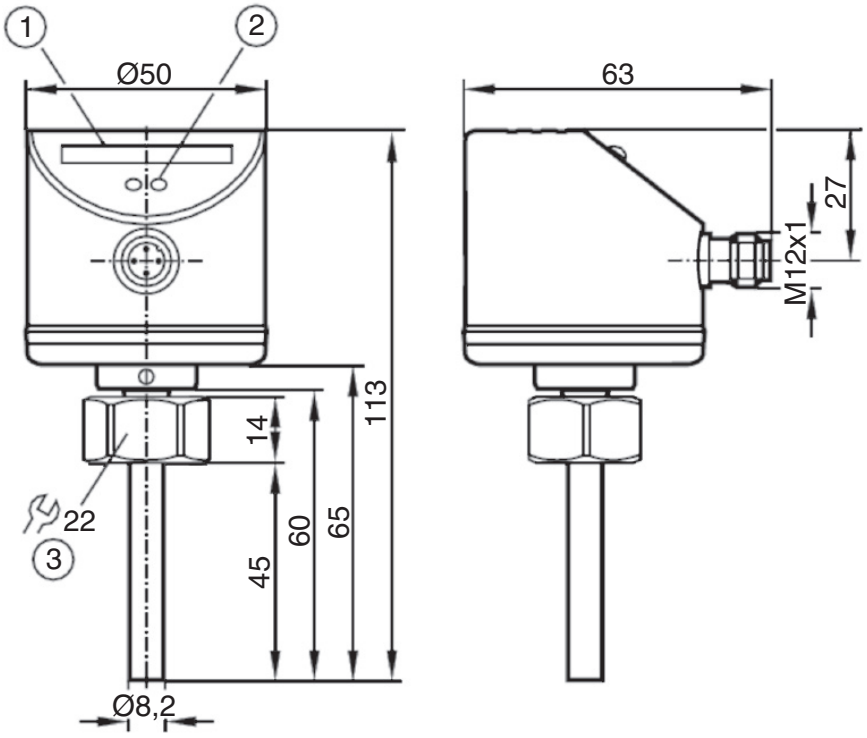
When unit flow rate is above the minimum flow rate, then the output is switched on, sending 24 vac to the SIOB-B (J1-DI-03) to prove flow has been established.

For recommended maintenance, check the sensor tip for buildup every 6 months. Clean the tip with a soft cloth. If necessary, buildup (e.g., lime) can be removed with a common vinegar cleansing agent.

This flow switch is equipped with a status LED display. When power is supplied to the device, an initialization period is started. During this period, all indicator LEDs are lit green and then turn off from 9 to 0 as the initialization period ends.

Once the initialization period is completed, the normal status LED sequence begins. If the flow is below the switch with increasing flow, sequential LEDs are lit. If the flow switch is open, LED 4 will be red. If the flow switch is closed, LED 4 will be orange.

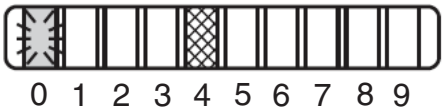
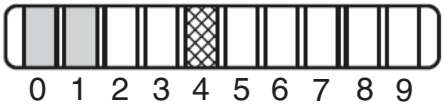
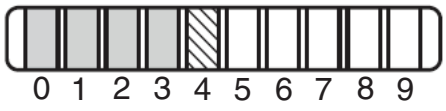
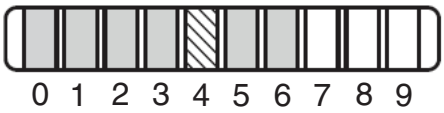
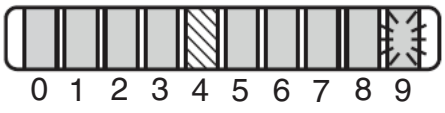
Table 56 indicates the status of the switch.



LEGEND
1 — LED display
2 — Setting push buttons
3 — Tightening torque 25 N·m

Fig. 65 — Chilled Water Flow Switch

Table 56 — Operating Indicators

	Current flow below the display range
	Current flow below the switch point
	Current flow corresponds to the switch point
	Current flow above the switch point
	Current flow above the display range
INTERFERENCE INDICATORS	
All LEDs are solid orange	Default Factory Setting restoration initiated
All LEDs are flashing orange	Default Factory Setting restoration in progress
Display OFF (no LED lights)	No LEDS will be lit for the following conditions: - Manual setpoint correction has been initiated - Default Factory Setting restored - No power to flow switch - The switch has failed
All LEDs are flashing red	Automatic adjustment not successful — the switch point is outside the measuring range

LEGEND


LED lights green


LED lights red


LED lights orange


LED lights flashing

Flow Switch Setpoint Adjustment

This thermal dispersion flow switch has the ability to adjust the flow trip point. This operation should only be completed after troubleshooting, once flow has been confirmed to be adequate.

⚠ CAUTION

Adjusting the flow switch setpoint to below the recommended minimum flow can result in evaporator freeze-up and damage to the system. Operation below minimum flow is not recommended. Damage caused by operation below minimum flow may be considered abuse of the systems and is not covered under warranty.

Flow Switch Parameter Setting

1. Set-up
   a. Supply voltage to flow switch from chiller 24-v control.
   b. All LEDs will go on and off again step by step. During this time, the output is closed.
   c. The switch is not in the operating mode.
2. Change the switch point (optional)
   A switch setpoint change is not recommend, but it can be adjusted if higher flow fluctuation or pulsation and faster response time of the flow switch is required. Low switch point means fast response with rising flow. High switch point means fast response with falling flow.
   a. To set switch setpoint, press the – or + button.
   b. All LEDs are off.
   c. Press the – or + button as often as required. Each press of the button shifts the flow by one half LED in the indicated direction.
   d. As soon as a button is pressed, the LEDs are switched on, with the LEDs of the current set value flashing.

   NOTE: If no button is pressed for 2 s, the unit returns to the operating mode with the newly set value.
3. Restore the factory setting (reset)
   a. Press the + button for at least 15 s.
   b. All LEDs first light up orange, then they flash orange.
   c. Release the button. All settings are reset to the factory setting: Switch point: 0.66 ft/s (20 cm/s).
   d. If the setpoint has not locked, then all LEDs go off for 2 s.
4. Lock / unlock the switch
   The switch can be locked electronically to prevent unintentional settings.
   a. Press both the **– and +** buttons simultaneously for 10 s in the operating mode.
   b. The indicator LED light will go out; the switch settings will lock or unlock. The replacement switch setting is in the "not locked" status when it is supplied. The switch setting is set and locked from factory.

Condenser Coil Maintenance and Cleaning

Routine cleaning of coil surfaces is essential to maintain proper operation of the unit. Elimination of contamination and removal of harmful residues will greatly increase the life of the coil and extend the life of the unit. The following maintenance and cleaning procedures are recommended as part of the routine maintenance activities to extend the life of the RTPF (round tube plate fin) coil and MCHX (microchannel heat exchanger) coil.

REMOVE SURFACE-LOADED FIBERS

Surface-loaded fibers or dirt should be removed with a vacuum cleaner. If a vacuum cleaner is not available, then a soft, nonmetallic bristle brush may be used. In either case, the tool should be applied in the direction of the fins. Coil surfaces can be easily damaged if the tool is applied across the fins (fin edges can be easily bent over and damage the coating of a protected coil).

NOTE: The use of a water stream, such as a garden hose, against a surface-loaded coil will drive the fibers and dirt into the coil. This will make cleaning efforts more difficult. Surface-loaded fibers must be completely removed prior to using low velocity clean water rinse.

PERIODIC CLEAN WATER RINSE

A periodic clean water rinse is very beneficial for coils that are applied in coastal or industrial environments. However, it is very important that the water rinse is made with a very low velocity water stream to avoid damaging the fin edges. Monthly cleaning is recommended.

ROUTINE CLEANING OF COIL SURFACE

Routine cleaning with Totaline® environmentally balanced coil cleaner is essential to extend the life of coils. This cleaner is available from Carrier Replacement Parts division as part number P902-0301 for a one gallon container and part number P902-0305 for a 5 gallon container. It is recommended that all coils, including MCHX, e-coated MCHX, standard copper tube aluminum fin, precoated fin, copper fin, and e-coated coils, be cleaned with the Totaline environmentally balanced coil cleaner as described below. Coil cleaning should be part of the unit's regularly scheduled maintenance procedures to ensure the long life of the coil. Failure to clean the coils may result in reduced durability in the environment.

Avoid the use of:

- coil brighteners
- acid cleaning prior to painting
- high pressure washers
- poor quality water for cleaning

Totaline environmentally balanced coil cleaner is nonflammable, hypoallergenic, nonbacterial, and a USDA accepted biodegradable agent that will not harm the coil or surrounding components, such as electrical wiring, painted metal surfaces, or insulation. Use of non-recommended coil cleaners is strongly discouraged since coil and unit durability could be affected.

Totaline Environmentally Balanced Coil Cleaner Application Equipment

- 2-1/2 gallon garden sprayer
- water rinse with low velocity spray nozzle

⚠CAUTION

Harsh chemicals, household bleach, or acid or basic cleaners should not be used to clean outdoor or indoor coils of any kind. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion at the fin/tube interface, where dissimilar materials are in contact. If there is dirt below the surface of the coil, use the Totaline environmentally balanced coil cleaner.

⚠CAUTION

High velocity water, from a pressure washer or garden hose, or compressed air should never be used to clean an RTPF coil. The force of the water or air jet will bend the fin edges and increase airside pressure drop. High velocity water, from a pressure washer or garden hose, or compressed air should never be used to clean an MCHX coil, as it may fracture the tube/fin bond. Reduced unit performance or nuisance unit shutdown may occur.

Totaline Environmentally Balanced Coil Cleaner Application Instructions

1. Proper eye protection, such as safety glasses, is recommended during mixing and application.
2. Remove all surface-loaded fibers and dirt with a vacuum cleaner as described above.
3. Thoroughly wet finned surfaces with clean water and a low velocity garden hose, being careful not to bend fins.
4. Mix Totaline environmentally balanced coil cleaner in a 2-1/2 gallon garden sprayer according to the instructions included with the cleaner. The optimum solution temperature is 100°F (37.8°C).

NOTE: DO NOT USE water in excess of 130°F (54.4°C), as the enzymatic activity will be destroyed.

5. Thoroughly apply Totaline environmentally balanced coil cleaner solution to all coil surfaces, including finned area, tube sheets, and coil headers.
6. Hold garden sprayer nozzle close to finned areas and apply cleaner with a vertical, up-and-down motion. Avoid spraying in a horizontal pattern to minimize the potential for fin damage.
7. Ensure cleaner thoroughly penetrates deep into finned areas.
8. Interior and exterior finned areas must be thoroughly cleaned.
9. Finned surfaces should remain wet with cleaning solution for 10 minutes. Ensure surfaces are not allowed to dry before rinsing. Reapply cleaner as needed to ensure 10-minute saturation is achieved.
10. Thoroughly rinse all surfaces with low velocity clean water using a downward rinsing motion of the water spray nozzle. Protect fins from damage from the spray nozzle.

Condenser Fans

A formed metal mount bolted to the coil caps supports each fan and motor assembly. A plastic fan guard provides protection from the rotating fan. (See Fig. 66.) To remove the fan, a special puller (Replacement Components Division [RCD] part no. 30RB680082) can be used. The fan utilizes a set screw and does not require the use of retaining compound in the keyway. The fan can be removed without the puller, but its use eases disassembly.

The exposed end of the fan motor shaft is protected from weather by an axial fan cap. The fan needs to be positioned fully down against the step on the motor shaft. Apply blue thread locker (LOCTITE[1] 243) to the threads of both the axial bolt and the set screw. Install the thick washer and M8 axial bolt; do not fully tighten. Install set screw and tighten to 16 ± 2 ft-lb (21.7 ± 2.7 N•m). Torque the axial bolt to 24 ± 2 ft-lb (32.5 ± 2.7 N•m). Reinstall plastic fan guard.

1. LOCTITE is a registered trademark of Henkel IP & Holding GMBH.

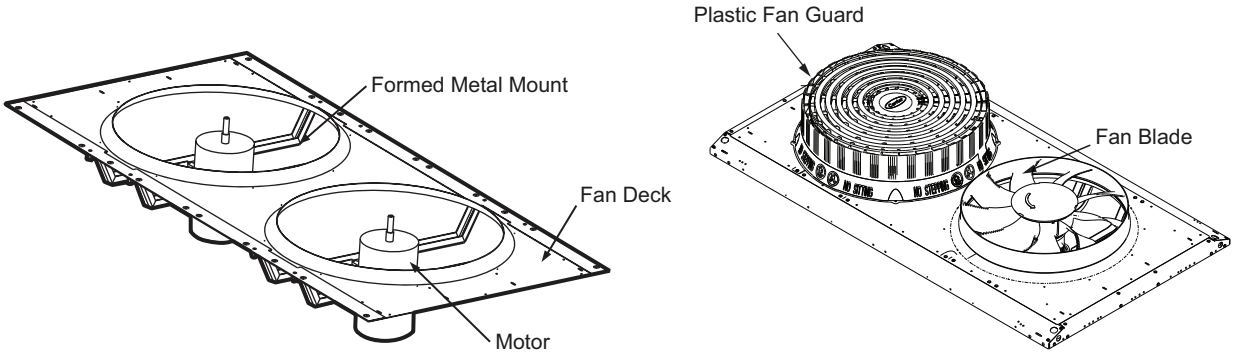


Fig. 66 — Fan Mounting

Refrigerant Circuit

LEAK TESTING

Units are shipped with complete operating charge of refrigerant R-410A or R-32 (see Physical Data tables supplied in the 30RC Installation Instructions) and should be under sufficient pressure to conduct a leak test. If there is no pressure in the system, then introduce enough nitrogen to search for the leak.

Under no circumstances shall potential sources of ignition be used in the search for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall NOT be used.

The following leak detection methods are deemed acceptable for all refrigerant systems:

1. Electronic leak detectors may be used to detect refrigerant leaks, but in the case of A2L refrigerants, the sensitivity may not be adequate or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set to the LFL (lower flammability limit) of R-32, which is 14%.
2. Leak detection fluids are also suitable for use with most refrigerants, but the use of detergents containing chlorine shall be avoided, as the chlorine may react with the refrigerant and corrode the copper pipework. Examples of leak detection fluids are the bubble method and fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found that requires brazing, all of the refrigerant shall be recovered from the system or isolated (by means of shut off valves) in a part of the system remote from the leak. After leaks are repaired, the system must be evacuated and dehydrated if it has not been already.

REFRIGERANT REMOVAL AND EVACUATION

When breaking into the refrigerant circuit to make repairs—or for any other purpose—conventional procedures shall be used. However, for A2L refrigerants, it is important that best practices be followed, since flammability is a consideration. The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations.
2. Purge the circuit with inert gas.
3. Open the circuit by cutting.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For guidance on refrigerant recovery and the use of appropriate refrigerant recovery cylinders and equipment, reference UL 60335-2-40, Annex DD, Clause 13.

For 30RC chillers requiring R-32, the system shall be purged with oxygen-free nitrogen to render the equipment safe for A2L refrigerants. This process may need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

REFRIGERANT CHARGE

Refer to the Physical Data tables supplied in the 30RC Installation Instructions. Immediately ahead of filter drier in each circuit is a factory-installed liquid line service valve. Each valve has a 1/4 in. Schrader connection for charging liquid refrigerant.

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the air-conditioning equipment is earthed/grounded prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the air-conditioning equipment.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow-up leak test shall be carried out prior to leaving the site.

Charging with Unit Off and Evacuated

Close liquid line service valve before charging. Weigh in charge shown on unit nameplate. Open liquid line service valve; start unit and allow it to run for several minutes fully loaded. Check for a clear sight glass. Be sure clear condition is liquid and not vapor.

Charging with Unit Running

If charge is to be added to a circuit while the unit is operating, then all condenser fans and compressors for the respective circuit must be operating. It may be necessary to block condenser coils at low ambient temperatures to raise the condensing temperature to approximately 121°F (49.4°C), which is 422 psig for R-410A or 431 psig for R-32. Do not totally block a coil to do this. Partially block all coils in a uniform pattern. Charge each circuit until the sight glass shows clear liquid and has the correct liquid line temperature corresponding to Fig. 67.

CONDENSER TYPE	LEAVING WATER TEMPERATURE	LIQUID LINE TEMPERATURE
MCHX	38.0°F (3.4°C) and above	See graph line A
Al-Cu (RTPF)	38.0°F (3.4°C) and above	See graph line B
MCHX	Below 37.9°F (3.3°C)	See graph line C

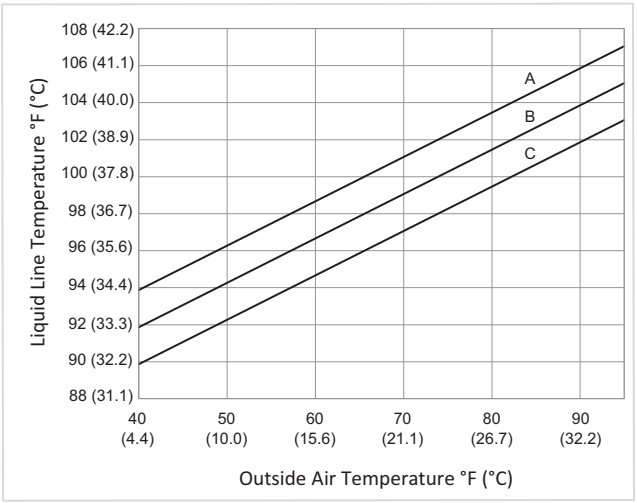


Fig. 67 — Liquid Line Temperature

If the unit has variable speed condenser fans, then the unit can be run in Greenspeed Charging Mode. This mode is enabled in the last screen of the Capacity Control menu (***Main Menu → Maintenance Menu → Capacity Control → Greenspeed Charging Mode*** = **On**). In this mode, the fans will adjust the high side pressure to maintain a 121°F (49.4°C) SCT (saturated condensing temperature). Charge each circuit to the liquid temperatures corresponding to Fig. 67. Unless manually disabled, the Greenspeed Charging Mode will remain in effect for 4 hours. If system load is low, one circuit should be charged at a time, while the other is disabled. The compressors for each circuit can be disabled manually through the Comp Disabled Cfg screen (***Main Menu → Configuration Menu → Comp Disabled Cfg***). For example, if charging

circuit A, then manually disable all circuit B compressors by setting **Compressor B1 Disable**, **Compressor B2 Disable**, **Compressor B3 Disable**, and **Compressor B4 Disable** to **Yes**.

IMPORTANT: When adjusting refrigerant charge, circulate fluid through evaporator continuously to prevent freezing and possible damage to the evaporator. Do not overcharge, and never charge liquid into the low-pressure side of system.

Safety Devices

Chillers contain many safety devices and protection logic built into the electronic control. This section presents a brief summary of major safeties.

COMPRESSOR PROTECTION

Circuit Breaker

Each compressor is equipped with one molded case circuit breaker to provide short circuit protection. Do not bypass or increase the size of a breaker to correct problems. Determine the cause for trouble and correct it before resetting the breaker. The circuit breaker current rating is listed on the individual circuit breakers.

A high-pressure switch is mounted on the discharge line of each circuit. The switch is wired into SIOB-A for circuit A and SIOB-B-J4 for circuit B. If a switch opens, the Carrier Controller opens all compressor contactors in the circuit, and all compressors are locked off. See Table 57 for high pressure switch protection.

Table 57 — High-Pressure Switch Settings

DEVICE	CUT-OUT	CUT-IN
R-410A HP Switch	640 ± 10 psi (4413 ± 69 kPa)	493 ± 29 psi (3399 ± 200 kPa)
R-32 HP Switch	630 ± 10 psi (4344 ± 69 kPa)	490 ± 15 psi (3378 ± 103 kPa)

CRANKCASE HEATERS

Each compressor has a 56 w crankcase heater to prevent the absorption of liquid refrigerant by oil in the crankcase when the compressor is not running. The heater power source is the control power transformer.

IMPORTANT: Never open any switch or disconnect that de-energizes crankcase heaters unless unit is being serviced or is to be shut down for a prolonged period. After a prolonged shutdown or service, energize crankcase heaters for 24 hours before starting the unit.

Relief Devices

HIGH-SIDE PROTECTION

The fusible plug is located between the condenser and filter drier; a second is on filter drier.

These are both designed to relieve pressure on a temperature rise to approximately 210°F (99°C).

LOW-SIDE PROTECTION

The fusible plug is located on the suction line and is designed to relieve pressure on a temperature rise to approximately 170°F (77°C). Some local building codes require that relieved gases be removed. This connection will allow conformance to this requirement.

PRESSURE RELIEF VALVES

Optional factory-installed pressure relief valves are installed in each circuit and are located on the suction and discharge lines. These valves are designed to relieve if an abnormal pressure condition arises. Relief valves on the suction line relieve at 445 psig (3068 kPa). Relief valves on the discharge line relieve at 630 psig (4344 kPa) for units with R-32 refrigerant and 650 psig (4482 kPa) for units with R-410A refrigerant. These valves should not be capped. If a valve relieves, it should be replaced. If the valve is not replaced, it may relieve at a lower pressure or leak due to trapped dirt from the system that may prevent resealing. See Table 58. Some local building codes require that relieved gases be exhausted to a specific location. This connection allows conformance to this requirement.

Table 58 — Relief Valve Specifications

LOCATION	CARRIER PART NO.	CONNECTION SIZE	PRESSURE SETTINGS PSI ±3%
Suction Line	EB51RW061	1/4 in. [M]	445
Discharge Line R-32	EB51RW121	3/8 in. [M]	630
Discharge Line R-410A	EB51RW122	3/8 in. [M]	650

Inspection and Maintenance

The relief valves on this chiller protect the system against the potentially dangerous effects of overpressure. To ensure against damage to the equipment and possible injury to personnel, these devices must be kept in peak operating condition. At minimum, the following maintenance is required:

1. At least once a year, disconnect the vent piping at the valve outlet, if equipped. Inspect the vent piping for corrosion, a restriction, or blockage. If any is found, clean or replace the affected vent piping.
2. Carefully inspect the valve body and mechanism for any evidence of internal corrosion or rust, dirt, scale, leakage, etc. If corrosion or foreign material is found, do not attempt to repair or recondition; replace the valve.

If the chiller is installed in a corrosive atmosphere, or the relief valves are vented into a corrosive atmosphere, then inspect relief valves and piping at more frequent intervals.

Variable Frequency Drives

The 30RC units with Greenspeed® Intelligence are equipped with VFDs to control the condenser fans. The Danfoss VLT[1] HVAC drive's parameters and statuses can be accessed from within the Carrier Controller menus. The VFDs are configured through the Carrier Controller controls, and parameters should not be changed manually.

ADDRESSING AND COMMUNICATION

The 30RC units with Greenspeed Intelligence use Danfoss VFDs that operate through the Carrier controller, communicating commands to the drive over the LEN bus. As a result, each drive must have a unique address, as shown in Table 59. Addresses are factory set but can be verified in VFD Parameter 8-31.

Table 59 — VFD Addresses

VFD	ADDRESS
Circuit A Fan Drive 1	181
Circuit A Fan Drive 2	182
Circuit B Fan Drive 1	183
Circuit B Fan Drive 2	184

1. VLT is a registered trademark of Danfoss Group Global.

COMMUNICATION WIRING

LEN wiring is connected to each drive at VFD Terminals 61 (Ground), 68 (+), and 69 (–). See Fig. 68.

VFDs should be arranged in a daisy-chain pattern, meaning the communication wiring is connected to one drive, exits, and is connected to the next. This pattern repeats until the last drive on the communication bus is reached. See Fig. 69 to determine correct communications wiring.

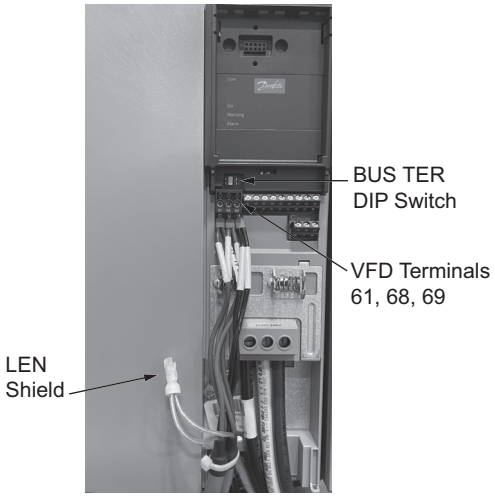
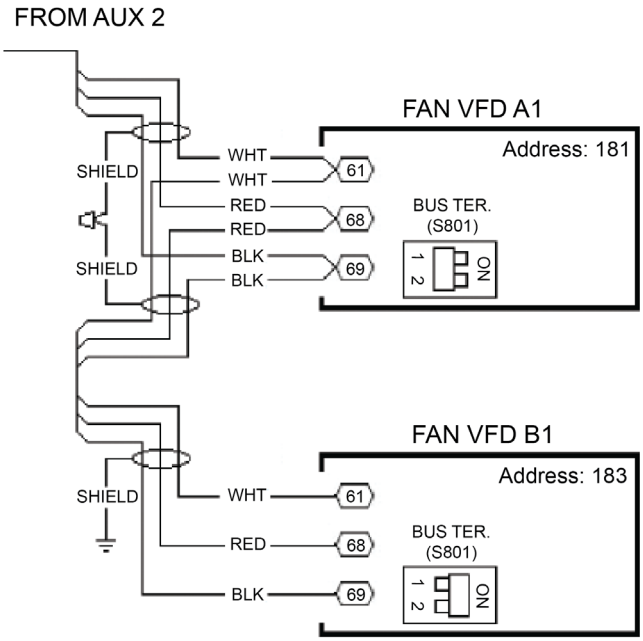


Fig. 68 — VFD LEN Wiring/BUS Termination



Bus Termination DIP Switch (BUS TER) "ON" for last VFD in the daisy chain only.

Fig. 69 — VFD Communication Wiring (Fan VFD A1-B1)

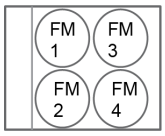
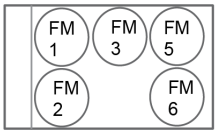
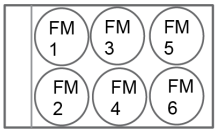
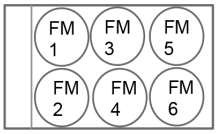
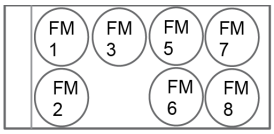
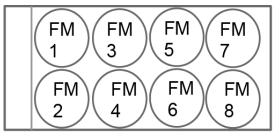
At each drive, where the LEN wiring enters, connects, and exits to the next drive, the LEN shield must be connected together to form a continuous ground but not grounded in the drive itself. At the last VFD of the daisy chain, the LEN shield must be grounded at the drive. To do this, strip the LEN wire cable and connect to ground.

Additionally, it is recommended that the BUS TER (Bus Termination) DIP Switch be turned ON at the last VFD in the daisy chain. This switch is located behind the Local Control Panel (LCP). See Fig. 68.

CONDENSER FAN DRIVES

Chillers with 0, 3, 6, or H in the 11th position of the model number will have condenser fans on each circuit that are controlled by one or 2 VFDs. The fans on each circuit all operate together at the same preprogrammed frequency. See Tables 60-63 for typical VFD arrangement and description of which fans are controlled by each drive. The fan drives are located inside the control box. Reference the component arrangement diagrams in Fig. 78-79 on pages 130-131 for VFD locations. For fixed speed fan sequencing, refer to Table 40 on page 62.

Table 60 — Condenser Fan Drive Arrangement

FANS	CKT					
		**30RC 065/067, 070/072, 080C, 082, 092C, 102C (ALL VOLTAGES)**				
	A	VFD Designation	A1			
		Fan Position	FM1	FM2		
	B	VFD Designation	B1			
		Fan Position	FM3	FM4		
		**30RC80 (ALL VOLTAGES)**				
	A	VFD Designation	A1			
		Fan Position	FM1	FM2	FM3	
	B	VFD Designation	B1			
		Fan Position	FM5	FM6		
		**30RC 090/092, 100/102, 110/112, 132C, 152C (ALL VOLTAGES)**				
	A	VFD Designation	A1			
		Fan Position	FM1	FM2	FM3	
	B	VFD Designation	B1			
		Fan Position	FM5	FM6	FM4	
		**30RC 120C/122C (ALL VOLTAGES)**				
	A	VFD Designation	A1			
		Fan Position	FM1	FM2		
	B	VFD Designation	B1			
		Fan Position	FM3	FM4	FM5	FM6
		**30RC 120/122 (ALL VOLTAGES)**				
	A	VFD Designation	A1			
		Fan Position	FM1	FM2	FM3	
	B	VFD Designation	B1			
		Fan Position	FM5	FM6	FM7	FM8
		**30RC 130/132, 150/152 (ALL VOLTAGES)**				
	A	VFD Designation	A1			
		Fan Position	FM1	FM2	FM3	FM4
	B	VFD Designation	B1			
		Fan Position	FM5	FM6	FM7	FM8

VFD STATUS

The current operating status and conditions of the VFDs can be viewed with the Carrier Controller controls.

Fan VFD Status

To view the operating status of the fan VFDs, follow the Carrier Controller path ***Main Menu → Maintenance Menu → Drive Maintenance 2***. This menu shows current operating conditions for both drives: Drive Power, Current, Nominal Current, Current Limit, Voltage, Frequency, Torque, and Command. To view the communication status of the fan VFDs, use the Carrier Controller (***Main Menu → Maintenance Menu → Drive Maintenance***).

VFD CONFIGURATION TABLES

The configuration parameters for the VFDs are stored in the control system and are automatically sent to the drives when addressed. The parameters should not need to be changed but are included as a reference for verification and troubleshooting. See Tables 61-63 for fan VFD parameters.

Table 61 — VFD Parameters

PARAMETER NUMBER	PARAMETER DESCRIPTION	SETTING DESCRIPTION	COMMON	SPECIFIC	SETTING
0-06	Grid Type	Supply voltage/freq.		X	—
1-01	Motor Control Principle	U/f	X		0
1-03	Torque Characteristics	Variable Torque	X		1
1-06	Clockwise Direction	Normal	X		0
1-20	Motor kW	Size dependent		X	—
1-22	Motor volts	Motor dependent		X	—
1-23	Motor frequency	60Hz	X		60
1-24	Motor amperage	Size dependent		X	—
1-25	Motor rpm	1140RPM	X		1140
1-39	Motor Poles	6 poles	X		6
1-73	Flying Restart	Disabled	X		0
1-80	Function at stop	Coast	X		0
1-90	Motor thermal protection	No protection	X		0
3-02	Min ref	0Hz	X		0
3-03	Max reference	60Hz	X		60
3-15	Src ref#1	No function	X		0
3-16	Src ref#2	No function	X		0
3-41	Ramp up	20s	X		20
3-42	Ramp down	20s	X		20
4-10	Motor speed direction	Clockwise	X		0
4-12	Motor speed low limit	5Hz	X		5
4-14	Motor speed high limit	60Hz	X		60
4-18	Current limit	110%	X		110
4-19	Max output frequency	61Hz	X		61
5-12	DI #27	No Operation	X		0
8-01	Control site	Digital and control word	X		0
8-02	Control Source	FC port=RS485	X		1
8-03	Time out time	10s	X		10
8-04	Time out function	Stop	X		2
14-01	Switching frequency	2.0kHz	X		2
14-03	Overmodulation	Off	X		0
14-50	RFI Filter	On	X		1

Table 62 — Fan VFD Parameters, Unit Specific, A1

UNIT SIZE	UNIT VOLTAGE	Hz	VFD PARAMETERS				FAN QTY
			A1				
			GRID TYPE	MOTOR kW	MOTOR VOLTS	MOTOR AMPS	
			0-06	1-20	1-22	1-24	
065	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
067	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
070	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
072	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
080 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
080	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
082	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
090	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
092 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
092	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
100	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
102 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
102	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
110	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3

Table 62 — Fan VFD Parameters, Unit Specific, A1 (cont)

UNIT SIZE	UNIT VOLTAGE	Hz	VFD PARAMETERS				FAN QTY
			A1				
			GRID TYPE	MOTOR kW	MOTOR VOLTS	MOTOR AMPS	
			0-06	1-20	1-22	1-24	
112	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
120 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
120	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
122 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
122	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
130	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
132 C	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
132	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
150	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
152 C	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
152	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4

Table 63 — Fan VFD Parameters, Unit Specific, B1

UNIT SIZE	UNIT VOLTAGE	Hz	VFD PARAMETERS				FAN QTY
			B1				
			GRID TYPE	MOTOR kW	MOTOR VOLTS	MOTOR AMPS	
			0-06	1-20	1-22	1-24	
065	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
067	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
070	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
072	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
080 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
080	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
082	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
090	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
092 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
092	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
100	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
102 C	208/230	60	102	14	208/230	21.2	2
	380		112	14	380	11.6	2
	460		122	14	460	9.6	2
	575		132	14	575	7.6	2
102	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
110	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3

Table 63 — Fan VFD Parameters, Unit Specific, B1 (cont)

UNIT SIZE	UNIT VOLTAGE	Hz	VFD PARAMETERS				FAN QTY
			B1				
			GRID TYPE	MOTOR kW	MOTOR VOLTS	MOTOR AMPS	
			0-06	1-20	1-22	1-24	
112	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
120 C	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
120	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
122 C	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
122	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
130	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
132 C	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
132	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
150	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4
152 C	208/230	60	102	15	208/230	31.8	3
	380		112	15	380	17.4	3
	460		122	15	460	14.4	3
	575		132	15	575	11.4	3
152	208/230	60	102	16	208/230	42.4	4
	380		112	16	380	23.2	4
	460		122	16	460	19.2	4
	575		132	16	575	15.2	4

VFD ALARM RESET

As long as communication is established between the Carrier Controller controls and the VFD, most alarms can be reset directly through the chiller control system.

VFD REPLACEMENT PROCEDURE

If required, VFDs can be replaced and programmed with the procedure below. The Fan VFD Display accessory (HR89ZZ006) is required to program the replacement VFD. Contact Carrier Services.

1. Disconnect power from unit. Wait a minimum of 15 minutes before continuing. After waiting, verify that there is no voltage on the power terminals.

⚠ WARNING

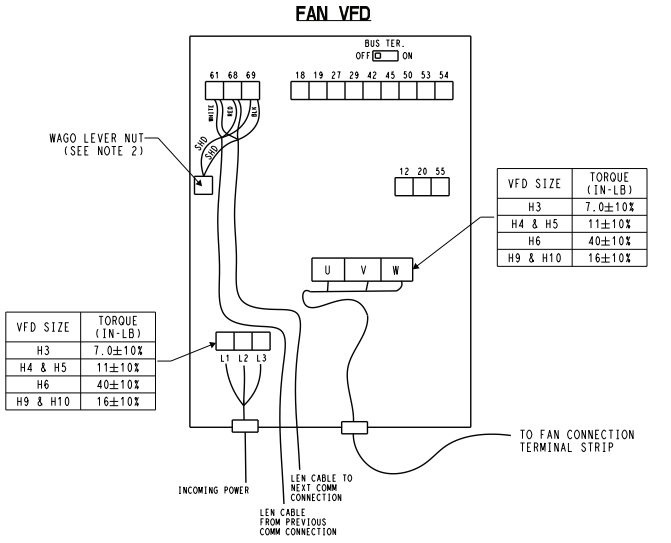
After unit power is disconnected, wait at least 15 minutes for the VFD capacitors to discharge before opening the drive. Failure to do so presents an electrical shock hazard and may result in personal injury.

2. Disconnect electrical power and communication connections from drive.
3. Unbolt and remove the drive from inside the powerbox, taking care to support the drive at all times during the procedure. Larger drives are equipped with lifting lugs that must be used to support the load.

⚠ CAUTION

Use all proper rigging procedures and precautions when moving VFDs to avoid damage to the equipment.

4. Lift, position, and fasten the replacement drive to the powerbox. Tighten all bolts securely.
5. Connect power and LEN control wiring to the drive. For wiring details for fan drives, see Fig 70. Use the same knockout openings on the new drive as on the drive being replaced. Torque connections are shown in Table 64.



NOTES:
1. TERMINATING RESISTOR MUST BE SWITCHED ON IN LAST FAN DRIVE WHICH WILL BE B1 IF ONLY 1 FAN DRIVE PER CIRCUIT OR B2 IF 2 FAN DRIVE PER CIRCUIT.
2. CONNECT SHIELD WIRES OF LEN CABLES TOGETHER WITH CRIMP CONNECTOR (P/N HY895B020) ON FAN VFD'S A1, A2 (IF PRESENT) B1 (IF B2 IS PRESENT) OTHERWISE CONNECT B1 SHIELD TO GROUND, IF B2 IS PRESENT CONNECT B2 SHIELD TO GROUND & CRIMP B1 SHIELDS TOGETHER.

Fig. 70 — Fan Drive Wiring

Table 64 — Power Connection Torque Values, Fan Drives

CARRIER P/N	ENCLOSURE FRAME	TORQUE (in-lb)	
		Mains/Motor	Ground
HR46JZ013	H6	40	27
HR46JZ014	H4	11	7
HR46JZ015	H10	16	27
HR46JZ016	H6	40	27
HR46JZ017	H5	11	7
HR46JZ018	H6	40	27
HR46JZ019	H5	11	7
HR46JZ020	H6	40	27
HR46JZ021	H6	40	27
HR46JZ022	H6	40	27
HK30WA395	H4	11	7
HK30WA396	H5	11	7
HK30WA462	H3	7	7
HK30WA463	H4	11	7
HK30WA467	H9	16	27
HK30WA469	H10	16	27

6. Turn on power to the unit and allow the drive screen to become active. The drive will need to be manually addressed for the control system to export the correct parameters. Use this procedure to address the VFDs:
   a. Using the display interface on the VFD drive, select Main Menu with the Menu button. Navigate to menu item 8-30 and confirm that the LEN option is selected. Using the up/down arrows and OK button, follow the following path: ***8-** (Command Options) → 8-3* (FC Port Settings) → 8-30 (Protocol)***. If LEN is not selected, press the OK button and use the arrows to scroll through the options and select it. If no LEN option appears, LEN communication is not enabled on the drive. Follow the process described in the next section, Enable LEN Communication, and then complete the remainder of this addressing procedure.
   b. Navigate to menu item 8-31 on the VFD display and enter the address for the drive being configured, using the following path: ***8-** (Command Options) → 8-3* (FC Port Settings) → 8-31 (Address)***. Press the OK button and use the up/down arrows to select the drive address. See Table 59 to determine the correct address. For fan drives, see Fig. 70 for typical arrangement.
   c. Turn the chiller power off and then on again. Cycling the power will cause the control system to send the correct configuration data files to the new drive.
   d. Verify that communication with the new drive has been established. For fan drives, follow this Carrier Controller path: ***Main Menu → Maintenance Menu → Drive Maintenance***. Then confirm that the relevant **Fan Drive Xn Com Ok?** status is **Yes**.

Enable LEN Communication

If the replacement drive received does not have LEN as an option under menu item 8-30 on the VFD display, then LEN will need to be manually enabled before the drive can be addressed. To enable the LEN communication option:

1. Navigate to menu item 14-29 on the VFD display. Select Main Menu with the Menu button, and then navigate through the following path: ***14-** (Special Functions) → 14-2* (Reset Functions) → 14-29 (Service Code)***. Set the 14-29 parameter to 00006222. Press OK.
2. Power down the drive, and then wait until the display is completely blank. Power up the drive again (power cycle) and check that the LEN protocol is selected on 8-30.

3. Proceed with the procedure for addressing the VFD above to complete the configuration process (see the VFD Replacement Procedure section, step 6, sub-step B).

LONG TERM STORAGE

If the unit is stored for long periods of time without use, then special procedures must be performed to ensure the safe and efficient operation of the VFD capacitor banks. If the unit has been stored for more than 3 years without power applied to the drives, then contact Carrier Service to obtain information and instructions for reforming the capacitor banks.

MAINTENANCE

Recommended Maintenance Schedule

The following are only recommended guidelines. Jobsite conditions may dictate that maintenance tasks be performed more often than recommended.

Routine for machines with e-coat condenser coils:

- Check condenser coils for debris; clean as necessary with Carrier approved coil cleaner.
- Periodic clean water rinse, especially in coastal and industrial applications.

Every month:

- Check condenser coils for debris; clean as necessary with Carrier approved coil cleaner.
- Check moisture-indicating sight glass for possible refrigerant loss and presence of moisture.
- Record water pressure differential.
- Record system superheat.

Every 3 months:

- Check all refrigerant joints and valves for refrigerant leaks; repair as necessary.
- Check chilled water flow switch operation.
- Check all condenser fans for proper operation.
- Check sight glass moisture indicator for moisture.
- Check compressor oil level.
- Check crankcase heater operation.
- Inspect pump seal, if equipped with hydronic pump package.
- Check the back of all fan drives for any debris. If present, clean each by blowing air from top to bottom.

Every 12 months:

- Check refrigerant charge.
- Check all electrical connections; tighten as necessary.
- Inspect all contactors and relays; replace as necessary.
- Check accuracy of thermistors; replace if greater than ±2°F (1.2°C) variance from calibrated thermometer.
- Check accuracy of transducers; replace if greater than ±5 psig (34.47 kPa) variance.
- Check to be sure that the proper concentration of antifreeze is present in the chilled water loop, if applicable.
- Verify that the chilled water loop is properly treated.
- Check refrigerant filter driers for excessive pressure drop; replace as necessary.
- Check chilled water strainers; clean as necessary.
- Check evaporator heater operation.
- Check pump heater operation, if equipped.
- Check condition of condenser fan blades and that they are securely fastened to the motor shaft.
- Perform Service Test to confirm operation of all components.
- Check for excessive evaporator approach (Leaving Chilled Water Temperature – Saturated Suction Temperature), which may indicate fouling. Clean evaporator vessel if necessary.

Every 3-5 years:

- Inspect pressure relief valves, if equipped.

TROUBLESHOOTING

Alarms and Alerts

The integral control system constantly monitors the unit and generates warnings when abnormal or fault conditions occur. Alarms may cause either a circuit (Alert) or the whole machine (Alarm) to shut down. Alarms and Alerts are assigned codes as described in Table 65.

To view information about current and past alarms or to reset alarms, press the Alarm bell button in the top right corner of the Carrier Controller display. A solid gray icon is present during normal operation. A ringing yellow bell icon indicates that there is an alarm, but the unit is still running. A ringing red bell icon indicates that the unit is shut down due to a detected fault.

CURRENT ALARMS

To access the current alarms view, press the Alarm bell button in the top right corner of the Carrier Controller display, and then select Current Alarms . This screen displays up to 10 current alarms with the time and date as well as a one line description of each alarm. See Table 65 for a list of possible alarms sorted alphabetically by description.

RESETTING ALARMS

The alarms can be reset without stopping the machine. The controller generates 2 types of alarms. Automatic reset alarms will reset without any intervention if the condition that caused the alarm corrects itself. Manual reset alarms require the service technician to check for the alarm cause and manually reset the alarm.

To reset any active alarms, press the Alarm button and then press the Reset Alarms icon . For Alarm Reset, press the YES button and select SET in the pop-up window. When resetting the alarm manually, the reset can be performed through the Carrier Controller display or remotely through the web interface (Reset Alarms menu).

Only logged-in users can access the Reset Alarms menu. The menu displays up to 5 alarm codes that are currently active on the unit, corresponding to the first 5 items displayed in the Current Alarms menu. Each alarm is also described by a numeric code. See Tables 66-67 for lists of alarms by code. See Table 68 for Master/Slave alarm codes.

In the event of a power supply interrupt, the unit restarts automatically without the need for an external command. However, any faults active when the supply is interrupted are saved and may in certain cases prevent a circuit or unit from restarting.

Before resetting any alarm, first determine the cause of the alarm and correct it. Do not reset the chiller at random without first investigating and correcting the cause(s) of the failure.

ALARM HISTORY

Once the cause of the alarm has been identified and corrected, it will be displayed in the alarm history. Information regarding resolved alarms is stored in the Alarm history menu, which is divided into 50 recent alarms and 50 recent major alarms. General alarms indicate pumps failure, transducers faults, network connection problems, etc. Major alarms indicate process failure.

To access the Alarm history menu, press the Alarm button and select Alarm Historic or Major Alarm Historic. The 50 most recent alarms of each type are stored in memory and are replaced on a first-in, first-out basis.

Table 65 — Alarm Reference Lists, By Name

ALARM NAME	ALARM CODE
Circuit A Discharge Transducer	12001
Circuit A High Pressure Switch Failure	10063
Circuit A High Superheat	10008
Circuit A Low Delta Pressure Operation Failure	10210
Circuit A Low Suction Temperature	10005
Circuit A Low Superheat	10011
Circuit A Repeated High Discharge Gas Overrides	10037
Circuit A SIOB Low Voltage Failure	57001
Circuit A Suction Gas Thermistor	15012
Circuit A Suction Transducer	12004
Circuit A VFD Fan Drive 1 Alert	35nnn
Circuit A VFD Fan Drive 1 Failure	17nnn
Circuit A VFD Fan Drive 2 Alert	36nnn
Circuit A VFD Fan Drive 2 Failure	18nnn
Circuit A Welded Contactor Failure	06001
Circuit B Discharge Transducer	12002
Circuit B High Pressure Switch Failure	10064
Circuit B High Superheat	10009
Circuit B Low Delta Pressure Operation Failure	10211
Circuit B Low Suction Temperature	10006
Circuit B Low Superheat	10012
Circuit B Repeated High Discharge Gas Overrides	10038
Circuit B SIOB Low Voltage Failure	57002
Circuit B Suction Gas Thermistor	15013
Circuit B Suction Transducer	12005
Circuit B VFD Fan Drive 1 Alert	37nnn
Circuit B VFD Fan Drive 1 Failure	19nnn
Circuit B VFD Fan Drive 2 Alert	38nnn
Circuit B VFD Fan Drive 2 Failure	20nnn
Circuit B Welded Contactor Failure	06002
Compressor A1 Failure	01199
Compressor A1 Not Started or Pressure Not Established	10016
Compressor A2 Failure	01299
Compressor A2 Not Started or Pressure Not Established	10017
Compressor A3 Failure	01399
Compressor A3 Not Started or Pressure Not Established	10018
Compressor A4 Failure	01499
Compressor A4 Not Started or Pressure Not Established	10019
Compressor B1 Failure	02199
Compressor B1 Not Started or Pressure Not Established	10020
Compressor B2 Failure	02299
Compressor B2 Not Started or Pressure Not Established	10021
Compressor B3 Failure	02399
Compressor B3 Not Started or Pressure Not Established	10022
Compressor B4 Failure	02499
Compressor B4 Not Started or Pressure Not Established	10023
Current Phase Reversal	10053
Customer Interlock Failure	10014
Database Module Failure	55001
EMM SIOB Low Voltage Failure	57006
Evaporator Entering Fluid Thermistor	15001
Evaporator Leaving Fluid Thermistor	15002
F-Gas Scheduled Check Required	13005
Illegal Factory Configuration Number 1 to nn	70nn

Table 65 — Alarm Reference Lists, By Name

ALARM NAME	ALARM CODE
Lenscan Module Failure	56001
Loss of Communication with Circuit A SIOB Board	04901
Loss of Communication with Circuit B SIOB Board	04902
Loss of Communication with Energy Management SIOB Board	04906
Loss of Communication with Fan Board No. 1	04501
Loss of Communication with VFD Fan Drive 1 Circuit A	04701
Loss of Communication with System Manager	10029
Loss of Communication with VFD Fan Drive 2 Circuit A	04702
Loss of Communication with VFD Fan Drive 1 Circuit B	04703
Loss of Communication with VFD Fan Drive 2 Circuit B	04704
Main EXV Stepper Motor Failure — Circuit A	57020
Main EXV Stepper Motor Failure — Circuit B	57021
Maintenance Servicing Required	13004
Master/Slave Common Leaving Fluid Thermistor	15011
Master/Slave Communication Failure	10030
Master Slave Configuration Error Number 1 to nn	90nn
No Factory Configuration	08000
OAT Thermistor Failure	15010
Refrigerant Leakage Detection	10050
Space Temperature Thermistor	15021
Unit Is In Emergency Stop	10031
Water Exchanger Flow Switch Failure	10051
Water Exchanger Freeze Protection	10001
Water Exchanger Temperature Sensors Swap	10097
Water Pump No. 1 Fault	10032
Water Pump No. 2 Fault	10033

NOTE: For VFD alarms, “nnn” corresponds to the alarm code listed in Table 70.

LEGEND

EMM — Energy Management Module
EXV — Electronic Expansion Valve
OAT — Outdoor Air Temperature
SIOB — Standard Input Output Board
VFD — Variable Frequency Drive

Table 66 — Alarm Reference Lists, By Code

ALARM CODE	ALARM NAME
01199	Compressor A1 Failure
01299	Compressor A2 Failure
01399	Compressor A3 Failure
01499	Compressor A4 Failure
02199	Compressor B1 Failure
02299	Compressor B2 Failure
02399	Compressor B3 Failure
02499	Compressor B4 Failure
04501	Loss of Communication with Fan Board No. 1
04701	Loss of Communication with VFD Fan Drive 1 Circuit A
04702	Loss of Communication with VFD Fan Drive 2 Circuit A
04703	Loss of Communication with VFD Fan Drive 1 Circuit B
04704	Loss of Communication with VFD Fan Drive 2 Circuit B
04901	Loss of Communication with Circuit A SIOB Board
04902	Loss of Communication with Circuit B SIOB Board
04906	Loss of Communication with Energy Management SIOB Board
06001	Circuit A Welded Contactor Failure
06002	Circuit B Welded Contactor Failure
08000	No Factory Configuration
10001	Water Exchanger Freeze Protection
10005	Circuit A Low Suction Temperature
10006	Circuit B Low Suction Temperature
10008	Circuit A High Superheat
10009	Circuit B High Superheat
10011	Circuit A Low Superheat
10012	Circuit B Low Superheat
10014	Customer Interlock Failure
10016	Compressor A1 Not Started or Pressure Not Established
10017	Compressor A2 Not Started or Pressure Not Established
10018	Compressor A3 Not Started or Pressure Not Established
10019	Compressor A4 Not Started or Pressure Not Established
10020	Compressor B1 Not Started or Pressure Not Established
10021	Compressor B2 Not Started or Pressure Not Established
10022	Compressor B3 Not Started or Pressure Not Established
10023	Compressor B4 Not Started or Pressure Not Established
10029	Loss of Communication with System Manager
10030	Master/Slave Communication Failure
10031	Unit Is In Emergency Stop
10032	Water Pump No. 1 Fault
10033	Water Pump No. 2 Fault
10037	Circuit A Repeated High Discharge Gas Overrides
10038	Circuit B Repeated High Discharge Gas Overrides
10050	Refrigerant Leakage Detection
10051	Water Exchanger Flow Switch Failure
10053	Current Phase Reversal
10063	Circuit A High Pressure Switch Failure
10064	Circuit B High Pressure Switch Failure
10097	Water Exchanger Temperature Sensors Swap
10210	Circuit A Low Delta Pressure Operation Failure
10211	Circuit B Low Delta Pressure Operation Failure
12001	Circuit A Discharge Transducer
12002	Circuit B Discharge Transducer
12004	Circuit A Suction Transducer
12005	Circuit B Suction Transducer
13004	Maintenance Servicing Required
13005	F-Gas Scheduled Check Required
15001	Evaporator Entering Fluid Thermistor
15002	Evaporator Leaving Fluid Thermistor
15010	OAT Thermistor Failure
15011	Master/Slave Common Leaving Fluid Thermistor
15012	Circuit A Suction Gas Thermistor
15013	Circuit B Suction Gas Thermistor

Table 66 — Alarm Reference Lists, By Code (cont)

ALARM CODE	ALARM NAME
15021	Space Temperature Thermistor
17nnn	Circuit A VFD Fan Drive 1 Failure
18nnn	Circuit A VFD Fan Drive 2 Failure
19nnn	Circuit B VFD Fan Drive 1 Failure
20nnn	Circuit B VFD Fan Drive 2 Failure
35nnn	Circuit A VFD Fan Drive 1 Alert
36nnn	Circuit A VFD Fan Drive 2 Alert
37nnn	Circuit B VFD Fan Drive 1 Alert
38nnn	Circuit B VFD Fan Drive 2 Alert
55001	Database Module Failure
56001	Lenscan Module Failure
57001	Circuit A SIOB Low Voltage Failure
57002	Circuit B SIOB Low Voltage Failure
57006	EMM SIOB Low Voltage Failure
57020	Main EXV Stepper Motor Failure — Circuit A
57021	Main EXV Stepper Motor Failure — Circuit B
70nn	Illegal Factory Configuration Number 1 to nn
90nn	Master Slave Configuration Error Number 1 to nn

LEGEND

EMM — Energy Management Module
EXV — Electronic Expansion Valve
OAT — Outdoor Air Temperature
SIOB — Standard Input Output Board
VFD — Variable Frequency Drive

NOTE: For VFD alarms, “nnn” corresponds to the alarm code listed in Table 70.

Table 67 — Alarm Details By Code

ALARM CODE	ALARM NAME	CRITERIA FOR TRIP	ACTION TAKEN BY CONTROL	RESET METHOD	POSSIBLE CAUSES/CORRECTIVE ACTIONS
01199	Compressor A1 Failure	Tested when unit is ON or OFF. The alarm is tripped if the Compressor Capacity (***Main Menu*** → ***Configuration Menu*** → ***Factory2 Configuration***) is defined and if Compressor Failure is opened (***Main Menu*** → ***Inputs***).	Compressor A1 shuts down	Manual	Compressor temperature too high, high pressure switch opened, compressor not started
01299	Compressor A2 Failure		Compressor A2 shuts down		
01399	Compressor A3 Failure		Compressor A3 shuts down		
01499	Compressor A4 Failure		Compressor A4 shuts down		
02199	Compressor B1 Failure		Compressor B1 shuts down		
02299	Compressor B2 Failure		Compressor B2 shuts down		
02399	Compressor B3 Failure		Compressor B3 shuts down		
02499	Compressor B4 Failure		Compressor B4 shuts down		
04501	Loss of Communication with Fan Board No. 1	No communication with Fan Board 1	Circuits A and B shut down or not allowed to start	Automatic	Wrong module address, wrong unit configuration, wiring error, power loss to module
04701	Loss of Communication with VFD Fan Drive 1 Circuit A	Alarm will trip if communication with Circuit A Fan A1 VFD is lost	Circuit A will be shut down immediately	Automatic when the communication is reestablished	If this condition is encountered, then check the following items for faults: - power supply to the fan drive board - local equipment network (LEN) wiring - VFD parameters against list - VFD address - unit configuration for correct unit size, low ambient selection, voltage, frequency, and tier
04702	Loss of Communication with VFD Fan Drive 2 Circuit A	Alarm will trip if communication with Circuit A Fan A2 VFD is lost	Circuit A will be shut down immediately	Automatic when the communication is reestablished	
04703	Loss of Communication with VFD Fan Drive 1 Circuit B	Alarm will trip if communication with Circuit B Fan B1 VFD is lost	Circuit B will be shut down immediately	Automatic when the communication is reestablished	
04704	Loss of Communication with VFD Fan Drive 2 Circuit B	Alarm will trip if communication with Circuit B Fan B2 VFD is lost	Circuit B will be shut down immediately	Automatic when the communication is reestablished	
04901	Loss of Communication with Circuit A SIOB Board	Alarm will trip if communication with SIOB-A Board is lost	Unit will be stopped immediately	Automatic when the communication is reestablished	If this condition is encountered, then check the following items for faults: - power supply to the SIOB - local equipment network (LEN) wiring - confirm unit configuration - board addressing DIP switches
04902	Loss of Communication with Circuit B SIOB Board	Alarm will trip if communication with SIOB-B Board is lost			
04906	Loss of Communication with Energy Management SIOB Board	Alarm will trip if communication with Energy Management Module (EMM) Board is lost	No action on the unit, EMM functions will not operate	Automatic when the communication is reestablished	If this condition is encountered, then check the following items for faults: - the EMM is installed (***Main Menu*** → ***Configuration Menu*** → ***Factory Configuration*** → **Energy Management Module = Yes**) - power supply to EMM - address of the EMM - local equipment network (LEN) wiring If no EMM board is installed, then confirm unit configuration to assure that no options requiring EMM are selected
06001	Circuit A Welded Contactor Failure	Controls determine compressor is still running when circuit should be off	EXV, fan control, and pump operate as normal to save compressor until high pressure, freeze, or flow failure conditions occur	Manual	One or more circuit compressor contactors welded closed
06002	Circuit B Welded Contactor Failure				
08000	No Factory Configuration	The alarm will be generated if the **Unit Capacity** (***Main Menu*** → ***Configuration Menu*** → ***Factory Configuration***) is missing	Unit is not allowed to start	Automatic when configured correctly	If this condition is encountered, then confirm unit configuration

Table 67 — Alarm Details By Code (cont)

ALARM CODE	ALARM NAME	CRITERIA FOR TRIP	ACTION TAKEN BY CONTROL	RESET METHOD	POSSIBLE CAUSES/CORRECTIVE ACTIONS
10001	Water Exchanger Freeze Protection	Tested when the unit is ON or OFF AND one of the following conditions is true: 1. Entering Water Temperature is less than the fluid freeze point 2. Leaving Water Temperature is less than the fluid freeze point The freeze point is 34°F (1.1°C) if **Exchanger Fluid Type** (***Main Menu → Configuration Menu → Factory Configuration***) is **1 (Water)** or 32°F (0°C) if **Exchanger Fluid Type** is **1** and **Glycol in Loop** (***Main Menu → Configuration Menu → Service Configuration***) is set to **Yes**. If **Exchanger Fluid Type** is **3** (Low Brine), brine freeze is a field configured under **Brine Freeze Setpoint** (***Main Menu → Configuration Menu → Service Configuration***).	The unit is shut down if it was running or is not allowed to start. The command for the cooler pump will remain ON.	Automatic for the first time within 24 hours OR Manual if the alarm has occurred more than once in the last 24 hours The alarm is reset if the leaving and entering water temperatures are more than 3.6°F (2°C) above the freeze point	If this condition is encountered, check the following items: - confirm solution and concentration and compare the value with **Brine Freeze Setpoint** (***Main Menu → Configuration Menu → Service Configuration***) - entering and leaving fluid thermistors accuracy - water flow rate - loop volume (Low loop volume at nominal flow rates can, in extreme cases, bypass cold water to the evaporator.) - evaporator heater operation If the Leaving Water Setpoint is above 40°F (4.4°C) and there is glycol in the loop, consider setting **Glycol in Loop** (***Main Menu → Configuration Menu → Service Configuration***) to **Yes** to utilize a lower freeze point, 32°F (0°C). Further lowering of the freeze point can be accomplished by setting the **Exchanger Fluid Type** (***Main Menu → Configuration Menu → Factory Configuration***) to **3** for Low Temperature Brine to utilize the **Brine Freeze Setpoint** (***Main Menu → Configuration Menu → Service Configuration***) instead of the 34°F (1.1°C) or 32°F (0°C) minimums for fluid type 1.
10005	Circuit A Low Suction Temperature	Tested only when the circuit is ON. The alarm will trip if the circuit is running and SST < –22°F (–30°C) for more than 30 seconds.	Circuit A shuts down Prior to alarm trip, the control will take action to avoid alarm. See capacity overrides 23 and 29 on page 45.	Automatic if first occurrence in 24 hours OR Manual if the alarm has occurred in the previous 24 hours In order for the unit controls to reset, the circuit's Saturated Suction Temperature must be greater than –21.1°F (–29.5°C)	If this condition is encountered, check the following items for faults: - Sensor wiring to SIOB - Board for faulty channel - Faulty suction transducer - Evaporator water flow switch - Loop volume - EXV operation / blocked - Liquid line refrigerant restriction, filter drier, service valve, etc. - Refrigerant charge If the Leaving Water Setpoint is above 40°F (4.4°C) and there is glycol in the loop, consider setting the **Glycol in Loop** (***Main Menu → Configuration Menu → Service Configuration***) to **Yes** to utilize a lower freeze point, 32°F (0°C). Further lowering of the freeze point can be accomplished by setting the **Exchanger Fluid Type** (***Main Menu → Configuration Menu → Factory Configuration***) to **3** for Low Temperature Brine to utilize the **Brine Freeze Setpoint** (***Main Menu → Configuration Menu → Service Configuration***) instead of the 34°F (1.1°C) or 32°F (0°C) for fluid type 1.
10006	Circuit B Low Suction Temperature		Circuit B shuts down Prior to alarm trip, the control will take action to avoid alarm. See capacity overrides 24 and 30 on page 45.		
10008	Circuit A High Superheat	EXV > 98%, Suction Superheat > 54°F (30.0°C) AND SST < Maximum Operating Pressure (MOP) for more than 5 minutes	Circuit A shuts down	Manual	Faulty transducer, faulty thermistor, faulty wiring, faulty EXV, low refrigerant charge, plugged or restricted liquid line
10009	Circuit B High Superheat		Circuit B shuts down		
10011	Circuit A Low Superheat	EXV < 7% and Suction Superheat is less than 3.6°F (2°C) or SST > MOP for more than 2 minutes	Circuit A shuts down	Manual	Faulty transducer, faulty thermistor, faulty wiring, faulty EXV, or incorrect configuration
10012	Circuit B Low Superheat		Circuit B shuts down		
10014	Customer Interlock Failure	Tested only when the unit is ON: Case 1: If EMM option is configured, then the alarm will trip if the Remote Lockout Switch (CCN variable **REM_LOCK**) is closed and the unit is running. Case 2: The alarm will trip if the customer-supplied Pump Interlock (CCN variable **LOCK_SW**) is opened and the unit is running.	Unit shuts down	Automatic if the alarm was triggered when the unit was stopped or if the alarm was triggered no more than 10 seconds after a SIOB low voltage alarm (57001/57002) Manual otherwise	If this condition is encountered, then check the following items for faults: - remote lockout switch is closed (Connection EMM-J1-DI03) - pump interlock is opened (Connection SIOBB-J1-DI02)

Table 67 — Alarm Details By Code (cont)

ALARM CODE	ALARM NAME	CRITERIA FOR TRIP	ACTION TAKEN BY CONTROL	RESET METHOD	POSSIBLE CAUSES/CORRECTIVE ACTIONS
10016	Compressor A1 Not Started or Pressure Not Established	Compressor differential (Discharge-Suction) did not increase by 10 psig (69 kPa) in 2 minutes	Circuit A shuts down	Manual	No power to the compressor, faulty compressor contactor, low control voltage, faulty discharge or suction pressure transducers, wiring error, improper electrical phasing
10017	Compressor A2 Not Started or Pressure Not Established				
10018	Compressor A3 Not Started or Pressure Not Established				
10019	Compressor A4 Not Started or Pressure Not Established				
10020	Compressor B1 Not Started or Pressure Not Established		Circuit B shuts down		
10021	Compressor B2 Not Started or Pressure Not Established				
10022	Compressor B3 Not Started or Pressure Not Established				
10023	Compressor B4 Not Started or Pressure Not Established				
10029	Loss of Communication with System Manager	Loss of communication with an external control device for more than 2 minutes	If **Auto Start When SM Lost** (***Main Menu → Configuration Menu → Service Configuration***) is set to **Enable**, then the unit shall continue to run. If disabled, then the unit will shut down.	Automatic	Faulty communication wiring, no power supply to the external controller
10030	Master/Slave Communication Failure	Communication between the master and slave machines has been lost	Units operate as stand alone machines	Automatic	Faulty communication wiring, no power or control power to the main base board for either module
10031	Unit Is In Emergency Stop	Tested when the unit is ON and OFF. The alarm will trip when the CCN command for an **Emergency Stop** is sent across the network	Unit shuts down	Automatic after the CCN variable **EMSTOP** returns to normal. The unit will be normally restarted.	If this condition is encountered, then check the following item for faults: - CCN Emergency Stop command
10032	Water Pump No. 1 Fault	Tested only when the unit is ON. If the evaporator flow switch is failed after the Unit Off to On Delay period (***Main Menu → Modes →*** **Start Up Delay in Effect = m_delay = Yes**) while the pump is commanded to be on, then the alarm will be tripped.	If unit is configured for 2 pumps, then the unit will be stopped and restarted with other pump. If no pump remains available, then the unit will stop immediately.	Automatic if the alarm was triggered no more than 20 seconds before a SIOB low voltage alarm (57001/57002) Manual otherwise	If this condition is encountered, then check the following items for faults: - interlock wiring circuit (SIOB-B J1) - control signal to pump controller (SIOB-B J23 and J22) - evaporator pump contactor for proper operation - control voltage for proper voltage - open chilled water flow switch (SIOB-B J1)
10033	Water Pump No. 2 Fault				
10037	Circuit A Repeated High Discharge Gas Overrides	Tested only when the unit is ON. If the circuit is running and more than 8 successive capacity decreases have occurred due to high discharge gas temperatures (see overrides 26 and 27 on page 45), or if more than 6 successive capacity decreases have occurred due to high discharge pressure (see overrides 16 and 17 on page 45), then the alarm trips.	Circuit A shall continue to run if unit is running. If circuit is stopped, it shall not be allowed to restart.	Manual if the circuit has stopped Automatic otherwise	Condenser air recirculation, dirty or plugged condenser coils, inaccurate discharge transducer, faulty condenser fan
10038	Circuit B Repeated High Discharge Gas Overrides		Circuit B shall continue to run if unit is running. If circuit is stopped, it shall not be allowed to restart.		
10050	Refrigerant Leakage Detection	Tested if **Leakage Charge Detection** (***Main Menu → Configuration Menu → Factory Configuration***) is set to **Yes.** If the leakage input voltage is above the threshold (***Main Menu → Configuration Menu → Service Configuration →*** **Leakage Charge Threshold**) configured for more than the configured time (***Main Menu → Configuration Menu → Service Configuration →*** **Leakage Charge Timer**), then an alert will be set.	None	Automatic	Refrigerant leak or leak detector defective

Table 67 — Alarm Details By Code (cont)

ALARM CODE	ALARM NAME	CRITERIA FOR TRIP	ACTION TAKEN BY CONTROL	RESET METHOD	POSSIBLE CAUSES/CORRECTIVE ACTIONS
10051	Water Exchanger Flow Switch Failure	Tested when the unit is ON: The alarm will trip if the evaporator flow switch fails to close with the Off to On Delay OR if the evaporator flow switch is opened during normal operation. Note: If 2 pumps are configured (***Main Menu*** → ***Configuration Menu*** → ***Pump Configuration*** → ***Pump Sequence*** **> 2**), alarms 10032 and 10033 will be set instead of 10051 to force pump rotation. Tested when unit is OFF: The alarm will trip if evaporator pump control is configured (***Main Menu*** → ***Configuration Menu*** → ***Pump Configuration*** → ***Pump Sequence*** **> 0**) and if the Flow Checked If Pump Off (***Main Menu*** → ***Configuration Menu*** → ***Pump Configuration*** → ***Flow Checked If Pump Off*** **= Yes**) is enabled and the evaporator flow switch is closed after the evaporator pump command is OFF for more than 1 minute.	Unit shuts down	Automatic if the unit was stopped Manual otherwise	Flow switch fault
10053	Current Phase Reversal	Improper phasing detected by the reverse rotation board	Unit not allowed to start	Automatic	Check power phasing, improper wiring, or faulty detection board
10063	Circuit A High Pressure Switch Failure	The alarm will trip if the High Pressure Switch input for the circuit (***Main Menu*** → ***Inputs***) is **Open**.	Circuit A shuts down	Manual	Switch fault
10064	Circuit B High Pressure Switch Failure		Circuit B shuts down		
10097	Water Exchanger Temperature Sensors Swap	Tested only when the unit is running. The alarm will trip if the leaving water temperature is higher than the entering water temperature for more than 1 minute.	The unit will be stopped	Manual	If this condition is encountered, then check the following items for faults: - LWT (SIOB-A-J25) and EWT (SIOB-A-J25) wiring at SIOB - faulty entering or leaving water temperature sensors - evaporator nozzles for proper water temperature sensor locations
10210	Circuit A Low Delta Pressure Operation Failure	Tested while the circuit is running. If the circuit's saturated condensing temperature remains below the limit for more than 10 minutes, then the alarm will be tripped. Prior to alarm trip, the control will take action to avoid these alarms. See capacity overrides 58 and 59 on page 46.	Circuit A shuts down	Automatic if the alarm occurred up to 3 times in the last 24 hours Manual otherwise Automatic reset is possible when circuit capacity is 0%.	Circuit running in part load with all available compressors and low delta pressure during operation. Not enough capacity available/failed or disabled due to compressor(s).
10211	Circuit B Low Delta Pressure Operation Failure		Circuit B shuts down		
12001	Circuit A Discharge Transducer	Tested when the unit is ON or OFF. Alarm will trip if the pressure transducer reads below 12 psi (83 kPa)	Circuit will be shut down immediately	Automatic if transducer reading returns to normal. Affected circuit will be restarted normally.	If this condition is encountered, then check the following items for faults: - sensor wiring to the SIOB - faulty channel on the board - sensor accuracy See the Transducers section on page 77 for sensor description and connections.
12002	Circuit B Discharge Transducer				
12004	Circuit A Suction Transducer	Tested when compressor is ON or OFF. Alarm will trip if the pressure transducer reading is below 12 psi (83 kPa). If tested when compressor is ON: if SST – LWT > 0 and unit is in cooling mode for 60 seconds, then the alarm will be tripped.	Circuit will be shut down immediately	Automatic if transducer reading returns to normal OR Manual if the alarm has occurred more than 3 times within the last 24 hours	
12005	Circuit B Suction Transducer				
13004	Maintenance Servicing Required	Tested when the unit is ON and OFF. The alert shall be tripped if the defined delay is elapsed or close to elapsed.	None (alert only)	Automatic if a new date is set with **S_RESET** value in the Service Maintenance table. Manual otherwise. Note: If the scheduled date has NOT passed yet, then it is possible to reset this alarm manually. However, if the scheduled date has already passed, then it is necessary to set the new date (**S_RESET**).	Servicing action required (the scheduled date has been reached)

Table 67 — Alarm Details By Code (cont)

ALARM CODE	ALARM NAME	CRITERIA FOR TRIP	ACTION TAKEN BY CONTROL	RESET METHOD	POSSIBLE CAUSES/CORRECTIVE ACTIONS
13005	F-Gas Scheduled Check Required	Tested when the unit is ON and OFF and if an F-Gas check period has been defined. The alert shall be tripped if the defined delay is elapsed or close to elapsed.	None (alert only)	Automatic if a new date is set with **S_RESET** value in the Service Maintenance table Manual otherwise Note: If the scheduled date has NOT passed yet, then it is possible to reset this alarm manually. However, if the scheduled date already passed, then it is necessary to set the new date (**S_RESET**).	Servicing action required
15001	Evaporator Entering Fluid Thermistor	Tested when the unit is ON or OFF. Alarm will trip if the temperature measured by the evaporator entering fluid sensor is outside the range of –40 to 302°F (–40 to 150°C).	Unit is shut down normally or not allowed to start	Automatic, if thermistor reading is inside the range of –40 to 302°F (–40 to 150°C)	If this condition is encountered, then check the following items for faults: - sensor wiring to the SIOB - faulty channel on the board - sensor accuracy See the Thermistors section on page 69 for thermistor description and connections.
15002	Evaporator Leaving Fluid Thermistor	Tested when the unit is ON or OFF. Alarm will trip if the temperature measured by the evaporator leaving fluid sensor is outside the range of –40 to 302°F (–40 to 150°C).			
15010	OAT Thermistor Failure	Tested when the unit is ON or OFF. Alarm will trip if the temperature measured by the OAT sensor is outside the range of –40 to 302°F (–40 to 150°C)	Unit is shut down normally or not allowed to start	Automatic, if thermistor reading is inside the range of –40 to 302°F (–40 to 150°C)	
15011	Master/Slave Common Leaving Fluid Thermistor	Tested when the unit is ON or OFF. AND if both of the following parameters in Master/Slave Configuration (***Main Menu*** → ***Configuration Menu*** → ***Master Slave Configuration***) are set: 1. **Master/Slave Select** set to **1 = Master** or **2 = Slave** 2. **Chiller in Series** set to **No** AND if Entering Fluid Control is not selected (***Main Menu*** → ***Configuration Menu*** → ***General Configuration*** → **Entering Fluid Control = No**). Alarm will trip if the temperature measured by the common leaving fluid sensor is outside the range of –40 to 302°F (–40 to 150°C).	The units will operate independently on their own LWT sensors. If the failure is on the lead chiller, then the lag unit shall be allowed to start, even if the lead is not at maximum capacity.	Automatic if thermistor reading returns to normal	If this condition is encountered, check the following items for faults: - sensor wiring to the SIOB - faulty channel on the board - sensor accuracy See the Thermistors section on page 69 for thermistor description and connections.
15012	Circuit A Suction Gas Thermistor	Tested when the circuit is ON or OFF. Alarm will trip if the circuit suction gas sensor reading is outside the range of –40 to 302°F (–40 to 150°C), or if the compressor(s) have been running for more than 60 seconds and the suction gas sensor reading is greater than the entering water temperature plus 9°F (–12.8°C) and plus a variable value based on outside air temperature.	Circuit will shut down immediately	Automatic if thermistor reading returns to normal. Affected circuit will be restarted normally.	If this condition is encountered, then check the following items for faults: - sensor wiring to the SIOB - faulty channel on the board - sensor accuracy See the Thermistors section on page 69 for thermistor description and connections.
15013	Circuit B Suction Gas Thermistor				
15021	Space Temperature Thermistor	Tested when the circuit is ON or OFF AND if **Cooling** or **Heating Reset Select** (***Main Menu*** → ***Configuration Menu*** → ***Reset Configuration***) is set to 4 (Space Temperature) AND if the EMM board is present and configured. Alarm will trip if the space temperature sensor reading is outside the range of –40 to 302°F (–40 to 150°C).	No action on the unit. The setpoint reset will be canceled.	Automatic if thermistor reading returns to normal	If this condition is encountered, then check the following items for faults: - sensor wiring to the SIOB - faulty channel on the board - sensor accuracy See the Thermistors section on page 69 for thermistor description and connections.
17nnn	Circuit A VFD Fan Drive 1 Failure	See Table 70 — Alarms List on page 112. Danfoss drive only.	Circuit A shuts down	Automatic	See Table 70 for VFD Alarm/Alert Codes
18nnn	Circuit A VFD Fan Drive 2 Failure				
19nnn	Circuit B VFD Fan Drive 1 Failure		Circuit B shuts down		
20nnn	Circuit B VFD Fan Drive 2 Failure				

Table 67 — Alarm Details By Code (cont)

ALARM CODE	ALARM NAME	CRITERIA FOR TRIP	ACTION TAKEN BY CONTROL	RESET METHOD	POSSIBLE CAUSES/CORRECTIVE ACTIONS
35nnn	Circuit A VFD Fan Drive 1 Alert	See Table 70 — Alarms List on page 112. Danfoss drive only.	The unit switches to the second pump if equipped with a dual pump. If both pumps fail, then the unit shuts down.	Automatic	See Table 70 for VFD Alarm/Alert Codes
36nnn	Circuit A VFD Fan Drive 2 Alert		None		
37nnn	Circuit B VFD Fan Drive 1 Alert				
38nnn	Circuit B VFD Fan Drive 2 Alert				
55001	Database Module Failure	Tested when the unit is ON or OFF. If database module returns an error, then alarm will be tripped.	Unit will be stopped	Automatic	Software malfunction. Power cycle the display.
56001	Lenscan Module Failure	Tested when the unit is ON or OFF. If Lenscan module returns an error, then alarm will be tripped.	Unit will be stopped	Automatic	Software malfunction. Power cycle the display.
57001	Circuit A SIOB Low Voltage Failure	Tested when the unit is ON or OFF. If the SIOB board detects a low voltage, then the alarm will be set.	Unit shuts down	Automatic if the alarm occurred not more than 6 times in the last 24 hours. Manual otherwise.	Unstable electrical supply or electrical issue
57002	Circuit B SIOB Low Voltage Failure				
57006	EMM SIOB Low Voltage Failure				
57020	Main EXV Stepper Motor Failure — Circuit A	Tested when unit is ON or OFF. If the SIOB detects an EXV motor is not in the commanded position, then the alarm is set.	Circuit A shall be stopped	Manual	Check EXV connections on SIOB Check connection on EXV
57021	Main EXV Stepper Motor Failure — Circuit B		Circuit B shall be stopped		
70nn	Illegal Factory Configuration Number 1 to nn	The alarm will be generated if one of these conditions is met: 01: Unit size unknown (FACTORY_unitsize) 02: Fan type unavailable for the configured unit size 03: Pump configuration failure. Pump doesn't exist for the configured unit size. 04: This configuration is NOT available for the unit (current setting of FACTORY_unit_typ, FACTORY_country, FACTORY_refrig and FACTORY_compact does not exist). 05: The entered unit configuration is not compatible with HFC option (305A or 305B) 06: The entered voltage FACTORY_voltage unit configuration is unavailable (US only) 07: The fan configuration is unavailable. The combination between parameters FACTORY_fan_typ and FACTORY_fan_spd doesn't exist.	Unit is not allowed to start	Automatic when configured correctly	If this condition is encountered, then confirm unit configuration
90nn	Master Slave Configuration Error Number 1 to nn	Tested when the unit is ON and OFF. The alarm from 9001 to 9016 will be tripped if the unit is in Master or Slave operating type and a master/slave configuration error (**ms_error**) is detected. See Table 68 for alarm descriptions.	Master/Slave functions are deactivated. Both chillers will operate as standalone units.	Automatic when the master/slave configuration returns to normal or if the unit is no longer in Master operating type	If this condition is encountered, then check the following items for faults: - CCN wiring - control power to each SIOB, Master and Slave - confirm correct configuration

LEGEND

CCN — Carrier Comfort Network®
EMM — Energy Management Module
EWT — Entering Water Temperature
EXV — Electronic Expansion Valve
LEN — Local Equipment Network
LWT — Leaving Water Temperature
MOP — Maximum Operating Pressure
OAT — Outdoor Air Temperature
SIOB — Standard Input Output Board
SST — Saturated Suction Temperature
VFD — Variable Frequency Drive

Table 68 — Master/Slave Alarm Codes

ALARM CODE	ALARM DESCRIPTION
09001	**Lag_pump** control is selected while pump configuration is disabled
09002	Master and Slave have the same address
09003	No Slave configured
09004	Slave **Lag_pump** is selected while slave pump configuration is disabled
09005	Master and Slave will have the same water control type
09006	Master and Slave will have the same water control type
09007	Master lag pump control is configured
09008	Master lag pump control is not configured
09009	Slave **dem_lim** (demand limiting), **CHIL_S_S** (start/stop command), control point, or setpoint is forced with force < 4 (unit continues to operate)
09010	Slave **dem_lim** (demand limiting), **CHIL_S_S** (start/stop command), control point, or setpoint is forced with force < 4 (unit fails)
09013	Master and Slave Heat/Cool selection conflict
09014	Master and Slave parallel and series selection conflict
09015	Master and Slave EWT option in conflict with chiller in series
09016	Slave EWT option in conflict with chiller in series

LEGEND

CCN — Carrier Comfort Network®

EWT — Entering Water Temperature

VFD ALARMS AND ALERTS

Alarms and alerts associated with the VFD function follow a different naming convention than general unit faults. These alarms and alerts can be viewed and reset following the procedures outlined in the sections Current Alarms and Resetting Alarms on page 100. Table 69 lists the VFD alarm and alert naming conventions, while Table 70 lists the Danfoss codes associated with the alarms and alerts. These represent the most common alarms and alerts associated with VFD malfunction. Refer to the appropriate Danfoss documentation for more information on other alarms.

Table 69 — VFD Alarm/Alert Naming Conventions

VFD ALARMS AND ALERTS	ALARM FORMAT*	ALERT FORMAT*
Circuit A VFD Fan Drive 1 Failure	17nnn	35nnn
Circuit A VFD Fan Drive 2 Failure	18nnn	36nnn
Circuit B VFD Fan Drive 1 Failure	19nnn	37nnn
Circuit B VFD Fan Drive 2 Failure	20nnn	38nnn

* The Danfoss Alarm/Alert code is represented by nnn. See Table 70.

Table 70 — VFD Alarms List

NNN CODE	WARNING/ ALARM	DESCRIPTION	POSSIBLE CAUSES	ACTION TO BE TAKEN	REFERENCE PARAMETER
002	NOTE 1	Live Zero Error	This warning or alarm only appears if programmed in parameter 6-01 Live Zero Timeout Function. The signal on one of the analog inputs is less than 50% of the minimum value programmed for that input. Broken wiring or a faulty device sending the signal can cause this condition.	• Check the connections on all the analog mains terminals. - Control card terminals 53 and 54 for signals, terminal 55 common. - MCB 101 terminals 11 and 12 for signals, terminal 10 common. - MCB 109 terminals 1, 3, and 5 for signals, terminals 2, 4, and 6 common. • Check that the frequency converter programming and switch settings match the analog signal type. • Perform an input terminal signal test.	6-01 Live Zero Timeout
004	NOTE 1	Mains Phase Loss	A phase is missing on the supply side, or the mains voltage imbalance is too high. This message also appears for a fault in the input rectifier on the frequency converter. Options are programmed in parameter 14-12 Function at Mains Imbalance.	Check the supply voltage and supply currents to the frequency converter.	14-12 Function at Mains Imbalance
007	NOTE 1	DC Overvoltage	If the DC-link voltage exceeds the limit, then the frequency converter trips after a time.	• Extend the ramp time. • Change the ramp type.	3-42 Ramp 1 Ramp Down Time
008	NOTE 1	DC Undervoltage	If the DC-link voltage drops below the undervoltage limit, then the frequency converter checks if a 24-v DC backup supply is connected. If no 24-v DC backup supply is connected, then the frequency converter trips after a fixed time delay. The time delay varies with unit size.	• Check that the supply voltage matches the frequency converter voltage. • Perform an input voltage test. • Perform a soft charge circuit test.	—
009	NOTE 1	Inverter Overloaded	The frequency converter has run with more than 100% overload for too long and is about to cut out. The counter for electronic thermal inverter protection issues a warning at 98% and trips at 100% while giving an alarm. The frequency converter cannot be reset until the counter is below 90%.	• Compare the output current shown on the Drive Maintenance 2 screen (***Main Menu → Maintenance Menu → Drive Maintenance 2***) from the Carrier controller with the frequency converter rated current. • Compare the output current shown on the Drive Maintenance 2 screen (***Main Menu → Maintenance Menu → Drive Maintenance 2***) from the Carrier controller with the measured motor current.	—
010	NOTE 1	Motor ETR Overtemperature	According to the electronic thermal protection (ETR), the motor is too hot. Select whether the frequency converter issues a warning or an alarm when the counter reaches 100% in parameter 1-90 Motor Thermal Protection. The fault occurs when the motor runs with more than 100% overload for too long.	• Check for motor overheating. • Check if the motor is mechanically overloaded. • Check that the motor current set in 1-24 Motor Current is correct. • Ensure that the motor data in parameters 1-20 to 1-25 are set correctly.	1-90 Motor Thermal Protection (this parameter should be set to [0])
011	NOTE 1	Motor Thermistor Overtemperature	Check whether the thermistor is disconnected. Select whether the frequency converter issues a warning or an alarm in parameter 1-90 Motor Thermal Protection.	• Check for motor overheating. • Check if the motor is mechanically overloaded.	1-90 Motor Thermal Protection (this parameter should be set to [0])
013	NOTE 1	Overcurrent	The inverter peak current limit (approximately 200% of the rated current) is exceeded. The warning lasts approximately 1.5 s, and then the frequency converter trips and issues an alarm. Shock loading or quick acceleration with high-inertia loads can cause this fault. If the acceleration during ramp-up is quick, then the fault can also appear after kinetic backup. If extended mechanical brake control is selected, a trip can be reset externally.	• Remove the power and check if the motor shaft can be turned. • Check that the motor size matches the frequency converter. • Check that the motor data is correct in parameters 1-20 to 1-25.	—
014	Alarm	Earth Fault	There is current from the output phase to ground, either in the cable between the frequency converter and the motor or in the motor itself. This fault is detected during motor operation.	• Remove power to the frequency converter and repair the ground fault. • Check for ground faults in the motor by measuring the resistance to ground of the motor cables and the motor with a megohmmeter.	—
016	Alarm	Short Circuit	There is short-circuiting in the motor or motor wiring.	Remove the power to the frequency converter and repair the short circuit.	—
017	NOTE 1	Control Word Timeout (Serial Communication Failure)	There is no communication to the frequency converter. The warning is only active when 8-04 Control Word Timeout Function is NOT set to [0] Off. If 8-04 Control Word Timeout Function is set to [5] Stop and Trip, then a warning appears and the frequency converter ramps down until it stops and then displays an alarm.	Check the connections on the serial communications cables, including the shields and termination resistors.	8-03 Control Timeout Time 8-04 Control Timeout Function
030	Alarm	U Phase Loss	Motor phase U between the frequency converter and the motor is missing.	Remove the power from the frequency converter and check motor phase U.	4-58 Missing Motor Phase Function
031	Alarm	V Phase Loss	Motor phase V between the frequency converter and the motor is missing.	Remove the power from the frequency converter and check motor phase V.	4-58 Missing Motor Phase Function
032	Alarm	W Phase Loss	Motor phase W between the frequency converter and the motor is missing.	Remove the power from the frequency converter and check motor phase W.	4-58 Missing Motor Phase Function
038	Alarm	Internal Fault	Contact Carrier Service.	Contact Carrier Service.	—
044	Alarm	Earth Fault	Discharge from output phases to ground using the value of parameter 15-31 *InternalFaultReason*, if possible.	• Remove power to the frequency converter and repair the ground fault. • Check for ground faults in the motor by measuring the resistance to ground of the motor cables and the motor with a megohmmeter.	—
046	Alarm	Control Voltage Fault	Control voltage is low — contact Carrier Service.	Contact Carrier Service	—

Table 70 — VFD Alarms List (cont)

NNN CODE	WARNING/ ALARM	DESCRIPTION	POSSIBLE CAUSES	ACTION TO BE TAKEN	REFERENCE PARAMETER
047	NOTE 1	24-v Supply Low	24-v DC supply may be overloaded.	Contact Carrier Service.	—
059	Warning	Current Limit Exceeded	The current is higher than the value in parameter 4-18 Current Limit.	Ensure that motor data in parameters 1-20 to 1-25 are set correctly. Contact Carrier Service.	—
060	Alarm	External Interlock	External interlock has been activated.	To resume normal operation, apply 24-v DC to the terminal programmed for external interlock and reset the frequency converter (via serial communication or digital I/O).	For 060 Reference Parameter: Digital inputs configured on 5-1* (e.g., 5-10, 5-11, etc.)
066	Warning	Heat Sink Temperature Low	The frequency converter is too cold to operate. This warning is based on the temperature sensor in the IGBT module.	Confirm that the VFD heater is working properly by checking voltage across the heater terminals,.120-v should be present at low temperatures that would trigger this warning.	—
069	Alarm	Power Card Temperature	The temperature sensor on the power card is either too hot or too cold.	• Check that the ambient operating temperature is within limits. • Check for clogged filters. • Check fan operation. • Check the power card.	—
070	Alarm	Illegal FC Configuration	The control card and power card are not matched.	Contact Carrier Service.	—
079	NOTE 1	Illegal Power Section Configuration	Internal fault.	Contact Carrier Service.	—
080	Alarm	Drive Initialized	All parameter settings are initialized to default settings.	Drive address needs to be set so that correct parameters can be loaded by chiller controls.	—

LEGEND

AMA — Automatic Motor Adaptation
IGBT — Insulated Gate Bipolar Transistor
PTC — Positive Temperature Coefficient
VFD — Variable Frequency Drive

NOTE:
1. Warning or Alarm is determined by the setting of the reference Parameter.

Troubleshooting Software

The Carrier Controller software offers several tools to assist with troubleshooting unit issues.

BLACK BOX FUNCTION

The control system is equipped with a "black box" function that continuously stores operating parameters in the onboard memory every 5 seconds. For each alarm event that is triggered, the system collects up to 180 records (15 minutes) of data, with approximately 14 minutes of data recorded before the alarm is triggered and 1 minute of data after. The black box function is capable of storing 20 events of data on a rotating basis (first in, first out). This file can be accessed by using the Carrier Service Tools; contact your Carrier representative for assistance. See Tables 71 and 72.

Table 71 — Black Box Function Recorded Parameters

POINT NAME	DESCRIPTION	UNIT CONFIG.
alarm_1c	Current Alarm 1	—
alarm_2c	Current Alarm 2	—
alarm_3c	Current Alarm 3	—
alarm_4c	Current Alarm 4	—
alarm_5c	Current Alarm 5	—
ALM	Alarm State	—
BOILER	Boiler Output	Heat pump and EMM
CAPA_T	CIR A Total Capacity	—
CAPB_T	CIR B Total Capacity	—
CP_A1	Compressor A1 Command	—
CP_A2	Compressor A2 Command	—
CP_A3	Compressor A3 Command	—
CP_A4	Compressor A4 Command	—
cp_a1_f	Compressor A1 Failure	—
cp_a2_f	Compressor A2 Failure	—
cp_a3_f	Compressor A3 Failure	—
cp_a4_f	Compressor A4 Failure	—
CP_B1	Compressor B1 Command	—
CP_B2	Compressor B2 Command	—
CP_B3	Compressor B3 Command	—
CP_B4	Compressor B4 Command	—
cp_b1_f	Compressor B1 Failure	—
cp_b2_f	Compressor B2 Failure	—
cp_b3_f	Compressor B3 Failure	—
cp_b4_f	Compressor B4 Failure	—
CTRL_PNT	Control Point	—
DEM_LIM	Active Demand Limit Val	—
DRVCOM_1	Fan Drive A Com Ok?	Premium unit
DRVCOM_2	Fan Drive A2 Com Ok?	Premium unit
DRVCOM_3	Com with Fan A2 Drive Ok?	Hydronic Kit
DRVCOM_4	Com with Fan B2 Drive Ok?	Hydronic Kit
EHS1	Electrical Heat Stage 1	Heat pump and EMM

Table 71 — Black Box Function Recorded Parameters (cont)

POINT NAME	DESCRIPTION	UNIT CONFIG.
ELEC_BOX	Electrical Box Failure	—
EWT	Entering Fluid Temp	—
EXV_A	EXV Position Circuit A	—
EXV_B	EXV Position Circuit B	—
FAN_ST_A	Fan Staging Number Circuit A	—
FAN_ST_B	Fan Staging Number Circuit B	—
flow	Water Flow	Hydronic Kit
FLOW_SW	Flow Switch Status	—
HEATCOOL	Heat/Cool Status	—
HP_SW_A	High Pressure Switch A	—
HP_SW_B	High Pressure Switch B	—
LWT	Leaving Fluid Temp	—
m_ice	Ice Mode In Effect	EMM
mstslv	Unit is Master or Slave	Master/Slave in effect
OAT	Outdoor Air Temperature	—
ov_exv_a	EXV Override Circuit A	—
ov_exv_b	EXV Override Circuit B	—
over_cap	Active Override Capacity	—
PUMP_1	Water Pump #1 Command	Hydronic Kit
PUMP_2	Water Pump #2 Command	Hydronic Kit
SCT_A	Saturated Condensing Temperature Circuit A	—
SCT_B	Saturated Condensing Temperature Circuit B	—
SH_A	Suction Superheat Temperature A	—
SH_B	Suction Superheat Temperature B	—
smz	Load/Unload Factor	—
SST_A	Saturated Suction Temperature A	—
SST_B	Saturated Suction Temperature B	—
STATUS	Run Status	—
SUCT_A	Compressor Suction Temperature A	—
SUCT_B	Compressor Suction Temperature B	—
VFAN_A	Variable Fan A Command	Premium unit
VFAN_B	Variable Fan B Command	Premium unit
wp_out	Outlet Water Pressure	Hydronic Kit
wp_in	Inlet Water Pressure	Hydronic Kit
wp_off	Water Pressure Offset	Hydronic Kit
zm	Current Z Multiplier Val	—

LEGEND

A — Circuit A
B — Circuit B
EXV — Electronic Expansion Valve

Table 72 — Black Box Function Alarms Collected

ALARM CODE	ALARM TEXT DESCRIPTION AND CCN MESSAGE
01199	Compressor A1 Failure
01299	Compressor A2 Failure
01399	Compressor A3 Failure
01499	Compressor A4 Failure
02199	Compressor B1 Failure
02299	Compressor B2 Failure
02399	Compressor B3 Failure
02499	Compressor B4 Failure
04701	Loss of Communication with VFD Fan Drive 1 Circuit A
04702	Loss of Communication with VFD Fan Drive 2 Circuit A
04703	Loss of Communication with VFD Fan Drive 1 Circuit B
04704	Loss of Communication with VFD Fan Drive 2 Circuit B
04901	Loss of Communication with Circuit A SIOB Board
04902	Loss of Communication with Circuit B SIOB Board
06001	Circuit A Welded Contactor Failure
06002	Circuit B Welded Contactor Failure
10001	Water Exchanger Freeze Protection
10005	Circuit A Low Suction Temperature
10006	Circuit B Low Suction Temperature
10008	Circuit A High Superheat
10009	Circuit B High Superheat
10011	Circuit A Low Superheat
10012	Circuit B Low Superheat
10016	Compressor A1 Not Started or Pressure Not Established
10017	Compressor A2 Not Started or Pressure Not Established
10018	Compressor A3 Not Started or Pressure Not Established
10019	Compressor A4 Not Started or Pressure Not Established
10020	Compressor B1 Not Started or Pressure Not Established
10021	Compressor B2 Not Started or Pressure Not Established
10022	Compressor B3 Not Started or Pressure Not Established
10023	Compressor B4 Not Started or Pressure Not Established

Table 72 — Black Box Function Alarms Collected (cont)

ALARM CODE	ALARM TEXT DESCRIPTION AND CCN MESSAGE
10032	Water Pump #1 Fault
10033	Water Pump #2 Fault
10037	Circuit A Repeated High Discharge Gas Overrides
10038	Circuit B Repeated High Discharge Gas Overrides
10050	Refrigerant Leak Detection
10051	Water Exchanger Flow Switch Failure
10063	Circuit A High Pressure Switch Failure
10064	Circuit B High Pressure Switch Failure
10097	Water Exchanger Temperature Sensors Swap
10210	Circuit A Low Delta Pressure Operation Failure
10211	Circuit B Low Delta Pressure Operation Failure
12004	Circuit A Suction Transducer
12005	Circuit A Suction Transducer
15012	Circuit A Suction Gas Thermistor
15013	Circuit B Suction Gas Thermistor
17nnn	Circuit A VFD Fan Drive 1 Failure
18nnn	Circuit A VFD Fan Drive 2 Failure
19nnn	Circuit B VFD Fan Drive 1 Failure
20nnn	Circuit B VFD Fan Drive 2 Failure
35nnn	Circuit A VFD Fan Drive 1 Alert
36nnn	Circuit A VFD Fan Drive 2 Alert
37nnn	Circuit B VFD Fan Drive 1 Alert
38nnn	Circuit B VFD Fan Drive 2 Alert
57001	Circuit A SIOB Low Voltage Failure
57002	Circuit B SIOB Low Voltage Failure
57006	EMM SIOB Low Voltage Failure
57020	Main EXV Stepper Motor Failure — Circuit A
57021	Main EXV Stepper Motor Failure — Circuit B

LEGEND

EXV — Electronic Expansion Valve

VFD — Variable Frequency Drive

TROUBLESHOOTING GUIDE

Table 73 shows potential unit issues and possible solutions. This table is meant only as a guide and is not an exhaustive list of issues or solutions.

Table 73 — Troubleshooting

SYMPTOM	POSSIBLE CAUSE	POSSIBLE REMEDY
Unit Does Not Run	Check for power to unit	• Check overcurrent protection device • Check non-fused disconnect (if equipped) • Restore power to unit • Check Active Capacity Override, over_cap
	Wrong or incorrect unit configuration	Check unit configuration
	Active alarm	Check Alarm status. See the Alarms and Alerts section on page 100 and follow troubleshooting instructions.
	Active operating mode	Check for Operating Modes. See the Operating Modes section on page 66 and follow troubleshooting instructions.
	High pressure switch (HPS) open	Recheck high pressure switch
Unit Operates Too Long or Continuously	Low refrigerant charge	Check for leak and add refrigerant
	Air in chilled water loop	Purge water loop
	Non-condensables in refrigerant circuit	Remove refrigerant and recharge
	Inoperative EXV	• Check EXV and clean or replace • Check EXV cable and replace if necessary • Check EXV board for output signal
	Load too high	Unit may be undersized for application
	Compressor or control contacts welded	Replace contactor or relay
Circuit Does Not Run	Active alarm	Check Alarm status. See the Alarms and Alerts section on page 100 and follow troubleshooting instructions. Check Active Capacity Override, over_cap.
	Active operating mode	Check for Operating Modes. See the Operating Modes section on page 66 and follow troubleshooting instructions.Check Active Capacity Override, over_cap.
Circuit Does Not Load	Active alarm	Check Alarm status. See the Alarms and Alerts section on page 100 and follow troubleshooting instructions.
	Active operating mode	Check for Operating Modes. See the Operating Modes section on page 66 and follow troubleshooting instructions.
	Low saturated suction temperature	See Capacity Control Overrides No. 23 and No. 24 on page 45
	High circuit suction superheat	The circuit capacity is not allowed to increase if circuit superheat is greater than 45°F (7.2°C). • Check for faulty suction transducer or wiring • Check for restriction in liquid line (filter drier, service valve, etc.) • Check EXV operation • Check for proper refrigerant charge
	Low suction superheat	The circuit capacity is not allowed to increase if circuit superheat is less than 3.6°F (–15.8°C). • Check for faulty suction transducer or wiring • Check for restriction in liquid line (filter drier, service valve, etc.) • Check EXV operation • Check for proper refrigerant charge
Compressor or Fans Do Not Run	Active alarm	Check Alarm status. See the Alarms and Alerts section on page 100 and follow troubleshooting instructions.
	Active operating mode	Check for Operating Modes. See the Operating Modes section on page 66 and follow troubleshooting instructions.
	VFD fuses blown	Check fan VFD fuses and replace if necessary
	Inoperative compressor contactor	• Check control wiring • Check scroll protection module • Check contactor operation and replace if necessary
Chilled Water Pump Is ON but the Machine Is OFF	Evaporator freeze protection	Chilled water loop temperature too low. Check evaporator heater.

LEGEND

EXV — Electronic Expansion Valve
HPS — High Pressure Switch
VFD — Variable Frequency Drive

Electrical Schematics

Control and power schematics for 30RC units with and without Greenspeed® Intelligence are shown in Fig. 71-79.

Quick Test (Service Test)

Main power and control circuit power must be on for Quick Test. The Carrier Controller Quick Test function is used to verify proper operation of various devices within the chiller, such as condenser fans, pumps, EXVs, and remote alarm relays. This is helpful during the start-up procedure to determine whether devices are installed correctly.

To use the Quick Test mode, the unit must be in the local OFF mode. The main control gives access to 2 Quick Test tables, allowing technicians to test all unit outputs. To reach the Quick Test menu, follow the path ***Main Menu → Quick Test #1*** or ***Quick Test #2***. The unit must be in Local Off mode to adjust parameters in the table. The Quick Test function is not available remotely and can only be used from the Carrier Controller display. See the Start-Up Checklist at the end of this document, page CL-8, for a list of the parameters in the Quick Test Tables.

EXAMPLE: TEST THE FUNCTION OF THE CIRCUIT A CONDENSER FANS

- Power must be applied to the unit. The Enable-Off-Remote Contact switch must be in the OFF position.
- Press the Start/Stop button and ensure the unit is in Local Off.
- Navigate to the Quick Test No. 1 table and set Quick Test Enable to Enable.
- Set VariFan Speed A to 100%, then select SET from the pop-up menu to accept the entry. Confirm all fans on circuit A are running.

Test component function by turning the item values from OFF to ON or adjusting the actuated percentage. These discrete outputs are then turned off if there is no keypad activity for 10 minutes. See Fig. 78 and 79 for component arrangement diagrams.

NOTE: There may be up to a one-minute delay before the selected item is energized.

Legend For Fig. 72-79

ADDR	—	Address
AC/L	—	AC Line
ALM	—	Alarm
AC/N	—	AC Neutral
AUX	—	Auxiliary
ALT	—	Alert
BPHE	—	Brazed Plate Heat Exchanger
CB	—	Circuit Breaker
CL/HT	—	Cooler Heater
CLR	—	Evaporator
COMPR	—	Compressor
CSR	—	Current Sensing Relay
CWFS	—	Chilled Water Flow Switch
CWP	—	Condenser Water Pump
DGT	—	Discharge Gas Temperature
DPT	—	Discharge Pressure and Temperature
DX	—	Direct Expansion
ECTA	—	Economizer A Temp
ECTB	—	Economizer B Temp
EMM	—	Energy Management Module
EPT	—	Economizer Pressure Transducer
EVP	—	Evaporator
EXV	—	Electronic Expansion Valve
FIOP	—	Factory-Installed Option
FM	—	Fan Motor
FU	—	Fuse
FVFD	—	Fan Variable Frequency Drive
GFI-CO	—	Ground Fault Interrupter - Convenience Outlet
GND	—	Ground
HPS	—	High-Pressure Switch
HTR	—	Heater
LIQ	—	Liquid
MLV	—	Minimum Load Value
MP	—	Motor Protector
NEC	—	National Electrical Code
OPT	—	Oil Pressure Transducer
PL	—	Plug
PMP	—	Pump
PVFD	—	Pump Variable Frequency Drive
RRB	—	Reverse Rotation Board
SGT	—	Suction Gas Temperature
SIOB	—	Standard Input/Output Board
SPT	—	Space Temperature
SW	—	Switch
TB	—	Terminal Block
TRAN	—	Transformer
VFD	—	Variable Frequency Drive
UPC	—	Universal Protocol Converter
UBS	—	Universal Serial Bus
XL	—	Across the Line

NOTES:

1. FACTORY WIRING IS IN ACCORDANCE WITH UL60335-2-40 STANDARDS. FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. WIRING FOR MAIN FIELD SUPPLY MUST BE RATED 75°C MINIMUM. USE COPPER FOR ALL UNITS. INCOMING WIRE SIZE RANGE FOR THE TERMINAL BLOCK IS #4 AWG TO #500 KCMIL.
   INCOMING WIRE SIZE RANGE OF NON-FUSED DISCONNECT IS:
   400A — QTY 2, #2/0 AWG TO 250 KCMIL, OR QTY 1, #2/0 AWG TO 500 KCMIL
   600A — QTY 2, #2 AWG TO 500 KCMIL
   800A — QTY 3, #3/0 AWG TO 400 KCMIL, OR QTY 2, 500 KCMIL TO 750 KCMIL
3. TERMINALS 9 AND 10 OF TB5 ARE FOR FIELD EXTERNAL CONNECTIONS FOR REMOTE ON-OFF. THE CONTACTS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50MA.
4. TERMINALS 1 AND 2 OF TB5 ARE FOR EXTERNAL CONNECTIONS OF CHILLED WATER PUMP INTERLOCK. THE CONTACTS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50MA.
5. TERMINALS 11 AND 13 OF TB5 ARE FOR CONTROL OF CHILLED WATER PUMP 1 (PMP1) STARTER. TERMINALS 13 AND 15 OF TB5 ARE FOR CONTROL OF CHILLED WATER PUMP 2 (PMP2) STARTER. THE MAXIMUM LOAD ALLOWED FOR THE CHILLED WATER PUMP RELAY IS 5VA SEALED, 10VA INRUSH AT 24V. FIELD POWER SUPPLY IS NOT REQUIRED.
6. TERMINALS 12 AND 13 OF TB5 ARE FOR AN ALARM RELAY. THE MAXIMUM LOAD ALLOWED FOR THE ALARM RELAY IS 10VA SEALED, 25VA INRUSH AT 24V. FIELD POWER SUPPLY IS NOT REQUIRED.
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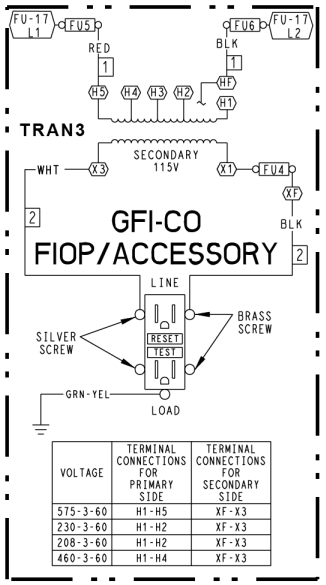
8. MAKE APPROPRIATE CONNECTIONS TO TB6 AS SHOWN FOR ENERGY MANAGEMENT BOARD OPTIONS. THE CONTACTS FOR OCCUPANCY OVERRIDE, DEMAND LIMIT AND ICE DONE OPTIONS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50MA.
9. TERMINALS 11 AND 17 OF TB6 ARE FOR A SHUTDOWN RELAY. THE MAXIMUM LOAD ALLOWED FOR THE SHUTDOWN RELAY IS 10VA SEALED, 25VA INRUSH AT 24V. FIELD POWER SUPPLY IS NOT REQUIRED.
10. TERMINALS 11 AND 16 OF TB6 ARE FOR AN ALERT RELAY. THE MAXIMUM LOAD ALLOWED FOR THE ALERT RELAY IS 10VA SEALED, 25VA INRUSH AT 24V. FIELD POWER SUPPLY IS NOT REQUIRED.

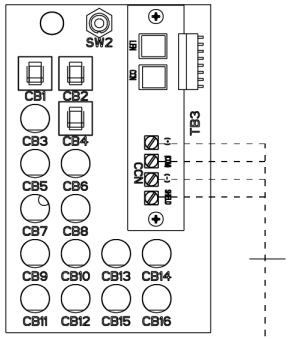
LEGEND

A	— ALARM
ALM R	— ALARM RELAY
BAS	— BUILDING AUTOMATION SYSTEM
EMM	— ENERGY MANAGEMENT
FIOP	— FACTORY INSTALLED OPTION
GFI-CO	— GROUND FAULT INTERCEPTOR
HGB	— HOT GAS BYPASS
MLV	— MINIMUM LOAD VALVE
NEC	— NATIONAL ELECTRICAL CODE
PMP	— CHILLED WATER PUMP
RUN R	— RUN RELAY
SHD R	— SHUTDOWN RELAY
SW	— SWITCH
TB	— TERMINAL BLOCK
UPC	— UNIVERSAL PROTOCOL CARD

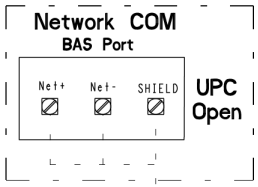
▪ ▪ FIELD POWER WIRING
– – FIELD CONTROL WIRIING
——— FACTORY-INSTALLED WIRING



VOLTAGE	TERMINAL CONNECTIONS FOR PRIMARY SIDE	TERMINAL CONNECTIONS FOR SECONDARY SIDE
575-3-60	H1-H5	XF-X3
230-3-60	H1-H2	XF-X3
208-3-60	H1-H2	XF-X3
460-3-60	H1-H4	XF-X3



DATA COM PORT



Network Wiring

Fig. 71 — 30RC Typical Field Wiring Schematic

NOTES:

1. FACTORY WIRING IS IN ACCORDANCE WITH UL60335-2-40 STANDARDS. FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
2. WIRING FOR MAIN FIELD SUPPLY MUST BE RATED 75°C MINIMUM. USE COPPER FOR ALL UNITS. INCOMING WIRE SIZE RANGE FOR THE TERMINAL BLOCK IS #4 AWG TO #500 KCMIL.
   INCOMING WIRE SIZE RANGE OF NON-FUSED DISCONNECT IS:
   400A — QTY 2, #2/0 AWG TO 250 KCMIL, OR QTY 1, #2/0 AWG TO 500 KCMIL
   600A — QTY 2, #2 AWG TO 500 KCMIL
   800A — QTY 3, #3/0 AWG TO 400 KCMIL, OR QTY 2, 500 KCMIL TO 750 KCMIL
3. TERMINALS 9 AND 10 OF TB5 ARE FOR FIELD EXTERNAL CONNECTIONS FOR REMOTE ON-OFF. THE CONTACTS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50MA.
4. TERMINALS 1 AND 2 OF TB5 ARE FOR EXTERNAL CONNECTIONS OF CHILLED WATER PUMP INTERLOCK. THE CONTACTS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50MA.
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6. TERMINALS 12 AND 13 OF TB5 ARE FOR AN ALARM RELAY. THE MAXIMUM LOAD ALLOWED FOR THE ALARM RELAY IS 10VA SEALED, 25VA INRUSH AT 24V. FIELD POWER SUPPLY IS NOT REQUIRED.
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8. MAKE APPROPRIATE CONNECTIONS TO TB6 AS SHOWN FOR ENERGY MANAGEMENT BOARD OPTIONS. THE CONTACTS FOR OCCUPANCY OVERRIDE, DEMAND LIMIT AND ICE DONE OPTIONS MUST BE RATED FOR DRY CIRCUIT APPLICATION CAPABLE OF HANDLING A 24VAC LOAD UP TO 50MA.
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LEGEND

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EMM	— ENERGY MANAGEMENT
FIOP	— FACTORY INSTALLED OPTION
GFI-CO	— GROUND FAULT INTERCEPTOR
HGB	— HOT GAS BYPASS
MLV	— MINIMUM LOAD VALVE
NEC	— NATIONAL ELECTRICAL CODE
PMP	— CHILLED WATER PUMP
RUN R	— RUN RELAY
SHD R	— SHUTDOWN RELAY
SW	— SWITCH
TB	— TERMINAL BLOCK
UPC	— UNIVERSAL PROTOCOL CARD

▪ ▪ FIELD POWER WIRING
– – FIELD CONTROL WIRIING
——— FACTORY-INSTALLED WIRING

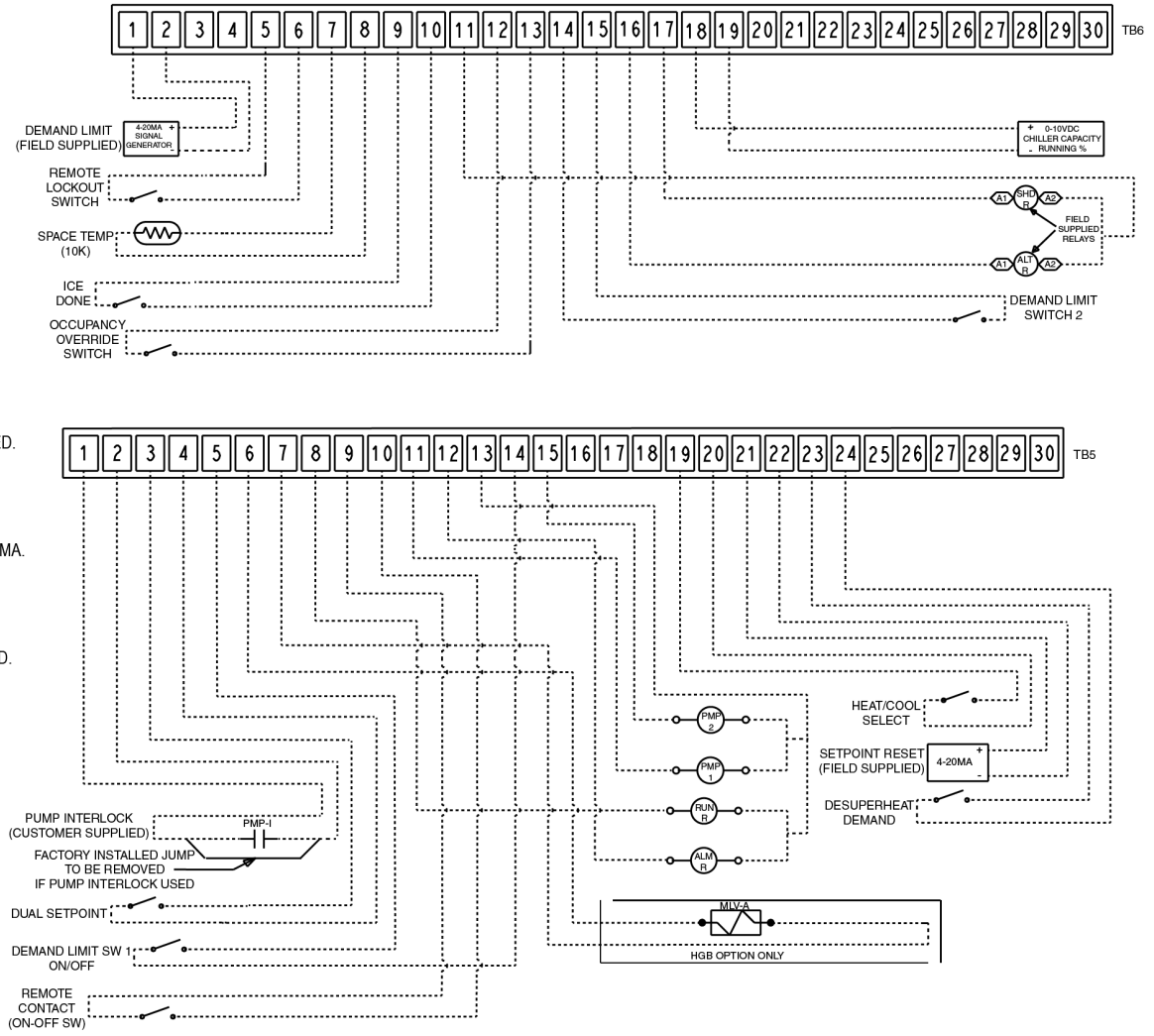

Fig. 71 — 30RC Typical Field Wiring Schematic (cont)

NOTES:

1. FACTORY WIRING IS IN ACCORDANCE WITH UL60335-2-40 STANDARDS. FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
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LEGEND

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BAS	— BUILDING AUTOMATION SYSTEM
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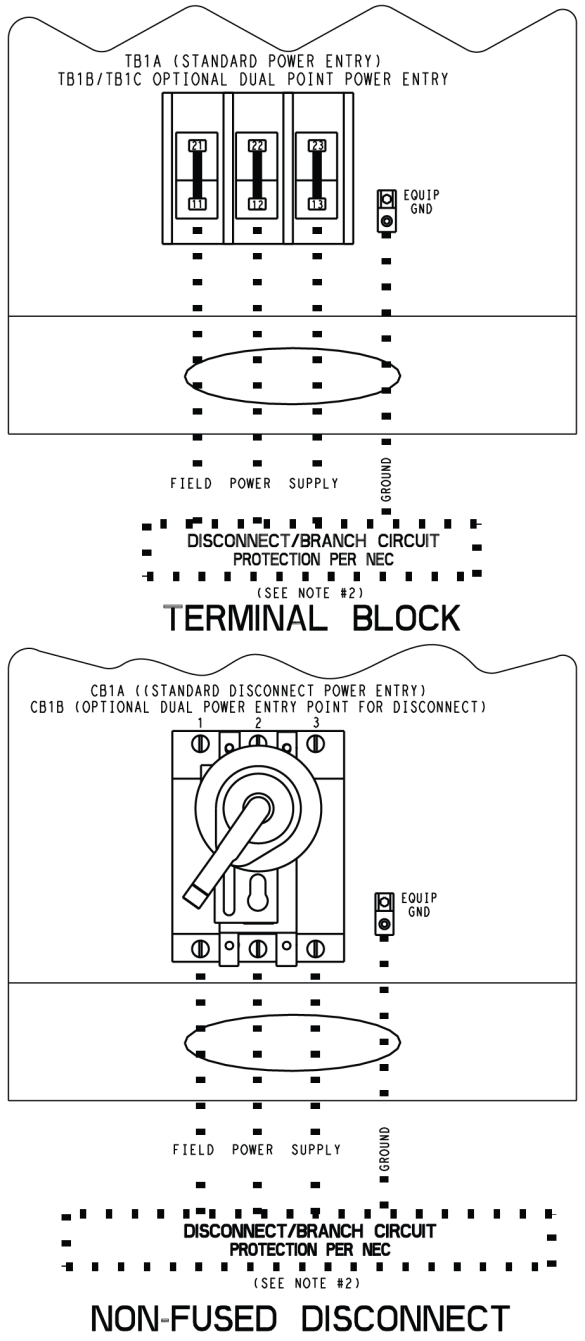
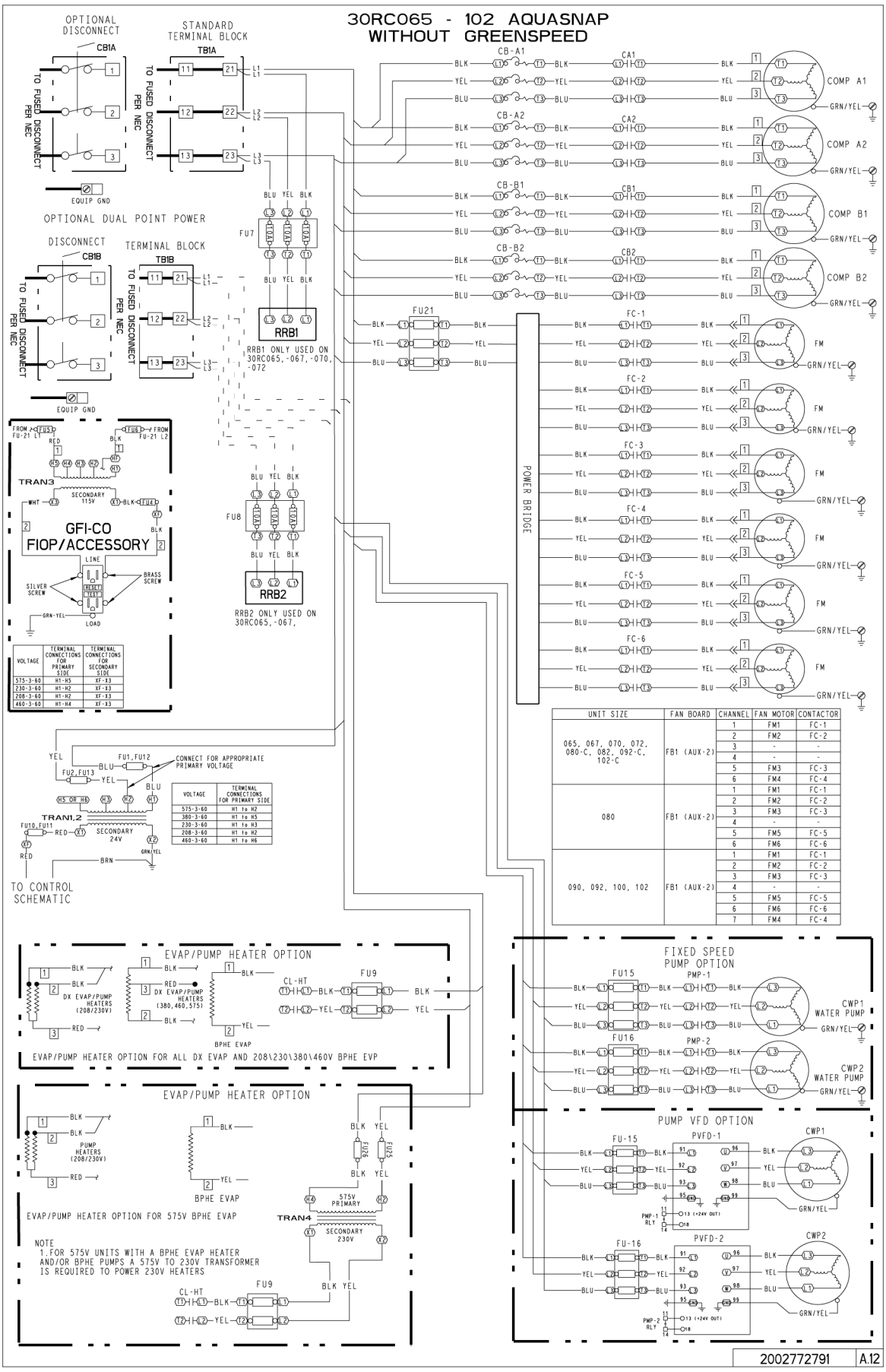
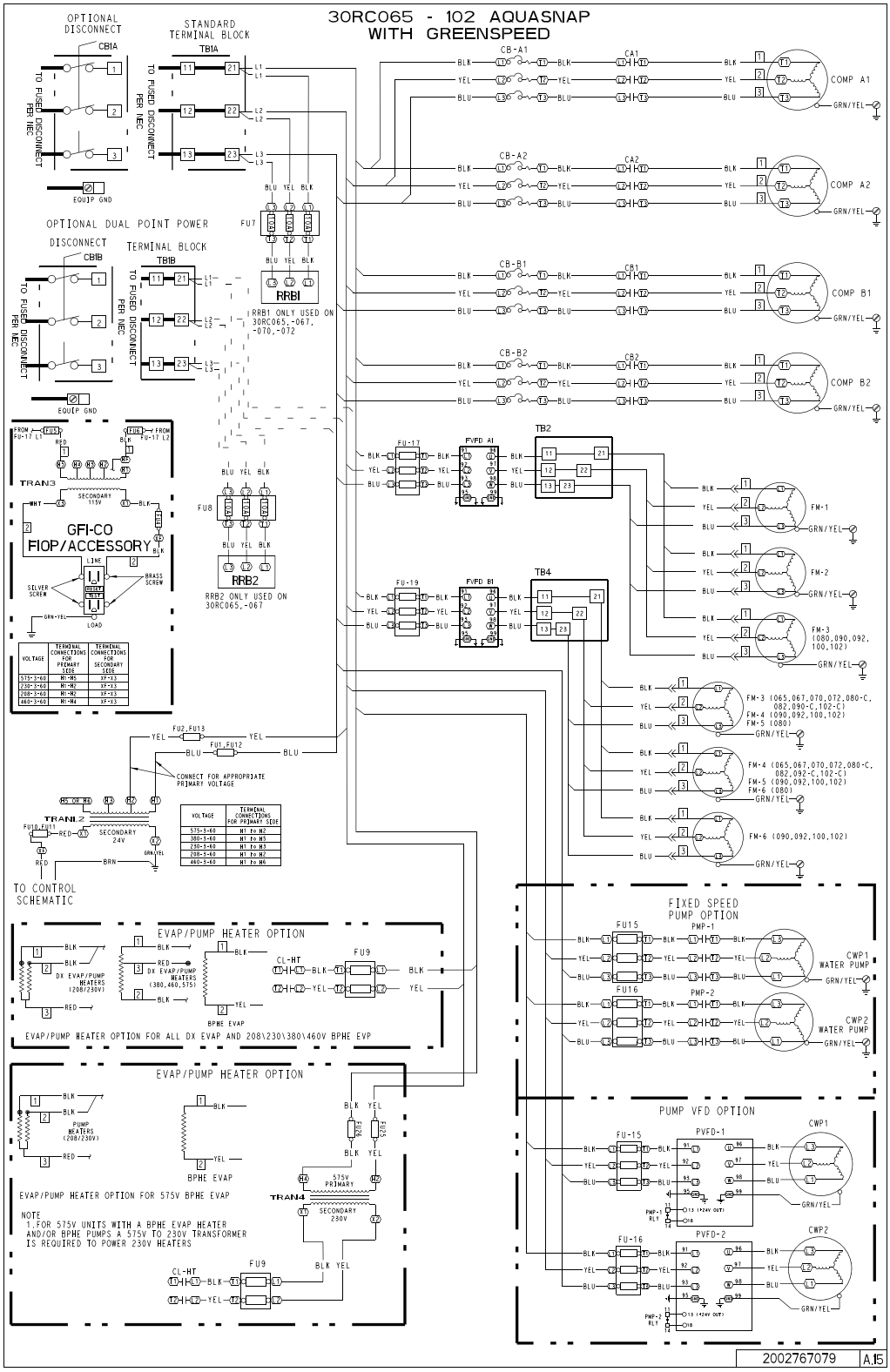


Fig. 71 — 30RC Typical Field Wiring Schematic (cont)



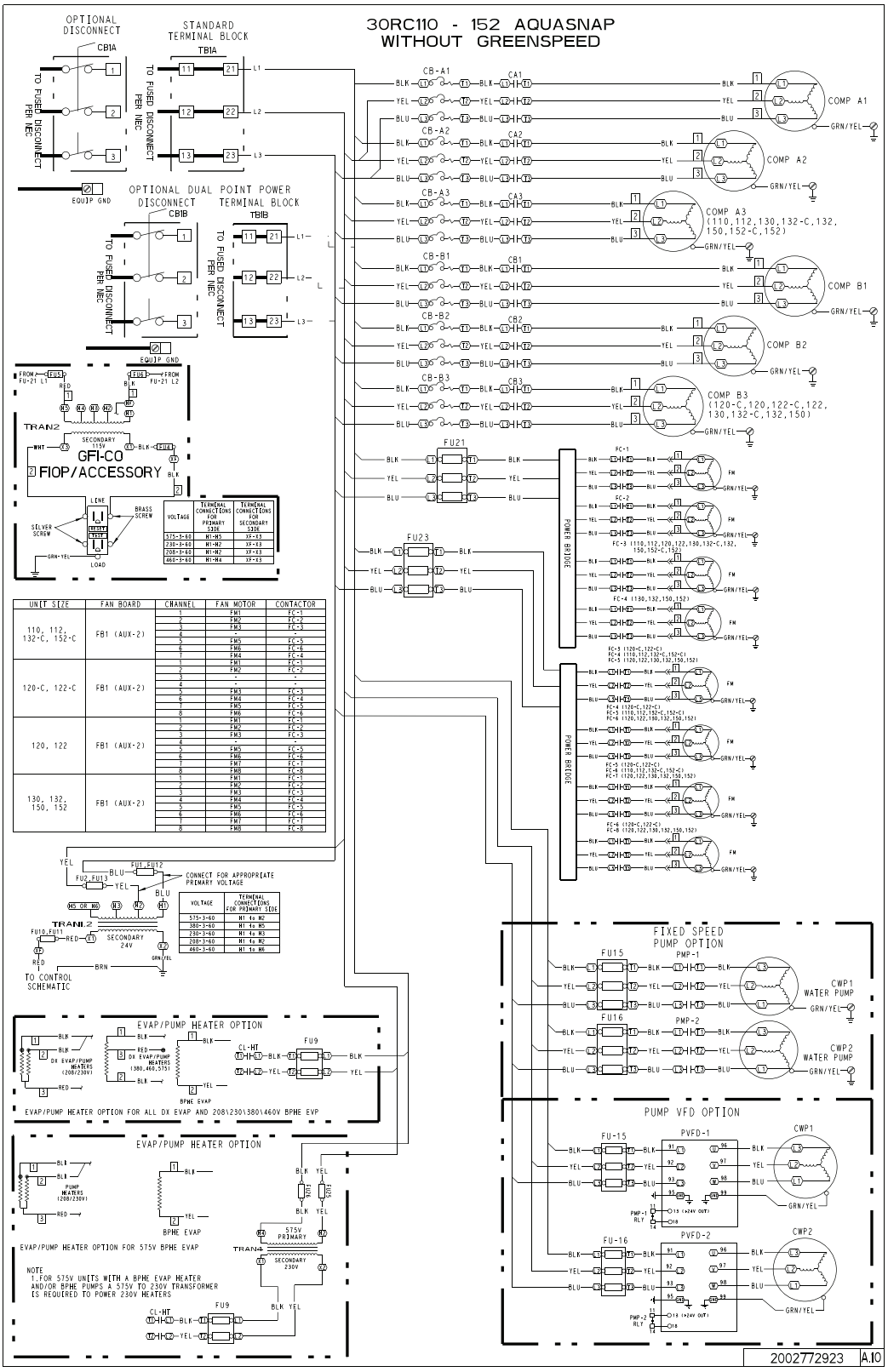
NOTE: See Legend on page 117.

Fig. 72 — 30RC 065-102 Fixed Speed (All Voltages) Power Schematic



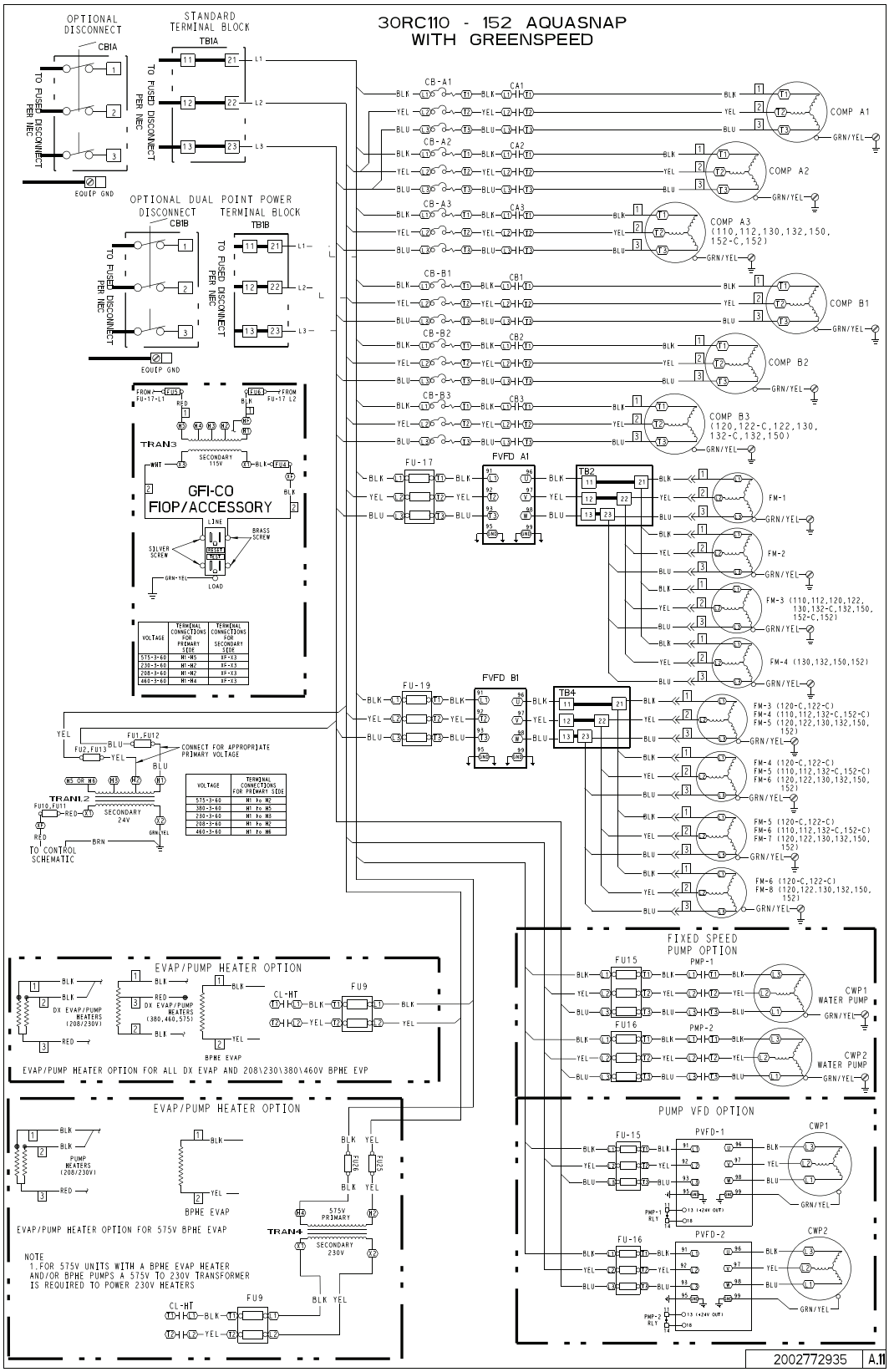
NOTE: See Legend on page 117.

Fig. 73 — 30RC 065-102 Greenspeed (All Voltages) Power Schematic



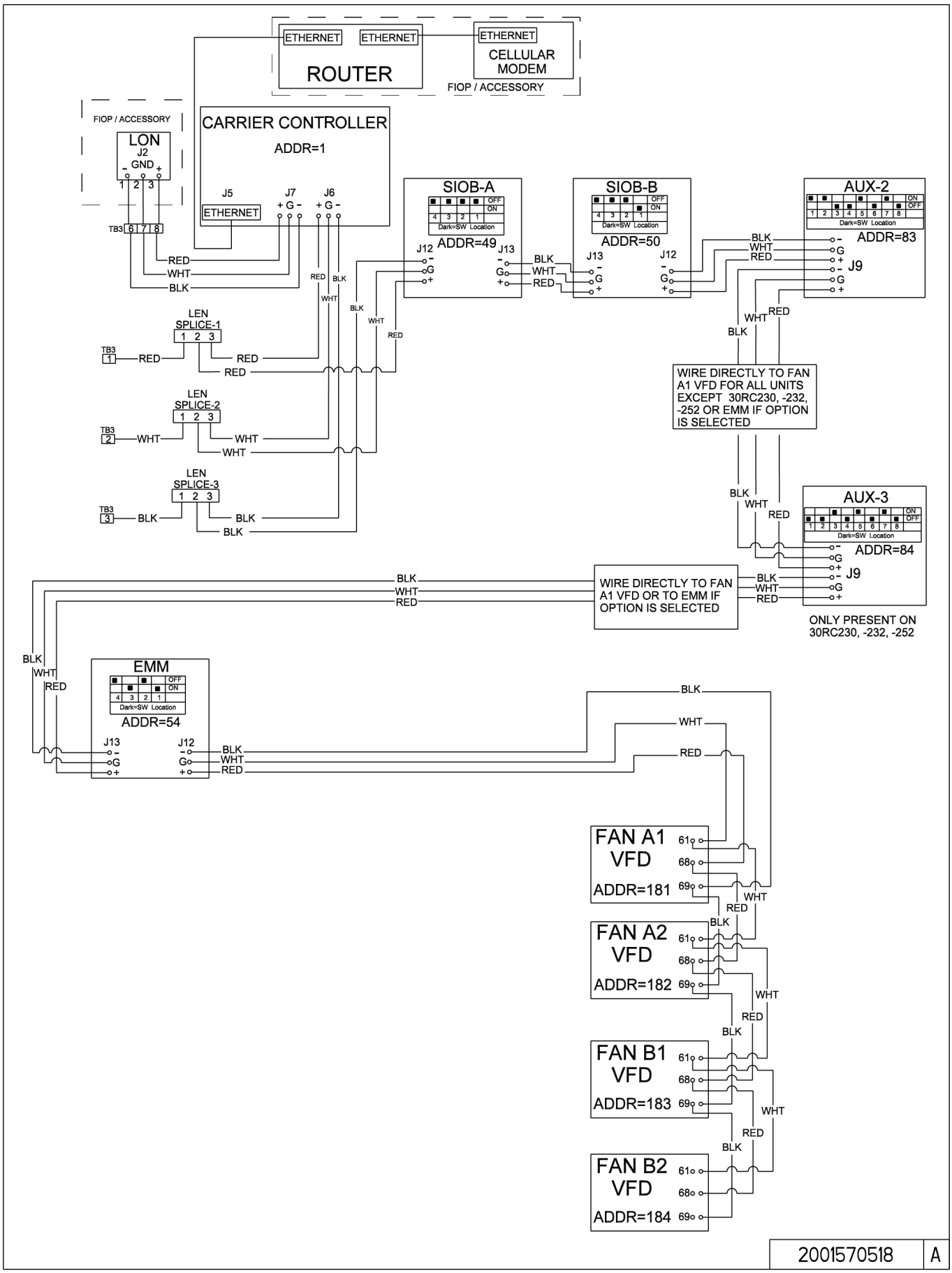
NOTE: See Legend on page 117.

Fig. 74 — 30RC 110-152 Fixed Speed (All Voltages) Power Schematic



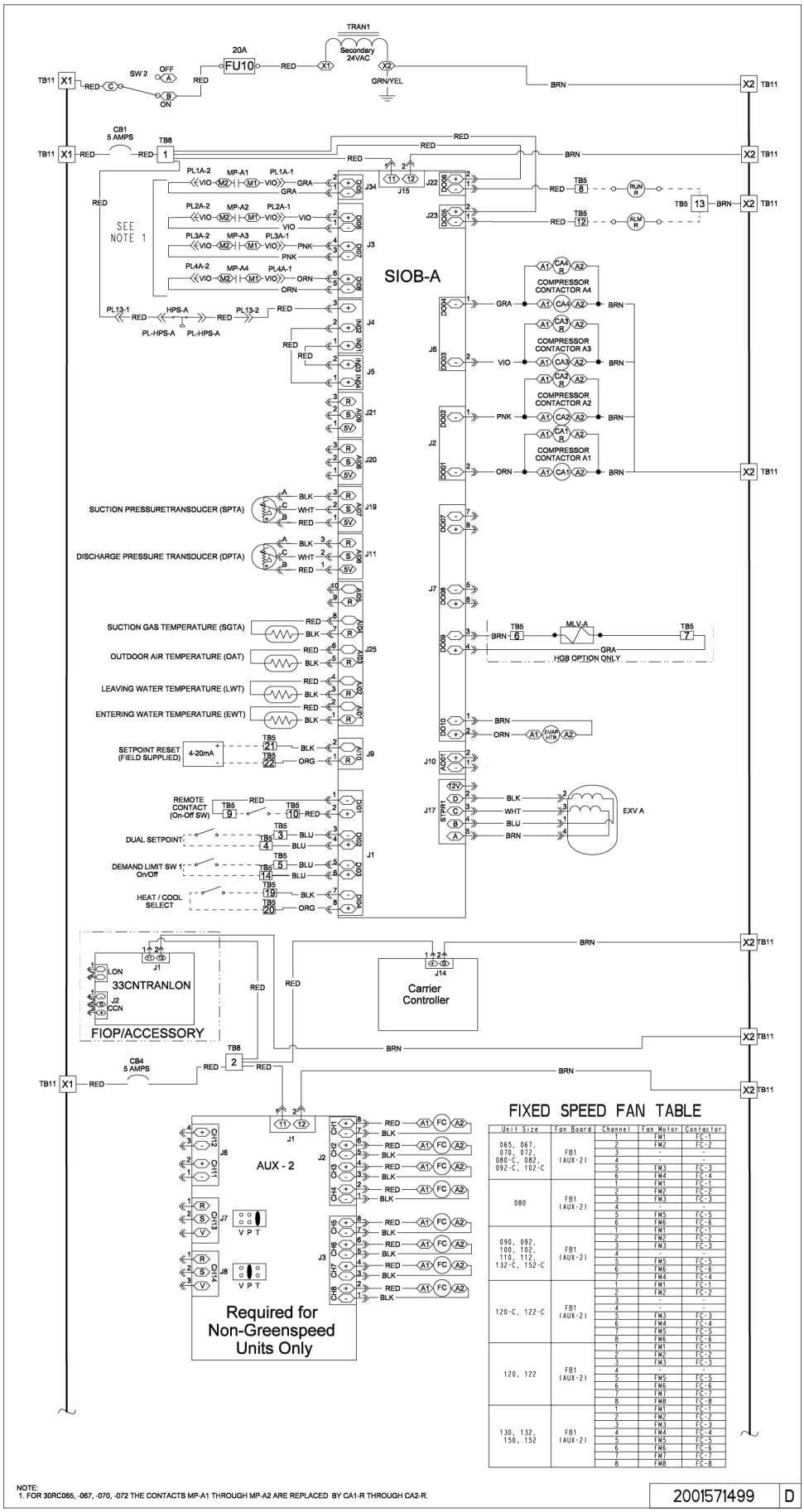
NOTE: See Legend on page 117.

Fig. 75 — 30RC 110-152 Greenspeed (All Voltages) Power Schematic



NOTE: See Legend on page 117.

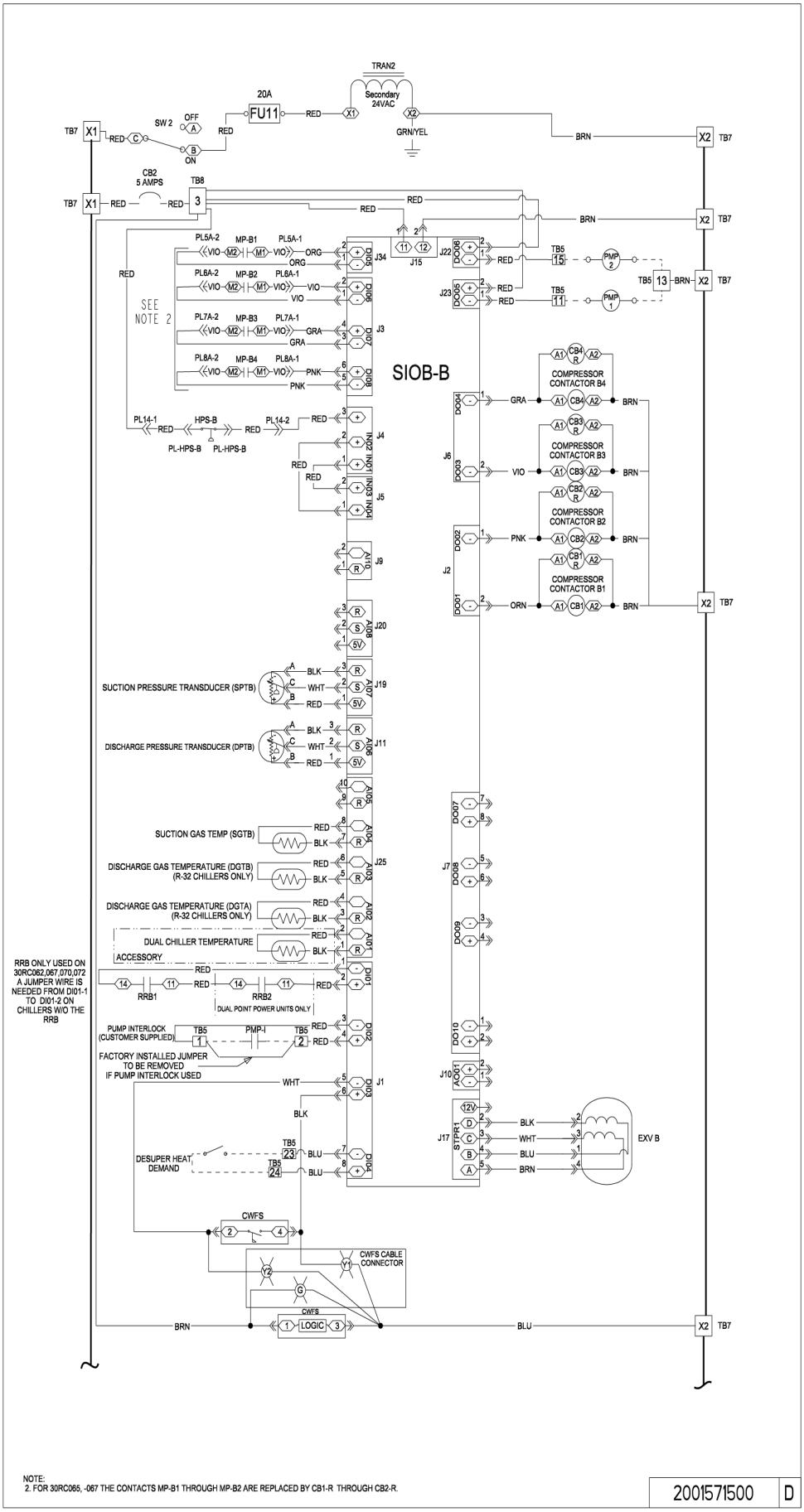
Fig. 76 — 30RC Communication Wiring



Unit Size	Fan Board	Channel	Fan Motor	Contactor
065, 067, 070, 072, 080-C, 082, 092-C, 102-C	FB1 (AUX-2)	1	FM1	FC-1
		2	FM2	FC-2
		3	-	-
		4	-	-
		5	FM3	FC-3
		6	FM4	FC-4
080	FB1 (AUX-2)	1	FM1	FC-1
		2	FM2	FC-2
		3	FM3	FC-3
		4	-	-
		5	FM5	FC-5
		6	FM6	FC-6
090, 092, 100, 102, 110, 112, 132-C, 152-C	FB1 (AUX-2)	1	FM1	FC-1
		2	FM2	FC-2
		3	FM3	FC-3
		4	-	-
		5	FM5	FC-5
		6	FM6	FC-6
		7	FM4	FC-4
120-C, 122-C	FB1 (AUX-2)	1	FM1	FC-1
		2	FM2	FC-2
		3	-	-
		4	-	-
		5	FM3	FC-3
		6	FM4	FC-4
		7	FM5	FC-5
		8	FM6	FC-6
120, 122	FB1 (AUX-2)	1	FM1	FC-1
		2	FM2	FC-2
		3	FM3	FC-3
		4	-	-
		5	FM5	FC-5
		6	FM6	FC-6
		7	FM7	FC-7
		8	FM8	FC-8
130, 132, 150, 152	FB1 (AUX-2)	1	FM1	FC-1
		2	FM2	FC-2
		3	FM3	FC-3
		4	FM4	FC-4
		5	FM5	FC-5
		6	FM6	FC-6
		7	FM7	FC-7
		8	FM8	FC-8

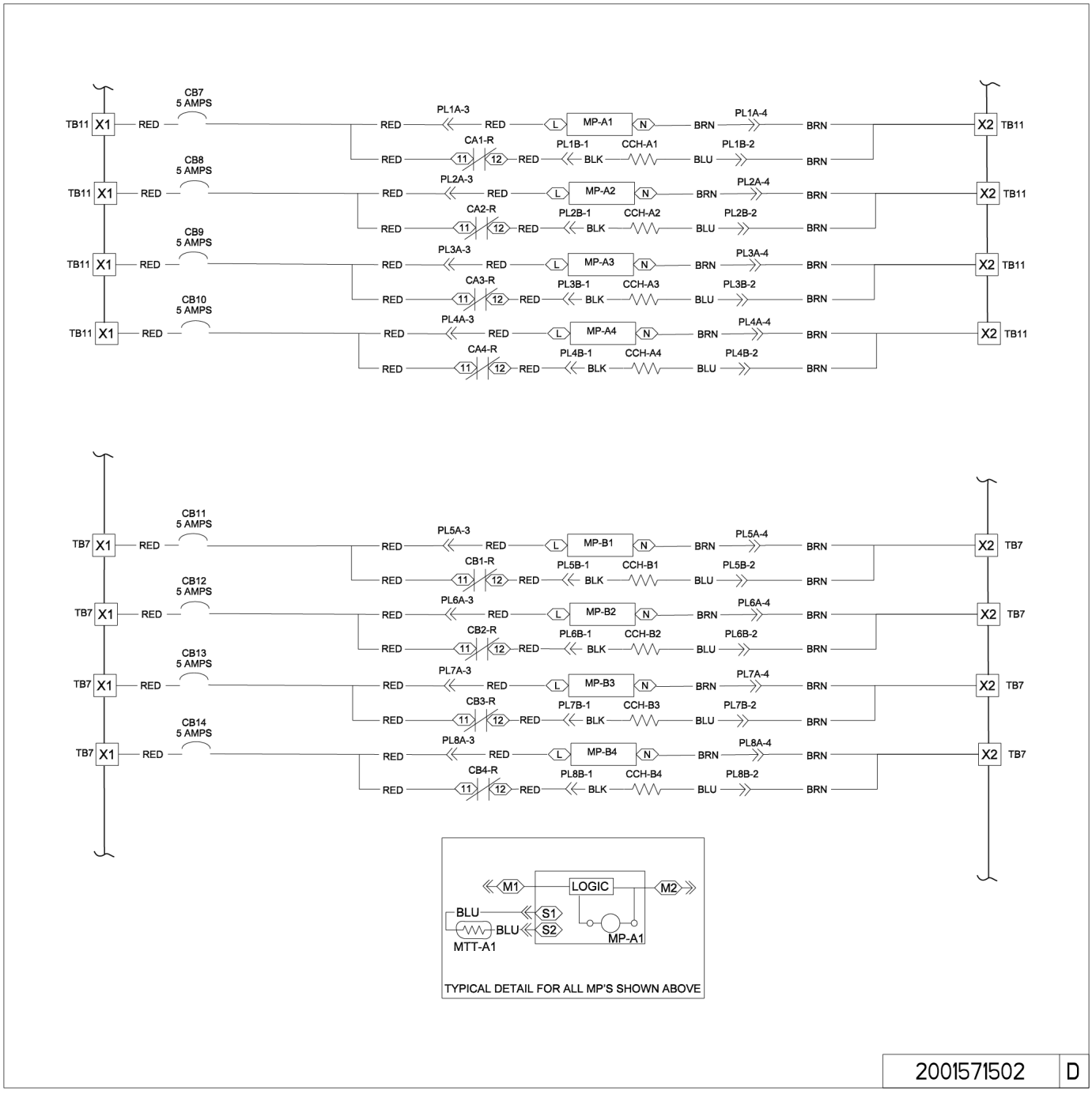
NOTE: See Legend on page 117.

Fig. 77 — 30RC 065-152 24-v Control Wiring (All Voltages)



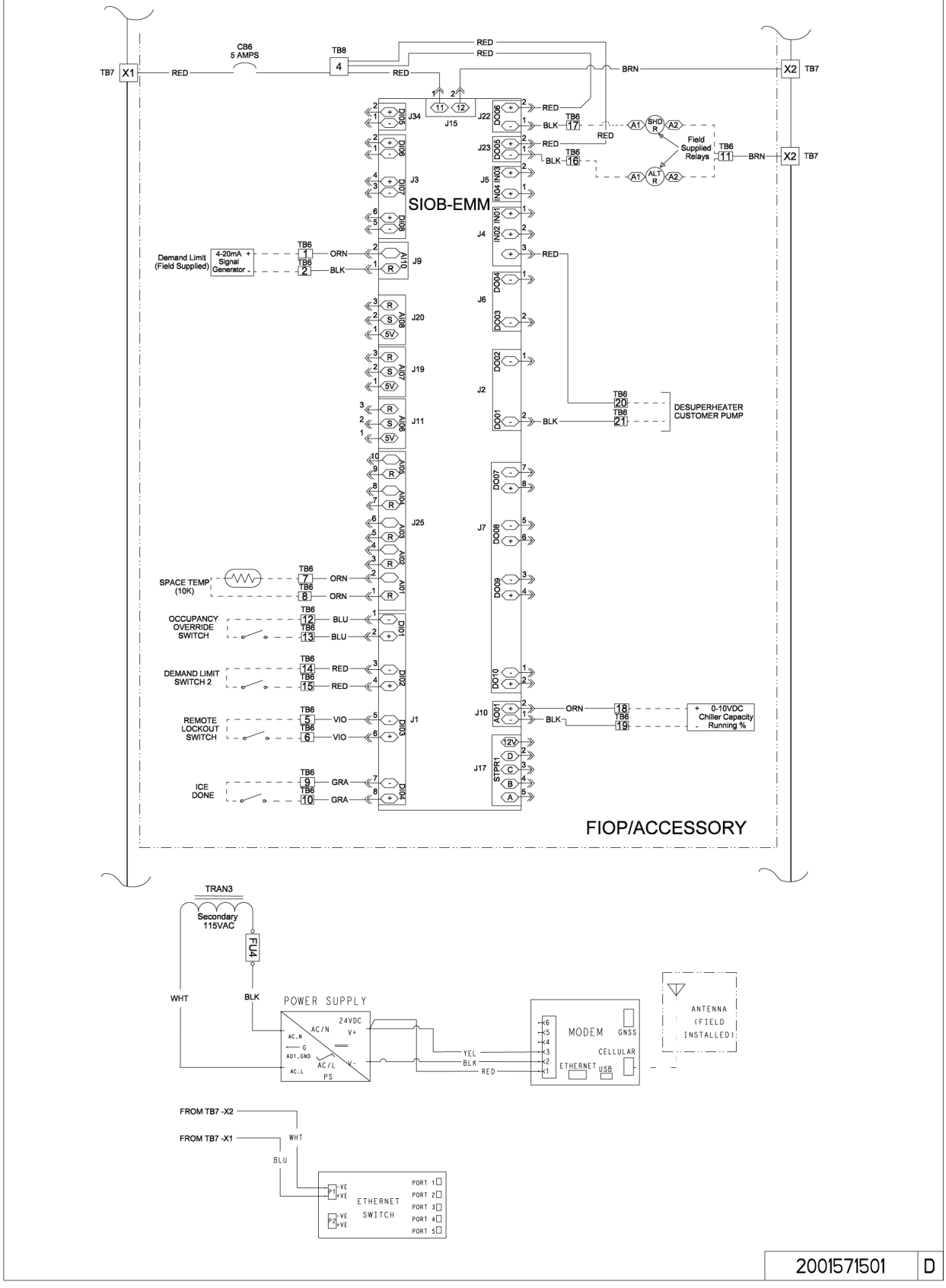
NOTE: See Legend on page 117.

Fig. 77 — 30RC 065-152 24-v Control Wiring (All Voltages) (cont)



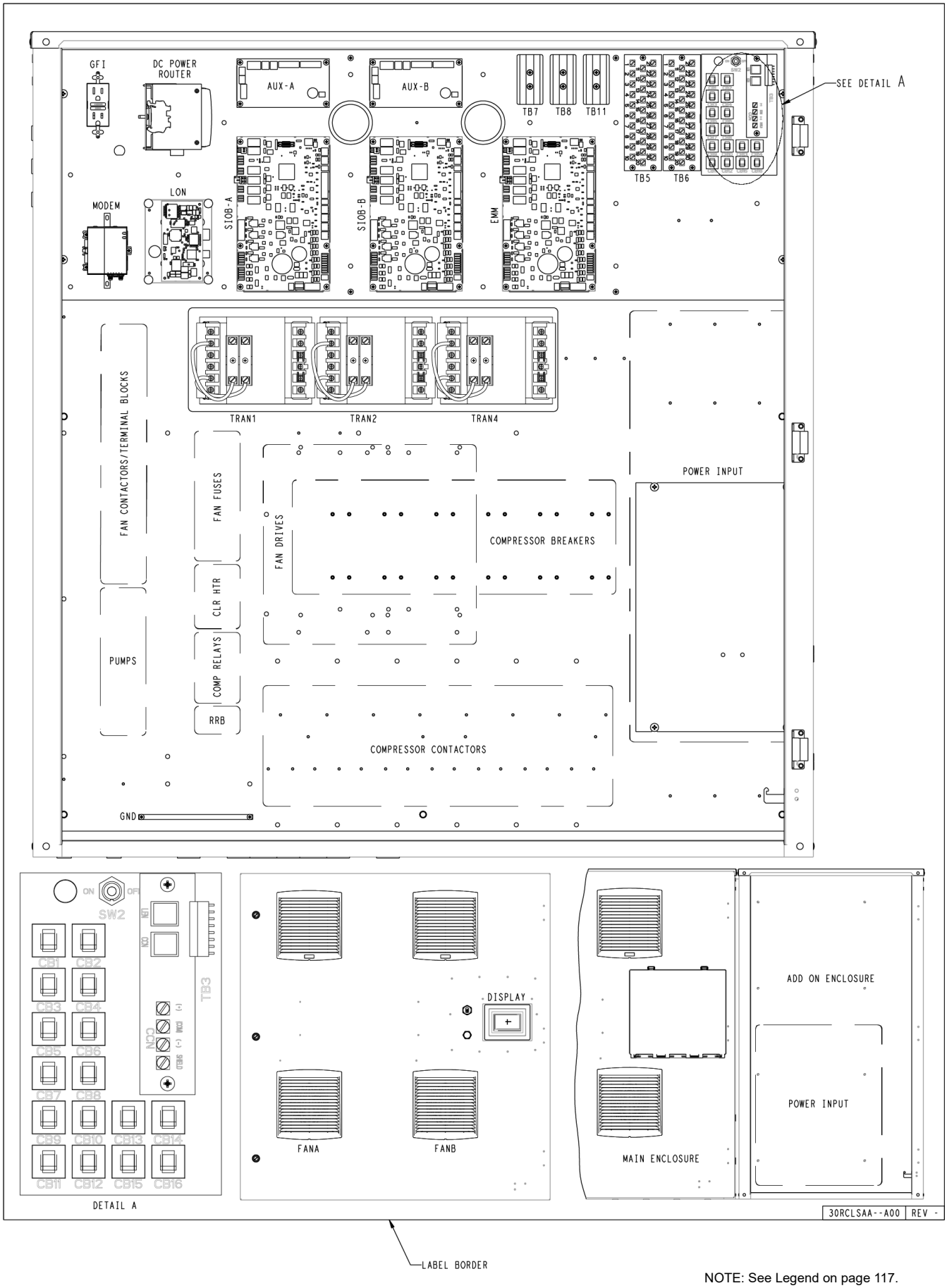
NOTE: See Legend on page 117.

Fig. 77 — 30RC 065-152 24-v Control Wiring (All Voltages) (cont)



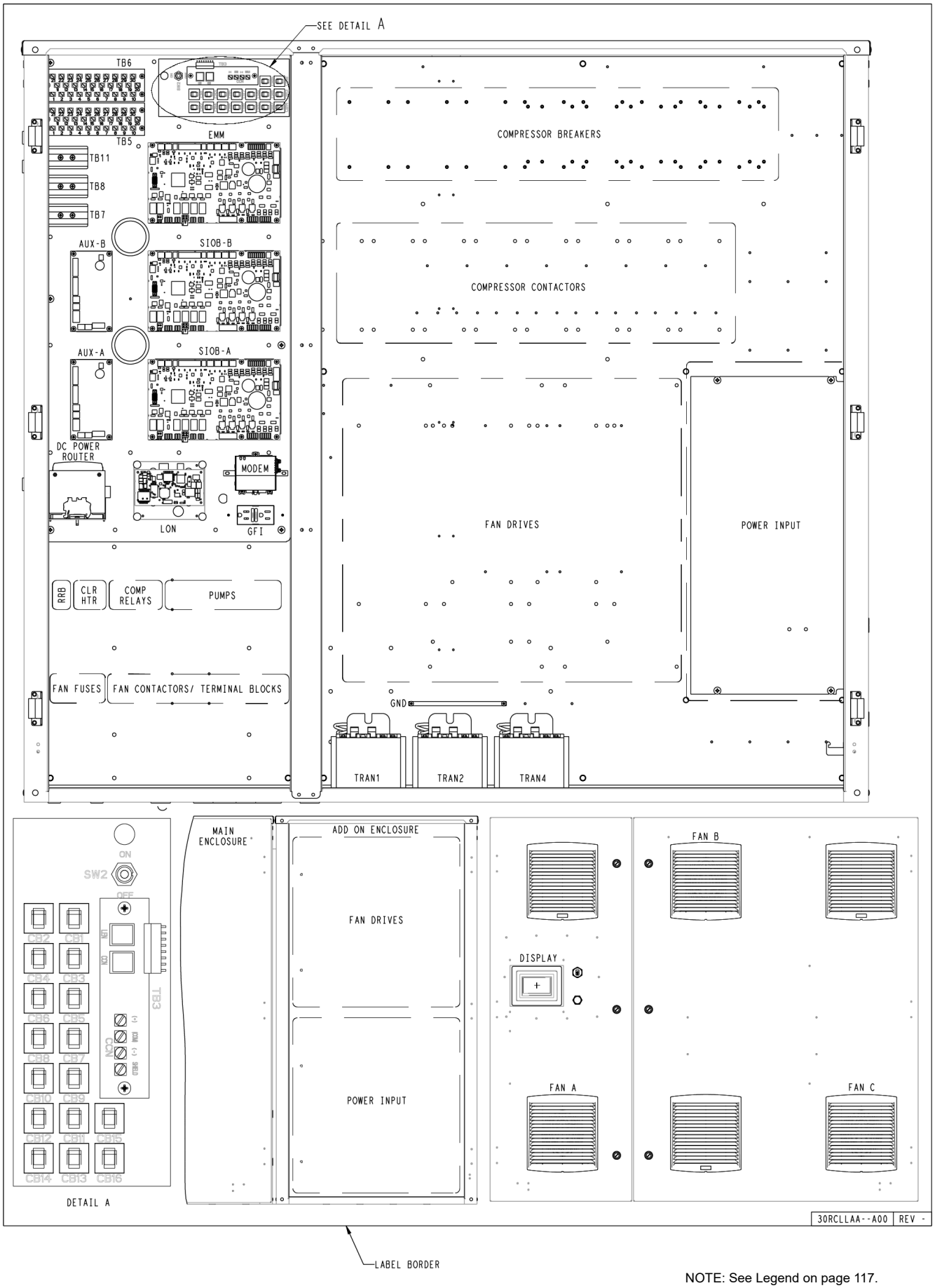
NOTE: See Legend on page 117.

Fig. 77 — 30RC 065-152 24-v Control Wiring (All Voltages) (cont)



NOTE: See Legend on page 117.

Fig. 78 — Component Arrangement Diagram for 30RC 065-152 — Small Main



NOTE: See Legend on page 117.

Fig. 79 — Component Arrangement Diagram for 30RC 065-152 — Large Main

APPENDIX A — CARRIER CONTROLLER DISPLAY TABLES

Menu Descriptions

MAIN MENU

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	General Parameters	GENUNIT
	Temperatures	TEMP
	Pressures	PRESSURE
	Inputs Status	INPUTS
	Outputs Status	OUTPUTS
	Pump Status	PUMPSTAT
	Run Times	RUNTIME
	Modes	MODES
	DC Free Cooling Status[1]	DCFC_STA
	Msc Status	MSC_STAT
	Heat Reclaim[1]	RECLAIM
	Hydraulic Free Cooling[1]	HYD_FC
	Trendings	TRENDING
	Setpoint Configuration	SETPOINT
	Configuration Menu	CONFIG
	Energy Monitoring	ENERGY
	Software Options[1]	OPT_STA
	Quick Test #1	QCK_TST1
	Quick Test #2	QCK_TST2
	Maintenance Menu	MAINTAIN

See Legend and Notes on page 180.

NOTES:
1. Not applicable to North America units.

GENUNIT — GENERAL PARAMETERS

Carrier Controller PATH: Main Menu → General Parameters

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Local = 0 Network = 1 Remote = 2[1]	CTRL_TYP	0 to 2	—	—	RO
2	Run Status[2]	STATUS	—	—	—	RO
3	Net.: Cmd Start/Stop[3]	CHIL_S_S	0 to 1	—	—	RO
4	Net.: Cmd Occupied[4]	CHIL_OCC	0 to 1	—	—	RO
5	Minutes Left for Start	min_left	—	—	min	RO
6	Heat/Cool status	HEATCOOL	—	—	—	RO
7	Heat/Cool Select[5]	HC_SEL	0 to 2	—	—	RW
8	0 = Cool, 1 = Heat, 2 = Auto	—	—	—	—	—
9	Setpoint Select[6]	SP_SEL	0 to 2	—	—	RW
10	0 = Auto, 1 = Spt1, 2 = Spt2	—	—	—	—	—
11	Setpoint Occupied?	SP_OCC	0 to 1	—	—	RO
12	Unit Total Capacity	CAP_T	—	—	%	RO
13	Cir A Total Capacity	CAPA_T	—	—	%	RO
14	Cir B Total Capacity	CAPB_T	—	—	%	RO
15	Current Setpoint	SP	—	—	°C / °F	RO
16	Control Point[7]	CTRL_PNT	–20.0 to 67.2	—	°C	RO
			–4.0 to 153.0	—	°F	RO
17	Control Water Temp	CTRL_WT	–20.0 to 67.2	—	°C	RO
			–4.0 to 153.0	—	°F	RO
18	Outdoor Air Temp	OAT	–20.0 to 67.2	—	°C	RO
			–4.0 to 153.0	—	°F	RO
19	Emergency Stop[8]	EMSTOP	0 to 1	—	—	RO
20	Active Demand Limit Val[9]	DEM_LIM	0 to 100	—	%	RO
21	Lag Capacity Limit Value	LAG_LIM	0 to 100	—	%	RO
22	Active FC Dem Lim Val[10]	DEMFCLIM	0 to 100	—	%	RO
23	Lag FC Cap Limit Value[10]	LAGFCLIM	0 to 100	—	%	RO

See Legend and Notes on page 180.

NOTES:

1. Operating mode: 0 = Local, 1 = Network, 2 = Remote
2. Unit running status:

STATUS	DESCRIPTION
Off	Unit is stopped manually.
Stopping	Unit is currently stopping.
Delay	Unit is in delay at start-up.
Running	Unit compressor capacity is more than 0%.
Ready	Unit is ready to start (compressor capacity amounts to 0%).
Override	The compressor cannot start because of an active override.
Trip out	Unit is down due to an alarm.
Test	Unit is in quick test mode.

3. Start / Stop command:
   Used to Start/Stop the chiller when the unit is under Network control type. This item can be forced if the unit is in Network mode. Otherwise, the forced value is displayed but not used.
4. Occupied / Unoccupied command:
   This item can be forced. If the unit is in Network mode, the forced value will be used instead of the real occupancy state. Otherwise, the forced value cannot be used and the regular schedule is in use.
5. Heat / Cool mode selection:
   0 = Cooling
   1 = Heating
   2 = Automatic cool / heat changeover
6. Setpoint selection:
   0 = Automatic changeover between setpoints
   1 = Setpoint 1 (active during occupied periods)
   2 = Setpoint 2 (active during unoccupied periods)
   NOTE: Setpoint can be forced when the unit is in Network mode.
7. Control point is the calculated setpoint that the unit should reach. This item can be forced only when the unit is in Network mode. In the Network mode, the forced value will be used instead of the control point calculation. If the unit is not in Network mode, the forced value will not be used.
8. Emergency Stop command:
   When the Emergency Stop command is activated, the unit will be stopped regardless of the active mode. An alarm will be triggered. Manual reset is required.
9. Active demand limit:
   This item can be forced only when the unit is in Network mode. In the Network mode, the forced value will be used regardless of the status of the external limit switch contact and the demand limit switch setpoint.
10. Not applicable to North America units.

TEMP — Temperatures

Carrier Controller PATH: Main Menu → Temperatures

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Entering Fluid Temp[1]	EWT	—	—	°C/°F	RO
2	Leaving Fluid Temp[2]	LWT	—	—	°C/°F	RO
3	Outdoor Air Temp[3]	OAT	—	—	°C/°F	RO
4	Saturated Cond Tmp cir A	SCT_A	—	—	°C/°F	RO
5	Saturated Suction Temp A	SST_A	—	—	°C/°F	RO
6	Compressor Suction Tmp A	SUCT_A	—	—	°C/°F	RO
7	Suction Superheat Tmp A	SH_A	—	—	°C/°F	RO
8	Discharge Gas Temp A	DGT_A	—	—	°C/°F	RO
9	Mean Disc. Gas Temp A	DGTM_A	—	—	°C/°F	RO
10	Defrost Temperature A[4]	DEFRT_A	—	—	°C/°F	RO
11	Saturated Cond Tmp cir B	SCT_B	—	—	°C/°F	RO
12	Saturated Suction Temp B	SST_B	—	—	°C/°F	RO
13	Compressor Suction Tmp B	SUCT_B	—	—	°C/°F	RO
14	Suction Superheat Tmp B	SH_B	—	—	°C/°F	RO
15	Discharger Gas Temp B	DGT_B	—	—	°C/°F	RO
16	Mean Disc. Gas Temp B	DGTM_B	—	—	°C/°F	RO
17	Defrost Temperature B[5]	DEFRT_B	—	—	°C/°F	RO
18	Optional Space Temp[6]	SPACETMP	—	—	°C/°F	RO
19	Cold Water System Temp	CHWSTEMP	—	—	°C/°F	RO
20	Reclaim controlled water[7]	HRCtrWat	—	—	°C/°F	RO
21	HR Leaving Fluid temp[7]	HR_LWT	—	—	°C/°F	RO
22	FC Evap Water Temp[7]	FC_EV_WT	—	—	°C/°F	RO

See Legend and Notes on page 180.

NOTES:
1. Entering Fluid Temperature:
   Unit capacity is controlled based on evaporator entering fluid temperature. This option is set in the General Configuration menu.
2. Leaving Fluid Temperature:
   Unit capacity is controlled based on cooler leaving fluid temperature. This option is set in the Service Configuration menu.
3. Outside Air Temp:
   Outside Air Temperature (OAT) determines a number of operations of the unit, including: heat/cool changeover, water exchanger heater operation, defrost cycle for heat pumps, and many more.
4. Defrost Temperature A:
   Defrost temperature for circuit A applies to heat pumps only.
5. Defrost Temperature B:
   Defrost temperature for circuit B applies to heat pumps only.
6. Optional Space Temp:
   Optional space temperature for reset. Applies to units with the EMM option.
7. Not applicable to North America units.

PRESSURE — Pressures

Carrier Controller PATH: Main Menu → Pressures

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/WRITE
1	Discharge Pressure A[1]	DP_A	—	—	kPa / psi	RO
2	Main Suction Pressure A[2]	SP_A	—	—	kPa / psi	RO
3	Discharge Pressure B[1]	DP_B	—	—	kPa / psi	RO
4	Main Suction Pressure B[2]	SP_B	—	—	kPa / psi	RO
5	Inlet unit water pres.[3]	PUMP_EWP	—	—	kPa / psi	RO
6	Outlet unit water pres.[3]	PUMP_LWP	—	—	kPa / psi	RO

See Legend and Notes on page 180.

NOTES:
1. Discharge Pressure:
   Pressure generated by the compressor at the discharge port (circuit A or circuit B).
2. Suction Pressure:
   The intake pressure at the suction port of the compressor (circuit A or circuit B).
3. Not applicable to North America units.

INPUTS — Inputs Status

Carrier Controller PATH: Main Menu → Inputs

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/WRITE
1	Remote On/Off Switch[1]	ONOFF_SW	Open / Close	—	—	RO
2	Remote HeatCool Switch[2]	HC_SW	Open / Close	—	—	RO
3	Remote Setpoint Switch[3]	SETP_SW	Open / Close	—	—	RO
4	Limit Switch 1[4]	LIM_SW1	Open / Close	—	—	RO
5	Limit Switch 2[5]	LIM_SW2	Open / Close	—	—	RO
6	Customer Interlock[6]	LOCK_SW	Open / Close	—	—	RO
7	Flow Switch Status[7]	FLOW_SW	Open / Close	—	—	RO
8	Desuperheater demand	DSHTR_SW	Open / Close	—	—	RO
9	Remote Interlock Status[8]	REM_LOCK	Open / Close	—	—	RO
10	Occupied Override Switch	OCC_OVSW	Open / Close	—	—	RO
11	Ice Done Storage Switch	ICE_SW	Open / Close	—	—	RO
12	Electrical Box Failure	ELEC_BOX	Open / Close	—	—	RO
13	Compressor A1 failure	cp_a1_f	Open / Close	—	—	RO
14	Compressor A2 failure	cp_a2_f	Open / Close	—	—	RO
15	Compressor A3 failure	cp_a3_f	Open / Close	—	—	RO
16	Compressor A4 failure	cp_a4_f	Open / Close	—	—	RO
17	High Pressure Switch A	HP_SW_A	Open / Close	—	—	RO
18	Compressor B1 failure	cp_b1_f	Open / Close	—	—	RO
19	Compressor B2 failure	cp_b2_f	Open / Close	—	—	RO
20	Compressor B3 failure	cp_b3_f	Open / Close	—	—	RO
21	Compressor B4 failure	cp_b4_f	Open / Close	—	—	RO
22	High Pressure Switch B	HP_SW_B	Open / Close	—	—	RO
23	Leakage Detection 1	leak_v1	—	—	V	RO
24	Leakage Detection 2[9]	leak_v2	—	—	V	RO
25	Setpoint Reset Signal	SP_RESET	4 to 20	4	mA	RO
26	Capacity Limit Control	LIM_4_20	4 to 20	4	mA	RO
27	Remote Reclaim switch[9]	RECL_SW	Open / Close	—	—	RO
28	Is FC Evap Valve Closed?[9]	fc_ev_ci	No / Yes	—	—	RO
29	Is FC Evap Valve Opened?[9]	fc_ev_oi	No / Yes	—	—	RO
30	Is FC Coil Valve Closed?[9]	fc_cv_ci	No / Yes	—	—	RO
31	Is FC Coil Valve Opened?[9]	fc_cv_oi	No / Yes	—	—	RO

See Legend and Notes on page 180.

NOTES:

1. Remote On/Off Switch:
   Used to command the unit start/stop when the unit is controlled remotely. The switch is provided on the customer's terminal block of the SIOB/CIOB board.
2. Remote HeatCool Switch:
   Used to switch between heating and cooling when the unit is controlled remotely. The switch is provided on the customer's terminal block of the SIOB/CIOB board. Applies to heat pumps.
3. Remote Setpoint Switch:
   Used when the unit is controlled remotely.
   The switch input is provided on the customer's terminal block on the SIOB/CIOB board.
4. Limit switch 1:
   Used to activate the demand limit.
5. Limit switch 2:
   Used when the unit is controlled remotely. It needs to have the optional EMM (Energy Management Module) Board.
6. Customer interlock:
   This contact is available on SIOB/CIOB board (circuit B). The alarm is raised when the input is open (alarm 10014).
7. Flow Switch Status:
   Used to control the cooler flow by setting the setpoint required to maintain the minimum flow on the cooler side.
8. Remote Interlock Status:
   When the contact is closed, the unit will be stopped with no delay (alarm 10014). The switch is provided on the customer's terminal block of the optional EMM board.
9. Not applicable to North America units.

OUTPUTS — Outputs Status

Carrier Controller PATH: Main Menu → Outputs

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Compressor A1	CP_A1	Off / On	—	—	RO
2	Compressor A2	CP_A2	Off / On	—	—	RO
3	Compressor A3	CP_A3	Off / On	—	—	RO
4	Compressor A4	CP_A4	Off / On	—	—	RO
5	Fan A1	FAN_A1	Off / On	—	—	RO
6	Fan A2	FAN_A2	Off / On	—	—	RO
7	Fan A3	FAN_A3	Off / On	—	—	RO
8	Fan A4	FAN_A4	Off / On	—	—	RO
9	Fan A5	FAN_A5	Off / On	—	—	RO
10	Fan A6	FAN_A6	Off / On	—	—	RO
11	Fan Staging Number Cir A	FAN_ST_A	0 to 10	—	—	RO
12	Variable fan A command	VARFAN_A	—	—	%	RO
13	EXV position Circuit A	EXV_A	0 to 100	—	%	RO
14	4-way Refrig. Valve A[1]	REV_A	Off / On	—	—	RO
15	Compressor Head Heater A	HD_HTR_A	Off / On	—	—	RO
16	Coil Heater A	CO_HTR_A	Off / On	—	—	RO
17	Compressor B1	CP_B1	Off / On	—	—	RO
18	Compressor B2	CP_B2	Off / On	—	—	RO
19	Compressor B3	CP_B3	Off / On	—	—	RO
20	Compressor B4	CP_B4	Off / On	—	—	RO
21	Fan B1	FAN_B1	Off / On	—	—	RO
22	Fan B2	FAN_B2	Off / On	—	—	RO
23	Fan B3	FAN_B3	Off / On	—	—	RO
24	Fan B4	FAN_B4	Off / On	—	—	RO
25	Fan B5	FAN_B5	Off / On	—	—	RO
26	Fan B6	FAN_B6	Off / On	—	—	RO
27	Fan Staging Number Cir B	FAN_ST_B	0 to 10	—	—	RO
28	Variable fan B command	VARFAN_B	—	—	%	RO
29	EXV position Circuit B	EXV_B	0 to 100	—	%	RO
30	4-way Refrig. Valve B [1]	REV_B	Off / On	—	—	RO
31	Compressor Head Heater B	HD_HTR_B	Off / On	—	—	RO
32	Coil Heater B	CO_HTR_B	Off / On	—	—	RO
33	Running Relay Status	RUNNING	Off / On	—	—	RO
34	Alarm Relay Status	ALARM	Off / On	—	—	RO
35	Alert Relay State	ALERT	Off / On	—	—	RO
36	Shutdown Indicator State	SHUTDOWN	Off / On	—	—	RO
37	Exchanger heater[2]	EXCH_HTR	Off / On	—	—	RO
38	Flow Switch Setpoint cfg[3]	SET_FLOW	Off / On	—	—	RO
39	Chiller Capacity Running	CAPT_010	—	—	V	RO
40	Boiler Output[3]	BOILER	Off / On	—	—	RO
41	Electrical Heat Stage 1[3]	EHS1	Off / On	—	—	RO
42	Electrical Heat Stage 2[3]	EHS2	Off / On	—	—	RO
43	Electrical Heat Stage 3[3]	EHS3	Off / On	—	—	RO
44	Electrical Heat Stage 4[3]	EHS4	Off / On	—	—	RO
45	Desuperheater Pump	DSH_PUMP	Off / On	—	—	RO
46	FC Evap Valve Close Cmd[4]	fc_ev_cc	Off / On	—	—	RO
47	FC Evap Valve Open Cmd[4]	fc_ev_oc	Off / On	—	—	RO
48	FC Coil Valve Close Cmd[4]	fc_cv_cc	Off / On	—	—	RO
49	FC Coil Valve Open Cmd[4]	fc_cv_oc	Off / On	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. 4-way refrigerant valve:
   4-way refrigerant valve is used to manage cooling/heating/defrost operation.
   Applies to heat pumps.
2. Exchanger heater:
   Provides anti-freeze protection.
3. Boiler Output/Electrical Heat Stage:
   Applies to heat pumps.
4. Not applicable to North America units.

PUMPSTAT — Pump Status

Carrier Controller PATH: Main Menu → Pump Status

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Rotate Water Pumps Now?	ROTWPUMP	No / Yes	—	—	RO
2	Water Pump #1 Command	PUMP_1	Off / On	—	—	RO
3	Water Pump #2 Command	PUMP_2	Off / On	—	—	RO
4	Outlet Water Pres.(cor)[1]	wp_out	—	—	kPa / PSI	RO
5	Inlet Water Pres.(cor)[1]	wp_in	—	—	kPa / PSI	RO
6	Water Pres. Calibration?[1]	WP_CAL	No / Yes	—	—	RW
7	Water Pressure Offset[1]	wp_off	—	—	kPa / PSI	RO
8	Delta Pressure Filter[1]	wp_filt	—	—	kPa / PSI	RO
9	Minimum Water Pressure[1]	wp_min	—	—	kPa / PSI	RO
10	Water Flow[1]	flow	—	—	l/s / GPS	RO
11	Water Delta T Setpoint[1]	dt_stp	—	—	^C / ^F	RO
12	Current Water Delta T[1]	delta_t	—	—	^C / ^F	RO
13	Water Delta P Setpoint[1]	dp_stp	—	—	kPa / PSI	RO
14	Current Water Delta P[1]	delta_p	—	—	kPa / PSI	RO
15	Variable speed pump cmd[1]	VPMP_CMD	0 to 100	—	%	RO

See Legend and Notes on page 180.

NOTES:
1. Not applicable to North America units.

RUNTIME — Run Times

Carrier Controller PATH: Main Menu → Run Times

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Machine Operating Hours	hr_mach	—	—	Hour	RO
2	Machine Starts Number	st_mach	—	—	—	RO
3	Compressor A1 Hours	hr_cp_a1	—	—	Hour	RO
4	Compressor A2 Hours	hr_cp_a2	—	—	Hour	RO
5	Compressor A3 Hours	hr_cp_a3	—	—	Hour	RO
6	Compressor A4 Hours	hr_cp_a4	—	—	Hour	RO
7	Compressor B1 Hours	hr_cp_b1	—	—	Hour	RO
8	Compressor B2 Hours	hr_cp_b2	—	—	Hour	RO
9	Compressor B3 Hours	hr_cp_b3	—	—	Hour	RO
10	Compressor B4 Hours	hr_cp_b4	—	—	Hour	RO
11	Compressor A1 Starts	st_cp_a1	—	—	—	RO
12	Compressor A2 Starts	st_cp_a2	—	—	—	RO
13	Compressor A3 Starts	st_cp_a3	—	—	—	RO
14	Compressor A4 Starts	st_cp_a4	—	—	—	RO
15	Compressor B1 Starts	st_cp_b1	—	—	—	RO
16	Compressor B2 Starts	st_cp_b2	—	—	—	RO
17	Compressor B3 Starts	st_cp_b3	—	—	—	RO
18	Compressor B4 Starts	st_cp_b4	—	—	—	RO
19	Fan A1 Hours	hr_fana1	—	—	Hour	RO
20	Fan A2 Hours	hr_fana2	—	—	Hour	RO
21	Fan A3 Hours	hr_fana3	—	—	Hour	RO
22	Fan A4 Hours	hr_fana4	—	—	Hour	RO
23	Fan A5 Hours	hr_fana5	—	—	Hour	RO
24	Fan A6 Hours	hr_fana6	—	—	Hour	RO
25	Fan A7 Hours	hr_fana7	—	—	Hour	RO
26	Fan A8 Hours	hr_fana8	—	—	Hour	RO
27	Fan B1 Hours	hr_fanb1	—	—	Hour	RO
28	Fan B2 Hours	hr_fanb2	—	—	Hour	RO
29	Fan B3 Hours	hr_fanb3	—	—	Hour	RO
30	Fan B4 Hours	hr_fanb4	—	—	Hour	RO
31	Fan B5 Hours	hr_fanb5	—	—	Hour	RO
32	Fan B6 Hours	hr_fanb6	—	—	Hour	RO
33	Fan B7 Hours	hr_fanb7	—	—	Hour	RO
34	Fan B8 Hours	hr_fanb8	—	—	Hour	RO
35	Water Pump #1 Hours	hr_pump1	—	—	Hour	RO
36	Water Pump #2 Hours	hr_pump2	—	—	Hour	RO
37	Circuit A Defrost Number[1]	nb_defra	—	—	—	RO
38	Circuit B Defrost Number[1]	nb_defrb	—	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Defrost number:
   Used to indicate the number of defrost sessions on a given circuit. Applies to heat pumps.

MODES — Modes

Carrier Controller PATH: Main Menu → Modes

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Start Up Delay In Effect[1]	m_delay	No / Yes	—	—	RO
2	Second Setpoint In Use[2]	m_2stpt	No / Yes	—	—	RO
3	Reset In Effect[3]	m_reset	No / Yes	—	—	RO
4	Demand limit active[4]	m_demlim	No / Yes	—	—	RO
5	Ramp Loading Active[5]	m_rpload	No / Yes	—	—	RO
6	Water Exchanger Heater[6]	m_whtr	No / Yes	—	—	RO
7	Water Pump Rotation[7]	m_pmprot	No / Yes	—	—	RO
8	Pump Periodic Start[8]	m_pmpper	No / Yes	—	—	RO
9	Low Suction Circuit A	m_lowsca	No / Yes	—	—	RO
10	Low Suction Circuit B	m_lowscb	No / Yes	—	—	RO
11	High DGT Circuit A	m_hidgta	No / Yes	—	—	RO
12	High DGT Circuit B	m_hidgtb	No / Yes	—	—	RO
13	High Press Override CirA	m_hiprsa	No / Yes	—	—	RO
14	High Press Override CirB	m_hiprsb	No / Yes	—	—	RO
15	Low Delta Press Cir A	m_dltp_a	No / Yes	—	—	RO
16	Low Delta Press Cir B	m_dltp_b	No / Yes	—	—	RO
17	Night Low Noise Active	m_night	No / Yes	—	—	RO
18	System Manager Active	m_hsm	No / Yes	—	—	RO
19	Master Slave Active[9]	m_slave	No / Yes	—	—	RO
20	Auto Changeover Active	m_autoch	No / Yes	—	—	RO
21	Defrost Active Circuit A[10]	m_defr_a	No / Yes	—	—	RO
22	Defrost Active Circuit B[10]	m_defr_b	No / Yes	—	—	RO
23	Boiler Active[11]	m_boiler	No / Yes	—	—	RO
24	Electric Heater Active[11]	m_ehs	No / Yes	—	—	RO
25	Heating Low EWT Lockout	m_ewtlck	No / Yes	—	—	RO
26	Ice Mode In Effect	m_ice	No / Yes	—	—	RO
27	Fast Capacity Recovery[12]	m_fastRe	No / Yes	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Start Up Delay in Effect:
   The unit start is delayed.
2. Second Setpoint in Use:
   The setpoint used during unoccupied periods.
3. Reset in Effect:
   See Temperature Reset section on page 53.
4. Demand Limit Active:
   See Demand Limit section on page 57.
5. Ramp loading:
   Used to minimize the rate at which the water temperature changes.
6. Water exchanger heater:
   Used to provide anti-freeze protection.
7. Water pump rotation:
   See Evaporator Pump Control section on page 40.
8. Pump periodic start:
   See Evaporator Pump Control section on page 40.
9. Master Slave Active:
   See Dual Chiller Control section on page 46.
10. Defrost active:
    Applies to heat pumps.
11. Boiler Active/Electrical Heater Active:
    Applies to heat pumps.
12. Fast capacity recovery:
    See Fast Loading section on page 59.

DCFC_STA — DC Free Cooling Status[1]

Carrier Controller PATH: Main Menu → DC Free Cooling Status

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	OAT Free Cooling	oat	—	—	°C / °F	RO
2	FC Leaving Water Temp	lwt	—	—	°C / °F	RO
3	FC Water Loop Temp	wloop	—	—	°C / °F	RO
4	Free Cooling Mode Active	m_dcfc	No / Yes	—	—	RO
5	FC Capacity	dcfc_cap	0 to 100	—	%	RO
6	Fix Speed Fans Stage	f_stage	0 to 10	—	—	RO
7	Varifan Speed	vf_speed	0 to 100	—	%	RO
8	PID Output	pid_out	0 to 100	—	%	RO
9	DCFC Operating Hours	FC_HOUR	0 to 999999	—	Hour	RO
10	DCFC Fan Stage 1 Start	FC_FAN1S	0 to 999999	—	—	RO
11	DCFC Fan Stage 1 Hours	FC_FAN1H	0 to 999999	—	Hour	RO
12	DCFC Fan Stage 2 Start	FC_FAN2S	0 to 999999	—	—	RO
13	DCFC Fan Stage 2 Hours	FC_FAN2H	0 to 999999	—	Hour	RO
14	DCFC Fan Stage 3 Start	FC_FAN3S	0 to 999999	—	—	RO
15	DCFC Fan Stage 3 Hours	FC_FAN3H	0 to 999999	—	Hour	RO
16	DCFC Fan Stage 4 Start	FC_FAN4S	0 to 999999	—	—	RO
17	DCFC Fan Stage 4 Hours	FC_FAN4H	0 to 999999	—	Hour	RO
18	DCFC Fan Stage 5 Start	FC_FAN5S	0 to 999999	—	—	RO
19	DCFC Fan Stage 5 Hours	FC_FAN5H	0 to 999999	—	Hour	RO
20	DCFC Fan Stage 6 Start	FC_FAN6S	0 to 999999	—	—	RO
21	DCFC Fan Stage 6 Hours	FC_FAN6H	0 to 999999	—	Hour	RO
22	DCFC Fan Stage 7 Start	FC_FAN7S	0 to 999999	—	—	RO
23	DCFC Fan Stage 7 Hours	FC_FAN7H	0 to 999999	—	Hour	RO
24	DCFC Variable Fan Start	FC_VFANS	0 to 999999	—	—	RO
25	DCFC Variable Fan Hours	FC_VFANH	0 to 999999	—	Hour	RO

See Legend and Notes on page 180.

NOTES:
1. DC Free Cooling Status table not applicable to North America units.

MSC_STAT — Msc Status

Carrier Controller PATH: Main Menu → Msc Status

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Eco Pump Mode Active	m_ecopmp	No / Yes	—	—	RO

See Legend and Notes on page 180.

RECLAIM — Heat Reclaim[1]

Carrier Controller PATH: Main Menu → Heat Reclaim

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Reclaim Selection	RECL_SEL	No / Yes	No	—	RW
2	Reclaim Status	HR_stat	0 to 10	0	—	RO
3	Reclaim control point	HRCrtPnt	—	—	°C / °F	RO
4	Reclaim controlled water	HRCtrWat	—	—	°C / °F	RO
5	HR Leaving Fluid temp	HR_LWT	—	—	°C / °F	RO
6	Heat Reclaim Flow switch	HR_FLOW	Open / Close	Open	—	RO
7	3WayValve / VarPump cmd	cmd_3WV	0 to 100	0	%	RO
8	3WayValve / VarPump outp	out_3WV	0 to 10	0	V	RO
9	3WayValve / VarPump mode	mode_3WV	0 to 1	0	—	RO
10	0: Low HR LWT control	—	—	—	—	—
11	1: HR water temp control	—	—	—	—	—
12	HR active mode (3VW/Fan)	actiMode	0 to 1	1	—	RO
13	0: 3-way valve mode	—	—	—	—	—
14	1: Fan mode	—	—	—	—	—
15	Reclaim pump command	HR_pump	Off / On	Off	—	RO
16	Reclaim BPHE Heater	HRheater	Off / On	Off	—	RO

See Legend and Notes on page 180.

NOTES:
1. Heat Reclaim table not applicable to North America units.

HYD_FC — Hydraulic Free Cooling[1]

Carrier Controller PATH: Main Menu → Hydraulic Free Cooling

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Free Cooling Disable?	FC_DSBLE	No / Yes	No	—	RW
2	Total FC Capacity	fcCapT	—	—	%	RO
3	Water Loop Position	wLoopPst	Mecha Cooling / Mixed/Free Cooling	—	—	RO
4	FC Override	fc_ovr	—	—	—	RO
5	FC Capacity A	fcCapA	—	—	%	RO
6	Mode of Circuit A	modeCirA	0 to 3	0	—	RO
7	MC Current Power A	mcCurPwA	—	—	kW	RO
8	FC Current Power A	fcCurPwA	—	—	kW	RO
9	FC Max Power A	fcMaxPwA	—	—	kW	RO
10	FC Capacity B	fcCapB	—	—	%	RO
11	Mode of circuit B	modeCirB	0 to 3	0	—	RO
12	MC Current Power B	mcCurPwB	—	—	kW	RO
13	FC Current Power B	fcCurPwB	—	—	kW	RO
14	FC Max Power B	fcMaxPwB	—	—	kW	RO
15	FC Evap Valve Request	fc_ev_rq	Close / Open	Open	—	RO
16	FC Coil Valve Request	fc_cv_rq	Close / Open	Close	—	RO
17	FC Evap Valve Status	fc_ev_st	0 to 8	—	—	RO
18	FC Coil Valve Status	fc_cv_st	0 to 8	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Hydraulic Free Cooling table not applicable to North America units.

TRENDING — Trendings[1]

Carrier Controller PATH: Main Menu → Trendings

LINE	DISPLAYED TEXT[2]	CCN NAME	RANGE	DEFAULT VALUE	UNIT[3]
1	Cir A Total Capacity	GENUNIT_CAPA_T	0 to 100	—	%
2	Cir B Total Capacity	GENUNIT_CAPB_T	0 to 100	—	%
3	Control Point	GENUNIT_CTRL_PNT	—	—	°C / °F
4	Outdoor Air Temp	TEMP_OAT	—	—	°C / °F
5	Cooler Entering Fluid	TEMP_EWT	—	—	°C / °F
6	Cooler Leaving Fluid	TEMP_LWT	—	—	°C / °F
7	Saturated Cond Tmp cir A	TEMP_SCT_A	—	—	°C / °F
8	Saturated Cond Tmp cir B	TEMP_SCT_B	—	—	°C / °F
9	Saturated Suction Temp A	TEMP_SST_A	—	—	°C / °F
10	Saturated Suction Temp B	TEMP_SST_B	—	—	°C / °F
11	Reclaim controlled water[4]	TEMP_HRCtrWat	—	—	°C / °F
12	HR Leaving Fluid temp[4]	TEMP_HR_LWT	—	—	°C / °F

See Legend and Notes on page 180.

NOTES:
1. The list of trending points cannot be modified. Trending points can only be enabled or disabled. Only 4 points can be selected at a time on a 4.3 in. controller.
2. Trending points cannot be changed.
3. Unit display depends on the display configuration.
4. Not applicable to North America units.

SETPOINT — Setpoint Configuration

Carrier Controller PATH: Main Menu → Setpoint Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE[1]	DEFAULT VALUE	UNIT	READ/ WRITE
1	Cooling Setpoint 1[2]	csp1	–28.9 to 21.1	6.7	°C	RW
			–20.0 to 70.0	44.0	°F	RW
2	Cooling Setpoint 2[3]	csp2	–28.9 to 21.1	6.7	°C	RW
			–20.0 to 70.0	44.0	°F	RW
3	Cooling Ice Setpoint[3]	ice_sp	–28.9 to 21.1	6.7	°C	RW
			–20.0 to 70.0	44.0	°F	RW
4	Cooling Ramp Loading	cramp_sp	0.1 to 1.1	0.6	^C	RW
			0.2 to 2.0	1.0	^F	RW
5	Heating Setpoint 1[4]	hsp1	20.0 to 63.0	37.8	°C	RW
			68.0 to 145.4	100.0	°F	RW
6	Heating Setpoint 2[4]	hsp2	20.0 to 63.0	37.8	°C	RW
			68.0 to 145.4	100.0	°F	RW
7	Heating Ramp Loading	hramp_sp	0.1 to 1.1	0.6	^C	RW
			0.2 to 2.0	1.0	^F	RW
8	Cool Changeover Setpt	cauto_sp	3.9 to 50.0	23.9	°C	RW
			39.0 to 122.0	75.0	°F	RW
9	Heat Changeover Setpt	hauto_sp	0 to 46.1	17.8	°C	RW
			32.0 to 115.0	64.0	°F	RW
10	Switch Limit Setpoint 1[5]	lim_sp1	0 to 100	100.0	%	RW
11	Switch Limit Setpoint 2[5]	lim_sp2	0 to 100	100.0	%	RW
12	Switch Limit Setpoint 3[5]	lim_sp3	0 to 100	100.0	%	RW
13	Heat Reclaim Setpoint[6]	hr_stp	25.0 to 65.0	50.0	°C	RW
			77.0 to 149.0	122.0	°F	RW
14	Heat Reclaim Deadband[6]	hr_deadb	0.5 to 5.0	2.0	^C	RW
			0.9 to 9.0	3.6	^F	RW
15	Desuperheat Min SCT	min_sct	23.9 to 50.0	40.0	°C	RW
			75.0 to 122.0	104.0	°F	RW

See Legend and Notes on page 180.

NOTES:
1. The range may vary depending on the unit configuration, e.g., fluid type.
2. Cooling setpoint:
   Applies to units operating in cooling mode.
3. Cooling ice setpoint:
   Applies to units with the EMM (energy management module) option.
4. Heating setpoint:
   Applies to units operating in heating mode.
5. Switch limit setpoint
   See Demand Limit section on page 57.
6. Not applicable to North America units.

ENERGY — Energy Monitoring

Carrier Controller PATH: Main Menu → Energy Monitoring

LINE	DISPLAYED TEXT[1]	CCN NAME	RANGE	DEFAULT VALUE	UNIT†	READ/ WRITE
1	COOLING MODE	—	—	—	—	—
2	Cooling Power Output	cPwrOut	—	—	kW	RO
3	Electrical Power Input	cPwrIn	—	—	kW	RO
4	Energy Efficiency (EER)	eer	—	—	—	RO
5	Cooling Energy Output	cEnergOu	—	—	kWh	RO
6	Electrical Energy Input	cEnergIn	—	—	kWh	RO
7	Integrated EER	energEer	—	—	—	RO
8	HEATING MODE	—	—	—	—	—
9	Heating Power Output	hPwrOut	—	—	kW	RO
10	Electrical Power Input	hPwrIn	—	—	kW	RO
11	Coef. Of Perf. (COP)	cop	—	—	—	RO
12	Heating Energy Output	hEnergOu	—	—	kWh	RO
13	Electrical Energy Input	hEnergIn	—	—	kWh	RO
14	Integrated COP	energCop	—	—	—	RO
15	—	—	—	—	—	—
16	Reset of Energy Counter	reset_en	No / Yes	—	—	RW
17	Last Reset Date	reset_da	—	—	—	RO
18	Last Reset Time	reset_ti	—	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. The information in this table, based on estimates, is indicative and cannot be used as a real energy meter. The powers and energies take into account only the power of compressors and fans.

OPT_STA — Software Options[1]

Carrier Controller PATH: Main Menu → Software Options

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	OPT6: Low Brine	opt6	No / Yes	No	—	RO
2	OPT149: BACnet	opt149	No / Yes	No	—	RO
3	OPT149B: Modbus	opt149B	No / Yes	No	—	RO
4	OPT119C: Cool Floor Optim	opt119C	No / Yes	No	—	RO

See Legend and Notes on page 180.

NOTES:
1. Software Options table not applicable to North America units.

QCK_TST1 — Quick Test #1[1]

Carrier Controller PATH: Main Menu → Quick Test #1

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Unit must be in Loff[2]	—	—	—	—	—
2	Quick Test Enable[3]	QCK_TEST	No / Yes	No	—	RW
3	Pump #1 Output[4]	Q_PUMP1	0 to 2	0	—	RW
4	Pump #2 Output[4]	Q_PUMP2	0 to 2	0	—	RW
5	Variable Pump Speed #1[5]	Q_VPUMP1	0 to 100	0	%	RW
6	Variable Pump Speed #2[5]	Q_VPUMP2	0 to 100	0	%	RW
7	Exchanger Heater Output	Q_HEATER	Off / On	Off	—	RW
8	Alarm Relay Status	Q_ALARM	Off / On	Off	—	RW
9	Running Relay Status	Q_RUN	Off / On	Off	—	RW
10	Set Flow Switch[5]	Q_SETFLO	Off / On	Off	—	RW
11	Reverse Vlv Output Cir A	Q_RV_A	Off / On	Off	—	RW
12	Fan A1 Output	Q_FAN_A1	Off / On	Off	—	RW
13	Fan A2 Output	Q_FAN_A2	Off / On	Off	—	RW
14	Fan A3 Output	Q_FAN_A3	Off / On	Off	—	RW
15	Fan A4 Output	Q_FAN_A4	Off / On	Off	—	RW
16	Fan A5 Output	Q_FAN_A5	Off / On	Off	—	RW
17	Fan A6 Output	Q_FAN_A6	Off / On	Off	—	RW
18	Variable Fan Speed A	Q_VFAN_A	0 to 100	0	%	RW
19	EXV Position Circuit A[6]	Q_EXV_A	0 to 100	0	%	RW
20	Compressor Head Heater A	Q_HD_HTA	Off / On	Off	—	RW
21	Reverse Vlv Output Cir B	Q_RV_B	Off / On	Off	—	RW
22	Fan B1 Output	Q_FAN_B1	Off / On	Off	—	RW
23	Fan B2 Output	Q_FAN_B2	Off / On	Off	—	RW
24	Fan B3 Output	Q_FAN_B3	Off / On	Off	—	RW
25	Fan B4 Output	Q_FAN_B4	Off / On	Off	—	RW
26	Fan B5 Output	Q_FAN_B5	Off / On	Off	—	RW
27	Fan B6 Output	Q_FAN_B6	Off / On	Off	—	RW
28	Variable Fan Speed B	Q_VFAN_B	0 to 100	0	%	RW
29	EXV Position Circuit B	Q_EXV_B	0 to 100	0	%	RW
30	Compressor Head Heater B	Q_HD_HTB	Off / On	Off	—	RW
31	High Pressure Test[7]	HP_TEST	0 to 4	0	—	RW
32	1: HP test on cir A	—	—	—	—	—
33	2: HP test on cir B	—	—	—	—	—
34	3: N/A	—	—	—	—	—
35	4: HP test on both cir	—	—	—	—	—
36	HEAT RECLAIM[5]	—	—	—	—	—
37	Reclaim pump command[5]	QHR_PMP	Off / On	Off	—	RW
38	Reclaim 3way Valve cmd[5]	QHR_3WV	0 to 100	0	%	RW
39	Reclaim BPHE Heater[5]	QHR_HTR	Off / On	Off	—	RW
40	HYDRAULIC FREE COOLING[5]	—	—	—	—	—
41	FC Evaporator Valve[5]	Q_FC_EV	Close / Open	Close	—	RW
42	FC Coil Valve[5]	Q_FC_CV	Close / Open	Close	—	RW

See Legend and Notes on page 180.

NOTES:

1. The main control gives access to 2 Quick Test tables allowing users and technicians to test all unit outputs. To access the Quick Test menu, navigate to the Main menu and select Quick Test #1 (user access level required) or Quick Test #2 (service access level required).
   To enable the Quick Test, it is necessary to set “Quick test Enable” [QCK_TEST] to “yes” in the QCK_TST1 menu. This function is allowed only when the unit is in Local Off operating type.
2. Unit must be in Local-off mode:
   To enable to Quick Test mode, the unit must be stopped (Local-off mode).
3. Quick Test Enable:
   To test unit components, please enable the Quick Test function by setting the “Quick test Enable” parameter to “yes.”
4. Pump Quick Test:
   When the pump is a single speed pump, the pump is energized if the value is above 0.
   0 = No test
   1 = [ON] Pump shall run for 20 seconds
   2 = [FORCED] Pump shall run all the time (set the value to “0” to stop the pump test)
5. Not applicable to North America units.
6. EXV position:
   100% = EXV fully open
7. High pressure test:
   0 = No pressure test
   1 = Circuit A high pressure test
   2 = Circuit B high pressure test
   4 = High pressure test on both circuits

QCK_TST2 — Quick Test #2

Carrier Controller PATH: Main Menu → Quick Test #2

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Unit must be in Loff	—	—	—	—	—
2	ENERGY MANAGEMENT	—	—	—	—	—
3	Total Capacity Output [1]	Q_CAP010	0 to 100	0	%	RW
4	Compressor A1 Output[2]	Q_CAP1	Off / On	Off	—	RW
5	Compressor A2 Output[2]	Q_CAP2	Off / On	Off	—	RW
6	Compressor A3 Output[2]	Q_CAP3	Off / On	Off	—	RW
7	Compressor A4 Output[2]	Q_CAP4	Off / On	Off	—	RW
8	Quick test Status A[3]	q_stat_a	0 to 10x	0	—	RW
9	Compressor B1 Output[2]	Q_CPB1	Off / On	Off	—	RW
10	Compressor B2 Output[2]	Q_CPB2	Off / On	Off	—	RW
11	Compressor B3 Output[2]	Q_CPB3	Off / On	Off	—	RW
12	Compressor B4 Output[2]	Q_CPB4	Off / On	Off	—	RW
13	Quick test Status B[4]	q_stat-b	0 to 10x	0	—	RW
14	Boiler Output[1,5]	Q_BOILER	Off / On	Off	—	RW
15	Alert Relay Switch[1]	Q_ALERT	Off / On	Off	—	RW
16	Shutdown Relay Status[1]	Q_SHUTD	Off / On	Off	—	RW
17	Electric heat stage #1[1,5]	Q_EHS1	Off / On	Off	—	RW
18	Electric heat stage #2[1,5]	Q_EHS2	Off / On	Off	—	RW
19	Electric heat stage #3[1,5]	Q_EHS3	Off / On	Off	—	RW
20	Electric heat stage #4[1,5]	Q_EHS4	Off / On	Off	—	RW
21	Desuperheater Pump	Q_DH_PMP	Off / On	Off	—	RW
22	Coil Heater A	Q_CO_HTA	Off / On	Off	—	RW
23	Coil Heater B	Q_CO_HTB	Off / On	Off	—	RW
24	DC FREE COOLING[6]	—	—	—	—	—
25	DCFC Water Valve Outputs[6]	Q_FDC_WV	Off / On	Off	—	RW
26	DCFC Variable Fan Speed [6]	Q_FDC_VF	0 to 100	0	%	RW
27	DCFC Simple Fan Number[6]	Q_FDC_SF	0 to 7	0	—	RW

See Legend and Notes on page 180.

NOTES:
1. Energy Management:
   This parameter can be tested only if EMM (energy management module) option is configured.
2. Compressor test
3. Status of the last compressor quick test, circuit A (x = compressor number):
   0 = compressor test stopped
   1 = compressor test in progress
   2 = compressor test completed successfully
   3x to 10x = test failure
4. Status of the last compressor quick test, circuit B (x = compressor number):
   0 = compressor test stopped
   1 = compressor test in progress
   2 = compressor test completed successfully
   3x to 10x = test failure
5. Boiler Output / Electrical Heat Stage:
   Applies to heat pumps.
6. Not applicable to North America units.

CONFIGURATION MENU

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	General Configuration	GENCONF
	Pump Configuration	PUMPCONF
	Reset Configuration	RESETCFG
	Backup Configuration	BACKUP
	User Configuration	USERCONF
	Heat Reclaim Config[1]	HR_CFG
	Schedule Menu	SCHEDULE
	Holiday Menu	HOLIDAY
	Date/Time	DATETIME
	Network Menu	NETWORK
	Control Identification	CTRLID
	Factory Configurations	FACTORY
	Factory2 Configuration	FACTORY2
	DC Free Cooling Config[1]	DCFC_CFG
	Hyd Free Cooling Config[1]	H_FC_CFG
	Option Selection	OPT_SEL
	Service Configuration	SERVICE1
	Service2 Configuration	SERVICE2
	Running Hour Configuration	UPDTHOUR
	Master Slave Config	MST_SLV

CONFIGURATION MENU (CONT)

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	Comp Disabled Cfg	CP_UNABL
	Msc Configuration	MSC_SERV
	Add Options[1]	ADD_OPT

See Legend and Notes on page 180.

NOTES:
1. Not applicable to North America units.

GENCONF — General Configuration Table

Carrier Controller PATH: Main Menu ® Configuration Menu ® General Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Cir Priority Sequence[1]	prio_cir	0 to 2	0	—	RW
2	0 = Auto, 1 = A Prio	—	—	—	—	—
3	2 = B Prio	—	—	—	—	—
4	Staged Loading Sequence[2]	seq_typ	No / Yes	No	—	RW
5	Ramp Loading Select[3]	ramp_sel	No / Yes	No	—	RW
6	Demand Limit Type Select[4]	lim_sel	0 to 2	0	—	RW
7	0 = None	—	—	—	—	—
8	1 = Switch Control	—	—	—	—	—
9	2 = 4-20 mA Control	—	—	—	—	—
10	Unit Off to On Delay	off_on_d	1 to 15	1	min	RW
11	Heating OAT Threshold	heat_th	–12.0 to 0	–12	°C	RW
			10.4 to 32.0	10.4	°F	RW
12	Night Mode Start Hour	nh_start	0	—	—	RW
13	Night Mode End Hour	nh_end	0	—	—	RW
14	Night Capacity Limit	nh_limit	0 to 100	100	%	RW
15	Ice Mode Enable[5]	ice_cnfg	No / Yes	No	—	RW
16	Both Command Sel (HSM)	both_sel	No / Yes	No	—	RW
17	Auto Changeover Select	auto_sel	No / Yes	No	—	RW
18	Entering Fluid Control[6]	ewt_opt	No / Yes	No	—	RW

See Legend and Notes on page 180.

NOTES:
1. Cir Priority Sequence:
   0 = Automatic circuit selection
   1 = Circuit A selected
   2 = Circuit B selected
2. Staged Loading Sequence:
   The control loads the lead circuit before the lag circuit is started.
3. Ramp Loading Sequence:
   Ramp loading allows for minimizing the rate at which the water temperature changes.
4. Demand Limit Type Select:
   See Demand Limit section on page 57.
5. Ice Mode Enable:
   This mode applies to units fitted with the optional energy management module (EMM).
6. Entering Fluid Control:
   If this option is selected (value set to “yes”), then the system controls unit capacity based on the entering fluid temperature; otherwise, the control is based on the leaving fluid temperature.

PUMPCONF — Pump Configuration Table

Carrier Controller PATH: Main Menu → Configuration Menu → Pump Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Pumps Sequence[1]	pump_seq	0 to 4	0	—	RW
2	0 = No Pump	—	—	—	—	—
3	1 = One Pump Only	—	—	—	—	—
4	2 = Two Pumps Auto	—	—	—	—	—
5	3 = Pump#1 Manual	—	—	—	—	—
6	4 = Pump#2 Manual	—	—	—	—	—
7	Pump Auto Rotation Delay[2]	pump_del	24 to 3000	48	hour	RW
8	Pump Sticking Protection[3]	pump_per	No / Yes	No	—	RW
9	Stop Pump During Standby[4]	pump_sby	No / Yes	No	—	RW
10	Flow Checked If Pump Off[5]	pump_loc	No / Yes	Yes	—	RW
11	Flow Control Method[6]	flow_ctl	1 to 3	1	—	RW
12	1 = Constant Speed[6]	—	—	—	—	—
13	2 = Delta Temperature[6]	—	—	—	—	—
14	3 = Delta Pressure[6]	—	—	—	—	—
15	Flow Delta T Setpoint[6]	dt_stp	3.0 to 10.0 5.4 to 18.0	5.0 9.0	^C ^F	RW
16	Flow Delta P Setpoint[6]	dp_stp	50.0 to 300.0 7.25 to 43.51	200.0 29.0	kPa PSI	RW
17	Pressure Zero Value[6]	wtr_zval	–100.0 to 10.0 –14.5 to 1.45	–100.0 –14.5	kPa PSI	RW
18	Pump Minimum Speed[6]	pump_min	30 to 100	60	%	RW
19	Pump Min Speed Cap = 0%[6]	pump_sav	30 to 100	60	%	RW
20	Pump Maximum Speed[6]	pump_max	30 to 100	100	%	RW
21	Min Water Press Thres[6]	MinWpThr	70.0 to 1000.05 10.15 to 145.04	100.0 14.5	kPa PSI	RW
22	Water Pump Max Delta P[6]	WtPmpMxP	96.5 to 551.6 14.0 to 80.0	500.0 72.52	kPa PSI	RW

See Legend and Notes on page 180.

NOTES:

1. Pumps Sequence:
   Used to set the pump control sequence

0	No pump selected
1	Only one pump is used
2	Two pumps are used (the active pump is automatically selected by the control)
3	Pump 1 is used
4	Pump 2 is used

2. Pump Auto Rotation Delay:
   Both pumps cannot operate at the same time. This delay is applied in the case of the pump changeover.
3. Pump Sticking Protection:
   Pump sticking protection allows for starting the pumps periodically when the unit it stopped for a longer period of time, e.g. winter season.
4. Stop Pump during Standby:
   See Evaporator Pump Control section on page 40.
5. Flow Checked If Pump Off:
   Water flow is checked when the pump is off.
6. Not applicable to North America units.

RESETCFG — Reset Configuration

Carrier Controller PATH: Main Menu → Configuration Menu → Reset Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Cooling Reset Select[1]	cr_sel	0 to 4	—	—	RW
2	Heating Reset Select[1]	hr_sel	0 to 4	—	—	RW
3	0 = None, 1 = OAT, 2 = Delta T	—	—	—	—	—
4	3 = 4-20 mA control	—	—	—	—	—
5	4 = Space Temp	—	—	—	—	—
6	—	—	—	—	—	—
7	Cooling	—	—	—	—	—
8	OAT No Reset Value	oat_crno	–10 to 51.7 14 to 125	–10 14	°C °F	RW
9	OAT Full Reset Value	oat_crfu	–10 to 51.7 14 to 125	–10 14	°C °F	RW
10	Delta T No Reset Value	dt_cr_no	0 to 13.9 0 to 25.0	0 0	^C ^F	RW
11	Delta T Full Reset Value	dt_cr_fu	0 to 13.9 0 to 25.0	0 0	^C ^F	RW
12	Current No Reset Value	I_cr_no	0 to 20	0	mA	RW
13	Current Full Reset Value	I_cr_fu	0 to 20	0	mA	RW
14	Space T No Reset Value	spacr_no	–10.0 to 51.7 14.0 to 125.0	–10 14	°C °F	RW
15	Space T Full Reset Value	spacr_fu	–10.0 to 51.7 14.0 to 125.0	–10 14	°C °F	RW
16	Cooling Reset Deg. Value	cr_deg	–16.7 to 16.7 –30.0 to 30.0	0 0	^C ^F	RW
17	—	—	—	—	—	—
18	Heating	—	—	—	—	—
19	OAT No Reset Value	oat_hmo	–10.0 to 51.7 14.0 to 125.0	–10 14	°C °F	RW
20	OAT Full Reset Value	oat_hrfu	–10.0 to 51.7 14.0 to 125.0	–10 14	°C °F	RW
21	Delta T No Reset Value	dt_hr_no	0 to 13.9 0 to 25.0	0 0	^C ^F	RW
22	Delta T Full Reset Value	dt_hr_fu	0 to 13.9 0 to 25.0	0 0	^C ^F	RW
23	Current No Reset Value	I_hr_no	0 to 20	0	mA	RW
24	Current Full Reset Value	I_hr_fu	0 to 20	0	mA	RW
25	Space T No Reset Value	spahr_no	–10.0 to 51.7 14.0 to 125.0	–10 14	°C °F	RW
26	Space T Full Reset Value	spahr_fu	–10.0 to 51.7 14.0 to 125.0	–10 14	°C °F	RW
27	Heating Reset Deg. Value	hr_deg	–16.7 to 16.7 –30.0 to 30.0	0 0	^C ^F	RW

See Legend and Notes on page 180.

NOTES:
1. Reset Select:
See Temperature Reset section on page 53.

APPENDIX A — CARRIER CONTROLLER DISPLAY TABLES (cont)

BACKUP — Backup Configuration[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Backup Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Boiler OAT Threshold[2]	boil_th	–15.0 to 15.0 5.0 to 59.0	–10.0 14.0	°C °F	RW
2	Elec Stage OAT Threshold[3]	ehs_th	–5.0 to 21.0 23.0 to 70.0	5.0 41.0	°C °F	RW
3	Electrical Pulldown Time[4]	ehs_pull	0 to 60	0	min	RW
4	Last EHS for backup[5]	ehs_back	No / Yes	No	—	RW
5	Quick EHS for defrost[6]	ehs_defr	No / Yes	No	—	RW
6	EHS Proportional Gain	ehs_kp	–20 to 20	2	—	RW
7	EHS Integral Gain	ehs_ki	–5 to 5	0	—	RW
8	EHS Derivative Gain	ehs_kd	–20 to 20	0	—	RW

See Legend and Notes on page 180.

NOTES:
1. Applies to heat pumps.
2. Boiler OAT Threshold:
   The boiler may be activated when OAT is below the defined threshold
3. Elec Stage OAT Threshold:
   Electric heating can be used when OAT is below the defined threshold
4. Electrical Pulldown Time:
   The pull-down time is the time required to reach the desired temperature after the unit is switched on. The electric heater pull-down time determines the length of time between starting the chiller and checking whether an additional electric heater stage should be added. The pull-down time is initialized every time the unit is switched on manually or the unit goes from unoccupied to occupied mode.
5. Elec Stage for backup:
   This electric heater stage can be used when the unit is down due to a failure or it is fully unloaded because of operating envelope protection.
6. Quick EHS for defrost:
   Electric heating activated during the defrost session

USERCONF — User Configuration

Carrier Controller PATH: Main Menu → Configuration Menu → User Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Alarm Relay for Alerts?[1]	alert_r	No / Yes	No	—	RW
2	Reversed Alarm Relay[2]	al_rever	0 to 1	0	—	RW

See Legend and Notes on page 180.

NOTES:
1. Alarm relay for alerts:
   Alarm relay status. Alarm output relay is used for “alarm” + “alert”
2. Reversed alarm relay:
   Alarm / Alert signals reverted
   No (0) = standard operation
   Yes (1) = alarm/alert/shutdown outputs are “On” even if there is no alarm/alert (alarm output unavailable)

HR_CFG — Heat Reclaim Config

Carrier Controller PATH: Main Menu → Configuration Menu → Heat Reclaim Config

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	HR variable speed pump ?	hrVarPmp	No / Yes	No	—	RW
2	HR condenser fluid	hr_flui	Water / Brine	Water	—	RW
3	HR eco mode ?	hr_eco	Off / On	Off	—	RW
4	HR reverse 3VW cmd ?	rev_3WV	No / Yes	No	—	RW
5	NO: 0V = close	—	—	—	—	—
6	YES: 0V = open	—	—	—	—	—
7	HR Control on EWT ?	HRewtctl	No / Yes	Yes	—	RW
8	PID gain prop 3w valve	kp_HR3wc	–20 to 20	2	—	RW
9	PID gain int 3w valve	ki_HR3wc	–5 to 5	0.2	—	RW
10	PID gain deri 3w valve	kd_HR3wc	–20 to 20	0.4	—	RW
11	PID gain prop fan	kp_HRFan	–20 to 20	5	—	RW
12	PID gain int fan	ki_HRFan	–5 to 5	0.5	—	RW
13	PID gain deri fan	kd_HRFan	–20 to 20	0	—	RW
14	HR VarPump min pos	minHRpmp	0 to 60	30	%	RW
15	3WayValve/VarPmp max pos	mazHR3wv	70 to 100	100	%	RW
16	HR delay flow switch	flowTmr	10 to 120	20	sec	RW
17	Min flow 3wv enable	minFloEn	No / Yes	No	—	RW
18	Min flow 3wv position	minFlow	10 to 100	15	%	RW
19	HR Min water temp	min_wt	–10.0 to 1.1 14.0 to 34.0	1.1 34.0	°C °F	RW

See Legend and Notes on page 180.

NOTES:
1. Heat Reclaim not applicable to North America units.

SCHEDULE MENU

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	OCCPC01S — Schedule Menu	OCCPC01S
	OCCPC02S — Schedule Menu	OCCPC02S

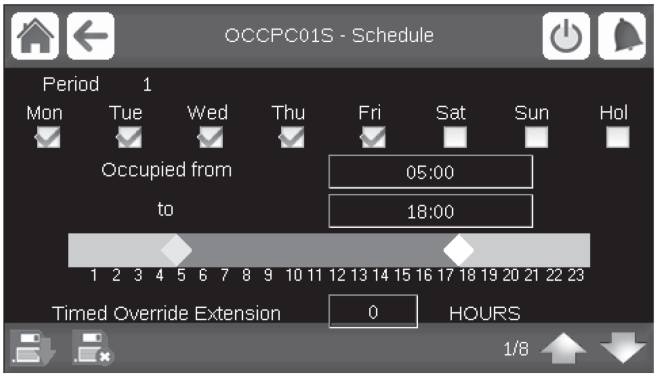
The control incorporates 2 time schedules, where the first one (OCCPC01S) is used for controlling the unit start/stop and the second one (OCCPC02S) is used for controlling the dual setpoint.

The Schedule menu is presented in a graphical form on the touch screen display, but it is also possible to access occupancy parameters via the Service Tool.

- The first timer program (schedule 1, OCCPC01S) provides a means to automatically switch the unit from an occupied mode to an unoccupied mode. The unit is started during occupied periods.
- The second timer program (schedule 2, OCCPC02S) provides a means to automatically switch the active setpoint from an occupied setpoint to an unoccupied setpoint. Setpoint 1 is used during occupied periods and setpoint 2 during unoccupied periods.

The control offers the user the possibility of setting 8 occupancy periods, where each occupancy period includes the following elements to be defined:

- Day of the week: Select the days when the period is occupied.
- Occupancy time (“occupied from” to “occupied to”): Set occupancy hours for the selected days.
- Timed Override Extension: Extend the schedule if necessary.



OCCPC01S — Schedule: Unit Start/Stop Configuration Table

Carrier Controller PATH: Main Menu → Configuration Menu → Schedule Menu →

OCCPC01S — Schedule Menu

LINE	DISPLAYED TEXT[1]	CCN NAME	RANGE	DEFAULT VALUE	UNIT
1	Timed Override Hours	OVR_EXT	0-4	0	—
2	Period 1 DOW (MTWTFSSH)	DOW1	0/1	11111111	—
3	Occupied From	OCCTOD1	0:00-24:00	00:00	—
4	Occupied To	UNOCTOD1	0:00-24:00	24:00	—
5	Period 2 DOW (MTWTFSSH)	DOW2	0/1	0000000	—
6	Occupied From	OCCTOD2	0:00-24:00	00:00	—
7	Occupied To	UNOCTOD2	0:00-24:00	00:00	—
8	Period 3 DOW (MTWTFSSH)	DOW3	0/1	0000000	—
9	Occupied From	OCCTOD3	0:00-24:00	00:00	—
10	Occupied To	UNOCTOD3	0:00-24:00	00:00	—
11	Period 4 DOW (MTWTFSSH)	DOW4	0/1	0000000	—
12	Occupied From	OCCTOD4	0:00-24:00	00:00	—
13	Occupied To	UNOCTOD4	0:00-24:00	00:00	—
14	Period 5 DOW (MTWTFSSH)	DOW5	0/1	0000000	—
15	Occupied From	OCCTOD5	0:00-24:00	00:00	—
16	Occupied To	UNOCTOD5	0:00-24:00	00:00	—
17	Period 6 DOW (MTWTFSSH)	DOW6	0/1	0000000	—
18	Occupied From	OCCTOD6	0:00-24:00	00:00	—
19	Occupied To	UNOCTOD6	0:00-24:00	00:00	—
20	Period 7 DOW (MTWTFSSH)	DOW7	0/1	0000000	—
21	Occupied From	OCCTOD7	0:00-24:00	00:00	—
22	Occupied To	UNOCTOD7	0:00-24:00	00:00	—
23	Period 8 DOW (MTWTFSSH)	DOW8	0/1	0000000	—
24	Occupied From	OCCTOD8	0:00-24:00	00:00	—
25	Occupied To	UNOCTOD8	0:00-24:00	00:00	—

See Legend and Notes on page 180.

NOTES:
1. The parameters in this table are presented in a graphical form on the touch screen display.

OCCPC01S — Schedule: Unit Start/Stop Maintenance Table[1]

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT
1	Current Mode[2]	MODE	0 to 1	—	—
2	Current Occup Period #[3]	PER_NO	1 to 8	—	—
3	Timed-Override in Effect[4]	OVERLAST	Yes / No	—	—
4	Timed-Override Duration[5]	OVR_HRS	0 to 4	—	Hour
5	Current Occupied Time[6]	STRTTIME	00:00 to 23:59	—	Hour
6	Current Unoccupied Time[7]	ENDTIME	00:00 to 23:59	—	Hour
7	Next Occupied Day	NXTOCDAY	Mon to Sun	—	—
8	Next Occupied Time	NXTOCTIM	00:00 to 23:59	—	Hour
9	Next Unoccupied Day	NXTUNDAY	Mon to Sun	—	—
10	Next Unoccupied Time	NXTUNTIM	00:00 to 23:59	—	Hour
11	Prev Unoccupied Day	PRVUNDAY	Mon to Sun	—	—
12	Prev Unoccupied Time	PRVUNTIM	00:00 to 23:59	—	Hour

See Legend and Notes on page 180.

NOTES:
1. Parameters given in this table cannot be accessed via the Carrier Controller touch screen. Only accessible via Network Service tool.
2. Current mode:
   0 = Occupied period
   1 = Unoccupied period
3. Current occupied period:
   This parameter shows which occupancy period is currently in use.
4. Schedule override:
   This parameter shows if there is any override currently applied to the schedule (“timed override extension” applied by the user).
5. Timed override extension:
   This parameter defines how long the “timed override extension” should take (the maximum possible time is 4 hours).
   Example: If the schedule occupancy normally ends at 18:00 and the “timed override extension” has been set to 3 hours, it means that the occupancy period will end at 21:00.
6. Current occupied time:
   This parameter defines when the current occupied period starts.
7. Current unoccupied time:
   This parameter defines when the current unoccupied period starts.

OCCPC02S — Schedule: Setpoint Control Configuration Table

Carrier Controller PATH: Main Menu → Configuration Menu → Schedule Menu →

OCCPC02S — Schedule Menu

LINE	DISPLAYED TEXT[1]	CCN NAME	RANGE	DEFAULT VALUE	UNIT
1	Timed Override Hours	OVR_EXT	0-4	0	—
2	Period 1 DOW (MTWTFSSH)	DOW1	0/1	11111111	—
3	Occupied From	OCCTOD1	0:00-24:00	00:00	—
4	Occupied To	UNOCTOD1	0:00-24:00	24:00	—
5	Period 2 DOW (MTWTFSSH)	DOW2	0/1	0000000	—
6	Occupied From	OCCTOD2	0:00-24:00	00:00	—
7	Occupied To	UNOCTOD2	0:00-24:00	00:00	—
8	Period 3 DOW (MTWTFSSH)	DOW3	0/1	0000000	—
9	Occupied From	OCCTOD3	0:00-24:00	00:00	—
10	Occupied To	UNOCTOD3	0:00-24:00	00:00	—
11	Period 4 DOW (MTWTFSSH)	DOW4	0/1	0000000	—
12	Occupied From	OCCTOD4	0:00-24:00	00:00	—
13	Occupied To	UNOCTOD4	0:00-24:00	00:00	—
14	Period 5 DOW (MTWTFSSH)	DOW5	0/1	0000000	—
15	Occupied From	OCCTOD5	0:00-24:00	00:00	—
16	Occupied To	UNOCTOD5	0:00-24:00	00:00	—
17	Period 6 DOW (MTWTFSSH)	DOW6	0/1	0000000	—
18	Occupied From	OCCTOD6	0:00-24:00	00:00	—
19	Occupied To	UNOCTOD6	0:00-24:00	00:00	—
20	Period 7 DOW (MTWTFSSH)	DOW7	0/1	0000000	—
21	Occupied From	OCCTOD7	0:00-24:00	00:00	—
22	Occupied To	UNOCTOD7	0:00-24:00	00:00	—
23	Period 8 DOW (MTWTFSSH)	DOW8	0/1	0000000	—
24	Occupied From	OCCTOD8	0:00-24:00	00:00	—
25	Occupied To	UNOCTOD8	0:00-24:00	00:00	—

See Legend and Notes on page 180.

NOTES:
1. The parameters in this table are presented in a graphical form on the touch screen display.

OCCPC02S — Schedule: Setpoint Control Maintenance Table[1]

LINE	DISPLAYED TEXT[1]	CCN NAME	RANGE	DEFAULT VALUE	UNIT
1	Current Mode[2]	MODE	0 to 1	—	—
2	Current Occup Period #[3]	PER_NO	1 to 8	—	—
3	Timed-Override in Effect[4]	OVERLAST	Yes / No	—	—
4	Timed-Override Duration[5]	OVR_HRS	0 to 4	—	Hour
5	Current Occupied Time[6]	STRTTIME	00:00 to 23:59	—	Hour
6	Current Unoccupied Time[7]	ENDTIME	00:00 to 23:59	—	Hour
7	Next Occupied Day	NXTOCDAY	Mon to Sun	—	—
8	Next Occupied Time	NXTOCTIM	00:00 to 23:59	—	Hour
9	Next Unoccupied Day	NXTUNDAY	Mon to Sun	—	—
10	Next Unoccupied Time	NXTUNTIM	00:00 to 23:59	—	Hour
11	Prev Unoccupied Day	PRVUNDAY	Mon to Sun	—	—
12	Prev Unoccupied Time	PRVUNTIM	00:00 to 23:59	—	Hour

See Legend and Notes on page 180.

NOTES:
1. Parameters given in this table cannot be accessed via the Carrier Controller touch screen. Only accessible via Network Service tool.
2. Current mode:
   0 = Occupied period
   1 = Unoccupied period
3. Current occupied period:
   This parameter shows which occupancy period is currently in use.
4. Schedule override:
   This parameter shows if there is any override currently applied to the schedule (“timed override extension” applied by the user).
5. Timed override extension:
   This parameter defines how long the “timed override extension” should take (the maximum possible time is 4 hours).
   Example: If the schedule occupancy normally ends at 18:00 and the “timed override extension” has been set to 3 hours, it means that the occupancy period will end at 21:00.
6. Current occupied time:
   This parameter defines when the current occupied period starts.
7. Current unoccupied time:
   This parameter defines when the current unoccupied period starts.

HOLIDAY MENU

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	HOLIDAY — HOLDY_01	HOLDY_01
	HOLIDAY — HOLDY_02	HOLDY_02
...	...	...
	HOLIDAY — HOLDY_16	HOLDY_16

The holiday menu includes 16 submenus defined as holiday periods, where each submenu equals one holiday period.

HOLIDAY — HOLDY_(...)[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Holiday Menu → HOLDY_(...)

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Holiday Start Month[2]	HOL_MON	0-12	0	—	RW
2	Start Day[3]	HOL_DAY	0-31	0	—	RW
3	Duration (days)[4]	HOL_LEN	0-99	0	—	RW

See Legend and Notes on page 180.

NOTES:
1. This table applies to HOLDY_01 through HOLDY_16.
2. Holiday start month:
   The month when the holiday period starts.
3. Holiday start day:
   The day of the month when the holiday period starts.
4. Holiday duration (days):
   The number of days that the holiday period lasts.

DATETIME — Date/Time

Carrier Controller PATH: Main Menu → Configuration Menu → Date/Time

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Daylight Saving Time	—	On / Off	—	—	RW
2	Location	—	Greenwich Mean Time (UTC) Eastern Time(US and Canada)(UTC-05.00) Brussels,Copenhagen,Madrid,Paris(UTC+01.00) Beijing… …	—	—	RW
3	Date/Time	—	YYYY/MM/DD, HH:MM:SS	—	—	—
4	Today is a Holiday[1]	—	No / Yes	—	—	RO
5	Tomorrow is a Holiday[2]	—	No / Yes	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Today is a Holiday:
   Information about holidays. Please note that holidays are set in the Holiday menu.
2. Tomorrow is a Holiday:
   Information about the upcoming holiday period. Holidays are set in the Holiday menu.

CTRL_ID — Control Identification

Carrier Controller PATH: Main Menu → Configuration Menu → Control Identification

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	CCN Element Number[1, 2]	—	0 to 239	1	—	RW
2	CCN Bus Number[2]	—	0 to 239	0	—	RW
3	CCN Baud Rate	—	9,600 / 19,200 / 38,400	9,600	—	RW
4	Device Description	—	—	30RC	—	RO
5	Location Description	—	—	—	—	RW
6	Software Version	—	—	ECG-SR-20V4G010	—	RO
7	Serial Number	—	—	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Element number:
   The “0” element number is NOT ALLOWED, thus please note that “0,0” address does NOT exist (address numbering starts with “0,1”).
   IMPORTANT: Controller address = [Bus Number], [Element Number]
2. Controller address:
   Controller address consists of the Bus Number and the Element Number.

   Controller address = [Bus Number], [Element Number]

   Example:
   Bus number = 0
   Element Number = 1
   Controller address = 0,1

FACTORY — Factory Configuration Table[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Factory Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Unit Type (Heat Pump = 2)[2]	unit_typ	1 to 2	1	—	RW
2	Unit Capacity[3]	unitsize	0 to 950	0	—	RW
3	Fan Type[4]	fan_typ	0 to 1	0	—	RW
4	Fan Speed[5]	fan_spd	0 to 1	0	—	RW
5	Desuperheater Select	desuper	No / Yes	No	—	RW
6	Exchanger Heater Select	exch_htr	No / Yes	No	—	RW
7	Energy Management Module	emm_opt	No / Yes	No	—	RW
8	Pump Type[6]	pump_typ	0 to 1	0	—	RW
9	Factory Dual Water Pump	dual_pmp	No / Yes	No	—	RW
10	Pump Control Method[7]	pump_ctl	1 to 2	1	—	RW
11	QM Code[7]	QM_code	—	—	—	RW
12	Country 0 = EU, 1 = US, 2 = CH	country	0 to 2	—	—	RW
13	Unit Refrigerant Type[8]	refrig	2 to 3	—	—	RW
14	Exchanger Fluid Type[9]	flui_typ	1 to 4	1	—	RW
15	Leakage Charge Detection	leak_chk	No / Yes	No	—	RW
16	DC Free Cooling Select[7]	dcfc_sel	No / Yes	No	—	RW
17	Soft Starter Selection[7]	softStr	0 to 2	0	—	RW
18	Fan Low Noise Option[7]	lownoise	0 to 2	0	—	RW
19	Power Frequency 60Hz Sel[10]	freq_60H	No / Yes	No	—	RW
20	Option 282 : CE[7]	opt_282	No / Yes	No	—	RW
21	Option 119C Selection[7]	opt_119C	No / Yes	No	—	RW
22	Option 50: Heat Reclaim[7]	rclm_opt	No / Yes	No	—	RW
23	Option 41C: HR Heater[7]	opt_41C	No / Yes	No	—	RW
24	Free Cooling Option[7]	fc_opt	0 to 2	0	—	RW
25	Exchanger Coil Type[11]	coil_typ	0 to 2	0	—	RW
26	0: MCHE	—	—	—	—	—
27	1: RTPF	—	—	—	—	—
28	2: MCHE after 2022/07/01[7]	—	—	—	—	—
29	Exchanger Family[12]	exch	0 to 1	0	—	RW
30	Compact Tier Selection[13]	compact	No / Yes	No	—	RW
31	Supply_Voltage[14]	voltage	0 to 3	0	—	RW
32	Hot Gas Bypass Selection[15]	hgbp_sel	No / Yes	No	—	RW

See Legend and Notes on page 180.

NOTES:
1. Note that parameters given in the table may vary from the actual look depending on the options installed. Factory tables presented here are for the purpose of information only.
2. Unit type:
   1 = Cooling only (30RCxxx)
   2 = Heat pump (30RQxxx)
3. Unit capacity:
   30RCxxx chillers: 65 to 252 tons
   30RQxxx heat pumps: 72 to 152 tons
4. Fan type:
   0 = Fixed speed AC fans
   1 = Variable speed AC fans
5. Maximum Fan speed:
   0 = Fixed Speed (850 RPM)
   1 = Variable Speed (1150 RPM)
6. Pump Type:
   0 = No internal pump
   1 = Internal pump
7. Not applicable to North America units.
8. Unit refrigerant type:
   1 = Not available
   2 = R-410A
   3 = R-32
9. Fluid Type:
   1 = Water (Unit allowed to run with LWT > 40°F (4.4°C)
   OR LWT > 38°F (3.3°C) if ***Glycol in Loop = Yes*** in the Service Configuration table)
   3 = Low Brine (Unit allowed to run with LWT > 15°F (-9.4°C) for R-410A units
   OR LWT > 20°F (-6.7°C) for R-32 units)
10. 60 Hz frequency
    Must be set to “Yes” for North America units.
11. Exchanger coil type:
    0 = Micro-channel heat exchanger (MCHE)
    1 = Round-tube, plate-fin heat exchanger (RTPF)
12. Exchanger family:
    0 = BPHE (brazed plate heat exchanger)
    1 = Shell & Tube
13. Compact tier selection:
    This parameter must be set to “yes” for compact units
14. Supply voltage:
    Enter voltage directly: 230, 380, 460, or 575.
15. Hot Gas Bypass Selection:
    This parameter can only be set to “Yes” when Exchanger Fluid Type is set to 1.

FACTORY2 — Factory2 Parameters Table[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Factory2 Parameters

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Compressor A1 Capacity[2]	cap_a1	0 to 99	—	—	RW
2	Compressor A2 Capacity[2]	cap_a2	0 to 99	—	—	RW
3	Compressor A3 Capacity[2]	cap_a3	0 to 99	—	—	RW
4	Compressor A4 Capacity[2]	cap_a4	0 to 99	—	—	RW
5	Compressor B1 Capacity[2]	cap_b1	0 to 99	—	—	RW
6	Compressor B2 Capacity[2]	cap_b2	0 to 99	—	—	RW
7	Compressor B3 Capacity[2]	cap_b3	0 to 99	—	—	RW
8	Compressor B4 Capacity[2]	cap_b4	0 to 99	—	—	RW
9	Circuit A Total Fans NB[3]	nb_fan_a	0 to 8	—	—	RW
10	Circuit B Total Fans NB[3]	nb_fan_b	0 to 8	—	—	RW
11	EXV A Type	exvTyp_a	0 to 4	0	—	RW
12	EXV A Name	exvNam_a	—	—	—	RW
13	EXV A Maximum Steps Nb	exvmax_a	0 to 15,000	—	—	RW
14	EXV B Type	exvTyp_b	0 to 4	—	—	RW
15	EXV B Name	exvNam_b	—	—	—	RW
16	EXV B Maximum Steps Nb	exvmax_b	0 to 15000	—	—	RW
17	Hydronic kit Config[4]	—	—	—	—	—
18	Pump Type	ClPumpTp	—	—	—	RW
19	Pump Name[4]	ClPumpNa	—	—	—	RW
20	Pump Minimum Flow	ClPumpMF	—	—	—	RW
21	Exchanger Type[5]	ClExchTp	—	—	—	RW
22	Exchanger Name	ClExchNa	—	—	—	RW
23	Piping Type[4]	ClPipgTp	0 to 2	0		RW
24	Piping Name[4]	ClPipgNa	—	—	—	RW
25	Hydraulic Free Cooling[4]	—	—	—	—	—
26	FC Evap Valve Name[4]	FcEvVNa	—	—	—	RW
27	FC Coil Valve Name[4]	FcCoVNa	—	—	—	RW

See Legend and Notes on page 180.

NOTES:

1. Please note that the FACTORY2 menu displays a set of different components of the unit, e.g. pump, exchanger, or piping. The values given in this table are computed automatically according to the unit size and the water pump type.
   The FACTORY2 table is listed with parts mentioned in the Bill of Material (BoM).
2. Compressor capacity is determined automatically if the unit size entered in the FACTORY table matches the compressor/fan arrangement.
3. Total Fan Stages number per circuit is determined automatically if the unit size entered in the FACTORY table matches the compressor/fan arrangement.
4. Not applicable to North America units.
5. Exchanger type:

0 = NO_EXCH	23 = BPHE_ACK540_170
12 = BPHE_ACK240_126	26 = BPHE_ACK540_230
14 = BPHE_ACK240_146	27 = BPHE_ACK540_254
15 = BPHE_ACK240_170	29 = SHELL_TUBE_DXC
16 = BPHE_ACK540_90	30 = SHELL_TUBE_DXF
18 = BPHE_ACK540_118	31 = SHELL_TUBE_DXJ
20 = BPHE_ACK540_134	32 = SHELL_TUBE_DXO
22 = BPHE_ACK540_154	

DCFC_CFG — DC Free Cooling Configuration[1]

Carrier Controller PATH: Main Menu → Configuration Menu → DC Free Cooling Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	OAT Selection	oat_s	5.0 to 20.0 41.0 to 68.0	10.0 50.0	°C °F	RW
2	Start Valve Threshold	start_th	0.5 to 15.0 0.9 to 27.0	4.0 7.2	^C ^F	RW
3	Stop Valve Threshold	stop_th	1.0 to 15.0 1.8 to 27.0	2.0 3.6	^C ^F	RW
4	Chiller Activation Delay	chil_del	1 to 60	10	min	RW
5	Fan Start/Stop Dead Band	dband	0 to 5.0 0 to 9.0	2.0 3.6	^C ^F	RW
6	Proportional Gain Vfan	pg	–50 to 50	5.0	—	RW
7	Integral Gain Vfan	ig	–5 to 5	2.5	—	RW
8	Derivative Gain Vfan	dg	–20 to 20	1.0	—	RW
9	Fans Minimum On Time	on_tmr	10 to 900	60	sec	RW
10	Fans Minimum Off Time	off_tmr	10 to 900	60	sec	RW
11	Number of Fan Lines	nb_line	1 to 2	1	—	RW
12	Number of Fix Speed Fans	nb_fan	0 to 20	1	—	RW
13	Variable Speed Fan Stage	vfan	No / Yes	No	—	RW
14	Vfan Stage Delta Speed	vf_delta	0 to 100	20	%	RW
15	Delta T Setpoint	dt_setp	3 to 10.0 5.4 to 18.0	9.0 16.2	^C ^F	RW
16	Fan speed max	vfan_max	0 to 100	100	%	RW

See Legend and Notes on page 180.

NOTES:
1. DC Free Cooling not applicable to North America units.

H_FC_CFG — Hyd Free Cooling Config[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Hyd Free Cooling Config

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Hyd FC Fan PID Kp	hfcFanKp	–100 to 100	–5	—	RW
2	Hyd FC Fan PID Ki	hfcFanKi	–100 to 100	–1	—	RW
3	HYD FC Fan PID Kd	hfcFanKd	–20 to 20	0	—	RW

See Legend and Notes on page 180.

NOTES:
1. Hydraulic Free Cooling not applicable to North America units.

OPT_SEL — Option Selection

Carrier Controller PATH: Main Menu → Configuration Menu → Option Selection

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Electrical Heat Stages	ehs_en	0 to 4	0	—	RW
2	Boiler Enable	boil_en	No / Yes	No	—	RW
3	DC Free Cooling Enable[1]	dcfc_en	0 to 2	0	—	RW
4	0: No[1]		—	—	—	—
5	1: With OAT Selection[1]		—	—	—	—
6	2: Without OAT Selection[1]		—	—	—	—

See Legend and Notes on page 180.

NOTES:
1. Not applicable to North America units.

SERVICE1 — Service Configuration

Carrier Controller PATH: Main Menu → Configuration Menu → Service Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	High Pressure Threshold	hp_th	3447.4 to 4550.54 500 to 660	4400.4 638.2	kPa PSI	RW
2	Exch. Heater Delta Spt	heatersp	0.6 to 3.3 1.0 to 6.0	1.9 3.4	^C ^F	RW
3	Brine Freeze Setpoint [1]	freezesp	–28.9 to 1.1 –20.0 to 34.0	1.1 34.0	°C °F	RW
4	Minimum LWT Setpoint [2]	mini_lwt	–28.9 to 3.3 –20. to 38.0	3.3 38.0	°C °F	RW
5	Auto Start When SM lost	auto_sm	Disable / Enable	Disable	—	RW
6	Auto Z Multiplier Stp	zm_stp	4 to 8	6	—	RW
7	Maximum Z Multiplier	hc_zm	1 to 6	6	—	RW
8	Flow Setpoint [3]	flow_sp	0 to 65	60	—	RW
9	Pump Cycl. Freeze Prot.	pump_cyc	No / Yes	No	—	RW
10	Blackbox In Metric ?	b_metric	No / Yes	Yes	—	RW
11	Unit Altitude (in meter)	unit_alt	–1500 to 5000	0	m	RW
12	Leakage Charge Threshold	Leak_thr	0 to 5	2.5	V	RW
13	Leakage Charge Timer	Leak_tmr	0 to 600	60	min	RW
14	Free Defr Allowed Period	FrDfrPer	0 to 99	2	hour	RW
15	Oat Min for Free Defrost	OatFrDfr	1.0 to 20.0 33.8 to 68.0	1.5 34.7	°C °F	RW
16	Fast Capacity Recovery [4]	fastcapr	No / Yes	No	—	RW
17	Glycol in Loop [5]	glycol	No / Yes	No	—	RW

See Legend and Notes on page 180.

NOTES:
1. Brine freeze setpoint:
   This value shall prevent the customer from entering a fluid temperature setpoint too low, which can cause evaporator freeze conditions.
2. Minimum LWT setpoint:
   This setpoint is applied to Brine application to limit customer cooling setpoint. It must be lower than Brine freeze setpoint.
3. Not applicable to North America units.
4. Fast capacity recovery:
   See Fast Loading section on page 59.
5. The minimum cooling setpoint may be lowered to 38°F (3.3°C) for Fluid Type 1 if the parameter Glycol in Loop is set to Yes. The Glycol in Loop parameter should only be set to Yes when the chiller is used in comfort cooling applications and there is a suitable inhibited antifreeze solution present in the chilled water loop.

SERVICE2 — Service2 Configuration

Carrier Controller PATH: Main Menu → Configuration Menu → Service2 Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	FAN CONFIG	—	—	—	—	—
2	Varifan PID Prop Gain	fan_kp	–20 to 20	1.1	—	RW
3	Varifan PID Integ Gain	fan_ki	–5 to 5	0.2	—	RW
4	Varifan PID Deriv Gain	fan_kd	–20 to 20	0.01	—	RW
5	Maximum Fan Speed	fan_max	70 to 100	100	%	RW
6	Varifan Heating mode	—	—	—	—	—
7	Varifan Heat. Prop Gain	vfheatkp	–20 to 20	0	—	RW
8	Varifan Heat. Integ Gain	vfheatki	–5 to 5	0.05	—	RW
9	Varifan Heat. Deriv Gain	vfheatkd	–20 to 20	0	—	RW
10	EXV CONFIG	—	—	—	—	—
11	EXV MOP Setpoint	mop_sp	–0.7 to 25.0 30.8 to 77	20.0 68.0	°C °F	RW
12	EXV A Superheat Setpoint [1]	sh_sp_a	1.4 to 30.0 2.5 to 54.0	5.0 9.0	^C ^F	RW
13	EXV B Superheat Setpoint [1]	sh_sp_b	1.4 to 30.0 2.5 to 54.0	5.0 9.0	^C ^F	RW
14	HEAT RECLAIM CONFIG [2]	—	—	—	—	—
15	HR PID Kp (Boiled Water) [2]	hrVBo_kp	–20 to 20	2	—	RW
16	HR PID Ki (Boiled Water) [2]	hrVBo_ki	–5 to 5	0.2	—	RW
17	HR PID Kd (Boiled Water) [2]	hrVBo_kd	–20 to 20	1	—	RW

See Legend and Notes on page 180.

NOTES:
1. Superheat setpoint:
   When the circuit is in part_load, the sh_sp maximum value taken in account is 5^C (9^F). The goal is to ensure a correct oil lubrication of the compressor.
2. Not applicable to North America units.

APPENDIX A — CARRIER CONTROLLER DISPLAY TABLES (cont)

UPDTHOUR — Running Hour Configuration[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Running Hour Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Machine Operating Hours	hr_mach	0 to 99999990	0	Hour	RW
2	Machine Starts Number	st_mach	0 to 99999990	0	—	RW
3	Compressor A1 Hours	hr_cp_a1	0 to 99999990	0	Hour	RW
4	Compressor A2 Hours	hr_cp_a2	0 to 99999990	0	Hour	RW
5	Compressor A3 Hours	hr_cp_a3	0 to 99999990	0	Hour	RW
6	Compressor A4 Hours	hr_cp_a4	0 to 99999990	0	Hour	RW
7	Compressor B1 Hours	hr_cp_b1	0 to 99999990	0	Hour	RW
8	Compressor B2 Hours	hr_cp_b2	0 to 99999990	0	Hour	RW
9	Compressor B3 Hours	hr_cp_b3	0 to 99999990	0	Hour	RW
10	Compressor B4 Hours	hr_cp_b4	0 to 99999990	0	Hour	RW
11	Compressor A1 Starts	st_cp_a1	0 to 99999990	0	—	RW
12	Compressor A2 Starts	st_cp_a2	0 to 99999990	0	—	RW
13	Compressor A3 Starts	st_cp_a3	0 to 99999990	0	—	RW
14	Compressor A4 Starts	st_cp_a4	0 to 99999990	0	—	RW
15	Compressor B1 Starts	st_cp_b1	0 to 99999990	0	—	RW
16	Compressor B2 Starts	st_cp_b2	0 to 99999990	0	—	RW
17	Compressor B3 Starts	st_cp_b3	0 to 99999990	0	—	RW
18	Compressor B4 Starts	st_cp_b4	0 to 99999990	0	—	RW
19	Fan A1 Hours	hr_fana1	0 to 99999990	0	Hour	RW
20	Fan A2 Hours	hr_fana2	0 to 99999990	0	Hour	RW
21	Fan A3 Hours	hr_fana3	0 to 99999990	0	Hour	RW
22	Fan A4 Hours	hr_fana4	0 to 99999990	0	Hour	RW
23	Fan A5 Hours	hr_fana5	0 to 99999990	0	Hour	RW
24	Fan A6 Hours	hr_fana6	0 to 99999990	0	Hour	RW
25	Fan A7 Hours	hr_fana7	0 to 99999990	0	Hour	RW
26	Fan A8 Hours	hr_fana8	0 to 99999990	0	Hour	RW
27	Fan B1 Hours	hr_fanb1	0 to 99999990	0	Hour	RW
28	Fan B2 Hours	hr_fanb2	0 to 99999990	0	Hour	RW
29	Fan B3 Hours	hr_fanb3	0 to 99999990	0	Hour	RW
30	Fan B4 Hours	hr_fanb4	0 to 99999990	0	Hour	RW
31	Fan B5 Hours	hr_fanb5	0 to 99999990	0	Hour	RW
32	Fan B6 Hours	hr_fanb6	0 to 99999990	0	Hour	RW
33	Fan B7 Hours	hr_fanb7	0 to 99999990	0	Hour	RW
34	Fan B8 Hours	hr_fanb8	0 to 99999990	0	Hour	RW
35	Water Pump #1 Hours	hr_pump1	0 to 99999990	0	Hour	RW
36	Water Pump #2 Hours	hr_pump2	0 to 99999990	0	Hour	RW
37	Circuit A Defrost Number	nb_defra	0 to 99999990	0	—	RW
38	Circuit B Defrost Number	nb_defrb	0 to 99999990	0	—	RW
39	FC Operating Hours[2]	FC_HOUR	0 to 999999	0	Hour	RW
40	FC Fan Stage 1 Start[2]	FC_FAN1S	0 to 999999	0	—	RW
41	FC Fan Stage 1 Hours[2]	FC_FAN1H	0 to 999999	0	Hour	RW
42	FC Fan Stage 2 Start[2]	FC_FAN2S	0 to 999999	0	—	RW
43	FC Fan Stage 2 Hours[2]	FC_FAN2H	0 to 999999	0	Hour	RW
44	FC Fan Stage 3 Start[2]	FC_FAN3S	0 to 999999	0	—	RW
45	FC Fan Stage 3 Hours[2]	FC_FAN3H	0 to 999999	0	Hour	RW
46	FC Fan Stage 4 Start[2]	FC_FAN4S	0 to 999999	—	—	RW
47	FC Fan Stage 4 Hours[2]	FC_FAN4H	0 to 999999	—	Hour	RW
48	FC Fan Stage 5 Start[2]	FC_FAN5S	0 to 999999	—	—	RW
49	FC Fan Stage 5 Hours[2]	FC_FAN5H	0 to 999999	—	Hour	RW
50	FC Fan Stage 6 Start[2]	FC_FAN6S	0 to 999999	—	—	RW
51	FC Fan Stage 6 Hours[2]	FC_FAN6H	0 to 999999	—	Hour	RW
52	FC Fan Stage 7 Start[2]	FC_FAN7S	0 to 999999	—	—	RW
53	FC Fan Stage 7 Hours[2]	FC_FAN7H	0 to 999999	—	Hour	RW

See Legend and Notes on page 180.

NOTES:
1. This table should be used in the event of a module failure. Parameters can be modified only on the first power-up before the first compressor starts.
2. Not applicable to North America units.

APPENDIX A — CARRIER CONTROLLER DISPLAY TABLES (cont)

MST_SLV — Master/Slave Configuration[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Master/Slave Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	MASTER/SLAVE CONTROL	—	—	—	—	—
2	Master/Slave Select[2]	ms_sel	0 to 2	0	—	RW
3	0 = disable	—	—	—	—	—
4	1 = Master	—	—	—	—	—
5	2 = Slave	—	—	—	—	—
6	Master Control Type[3]	ms_ctrl	1 to 3	1	—	RW
7	1 = Local Control	—	—	—	—	—
8	2 = Remote Control	—	—	—	—	—
9	3 = Network Control	—	—	—	—	—
10	Slave Address	slv_addr	1 to 236	2	—	RW
11	Lead Lag Select[4]	lead_sel	0 to 2	0	—	RW
12	0 = Always Lead	—	—	—	—	—
13	1 = Lag Once Failed Only	—	—	—	—	—
14	2 = Lead/Lag Runtime Sel	—	—	—	—	—
15	Lead/Lag Balance Delta[5]	ll_bal_d	40 to 400	168	hour	RW
16	Lead/Lag Start Timer	lstr_tim	2 to 30	10	min	RW
17	Lead Pulldown Time	lead_pul	0 to 60	0	min	RW
18	Start If Error Higher	start_dt	1.7 to 10.0 3.0 to 18.0	2.2 4.0	^C ^F	RW
19	Lag Minimum Running Time	lag_mini	0 to 150	0	min	RW
20	Lag Unit Pump Control	lag_pump	0 to 1	0	—	RW
21	0 = Stop if Unit Stops	—	—	—	—	—
22	1 = Run if unit Stops	—	—	—	—	—
23	Chiller In Series	ll_serie	No / Yes	No	—	RW
24	Legacy compatibility?[6]	islegacy	No / Yes	No	—	RW

See Legend and Notes on page 180.

NOTES:
1. Master/slave assembly can be modified only when the unit is Off.
   Changing any parameters in the master/slave configuration triggers the reboot sequence.
2. Master/slave selection:
   For units in the master/slave assembly, the master unit must be set to “1” and the Slave unit must be set to “2.”
3. Master control type:
   The master unit may be set to be controlled locally, remotely, or via network. The Master sends all commands controlling the slave unit, which must be in Network operating mode.
4. Lead / lag selection:
   The master/slave control requires the lead unit and the lag unit to be selected regardless of master/slave configuration.
   This parameter is set only for the master.
   0 = Master unit is always the lead
   1 = Master unit is the lag in case of failure
   2 = Lead/lag is based on the wear factor
5. Lead / lag balance:
   Used to equalize the run times of units working in the master/slave assembly. Slave unit must be in Network operating mode.
6. Legacy Compatibility?:
   No = No message adaptation (the other unit of the master/slave assembly has also PIC6 hardware)
   Yes = Message conversion for legacy PIC5 compatibility (the other unit of the master/slave assembly has PIC5 hardware)

CP_UNABL — Compressor Disabled Cfg

Carrier Controller PATH: Main Menu → Configuration Menu → Compressor Disabled Cfg

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Compressor A1 Disable	un_cp_a1	No / Yes	No	—	RW
2	Compressor A2 Disable	un_cp_a2	No / Yes	No	—	RW
3	Compressor A3 Disable	un_cp_a3	No / Yes	No	—	RW
4	Compressor A4 Disable	un_cp_a4	No / Yes	No	—	RW
5	Compressor B1 Disable	un_cp_b1	No / Yes	No	—	RW
6	Compressor B2 Disable	un_cp_b2	No / Yes	No	—	RW
7	Compressor B3 Disable	un_cp_b3	No / Yes	No	—	RW
8	Compressor B4 Disable	un_cp_b4	No / Yes	No	—	RW

See Legend and Notes on page 180.

MSC_SERV — Msc Configuration

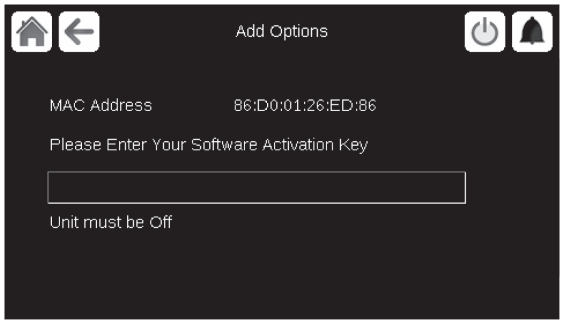
Carrier Controller PATH: Main Menu → Configuration Menu → Msc Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	ECO PUMP CONFIG	—	—	—	—	—
2	Eco Pump Enable	eco_pmp	No / Yes	No	—	RW
3	Pump Off Time	ecop_off	2 to 60	2	min	RW
4	Pump On Time	ecop_on	5 to 60	5	min	RW

See Legend and Notes on page 180.

ADD_OPT — Add Options[1]

Carrier Controller PATH: Main Menu → Configuration Menu → Add Options



See Legend and Notes on page 180.

NOTES:
1. Add Options not applicable to North America units.

NETWORK MENU

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	Email Configuration	EMAILCFG
	ModbusRTU Config.	MODBUSRS
	ModbusTCP/IP Config.	MODBUSIP
	BACNet Standard Conf.	BACNET

See Legend and Notes on page 180.

EMAILCFG — Email Configuration

Carrier Controller PATH: Main Menu ® Configuration Menu ® Network Menu ® Email Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Sender Email Part1[1]	senderP1	—	—	—	RW
2	@		—	—	—	—
3	Sender Email Part2[1]	senderP2	—	—	—	RW
4	Recip1 Email Part1[2]	recip1P1	—	—	—	RW
5	@		—	—	—	—
6	Recip1 Email Part2[2]	recip1P2	—	—	—	RW
7	Recip2 Email Part1[3]	recip2P1	—	—	—	RW
8	@		—	—	—	—
9	Recip2 Email Part2[3]	recip2P2	0 to 255	—	—	RW
10	SMTP IP Addr Part 1[4]	smtpP1	0 to 255	—	—	RW
11	SMTP IP Addr Part[4]	smtpP2	0 to 255	—	—	RW
12	SMTP IP Addr Part 3[4]	smtpP3	0 to 255	—	—	RW
13	SMTP IP Addr Part 4[4]	smtpP4	—	—	—	RW
14	Account Email Part1[5]	accP1	—	—	—	RW
15	@		—	—	—	—
16	Account Email Part2[5]	accP2	—	—	—	RW
17	Account Password[6]	accPass	—	—	—	RW
18	Port Number[7]	portNbr	0 to 65535	25	—	RW
19	Server Timeout[8]	srvTim	0 to 255	30	sec	RW
20	Server Authentication[9]	srvAut	0 to 1	0	—	RW

See Legend and Notes on page 180.

NOTES:
1. Sender Email address:
   If not filled, email sender will be 0@0. Optional.
2. Recipient Email final form is part1@part2:
   These 2 items need to be configured.
3. Second Recipient Email:
   Final form is part1@part2. Optional.
4. Parts of the smtp address WWW.XXX.YYY.ZZZ
   This address must be filled to be able to send an email.
5. Account email:
   May be needed by some FTP providers.
6. Password linked to account email.
7. Network Port number used for SMTP protocol.
8. Timeout configuration:
   10 seconds may be used.
9. Server authentication:
   If this item is set to 1, then the account Email and account password are enabled. If set to 0, the account number and password are disabled.

APPENDIX A — CARRIER CONTROLLER DISPLAY TABLES (cont)

MODBUSRS — ModbusRTU Configuration

Carrier Controller PATH: Main Menu → Configuration Menu → Network Menu → ModbusRTU Configuration

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	RTU Server Enable	modrt_en	No / Yes	No	—	RW
2	Server UID	ser_UID	1 to 247	1	—	RW
3	Metric Unit	metric	No / Yes	Yes	—	RW
4	Swap Bytes	swap_b	0 to 1	0	—	RW
5	0 = Big Endian	—	—	—	—	—
6	1 = Little Endian	—	—	—	—	—
7	Baudrate	baudrate	0 to 2	0	—	RW
8	0 = 9600	—	—	—	—	—
9	1 = 19200	—	—	—	—	—
10	2 = 38400	—	—	—	—	—
11	Parity	parity	0 to 2	0	—	RW
12	0 = No parity	—	—	—	—	—
13	1 = Odd parity	—	—	—	—	—
14	2 = Even parity	—	—	—	—	—
15	Stop bit number	stop_bit	0 to 1	0	—	RW
16	0 = One stop bit	—	—	—	—	—
17	1 = Two stop bit	—	—	—	—	—
18	Real Type Management	real_typ	0 to 1	1	—	RW
19	0 = Float X10	—	—	—	—	—
20	1 = IEE 754	—	—	—	—	—
21	Enable 32 bits registers	reg32bit	0 to 1	1	—	RW
22	0 = IR/HR in 16 bit mode	—	—	—	—	—
23	1 = IR/HR in 32 bit mode	—	—	—	—	—

See Legend and Notes on page 180.

MODBUSIP — Modbus TCP/IP

Carrier Controller PATH: Main Menu → Configuration Menu → Network Menu → Modbus TCP/IP

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	TCP/IP Server Enable	modip_en	No / Yes	No	—	RW
2	Server UID	ser_UID	1 to 247	1	—	RW
3	IP Port Number	port_nbr	0 to 65535	502	—	RW
4	Metric Unit	metric	No / Yes	Yes	—	RW
5	Swap Bytes	swap_b	0 to 1	0	—	RW
6	0 = Big Endian	—	—	—	—	—
7	1 = Little Endian	—	—	—	—	—
8	Real Type Management	real_typ	0 to 1	1	—	RW
9	0 = Float X10	—	—	—	—	—
10	1 = IEE 754	—	—	—	—	—
11	Enable 32 bits registers	reg32bit	0 to 1	1	—	RW
12	0 = IR/HR in 16 bit mode	—	—	—	—	—
13	1 = IR/HR in 32 bit mode	—	—	—	—	—
14	IP port interface name	conifnam	0 to 1	0	—	RW
15	0 = J5/J15	—	—	—	—	—
16	1 = J16	—	—	—	—	—
17	Com. timeout (s)	timeout	60 to 600	120	sec	RW
18	Keepalive idle delay(s)	idle	0 to 30	10	sec	RW
19	Keepalive interval(s)	intrvl	0 to 2	1	sec	RW
20	Keepalive probes nb	probes	0 to 10	10	—	RW

See Legend and Notes on page 180.

BACNET — BACNet Standard Conf.

Carrier Controller PATH: Main Menu → Configuration Menu → Network Menu → BACNET

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	BACnet Enable	bacena	Disable / Enable	Disable	—	RW
2	Metric Unit	bacunit	No / Yes	Yes	—	RW
3	Network	network	1 to 4000	1600	—	RW
4	UPD Port Number	udpport	47808 to 47823	47808	—	RW
5	Device Id Manual	bac_id	0 to 4194302	1600001	—	RW
6	Device Id Auto Option	auid_opt	Disable / Enable	Disable	—	RW
7	Alarm reporting	balmena	Disable / Enable	Enable	—	RW
8	BACnet Manage Occupancy	mng_occ	No / Yes	No	—	RW
9	IP port Interface name	conifnam	0 to1	0	—	RW
10	0 = J5/J15	—	—	—	—	—
11	1 = J16	—	—	—	—	—

See Legend and Notes on page 180.

MAINTENANCE MENU[1, 2]

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	Capacity Control	LOADFACT
	Drive Maintenance	DRV_CTRL
	Drive Maintenance 2	DRV_CTL2
	Last PowerOn Reset	LAST_POR
	Master Slave Control	M_MSTSLV
	System Version	SYSVER
	Service Maintenance	SERMAINT
—	Defrost[3]	DEFROST
—	Maintenance Configuration[3]	MAINTCFG

See Legend and Notes on page 180.

NOTES:
1. The maintenance menu provides access to a wide variety of chillers parameters, including capacity control, fans and pumps drives status, and many more.
2. If the unit has been powered for more than 48 hours, then the rolling password functionality will be activated, and service and factory password will automatically change upon QR Code change.
3. Access via the Network Service Tool.

LOADFACT — Capacity Control

Carrier Controller PATH: Main Menu → Maintenance Menu → Capacity Control

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Average Ctrl Water Temp	ctrl_avg	—	—	°C / °F	RO
2	Differential Water Temp	diff_wt	—	—	°C / °F	RO
3	Water Delta T	delta_t	—	—	^C / ^F	RO
4	Control Point	CTRL_PNT	—	—	°C / °F	RO
5	Reset Amount	reset	—	—	^C / ^F	RO
6	Controlled Temp Error	tp_error	—	—	^C / ^F	RO
7	Actual Capacity	cap_t	—	—	%	RO
8	Actual Capacity Limit	cap_lim	—	—	%	RO
9	Current Z Multiplier Val	zm	—	—	—	RO
10	Load/Unload Factor	smz	—	—	%	RO
11	Active Stage Number	cur_stag	—	—	—	RO
12	Active Capacity Override	over_cap	—	—	—	RO
13	H P Ctrl Override Cir A	ov_hd_a	—	—	—	RO
14	SCT Control Point Cir A	sct_ct_a	0 to 65.6 32.0 to 150.0	0 32.0	°C °F	RO
15	Minimum SCT Threshold A	minSct_a	—	—	°C / °F	RO
16	SH Setpoint Circuit A	sh_sp_a	—	—	^C / ^F	RO
17	Cooler Exchange DT Cir A	pinch_a	—	—	^C / ^F	RO
18	Cooler Pinch Ctl Point A	pinc_spa	—	—	^C / ^F	RO
19	EXV Override Circuit A	ov_exv_a	—	—	—	RO
20	EXV value A	exv_v_a	—	—	%	RO
21	H P Ctrl Override Cir B	ov_hd_b	—	—	—	RO
22	SCT Control Point Cir B	sct_ct_b	0 to 65.6 32.0 to 150.0	0 32.0	°C °F	RO
23	Minimum SCT Threshold B	minSct_b	—	—	°C / °F	RO
24	SH Setpoint Circuit B	sh_sp_b	—	—	^C / ^F	RO
25	Cooler Exchange DT Cir B	pinch_b	—	—	^C / ^F	RO
26	Cooler Pinch Ctl Point B	pinc_spb	—	—	^C / ^F	RO
27	EXV Override Circuit B	ov_exv_b	—	—	—	RO
28	EXV value B	exv_v_b	—	—	%	RO
29	EHS Ctrl Override[1]	over_ehs	—	—	—	RO
30	Requested Electric Stage[1]	eh_stage	—	—	—	RO
31	Electrical Pulldown?[1]	ehspulld	False / True	False	—	RO
32	EHS status[1]	ehs_stat	—	—	—	RO
33	Required Cooling Power	req_pwr	—	—	kW	RO
34	Flow Switch Cfg status[2]	flowSw_s	—	—	—	RO
35	Hydronic Kit Status	hydKit_s	—	—	—	RO
36	Greenspeed Charging Mode	sct_c_m	Off / On	Off	—	RW

See Legend and Notes on page 180.

NOTES:
1. Applies to heat pumps.
2. Not applicable to North America units.

DRV_CTRL — Drive Maintenance

Carrier Controller PATH: Main Menu → Maintenance Menu → Drive Maintenance

LINE	DISPLAYED TEXT*	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	DRIVE 1 : FAN A1	—	—	—	—	—
2	Fan Drive A Enabled?	drv_en_1	No / Yes	—	—	RO
3	Fan Drive A Com Ok?	DRVCOM_1	No / Yes	—	—	RO
4	DRIVE 2 : FAN A2	—	—	—	—	—
5	Fan Drive A2 Enabled?	drv_en_2	No / Yes	—	—	RO
6	Fan Drive A2 Com Ok?	DRVCOM_2	No / Yes	—	—	RO
7	DRIVE 3 : FAN B1	—	—	—	—	—
8	Fan Drive B Enabled?	drv_en_3	No / Yes	—	—	RO
9	Fan Drive B Com Ok?	DRVCOM_3	No / Yes	—	—	RO
10	DRIVE 4 : FAN B2	—	—	—	—	—
11	Fan Drive B2 Enabled?	drv_en_4	No / Yes	—	—	RO
12	Fan Drive B2 Com Ok?	DRVCOM_4	No / Yes	—	—	RO
13	DRIVE 5 : WATER PUMP 1	—	—	—	—	—
14	Pump Drive 1 Enabled?	drv_en_5	No / Yes	—	—	RO
15	Pump Drive 1 Com Ok?	DRVCOM_5	No / Yes	—	—	RO
16	DRIVE 6 : WATER PUMP 2	—	—	—	—	—
17	Pump Drive 2 Enabled?	drv_en_6	No / Yes	—	—	RO
18	Pump Drive 2 Com Ok?	DRVCOM_6	No / Yes	—	—	RO
19	DRIVE ADDRESS SETUP	—	—	—	—	—
20	Attach LEN Drive	SET_DRV	0 to 6	—	—	RW

See Legend and Notes on page 180.

DRV_CTRL2 — Drive Maintenance 2

Carrier Controller PATH: Main Menu → Maintenance Menu → Drive Maintenance 2

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	DRIVE 1 : FAN A1	—	—	—	—	—
2	Fan Drive A Power	drvpwr_1	—	—	kW	RO
3	Fan Drive A Current	drv_I_1	—	—	A	RO
4	Fan Drive A Nom. Cur.	drv_nI_1	—	—	A	RO
5	Fan Drive A Cur. Limit	drv_CL_1	—	—	A	RO
6	Fan Drive A Voltage	drv_V_1	—	—	V	RO
7	Fan Drive A Frequency	drv_F_1	—	—	Hz	RO
8	Fan Drive A Torque	drv_T_1	—	—	—	RO
9	Fan Drive A Command	drvCmd_1	—	—	%	RO
10	DRIVE 2 : FAN A2	—	—	—	—	—
11	Fan Drive A2 Power	drvpwr_2	—	—	kW	RO
12	Fan Drive A2 Current	drv_I_2	—	—	A	RO
13	Fan Drive A2 Nom. Cur.	drv_nI_2	—	—	A	RO
14	Fan Drive A2 Cur. Limit	drv_CL_2	—	—	A	RO
15	Fan Drive A2 Voltage	drv_V_2	—	—	V	RO
16	Fan Drive A2 Frequency	drv_F_2	—	—	Hz	RO
17	Fan Drive A2 Torque	drv_T_2	—	—	—	RO
18	Fan Drive A2 Command	drvCmd_2	—	—	V	RO
19	DRIVE 3 : FAN B1	—	—	—	—	—
20	Fan Drive B Power	drvpwr_3	—	—	kW	RO
21	Fan Drive B Current	drv_I_3	—	—	A	RO
22	Fan Drive B Nom. Cur.	drv_nI_3	—	—	A	RO
23	Fan Drive B Cur. Limit	drv_CL_3	—	—	A	RO
24	Fan Drive B Voltage	drv_V_3	—	—	V	RO
25	Fan Drive B Frequency	drv_F_3	—	—	Hz	RO
26	Fan Drive B Torque	drv_T_3	—	—	—	RO
27	Fan Drive B Command	drvCmd_3	—	—	%	RO
28	DRIVE 4 : FAN B2	—	—	—	—	—
29	Fan Drive B2 Power	drvpwr_4	—	—	kW	RO
30	Fan Drive B2 Current	drv_I_4	—	—	A	RO
31	Fan Drive B2 Nom. Cur.	drv_nI_4	—	—	A	RO
32	Fan Drive B2 Cur. Limit	drv_CL_4	—	—	A	RO
33	Fan Drive B2 Voltage	drv_V_4	—	—	V	RO
34	Fan Drive B2 Frequency	drv_F_4	—	—	Hz	RO
35	Fan Drive B2 Torque	drv_T_4	—	—	—	RO
36	Fan Drive B2 Command	drvCmd_4	—	—	%	RO
37	DRIVE 5 : WATER PUMP 1[1]	—	—	—	—	—
38	Pump Drive 1 Power[1]	drvpwr_5	—	—	kW	RO
39	Pump Drive 1 Current[1]	drv_I_5	—	—	A	RO
40	Pump Drive 1 Nom. Cur.[1]	drv_nI_5	—	—	A	RO
41	Pump Drive 1 Cur. Limit[1]	drv_CL_5	—	—	A	RO
42	Pump Drive 1 Voltage[1]	drv_V_5	—	—	V	RO
43	Pump Drive 1 Frequency[1]	drv_F_5	—	—	Hz	RO
44	Pump Drive 1 Torque[1]	drv_T_5	—	—	—	RO
45	Pump Drive 1 Command[1]	drvCmd_5	—	—	%	RO
46	DRIVE 6 : WATER PUMP 2[1]	—	—	—		—
47	Pump Drive 2 Power[1]	drvpwr_6	—	—	kW	RO
48	Pump Drive 2 Current[1]	drv_I_6	—	—	A	RO
49	Pump Drive 2 Nom. Cur.[1]	drv_nI_6	—	—	A	RO
50	Pump Drive 2 Cur. Limit[1]	drv_CL_6	—	—	A	RO
51	Pump Drive 2 Voltage[1]	drv_V_6	—	—	V	RO
52	Pump Drive 2 Frequency[1]	drv_F_6	—	—	Hz	RO
53	Pump Drive 2 Torque[1]	drv_T_6	—	—	—	RO
54	Pump Drive 2 Command[1]	drvCmd_6	—	—	%	RO

See Legend and Notes on page 180.

NOTES:
1. Not applicable to North America units.

LAST_POR — Last PowerOn Reset

Carrier Controller PATH: Main Menu → Maintenance Menu → Last PowerOn Reset

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Power On 1 :day-mon-year	date_on1	—	—	—	RO
2	Power On 1 :hour-minute	time_on1	—	—	—	RO
3	PowerDown 1:day-mon-year	date_of1	—	—	—	RO
4	PowerDown 1:hour-minute	time_of1	—	—	—	RO
5	PowerDown 1:reason[1]	rebreas1	1 to 5	—	—	RO
6	Power On 2 :day-mon-year	date_on2	—	—	—	RO
7	Power On 2 :hour-minute	time_on2	—	—	—	RO
8	PowerDown 2:day-mon-year	date_of2	—	—	—	RO
9	PowerDown 2:hour-minute	time_of2	—	—	—	RO
10	PowerDown 2:reason[1]	rebreas2	1 to 5	—	—	RO
11	Power On 3 :day-mon-year	date_on3	—	—	—	RO
12	Power On 3 :hour-minute	time_on3	—	—	—	RO
13	PowerDown 3:day-mon-year	date_of3	—	—	—	RO
14	PowerDown 3:hour-minute	time_of3	—	—	—	RO
15	PowerDown 3:reason[1]	rebreas3	1 to 5	—	—	RO
16	Power On 4 :day-mon-year	date_on4	—	—	—	RO
17	Power On 4 :hour-minute	time_on4	—	—	—	RO
18	PowerDown 4:day-mon-year	date_of4	—	—	—	RO
19	PowerDown 4:hour-minute	time_of4	—	—	—	RO
20	PowerDown 4:reason[1]	rebreas4	1 to 5	—	—	RO
21	Power On 5 :day-mon-year	date_on5	—	—	—	RO
22	Power On 5 :hour-minute	time_on5	—	—	—	RO
23	PowerDown 5:day-mon-year	date_of5	—	—	—	RO
24	PowerDown 5:hour-minute	time_of5	—	—	—	RO
25	PowerDown 5:reason[1]	rebreas5	1 to 5	—	—	RO
26	Capacity At Power Down	cap_off	—	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Reboot reasons [values] are listed below:
   1 = Reboot required by software application (example: after a CCN table update)
   2 = Application crash
   3 = Power loss (24 vac power on the display has been removed)
   4 = Watchdog (the electronic hardware watchdog has been triggered)
   5 = Undefined (the reboot reason has not been identified by the algorithm)

M_MSTSLV — Master Slave Control

Carrier Controller PATH: Main Menu → Maintenance Menu → Master Slave Control

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Unit is Master or Slave	mstslv	Disable / Master / Slave	Disable	—	RO
2	Master Control Type[1]	ms_ctrl	Local / Net / Rem	Local	—	RO
3	Master/Slave Ctrl Active	ms_activ	False / True	False	—	RO
4	Lead Unit is the:	lead_sel	Master / Slave	Master	—	RO
5	Slave Chiller State[2]	slv_stat	0 to 4	0	—	RO
6	Slave Chiller Total Cap	slv_capt	—	—	%	RO
7	Lag Start Delay	l_strt_d	—	—	min	RO
8	Lead/lag Hours Delta	ll_hr_d	—	—	hour	RO
9	Lead/lag Changeover?	ll_chang	No / Yes	No	—	RO
10	Lead Pulldown?	ll_pull	No / Yes	No	—	RO
11	Master/Slave Error	ms_error	—	—	—	RO
12	Max Available Capacity?	cap_max	No / Yes	No	—	RO
13	Max FC available cap ?[3]	fcCapMax	No / Yes	No		RO
14	Slave lagstat	lagstat	—	—	—	RO
15	Slave Operating Hours	slav_hr	—	—	hour	RO
16	Slave Entering Fluid	slav_ewt	—	—	°C / °F	RO
17	Slave Leaving Fluid	slav_lwt	—	—	°C / °F	RO

See Legend and Notes on page 180.

NOTES:
1. Master Control Type:
   Local control
   Network
   Remote Control
2. Slave Chiller State:
   0 = Chiller Off
   1 = Chiller On
   2 = Chiller in Local Operating Mode
   3 = Chiller Restarted
   4 = Chiller Fault
3. Not applicable to North America units.

SYSVER — System Version

Carrier Controller PATH: Main Menu → Maintenance Menu → System Version

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	SIOB A CESR Number	sr_sioba	—	—	—	RO
2	SIOB B CESR Number	sr_siobb	—	—	—	RO
3	SIOB EMM CESR Number[1]	sr_siobe	—	—	—	RO
4	AUX2 CESR Number[1]	sr_aux2	—	—	—	RO
5	AUX1 VFAN@86 CESR Number[1, 2]	sr_aux11	—	—	—	RO
6	AUX1 DCFC@90 CESR Number[1, 2]	sr_aux12	—	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Note that these boards are optional.
2. Not applicable to North America units.

SERMAINT — Service Maintenance

Carrier Controller PATH: Main Menu → Maintenance Menu → Service Maintenance

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Reset Maintenance Alert	S_RESET	0 to 5	0	—	RW
2	—	—	—	—	—	—
3	GENERAL SERVICING DELAYS	—	—	—	—	—
4	1 – Next Service Mntn	—	—	—	—	—
5	Date of Maintenance	s_date	xxx	'Disabled'	—	RO
6	Hour of Maintenance	s_hour	xxx	'Disabled'	—	RO
7	Operating Days until Mntn	s_days	xxx	'Disabled'	—	RO
8	—	—	—	—	—	—
9	REGULATORY SERVICING	—	—	—	—	—
10	2 – F-Gas Check	—	—	—	—	—
11	Fgas seal check remind	f_date	xxx	'Disabled'	—	RO

See Legend and Notes on page 180.

DEFROST — Defrost[1]

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	CIR A DEFROST CONTROL	—	—	—	—	—
2	Next Sequence Allowed in	def_se_a	—	—	min	RO
3	Exchanger Frost Factor	frost_a	—	—	%	RO
4	Defrost Active?	def_ac_a	No / Yes	No	—	RO
5	Override State	over_d_a	—	—	—	RO
6	Defrost Temperature	DEFRT_A	—	—	°C / °F	RO
7	Frost Duration	frst_dua	—	—	min	RO
8	Defrost Duration	defr_dua	—	—	min	RO
9	Fan Sequence Started?	def_fa_a	—	—	—	RO
10	SST Limit Cir A	sstLim_a	—	—	°C / °F	RO
11	SCT limit Calculation	sctlim_a	—	—	°C / °F	RO
12	Mean SCT Calculation	sct_dm_a	—	—	°C / °F	RO
13	Mean SST Calculation	sst_dm_a	—	—	°C / °F	RO
14	Delta: OAT - Mean SST	delt_a	—	—	^C / ^F	RO
15	Reference Delta	delt_r_a	—	—	^C / ^F	RO
16	Delta - Reference Delta	delt_v_a	—	—	^C / ^F	RO
17	Frost Integrator Gain	fr_int_a	—	—	—	RO
18	Defrost Fan Start Cal A	def_ca_a	—	—	kPa / PSI	RO
19	Defrost Fan Offset Cal A	def_of_a	—	—	kPa / PSI	RO
20	CIR B DEFROST CONTROL	—	—	—	—	—
21	Next Sequence Allowed in	def_se_b	—	—	min	RO
22	Exchanger Frost Factor	frost_b	—	—	%	RO
23	Defrost Active?	def_ac_b	No / Yes	No	—	RO
24	Override State	over_d_b	—	—	—	RO
25	Defrost Temperature	DEFRT_B	—	—	°C / °F	RO
26	Frost Duration	frst_dub	—	—	min	RO
27	Defrost Duration	defr_dub	—	—	min	RO
28	Fan Sequence Started?	def_fa_b	—	—	—	RO
29	SST Limit Cir B	sstLim_b	—	—	°C / °F	RO
30	SCT limit Calculation	sctlim_b	—	—	°C / °F	RO
31	Mean SCT Calculation	sct_dm_b	—	—	°C / °F	RO
32	Mean SST Calculation	sst_dm_b	—	—	°C / °F	RO
33	Delta: OAT - Mean SST	delt_b	—	—	^C / ^F	RO
34	Reference Delta	delt_r_b	—	—	^C / ^F	RO
35	Delta - Reference Delta	delt_v_b	—	—	^C / ^F	RO
36	Frost Integrator Gain	fr_int_b	—	—	—	RO
37	Defrost Fan Start Cal B	def_ca_b	—	—	kPa / PSI	RO
38	Defrost Fan Offset Cal B	def_of_b	—	—	kPa / PSI	RO
39	Free Defr Allowed Timer	—	—	—	—	—
40	water below ctrl_pnt	FrDfrTmr	—	—	hour	RO

See Legend and Notes on page 180.

NOTES:
1. Not accessible through Carrier Controller. Only accessible via Network Service Tool.

MAINTCFG — Maintenance Configuration[1]

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Device Name	—	—	—	—	—
2	Maintenance Alert Type	mntn_typ	0 to 3	0	—	RW
3	0: No	—	—	—	—	—
4	1: Frequency in Months	—	—	—	—	—
5	2: Frequency in Hours	—	—	—	—	—
6	3: Running days	—	—	—	—	—
7	MAINTENANCE CONFIG	—	—	—	—	—
8	Frequency in months	mth_freq	1 to 99	12	—	RW
9	Frequency in hours	hr_freq	0 to 10000	2000	hour	RW
10	Running Days	run_days	0 to 10000	0	—	RW
11	Fgas Check Freq (months)	fgas_frq	0 to 12	0	—	RW

See Legend and Notes on page 180.

NOTES:
1. Not accessible through Carrier Controller. Only accessible via Network Service Tool.

SYSTEM MENU

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	CPU Load	CPULOAD
	EOL Resistor	EOLRES
	Network	NETWORK
	Date/Time[1]	DATETIME
	Language & Unit System	LANGUNIT
	Brightness	BRIGHTNS
	Software Info	SWINFO
	Hardware Info	HWINFO
	USB Log	USB_LOG

See Legend and Notes on page 180.

NOTES:
1. See Date/Time display table on page 155.

CPULOAD — CPU Load

Carrier Controller PATH: System Menu ® CPU Load

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	CPU load[1]	—	—	0 to 100	%	RO
2	RAM Memory utilization[1]	—	—	0 to 100	%	RO
3	FLASH Memory utilization[1]	—	—	0 to 100	%	RO

See Legend and Notes on page 180.

NOTES:
1. If the value displayed is close or equal to 100%, a note could be reported back to the Carrier quality department.

EOLRES — EOL Resistor[1]

Carrier Controller PATH: System Menu → EOL Resistor

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	End of Line Res. J6(LEN)	—	Disable / Enable	Disable	—	RW
2	End of Line Res. J7(CCN)	—	Disable / Enable	Disable	—	RW
3	End of Line Resistor J8	—	Disable / Enable	Disable	—	RW
4	End of Line Resistor J10	—	Disable / Enable	Disable	—	RW

See Legend and Notes on page 180.

NOTES:
1. EOL = end of line. The End of line resistor can be useful to improve RS485 communication signals. On the communication bus, only the last equipment in the RS485 bus shall have its EOL closed (enable). It is recommended to have an EOL resistor on the bus if the communication cable length is high (>100 meters).

NETWORK — Network

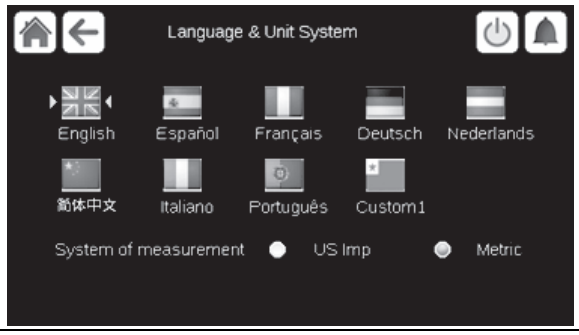
Carrier Controller PATH: Main Menu → System Menu → Network

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
4.3 in. controller						
1	IP Network Interface J5 (eth0):	—	—	—	—	—
2	MAC Address	—	xx:xx:xx:xx:xx:xx	—	—	—
3	TCP/IP Address	—	169.254.1.1	—	—	RO
4	Subnet Mask	—	255.255.0.0	—	—	RW
5	Default Gateway	—	169.254.1.3	—	—	RW
6	Gateway Mask	—	255.0.0.0	—	—	RW
7	Domain Name Server (DNS)	—	169.254.1.3	—	—	RW
8	—	—	169.254.1.4	—	—	RW
7 in. controller						
9	IP Network Interface J15 (eth0):					
10	MAC Address	—	xx:xx:xx:xx:xx:xx	—	—	—
11	TCP/IP Address	—	169.254.1.1	—	—	RO
12	Subnet Mask	—	255.255.0.0	—	—	RW
13	Default Gateway	—	169.254.1.3	—	—	RW
14	Gateway Mask	—	255.0.0.0	—	—	RW
15	Domain Name Server (DNS)	—	169.254.1.3	—	—	RW
16	—	—	169.254.1.4	—	—	RW
17	IP Network Interface J16 (eth1):					
18	MAC Address	—	xx:xx:xx:xx:xx:xx	—	—	—
19	TCP/IP Address	—	192.168.100.100	—	—	RO
20	Subnet Mask	—	255.255.255.0	—	—	RW
21	Default Gateway	—	192.168.100.1	—	—	RW
22	Gateway Mask	—	0.0.0.0	—	—	RW

See Legend and Notes on page 180.

LANGUNIT — Language & Unit System

Carrier Controller PATH: System Menu → Language & Unit System

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	(Languages)[1] 	—	—	English	—	RW
2	System of measurement: US Imp/Metric[2]	—	—	Metric	—	—

See Legend and Notes on page 180.

NOTES:
1. Language list: English, Spanish, French, German, Dutch, Chinese, Italian, Portuguese and “undefined” (custom language).
   Custom language: The control system allows users to add new languages to the control. Custom languages can be uploaded only by service
2. System of measurement:
   US Imp = Parameters displayed in US Imperial units
   Metric = Parameters displayed in metric units

BRIGHTNS — Brightness

Carrier Controller PATH: System Menu → Brightness

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Brightness	—	0 to 100	80	%	RW

See Legend and Notes on page 180.

SWINFO — Software Info

Carrier Controller PATH: System Menu → Software Info

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Software Version	—	ECG-SR-20V4G100	—	—	RO
2	SDK Version	—	N.NNN.N	—	—	RO
3	UI Version	—	NN	—	—	RO
4	Brand	—	CARRIER	—	—	RO

See Legend and Notes on page 180.

HWINFO — Hardware Info

Carrier Controller PATH: System Menu → Hardware Info

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Board Variant	—	—	—	—	RO
2	Board Revision	—	—	—	—	RO
3	Screen Size	—	43	—	—	RO

See Legend and Notes on page 180.

USB_LOG — USB Log

Carrier Controller PATH: System Menu → USB Log

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Collection Name[1]	—	—	—	—	RO
2	Technical Data[2]	—	Yes/No	No	—	RO
3	Developer Data[3]	—	Yes/No	No	—	RO

See Legend and Notes on page 180.

NOTES:
1. Collection Name:
   You can enter the name of the file containing log files
2. Technical Data:
   Set the “Technical Data” to “Yes” to retrieve data including Blackboxes, configuration data (nvm), and Trends.
3. Developer Data: Set the “Developer Data” to “Yes” to retrieve Application, IoT, Platform, Start-up, var msg logs.

The USB log screen can be accessed in the System Menu when logged in at Service or Factory level. This menu can be used to retrieve Technical/Developer log files from the controller.

To export Technical/Developer data, it is highly recommended to prepare a USB flash drive, preferably 4GB, 16GB or 32GB storage size. The USB flash drive must be formated in FAT/FAT32. USB flash drives with 64GB or more will not be able to format FAT/FAT32 from a Windows machine.

To retrieve Technical/Developer log files, do the following:

1. Plug the USB flash drive into Port J9 on the 4.3 in. display or Port J5 on the 7 in. display.
2. Go to the System Menu and select USB log.
3. Type the name of the file to be saved on your flash drive ("Collection Name").
4. Select the data that should be copied: Technical Data, Developer Data, or both.
5. Press the Save button . The “Log collection in progress” message will be displayed.
6. As soon as all logs are saved, you will see the “Logs copied Successfully” message. Then you can remove the USB flash drive and check logs on your device.

ALARM MENU

ICON	DISPLAYED TEXT	ASSOCIATED TABLE
	Reset Alarms	ALARMRST
	Current Alarms	CUR_ALM
	Alarm Historic	ALMHIST1
	Major Alarm Historic	ALMHIST2

See Legend and Notes on page 180.

ALARMRST — Reset Alarms

Carrier Controller PATH: Alarm Menu → Reset Alarms

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Alarm Reset[1]	RST_ALM	No / Yes	—	—	RW
2	Alarm State[2]	ALM	—	—	—	RO
3	Current Alarm 1	alarm_1c	—	—	—	RO
4	Current Alarm 2	alarm_2c	—	—	—	RO
5	Current Alarm 3	alarm_3c	—	—	—	RO
6	Current Alarm 4	alarm_4c	—	—	—	RO
7	Current Alarm 5	alarm_5c	—	—	—	RO
8	Jbus Current Alarm 1	alarm_1	—	—	—	RO
9	Jbus Current Alarm 2	alarm_2	—	—	—	RO
10	Jbus Current Alarm 3	alarm_3	—	—	—	RO
11	Jbus Current Alarm 4	alarm_4	—	—	—	RO
12	Jbus Current Alarm 5	alarm_5	—	—	—	RO

See Legend and Notes on page 180.

NOTES:
1. Alarm reset:
   Alarms can be reset manually by the user or automatically, for some Alarms, when operating conditions return to normal.
2. Alarm state:
   Normal = No alarm
   Partial = There is an alarm, but the unit continues to operate
   Shutdown = Unit shuts down

CUR_ALM — Current Alarms

Carrier Controller PATH: Alarm Menu → Current Alarms

LINE	NAME	DATE	HOUR	ALARM TEXT
1	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
2	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
...	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
10	Alarm	YYYY/MM/DD	HH:MM	Alarm Text

See Legend and Notes on page 180.

ALARMHIST1 — Alarm Historic

Carrier Controller PATH: Alarm Menu → Alarm Historic

LINE	NAME	DATE	HOUR	ALARM TEXT
1	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
2	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
...	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
50	Alarm	YYYY/MM/DD	HH:MM	Alarm Text

See Legend and Notes on page 180.

ALARMHIST2 — Major Alarm Historic

Carrier Controller PATH: Alarm Menu → Major Alarm Historic

LINE	NAME	DATE	HOUR	ALARM TEXT
1	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
2	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
...	Alarm	YYYY/MM/DD	HH:MM	Alarm Text
50	Alarm	YYYY/MM/DD	HH:MM	Alarm Text

See Legend and Notes on page 180.

The DCT 1 and DCT 2 tables contain items from different CCN tables. When Data collection with a PCDCT tool is requested, these 2 tables include the most useful parameters used for chiller debugging.

Note that information present in these tables is extracted from other CCN tables and can also be found in other tables as well.

DCT 1

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	Cir A Total Capacity	CAPA_T	—	—	%	RO
2	High Pressure Switch A	HP_SW_A	Open / Close	Open	—	RO
3	Compressor A1	CP_A1	Off / On	Off	—	RO
4	Compressor A2	CP_A2	Off / On	Off	—	RO
5	Compressor A3	CP_A3	Off / On	Off	—	RO
6	Compressor A4	CP_A4	Off / On	Off	—	RO
7	Fan Staging Number Cir A	FAN_ST_A	0 to 10	0	—	RO
8	Variable fan A command	VFAN_A	—	—	%	RO
9	Discharge Pressure A	DP_A	—	—	kPa / psi	RO
10	Main Suction Pressure A	SP_A	—	—	kPa / psi	RO
11	Saturated Cond Tmp cir A	SCT_A	—	—	°C / °F	RO
12	Saturated Suction Temp A	SST_A	—	—	°C / °F	RO
13	Compressor Suction Tmp A	SUCT_A	—	—	°C / °F	RO
14	Suction Superheat Tmp A	SH_A	—	—	^C / ^F	RO
15	SH Setpoint Circuit A	sh_sp_a	—	—	^C / ^F	RO
16	Cooler Exchange DT Cir A	pinch_a	—	—	^C / ^F	RO
17	EXV position Circuit A	EXV_A	0 to 100	0	%	RO
18	EXV value A	exv_v_a	—	—	—	RO
19	EXV Override Circuit A	ov_exv_a	—	—	—	RO
20	SCT Control Point Cir A	sct_ct_a	32 to 150	32	°C / °F	RO
21	Minimum SCT Threshold A	minSct_a	—	—	°C / °F	RO
22	H P Ctrl Override Cir A	ov_hd_a	—	—	—	RO
23	SCT limit Calculation	sctlim_a	—	—	°C / °F	RO
24	Mean SCT Calculation	sct_dm_a	—	—	°C / °F	RO
25	Mean SST Calculation	sst_dm_a	—	—	°C / °F	RO
26	Low Suction Circuit A	m_lowsca	No / Yes	No	—	RO
27	High DGT Circuit A	m_hidgta	No / Yes	No	—	RO
28	High Press Override CirA	m_hiprsa	No / Yes	No	—	RO
29	Low Delta Press Cir A	m_dltp_a	No / Yes	No	—	RO
30	—	—	—	—	—	—
31	Cir B Total Capacity	CAPB_T	—	0	%	RO
32	High Pressure Switch B	HP_SW_B	Open / Close	Open	—	RO
33	Compressor B1	CP_B1	Off / On	Off	—	RO
34	Compressor B2	CP_B2	Off / On	Off	—	RO
35	Compressor B3	CP_B3	Off / On	Off	—	RO
36	Compressor B4	CP_B4	Off / On	Off	—	RO
37	Fan Staging Number Cir B	FAN_ST_B	0 to 10	0	—	RO
38	Variable fan B command	VFAN_B	—	—	%	RO
39	Discharge Pressure B	DP_B	—	—	kPa / psi	RO
40	Main Suction Pressure B	SP_B	—	0	kPa / psi	RO
41	Saturated Cond Tmp cir B	SCT_B	—	0	°C / °F	RO
42	Saturated Suction Temp B	SST_B	—	0	°C / °F	RO
43	Compressor Suction Tmp B	SUCT_B	—	0	°C / °F	RO
44	Suction Superheat Tmp B	SH_B	—	0	^C / ^F	RO
45	SH Setpoint Circuit B	sh_sp_b	—	0	^C / ^F	RO
46	Cooler Exchange DT Cir B	pinch_b	—	0	^C / ^F	RO
47	EXV position Circuit B	EXV_B	0 to 100	0	%	RO
48	EXV value B	exv_v_b	—	—	—	RO
49	EXV Override Circuit B	ov_exv_b	—	—	—	RO
50	SCT Control Point Cir B	sct_ct_b	32 to 150	32	°C / °F	RO
51	Minimum SCT Threshold B	minSct_b	—	—	°C / °F	RO
52	H P Ctrl Override Cir B	ov_hd_b	—	—	—	RO
53	SCT limit Calculation	sctlim_b	—	—	°C / °F	RO
54	Mean SCT Calculation	sct_dm_b	—	—	°C / °F	RO
55	Mean SST Calculation	sst_dm_b	—	—	°C / °F	RO
56	Low Suction Circuit B	m_lowscb	No / Yes	No	—	RO
57	High DGT Circuit B	m_hidgtb	No / Yes	No	—	RO
58	High Press Override CirB	m_hiprsb	No / Yes	0	—	RO
59	Low Delta Press Cir B	m_dltp_b	0 to 1	0	—	RO

See Legend and Notes on page 180.

APPENDIX A — CARRIER CONTROLLER DISPLAY TABLES (cont)

DCT 2

LINE	DISPLAYED TEXT	CCN NAME	RANGE	DEFAULT VALUE	UNIT	READ/ WRITE
1	GENERIC	—	—	—	—	—
2	Local = 0 Net. = 1 Remote = 2	CTRL_TYP	0 to 2	0	—	RO
3	Run Status	STATUS	—	—	—	RO
4	Heat/Cool status	HEATCOOL	—	—	—	RO
5	Active Demand Limit Val	DEM_LIM	0 to 100	0	%	RO
6	Minutes Left for Start	min_left	—	—	min	RO
7	Unit Total Capacity	CAP_T	—	—	%	RO
8	Current Setpoint	SP	—	—	°C / °F	RO
9	Control Point	CTRL_PNT	–4 to 153	0	°C / °F	RO
10	Outdoor Air Temp	OAT	—	—	°C / °F	RO
11	Entering Fluid Temp	EWT	—	—	°C / °F	RO
12	Leaving Fluid Temp	LWT	—	—	°C / °F	RO
13	Discharge Gas Temp A	DGT_A	—	—	°C / °F	RO
14	Discharge Gas Temp B	DGT_B	—	—	°C / °F	RO
15	Flow Switch Status	FLOW_SW	Open / Close	Open	—	RO
16	Flow Switch Cfg status	flowSw_s	—	—	—	RO
17	Alarm State	ALM	—	—	—	RO
18	Current Alarm 1	alarm_1c	—	—	—	RO
19	Current Alarm 2	alarm_2c	—	—	—	RO
20	Current Alarm 3	alarm_3c	—	—	—	RO
21	Current Alarm 4	alarm_4c	—	—	—	RO
22	Current Z Multiplier Val	zm	—	—	—	RO
23	Load/Unload Factor	smz	—	—	%	RO
24	Active Capacity Override	over_cap	—	—	—	RO
25	Exchanger Heater	EXCH_HTR	Off / On	Off	—	RO
26	—	—	—	—	—	—
27	HEAT PUMP	—	—	—	—	—
28	4-way Refrig. Valve A	RV_A	Off / On	Off	—	RO
29	Exchanger Frost Factor	frost_a	—	—	%	RO
30	Defrost Temperature	DEFRT_A	—	—	°C / °F	RO
31	Next Sequence Allowed in	def_se_a	—	—	min	RO
32	Defrost Active?	def_ac_a	No / Yes	No	—	RO
33	Defrost Duration	defr_dua	—	—	min	RO
34	Override State	over_d_a	—	—	—	RO
35	—	—	—	—	—	—
36	4-way Refrig. Valve B	RV_B	Off / On	Off	—	RO
37	Exchanger Frost Factor	frost_b	—	—	%	RO
38	Defrost Temperature	DEFRT_B	—	—	°C / °F	RO
39	Next Sequence Allowed in	def_se_b	—	—	min	RO
40	Defrost Active?	def_ac_b	No / Yes	No	—	RO
41	Defrost Duration	defr_dub	—	—	min	RO
42	Override State	over_d_b	—	—	—	RO
43	ENERGY	—	—	—	—	—
44	Cooling capacity	coolCapa	—	—	kW	RO
45	Compressor power	cmp_pwra	—	—	kW	RO
46	Fan power	fan_pwra	—	—	kW	RO
47	Cooling capacity	coolCapb	—	—	kW	RO
48	Compressor power	cmp_pwrb	—	—	kW	RO
49	Fan power	fan_pwrb	—	—	kW	RO

See Legend and Notes on page 180.

LEGEND AND NOTES

For Appendix A tables, pages 133-180.

LEGEND

NA — North America
RO — Read Only
RW — Read/Write
Spt — Setpoint

NOTES:
1. Displayed text may differ depending on the language selected.
2. For access to menus, see the following table:

ALL	Basic password required	(None)
USER	User password required	(default password = 11)
SERVICE	Service password required (QR Code Different than 0)	(default password = 88 and QR Code = 0)

If the unit has been powered for more than 48 hours, then the rolling password functionality will be activated, and service and factory passwords will automatically change, upon QR code change.

APPENDIX B — CCN POINT TABLE

STATUS/DCFC_STA — DC FREE COOLING STATUS

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
OAT Free Cooling	±nnn.n	—	°F (°C)	oat	N	RO
FC Leaving Water Temp	±nnn.n	—	°F (°C)	lwt	N	RO
FC Water Loop Temp	±nnn.n	—	°F (°C)	wloop	N	RO
Free Cooling Mode Active	No/Yes	No	—	m_dcfc	N	RO
FC Capacity	0 to 100	—	%	dcfc_cap	N	RO
Fix Speed Fans Stage	0 to 10	—	—	f_stage	N	RO
Varifan Speed	0 to 100	—	%	vf_speed	N	RO
PID Output	0 to 100	—	%	pid_out	N	RO
DCFC Operating Hours	0 to 999999	—	hours	FC_HOUR	N	RO
DCFC Fan Stage 1 Start	0 to 999999	—	—	FC_FAN1S	N	RO
DCFC Fan Stage 1 Hours	0 to 999999	—	hours	FC_FAN1H	N	RO
DCFC Fan Stage 2 Start	0 to 999999	—	—	FC_FAN2S	N	RO
DCFC Fan Stage 2 Hours	0 to 999999	—	hours	FC_FAN2H	N	RO
DCFC Fan Stage 3 Start	0 to 999999	—	—	FC_FAN3S	N	RO
DCFC Fan Stage 3 Hours	0 to 999999	—	hours	FC_FAN3H	N	RO
DCFC Fan Stage 4 Start	0 to 999999	—	—	FC_FAN4S	N	RO
DCFC Fan Stage 4 Hours	0 to 999999	—	hours	FC_FAN4H	N	RO
DCFC Fan Stage 5 Start	0 to 999999	—	—	FC_FAN5S	N	RO
DCFC Fan Stage 5 Hours	0 to 999999	—	hours	FC_FAN5H	N	RO
DCFC Fan Stage 6 Start	0 to 999999	—	—	FC_FAN6S	N	RO
DCFC Fan Stage 6 Hours	0 to 999999	—	hours	FC_FAN6H	N	RO
DCFC Fan Stage 7 Start	0 to 999999	—	—	FC_FAN7S	N	RO
DCFC Fan Stage 7 Hours	0 to 999999	—	hours	FC_FAN7H	N	RO
DCFC Variable Fan Start	0 to 999999	—	—	FC_VFANS	N	RO
DCFC Variable Fan Hours	0 to 999999	—	hours	FC_VFANH	N	RO

STATUS/ENERGY — ENERGY MONITORING

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
COOLING MODE						
Cooling Power Output	nnn.n	—	KW	cPwrOut	N	RO
Electrical Power Input	nnn.n	—	KW	cPwrIn	N	RO
Energy Efficiency (EER)	nnn.n	—	—	eer	N	RO
Cooling Energy Output	nnn	—	KWH	cEnergOu	N	RO
Electrical Energy Input	nnn	—	KWH	cEnergIn	N	RO
Integrated EER	nnn.n	—	—	energEer	N	RO
HEATING MODE						
Heating Power Output	nnn.n	—	KW	hPwrOut	N	RO
Electrical Power Input	nnn.n	—	KW	hPwrIn	N	RO
Coef. Of Perf. (COP)	nnn.n	—	—	cop	N	RO
Heating Energy Output	nnn	—	KWH	hEnergOu	N	RO
Electrical Energy Input	nnn	—	KWH	hEnergIn	N	RO
Integrated COP	nnn.n	—		energCop	N	RO
Reset of Energy Counter	No/Yes	No	—	reset_en	N	RW
Last Reset Date	dd/mm/yyyy	—	—	reset_da	N	RO
Last Reset Time	hh:mn	—	—	reset_ti	N	RO

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

STATUS/GENUNIT — GENERAL PARAMETERS

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Local=0 Net.=1 Remote=2	0 to 2	0	—	CTRL_TYP	Y	RO
Run Status	Off / Stopping / Delay / Running Ready / Override / Trip Out / Test	—	—	STATUS	N	RO
Net.: Cmd Start/Stop	Disable/Enable	Disable	—	CHIL_S_S	Y	RW
Net.: Cmd Occupied	No/Yes	No	—	CHIL_OCC	Y	RW
Minutes Left for Start	nn.n	—	min	min_left	N	RO
Heat/Cool status	Cool/Heat	Cool	—	HEATCOOL	N	RO
Heat/Cool Select	0 to 2	0	—	HC_SEL	N	RW
0=Cool, 1=Heat, 2=Auto	—	—	—	—	—	—
Setpoint Select	0 to 2	0	—	SP_SEL	N	RW
0=Auto, 1=Spt1, 2=Spt2	—	—	—	—	—	—
Setpoint Occupied?	No/Yes	Yes	—	SP_OCC	N	RW
Unit Total Capacity	0 to 100	—	%	CAP_T	Y	RO
Cir A Total Capacity	0 to 100	—	%	CAPA_T	N	RO
Cir B Total Capacity	0 to 100	—	%	CAPB_T	M	RO
Current Setpoint	±nnn.n	—	°F (°C)	SP	Y	RO
Control Point	–4.0 to 153.0 (–20.0 to 67.2)	0	°F (°C)	CTRL_PNT	Y	RW
Control Water Temp	–4.0 to 153.0 (–20.0 to 67.2)	—	°F (°C)	CTRL_WT	N	RO
Outdoor Air Temp	–4.0 to 153.0 (–20.0 to 67.2)	—	°F (°C)	OAT	N	RO
Emergency Stop	Disable/Enable	Disable	—	EMSTOP	Y	RW
Active Demand Limit Val	0 to 100	—	%	DEM_LIM	Y	RW
Lag Capacity Limit Value	0 to 100	—	%	LAG_LIM	N	RW
Active FC Dem Lim Val	0 to 100	—	%	DEMFCLIM	N	RW
Lag FC Cap Limit Value	0 to 100	—	%	LAGFCLIM	N	RW

STATUS/HYD_FC — HYDRAULIC FREE COOLING

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Free Cooling Disable?	No/Yes	Yes		FC_DSBLE	N	RW
Total FC Capacity	0 to 100	—	%	fcCapT	N	RO
Water Loop Position	Mecha Cooling Mixed/Free Cooling	Mecha Cooling		wLoopPst	N	RO
FC Override	—	—	—	fc_ovr	N	RO
FC Capacity A	0 to 100	—	%	fcCapA	N	RO
Mode of Circuit A	0 = Mechanical Cooling 1 = Mixed Cooling 2 = Controlled Free Cooling 3 = Full Power Free Cooling	0	—	modeCirA	N	RO
MC Current Power A	nnn.n	—	KW	mcCurPwA	N	RO
FC Current Power A	nnn.n	—	KW	fcCurPwA	N	RO
FC Max Power A	nnn.n	—	KW	fcMaxPwA	N	RO
FC Capacity B	0 to 100	—	%	fcCapB	N	RO
Mode of circuit B	0 = Mechanical Cooling 1 = Mixed Cooling 2 = Controlled Free Cooling 3 = Full Power Free Cooling	0	—	modeCirB	N	RO
MC Current Power B	nnn.n	—	KW	mcCurPwB	N	RO
FC Current Power B	nnn.n	—	KW	fcCurPwB	N	RO
FC Max Power B	nnn.n	—	KW	fcMaxPwB	N	RO
FC Evap Valve Request	Close/Open	Open	—	fc_ev_rq	N	RO
FC Coil Valve Request	Close/Open	Close	—	fc_cv_rq	N	RO
FC Evap Valve Status	0 to 8	8	—	fc_ev_st	N	RO
FC Coil Valve Status	0 to 8	8	—	fc_cv_st	N	RO
Glycol Free Option						
FC Coil Pump Cmd	Off/On	Off	—	fc_pump	N	RO
Pump Pres. Calibration?	No/Yes	No	—	PMP_CAL	N	RO

See Legend on page 212.

STATUS/INPUTS — INPUTS STATUS						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Remote On/Off Switch	Open/Close	—	—	ONOFF_SW	N	RO
Remote HeatCool Switch	Open/Close	—	—	HC_SW	N	RO
Remote Setpoint Switch	Open/Close	—	—	SETP_SW	N	RO
Limit Switch 1	Open/Close	—	—	LIM_SW1	N	RO
Limit Switch 2	Open/Close	—	—	LIM_SW2	N	RO
Customer Interlock	Open/Close	—	—	LOCK_SW	N	RO
Flow Switch Status	Open/Close	—	—	FLOW_SW	Y	RO
Desuperheater demand	Open/Close	—	—	DSHTR_SW	N	RO
Remote Interlock Status	Open/Close	—	—	REM_LOCK	N	RO
Occupied Override Switch	Open/Close	—	—	OCC_OVSW	N	RO
Ice Done Storage Switch	Open/Close	—	—	ICE_SW	N	RO
Electrical Box Failure	Open/Close	—	—	ELEC_BOX	N	RO
Compressor A1 failure	Open/Close	—	—	cp_a1_f	N	RO
Compressor A2 failure	Open/Close	—	—	cp_a2_f	N	RO
Compressor A3 failure	Open/Close	—	—	cp_a3_f	N	RO
Compressor A4 failure	Open/Close	—	—	cp_a4_f	N	RO
High Pressure Switch A	Open/Close	—	—	HP_SW_A	N	RO
Compressor B1 failure	Open/Close	—	—	cp_b1_f	N	RO
Compressor B2 failure	Open/Close	—	—	cp_b2_f	N	RO
Compressor B3 failure	Open/Close	—	—	cp_b3_f	N	RO
Compressor B4 failure	Open/Close	—	—	cp_b4_f	N	RO
High Pressure Switch B	Open/Close	—	—	HP_SW_B	N	RO
Leakage detection 1	0.0 to 10.0	0	Volts	leak_v1	N	RO
Leakage detection 2	0.0 to 10.0	0	Volts	leak_v2	N	RO
Setpoint Reset Signal	4 to 20	4	ma	SP_RESET	N	RO
Capacity Limit Control	4 to 20	4	ma	LIM_4_20	N	RO
Remote Reclaim switch	Open/Close	—	—	RECL_SW	N	RO
Is FC Evap Valve Closed?	No/Yes	—	—	fc_ev_ci	N	RO
Is FC Evap Valve Opened?	No/Yes	—	—	fc_ev_oi	N	RO
Is FC Coil Valve Closed?	No/Yes	—	—	fc_cv_ci	N	RO
Is FC Coil Valve Opened?	No/Yes	—	—	fc_cv_oi	N	RO

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

STATUS/MODES — MODES

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Start Up Delay In Effect	No/Yes	—	—	m_delay	N	RO
Second Setpoint In Use	No/Yes	—	—	m_2stpt	N	RO
Reset In Effect	No/Yes	—	—	m_reset	N	RO
Demand limit active	No/Yes	—	—	m_demlim	N	RO
Ramp Loading Active	No/Yes	—	—	m_rpload	N	RO
Water Exchanger Heater	No/Yes	—	—	m_whtr	N	RO
Water Pump Rotation	No/Yes	—	—	m_pmprot	N	RO
Pump Periodic Start	No/Yes	—	—	m_pmpper	N	RO
Low Suction Circuit A	No/Yes	—	—	m_lowsca	N	RO
Low Suction Circuit B	No/Yes	—	—	m_lowscb	N	RO
High DGT Circuit A	No/Yes	—	—	m_hidgta	N	RO
High DGT Circuit B	No/Yes	—	—	m_hidgtb	N	RO
High Press Override CirA	No/Yes	—	—	m_hiprsa	N	RO
High Press Override CirB	No/Yes	—	—	m_hiprsb	N	RO
Low Delta Press Cir A	No/Yes	—	—	m_dltp_a	N	RO
Low Delta Press Cir B	No/Yes	—	—	m_dltp_b	N	RO
Night Low Noise Active	No/Yes	—	—	m_night	N	RO
System Manager Active	No/Yes	—	—	m_hsm	N	RO
Master Slave Active	No/Yes	—	—	m_slave	N	RO
Auto Changeover Active	No/Yes	—	—	m_autoch	N	RO
Defrost Active Circuit A	No/Yes	—	—	m_defr_a	N	RO
Defrost Active Circuit B	No/Yes	—	—	m_defr_b	N	RO
Boiler Active	No/Yes	—	—	m_boiler	N	RO
Electric Heater Active	No/Yes	—	—	m_ehs	N	RO
Heating Low EWT Lockout	No/Yes	—	—	m_ewtlck	N	RO
Ice Mode In Effect	No/Yes	—	—	m_ice	N	RO
Fast Capacity Recovery	No/Yes	—	—	m_fastRe	N	RO

STATUS/MSC_STAT — MSC STATUS

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Eco Pump Mode Active	No/Yes	—	—	m_ecopmp	N	RO

STATUS/OPT_STA — SOFTWARE OPTIONS

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
OPT6: Low Brine	No/Yes	—	—	opt6	N	RO
OPT149: BACnet	No/Yes	—	—	opt149	N	RO
OPT149B: Modbus	No/Yes	—	—	opt149B	N	RO
OPT119C:Cool Floor Optim	No/Yes	—	—	opt119C	N	RO

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

STATUS/OUTPUTS — OUTPUTS STATUS						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Compressor A1	Off/On	—	—	CP_A1	N	RO
Compressor A2	Off/On	—	—	CP_A2	N	RO
Compressor A3	Off/On	—	—	CP_A3	N	RO
Compressor A4	Off/On	—	—	CP_A4	N	RO
Fan A1	Off/On	—	—	FAN_A1	N	RO
Fan A2	Off/On	—	—	FAN_A2	N	RO
Fan A3	Off/On	—	—	FAN_A3	N	RO
Fan A4	Off/On	—	—	FAN_A4	N	RO
Fan A5	Off/On	—	—	FAN_A5	N	RO
Fan A6	Off/On	—	—	FAN_A6	N	RO
Fan Staging Number Cir A	0 to 10	—	—	FAN_ST_A	N	RO
Variable fan A command	0.0 to 100.0	—	%	VFAN_A	N	RO
EXV position Circuit A	0.0 to 100.0	—	%	EXV_A	N	RO
4-way Refrig. Valve A	Off/On	—	—	RV_A	N	RO
Compressor Head Heater A	Off/On	—	—	HD_HTR_A	N	RO
Coil Heater A	Off/On	—	—	CO_HTR_A	N	RO
Hot Gas Bypass Valve A	Off/On	—	—	HGBP_V_A	N	RO
Compressor B1	Off/On	—	—	CP_B1	N	RO
Compressor B2	Off/On	—	—	CP_B2	N	RO
Compressor B3	Off/On	—	—	CP_B3	N	RO
Compressor B4	Off/On	—	—	CP_B4	N	RO
Fan B1	Off/On	—	—	FAN_B1	N	RO
Fan B2	Off/On	—	—	FAN_B2	N	RO
Fan B3	Off/On	—	—	FAN_B3	N	RO
Fan B4	Off/On	—	—	FAN_B4	N	RO
Fan B5	Off/On	—	—	FAN_B5	N	RO
Fan B6	Off/On	—	—	FAN_B6	N	RO
Fan Staging Number Cir B	0 to 10	—	—	FAN_ST_B	N	RO
Variable fan B command	0.0 to 100.0	—	%	VFAN_B	N	RO
EXV position Circuit B	0.0 to 100.0	—	%	EXV_B	N	RO
4-way Refrig. Valve B	Off/On	—	—	RV_B	N	RO
Compressor Head Heater B	Off/On	—	—	HD_HTR_B	N	RO
Coil Heater B	Off/On	—	—	CO_HTR_B	N	RO
Running Relay Status	Off/On	—	—	RUNNING	N	RO
Alarm Relay Status	Off/On	—	—	ALARM	N	RO
Alert Relay State	Off/On	—	—	ALERT	N	RO
Shutdown Indicator State	Off/On	—	—	SHUTDOWN	N	RO
Exchanger Heater	Off/On	—	—	EXCH_HTR	N	RO
Flow Switch Setpoint cfg	Off/On	—	—	SET_FLOW	N	RO
Chiller Capacity Running	0.0 to 10.0	—	Volts	CAPT_010	N	RO
Boiler Output	Off/On	—	—	BOILER	N	RO
Electrical Heat Stage 1	Off/On	—	—	EHS1	N	RO
Electrical Heat Stage 2	Off/On	—	—	EHS2	N	RO
Electrical Heat Stage 3	Off/On	—	—	EHS3	N	RO
Electrical Heat Stage 4	Off/On	—	—	EHS4	N	RO
Desuperheater Pump	Off/On	—	—	DSH_PUMP	N	RO
FC Evap Valve Close Cmd	Off/On	—	—	fc_ev_cc	N	RO
FC Evap Valve Open Cmd	Off/On	—	—	fc_ev_oc	N	RO
FC Coil Valve Close Cmd	Off/On	—	—	fc_cv_cc	N	RO
FC Coil Valve Open Cmd	Off/On	—	—	fc_cv_oc	N	RO
FC Coil Pump Cmd	Off/On	—	—	fc_pump	N	RO

See Legend on page 212.

STATUS/PRESSURE — PRESSURES

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Discharge Pressure A	nnn.n	—	PSI (kPa)	DP_A	Y	RO
Main Suction Pressure A	nnn.n	—	PSI (kPa)	SP_A	Y	RO
Discharge Pressure B	nnn.n	—	PSI (kPa)	DP_B	Y	RO
Main Suction Pressure B	nnn.n	—	PSI (kPa)	SP_B	Y	RO
Inlet unit water pres.	nnn.n	—	PSI (kPa)	PUMP_EWP	N	RO
Outlet unit water pres.	nnn.n	—	PSI (kPa)	PUMP_LWP	N	RO
FC pmp inlet water pres	nnn.n	—	PSI (kPa)	fc_ewp	N	RO
FC pmp outlet water pres	nnn.n	—	PSI (kPa)	fc_lwp	N	RO

STATUS/PUMPSTAT — PUMP STATUS

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Rotate Water Pumps Now?	No/Yes	No	—	ROTWPUMP	N	RW
Water Pump #1 Command	Off/On	Off	—	PUMP_1	N	RW
Water Pump #2 Command	Off/On	Off	—	PUMP_2	N	RW
Outlet Water Pres.(cor)	nnn.n	—	PSI (kPa)	wp_out	N	RO
Inlet Water Pres.(cor)	nnn.n	—	PSI (kPa)	wp_in	N	RO
Water Pres. Calibration?	No	No	—	WP_CAL	N	RW
Water Pressure Offset	nnn.n	—	PSI (kPa)	wp_off	N	RO
Delta Pressure Filter	nnn.n	—	PSI (kPa)	wp_filt	N	RO
Minimum Water Pressure	nnn.n	—	PSI (kPa)	wp_min	N	RO
Water Flow	nnn.n	—	GPS (l/sec)	flow	N	RO
Water Delta T Setpoint	nnn.n	—	^F (^C)	dt_stp	N	RO
Current Water Delta T	nnn.n	—	^F (^C)	delta_t	N	RO
Water Delta P Setpoint	nnn.n	—	PSI (kPa)	dp_stp	N	RO
Current Water Delta P	nnn.n	—	PSI (kPa)	delta_p	N	RO
Variable speed pump cmd	0 to 100	—	%	VPMP_CMD	N	RW

STATUS/RECLAIM — HEAT RECLAIM

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Reclaim Selection	No/Yes	No	—	RECL_SEL	N	RW
Reclaim Status	0 to 10	0	—	HR_stat	N	RO
Reclaim control point	±nnn.n	—	°F (°C)	HRCtrPnt	N	RO
Reclaim controlled water	±nnn.n	—	°F (°C)	HRCtrWat	N	RO
HR Leaving Fluid temp	±nnn.n	—	°F (°C)	HR_LWT	N	RO
Heat Reclaim Flow switch	Open/Close	Open	—	HR_FLOW	N	RO
3WayValve / VarPump cmd	0.0 to 100.0	0	%	cmd_3WV	N	RO
3WayValve / VarPump outp	0.0 to 10.0	0	Volts	out_3WV	N	RO
3WayValve / VarPump mode	0 to 1	0	—	mode_3WV	N	RO
0: Low HR LWT control						
1: HR water temp control						
HR active mode (3WV/Fan)	0 to 1	1	—	actiMode	N	RO
0: 3-way valve mode						
1: Fan mode						
Reclaim pump command	Off/On	Off	—	HR_pump	N	RO
Reclaim BPHE Heater	Off/On	Off	—	HRheater	N	RO

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

STATUS/RUNTIME — RUN TIMES						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Machine Operating Hours	0 to 999999	—	hours	hr_mach	N	RO
Machine Starts Number	0 to 999999	—	—	st_mach	N	RO
Compressor A1 Hours	0 to 999999	—	hours	hr_cp_a1	N	RO
Compressor A2 Hours	0 to 999999	—	hours	hr_cp_a2	N	RO
Compressor A3 Hours	0 to 999999	—	hours	hr_cp_a3	N	RO
Compressor A4 Hours	0 to 999999	—	hours	hr_cp_a4	N	RO
Compressor B1 Hours	0 to 999999	—	hours	hr_cp_b1	N	RO
Compressor B2 Hours	0 to 999999	—	hours	hr_cp_b2	N	RO
Compressor B3 Hours	0 to 999999	—	hours	hr_cp_b3	N	RO
Compressor B4 Hours	0 to 999999	—	hours	hr_cp_b4	N	RO
Compressor A1 Starts	0 to 999999	—	—	st_cp_a1	N	RO
Compressor A2 Starts	0 to 999999	—	—	st_cp_a2	N	RO
Compressor A3 Starts	0 to 999999	—	—	st_cp_a3	N	RO
Compressor A4 Starts	0 to 999999	—	—	st_cp_a4	N	RO
Compressor B1 Starts	0 to 999999	—	—	st_cp_b1	N	RO
Compressor B2 Starts	0 to 999999	—	—	st_cp_b2	N	RO
Compressor B3 Starts	0 to 999999	—	—	st_cp_b3	N	RO
Compressor B4 Starts	0 to 999999	—	—	st_cp_b4	N	RO
Fan A1 Hours	0 to 999999	—	hours	hr_fana1	N	RO
Fan A2 Hours	0 to 999999	—	hours	hr_fana2	N	RO
Fan A3 Hours	0 to 999999	—	hours	hr_fana3	N	RO
Fan A4 Hours	0 to 999999	—	hours	hr_fana4	N	RO
Fan A5 Hours	0 to 999999	—	hours	hr_fana5	N	RO
Fan A6 Hours	0 to 999999	—	hours	hr_fana6	N	RO
Fan A7 Hours	0 to 999999	—	hours	hr_fana7	N	RO
Fan A8 Hours	0 to 999999	—	hours	hr_fana8	N	RO
Fan B1 Hours	0 to 999999	—	hours	hr_fanb1	N	RO
Fan B2 Hours	0 to 999999	—	hours	hr_fanb2	N	RO
Fan B3 Hours	0 to 999999	—	hours	hr_fanb3	N	RO
Fan B4 Hours	0 to 999999	—	hours	hr_fanb4	N	RO
Fan B5 Hours	0 to 999999	—	hours	hr_fanb5	N	RO
Fan B6 Hours	0 to 999999	—	hours	hr_fanb6	N	RO
Fan B7 Hours	0 to 999999	—	hours	hr_fanb7	N	RO
Fan B8 Hours	0 to 999999	—	hours	hr_fanb8	N	RO
Water Pump #1 Hours	0 to 999999	—	hours	hr_pump1	N	RO
Water Pump #2 Hours	0 to 999999	—	hours	hr_pump2	N	RO
Circuit A Defrost Number	0 to 999999	—	—	nb_defra	N	RO
Circuit B Defrost Number	0 to 999999	—	—	nb_defrb	N	RO

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

STATUS/TEMP — TEMPERATURES

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Entering Fluid Temp	±nnn.n	—	°F (°C)	EWT	Y	RO
Leaving Fluid Temp	±nnn.n	—	°F (°C)	LWT	Y	RO
Outdoor Air Temp	±nnn.n	—	°F (°C)	OAT	Y	RO
Saturated Cond Tmp cir A	±nnn.n	—	°F (°C)	SCT_A	Y	RO
Saturated Suction Temp A	±nnn.n	—	°F (°C)	SST_A	Y	RO
Compressor Suction Tmp A	±nnn.n	—	°F (°C)	SUCT_A	N	RO
Suction Superheat Tmp A	±nnn.n	—	°F (°C)	SH_A	N	RO
Discharge Gas Temp A	±nnn.n	—	°F (°C)	DGT_A	N	RO
Mean Disc. Gas Temp A	±nnn.n	—	°F (°C)	DGTM_A	N	RO
Defrost Temperature A	±nnn.n	—	°F (°C)	DEFRT_A	N	RO
Saturated Cond Tmp cir B	±nnn.n	—	°F (°C)	SCT_B	Y	RO
Saturated Suction Temp B	±nnn.n	—	°F (°C)	SST_B	Y	RO
Compressor Suction Tmp B	±nnn.n	—	°F (°C)	SUCT_B	N	RO
Suction Superheat Tmp B	±nnn.n	—	°F (°C)	SH_B	N	RO
Discharge Gas Temp B	±nnn.n	—	°F (°C)	DGT_B	N	RO
Mean Disc. Gas Temp B	±nnn.n	—	°F (°C)	DGTM_B	N	RO
Defrost Temperature B	±nnn.n	—	°F (°C)	DEFRT_B	N	RO
Optional Space Temp	±nnn.n	—	°F (°C)	SPACETMP	N	RO
Cold Water System Temp	±nnn.n	—	°F (°C)	CHWSTEMP	Y	RO
Reclaim controlled water	±nnn.n	—	°F (°C)	HRCtrWat	N	RO
HR Leaving Fluid temp	±nnn.n	—	°F (°C)	HR_LWT	N	RO
FC Evap Water Temp	±nnn.n	—	°F (°C)	FC_EV_WT	N	RO
FC Glycol Water Temp	±nnn.n	—	°F (°C)	FC_WGT	N	RO

MAINTENANCE/ALARMST — RESET ALARMS

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Alarm Reset	No/Yes	No	—	RST_ALM	N	RO
Alarm State	Normal / Partial / Shutdown	—	—	ALM	Y	RO
Current Alarm 1	nnnnn	—	—	alarm_1c	N	RO
Current Alarm 2	nnnnn	—	—	alarm_2c	N	RO
Current Alarm 3	nnnnn	—	—	alarm_3c	N	RO
Current Alarm 4	nnnnn	—	—	alarm_4c	N	RO
Current Alarm 5	nnnnn	—	—	alarm_5c	N	RO
Current Alarm 1 index	nn	—	—	alarm_1	N	RO
Current Alarm 2 index	nn	—	—	alarm_2	N	RO
Current Alarm 3 index	nn	—	—	alarm_3	N	RO
Current Alarm 4 index	nn	—	—	alarm_4	N	RO
Current Alarm 5 index	nn	—	—	alarm_5	N	RO

See Legend on page 212.

MAINTENANCE/DCT1 — CIRCUIT A						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Cir A Total Capacity	0 to 100	—	%	CAPA_T	N	RO
High Pressure Switch A	Open/Close	Open	—	HP_SW_A	N	RO
Compressor A1	Off/On	Off	—	CP_A1	N	RO
Compressor A2	Off/On	Off	—	CP_A2	N	RO
Compressor A3	Off/On	Off	—	CP_A3	N	RO
Compressor A4	Off/On	Off	—	CP_A4	N	RO
Fan Staging Number Cir A	0 to 10	0	—	FAN_ST_A	N	RO
Variable fan A command	0.0 to 100.0	—	%	VFAN_A	N	RO
Discharge Pressure A	nnn.n	—	PSI (kPa)	DP_A	N	RO
Main Suction Pressure A	nnn.n	—	PSI (kPa)	SP_A	N	RO
Saturated Cond Tmp cir A	±nnn.n	—	°F (°C)	SCT_A	N	RO
Saturated Suction Temp A	±nnn.n	—	°F (°C)	SST_A	N	RO
Compressor Suction Tmp A	±nnn.n	—	°F (°C)	SUCT_A	N	RO
Suction Superheat Tmp A	±nnn.n	—	^F (^C)	SH_A	N	RO
SH Setpoint Circuit A	±nnn.n	—	^F (^C)	sh_sp_a	N	RO
Cooler Exchange DT Cir A	±nnn.n	—	^F (^C)	pinch_a	N	RO
EXV position Circuit A	0.0 to 100.0	0	%	EXV_A	N	RO
EXV value A	±nnn.n	—	%	exv_v_a	N	RO
EXV Override Circuit A	–1 to 109	—	—	ov_exv_a	N	RO
SCT Control Point Cir A	32.0 to 150.0 0.0 to 65.6	32.0 0.0	°F (°C)	sct_ct_a	N	RO
Minimum SCT Threshold A	±nnn.n	—	°F (°C)	minSct_a	N	RO
H P Ctrl Override Cir A	0 to 90	—	—	ov_hd_a	N	RO
SCT limit Calculation	±nnn.n	—	°F (°C)	sctlim_a	N	RO
Mean SCT Calculation	±nnn.n	—	°F (°C)	sct_dm_a	N	RO
Mean SST Calculation	±nnn.n	—	°F (°C)	sst_dm_a	N	RO
Low Suction Circuit A	No/Yes	—	—	m_lowsca	N	RO
High DGT Circuit A	No/Yes	—	—	m_hidgta	N	RO
High Press Override CirA	No/Yes	—	—	m_hiprsa	N	RO
Low Delta Press Cir A	No/Yes	—	—	m_dltp_a	N	RO

See Legend on page 212.

MAINTENANCE/DCT1 — CIRCUIT B

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Cir B Total Capacity	0 to 100	—	%	CAPB_T	N	RO
High Pressure Switch B	Open/Close	Open	—	HP_SW_B	N	RO
Compressor B1	Off/On	Off	—	CP_B1	N	RO
Compressor B2	Off/On	Off	—	CP_B2	N	RO
Compressor B3	Off/On	Off	—	CP_B3	N	RO
Compressor B4	Off/On	Off	—	CP_B4	N	RO
Fan Staging Number Cir B	0 to 10	0	—	FAN_ST_B	N	RO
Variable fan B command	0.0 to 100.0	—	%	VFAN_B	N	RO
Discharge Pressure B	nnn.n	—	PSI (kPa)	DP_B	N	RO
Main Suction Pressure B	nnn.n	—	PSI (kPa)	SP_B	N	RO
Saturated Cond Tmp cir B	±nnn.n	—	°F (°C)	SCT_B	N	RO
Saturated Suction Temp B	±nnn.n	—	°F (°C)	SST_B	N	RO
Compressor Suction Tmp B	±nnn.n	—	°F (°C)	SUCT_B	N	RO
Suction Superheat Tmp B	±nnn.n	—	^F (^C)	SH_B	N	RO
SH Setpoint Circuit B	±nnn.n	—	^F (^C)	sh_sp_b	N	RO
Cooler Exchange DT Cir B	±nnn.n	—	^F (^C)	pinch_b	N	RO
EXV position Circuit B	0.0 to 100.0	0	%	EXV_B	N	RO
EXV value B	±nnn.n	—	%	exv_v_b	N	RO
EXV Override Circuit B	–1 to 109	—	—	ov_exv_b	N	RO
SCT Control Point Cir B	32.0 to 150.0 0.0 to 65.6	32.0 0.0	°F (°C)	sct_ct_b	N	RO
Minimum SCT Threshold B	±nnn.n	—	°F (°C)	minSct_b	N	RO
H P Ctrl Override Cir B	0 to 90	—	—	ov_hd_b	N	RO
SCT limit Calculation	±nnn.n	—	°F (°C)	sctlim_b	N	RO
Mean SCT Calculation	±nnn.n	—	°F (°C)	sct_dm_b	N	RO
Mean SST Calculation	±nnn.n	—	°F (°C)	sst_dm_b	N	RO
Low Suction Circuit B	No/Yes	—	—	m_lowscb	N	RO
High DGT Circuit B	No/Yes	—	—	m_hidgtb	N	RO
High Press Override CirB	No/Yes	—	—	m_hiprsb	N	RO
Low Delta Press Cir B	No/Yes	—	—	m_dltp_b	N	RO

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

MAINTENANCE/DCT2						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
GENERIC						
Local=0 Net.=1 Remote=2	0 to 2	0	—	CTRL_TYP	N	RO
Run Status	Off / Stopping / Delay / Running Ready / Override / Trip Out / Test	—	—	STATUS	N	RO
Heat/Cool status	Cool/Heat	Cool	—	HEATCOOL	N	RO
Active Demand Limit Val	0 to 100	—	%	DEM_LIM	N	RO
Minutes Left for Start	nn.n	—	min	min_left	N	RO
Unit Total Capacity	0 to 100	—	%	CAP_T	N	RO
Current Setpoint	±nnn.n	—	°F (°C)	SP	N	RO
Control Point	–4.0 to 153.0 (–20.0 to 67.2)	—	°F (°C)	CTRL_PNT	N	RO
Outdoor Air Temp	–4.0 to 153.0 (–20.0 to 67.2)	—	°F (°C)	OAT	N	RO
Entering Fluid Temp	±nnn.n	—	°F (°C)	EWT	N	RO
Leaving Fluid Temp	±nnn.n	—	°F (°C)	LWT	N	RO
Discharge Gas Temp A	±nnn.n	—	°F (°C)	DGT_A	N	RO
Discharge Gas Temp B	±nnn.n	—	°F (°C)	DGT_B	N	RO
Flow Switch Status	Open/Close	—	—	FLOW_SW	N	RO
Flow Switch Cfg status	0 to 8	—	—	flowSw_s	N	RO
Alarm State	Normal / Partial / Shutdown	—	—	ALM	N	RO
Current Alarm 1	nnnnn	—	—	alarm_1c	N	RO
Current Alarm 2	nnnnn	—	—	alarm_2c	N	RO
Current Alarm 3	nnnnn	—	—	alarm_3c	N	RO
Current Alarm 4	nnnnn	—	—	alarm_4c	N	RO
Current Z Multiplier Val	n.n	—	—	zm	N	RO
Load/Unload Factor	nnn.n	—	%	smz	N	RO
Active Capacity Override	0 to 74	—	—	over_cap	N	RO
Exchanger Heater	Off/On	—	—	EXCH_HTR	N	RO
HEAT PUMP						
4-way Refrig. Valve A	Off/On	—	—	RV_A	N	RO
Exchanger Frost Factor	0 to 100	0	%	frost_a	N	RO
Defrost Temperature	±nnn.n	—	°F (°C)	DEFRT_A	N	RO
Next Sequence Allowed in	nnn	—	min	def_se_a	N	RO
Defrost Active?	No/Yes	No	—	def_ac_a	N	RO
Defrost Duration	—	—	min	defr_dua	N	RO
Override State	nnn	—	—	over_d_a	N	RO
4-way Refrig. Valve B	Off/On	—		RV_B	N	RO
Exchanger Frost Factor	0 to 100	0	%	frost_b	N	RO
Defrost Temperature	±nnn.n	—	°F (°C)	DEFRT_B	N	RO
Next Sequence Allowed in	nnn	—	min	def_se_b	N	RO
Defrost Active?	No/Yes	No	—	def_ac_b	N	RO
Defrost Duration	—	—	min	defr_dub	N	RO
Override State	nnn	—	—	over_d_b	N	RO
ENERGY						
Cooling capacity	nnn.n	—	KW	coolCapa	N	RO
Compressor power	nnn.n	—	KW	cmp_pwra	N	RO
Fan power	nnn.n	—	KW	fan_pwra	N	RO
Cooling capacity	nnn.n	—	KW	coolCapb	N	RO
Compressor power	nnn.n	—	KW	cmp_pwrb	N	RO
Fan power	nnn.n	—	KW	fan_pwrb	N	RO

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

MAINTENANCE/DEFROST — DEFROST						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
CIR A DEFROST CONTROL						
Next Sequence Allowed in	nnn	—	min	def_se_a	N	RO
Exchanger Frost Factor	nnn	—	%	frost_a	N	RO
Defrost Active?	No/Yes	No	—	def_ac_a	N	RO
Override State	nnn	—	—	over_d_a	N	RO
Defrost Temperature	±nnn.n	—	°F (°C)	DEFRT_A	N	RO
Frost Duration	nn.n	—	min	frst_dua	N	RO
Defrost Duration	nn.n	—	min	defr_dua	N	RO
Fan Sequence Started?	—	—	—	def_fa_a	N	RO
SST Limit Cir A	±nnn.n	—	°F (°C)	sstLim_a	N	RO
SCT limit Calculation	±nnn.n	—	°F (°C)	sctlim_a	N	RO
Mean SCT Calculation	±nnn.n	—	°F (°C)	sct_dm_a	N	RO
Mean SST Calculation	±nnn.n	—	°F (°C)	sst_dm_a	N	RO
Delta: OAT - Mean SST	±nnn.n	—	^F (^C)	delt_a	N	RO
Reference Delta	±nnn.n	—	^F (^C)	delt_r_a	N	RO
Delta - Reference Delta	±nnn.n	—	^F (^C)	delt_v_a	N	RO
Frost Integrator Gain	nnn.n	—	—	fr_int_a	N	RO
Defrost Fan Start Cal A	nnn.n	—	PSI (kPa)	def_ca_a	N	RO
Defrost Fan Offset Cal A	nnn.n	—	PSI (kPa)	def_of_a	N	RO
CIR B DEFROST CONTROL						
Next Sequence Allowed in	nnn	—	min	def_se_b	N	RO
Exchanger Frost Factor	nnn	—	%	frost_b	N	RO
Defrost Active?	No/Yes	No	—	def_ac_b	N	RO
Override State	nnn	—	—	over_d_b	N	RO
Defrost Temperature	±nnn.n	—	°F (°C)	DEFRT_B	N	RO
Frost Duration	nn.n	—	min	frst_dub	N	RO
Defrost Duration	nn.n	—	min	defr_dub	N	RO
Fan Sequence Started?	—	—	—	def_fa_b	N	RO
SST Limit Cir B	±nnn.n	—	°F (°C)	sstLim_b	N	RO
SCT limit Calculation	±nnn.n	—	°F (°C)	sctlim_b	N	RO
Mean SCT Calculation	±nnn.n	—	°F (°C)	sct_dm_b	N	RO
Mean SST Calculation	±nnn.n	—	°F (°C)	sst_dm_b	N	RO
Delta: OAT - Mean SST	±nnn.n	—	^F (^C)	delt_b	N	RO
Reference Delta	±nnn.n	—	^F (^C)	delt_r_b	N	RO
Delta - Reference Delta	±nnn.n	—	^F (^C)	delt_v_b	N	RO
Frost Integrator Gain	nnn.n	—	—	fr_int_b	N	RO
Defrost Fan Start Cal B	nnn.n	—	PSI (kPa)	def_ca_b	N	RO
Defrost Fan Offset Cal B	nnn.n	—	PSI (kPa)	def_of_b	N	RO
Free Defr Allowed Timer						
Water below ctrl_pnt	nnn	—	hours	FrDfrTmr	N	RO

See Legend on page 212.

MAINTENANCE/DRV_CTRL — DRIVE MAINTENANCE						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
DRIVE 1: FAN A1						
Fan Drive A Enabled?	No/Yes	—	—	drv_en_1	N	RO
Fan Drive A Com Ok?	No/Yes	—	—	DRVCOM_1	N	RO
DRIVE 2: FAN A2						
Fan Drive A2 Enabled?	No/Yes	—	—	drv_en_2	N	RO
Fan Drive A2 Com Ok?	No/Yes	—	—	DRVCOM_2	N	RO
DRIVE 3: FAN B1						
Fan Drive B Enabled?	No/Yes	—	—	drv_en_3	N	RO
Fan Drive B Com Ok?	No/Yes	—	—	DRVCOM_3	N	RO
DRIVE 4: FAN B2						
Fan Drive B2 Enabled?	No/Yes	—	—	drv_en_4	N	RO
Fan Drive B2 Com Ok?	No/Yes	—	—	DRVCOM_4	N	RO
DRIVE 5: WATER PUMP 1						
Pump Drive 1 Enabled?	No/Yes	—	—	drv_en_5	N	RO
Pump Drive 1 Com Ok?	No/Yes	—	—	DRVCOM_5	N	RO
DRIVE 6: WATER PUMP 2						
Pump Drive 2 Enabled?	No/Yes	—	—	drv_en_6	N	RO
Pump Drive 2 Com Ok?	No/Yes	—	—	DRVCOM_6	N	RO
DRIVE ADDRESS SETUP						
Attach LEN Drive	0 to 6 1/2 = FA1/FA2 3/4 = FB1/FB2 5/6 = P1/P2	0	—	SET_DRV	N	RW

See Legend on page 212.

MAINTENANCE/DRV_CTL2 — DRIVE MAINTENANCE 2						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
DRIVE 1: FAN A1						
Fan Drive A Power	nnn.n	—	KW	drvpwr_1	N	RO
Fan Drive A Current	nnn.n	—	AMPS	drv_I_1	N	RO
Fan Drive A Nom. Cur.	nnn.n	—	AMPS	drv_nI_1	N	RO
Fan Drive A Cur. Limit	nnn.n	—	AMPS	drv_CL_1	N	RO
Fan Drive A Voltage	nnn.n	—	Volts	drv_V_1	N	RO
Fan Drive A Frequency	nnn.n	—	Hz	drv_F_1	N	RO
Fan Drive A Torque	nnn.n	—	—	drv_T_1	N	RO
Fan Drive A Command	0.0 to 100.0	—	%	drvCmd_1	N	RO
DRIVE 2: FAN A2						
Fan Drive A2 Power	nnn.n	—	KW	drvpwr_2	N	RO
Fan Drive A2 Current	nnn.n	—	AMPS	drv_I_2	N	RO
Fan Drive A2 Nom. Cur.	nnn.n	—	AMPS	drv_nI_2	N	RO
Fan Drive A2 Cur. Limit	nnn.n	—	AMPS	drv_CL_2	N	RO
Fan Drive A2 Voltage	nnn.n	—	Volts	drv_V_2	N	RO
Fan Drive A2 Frequency	nnn.n	—	Hz	drv_F_2	N	RO
Fan Drive A2 Torque	nnn.n	—	—	drv_T_2	N	RO
Fan Drive A2 Command	0.0 to 100.0	—	%	drvCmd_2	N	RO
DRIVE 3: FAN B1						
Fan Drive B Power	nnn.n	—	KW	drvpwr_3	N	RO
Fan Drive B Current	nnn.n	—	AMPS	drv_I_3	N	RO
Fan Drive B Nom. Cur.	nnn.n	—	AMPS	drv_nI_3	N	RO
Fan Drive B Cur. Limit	nnn.n	—	AMPS	drv_CL_3	N	RO
Fan Drive B Voltage	nnn.n	—	Volts	drv_V_3	N	RO
Fan Drive B Frequency	nnn.n	—	Hz	drv_F_3	N	RO
Fan Drive B Torque	nnn.n	—	—	drv_T_3	N	RO
Fan Drive B Command	0.0 to 100.0	—	%	drvCmd_3	N	RO
DRIVE 4: FAN B2						
Fan Drive B2 Power	nnn.n	—	KW	drvpwr_4	N	RO
Fan Drive B2 Current	nnn.n	—	AMPS	drv_I_4	N	RO
Fan Drive B2 Nom. Cur.	nnn.n	—	AMPS	drv_nI_4	N	RO
Fan Drive B2 Cur. Limit	nnn.n	—	AMPS	drv_CL_4	N	RO
Fan Drive B2 Voltage	nnn.n	—	Volts	drv_V_4	N	RO
Fan Drive B2 Frequency	nnn.n	—	Hz	drv_F_4	N	RO
Fan Drive B2 Torque	nnn.n	—	—	drv_T_4	N	RO
Fan Drive B2 Command	0.0 to 100.0	—	%	drvCmd_4	N	RO
DRIVE 5: WATER PUMP 1						
Pump Drive 1 Power	nnn.n	—	KW	drvpwr_5	N	RO
Pump Drive 1 Current	nnn.n	—	AMPS	drv_I_5	N	RO
Pump Drive 1 Nom. Cur.	nnn.n	—	AMPS	drv_nI_5	N	RO
Pump Drive 1 Cur. Limit	nnn.n	—	AMPS	drv_CL_5	N	RO
Pump Drive 1 Voltage	nnn.n	—	Volts	drv_V_5	N	RO
Pump Drive 1 Frequency	nnn.n	—	Hz	drv_F_5	N	RO
Pump Drive 1 Torque	nnn.n	—	—	drv_T_5	N	RO
Pump Drive 1 Command	0.0 to 100.0	—	%	drvCmd_5	N	RO
DRIVE 6: WATER PUMP 2						
Pump Drive 2 Power	nnn.n	—	KW	drvpwr_6	N	RO
Pump Drive 2 Current	nnn.n	—	AMPS	drv_I_6	N	RO
Pump Drive 2 Nom. Cur.	nnn.n	—	AMPS	drv_nI_6	N	RO
Pump Drive 2 Cur. Limit	nnn.n	—	AMPS	drv_CL_6	N	RO
Pump Drive 2 Voltage	nnn.n	—	Volts	drv_V_6	N	RO
Pump Drive 2 Frequency	nnn.n	—	Hz	drv_F_6	N	RO
Pump Drive 2 Torque	nnn.n	—	—	drv_T_6	N	RO
Pump Drive 2 Command	0.0 to 100.0	—	%	drvCmd_6	N	RO

See Legend on page 212.

MAINTENANCE/DRV_LAST_POR — LAST POWERON RESET						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Power On 1:day-mon-year	dd/mm/yyyy	—	—	date_on1	N	RO
Power On 1:hour-minute	hh:mn	—	—	time_on1	N	RO
PowerDown 1:day-mon-year	dd/mm/yyyy	—	—	date_of1	N	RO
PowerDown 1:hour-minute	hh:mn	—	—	time_of1	N	RO
PowerDown 1:reason	1 = Reboot required by software application 2 = Application crash 3 = Power loss 4 = Watchdog 5 = Unidentified	—	—	rebreas1	N	RO
Power On 2:day-mon-year	dd/mm/yyyy	—	—	date_on2	N	RO
Power On 2:hour-minute	hh:mn	—	—	time_on2	N	RO
PowerDown 2:day-mon-year	dd/mm/yyyy	—	—	date_of2	N	RO
PowerDown 2:hour-minute	hh:mn	—	—	time_of2	N	RO
PowerDown 2:reason	1 = Reboot required by software application 2 = Application crash 3 = Power loss 4 = Watchdog 5 = Unidentified	—	—	rebreas2	N	RO
Power On 3:day-mon-year	dd/mm/yyyy	—	—	date_on3	N	RO
Power On 3:hour-minute	hh:mn	—	—	time_on3	N	RO
PowerDown 3:day-mon-year	dd/mm/yyyy	—	—	date_of3	N	RO
PowerDown 3:hour-minute	hh:mn	—	—	time_of3	N	RO
PowerDown 3:reason	1 = Reboot required by software application 2 = Application crash 3 = Power loss 4 = Watchdog 5 = Unidentified	—	—	rebreas3	N	RO
Power On 4:day-mon-year	dd/mm/yyyy	—	—	date_on4	N	RO
Power On 4:hour-minute	hh:mn	—	—	time_on4	N	RO
PowerDown 4:day-mon-year	dd/mm/yyyy	—	—	date_of4	N	RO
PowerDown 4:hour-minute	hh:mn	—	—	time_of4	N	RO
PowerDown 4:reason	1 = Reboot required by software application 2 = Application crash 3 = Power loss 4 = Watchdog 5 = Unidentified	—	—	rebreas4	N	RO
Power On 5:day-mon-year	dd/mm/yyyy	—	—	date_on5	N	RO
Power On 5:hour-minute	hh:mn	—	—	time_on5	N	RO
PowerDown 5:day-mon-year	dd/mm/yyyy	—	—	date_of5	N	RO
PowerDown 5:hour-minute	hh:mn	—	—	time_of5	N	RO
PowerDown 5:reason	1 = Reboot required by software application 2 = Application crash 3 = Power loss 4 = Watchdog 5 = Unidentified	—	—	rebreas5	N	RO
Capacity At Power Down	0 to 100	—	%	cap_off	N	RO

See Legend on page 212.

MAINTENANCE/LOADFACT — CAPACITY CONTROL						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Average Ctrl Water Temp	±nnn.n	—	°F (°C)	ctrl_avg	N	RO
Differential Water Temp	±nnn.n	—	°F (°C)	diff_wt	N	RO
Water Delta T	±nnn.n	—	^F (^C)	delta_t	N	RO
Control Point	–4.0 to 153.0 (–20.0 to 67.2)	0	°F (°C)	CTRL_PNT	N	RO
Reset Amount	±nnn.n	—	^F (^C)	reset	N	RO
Controlled Temp Error	±nnn.n	—	^F (^C)	tp_error	N	RO
Actual Capacity	0 to 100	—	%	cap_t	N	RO
Actual Capacity Limit	0 to 100	—	%	cap_lim	N	RO
Current Z Multiplier Val	n.n	—	—	zm	N	RO
Load/Unload Factor	nnn.n	—	%	smz	N	RO
Active Stage Number	n	—	—	cur_stag	N	RO
Active Capacity Override	0 to 74	—	—	over_cap	N	RO
H P Ctrl Override Cir A	0 to 90	—	—	ov_hd_a	N	RO
SCT Control Point Cir A	32.0 to 150.0 0.0 to 65.6	32.0 0.0	°F (°C)	sct_ct_a	N	RW
Minimum SCT Threshold A	±nnn.n	—	°F (°C)	minSct_a	N	RO
SH Setpoint Circuit A	±nnn.n	—	^F (^C)	sh_sp_a	N	RO
Cooler Exchange DT Cir A	±nnn.n	—	^F (^C)	pinch_a	N	RO
Cooler Pinch Ctl Point A	±nnn.n	—	^F (^C)	pinc_spa	N	RO
EXV Override Circuit A	–1 to 109	—	—	ov_exv_a	N	RO
EXV value A	±nnn.n	—	%	exv_v_a	N	RO
H P Ctrl Override Cir B	0 to 90	—	—	ov_hd_b	N	RO
SCT Control Point Cir B	32.0 to 150.0 0.0 to 65.6	32.0 0.0	°F (°C)	sct_ct_b	N	RW
Minimum SCT Threshold B	±nnn.n	—	°F (°C)	minSct_b	N	RO
SH Setpoint Circuit B	±nnn.n	—	^F (^C)	sh_sp_b	N	RO
Cooler Exchange DT Cir B	±nnn.n	—	^F (^C)	pinch_b	N	RO
Cooler Pinch Ctl Point B	±nnn.n	—	^F (^C)	pinc_spb	N	RO
EXV Override Circuit B	–1 to 109	—	—	ov_exv_b	N	RO
EXV value B	±nnn.n	—	%	exv_v_b	N	RO
EHS Ctrl Override	nnn	—	—	over_ehs	N	RO
Requested Electric Stage	n	—	—	eh_stage	N	RO
Electrical Pulldown?	False/True	False	—	ehspulld	N	RO
EHS status	0 to 2	—	—	ehs_stat	N	RO
Required Cooling Power	nnnn	—	KW	req_pwr	N	RO
Flow Switch Cfg status	0 to 8	—	—	flowSw_s	N	RO
Hydronic Kit Status	nnn	—	—	hydKit_s	N	RO
Greenspeed Charging Mode	Off/On	Off	—	sct_c_m	N	RW

See Legend on page 212.

APPENDIX B — CCN POINT TABLE (cont)

MAINTENANCE/M_MSTSLV — MASTER SLAVE CONTROL						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Unit is Master or Slave	Disable / Master / Slave	Disable	—	mstslv	N	RO
Master Control Type	Local / Net / Remote	Local	—	ms_ctrl	N	RO
Master/Slave Ctrl Active	False / True	False	—	ms_activ	N	RO
Lead Unit is the:	Master / Slave	Master	—	lead_sel	N	RO
Slave Chiller State	0 = Chiller Off / 1 = Chiller On / 2 = Chiller In Local Operating Mode / 3 = Chiller Restarted / 4 = Chiller Fault	0	—	slv_stat	N	RO
Slave Chiller Total Cap	0 to 100	—	%	slv_capt	N	RO
Lag Start Delay	nn	—	min	l_strt_d	N	RO
Lead/lag Hours Delta	0 to 999999	—	hours	ll_hr_d	N	RO
Lead/lag Changeover?	No/Yes	No	—	ll_chang	N	RO
Lead Pulldown ?	No/Yes	No	—	ll_pull	N	RO
Master/Slave Error	0 to 16	—	—	ms_error	N	RO
Max Available Capacity ?	No/Yes	No	—	cap_max	N	RO
Max FC available cap ?	No/Yes	No	—	fcCapMax	N	RO
Slave lagstat	0 to 1	—	—	lagstat	N	RO
Slave Operating Hours	0 to 999999	—	hours	slav_hr	N	RO
Slave Entering Fluid	±nnn.n	—	°F (°C)	slav_ewt	N	RO
Slave Leaving Fluid	±nnn.n	—	°F (°C)	slav_lwt	N	RO

See Legend on page 212.

MAINTENANCE/QCK_TST1 — QUICK TEST #1						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Unit must be in Loff						
Quick Test Enable	No/Yes	No	—	QCK_TEST	N	RO
Pump #1 Output	0 to 2	0	—	Q_PUMP_1	N	RO
Pump #2 Output	0 to 2	0	—	Q_PUMP_2	N	RO
Variable Pump Speed #1	0 to 100	0	%	Q_VPUMP1	N	RO
Variable Pump Speed #2	0 to 100	0	%	Q_VPUMP2	N	RO
Exchanger Heater Output	Off/On	Off	—	Q_HEATER	N	RO
Alarm Relay Status	Off/On	Off	—	Q_ALARM	N	RO
Running Relay Status	Off/On	Off	—	Q_RUN	N	RO
Set Flow Switch	Off/On	Off	—	Q_SETFLO	N	RO
Reverse Vlv Output Cir A	Off/On	Off	—	Q_RV_A	N	RO
Fan A1 Output	Off/On	Off	—	Q_FAN_A1	N	RO
Fan A2 Output	Off/On	Off	—	Q_FAN_A2	N	RO
Fan A3 Output	Off/On	Off	—	Q_FAN_A3	N	RO
Fan A4 Output	Off/On	Off	—	Q_FAN_A4	N	RO
Fan A5 Output	Off/On	Off	—	Q_FAN_A5	N	RO
Fan A6 Output	Off/On	Off	—	Q_FAN_A6	N	RO
Variable Fan Speed A	0 to 100	0	%	Q_VFAN_A	N	RO
EXV Position Circuit A	0 to 100	0	%	Q_EXV_A	N	RO
Compressor Head Heater A	Off/On	Off	—	Q_HD_HTA	N	RO
Reverse Vlv Output Cir B	Off/On	Off	—	Q_RV_B	N	RO
Fan B1 Output	Off/On	Off	—	Q_FAN_B1	N	RO
Fan B2 Output	Off/On	Off	—	Q_FAN_B2	N	RO
Fan B3 Output	Off/On	Off	—	Q_FAN_B3	N	RO
Fan B4 Output	Off/On	Off	—	Q_FAN_B4	N	RO
Fan B5 Output	Off/On	Off	—	Q_FAN_B5	N	RO
Fan B6 Output	Off/On	Off	—	Q_FAN_B6	N	RO
Variable Fan Speed B	0 to 100	0	%	Q_VFAN_B	N	RO
EXV Position Circuit B	0 to 100	0	%	Q_EXV_B	N	RO
Compressor Head Heater B	Off/On	Off	—	Q_HD_HTB	N	RO
High Pressure Test	0 to 4	0	—	HP_TEST	N	RO
1: HP test on cir A						
2: HP test on cir B						
3: N/A						
4: HP test on both cir						
HEAT RECLAIM						
Reclaim pump command	Off/On	Off	—	QHR_PMP	N	RO
Reclaim 3Way Valve cmd	0 to 100	0	%	QHR_3WV	N	RO
Reclaim BPHE Heater	Off/On	Off	—	QHR_HTR	N	RO
HYDRAULIC FREE COOLING						
FC Evaporator Valve	Close/Open	Close	—	Q_FC_EV	N	RO
FC Coil Valve	Close/Open	Close	—	Q_FC_CV	N	RO
FC Coil Pump	Off/On	Off	—	Q_FC_PMP	N	RO

See Legend on page 212.

MAINTENANCE/QCK_TST2 — QUICK TEST #2						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Unit must be in Loff						
ENERGY MANAGEMENT						
Total Capacity Output	0 to 100	0	%	Q_CAP010	N	RO
Compressor A1 Output	Off/On	Off	—	Q_CPA1	N	RO
Compressor A2 Output	Off/On	Off	—	Q_CPA2	N	RO
Compressor A3 Output	Off/On	Off	—	Q_CPA3	N	RO
Compressor A4 Output	Off/On	Off	—	Q_CPA4	N	RO
Quick test Status A	0 to 10x	0	—	q_stat_a	N	RO
Compressor B1 Output	Off/On	Off	—	Q_CPB1	N	RO
Compressor B2 Output	Off/On	Off	—	Q_CPB2	N	RO
Compressor B3 Output	Off/On	Off	—	Q_CPB3	N	RO
Compressor B4 Output	Off/On	Off	—	Q_CPB4	N	RO
Quick test Status B	0 to 10x	0	—	q_stat_b	N	RO
Boiler Output	Off/On	Off	—	Q_BOILER	N	RO
Alert Relay Switch	Off/On	Off	—	Q_ALERT	N	RO
Shutdown Relay Status	Off/On	Off	—	Q_SHUTD	N	RO
Electric heat stage #1	Off/On	Off	—	Q_EHS1	N	RO
Electric heat stage #2	Off/On	Off	—	Q_EHS2	N	RO
Electric heat stage #3	Off/On	Off	—	Q_EHS3	N	RO
Electric heat stage #4	Off/On	Off	—	Q_EHS4	N	RO
Desuperheater Pump	Off/On	Off	—	Q_DH_PMP	N	RO
Coil Heater A	Off/On	Off	—	Q_CO_HTA	N	RO
Coil Heater B	Off/On	Off	—	Q_CO_HTB	N	RO
DC FREE COOLING						
DCFC Water Valve Ouputs	Off/On	Off	—	Q_FDC_WV	N	RO
DCFC Variable Fan Speed	0 to 100	0	%	Q_FDC_VF	N	RO
DCFC Simple Fan Number	0 to 7	0	—	Q_FDC_SF	N	RO
HOT GAS BYPASS						
Hot Gas Bypass Valve A	Off/On	Off	—	Q_HGBPVA	N	RO

MAINTENANCE/SERMAINT — SERVICE MAINTENANCE						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Reset Maintenance Alert	0 to 5	0	—	S_RESET	N	RW
GEN. SERVICING DELAYS						
1-Next Service Mntn						
Date of Maintenance	Disable by default, Else dd/mm/yy	Disable	—	s_date	N	RO
Hour of Maintenance	Disable by default, Else hh:mn	Disable	—	s_hour	N	RO
Operating Days until Mntn	Disable by default, Else nnn	Disable	—	s_days	N	RO
REGULATORY SERVICING						
2-F-Gas Check						
Fgas seal check remind	Disable by default, Else dd/mm/yy	Disable	—	f_date	N	RO
3-Glycol Corrosion Check						
Glycol corr check remind	Disable by default, Else dd/mm/yy	Disable	—	glycDate	N	RO

See Legend on page 212.

MAINTENANCE/SYSVER — SYSTEM VERSION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
SIOB A CESR Number	—	—	—	sr_sioba	N	RO
SIOB B CESR Number	—	—	—	sr_siobb	N	RO
SIOB EMM CESR Number	—	—	—	sr_siobe	N	RO
AUX2 FAN@83 CESR Number	—	—	—	sr_aux21	N	RO
AUX2 FAN@84 CESR Number	—	—	—	sr_aux22	N	RO
AUX1 VFAN@86 CESR Number	—	—	—	sr_aux11	N	RO
AUX1 DCFC@90 CESR Number	—	—	—	sr_aux12	N	RO

CONFIGURATION/BACKUP — BACKUP CONFIGURATION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Boiler OAT Threshold	5.0 to 59.0 –15.0 to 15.0	14.0 –10.0	°F (°C)	boil_th	N	RW
Elec Stage OAT Threshold	23.0 to 70.0 –5.0 to 21.0	41.0 5.0	°F (°C)	ehs_th	N	RW
Electrical Pulldown Time	0 to 60	0	min	ehs_pull	N	RW
Last EHS for backup	No/Yes	No	—	ehs_back	N	RW
Quick EHS for defrost	No/Yes	No	—	ehs_defr	N	RW
EHS Proportional Gain	–20 to 20	2	—	ehs_kp	N	RW
EHS Integral Gain	–5 to 5	0	—	ehs_ki	N	RW
EHS Derivative Gain	–20 to 20	0	—	ehs_kd	N	RW

CONFIGURATION/EMAILCFG — EMAIL CONFIGURATION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Sender Email Part1	—	—	—	senderP1	N	RW
@						
Sender Email Part2	—	—	—	senderP2	N	RW
Recip1 Email Part1	—	—	—	recip1P1	N	RW
@						
Recip1 Email Part2	—	—	—	recip1P2	N	RW
Recip2 Email Part1	—	—	—	recip2P1	N	RW
@						
Recip2 Email Part2	—	—	—	recip2P2	N	RW
SMTP IP Addr Part 1	0 to 255	0	—	smtpP1	N	RW
SMTP IP Addr Part 2	0 to 255	0	—	smtpP2	N	RW
SMTP IP Addr Part 3	0 to 255	0	—	smtpP3	N	RW
SMTP IP Addr Part 4	0 to 255	0	—	smtpP4	N	RW
Account Email Part1	—	—	—	accP1	N	RW
@						
Account Email Part2	—	—	—	accP2	N	RW
Account Password	—	—	—	accPass	N	RW
Port Number	0 to 65535	25	—	portNbr	N	RW
Server Timeout	0 to 255	30	sec	srvTim	N	RW
Server Authentication	0 to 1	0	—	srvAut	N	RW

CONFIGURATION/EOLRES — EOL RESISTOR

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
End Of Line Res. J6(LEN)	Disable/Enable	Disable	—	j6_eol	N	RW
End Of Line Res. J7(CCN)	Disable/Enable	Disable	—	j7_eol	N	RW
End Of Line Resistor J8	Disable/Enable	Disable	—	j8_eol	N	RW
End Of Line Resistor J10	Disable/Enable	Disable	—	j10_eol	N	RW

See Legend on page 212.

CONFIGURATION/GENCONF — GENERAL CONFIGURATION						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Cir Priority Sequence	0 to 2	0	—	prio_cir	N	RW
0=Auto, 1=A Prio						
2=B Prio						
Staged Loading Sequence	No/Yes	No	—	seq_typ	N	RW
Ramp Loading Select	No/Yes	No	—	ramp_sel	N	RW
Demand Limit Type Select	0 to 2	0	—	lim_sel	N	RW
0 = None						
1 = Switch Control						
2 = 4-20mA Control						
Unit Off to On Delay	1 to 15	1	min	off_on_d	N	RW
Heating OAT Threshold	1.4 to 32.0 –17.0 to 0	1.4 –17.0	°F (°C)	heat_th	N	RW
Night Mode Start Hour	0	—	—	nh_start	N	RW
Night Mode End Hour	0	—	—	nh_end	N	RW
Night Capacity Limit	0 to 100	100	%	nh_limit	N	RW
Ice Mode Enable	No/Yes	No	—	ice_cnfg	N	RW
Both Command Sel (HSM)	No/Yes	No	—	both_sel	N	RW
Auto Changeover Select	No/Yes	No	—	auto_sel	N	RW
Entering Fluid Control	No/Yes	No	—	ewt_opt	N	RW

CONFIGURATION/HR_CFG — HEAT RECLAIM CONFIG						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
HR variable speed pump ?	No/Yes	No	—	hrVarPmp	N	RW
HR condenser fluid	Water/Brine	Water	—	hr_flui	N	RW
HR eco mode ?	Off/On	Off	—	hr_eco	N	RW
HR reverse 3WV cmd ?	No/Yes	No	—	rev_3WV	N	RW
NO : 0V = close						
YES : 0V = open						
HR Control on EWT ?	No/Yes	Yes	—	HRewtctl	N	RW
PID gain prop 3w valve	–20 to 20	2	—	kp_HR3wv	N	RW
PID gain int 3w valve	–5.0 to 5.0	0.2	—	ki_HR3wv	N	RW
PID gain deri 3w valve	–20.0 to 20.0	0.4	—	kd_HR3wv	N	RW
PID gain prop fan	–20 to 20	5	—	kp_HRFan	N	RW
PID gain int fan	–5.0 to 5.0	0.5	—	ki_HRFan	N	RW
PID gain deri fan	–20 to 20	0	—	kd_HRFan	N	RW
HR VarPump min pos	0 to 60	30	%	minHRpmp	N	RW
3WayValve/VarPmp max pos	70 to 100	100	%	maxHR3wv	N	RW
HR delay flow switch	10 to 120	20	sec	flowTmr	N	RW
Min flow 3wv enable	No/Yes	No	—	minFloEn	N	RW
Min flow 3wv position	10 to 100	15	%	minFlow	N	RW
HR Min water temp	14.0 to 34.0 –10.0 to 1.1	34.0 1.1	°F (°C)	min_wt	N	RW

See Legend on page 212.

CONFIGURATION/PUMPCONF — PUMP CONFIGURATION						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Pumps Sequence	0 to 4	0	—	pump_seq	N	RW
0 = No Pump						
1 = One Pump Only						
2 = Two Pumps Auto						
3 = Pump#1 Manual						
4 = Pump#2 Manual						
Pump Auto Rotation Delay	24 to 3000	48	hours	pump_del	N	RW
Pump Sticking Protection	No/Yes	No	—	pump_per	N	RW
Stop Pump During Standby	No/Yes	No	—	pump_sby	N	RW
Flow Checked If Pump Off	No/Yes	Yes	—	pump_loc	N	RW
Flow Control Method	1 to 3	1	—	flow_ctl	N	RW
1 = Constant Speed						
2 = Delta Temperature						
3 = Delta Pressure						
Flow Delta T Setpoint	5.4 to 18.0 3.0 to 10.0	9.0 5.0	^F (^C)	dt_stp	N	RW
Flow Delta P Setpoint	7.25 to 43.51 50.0 to 300.0	29.0 200.0	PSI (kPa)	dp_stp	N	RW
Pressure Zero Value	–14.5 to 1.45 –100.0 to 10.0	–14.5 –100	PSI (kPa)	wtr_zval	N	RW
Pump Minimum Speed	30 to 100	60	%	pump_min	N	RW
Pump Min Speed Cap=0%	30 to 100	60	%	pump_sav	N	RW
Pump Maximum Speed	30 to 100	100	%	pump_max	N	RW
Min Water Press Thres	10.15 to 145.04 70.0 to 1000.05	14.5 100.0	PSIG (kPa)	MinWpThr	N	RW
Water Pump Max Delta P	14.0 to 80.0 96.5 to 551.6	72.52 500.0	PSIG (kPa)	WtPmpMxP	N	RW

See Legend on page 212.

CONFIGURATION/RESTCFG — RESET CONFIGURATION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Cooling Reset Select	0 to 4	0	—	cr_sel	N	RW
Heating Reset Select	0 to 4	0	—	hr_sel	N	RW
0=None, 1=OAT, 2=Delta T						
3=4-20mA control						
4=Space Temp						
Cooling						
OAT No Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	oat_crno	N	RW
OAT Full Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	oat_crfu	N	RW
Delta T No Reset Value	0 to 25.0 0 to 13.9	0 0	^F (^C)	dt_cr_no	N	RW
Delta T Full Reset Value	0 to 25.0 0 to 13.9	0 0	^F (^C)	dt_cr_fu	N	RW
Current No Reset Value	0 to 20	0	ma	I_cr_no	N	RW
Current Full Reset Value	0 to 20	0	ma	I_cr_fu	N	RW
Space T No Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	spacr_no	N	RW
Space T Full Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	spacr_fu	N	RW
Cooling Reset Deg. Value	–30.0 to 30.0 –16.7 to 16.7	0 0	^F (^C)	cr_deg	N	RW
Heating						
OAT No Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	oat_hrno	N	RW
OAT Full Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	oat_hrfu	N	RW
Delta T No Reset Value	0 to 25.0 0 to 13.9	0 0	^F (^C)	dt_hr_no	N	RW
Delta T Full Reset Value	0 to 25.0 0 to 13.9	0 0	^F (^C)	dt_hr_fu	N	RW
Current No Reset Value	0 to 20	0	ma	I_hr_no	N	RW
Current Full Reset Value	0 to 20	0	ma	I_hr_fu	N	RW
Space T No Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	spahr_no	N	RW
Space T Full Reset Value	14.0 to 125.0 –10.0 to 51.7	14.0 –10.0	°F (°C)	spahr_fu	N	RW
Heating Reset Deg. Value	–30.0 to 30.0 –16.7 to 16.7	0 0	^F (^C)	hr_deg	N	RW

CONFIGURATION/USERCONF — USER CONFIGURATION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Alarm Relay for Alerts?	No/Yes	No	—	alert_r	N	RW
Revered Alarm Relay	0 to 1	0	—	al_rever	N	RW

CONFIGURATION/ALARMDEF/ALARMS01

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Alarm Routing Control	—	00000000	—	ALRM_CNT	N	RW
Alarm Equipment Priority	0 to 7	4	—	EQP_TYP	N	RW
Comm Failure Retry Time	1 to 240	10	min	RETRY_TM	N	RW
Realarm Time	1 to 254	30	min	RE_ALARM	N	RW
Alarm System Name	Up to 8 Char	30RBP_R	—	ALRM_NAM	N	RW

CONFIGURATION/HOLIDAY/HOLDY_NN

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Holiday Start Month	0 to 12	0	—	HOL-MON	N	RW
Start Day	0 to 31	0	—	HOL-DAY	N	RW
Duration (Days)	0 to 99	0	—	HOL-LEN	N	RW

See Legend on page 212.

CONFIGURATION/OCCDEFCS/OCCPC01S

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Timed Override Hours	0 to 4	0	—	OVR-EXT	N	RW
Period 1 DOW (MTWTFSSH)	0/1	11111111	—	DOW1	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD1	N	RW
Occupied to	0:00 to 24:00	24:00	—	UNOCTOD1	N	RW
Period 2 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW
Period 3 DOW (MTWTFSSH)	0/1	00000000	—	DOW3	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD3	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD3	N	RW
Period 4 DOW (MTWTFSSH)	0/1	00000000	—	DOW4	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD4	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD4	N	RW
Period 5 DOW (MTWTFSSH)	0/1	00000000	—	DOW5	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD5	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD5	N	RW
Period 6 DOW (MTWTFSSH)	0/1	00000000	—	DOW6	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD6	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD6	N	RW
Period 7 DOW (MTWTFSSH)	0/1	00000000	—	DOW7	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD7	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD7	N	RW
Period 8 DOW (MTWTFSSH)	0/1	00000000	—	DOW8	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD8	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD8	N	RW

CONFIGURATION/OCCDEFCS/OCCPC02S

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Timed Override Hours	0 to 4	0	—	OVR-EXT	N	RW
Period 1 DOW (MTWTFSSH)	0/1	11111111	—	DOW1	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD1	N	RW
Occupied to	0:00 to 24:00	24:00	—	UNOCTOD1	N	RW
Period 2 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW
Period 3 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW
Period 4 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW
Period 5 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW
Period 6 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW
Period 7 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW
Period 8 DOW (MTWTFSSH)	0/1	00000000	—	DOW2	N	RW
Occupied from	0:00 to 24:00	0	—	OCCTOD2	N	RW
Occupied to	0:00 to 24:00	0	—	UNOCTOD2	N	RW

See Legend on page 212.

SERVICE/BACNET

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
BACnet Enable	Disable/Enable	Disable	—	bacena	N	RW
Metric Units?	No/Yes	Yes	—	bacunit	N	RW
Network	1 to 4000	1600	—	network	N	RW
UDP Port Number	47808 to 47823	47808	—	udpport	N	RW
Device Id manual	0 to 4194302	1600001	—	bac_id	N	RW
Device Id Auto Option	Disable/Enable	Disable	—	auid_opt	N	RW
Alarm reporting	Disable/Enable	Enable	—	balmena	N	RW
BACnet Manage Occupancy	No/Yes	No	—	mng_occ	N	RW
IP port interface name	0 to 1	0	—	conifnam	N	RW
0 = J5 / J15						
1 = J16						

SERVICE/CP_UNABL — COMP DISABLED CFG

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
Compressor A1 Disable	No/Yes	No	—	un_cp_a1	N	RW
Compressor A2 Disable	No/Yes	No	—	un_cp_a2	N	RW
Compressor A3 Disable	No/Yes	No	—	un_cp_a3	N	RW
Compressor A4 Disable	No/Yes	No	—	un_cp_a4	N	RW
Compressor B1 Disable	No/Yes	No	—	un_cp_b1	N	RW
Compressor B2 Disable	No/Yes	No	—	un_cp_b2	N	RW
Compressor B3 Disable	No/Yes	No	—	un_cp_b3	N	RW
Compressor B4 Disable	No/Yes	No	—	un_cp_b4	N	RW

SERVICE/DCFC_CFG — DC FREE COOLING CONFIG

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
OAT Selection	41.0 to 68.0 5.0 to 20.0	50.0 10.0	°F (°C)	oat_s	N	RW
Start Valve Threshold	0.9 to 27.0 0.5 to 15.0	7.2 4.0	^F (^C)	start_th	N	RW
Stop Valve Threshold	1.8 to 27.0 1.0 to 15.0	3.6 2.0	^F (^C)	stop_th	N	RW
Chiller Activation Delay	1 to 60	10	min	chil_del	N	RW
Fan Start/Stop Dead Band	0 to 9.0 0 to 5.0	3.6 2.0	^F (^C)	dband	N	RW
Proportional Gain Vfan	–50.0 to 50.0	5	—	pg	N	RW
Integral Gain Vfan	–5.0 to 5.0	2.5	—	ig	N	RW
Derivative Gain Vfan	–20.0 to 20.0	1	—	dg	N	RW
Fans Minimum On Time	10 to 900	60	sec	on_tmr	N	RW
Fans Minimum Off Time	10 to 900	60	sec	off_tmr	N	RW
Number of Fan Lines	1 to 2	1	—	nb_line	N	RW
Number of Fix Speed Fans	0 to 20	1	—	nb_fan	N	RW
Variable Speed Fan Stage	No/Yes	No	—	vfan	N	RW
Vfan Stage Delta Speed	0 to 100	20	%	vf_delta	N	RW
Delta T Setpoint	5.4 to 18.0 3 to 10.0	16.2 9.0	^F (^C)	dt_setp	N	RW
Fan speed max	0 to 100	100	%	vfan_max	N	RW

See Legend on page 212.

SERVICE/FACTORY — FACTORY CONFIGURATIONS						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Unit Type (Heat Pump=2)	1 to 2	1	—	unit_typ	N	RW
Unit Capacity	0 to 950	0	—	unitsize	N	RW
Fan Type	0 to 2	0	—	fan_typ	N	RW
Fan Speed	0 to 3	0	—	fan_spd	N	RW
Desuperheater Select	No/Yes	No	—	desuper	N	RW
Exchanger Heater Select	No/Yes	No	—	exch_htr	N	RW
Energy Management Module	No/Yes	No	—	emm_opt	N	RW
Pump Type	0 to 2	0	—	pump_typ	N	RW
Factory Dual Water Pump	No/Yes	No	—	dual_pmp	N	RW
Pump Control Method	1 to 2	1	—	pump_ctl	N	RW
QM code	—	—	—	QM_code	N	RW
Country 0=EU, 1=US, 2=CH	0 to 2	—	—	country	N	RW
Unit Refrigerant Type	2 to 3	—	—	refrig	N	RW
Exchanger Fluid Type	1 to 4	1	—	flui_typ	N	RW
Leakage Charge Detection	No/Yes	No	—	leak_chk	N	RW
DC Free Cooling Select	No/Yes	No	—	dcfc_sel	N	RW
Soft Starter Selection	0 to 2	0	—	softStr	N	RW
Fan Low Noise Option	0 to 2	0	—	lownoise	N	RW
Power Frequency 60Hz Sel	No/Yes	No	—	freq_60H	N	RW
Option 282 : CEM	No/Yes	No	—	opt_282	N	RW
Option 119C Selection	No/Yes	No	—	opt_119C	N	RW
Option 50: Heat Reclaim	No/Yes	No	—	rclm_opt	N	RW
Option 41C : HR Heater	No/Yes	No	—	opt_41C	N	RW
Free Cooling Option	0 to 2	0	—	fc_opt	N	RW
Exchanger Coil Type	0 to 2	0	—	coil_typ	N	RW
0:MCHE before 2022/07/01						
1:RTPF						
2:MCHE after 2022/07/01						
Exchanger Family	0 to 1	0	—	exch	N	RW
Compact Tier Selection	No/Yes	No	—	compact	N	RW
Supply_voltage	230/380/460/575	—	—	voltage	N	RW
Hot Gas Bypass Selection	No/Yes	No	—	hgbp_sel	N	RW

SERVICE/FACTORY0						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Carrier Unit Capacity	0 to 4000	0	—	unitsize	N	RO
BACnet Enable	0 = Disable 1 = Enable	0	—	bac_ena	N	RO
Brand Identifier Status	1 = Carrier 2 = Ciat	1	—	brand_id	N	RO

See Legend on page 212.

SERVICE/FACTORY2 — FACTORY2 CONFIGURATION						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Compressor A1 Capacity	nn	0	—	cap_a1	N	RW
Compressor A2 Capacity	nn	0	—	cap_a2	N	RW
Compressor A3 Capacity	nn	0	—	cap_a3	N	RW
Compressor A4 Capacity	nn	0	—	cap_a4	N	RW
Compressor B1 Capacity	nn	0	—	cap_b1	N	RW
Compressor B2 Capacity	nn	0	—	cap_b2	N	RW
Compressor B3 Capacity	nn	0	—	cap_b3	N	RW
Compressor B4 Capacity	nn	0	—	cap_b4	N	RW
Circuit A Total Fans NB	nn	0	—	nb_fan_a	N	RW
Circuit B Total Fans NB	nn	0	—	nb_fan_b	N	RW
EXV A Type	nnn	0	—	exvTyp_a	N	RW
EXV A Name	—	—	—	exvNam_a	N	RW
EXV A Maximum Steps Nb	nnnnn	0	—	exvmax_a	N	RW
EXV B Type	nnn	0	—	exvTyp_b	N	RW
EXV B Name	—	—	—	exvNam_b	N	RW
EXV B Maximum Steps Nb	nnnnn	0	—	exvmax_b	N	RW
Hydronic kit Config						
Pump Type	nn	0	—	ClPumpTp	N	RW
Pump Name	—	—	—	ClPumpNa	N	RW
Pump Minimum Flow	±nnn.n	0	—	ClPumpMF	N	RW
Exchanger Type	nn	0	—	ClExchTp	N	RW
Exchanger Name	—	—	—	ClExchNa	N	RW
Piping Type	n	0	—	ClPipgTp	N	RW
Piping Name	—	—	—	ClPipgNa	N	RW
Hydraulic Free Cooling						
FC Evap Valve Name	—	—	—	FcEvVNa	N	RW
FC Coil Valve Name	—	—	—	FcCoVNa	N	RW
FC Coil Pump Type	—	0	—	FcPumpTp	N	RW
FC Coil Pump Name	—	—	—	FcPumpNa	N	RW

SERVICE/H_FC-CFG — HYD FREE COOLING CONFIG						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Hyd FC Fan PID Kp	–100 to 100	–5	—	hfcFanKp	N	RW
Hyd FC Fan PID Ki	–100 to 100	–1	—	hfcFanKi	N	RW
Hyd FC Fan PID Kd	–20 to 20	0.0	—	hfcFanKd	N	RW

SERVICE/MAINTCFG — MAINTENANCE CONFIGURATION						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Device Name						
Maintenance Alert Type	0 to 3	0	—	mntn_typ	N	RW
0: No						
1: Frequency in Months						
2: Frequency in Hours						
3: Running days						

MAINTENANCE CONFIG						
Frequency in months	1 to 99	12	—	mth_freq	N	RW
Frequency in hours	0 to 10000	2000	hours	hr_freq	N	RW
Running Days	0 to 10000	0	—	run_days	N	RW
Fgas Check Freq (months)	0 to 12	0	—	fgas_frq	N	RW
FC Glycol Check Freq	0 to 12	0	—	glyc_frq	N	RW

See Legend on page 212.

SERVICE/MODBUSIP — MODBUS TCP/IP CONFIG.

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
TCP/IP Server Enable	No/Yes	No	—	modip_en	N	RW
Server UID	1 to 247	1	—	ser_UID	N	RW
Port Number	0 to 65535	502	—	port_nbr	N	RW
Metric Unit	No/Yes	Yes	—	metric	N	RW
Swap Bytes	0 to 1	0	—	swap_b	N	RW
0 = Big Endian						
1 = Little Endian						
Real type management	0 to 1	1	—	real_typ	N	RW
0 = Float X10						
1 = IEEE 754						
Enable 32 bits registers	0 to 1	1	—	reg32bit	N	RW
0 = IR/HR in 16 bit mode						
1 = IR/HR in 32 bit mode						
IP port interface name	0 to 1	0	—	conifnam	N	RW
0 = J5 / J15						
1 = J16						
Com. timeout (s)	60 to 600	120	sec	timeout	N	RW
Keepalive idle delay(s)	0 to 30	10	sec	idle	N	RW
Keepalive interval(s)	0 to 2	1	sec	intrvl	N	RW
Keepalive probes nb	0 to 10	10	—	probes	N	RW

SERVICE/MODBUSRS — MODBUS RTU CONFIG.

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
RTU Server Enable	No/Yes	No	—	modrt_en	N	RW
Server UID	1 to 247	1	—	ser_UID	N	RW
Metric Unit	No/Yes	Yes	—	metric	N	RW
Swap Bytes	0 to 1	0	—	swap_b	N	RW
0 = Big Endian						
1 = Little Endian						
Baudrate	9600 to 38400	9600	—	baudrate	N	RW
0 = 9600						
1 = 19200						
2 = 38400						
Parity	0 to 2	0	—	parity	N	RW
0 = No Parity						
1 = Odd Parity						
2 = Even Parity						
Stop bit	0 to 1	0	—	stop_bit	N	RW
0 = One Stop Bit						
1 = Two Stop Bits						
Real type management	0 to 1	1	—	real_typ	N	RW
0 = Float X10						
1 = IEEE 754						
Enable 32 bits registers	0 to 1	1	—	reg32bit	N	RW
0 = IR/HR in 16 bit mode						
1 = IR/HR in 32 bit mode						

SERVICE/MSC_SERV — MSC CONFIGURATION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
ECO PUMP CONFIG						
Eco Pump Enable	No/Yes	No	—	eco_pmp	N	RW
Pump Off Time	2 to 60	2	min	ecop_off	N	RW
Pump On Time	5 to 60	5	min	ecop_on	N	RW

See Legend on page 212.

SERVICE/MST_SLV — MASTER SLAVE CONFIG						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
MASTER/SLAVE CONTROL						
Master/Slave Select	0 to 2	0	—	ms_sel	N	RW
0=Disable						
1=Master						
2=Slave						
Master Control Type	1 to 3	1	—	ms_ctrl	N	RW
1=Local Control						
2=Remote Control						
3=Network Control						
Slave Address	1 to 236	2	—	slv_addr	N	RW
Lead Lag Select	0 to 2	0	—	lead_sel	N	RW
0=Always Lead						
1=Lag Once Failed Only						
2=Lead/Lag Runtime Sel						
Lead/Lag Balance Delta	40 to 400	168	hours	ll_bal_d	N	RW
Lead/Lag Start Timer	2 to 30	10	min	lstr_tim	N	RW
Lead Pulldown Time	0 to 60	0	min	lead_pul	N	RW
Start If Error Higher	3.0 to 18.0 1.7 to 10.0	4.0 2.2	^F (^C)	start_dt	N	RW
Lag Minimum Running Time	0 to 150	0	min	lag_mini	N	RW
Lag Unit Pump Control	0 to 1	0	—	lag_pump	N	RW
0=Stop if Unit Stops						
1=Run if Unit Stops						
Chiller In Series	No/Yes	No	—	ll_serie	N	RW
Legacy compatibility ?	No/Yes	No	—	islegacy	N	RW

SERVICE/OPT_SEL — OPTION SELECTION						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Electrical Heat Stages	0 to 4	0	—	ehs_en	N	RW
Boiler Enable	No/Yes	No	—	boil_en	N	RW
DC Free Cooling Enable	0 to 2	0	—	dcfc_en	N	RW
0: No						
1: With OAT selection						
2: Without OAT selection						

See Legend on page 212.

SERVICE/SERVICE1 — SERVICE CONFIGURATION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
High Pressure Threshold	500 to 660 3447.4 to 4550.54	638.2 4400.4	PSI (kPa)	hp_th	N	RW
Exch. Heater Delta Spt	1.0 to 6.0 0.6 to 3.3	3.4 1.9	^F (^C)	heatersp	N	RW
Brine Freeze Setpoint	–20.0 to 34.0 –28.9 to 1.1	34.0 1.1	°F (°C)	freezesp	N	RW
Minimum LWT Setpoint	–20.0 to 38.0 –28.9 to 3.3	38.0 3.3	°F (°C)	mini_lwt	N	RW
Auto Start when SM lost	Disable/Enable	Disable	—	auto_sm	N	RW
Auto Z Multiplier Stp	4 to 8	6	—	zm_stp	N	RW
Maximum Z Multiplier	1 to 6	6	—	hc_zm	N	RW
Flow Setpoint	0 to 65	60	—	flow_sp	N	RW
Pump Cycl. Freeze Prot.	No/Yes	No	—	pump_cyc	N	RW
Blackbox In Metric ?	No/Yes	Yes	—	b_metric	N	RW
Unit Altitude (in meter)	–1500 to 5000	0	—	unit_alt	N	RW
Leakage Charge Threshold	0 to 5	2.5	Volts	Leak_thr	N	RW
Leakage Charge Timer	0 to 600	60	min	Leak_tmr	N	RW
Free Defr Allowed Period	0 to 99	2	hours	FrDfrPer	N	RW
Oat Min for Free Defrost	33.8 to 68.0 1.0 to 20.0	34.7 1.5	°F (°C)	OatFrDfr	N	RW
Fast Capacity Recovery	No/Yes	No	—	fastcapr	N	RW
Glycol in loop	No/Yes	No	—	glycol	N	RW

SERVICE/SERVICE2 — SERVICE2 CONFIGURATION

DESCRIPTION	VALUE	DEFAULT	UNITS	POINT NAME	TRANSLATOR ACCESSIBLE	NETWORK ACCESS
FAN CONFIG						
Varifan PID Prop Gain	–20 to 20	1.1	—	fan_kp	N	RW
Varifan PID Integ Gain	–5 to 5	0.2	—	fan_ki	N	RW
Varifan PID Deriv Gain	–20 to 20	0.01	—	fan_kd	N	RW
Maximum Fan Speed	70 to 100	100	%	fan_max	N	RW
Varifan Heating mode						
Varifan Heat. Prop Gain	–20 to 20	0	—	vfheatkp	N	RW
Varifan Heat. Integ Gain	–5 to 5	0.05	—	vfheatki	N	RW
Varifan Heat. Deriv Gain	–20 to 20	0	—	vfheatkd	N	RW
EXV CONFIG						
EXV MOP Setpoint	30.8 to 77 –0.7 to 25.0	68.0 20.0	°F (°C)	mop_sp	N	RW
EXV A Superheat Setpoint	2.5 to 54.0 1.4 to 30.0	9.0 5.0	^F (^C)	sh_sp_a	N	RW
EXV B Superheat Setpoint	2.5 to 54.0 1.4 to 30.0	9.0 5.0	^F (^C)	sh_sp_b	N	RW
HEAT RECLAIM CONFIG					N	RW
HR PID Kp (Boiled Water)	–20 to 20	2	—	hrVBo_kp	N	RW
HR PID Ki (Boiled Water)	–5 to 5	0.2	—	hrVBo_ki	N	RW
HR PID Kd (Boiled Water)	–20 to 20	1	—	hrVBo_kd	N	RW

See Legend on page 212.

SERVICE/UPDTHOUR — RUNNING HOUR CONFIGURATION						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Machine Operating Hours	0 to 999999	0	hours	hr_mach	N	RW
Machine Starts Number	0 to 999999	0	—	st_mach	N	RW
Compressor A1 Hours	0 to 999999	0	hours	hr_cp_a1	N	RW
Compressor A2 Hours	0 to 999999	0	hours	hr_cp_a2	N	RW
Compressor A3 Hours	0 to 999999	0	hours	hr_cp_a3	N	RW
Compressor A4 Hours	0 to 999999	0	hours	hr_cp_a4	N	RW
Compressor B1 Hours	0 to 999999	0	hours	hr_cp_b1	N	RW
Compressor B2 Hours	0 to 999999	0	hours	hr_cp_b2	N	RW
Compressor B3 Hours	0 to 999999	0	hours	hr_cp_b3	N	RW
Compressor B4 Hours	0 to 999999	0	hours	hr_cp_b4	N	RW
Compressor A1 Starts	0 to 999999	0	—	st_cp_a1	N	RW
Compressor A2 Starts	0 to 999999	0	—	st_cp_a2	N	RW
Compressor A3 Starts	0 to 999999	0	—	st_cp_a3	N	RW
Compressor A4 Starts	0 to 999999	0	—	st_cp_a4	N	RW
Compressor B1 Starts	0 to 999999	0	—	st_cp_b1	N	RW
Compressor B2 Starts	0 to 999999	0	—	st_cp_b2	N	RW
Compressor B3 Starts	0 to 999999	0	—	st_cp_b3	N	RW
Compressor B4 Starts	0 to 999999	0	—	st_cp_b4	N	RW
Fan A1 Hours	0 to 999999	0	hours	hr_fana1	N	RW
Fan A2 Hours	0 to 999999	0	hours	hr_fana2	N	RW
Fan A3 Hours	0 to 999999	0	hours	hr_fana3	N	RW
Fan A4 Hours	0 to 999999	0	hours	hr_fana4	N	RW
Fan A5 Hours	0 to 999999	0	hours	hr_fana5	N	RW
Fan A6 Hours	0 to 999999	0	hours	hr_fana6	N	RW
Fan A7 Hours	0 to 999999	0	hours	hr_fana7	N	RW
Fan A8 Hours	0 to 999999	0	hours	hr_fana8	N	RW
Fan B1 Hours	0 to 999999	0	hours	hr_fanb1	N	RW
Fan B2 Hours	0 to 999999	0	hours	hr_fanb2	N	RW
Fan B3 Hours	0 to 999999	0	hours	hr_fanb3	N	RW
Fan B4 Hours	0 to 999999	0	hours	hr_fanb4	N	RW
Fan B5 Hours	0 to 999999	0	hours	hr_fanb5	N	RW
Fan B6 Hours	0 to 999999	0	hours	hr_fanb6	N	RW
Fan B7 Hours	0 to 999999	0	hours	hr_fanb7	N	RW
Fan B8 Hours	0 to 999999	0	hours	hr_fanb8	N	RW
Water Pump #1 Hours	0 to 999999	0	hours	hr_pump1	N	RW
Water Pump #2 Hours	0 to 999999	0	hours	hr_pump2	N	RW
Circuit A Defrost Number	0 to 999999	0	—	nb_defra	N	RW
Circuit B Defrost Number	0 to 999999	0	—	nb_defrb	N	RW
FC Operating Hours	0 to 999999	0	hours	FC_HOUR	N	RW
FC Fan Stage 1 Start	0 to 999999	0	—	FC_FAN1S	N	RW
FC Fan Stage 1 Hours	0 to 999999	0	hours	FC_FAN1H	N	RW
FC Fan Stage 2 Start	0 to 999999	0	—	FC_FAN2S	N	RW
FC Fan Stage 2 Hours	0 to 999999	0	hours	FC_FAN2H	N	RW
FC Fan Stage 3 Start	0 to 999999	0	—	FC_FAN3S	N	RW
FC Fan Stage 3 Hours	0 to 999999	0	hours	FC_FAN3H	N	RW
FC Fan Stage 4 Start	0 to 999999	0	—	FC_FAN4S	N	RW
FC Fan Stage 4 Hours	0 to 999999	0	hours	FC_FAN4H	N	RW
FC Fan Stage 5 Start	0 to 999999	0	—	FC_FAN5S	N	RW
FC Fan Stage 5 Hours	0 to 999999	0	hours	FC_FAN5H	N	RW
FC Fan Stage 6 Start	0 to 999999	0	—	FC_FAN6S	N	RW
FC Fan Stage 6 Hours	0 to 999999	0	hours	FC_FAN6H	N	RW
FC Fan Stage 7 Start	0 to 999999	0	—	FC_FAN7S	N	RW
FC Fan Stage 7 Hours	0 to 999999	0	hours	FC_FAN7H	N	RW

See Legend on page 212.

SERVICE/SETPOINT — SETPOINT CONFIGURATION						
DESCRIPTION	**VALUE**	**DEFAULT**	**UNITS**	**POINT NAME**	**TRANSLATOR ACCESSIBLE**	**NETWORK ACCESS**
Cooling Setpoint 1	–20.0 to 78.8 –28.9 to 26.0	44.0 6.7	°F (°C)	csp1	Y	RW
Cooling Setpoint 2	–20.0 to 78.8 –28.9 to 26.0	44.0 6.7	°F (°C)	csp2	N	RW
Cooling Ice Setpoint	–20.0 to 78.8 –28.9 to 26.0	44.0 6.7	°F (°C)	ice_sp	N	RW
Cooling Ramp Loading	0.2 to 2.0 0.1 to 1.1	1.0 0.6	^F (^C)	cramp_sp	N	RW
Heating Setpoint 1	68.0 to 145.4 20.0 to 63.0	100.0 37.8	°F (°C)	hsp1	Y	RW
Heating Setpoint 2	68.0 to 145.4 20.0 to 63.0	100.0 37.8	°F (°C)	hsp2	N	RW
Heating Ramp Loading	0.2 to 2.0 0.1 to 1.1	1.0 0.6	^F (^C)	hramp_sp	N	RW
Cool Changeover Setpt	39.0 to 122.0 3.9 to 50.0	75.0 23.9	°F (°C)	cauto_sp	N	RW
Heat Changeover Setpt	32.0 to 115.0 0 to 46.1	64.0 17.8	°F (°C)	hauto_sp	N	RW
Switch Limit Setpoint 1	0 to 100	100	%	lim_sp1	N	RW
Switch Limit Setpoint 2	0 to 100	100	%	lim_sp2	N	RW
Switch Limit Setpoint 3	0 to 100	100	%	lim_sp3	N	RW
Heat Reclaim Setpoint	95.0 to 122.0 35.0 to 50.0	122.0 50.0	°F (°C)	hr_stp	N	RW
Heat Reclaim Deadband	5.0 to 27.0 2.8 to 15.0	9.0 5.0	^F (^C)	hr_deadb	N	RW
Desuperheat Min SCT	75.0 to 122.0 23.9 to 50.0	104.0 40.0	°F (°C)	min_sct	N	RW

LEGEND
RO — Read Only
RW — Read/Write

APPENDIX C — LON POINT TABLE
SAMPLE CONFIGURATION

LON POINT	SNVT TYPE	POINT	READ/WRITE	CCN POINT DESCRIPTION	CCN POINT NAME
CHLRMAP1					
nviChillerEnable	SNVT_switch	POINT01	W	Net.: Cmd Start/Stop	CHIL_S_S
nviCoolSetpt	SNVT_temp_p	POINT02	W	Control Point	CTRL_PNT
nvoOnOff	SNVT_switch	POINT03	R	Net.: Cmd Start/Stop	CHIL_S_S
nvoActiveSetpt	SNVT_temp_p	POINT04	R	Current Setpoint	SP
nviCapacityLim	SNVT_lev_percent	POINT05	W	Active Demand Limit Val	DEM_LIM
nviHeatSetpt	SNVT_temp_p	POINT06	W	Heating Setpoint 1	hsp1
nvoActualCapacity	SNVT_lev_percent	POINT07	R	Unit Total Capacity	CAP_T
nvoCapacityLim	SNVT_lev_percent	POINT08	R	Active Demand Limit Val	DEM_LIM
nvoLvgCHWTemp	SNVT_temp_p	POINT09	R	Leaving Fluid Temp	LWT
nvoEntCHWTemp	SNVT_temp_p	POINT10	R	Entering Fluid Temp	EWT
nvoEntCNDWTemp	SNVT_temp_p	POINT11	R	Outdoor Air Temp	OAT
nvoLvgCNDWTemp	SNVT_temp_p	POINT12	R	Cold Water System Temp	CHWSTEMP
nvoChillerStat.run_mode	SNVT_chlr_status	POINT13	R	—	—
nvoChillerStat.op_mode	SNVT_chlr_status	POINT14	R	—	—
nvoChillerStat.in_alarm	SNVT_chlr_status	POINT15	R	—	—
nvoChillerStat.run_enabl	SNVT_chlr_status	POINT16	R	—	—
nvoChillerStat.Local	SNVT_chlr_status	POINT17	R	—	—
nvoChillerStat.Limited	SNVT_chlr_status	POINT18	R	—	—
nvoChillerStat.chw_flow	SNVT_chlr_status	POINT19	R	—	—
nvoChillerStat.cndw_flow	SNVT_chlr_status	POINT20	R	—	—
nviOccSchedule	SNVT_tod_event	POINT21	W	—	—
CHLRMAP2					
nviTEMP1	SNVT_temp_p	POINT22	W	Cooling Setpoint 1	csp1
nvoTEMP1	SNVT_temp_p	POINT23	R	Cooling Setpoint 1	csp1
nvoTEMP2	SNVT_temp_p	POINT24	R	Heating Setpoint 1	hsp1
nvoTEMP3	SNVT_temp_p	POINT25	R	Saturated Cond Temp cir A	SCT_A
nvoTEMP4	SNVT_temp_p	POINT26	R	Saturated Suction Temp A	SST_A
nvoTEMP5	SNVT_temp_p	POINT27	R	Saturated Cond Tmp cir A	SCT_b
nvoTEMP6	SNVT_temp_p	POINT28	R	Saturated Suction Temp B	SST_B
nviPRESS1	SNVT_press_p	POINT29	W		
nvoPRESS1	SNVT_press_p	POINT30	R	Discharge Pressure A	DP_A
nvoPRESS2	SNVT_press_p	POINT31	R	Main Suction Pressure A	SP_A
nvoPRESS3	SNVT_press_p	POINT32	R	Discharge Pressure B	DP_B
nvoPRESS4	SNVT_press_p	POINT33	R	Main Suction Pressure B	SP_B
nvIPCT1	SNVT_lev_percent	POINT34	R		
nvIPCT2	SNVT_lev_percent	POINT35	R		
nvoTEMPDIFF1	SNVT_temp_diff_p	POINT36	R		
nvoTEMPDIFF2	SNVT_temp_diff_p	POINT37	R		
nviDISCRETE1	SNVT_switch	POINT38	W	Emergency Stop	EMSTOP
nviDISCRETE2	SNVT_switch	POINT39	W		
nvoDISCRETE1	SNVT_switch	POINT40	R	Emergency Stop	EMSTOP
nvoDISCRETE2	SNVT_switch	POINT41	R	Net.: Cmd Occupied	CHIL_OCC
nvoDISCRETE3	SNVT_switch	POINT42	R	Flow Switch Status	FLOW_SW
nvoDISCRETE4	SNVT_switch	POINT43	R		
nvoDISCRETE5	SNVT_switch	POINT44	R		
nvoDISCRETE6	SNVT_switch	POINT45	R		
nviCOUNT1	SNVT_count	POINT46	W		
nvoCOUNT1	SNVT_count	POINT47	R	Alarm State	ALM
nvoCOUNT2	SNVT_count	POINT48	R	Local = 0 Net. = 1 Remote = 2	CTRL_TYP
nvoCOUNTinc1	SNVT_count_inc	POINT49	R		
nvoCOUNTinc2	SNVT_count_inc	POINT50	R		

LEGEND

R — Read Only
W — Read Write
SNVT — Standard Network Variable Type
Spt — Setpoint

APPENDIX D — BACNET IP POINTS

BACnet 1

Object Name	Instance	Log Interval	Trend Log Object Instance	Description
TEMP_EWT	1	300	1	Entering Fluid Temp
TEMP_LWT	2	300	2	Leaving Fluid Temp
TEMP_OAT	3	300	3	Outdoor Air Temp
GENUNIT_CTRL_WT	4	300	4	Control Water Temp
TEMP_CHWSTEMP	5	300	5	Cold Water System Temp
GENUNIT_CTRL_PNT_rd	6	300	6	Control Point
GENUNIT_CAP_T	9	300	7	Unit Total Capacity
GENUNIT_STATUS	22	300	8	Run Status
RUNTIME_hr_mach	960	3600	9	Machine Operating Hours
RUNTIME_st_mach	961	300	10	Machine Starts Number
HR_PARTIAL_DOWNTIME	966	3600	11	Cumul Time Partial Alm
HR_TOTAL_DOWNTIME	967	3600	12	Cumul Time Tripout Alm
ALARMRST_ALM	990	300	13	Alarm Status
TEMP_SCT_A	1005	300	14	Saturated Cond Tmp cir A
TEMP_SCT_B	2005	300	15	Saturated Cond Tmp cir B
TEMP_SST_A	1006	300	16	Saturated Suction Temp A
TEMP_SST_B	2006	300	17	Saturated Suction Temp B
TEMP_DGT_A	1009	300	18	Discharge Gas Temp A
TEMP_DGT_B	2009	300	19	Discharge Gas Temp B
OUTPUTS_EXV_A	1014	300	20	EXV position Circuit A
OUTPUTS_EXV_B	2014	300	21	EXV position Circuit B
GENUNIT_CAPA_T	1017	300	22	Cir A Total Capacity
GENUNIT_CAPB_T	2017	300	23	Cir B Total Capacity
DRV_CTL2_drvpwr_5	1020	300	24	Pump Drive 1 Power
DRV_CTL2_drv_F_5	1024	300	25	Pump Drive 1 Frequency
DRV_CTL2_drvpwr_6	2020	300	26	Pump Drive 2 Power
DRV_CTL2_drv_F_6	2024	300	27	Pump Drive 2 Frequency
DRV_CTL2_drvpwr_1	1025	300	28	Fan Drive A Power
DRV_CTL2_drvpwr_2	1026	300	29	Fan Drive A2 Power
DRV_CTL2_drvpwr_3	2025	300	30	Fan Drive B Power
DRV_CTL2_drvpwr_4	2026	300	31	Fan Drive B2 Power
RUNTIME_hr_cp_a1	1960	3600	32	Compressor A1 Hours
RUNTIME_hr_cp_b1	2960	3600	33	Compressor B1 Hours
RUNTIME_st_cp_a1	1964	300	34	Compressor A1 Starts
RUNTIME_st_cp_b1	2964	300	35	Compressor B1 Starts
GENUNIT_CTRL_PNT_wr	10006	300	36	Control Point

LEGEND

EXV — Electronic Expansion Valve

APPENDIX D — BACNET IP POINTS (cont)

BACnet 2

Object Name	Type	Instance	COVInc	PV Access	Description
TEMP_EWT	AV	1	18	RO	Entering Fluid Temp
TEMP_LWT	AV	2	18	RO	Leaving Fluid Temp
TEMP_OAT	AV	3	18	RO	Outdoor Air Temp
GENUNIT_CTRL_WT	AV	4	18	RO	Control Water Temp
TEMP_CHWSTEMP	AV	5	18	RO	Cold Water System Temp
GENUNIT_CTRL_PNT_rd	AV	6	1	RO	Control Point
GENUNIT_SP	AV	7	0	RO	Current Setpoint
GENUNIT_DEM_LIM_rd	AV	8	0	RO	Active Demand Limit Val
GENUNIT_CAP_T	AV	9	10	RO	Unit Total Capacity
GENUNIT_min_left	AV	11	0	RO	Minutes Left for Start
GENUNIT_CHIL_S_S_rd	BV	12	0	RO	Net.: Cmd Start/Stop
GENUNIT_EMSTOP_rd	BV	13	0	RO	Emergency Stop
INPUTS_REM_LOCK	BV	14	0	RO	Remote Interlock Status
OUTPUTS_RUNNING	BV	15	0	RO	Running Relay Status
INPUTS_ONOFF_SW	BV	16	0	RO	Remote On/Off Switch
INPUTS_LIM_SW1	BV	18	0	RO	Limit Switch 1
INPUTS_LIM_SW2	BV	19	0	RO	Limit Switch 2
GENUNIT_CTRL_TYP	AV	21	0	RO	Local=0 Net.=1 Remote=2
GENUNIT_STATUS	AV	22	0	RO	Run Status
GENUNIT_HC_SEL_rd	AV	23	0	RO	Heat/Cool Select
GENUNIT_SP_SEL_rd	AV	24	0	RO	Setpoint Select
PRESSURE_PUMP_EWP	AV	37	0	RO	Inlet unit water pres.
PRESSURE_PUMP_LWP	AV	38	0	RO	Outlet unit water pres.
INPUTS_ELEC_BOX	BV	43	0	RO	Electrical Box Failure
INPUTS_HC_SW	BV	45	0	RO	Remote HeatCool Switch
INPUTS_SETP_SW	BV	48	0	RO	Remote Setpoint Switch
PUMPSTAT_PUMP_1_rd	BV	50	0	RO	Water Pump #1 Command
PUMPSTAT_PUMP_2_rd	BV	51	0	RO	Water Pump #2 Command
INPUTS_FLOW_SW	BV	52	0	RO	Flow Switch Status
OUTPUTS_HD_HTR_A	BV	57	0	RO	Compressor Head Heater A
GENUNIT_CHIL_OCC_rd	BV	58	0	RO	Net.: Cmd Occupied
GENUNIT_SP_OCC_rd	BV	59	0	RO	Setpoint Occupied?
BACnet_bacena	BV	60	0	RO	BACnet Enable
BACnet_bacunit	BV	61	0	RO	Metric Units?
BACnet_network	AV	62	0	RO	Network
BACnet_ident	AV	63	0	RO	Device Id Actually Used
BACnet_COLOR	MV	64	0	RO	ALC color value
BACnet_PRIME_V	AV	65	0	RO	ALC prime value
BACnet_BMS_OCC	AV	66	0	RW	BMS's request for occupancy: 0=UNOCC, 1=OCC, 2, None.
PUMPSTAT_VPMP_CMD	AV	70	0	RO	Variable speed pump cmd
PUMPSTAT_flow	AV	71	0	RO	Water Flow
FACTORY_pump_ctl	AV	72	0	RO	Pump Control Method
PUMPCONF_pump_seq	AV	73	0	RO	Pumps Sequence
OUTPUTS_HD_HTR_B	AV	75	0	RO	Compressor Head Heater B
SETPOINT_csp1	AV	900	0	RW	Cooling Setpoint 1
SETPOINT_csp2	AV	901	0	RW	Cooling Setpoint 2
SETPOINT_ice_sp	AV	902	0	RW	Cooling Ice Setpoint
SETPOINT_hsp1	AV	903	0	RW	Heating Setpoint 1
SETPOINT_hsp2	AV	904	0	RW	Heating Setpoint 2
SETPOINT_lim_sp1	AV	905	0	RW	Switch Limit Setpoint 1
SETPOINT_lim_sp2	AV	906	0	RW	Switch Limit Setpoint 2
SETPOINT_lim_sp3	AV	907	0	RW	Switch Limit Setpoint 3
RUNTIME_hr_mach	AV	960	0	RO	Machine Operating Hours
RUNTIME_st_mach	AV	961	1	RO	Machine Starts Number
RUNTIME_hr_pump1	AV	962	0	RO	Water Pump #1 Hours
RUNTIME_hr_pump2	AV	963	0	RO	Water Pump #2 Hours
HR_PARTIAL_DOWNTIME	AV	966	0	RO	Cumul Time Partial Alm
HR_TOTAL_DOWNTIME	AV	967	0	RO	Cumul Time Tripout Alm

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
ALARMRST_alarm_1c	AV	980	0	RO	Current Alarm 1
ALARMRST_alarm_2c	AV	981	0	RO	Current Alarm 2
ALARMRST_alarm_3c	AV	982	0	RO	Current Alarm 3
ALARMRST_alarm_4c	AV	983	0	RO	Current Alarm 4
ALARMRST_alarm_5c	AV	984	0	RO	Current Alarm 5
ALARMRST_alarm_1	AV	985	0	RO	Current Alarm 1 index
ALARMRST_alarm_2	AV	986	0	RO	Current Alarm 2 index
ALARMRST_alarm_3	AV	987	0	RO	Current Alarm 3 index
ALARMRST_alarm_4	AV	988	0	RO	Current Alarm 4 index
ALARMRST_alarm_5	AV	989	0	RO	Current Alarm 5 index
ALARMRST_ALM	AV	990	1	RO	Alarm Status
PRESSURE_DP_A	AV	1000	0	RO	Discharge Pressure A
PRESSURE_DP_B	AV	2000	0	RO	Discharge Pressure B
PRESSURE_SP_A	AV	1001	0	RO	Main Suction Pressure A
PRESSURE_SP_B	AV	2001	0	RO	Main Suction Pressure B
TEMP_SCT_A	AV	1005	18	RO	Saturated Cond Tmp cir A
TEMP_SCT_B	AV	2005	18	RO	Saturated Cond Tmp cir B
TEMP_SST_A	AV	1006	18	RO	Saturated Suction Temp A
TEMP_SST_B	AV	2006	18	RO	Saturated Suction Temp B
TEMP_SUCT_A	AV	1007	0	RO	Compressor Suction Tmp A
TEMP_SUCT_B	AV	2007	0	RO	Compressor Suction Tmp B
TEMP_DGT_A	AV	1009	18	RO	Discharge Gas Temp A
TEMP_DGT_B	AV	2009	18	RO	Discharge Gas Temp B
TEMP_SH_A	AV	1011	0	RO	Suction Superheat Tmp A
TEMP_SH_B	AV	2011	0	RO	Suction Superheat Tmp B
LOADFACT_pinch_a	AV	1013	0	RO	Cooler Exchange DT Cir A
LOADFACT_pinch_b	AV	2013	0	RO	Cooler Exchange DT Cir B
OUTPUTS_EXV_A	AV	1014	10	RO	EXV position Circuit A
OUTPUTS_EXV_B	AV	2014	10	RO	EXV position Circuit B
OUTPUTS_VFAN_A	AV	1015	0	RO	Variable fan A command
OUTPUTS_VFAN_B	AV	2015	0	RO	Variable fan B command
GENUNIT_CAPA_T	AV	1017	10	RO	Cir A Total Capacity
GENUNIT_CAPB_T	AV	2017	10	RO	Cir B Total Capacity
DRV_CTL2_drvpwr_5	AV	1020	0	RO	Pump Drive 1 Power
DRV_CTL2_drv_I_5	AV	1021	0	RO	Pump Drive 1 Current
DRV_CTL2_drv_V_5	AV	1022	0	RO	Pump Drive 1 Voltage
DRV_CTL2_drv_T_5	AV	1023	0	RO	Pump Drive 1 Torque
DRV_CTL2_drv_F_5	AV	1024	10	RO	Pump Drive 1 Frequency
DRV_CTL2_drvpwr_6	AV	2020	0	RO	Pump Drive 2 Power
DRV_CTL2_drv_I_6	AV	2021	0	RO	Pump Drive 2 Current
DRV_CTL2_drv_V_6	AV	2022	0	RO	Pump Drive 2 Voltage
DRV_CTL2_drv_T_6	AV	2023	0	RO	Pump Drive 2 Torque
DRV_CTL2_drv_F_6	AV	2024	10	RO	Pump Drive 2 Frequency
DRV_CTL2_drvpwr_1	AV	1025	10	RO	Fan Drive A Power
DRV_CTL2_drvpwr_2	AV	1026	10	RO	Fan Drive A2 Power
DRV_CTL2_drvpwr_3	AV	2025	10	RO	Fan Drive B Power
DRV_CTL2_drvpwr_4	AV	2026	10	RO	Fan Drive B2 Power
OUTPUTS_CP_A1	BV	1032	0	RO	Compressor A1
OUTPUTS_CP_B1	BV	2032	0	RO	Compressor B1
OUTPUTS_CP_A2	BV	1033	0	RO	Compressor A2
OUTPUTS_CP_B2	BV	2033	0	RO	Compressor B2
OUTPUTS_CP_A3	BV	1034	0	RO	Compressor A3
OUTPUTS_CP_B3	BV	2034	0	RO	Compressor B3
OUTPUTS_CP_A4	BV	1035	0	RO	Compressor A4
OUTPUTS_CP_B4	BV	2035	0	RO	Compressor B4

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
RUNTIME_hr_cp_a1	AV	1960	0	RO	Compressor A1 Hours
RUNTIME_hr_cp_b1	AV	2960	0	RO	Compressor B1 Hours
RUNTIME_hr_cp_a2	AV	1961	0	RO	Compressor A2 Hours
RUNTIME_hr_cp_b2	AV	2961	0	RO	Compressor B2 Hours
RUNTIME_hr_cp_a3	AV	1962	0	RO	Compressor A3 Hours
RUNTIME_hr_cp_b3	AV	2962	0	RO	Compressor B3 Hours
RUNTIME_hr_cp_a4	AV	1963	0	RO	Compressor A4 Hours
RUNTIME_hr_cp_b4	AV	2963	0	RO	Compressor B4 Hours
RUNTIME_st_cp_a1	AV	1964	1	RO	Compressor A1 Starts
RUNTIME_st_cp_b1	AV	2964	1	RO	Compressor B1 Starts
RUNTIME_st_cp_a2	AV	1965	0	RO	Compressor A2 Starts
RUNTIME_st_cp_b2	AV	2965	0	RO	Compressor B2 Starts
RUNTIME_st_cp_a3	AV	1966	0	RO	Compressor A3 Starts
RUNTIME_st_cp_b3	AV	2966	0	RO	Compressor B3 Starts
RUNTIME_st_cp_a4	AV	1967	0	RO	Compressor A4 Starts
RUNTIME_st_cp_b4	AV	2967	0	RO	Compressor B4 Starts
RUNTIME_hr_fana1	AV	1969	0	RO	Fan A1 Hours
RUNTIME_hr_fanb1	AV	2969	0	RO	Fan B1 Hours
RUNTIME_hr_fana2	AV	1970	0	RO	Fan A2 Hours
RUNTIME_hr_fanb2	AV	2970	0	RO	Fan B2 Hours
RUNTIME_hr_fana3	AV	1971	0	RO	Fan A3 Hours
RUNTIME_hr_fanb3	AV	2971	0	RO	Fan B3 Hours
RUNTIME_hr_fana4	AV	1972	0	RO	Fan A4 Hours
RUNTIME_hr_fanb4	AV	2972	0	RO	Fan B4 Hours
RUNTIME_hr_fana5	AV	1973	0	RO	Fan A5 Hours
RUNTIME_hr_fanb5	AV	2973	0	RO	Fan B5 Hours
RUNTIME_hr_fana6	AV	1974	0	RO	Fan A6 Hours
RUNTIME_hr_fanb6	AV	2974	0	RO	Fan B6 Hours
RUNTIME_hr_fana7	AV	1975	0	RO	Fan A7 Hours
RUNTIME_hr_fanb7	AV	2975	0	RO	Fan B7 Hours
RUNTIME_hr_fana8	AV	1976	0	RO	Fan A8 Hours
RUNTIME_hr_fanb8	AV	2976	0	RO	Fan B8 Hours
GENCONF_prio_cir	AV	5000	0	RO	Cir Priority Sequence
GENCONF_seq_typ	BV	5001	0	RO	Staged Loading Sequence
GENCONF_ramp_sel	BV	5002	0	RO	Ramp Loading Select
GENCONF_lim_sel	AV	5003	0	RO	Demand Limit Type Select
GENCONF_off_on_d	AV	5004	0	RO	Unit Off to On Delay
GENCONF_heat_th	AV	5005	0	RO	Heating OAT Threshold
GENCONF_nh_start	AV	5006	0	RO	Night Mode Start Hour
GENCONF_nh_end	AV	5007	0	RO	Night Mode End Hour
GENCONF_nh_limit	AV	5008	0	RO	Night Capacity Limit
GENCONF_ice_cnfg	BV	5009	0	RO	Ice Mode Enable
GENCONF_both_sel	BV	5010	0	RO	Both Command Sel (HSM)
GENCONF_auto_sel	BV	5011	0	RO	Auto Changeover Select
PUMPCONF_pump_del	AV	5013	0	RO	Pump Auto Rotation Delay
PUMPCONF_pump_per	BV	5014	0	RO	Pump Sticking Protection
PUMPCONF_pump_sby	BV	5015	0	RO	Stop Pump During Standby
PUMPCONF_pump_loc	BV	5016	0	RO	Flow Checked If Pump Off
USERCONF_use_pass	AV	5017	0	RO	User Password
USERCONF_language	AV	5018	0	RO	Language Selection

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
RESETCFG_cr_sel	AV	5019	0	RO	Cooling Reset Select
RESETCFG_hr_sel	AV	5020	0	RO	Heating Reset Select
RESETCFG_oat_crno	AV	5021	0	RO	OAT No Reset Value
RESETCFG_oat_crfu	AV	5022	0	RO	OAT Full Reset Value
RESETCFG_dt_cr_no	AV	5023	0	RO	Delta T No Reset Value
RESETCFG_dt_cr_fu	AV	5024	0	RO	Delta T Full Reset Value
RESETCFG_I_cr_no	AV	5025	0	RO	Current No Reset Value
RESETCFG_I_cr_fu	AV	5026	0	RO	Current Full Reset Value
RESETCFG_spacr_no	AV	5027	0	RO	Space T No Reset Value
RESETCFG_spacr_fu	AV	5028	0	RO	Space T Full Reset Value
RESETCFG_cr_deg	AV	5029	0	RO	Cooling Reset Deg. Value
RESETCFG_oat_hrno	AV	5030	0	RO	OAT No Reset Value
RESETCFG_oat_hrfu	AV	5031	0	RO	OAT Full Reset Value
RESETCFG_dt_hr_no	AV	5032	0	RO	Delta T No Reset Value
RESETCFG_dt_hr_fu	AV	5033	0	RO	Delta T Full Reset Value
RESETCFG_I_hr_no	AV	5034	0	RO	Current No Reset Value
RESETCFG_I_hr_fu	AV	5035	0	RO	Current Full Reset Value
RESETCFG_spahr_no	AV	5036	0	RO	Space T No Reset Value
RESETCFG_spahr_fu	AV	5037	0	RO	Space T Full Reset Value
RESETCFG_hr_deg	AV	5038	0	RO	Heating Reset Deg. Value
BACKUP_boil_th	AV	5039	0	RO	Boiler OAT Threshold
BACKUP_ehs_th	AV	5040	0	RO	Elec Stage OAT Threshold
BACKUP_ehs_pull	AV	5041	0	RO	Electrical Pulldown Time
BACKUP_ehs_back	BV	5042	0	RO	Last EHS for backup
BACKUP_ehs_defr	BV	5043	0	RO	Quick EHS for defrost
BACKUP_ehs_kp	AV	5044	0	RO	EHS Proportional Gain
BACKUP_ehs_ki	AV	5045	0	RO	EHS Integral Gain
BACKUP_ehs_kd	AV	5046	0	RO	EHS Derivative Gain
FACTORY_unit_typ	AV	5051	0	RO	Unit Type (Heat Pump=2)
FACTORY_unitsize	AV	5053	0	RO	Unit Capacity
FACTORY_fan_typ	AV	5054	0	RO	Fan Type
FACTORY_fan_spd	AV	5055	0	RO	Fan Speed
FACTORY_desuper	BV	5056	0	RO	Desuperheater Select
FACTORY_exch_htr	BV	5057	0	RO	Exchanger Heater Select
FACTORY_emm_opt	BV	5058	0	RO	Energy Management Module
FACTORY_pump_typ	AV	5061	0	RO	Pump Type
FACTORY_dual_pmp	BV	5062	0	RO	Factory Dual Water Pump
FACTORY_QM_code	AV	5065	0	RO	QM code
FACTORY_fac_pass	AV	5066	0	RO	Factory Password
FACTORY_country	AV	5067	0	RO	Country 0=EU, 1=US, 2=CH
FACTORY_refrig	BV	5068	0	RO	Unit Refrigerant Type
FACTORY_flui_typ	AV	5069	0	RO	Exchanger Fluid Type
FACTORY_leak_chk	BV	5070	0	RO	Leakage Charge Detection
FACTORY_dcfc_sel	BV	5071	0	RO	DC Free Cooling Select
FACTORY2_cap_a1	AV	5073	0	RO	Compressor A1 Capacity
FACTORY2_cap_a2	AV	5074	0	RO	Compressor A2 Capacity
FACTORY2_cap_a3	AV	5075	0	RO	Compressor A3 Capacity
FACTORY2_cap_a4	AV	5076	0	RO	Compressor A4 Capacity
FACTORY2_cap_b1	AV	5077	0	RO	Compressor B1 Capacity
FACTORY2_cap_b2	AV	5078	0	RO	Compressor B2 Capacity
FACTORY2_cap_b3	AV	5079	0	RO	Compressor B3 Capacity
FACTORY2_cap_b4	AV	5080	0	RO	Compressor B4 Capacity
FACTORY2_nb_fan_a	AV	5081	0	RO	Circuit A Total Fans NB
FACTORY2_nb_fan_b	AV	5082	0	RO	Circuit B Total Fans NB
FACTORY2_exvmax_a	AV	5083	0	RO	EXV A Maximum Steps Nb
FACTORY2_exvRat_a	AV	5084	0	RO	EXV A Rate (steps/sec)
FACTORY2_exvmax_b	AV	5085	0	RO	EXV B Maximum Steps Nb
FACTORY2_exvRat_b	AV	5086	0	RO	EXV B Rate (steps/sec)
FACTORY2_ClPumpTp	AV	5087	0	RO	Pump Type
FACTORY2_ClExchTp	AV	5089	0	RO	Exchanger Type
FACTORY2_ClPipgTp	AV	5091	0	RO	Piping Type

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
GENCONF_ewt_opt	BV	5093	0	RO	Entering Fluid Control
SERVICE1_hp_th	AV	5094	0	RO	High Pressure Threshold
SERVICE1_heatersp	AV	5095	0	RO	Exch. Heater Delta Spt
SERVICE1_freezesp	AV	5096	0	RO	Brine Freeze Setpoint
SERVICE1_mini_lwt	AV	5097	0	RO	Minimum LWT Setpoint
SERVICE1_auto_sm	BV	5098	0	RO	Auto Start when SM lost
SERVICE1_zm_stp	AV	5099	0	RO	Auto Z Multiplier Stp
SERVICE1_hc_zm	AV	5100	0	RO	Maximum Z Multiplier
SERVICE1_ser_pass	AV	5101	0	RO	Service Password
SERVICE1_flow_sp	AV	5102	0	RO	Flow Setpoint
SERVICE1_pump_cyc	BV	5103	0	RO	Pump Cycl. Freeze Prot.
PUMPCONF_flow_ctl	AV	5104	0	RO	Flow Control Method
PUMPCONF_dt_stp	AV	5105	0	RO	Flow Delta T Setpoint
PUMPCONF_dp_stp	AV	5106	0	RO	Flow Delta P Setpoint
PUMPCONF_wtr_zval	AV	5107	0	RO	Pressure Zero Value
PUMPCONF_pump_min	AV	5108	0	RO	Pump Minimum Speed
PUMPCONF_pump_sav	AV	5109	0	RO	Pump Min Speed Cap=0%
PUMPCONF_pump_max	AV	5110	0	RO	Pump Maximum Speed
SERVICE1_b_metric	BV	5111	0	RO	Blackbox In Metric ?
SERVICE1_unit_alt	AV	5112	0	RO	Unit Altitude (in meter)
SERVICE1_FrDfrPer	AV	5113	0	RO	Free Defr Allowed Period
SERVICE1_OatFrDfr	AV	5114	0	RO	Oat Min for Free Defrost
SERVICE1_Leak_thr	AV	5115	0	RO	Leakage Charge Threshold
SERVICE1_Leak_tmr	AV	5116	0	RO	Leakage Charge Timer
PUMPCONF_MinWpThr	AV	5117	0	RO	Min Water Press Thres
UPDTHOUR_hr_mach	AV	5118	0	RO	Machine Operating Hours
UPDTHOUR_st_mach	AV	5119	0	RO	Machine Starts Number
UPDTHOUR_hr_cp_a1	AV	5120	0	RO	Compressor A1 Hours
UPDTHOUR_hr_cp_a2	AV	5121	0	RO	Compressor A2 Hours
UPDTHOUR_hr_cp_a3	AV	5122	0	RO	Compressor A3 Hours
UPDTHOUR_hr_cp_a4	AV	5123	0	RO	Compressor A4 Hours
UPDTHOUR_hr_cp_b1	AV	5124	0	RO	Compressor B1 Hours
UPDTHOUR_hr_cp_b2	AV	5125	0	RO	Compressor B2 Hours
UPDTHOUR_hr_cp_b3	AV	5126	0	RO	Compressor B3 Hours
UPDTHOUR_hr_cp_b4	AV	5127	0	RO	Compressor B4 Hours
UPDTHOUR_st_cp_a1	AV	5128	0	RO	Compressor A1 Starts
UPDTHOUR_st_cp_a2	AV	5129	0	RO	Compressor A2 Starts
UPDTHOUR_st_cp_a3	AV	5130	0	RO	Compressor A3 Starts
UPDTHOUR_st_cp_a4	AV	5131	0	RO	Compressor A4 Starts
UPDTHOUR_st_cp_b1	AV	5132	0	RO	Compressor B1 Starts
UPDTHOUR_st_cp_b2	AV	5133	0	RO	Compressor B2 Starts
UPDTHOUR_st_cp_b3	AV	5134	0	RO	Compressor B3 Starts
UPDTHOUR_st_cp_b4	AV	5135	0	RO	Compressor B4 Starts
UPDTHOUR_hr_fana1	AV	5136	0	RO	Fan A1 Hours
UPDTHOUR_hr_fana2	AV	5137	0	RO	Fan A2 Hours
UPDTHOUR_hr_fana3	AV	5138	0	RO	Fan A3 Hours
UPDTHOUR_hr_fana4	AV	5139	0	RO	Fan A4 Hours
UPDTHOUR_hr_fana5	AV	5140	0	RO	Fan A5 Hours
UPDTHOUR_hr_fana6	AV	5141	0	RO	Fan A6 Hours
UPDTHOUR_hr_fana7	AV	5142	0	RO	Fan A7 Hours
UPDTHOUR_hr_fana8	AV	5143	0	RO	Fan A8 Hours
UPDTHOUR_hr_fanb1	AV	5144	0	RO	Fan B1 Hours
UPDTHOUR_hr_fanb2	AV	5145	0	RO	Fan B2 Hours
UPDTHOUR_hr_fanb3	AV	5146	0	RO	Fan B3 Hours
UPDTHOUR_hr_fanb4	AV	5147	0	RO	Fan B4 Hours
UPDTHOUR_hr_fanb5	AV	5148	0	RO	Fan B5 Hours
UPDTHOUR_hr_fanb6	AV	5149	0	RO	Fan B6 Hours
UPDTHOUR_hr_fanb7	AV	5150	0	RO	Fan B7 Hours
UPDTHOUR_hr_fanb8	AV	5151	0	RO	Fan B8 Hours
UPDTHOUR_hr_pump1	AV	5152	0	RO	Water Pump #1 Hours
UPDTHOUR_hr_pump2	AV	5153	0	RO	Water Pump #2 Hours

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
UPDTHOUR_nb_defra	AV	5157	0	RO	Circuit A Defrost Number
UPDTHOUR_nb_defrb	AV	5158	0	RO	Circuit B Defrost Number
UPDTHOUR_FC_HOUR	AV	5159	0	RO	FC Operating Hours
UPDTHOUR_FC_FAN1S	AV	5160	0	RO	FC Fan Stage 1 Start
UPDTHOUR_FC_FAN1H	AV	5161	0	RO	FC Fan Stage 1 Hours
UPDTHOUR_FC_FAN2S	AV	5162	0	RO	FC Fan Stage 2 Start
UPDTHOUR_FC_FAN2H	AV	5163	0	RO	FC Fan Stage 2 Hours
UPDTHOUR_FC_FAN3S	AV	5164	0	RO	FC Fan Stage 3 Start
UPDTHOUR_FC_FAN3H	AV	5165	0	RO	FC Fan Stage 3 Hours
UPDTHOUR_FC_FAN4S	AV	5166	0	RO	FC Fan Stage 4 Start
UPDTHOUR_FC_FAN4H	AV	5167	0	RO	FC Fan Stage 4 Hours
UPDTHOUR_FC_FAN5S	AV	5168	0	RO	FC Fan Stage 5 Start
UPDTHOUR_FC_FAN5H	AV	5169	0	RO	FC Fan Stage 5 Hours
UPDTHOUR_FC_FAN6S	AV	5170	0	RO	FC Fan Stage 6 Start
UPDTHOUR_FC_FAN6H	AV	5171	0	RO	FC Fan Stage 6 Hours
UPDTHOUR_FC_FAN7S	AV	5172	0	RO	FC Fan Stage 7 Start
UPDTHOUR_FC_FAN7H	AV	5173	0	RO	FC Fan Stage 7 Hours
MST_SLV_ms_sel	AV	5174	0	RO	Master/Slave Select
MST_SLV_ms_ctrl	AV	5175	0	RO	Master Control Type
MST_SLV_slv_addr	AV	5176	0	RO	Slave Address
MST_SLV_lead_sel	AV	5177	0	RO	Lead Lag Select
MST_SLV_ll_bal_d	AV	5178	0	RO	Lead/Lag Balance Delta
MST_SLV_lstr_tim	AV	5179	0	RO	Lead/Lag Start Timer
MST_SLV_lead_pul	AV	5180	0	RO	Lead Pulldown Time
MST_SLV_start_dt	AV	5181	0	RO	Start If Error Higher
MST_SLV_lag_mini	AV	5182	0	RO	Lag Minimum Running Time
MST_SLV_lag_pump	BV	5183	0	RO	Lag Unit Pump Control
MST_SLV_ll_serie	BV	5184	0	RO	Chiller In Series
MST_SLV_mstEnbl	BV	5185	0	RO	master enable
MST_SLV_slvEnbl	BV	5186	0	RO	slave enable
MST_SLV_isLwtToo	BV	5187	0	RO	Is Lwt is too low or too high?
MST_SLV_islegacy	BV	5188	0	RO	Legacy compatibility ?
CP_UNABL_un_cp_a1	BV	5189	0	RO	Compressor A1 Disable
CP_UNABL_un_cp_a2	BV	5190	0	RO	Compressor A2 Disable
CP_UNABL_un_cp_a3	BV	5191	0	RO	Compressor A3 Disable
CP_UNABL_un_cp_a4	BV	5192	0	RO	Compressor A4 Disable
CP_UNABL_un_cp_b1	BV	5193	0	RO	Compressor B1 Disable
CP_UNABL_un_cp_b2	BV	5194	0	RO	Compressor B2 Disable
CP_UNABL_un_cp_b3	BV	5195	0	RO	Compressor B3 Disable
CP_UNABL_un_cp_b4	BV	5196	0	RO	Compressor B4 Disable
SERVICE2_fan_kp	AV	5197	0	RO	Varifan PID Prop Gain
SERVICE2_fan_ki	AV	5198	0	RO	Varifan PID Integ Gain
SERVICE2_fan_kd	AV	5199	0	RO	Varifan PID Deriv Gain
SERVICE2_fan_max	AV	5200	0	RO	Maximum Fan Speed
SERVICE2_vfheatkp	AV	5201	0	RO	Varifan Heat. Prop Gain
SERVICE2_vfheatki	AV	5202	0	RO	Varifan Heat. Integ Gain
SERVICE2_vfheatkd	AV	5203	0	RO	Varifan Heat. Deriv Gain
SERVICE2_mop_sp	AV	5204	0	RO	EXV MOP Setpoint
SERVICE2_sh_sp_a	AV	5205	0	RO	EXV A Superheat Setpoint
SERVICE2_sh_sp_b	AV	5206	0	RO	EXV B Superheat Setpoint
MAINTCFG_s_alert	BV	5209	0	RO	Servicing Alert
MAINTCFG_charge_c	BV	5210	0	RO	Refrigerant Charge Ctrl
MAINTCFG_wloop_c	BV	5211	0	RO	Water Loop Control
MAINTCFG_mntn_typ	AV	5212	0	RO	Maintenance Alert Type
MAINTCFG_mth_freq	AV	5213	0	RO	Frequency in months
MAINTCFG_hr_freq	AV	5214	0	RO	Frequency in hours
MAINTCFG_run_days	AV	5215	0	RO	Running Days
MAINTCFG_fgas_frq	AV	5216	0	RO	Fgas Check Freq (months)

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
MSC_SERV_eco_pmp	BV	5217	0	RO	Eco Pump Enable
MSC_SERV_ecop_off	AV	5218	0	RO	Pump Off Time
MSC_SERV_ecop_on	AV	5219	0	RO	Pump On Time
MSC_STAT_m_ecopmp	BV	5220	0	RO	Eco Pump Mode Active
OPT_SEL_ehs_en	AV	5221	0	RO	Electrical Heat Stages
OPT_SEL_boil_en	AV	5222	0	RO	Boiler Enable
OPT_SEL_dcfc_en	AV	5223	0	RO	DC Free Cooling Enable
DCFC_CFG_oat_s	AV	5224	0	RO	OAT Selection
DCFC_CFG_start_th	AV	5225	0	RO	Start Valve Threshold
DCFC_CFG_stop_th	AV	5226	0	RO	Stop Valve Threshold
DCFC_CFG_chil_del	AV	5227	0	RO	Chiller Activation Delay
DCFC_CFG_dband	AV	5228	0	RO	Fan Start/Stop Dead Band
DCFC_CFG_pg	AV	5229	0	RO	Proportional Gain Vfan
DCFC_CFG_ig	AV	5230	0	RO	Integral Gain Vfan
DCFC_CFG_dg	AV	5231	0	RO	Derivative Gain Vfan
DCFC_CFG_on_tmr	AV	5232	0	RO	Fans Minimum On Time
DCFC_CFG_off_tmr	AV	5233	0	RO	Fans Minimum Off Time
DCFC_CFG_nb_line	AV	5234	0	RO	Number of Fan Lines
DCFC_CFG_nb_fan	AV	5235	0	RO	Number of Fix Speed Fans
DCFC_CFG_vfan	BV	5236	0	RO	Variable Speed Fan Stage
DCFC_CFG_vf_delta	AV	5237	0	RO	Vfan Stage Delta Speed
DCFC_CFG_dt_setp	AV	5238	0	RO	Delta T Septoint
GENUNIT_CTRL_PNT_wr	AV	10006	0	RW	Control Point
GENUNIT_DEM_LIM_wr	AV	10008	0	RW	Active Demand Limit Val
GENUNIT_CHIL_S_S_wr	BV	10012	0	RW	Net.: Cmd Start/Stop
GENUNIT_EMSTOP_wr	BV	10013	0	RW	Emergency Stop
GENUNIT_HC_SEL_wr	AV	10023	0	RW	Heat/Cool Select
GENUNIT_SP_SEL_wr	AV	10024	0	RW	Setpoint Select
PUMPSTAT_PUMP_1_wr	BV	10050	0	RW	Water Pump #1 Command
PUMPSTAT_PUMP_2_wr	BV	10051	0	RW	Water Pump #2 Command
GENUNIT_CHIL_OCC_wr	BV	10058	0	RW	Net.: Cmd Occupied
GENUNIT_SP_OCC_wr	BV	10059	0	RW	Setpoint Occupied?
ALM_EWT_F	BV	115001	0	RO	Water Exchanger Entering Fluid Thermistor Failure
ALM_LWT_F	BV	115002	0	RO	Water Exchanger Leaving Fluid Thermistor Failure
ALM_DEFROST_T_A_F	BV	115003	0	RO	Circuit A Defrost Thermistor
ALM_DEFROST_T_B_F	BV	115004	0	RO	Circuit B Defrost Thermistor
ALM_OAT_F	BV	115010	0	RO	OAT Thermistor Failure
ALM_CHWSTEMP_F	BV	115011	0	RO	Master/Slave Common Leaving Fluid Thermistor
ALM_SUCTION_T_A_F	BV	115012	0	RO	Circuit A Suction Gas Thermistor
ALM_SUCTION_T_B_F	BV	115013	0	RO	Circuit B Suction Gas Thermistor
ALM_SPACE_TEMP_F	BV	115021	0	RO	Space Temperature Thermistor
ALM_FC_WLOOP_F	BV	115046	0	RO	FC_WLOOP_F
ALM_FC_LWT_F	BV	115047	0	RO	FC_LWT_F
ALM_FC_OAT_F	BV	115048	0	RO	FC_OAT_F
ALM_DP_A_F	BV	112001	0	RO	Circuit A Discharge Transducer
ALM_DP_B_F	BV	112002	0	RO	Circuit B Discharge Transducer
ALM_SP_A_F	BV	112004	0	RO	Circuit A Suction Transducer
ALM_SP_B_F	BV	112005	0	RO	Circuit B Suction Transducer
ALM_WP_IN_F	BV	112024	0	RO	Water Exchanger Entering Fluid Transducer Failure
ALM_WP_OUT_F	BV	112025	0	RO	Water Exchanger Leaving Fluid Transducer Failure
ALM_SIOB_A_COM_F	BV	104901	0	RO	Loss of communication with Circuit A SIOB/CIOB board
ALM_SIOB_B_COM_F	BV	104902	0	RO	Loss of communication with Circuit B SIOB/CIOB board
ALM_SIOB_EMM_COM_F	BV	104906	0	RO	Loss of communication with Energy Management SIOB/CIOB board
ALM_AUX2_FS_FAN_1_COM_F	BV	104501	0	RO	Loss of communication with FS Fan AUX2 board Number 1
ALM_AUX1_1_COM_F	BV	104502	0	RO	Loss of communication with Fan AUX1 Board Number 1
ALM_FC_AUX1_COM_F	BV	104601	0	RO	FC_AUX1_COM_F

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
ALM_FAN_DRIVE_A_COM_F	BV	104701	0	RO	Loss of communication with VFD Fan Drive 1 Circuit A
ALM_FAN_DRIVE_A2_COM_F	BV	104702	0	RO	Loss of communication with VFD Fan Drive 2 Circuit A
ALM_FAN_DRIVE_B_COM_F	BV	104703	0	RO	Loss of communication with VFD Fan Drive 1 Circuit B
ALM_FAN_DRIVE_B2_COM_F	BV	104704	0	RO	Loss of communication with VFD Fan Drive 2 Circuit B
ALM_PUMP_DRIVE_1_COM_F	BV	104705	0	RO	Loss of communication with VFD Pump Drive Number 1
ALM_PUMP_DRIVE_2_COM_F	BV	104706	0	RO	Loss of communication with VFD Pump Drive Number 2
ALM_EXCH_FREEZE_F	BV	110001	0	RO	Water Exchanger Freeze Protection
ALM_LOW_SUCTION_A_F	BV	110005	0	RO	Circuit A Low Saturated Suction Temperature
ALM_LOW_SUCTION_B_F	BV	110006	0	RO	Circuit B Low Saturated Suction Temperature
ALM_HIGH_SH_A_F	BV	110008	0	RO	Circuit A High Superheat
ALM_HIGH_SH_B_F	BV	110009	0	RO	Circuit B High Superheat
ALM_LOW_SH_A_F	BV	110011	0	RO	Circuit A Low Superheat
ALM_LOW_SH_B_F	BV	110012	0	RO	Circuit B Low Superheat
ALM_INTER_LOCK_F	BV	110014	0	RO	Customer Interlock Failure
ALM_CPA1_REVERSE_ROT_F	BV	110016	0	RO	Compressor A1 Not Started or Pressure Increase not established
ALM_CPA2_REVERSE_ROT_F	BV	110017	0	RO	Compressor A2 Not Started or Pressure Increase not established
ALM_CPA3_REVERSE_ROT_F	BV	110018	0	RO	Compressor A3 Not Started or Pressure Increase not established
ALM_CPA4_REVERSE_ROT_F	BV	110019	0	RO	Compressor A4 Not Started or Pressure Increase not established
ALM_CPB1_REVERSE_ROT_F	BV	110020	0	RO	Compressor B1 Not Started or Pressure Increase not established
ALM_CPB2_REVERSE_ROT_F	BV	110021	0	RO	Compressor B2 Not Started or Pressure Increase not established
ALM_CPB3_REVERSE_ROT_F	BV	110022	0	RO	Compressor B3 Not Started or Pressure Increase not established
ALM_CPB4_REVERSE_ROT_F	BV	110023	0	RO	Compressor B4 Not Started or Pressure Increase not established
ALM_ELEC_BOX_F	BV	110028	0	RO	Electrical Box Fault
ALM_LOSS_COM_MS_F	BV	110030	0	RO	Master/Slave Communication Failure
ALM_NETWORK_EMSTOP_F	BV	110031	0	RO	Unit is in Network emergency stop
ALM_WPUMP1_F	BV	110032	0	RO	Water Pump #1 Default
ALM_WPUMP2_F	BV	110033	0	RO	Water Pump #2 Default
ALM_REPEAT_HIGH_DGT_A_F	BV	110037	0	RO	Circuit A - Repeated High Discharge Gas Overrides
ALM_REPEAT_HIGH_DGT_B_F	BV	110038	0	RO	Circuit B - Repeated High Discharge Gas Overrides
ALM_REPEAT_LOW_SST_A_F	BV	110040	0	RO	Circuit A - Repeated Low Suction Temp Overrides
ALM_REPEAT_LOW_SST_B_F	BV	110041	0	RO	Circuit B - Repeated Low Suction Temp Overrides
ALM_HEAT_LOW_EWT_F	BV	110043	0	RO	Low Entering Water Temperature in Heating
ALM_EXCH_FLOW_F	BV	110051	0	RO	Water Exchanger Flow Switch Failure
ALM_HP_SWITCH_A_F	BV	110063	0	RO	Circuit A High Pressure Switch Failure
ALM_HP_SWITCH_B_F	BV	110064	0	RO	Circuit B High Pressure Switch Failure
ALM_FLOW_CONFIG_F	BV	110090	0	RO	Water Exchanger Flow Switch: Setpoint Configuration Failure
ALM_SENSORS_SWAP_F	BV	110097	0	RO	Water Exchanger Temperature Sensors Swapped
ALM_FLUIDE_FAIL	BV	110050	0	RO	Refrigerant Leakage Detection
ALM_FC_PROCESS_F	BV	110101	0	RO	Free Cooling Process Failure
ALM_WL_PRESS_ZERO_ERROR	BV	111202	0	RO	Water Loop : Delta Pressure Error
ALM_WL_PRESS_TOO_LOW	BV	111203	0	RO	Water Loop : Pressure Too Low
ALM_WL_PUMP_NOT_STARTED	BV	111204	0	RO	Water Loop : Pump Not Started
ALM_WL_PRESS_ERR_IN_RUN	BV	111205	0	RO	Water Loop : Pressure Error During Runtest
ALM_WL_PUMP_OVERLOAD	BV	111206	0	RO	Water Loop : Pump Overload
ALM_WL_LOW_FLOW	BV	111207	0	RO	Water Loop : Flow Too Low
ALM_WL_PRESS_CROSS	BV	111208	0	RO	Water Loop : Pressure Sensors Crossed
ALM_WL_LO_PRESS_WARN	BV	111209	0	RO	Water Loop : Low Pressure Warning
ALM_LOW_DELTP_A_F	BV	110210	0	RO	Low Delta Pressure Operation Failure - cir A
ALM_LOW_DELTP_B_F	BV	110211	0	RO	Low Delta Pressure Operation Failure - cir B
ALM_ILL_FACT_CONF_F	BV	107001	0	RO	Illegal Factory Configuration Number #1 to nn
ALM_INI_FACT_CONF_F	BV	108000	0	RO	No Factory Configuration

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
ALM_CPA1_F	BV	101199	0	RO	Compressor A1 Failure
ALM_CPA2_F	BV	101299	0	RO	Compressor A2 Failure
ALM_CPA3_F	BV	101399	0	RO	Compressor A3 Failure
ALM_CPA4_F	BV	101499	0	RO	Compressor A4 Failure
ALM_CPB1_F	BV	102199	0	RO	Compressor B1 Failure
ALM_CPB2_F	BV	102299	0	RO	Compressor B2 Failure
ALM_CPB3_F	BV	102399	0	RO	Compressor B3 Failure
ALM_CPB4_F	BV	102499	0	RO	Compressor B4 Failure
ALM_WELDED_CONTACT_A_F	BV	106001	0	RO	Circuit A Welded Contactor Failure
ALM_WELDED_CONTACT_B_F	BV	106002	0	RO	Circuit B Welded Contactor Failure
ALM_DATABASE_F	BV	155001	0	RO	Database Module Failure
ALM_LENSCAN_F	BV	156001	0	RO	Lenscan Module Failure
ALM_M_S_CONFIG_F	BV	109001	0	RO	Master Chiller Configuration Error Number #1 to nn
ALM_SERV_MAINT_ALERT	BV	113000	0	RO	Service Maintenance Alert Number # nn
ALM_FGAS_NEEDED	BV	113005	0	RO	Fgas check needed, call your maintenance company
ALM_VFAN_DRV_A1_F	BV	117001	0	RO	Circuit A VFD Fan Drive 1 Failure
ALM_VFAN_DRV_A2_F	BV	118002	0	RO	Circuit A VFD Fan Drive 2 Failure
ALM_VFAN_DRV_B1_F	BV	119001	0	RO	Circuit B VFD Fan Drive 1 Failure
ALM_VFAN_DRV_B2_F	BV	120001	0	RO	Circuit B VFD Fan Drive 2 Failure
ALM_VPUMP_DRV_1_F	BV	121001	0	RO	VFD Pump 1 Drive Failure
ALM_VPUMP_DRV_2_F	BV	122001	0	RO	VFD Pump 2 Drive Failure
ALM_VFAN_DRV_A1_ALERT	BV	135001	0	RO	Circuit A VFD Fan Drive 1 Alert
ALM_VFAN_DRV_A2_ALERT	BV	136001	0	RO	Circuit A VFD Fan Drive 2 Alert
ALM_VFAN_DRV_B1_ALERT	BV	137001	0	RO	Circuit B VFD Fan Drive 1 Alert
ALM_VFAN_DRV_B2_ALERT	BV	138001	0	RO	Circuit B VFD Fan Drive 2 Alert
ALM_VPUMP_DRV_1_ALERT	BV	139001	0	RO	VFD Pump 1 Drive Alert
ALM_VPUMP_DRV_2_ALERT	BV	140001	0	RO	VFD Pump 2 Drive Alert
ALM_SIOB_LOWVOLT_CIRA_F	BV	157001	0	RO	Circuit A SIOB/CIOB Low Voltage Failure
ALM_SIOB_LOWVOLT_CIRB_F	BV	157002	0	RO	Circuit B SIOB/CIOB Low Voltage Failure
ALM_SIOB_LOWVOLT_EMM_F	BV	157006	0	RO	EMM SIOB/CIOB Low Voltage Failure
ALM_EXV_A_F	BV	157020	0	RO	Main EXV Stepper Motor Failure - Cir A
ALM_EXV_B_F	BV	157021	0	RO	Main EXV Stepper Motor Failure - Cir B
ALM_LOSS_COM_SM_F	BV	110029	0	RO	Loss of Communication With System Manager
ALM_ILL_BRAND	BV	108001	0	RO	Illegal Brand identifier
EOLRES_j6_eol	BV	5239	0	RO	End Of Line Res. J6(LEN)
EOLRES_j7_eol	BV	5240	0	RO	End Of Line Res. J7(CCN)
EOLRES_j8_eol	BV	5241	0	RO	End Of Line Resistor J8
EOLRES_j10_eol	BV	5242	0	RO	End Of Line Resistor J10
INPUTS_HP_SW_A	AV	5243	0	RO	High Pressure Switch A
INPUTS_HP_SW_B	AV	5244	0	RO	High Pressure Switch B
INPUTS_SP_RESET	AV	5245	0	RO	Setpoint Reset Signal
INPUTS_LIM_4_20	AV	5246	0	RO	Capacity Limit Control
OUTPUTS_FAN_ST_A	AV	5247	0	RO	Fan Staging Number Cir A
OUTPUTS_FAN_ST_B	AV	5248	0	RO	Fan Staging Number Cir B
OUTPUTS_RV_A	BV	5249	0	RO	4-way Refrig. Valve A
OUTPUTS_RV_B	BV	5250	0	RO	4-way Refrig. Valve B
OUTPUTS_CO_HTR_A	BV	5251	0	RO	Coil Heater A
OUTPUTS_CO_HTR_B	BV	5252	0	RO	Coil Heater B
OUTPUTS_ALARM	BV	5253	0	RO	Alarm Relay Status
OUTPUTS_ALERT	BV	5254	0	RO	Alert Relay State
OUTPUTS_SHUTDOWN	BV	5255	0	RO	Shutdown Indicator State
OUTPUTS_EXCH_HTR	BV	5256	0	RO	Exchanger Heater
OUTPUTS_SETFLOW	BV	5257	0	RO	Flow Switch Setpoint cfg
OUTPUTS_CAPT_010	AV	5258	0	RO	Chiller Capacity Running
OUTPUTS_BOILER	BV	5259	0	RO	Boiler Output
OUTPUTS_EHS1	BV	5260	0	RO	Electrical Heat Stage 1
OUTPUTS_EHS2	BV	5261	0	RO	Electrical Heat Stage 2
OUTPUTS_EHS3	BV	5262	0	RO	Electrical Heat Stage 3
OUTPUTS_EHS4	BV	5263	0	RO	Electrical Heat Stage 4

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
PUMPSTAT_ROTWPUMP	BV	5264	0	RO	Rotate Water Pumps Now?
PUMPSTAT_wp_out	AV	5264	0	RO	Outlet Water Pres.(cor)
PUMPSTAT_wp_in	AV	5265	0	RO	Inlet Water Pres.(cor)
PUMPSTAT_WP_CAL	BV	5266	0	RO	Water Pres. Calibration?
PUMPSTAT_wp_off	AV	5267	0	RO	Water Pressure Offset
PUMPSTAT_wp_filt	AV	5268	0	RO	Delta Pressure Filter
PUMPSTAT_wp_min	AV	5269	0	RO	Minimum Water Pressure
PUMPSTAT_dt_stp	AV	5270	0	RO	Water Delta T Setpoint
PUMPSTAT_delta_t	AV	5271	0	RO	Current Water Delta T
PUMPSTAT_dp_stp	AV	5272	0	RO	Water Delta P Setpoint
PUMPSTAT_delta_p	AV	5273	0	RO	Current Water Delta P
RUNTIME_nb_defra	AV	5274	0	RO	Circuit A Defrost Number
RUNTIME_nb_defrb	AV	5275	0	RO	Circuit B Defrost Number
MODES_m_delay	BV	5276	0	RO	Start Up Delay In Effect
MODES_m_2stpt	BV	5277	0	RO	Second Setpoint In Use
MODES_m_reset	BV	5278	0	RO	Reset In Effect
MODES_m_demlim	BV	5279	0	RO	Demand limit active
MODES_m_rpload	BV	5280	0	RO	Ramp Loading Active
MODES_m_whtr	BV	5281	0	RO	Water Exchanger Heater
MODES_m_pmprot	BV	5282	0	RO	Water Pump Rotation
MODES_m_pmpper	BV	5283	0	RO	Pump Periodic Start
MODES_m_lowsca	BV	5284	0	RO	Low Suction Circuit A
MODES_m_lowscb	BV	5285	0	RO	Low Suction Circuit B
MODES_m_hidgta	BV	5286	0	RO	High DGT Circuit A
MODES_m_hidgtb	BV	5287	0	RO	High DGT Circuit B
MODES_m_hiprsa	BV	5288	0	RO	High Press Override CirA
MODES_m_hiprsb	BV	5289	0	RO	High Press Override CirB
MODES_m_dltp_a	BV	5290	0	RO	Low Delta Press Cir A
MODES_m_dltp_b	BV	5291	0	RO	Low Delta Press Cir B
MODES_m_night	BV	5292	0	RO	Night Low Noise Active
MODES_m_hsm	BV	5293	0	RO	System Manager Active
MODES_m_slave	BV	5294	0	RO	Master Slave Active
MODES_m_autoch	BV	5295	0	RO	Auto Changeover Active
MODES_m_defr_a	BV	5296	0	RO	Defrost Active Circuit A
MODES_m_defr_b	BV	5297	0	RO	Defrost Active Circuit B
MODES_m_boiler	BV	5298	0	RO	Boiler Active
MODES_m_ehs	BV	5299	0	RO	Electric Heater Active
MODES_m_ewtlck	BV	5300	0	RO	Heating Low EWT Lockout
MODES_m_ice	BV	5301	0	RO	Ice Mode In Effect
ENERGY_cPwrOut	AV	5302	0	RO	Cooling Power Output
ENERGY_cPwrIn	AV	5303	0	RO	Electical Power Input
ENERGY_eer	AV	5304	0	RO	Energy Efficiency (EER)
ENERGY_cEnergOu	AV	5305	0	RO	Cooling Energy Output
ENERGY_cEnergIn	AV	5306	0	RO	Electrical Energy Input
ENERGY_energEer	AV	5307	0	RO	Integrated EER
ENERGY_hPwrOut	AV	5308	0	RO	Heating Power Output
ENERGY_hPwrIn	AV	5309	0	RO	Electical Power Input
ENERGY_cop	AV	5310	0	RO	Coef. Of Perf. (COP)
ENERGY_hEnergOu	AV	5311	0	RO	Heating Energy Output
ENERGY_hEnergIn	AV	5312	0	RO	Electrical Energy Input
ENERGY_energCop	AV	5313	0	RO	Integrated COP
ENERGY_reset_en	BV	5314	0	RO	Reset of Energy Counter
DCFC_STA_oat	AV	5317	0	RO	OAT Free Cooling
DCFC_STA_lwt	AV	5318	0	RO	FC Leaving Water Temp
DCFC_STA_wloop	AV	5319	0	RO	FC Water Loop Temp
DCFC_STA_m_dcfc	BV	5320	0	NA	Free Cooling Mode Active
DCFC_STA_dcfc_cap	AV	5321	0	RO	FC Capacity
DCFC_STA_f_stage	AV	5322	0	RO	Fix Speed Fans Stage
DCFC_STA_vf_speed	AV	5323	0	RO	Varifan Speed
DCFC_STA_pid_out	AV	5324	0	RO	PID Output

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
DCFC_STA_FC_HOUR	AV	5325	0	RO	DCFC Operating Hours
DCFC_STA_FC_FAN1S	AV	5326	0	RO	DCFC Fan Stage 1 Start
DCFC_STA_FC_FAN1H	AV	5327	0	RO	DCFC Fan Stage 1 Hours
DCFC_STA_FC_FAN2S	AV	5328	0	RO	DCFC Fan Stage 2 Start
DCFC_STA_FC_FAN2H	AV	5329	0	RO	DCFC Fan Stage 2 Hours
DCFC_STA_FC_FAN3S	AV	5330	0	RO	DCFC Fan Stage 3 Start
DCFC_STA_FC_FAN3H	AV	5331	0	RO	DCFC Fan Stage 3 Hours
DCFC_STA_FC_FAN4S	AV	5332	0	RO	DCFC Fan Stage 4 Start
DCFC_STA_FC_FAN4H	AV	5333	0	RO	DCFC Fan Stage 4 Hours
DCFC_STA_FC_FAN5S	AV	5334	0	RO	DCFC Fan Stage 5 Start
DCFC_STA_FC_FAN5H	AV	5335	0	RO	DCFC Fan Stage 5 Hours
DCFC_STA_FC_FAN6S	AV	5336	0	RO	DCFC Fan Stage 6 Start
DCFC_STA_FC_FAN6H	AV	5337	0	RO	DCFC Fan Stage 6 Hours
DCFC_STA_FC_FAN7S	AV	5338	0	RO	DCFC Fan Stage 7 Start
DCFC_STA_FC_FAN7H	AV	5339	0	RO	DCFC Fan Stage 7 Hours
DCFC_STA_FC_VFANS	AV	5340	0	RO	DCFC Variable Fan Start
DCFC_STA_FC_VFANH	AV	5341	0	RO	DCFC Variable Fan Hours
OPT_STA_demo_sta	BV	5342	0	RO	Demo Mode Status
OPT_STA_opt149	BV	5343	0	RO	OPT149: BACnet
OPT_STA_opt5	BV	5344	0	RO	OPT5: Medium Brine
OPT_STA_opt6	BV	5345	0	RO	OPT6: Low Brine
OPT_STA_opt8	BV	5346	0	RO	OPT8: Light Brine
OPT_STA_opt295	BV	5347	0	RO	OPT295: Fast Cap Reco
OPT_STA_opt149B	BV	5348	0	RO	OPT149B: Modbus
LOADFACT_tp_error	AV	5349	0	RO	Controlled Temp Error
LOADFACT_cap_t	AV	5350	0	RO	Actual Capacity
LOADFACT_cap_lim	AV	5351	0	RO	Actual Capacity Limit
LOADFACT_zm	AV	5352	0	RO	Current Z Multiplier Val
LOADFACT_smz	AV	5353	0	RO	Load/Unload Factor
LOADFACT_cur_stag	AV	5354	0	RO	Active Stage Number
LOADFACT_over_cap	AV	5355	0	RO	Active Capacity Override
LOADFACT_ov_hd_a	AV	5356	0	RO	H P Ctrl Override Cir A
LOADFACT_sct_ct_a	AV	5357	0	RO	SCT Control Point Cir A
LOADFACT_minSct_a	AV	5358	0	RO	Minimum SCT Threshold A
LOADFACT_sh_sp_a	AV	5359	0	RO	SH Setpoint Circuit A
LOADFACT_sh_sp_b	AV	5360	0	RO	SH Setpoint Circuit B
LOADFACT_ov_exv_a	AV	5361	0	RO	EXV Override Circuit A
LOADFACT_ov_exv_b	AV	5362	0	RO	EXV Override Circuit B
LOADFACT_exv_v_a	AV	5363	0	RO	EXV value A
LOADFACT_exv_v_b	AV	5364	0	RO	EXV value B
LOADFACT_over_ehs	AV	5365	0	RO	EHS Ctrl Override
LOADFACT_eh_stage	AV	5366	0	RO	Requested Electric Stage
LOADFACT_ehspulld	BV	5367	0	RO	Electrical Pulldown?
LOADFACT_ehs_stat	AV	5368	0	RO	EHS status
LOADFACT_req_pwr	AV	5369	0	RO	Required Cooling Power
LOADFACT_flowSw_s	AV	5370	0	RO	Flow Switch Cfg status
LOADFACT_hydKit_s	AV	5371	0	RO	Hydronic Kit Status
LAST_POR_date_on1	AV	5372	0	RO	Power On 1 :day-mon-year
LAST_POR_time_on1	AV	5373	0	RO	Power On 1 :hour-minute
LAST_POR_date_of1	AV	5374	0	RO	PowerDown 1:day-mon-year
LAST_POR_time_of1	AV	5375	0	RO	PowerDown 1:hour-minute
LAST_POR_date_on2	AV	5376	0	RO	Power On 2 :day-mon-year
LAST_POR_time_on2	AV	5377	0	RO	Power On 2 :hour-minute
LAST_POR_date_of2	AV	5378	0	RO	PowerDown 2:day-mon-year
LAST_POR_time_of2	AV	5379	0	RO	PowerDown 2:hour-minute
LAST_POR_date_on3	AV	5380	0	RO	Power On 3 :day-mon-year
LAST_POR_time_on3	AV	5381	0	RO	Power On 3 :hour-minute
LAST_POR_date_of3	AV	5382	0	RO	PowerDown 3:day-mon-year
LAST_POR_time_of3	AV	5383	0	RO	PowerDown 3:hour-minute

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
LAST_POR_date_on4	AV	5384	0	RO	Power On 4 :day-mon-year
LAST_POR_time_on4	AV	5385	0	RO	Power On 4 :hour-minute
LAST_POR_date_of4	AV	5386	0	RO	PowerDown 4:day-mon-year
LAST_POR_time_of4	AV	5387	0	RO	PowerDown 4:hour-minute
LAST_POR_date_on5	AV	5388	0	RO	Power On 5 :day-mon-year
LAST_POR_time_on5	AV	5389	0	RO	Power On 5 :hour-minute
LAST_POR_date_of5	AV	5390	0	RO	PowerDown 5:day-mon-year
LAST_POR_time_of5	AV	5391	0	RO	PowerDown 5:hour-minute
M_MSTSLV_ms_activ	BV	5392	0	RO	Master/Slave Ctrl Active
M_MSTSLV_lead_sel	BV	5393	0	RO	Lead Unit is the:
M_MSTSLV_slv_stat	AV	5394	0	RO	Slave Chiller State
M_MSTSLV_slv_capt	AV	5395	0	RO	Slave Chiller Total Cap
M_MSTSLV_l_strt_d	AV	5396	0	RO	Lag Start Delay
M_MSTSLV_ll_hr_d	AV	5397	0	RO	Lead/lag Hours Delta
M_MSTSLV_ll_chang	BV	5398	0	RO	Lead/lag Changeover?
M_MSTSLV_ll_pull	BV	5399	0	RO	Lead Pulldown ?
M_MSTSLV_ms_error	AV	5400	0	RO	Master/Slave Error
M_MSTSLV_cap_max	BV	5401	0	RO	Max Available Capacity ?
M_MSTSLV_lagstat	AV	5402	0	RO	Slave lagstat
M_MSTSLV_slav_hr	AV	5403	0	RO	Slave Operating Hours
M_MSTSLV_slav_ewt	AV	5404	0	RO	Slave Entering Fluid
M_MSTSLV_slav_lwt	AV	5405	0	RO	Slave Leaving Fluid
DEFROST_def_se_a	AV	5406	0	RO	Next Sequence Allowed in
DEFROST_frost_a	AV	5407	0	RO	Exchanger Frost Factor
DEFROST_def_ac_a	BV	5408	0	RO	Defrost Active?
DEFROST_over_d_a	AV	5409	0	RO	Override State
DEFROST_DEFRT_A	AV	5410	0	RO	Defrost Temperature
DEFROST_defr_dua	AV	5411	0	RO	Defrost Duration
DEFROST_sctlim_a	AV	5412	0	RO	SCT limit Calculation
DEFROST_sct_dm_a	AV	5413	0	RO	Mean SCT Calculation
DEFROST_sst_dm_a	AV	5414	0	RO	Mean SST Calculation
DEFROST_delt_a	AV	5415	0	RO	Delta: OAT - Mean SST
DEFROST_delt_r_a	AV	5416	0	RO	Reference Delta
DEFROST_delt_v_a	AV	5417	0	RO	Delta - Reference Delta
DEFROST_fr_int_a	AV	5418	0	RO	Frost Integrator Gain
DEFROST_def_ca_a	AV	5419	0	RO	Defrost Fan Start Cal A
DEFROST_def_of_a	AV	5420	0	RO	Defrost Fan Offset Cal A
DEFROST_def_se_b	AV	5421	0	RO	Next Sequence Allowed in
DEFROST_frost_b	AV	5422	0	RO	Exchanger Frost Factor
DEFROST_def_ac_b	BV	5423	0	RO	Defrost Active?
DEFROST_over_d_b	AV	5424	0	RO	Override State
DEFROST_DEFRT_B	AV	5425	0	RO	Defrost Temperature
DEFROST_defr_dub	AV	5426	0	RO	Defrost Duration
DEFROST_sctlim_b	AV	5427	0	RO	SCT limit Calculation
DEFROST_sct_dm_b	AV	5428	0	RO	Mean SCT Calculation
DEFROST_sst_dm_b	AV	5429	0	RO	Mean SST Calculation
DEFROST_delt_b	AV	5430	0	RO	Delta: OAT - Mean SST
DEFROST_delt_r_b	AV	5431	0	RO	Reference Delta
DEFROST_delt_v_b	AV	5432	0	RO	Delta - Reference Delta
DEFROST_fr_int_b	AV	5433	0	RO	Frost Integrator Gain
DEFROST_def_ca_b	AV	5434	0	RO	Defrost Fan Start Cal B
DEFROST_def_of_b	AV	5435	0	RO	Defrost Fan Offset Cal B
DEFROST_FrDfrTmr	AV	5436	0	RO	water below ctrl_pnt
BACnet_port	AV	5437	0	RO	UDP Port Number
BACnet_bac_id_man	AV	5438	0	RO	Device Id manual
BACnet_auid_opt	BV	5439	0	RO	Device Id Auto Option
BACnet_balmena	BV	5440	0	RO	Alarm reporting
BACnet_mng_occ	BV	5441	0	RO	BACnet Manage Occupancy
BACnet_conIFnam	AV	5442	0	RO	IP port interface name
UNIT_HEATCOOL	AV	77	0	RO	Run Status
DCFC_CFG_vfan_max	AV	5751	0	RO	Fan speed max

See Legend on page 227.

APPENDIX D — BACNET IP POINTS (cont)

Object Name	Type	Instance	COVInc	PV Access	Description
FACTORY_opt_119C	BV	5072	0	RO	Option 119C Selection
ALM_HR_EWT_F	BV	15008	0	RO	Reclaim Condenser Entering Thermistor
ALM_HR_LWT_F	BV	15009	0	RO	Reclaim Condenser Leaving Thermistor
ALM_HR_FLOW_SW_F	BV	10052	0	RO	Heat Reclaim flow switch failure
ALM_HR_COND_FREEZE_F	BV	10128	0	RO	Heat Reclaim Condenser Freeze Protection
ALM_HR_HIGH_LWT_F	BV	10129	0	RO	Heat Reclaim high Water Temperature
RECLAIM_RECL_SEL_rd	BV	5667	0	RO	Reclaim Selection
RECLAIM_HR_stat	BV	5668	0	RO	Reclaim Status
RECLAIM_HRCtrPnt	AV	5669	0	RO	Reclaim control point
RECLAIM_HR_FLOW	BV	5670	0	RO	Heat Reclaim Flow switch
RECLAIM_HRCtrWat	AV	5671	0	RO	Reclaim controlled water
RECLAIM_HR_LWT	AV	5672	0	RO	HR Leaving Fluid temp
RECLAIM_HRheater	BV	5674	0	RO	Reclaim BPHE Heater
RECLAIM_cmd_3WV	AV	5678	0	RO	3WayValve / VarPump cmd
RECLAIM_out_3WV	AV	5679	0	RO	3WayValve / VarPump outp
RECLAIM_mode_3WV	AV	5680	0	RO	3WayValve / VarPump mode
RECLAIM_actiMode	BV	5681	0	RO	HR active mode (3WV/Fan)
RECLAIM_HR_pump	BV	5682	0	RO	Reclaim pump command
HR_CFG_hr_flui	BV	5693	0	RO	HR condenser fluid
HR_CFG_hr_eco	BV	5694	0	RO	HR eco mode ?
HR_CFG_rev_3WV	BV	5695	0	RO	HR reverse 3WV cmd ?
HR_CFG_HRewtctl	BV	5696	0	RO	HR Control on EWT ?
HR_CFG_kp_HR3wv	AV	5697	0	RO	PID gain prop 3w valve
HR_CFG_ki_HR3wv	AV	5698	0	RO	PID gain int 3w valve
HR_CFG_kd_HR3wv	AV	5699	0	RO	PID gain deri 3w valve
HR_CFG_kp_HRFan	AV	5700	0	RO	PID gain prop fan
HR_CFG_ki_HRFan	AV	5701	0	RO	PID gain int fan
HR_CFG_kd_HRFan	AV	5702	0	RO	PID gain deri fan
HR_CFG_minHRpmp	AV	5703	0	RO	HR VarPump min pos
HR_CFG_maxHR3wv	AV	5704	0	RO	3WayValve/VarPmp max pos
HR_CFG_flowTmr	AV	5705	0	RO	HR delay flow switch
HR_CFG_minFloEn	AV	5706	0	RO	Min flow 3wv enable
HR_CFG_minFlow	AV	5707	0	RO	Min flow 3wv position
RECLAIM_RECL_SEL_wr	BV	15667	0	RW	Reclaim Select
SETPOINT_hr_stp	AV	5709	0	RW	Heat Reclaim Setpoint
FACTORY_rclm_opt	AV	5710	0	RO	Option 50: Heat Reclaim
FACTORY_opt_41C	AV	5711	0	RO	Option 41C : HR Heater
ALM_AUX2_FS_FAN_2_COM_F	BV	104503	0	RO	Loss of communication with FS Fan AUX2 board Number 2
FACTORY_fc_opt	AV	78	0	RO	Free Cooling Option
HYD_FC_FC_DSBLE_rd	BV	79	0	RO	Free Cooling Disable?
PROTOCOL_FC_DSBLE_wr	BV	10079	0	RW	Free Cooling Disable?
HYD_FC_wLoopPstV	AV	80	0	RO	Water Loop Position
HYD_FC_fcCapT	AV	81	0	RO	Total FC Capacity
HYD_FC_fc_ev_rq	AV	82	0	RO	FC Evap Valve Request
HYD_FC_fc_cv_rq	AV	83	0	RO	FC Coil Valve Request
TEMP_FC_EV_WT	AV	84	0	RO	FC Evap Water Temp
ALM_FC_EVAP_WT_F	AV	115058	0	RO	FC Evaporator Water Thermistor Failure
ALM_FC_EVAP_VALVE_F	AV	110222	0	RO	FC Evaporator Valve Failure
ALM_FC_COIL_VALVE_F	AV	110220	0	WO	FC Coils Valve Failure

LEGEND

AV — Analog Value
BPHE — Brazed Plate Heat Exchanger
BV — Binary Value
CMD — Command
COVInc — Change of Value Increment
DGT — Discharge Gas Temperature
EHS — Electrical Heat Stage
EWT — Entering Water Temperature
EXV — Electronic Expansion Valve
FC — Fan Contactor
HR — Heat Reclaim
LWT — Leaving Water Temperature
OAT — Outdoor Air Temperature
PID — Proportional, Integral, Derivative Control
RO — Read Only
RW — Read Write
SCT — Saturated Condensing Temperature
SST — Saturated Suction Temperature
SH — Sensible Heat

APPENDIX E — MODBUS IP POINTS

ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x0001	1	ALM_EXCH_FREEZE_F	Water Exchanger Freeze Protection	DI		0	1	0
0x0005	5	ALM_LOW_SUCTION_A_F	Circuit A Low Saturated Suction Temperature	DI		0	1	0
0x0006	6	ALM_LOW_SUCTION_B_F	Circuit B Low Saturated Suction Temperature	DI		0	1	0
0x0008	8	ALM_HIGH_SH_A_F	Circuit A High Superheat	DI		0	1	0
0x0009	9	ALM_HIGH_SH_B_F	Circuit B High Superheat	DI		0	1	0
0x000B	11	ALM_LOW_SH_A_F	Circuit A Low Superheat	DI		0	1	0
0x000C	12	ALM_LOW_SH_B_F	Circuit B Low Superheat	DI		0	1	0
0x000E	14	ALM_INTER_LOCK_F	Customer Interlock Failure	DI		0	1	0
0x0010	16	ALM_CPA1_REVERSE_ROT_F	Compressor A1 Not Started or Pressure Increase not established	DI		0	1	0
0x0011	17	ALM_CPA2_REVERSE_ROT_F	Compressor A2 Not Started or Pressure Increase not established	DI		0	1	0
0x0012	18	ALM_CPA3_REVERSE_ROT_F	Compressor A3 Not Started or Pressure Increase not established	DI		0	1	0
0x0013	19	ALM_CPA4_REVERSE_ROT_F	Compressor A4 Not Started or Pressure Increase not established	DI		0	1	0
0x0014	20	ALM_CPB1_REVERSE_ROT_F	Compressor B1 Not Started or Pressure Increase not established	DI		0	1	0
0x0015	21	ALM_CPB2_REVERSE_ROT_F	Compressor B2 Not Started or Pressure Increase not established	DI		0	1	0
0x0016	22	ALM_CPB3_REVERSE_ROT_F	Compressor B3 Not Started or Pressure Increase not established	DI		0	1	0
0x0017	23	ALM_CPB4_REVERSE_ROT_F	Compressor B4 Not Started or Pressure Increase not established	DI		0	1	0
0x001C	28	ALM_ELEC_BOX_F	Electrical Box Fault	DI		0	1	0
0x001D	29	ALM_LOSS_COM_SM_F	Loss of Communication With System Manager	DI		0	1	0
0x001E	30	ALM_LOSS_COM_MS_F	Master/Slave Communication Failure	DI		0	1	0
0x001F	31	ALM_NETWORK_EMSTOP_F	Unit is in Network emergency stop	DI		0	1	0
0x0020	32	ALM_WPUMP1_F	Water Pump #1 Default	DI		0	1	0
0x0021	33	ALM_WPUMP2_F	Water Pump #2 Default	DI		0	1	0
0x0025	37	ALM_REPEAT_HIGH_DGT_A_F	Circuit A — Repeated High Discharge Gas Overrides	DI		0	1	0
0x0026	38	ALM_REPEAT_HIGH_DGT_B_F	Circuit B — Repeated High Discharge Gas Overrides	DI		0	1	0
0x0028	40	ALM_REPEAT_LOW_SST_A_F	Circuit A — Repeated Low Suction Temp Overrides	DI		0	1	0
0x0029	41	ALM_REPEAT_LOW_SST_B_F	Circuit B — Repeated Low Suction Temp Overrides	DI		0	1	0
0x002B	43	ALM_HEAT_LOW_EWT_F	Low Entering Water Temperature in Heating	DI		0	1	0
0x0032	50	ALM_FLUIDE_FAIL	Refrigerant Leakage Detection	DI		0	1	0
0x0033	51	ALM_EXCH_FLOW_F	Water Exchanger Flow Switch Failure	DI		0	1	0
0x003F	63	ALM_HP_SWITCH_A_F	Circuit A High Pressure Switch Failure	DI		0	1	0
0x0040	64	ALM_HP_SWITCH_B_F	Circuit B High Pressure Switch Failure	DI		0	1	0
0x005A	90	ALM_FLOW_CONFIG_F	Water Exchanger Flow Switch: Setpoint Configuration Failure	DI		0	1	0
0x0061	97	ALM_SENSORS_SWAP_F	Water Exchanger Temperature Sensors Swapped	DI		0	1	0
0x0065	101	ALM_FC_PROCESS_F	Free Cooling Process Failure	DI		0	1	0
0x00D2	210	ALM_LOW_DELTP_A_F	Low Delta Pressure Operation Failure — cir A	DI		0	1	0
0x00D3	211	ALM_LOW_DELTP_B_F	Low Delta Pressure Operation Failure — cir B	DI		0	1	0
0x00DC	220	ALM_FC_COIL_VALVE_F	FC Coils Valve Failure	DI		0	1	0
0x00DE	222	ALM_FC_EVAP_VALVE_F	FC Evaporator Valve Failure	DI		0	1	0
0x044B	1099	ALM_CPA1_F	Compressor A1 Failure	DI		0	1	0
0x04AF	1199	ALM_CPA2_F	Compressor A2 Failure	DI		0	1	0
0x0513	1299	ALM_CPA3_F	Compressor A3 Failure	DI		0	1	0

See Legend on page 235.

APPENDIX E — MODBUS IP POINTS (cont)

ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x0577	1399	ALM_CPB1_F	Compressor B1 Failure	DI		0	1	0
0x05DB	1499	ALM_CPB2_F	Compressor B2 Failure	DI		0	1	0
0x063F	1599	ALM_CPB3_F	Compressor B3 Failure	DI		0	1	0
0x06A3	1699	ALM_CPA4_F	Compressor A4 Failure	DI		0	1	0
0x0707	1799	ALM_CPB4_F	Compressor B4 Failure	DI		0	1	0
0x07D1	2001	ALM_DP_A_F	Circuit A Discharge Transducer	DI		0	1	0
0x07D2	2002	ALM_DP_B_F	Circuit B Discharge Transducer	DI		0	1	0
0x07D4	2004	ALM_SP_A_F	Circuit A Suction Transducer	DI		0	1	0
0x07D5	2005	ALM_SP_B_F	Circuit B Suction Transducer	DI		0	1	0
0x07E8	2024	ALM_WP_IN_F	Water Exchanger Entering Fluid Transducer Failure	DI		0	1	0
0x07E9	2025	ALM_WP_OUT_F	Water Exchanger Leaving Fluid Transducer Failure	DI		0	1	0
0x0BB8	3000	ALM_INI_FACT_CONF_F	No Factory Configuration	DI		0	1	0
0x0BB9	3001	ALM_ILL_FACT_CONF_F	Illegal Factory Configuration Number #1 to nn	DI		0	1	0
0x0BBA	3002	ALM_ILL_BRAND	Illegal Brand identifier	DI		0	0	0
0x0C1D	3101	ALM_SERV_MAINT_ALERT	Service Maintenance Alert Number # nn	DI		0	1	0
0x0C21	3105	ALM_FGAS_NEEDED	Fgas check needed, call your maintenance company	DI		0	1	0
0x0C82	3202	ALM_WL_PRESS_ZERO_ERROR	Water Loop : Delta Pressure Error	DI		0	1	0
0x0C83	3203	ALM_WL_PRESS_TOO_LOW	Water Loop : Pressure Too Low	DI		0	1	0
0x0C84	3204	ALM_WL_PUMP_NOT_STARTED	Water Loop : Pump Not Started	DI		0	1	0
0x0C85	3205	ALM_WL_PRESS_ERR_IN_RUN	Water Loop : Pressure Error During Runtest	DI		0	1	0
0x0C86	3206	ALM_WL_PUMP_OVERLOAD	Water Loop : Pump Overload	DI		0	1	0
0x0C87	3207	ALM_WL_LOW_FLOW	Water Loop : Flow Too Low	DI		0	1	0
0x0C88	3208	ALM_WL_PRESS_CROSS	Water Loop : Pressure Sensors Crossed	DI		0	1	0
0x0C89	3209	ALM_WL_LO_PRESS_WARN	Water Loop : Low Pressure Warning	DI		0	1	0
0x0CE5	3301	ALM_M_S_CONFIG_F	Master Chiller Configuration Error Number #1 to nn	DI		0	1	0
0x0DAC	3500	ALM_DATABASE_F	Database Module Failure	DI		0	1	0
0x0E10	3600	ALM_LENSCAN_F	Lenscan Module Failure	DI		0	1	0
0x0ED9	3801	ALM_WELDED_CONTACT_A_F	Circuit A Welded Contactor Failure	DI		0	1	0
0x0EDA	3802	ALM_WELDED_CONTACT_B_F	Circuit B Welded Contactor Failure	DI		0	1	0
0x0FA1	4001	ALM_SIOB_LOWVOLT_CIRA_F	Circuit A SIOB/CIOB Low Voltage Failure	DI		0	1	0
0x0FA2	4002	ALM_SIOB_LOWVOLT_CIRB_F	Circuit B SIOB/CIOB Low Voltage Failure	DI		0	1	0
0x0FA6	4006	ALM_SIOB_LOWVOLT_EMM_F	EMM SIOB/CIOB Low Voltage Failure	DI		0	1	0
0x0FB4	4020	ALM_EXV_A_F	Main EXV Stepper Motor Failure — Cir A	DI		0	1	0
0x0FB5	4021	ALM_EXV_B_F	Main EXV Stepper Motor Failure — Cir B	DI		0	1	0
0x1195	4501	ALM_AUX2_FS_FAN_1_COM_F	Loss of communication with FS Fan AUX2 board Number 1	DI		0	1	0
0x1197	4503	ALM_AUX2_FS_FAN_2_COM_F	Loss of communication with FS Fan AUX2 board Number 2	DI		0	1	0
0x1196	4502	ALM_AUX1_1_COM_F	Loss of communication with Fan AUX1 Board Number 1	DI		0	1	0
0x11F9	4601	ALM_FC_AUX1_COM_F	FC_AUX1_COM_F	DI		0	1	0
0x125D	4701	ALM_FAN_DRIVE_A_COM_F	Loss of communication with VFD Fan Drive 1 Circuit A	DI		0	1	0
0x125E	4702	ALM_FAN_DRIVE_A2_COM_F	Loss of communication with VFD Fan Drive 2 Circuit A	DI		0	1	0
0x125F	4703	ALM_FAN_DRIVE_B_COM_F	Loss of communication with VFD Fan Drive 1 Circuit B	DI		0	1	0
0x1260	4704	ALM_FAN_DRIVE_B2_COM_F	Loss of communication with VFD Fan Drive 2 Circuit B	DI		0	1	0
0x1261	4705	ALM_PUMP_DRIVE_1_COM_F	Loss of communication with VFD Pump Drive Number 1	DI		0	1	0
0x1262	4706	ALM_PUMP_DRIVE_2_COM_F	Loss of communication with VFD Pump Drive Number 2	DI		0	1	0

See Legend on page 235.

APPENDIX E — MODBUS IP POINTS (cont)

ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x1325	4901	ALM_SIOB_A_COM_F	Loss of communication with Circuit A SIOB/CIOB board	DI		0	1	0
0x1326	4902	ALM_SIOB_B_COM_F	Loss of communication with Circuit B SIOB/CIOB board	DI		0	1	0
0x132A	4906	ALM_SIOB_EMM_COM_F	Loss of communication with Energy Management SIOB/CIOB board	DI		0	1	0
0x1389	5001	ALM_EWT_F	Water Exchanger Entering Fluid Thermistor Failure	DI		0	1	0
0x138A	5002	ALM_LWT_F	Water Exchanger Leaving Fluid Thermistor Failure	DI		0	1	0
0x138B	5003	ALM_DEFROST_T_A_F	Circuit A Defrost Thermistor	DI		0	1	0
0x138C	5004	ALM_DEFROST_T_B_F	Circuit B Defrost Thermistor	DI		0	1	0
0x1392	5010	ALM_OAT_F	OAT Thermistor Failure	DI		0	1	0
0x1393	5011	ALM_CHWSTEMP_F	Master/Slave Common Leaving Fluid Thermistor	DI		0	1	0
0x1394	5012	ALM_SUCTION_T_A_F	Circuit A Suction Gas Thermistor	DI		0	1	0
0x1395	5013	ALM_SUCTION_T_B_F	Circuit B Suction Gas Thermistor	DI		0	1	0
0x139D	5021	ALM_SPACE_TEMP_F	Space Temperature Thermistor	DI		0	1	0
0x13B6	5046	ALM_FC_WLOOP_F	FC_WLOOP_F	DI		0	1	0
0x13B7	5047	ALM_FC_LWT_F	FC_LWT_F	DI		0	1	0
0x13B8	5048	ALM_FC_OAT_F	FC_OAT_F	DI		0	1	0
0x13C2	5058	ALM_FC_EVAP_WT_F	FC Evaporator Water Thermistor Failure	DI		0	1	0
0x1771	6001	ALM_VFAN_DRV_A1_F	Circuit A VFD Fan Drive 1 Failure	DI		0	1	0
0x17D5	6101	ALM_VFAN_DRV_A2_F	Circuit A VFD Fan Drive 2 Failure	DI		0	1	0
0x1839	6201	ALM_VFAN_DRV_B1_F	Circuit B VFD Fan Drive 1 Failure	DI		0	1	0
0x189D	6301	ALM_VFAN_DRV_B2_F	Circuit B VFD Fan Drive 2 Failure	DI		0	1	0
0x1901	6401	ALM_VPUMP_DRV_1_F	VFD Pump 1 Drive Failure	DI		0	1	0
0x1965	6501	ALM_VPUMP_DRV_2_F	VFD Pump 2 Drive Failure	DI		0	1	0
0x1FA5	8101	ALM_VFAN_DRV_A1_ALERT	Circuit A VFD Fan Drive 1 Alert	DI		0	1	0
0x2009	8201	ALM_VFAN_DRV_A2_ALERT	Circuit A VFD Fan Drive 2 Alert	DI		0	1	0
0x206D	8301	ALM_VFAN_DRV_B1_ALERT	Circuit B VFD Fan Drive 1 Alert	DI		0	1	0
0x20D1	8401	ALM_VFAN_DRV_B2_ALERT	Circuit B VFD Fan Drive 2 Alert	DI		0	1	0
0x2135	8501	ALM_VPUMP_DRV_1_ALERT	VFD Pump 1 Drive Alert	DI		0	1	0
0x2199	8601	ALM_VPUMP_DRV_2_ALERT	VFD Pump 2 Drive Alert	DI		0	1	0
0x1390	5008	ALM_HR_EWT_F	Reclaim Condenser Entering Thermistor	DI		0	1	0
0x1391	5009	ALM_HR_LWT_F	Reclaim Condenser Leaving Thermistor	DI		0	1	0
0x0034	52	ALM_HR_FLOW_SW_F	Heat Reclaim flow switch failure	DI		0	1	0
0x0080	128	ALM_HR_COND_FREEZE_F	Heat Reclaim Condenser Freeze Protection	DI		0	1	0
0x0081	129	ALM_HR_HIGH_LWT_F	Heat Reclaim high Water Temperature	DI		0	1	0
0x0384	900	SETPOINT_csp1	Cooling Setpoint 1	HR	°F	–20	78.8	44
					°C	–28.89	26.00	6.67
0x0386	902	SETPOINT_csp2	Cooling Setpoint 2	HR	°F	–20	78.8	44
					°C	–28.89	26.00	6.67
0x0388	904	SETPOINT_ice_sp	Cooling Ice Setpoint	HR	°F	–20	78.8	44
					°C	–28.89	26.00	6.67
0x038A	906	SETPOINT_hsp1	Heating Setpoint 1	HR	°F	68	145.4	100
					°C	20.00	63.00	37.78
0x038C	908	SETPOINT_hsp2	Heating Setpoint 2	HR	°F	68	145.4	100
					°C	20.00	63.00	37.78
0x038E	910	SETPOINT_lim_sp1	Switch Limit Setpoint 1	HR	PERCENT	0	100	100
0x0390	912	SETPOINT_lim_sp2	Switch Limit Setpoint 2	HR	PERCENT	0	100	100
0x0392	914	SETPOINT_lim_sp3	Switch Limit Setpoint 3	HR	PERCENT	0	100	100
0x0BC2	3010	PROTOCOL_CTRL_PNT	Control Point	HR	°F	–4	153	44.6
					°C	–20.00	67.22	7.00
0x0BC6	3014	PROTOCOL_DEM_LIM	Active Demand Limit Val	HR	PERCENT	0	100	0
0x0BCE	3022	PROTOCOL_CHIL_S_S	Net.: Cmd Start/Stop	HR		0	1	0
0x0BD0	3024	PROTOCOL_EMSTOP	Emergency Stop	HR		0	1	0
0x0BE4	3044	PROTOCOL_HC_SEL	Heat/Cool Select	HR		0	3	0
0x0BE6	3046	PROTOCOL_SP_SEL	Setpoint Select	HR		0	2	0

See Legend on page 235.

APPENDIX E — MODBUS IP POINTS (cont)

ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x0C1A	3098	PROTOCOL_PUMP_1	Water Pump #1 Command	HR		0	1	0
0x0C1C	3100	PROTOCOL_PUMP_2	Water Pump #2 Command	HR		0	1	0
0x0C2A	3114	PROTOCOL_CHIL_OCC	Net.: Cmd Occupied	HR		0	1	0
0x0C2C	3116	PROTOCOL_SP_OCC	Setpoint Occupied?	HR		0	1	0
0x0C54	3156	PROTOCOL_FC_DSBLE	Free Cooling Disable?	HR		0	1	0
0x0FA0	4000	MODBUSRS_metric	Metric Unit	HR		0	1	1
0x0FA2	4002	MODBUSRS_real_typ	Real type management	HR		0	1	1
0x0FA4	4004	MODBUSRS_swap_b	Swap Bytes	HR		0	1	0
0x0FA6	4006	MODBUSIP_metric	Metric Unit	HR		0	1	1
0x0FA8	4008	MODBUSIP_real_typ	Real type management	HR		0	1	1
0x0FAA	4010	MODBUSIP_swap_b	Swap Bytes	HR		0	1	0
0x1004	4100	GENCONF_ice_cnfg	Ice Mode Enable	HR		0	1	0
0x1006	4102	GENCONF_lim_sel	Demand Limit Type Select	HR		0	2	0
0x1010	4112	GENCONF_nh_limit	Night Capacity Limit	HR	PERCENT	0	100	100
0x1014	4116	GENCONF_off_on_d	Unit Off to On Delay	HR	MINUTES	1	15	1
0x101A	4122	GENCONF_prio_cir	Cir Priority Sequence	HR		0	2	0
0x101C	4124	GENCONF_ramp_sel	Ramp Loading Select	HR		0	1	0
0x101E	4126	GENCONF_seq_typ	Staged Loading Sequence	HR		0	1	0
0x1068	4200	RESETCFG_cr_deg	Cooling Reset Deg. Value	HR	^F	–30	30	0
					^C	–16.67	16.67	0
0x106A	4202	RESETCFG_cr_sel	Cooling Reset Select	HR		0	4	0
0x106C	4204	RESETCFG_dt_cr_fu	Delta T Full Reset Value	HR	^F	0	25	0
					^C	0	13.89	0
0x106E	4206	RESETCFG_dt_cr_no	Delta T No Reset Value	HR	^F	0	25	0
					^C	0	13.89	0
0x1070	4208	RESETCFG_dt_hr_fu	Delta T Full Reset Value	HR	^F	0	25	0
					^C	0	13.89	0
0x1072	4210	RESETCFG_dt_hr_no	Delta T No Reset Value	HR	^F	0	25	0
					^C	0	13.89	0
0x1074	4212	RESETCFG_hr_deg	Heating Reset Deg. Value	HR	^F	–30	30	0
					^C	–16.67	16.67	0
0x1076	4214	RESETCFG_hr_sel	Heating Reset Select	HR		0	4	0
0x1078	4216	RESETCFG_oat_crfu	OAT Full Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x107A	4218	RESETCFG_oat_crno	OAT No Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x107C	4220	RESETCFG_oat_hrfu	OAT Full Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x107E	4222	RESETCFG_oat_hrno	OAT No Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x1080	4224	RESETCFG_spacr_fu	Space T Full Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x1082	4226	RESETCFG_spacr_no	Space T No Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x1084	4228	RESETCFG_spahr_fu	Space T Full Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x1086	4230	RESETCFG_spahr_no	Space T No Reset Value	HR	°F	14	125	14
					°C	–9.99	51.67	–9.99
0x1088	4232	RESETCFG_I_cr_fu	Current Full Reset Value	HR	MILLIAMPS	0	20	0
0x108A	4234	RESETCFG_I_cr_no	Current No Reset Value	HR	MILLIAMPS	0	20	0
0x108C	4236	RESETCFG_I_hr_fu	Current Full Reset Value	HR	MILLIAMPS	0	20	0
0x108E	4238	RESETCFG_I_hr_no	Current No Reset Value	HR	MILLIAMPS	0	20	0
0x10CC	4300	PUMPCONF_pump_seq	Pumps Sequence	HR		0	4	0
0x10CE	4302	PUMPCONF_pump_del	Pump Auto Rotation Delay	HR	HOURS	24	3000	48
0x10D0	4304	PUMPCONF_pump_loc	Flow Checked If Pump Off	HR		0	1	1
0x10D2	4306	PUMPCONF_pump_per	Pump Sticking Protection	HR		0	1	0
0x10D4	4308	PUMPCONF_pump_sby	Stop Pump During Standby	HR		0	1	0

See Legend on page 235.

APPENDIX E — MODBUS IP POINTS (cont)

ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x0000	0	TEMP_EWT	Entering Fluid Temp	IR	°F			0
					°C			–17.78
0x0002	2	TEMP_LWT	Leaving Fluid Temp	IR	°F			0
					°C			–17.78
0x0004	4	TEMP_OAT	Outdoor Air Temp	IR	°F			0
					°C			–17.78
0x0006	6	GENUNIT_CTRL_WT	Control Water Temp	IR	°F	–4	153	0
					°C	–20.00	67.22	–17.78
0x0008	8	TEMP_CHWSTEMP	Cold Water System Temp	IR	°F			0
					°C			–17.78
0x000A	10	GENUNIT_CTRL_PNT	Control Point	IR	°F	–4	153	0
					°C	–20.00	67.22	–17.78
0x000C	12	GENUNIT_SP	Current Setpoint	IR	°F			0
					°C			–17.78
0x000E	14	GENUNIT_DEM_LIM	Active Demand Limit Val	IR	PERCENT	0	100	0
0x0010	16	GENUNIT_CAP_T	Unit Total Capacity	IR	PERCENT			0
0x0014	20	GENUNIT_min_left	Minutes Left for Start	IR	MINUTES			0
0x0016	22	GENUNIT_CHIL_S_S	Net.: Cmd Start/Stop	IR		0	1	0
0x0018	24	GENUNIT_EMSTOP	Emergency Stop	IR		0	1	0
0x001A	26	INPUTS_REM_LOCK	Remote Interlock Status	IR		0	1	0
0x001C	28	OUTPUTS_RUNNING	Running Relay Status	IR		0	1	0
0x001E	30	INPUTS_ONOFF_SW	Remote On/Off Switch	IR		0	1	0
0x0022	34	INPUTS_LIM_SW1	Limit Switch 1	IR		0	1	0
0x0024	36	INPUTS_LIM_SW2	Limit Switch 2	IR		0	1	0
0x0028	40	GENUNIT_CTRL_TYP	Local=0 Net.=1 Remote=2	IR		0	2	0
0x002A	42	UNIT_STATUS	Run Status	IR				0
0x002C	44	GENUNIT_HC_SEL	Heat/Cool Select	IR		0	3	0
0x002E	46	GENUNIT_SP_SEL	Setpoint Select	IR		0	2	0
0x0048	72	PRESSURE_PUMP_EWP	Inlet unit water pres.	IR	PSI			0
					kPa			0
0x004A	74	PRESSURE_PUMP_LWP	Outlet unit water pres.	IR	PSI			0
					kPa			0
0x0054	84	INPUTS_ELEC_BOX	Electrical Box Failure	IR		0	1	0
0x0058	88	INPUTS_HC_SW	Remote HeatCool Switch	IR		0	1	0
0x005E	94	INPUTS_SETP_SW	Remote Setpoint Switch	IR		0	1	0
0x0062	98	PUMPSTAT_PUMP_1	Water Pump #1 Command	IR		0	1	0
0x0064	100	PUMPSTAT_PUMP_2	Water Pump #2 Command	IR		0	1	0
0x0066	102	INPUTS_FLOW_SW	Flow Switch Status	IR		0	1	0
0x0070	112	OUTPUTS_HD_HTR_A	Compressor Head Heater A	IR		0	1	0
0x0072	114	GENUNIT_CHIL_OCC	Net.: Cmd Occupied	IR		0	1	0
0x0074	116	GENUNIT_SP_OCC	Setpoint Occupied?	IR		0	1	1
0x0076	118	BACnet_bacena	BACnet Enable	IR		0	1	0
0x0078	120	BACnet_bacunit	Metric Units?	IR		0	1	1
0x007A	122	BACnet_network	Network	IR		1	40000	1600
0x007C	124	BACnet_ident	Device Id Actually Used	IR		1	4194302	1
0x007E	126	BACnet_COLOR	ALC color value	IR		0	14	14
0x0080	128	BACnet_PRIME_V	ALC prime value	IR	°F			0
					°C			–17.78
0x0082	130	BACnet_BMS_OCC	BMS's request for occupancy: 0=UNOCC, 1=OCC, 2, None.	IR		0	2	2
0x008A	138	PUMPSTAT_VPMP_CMD	Variable speed pump cmd	IR	PERCENT	0	100	0
0x008C	140	PUMPSTAT_flow	Water Flow	IR	GPS			0
					l/s			0
0x008E	142	FACTORY_pump_ctl	Pump Control Method	IR		1	2	1
0x0094	148	OUTPUTS_HD_HTR_B	Compressor Head Heater B	IR		0	1	0
0x009A	154	FACTORY_fc_opt	Free Cooling Option	IR		0	4	0

See Legend on page 235.

APPENDIX E — MODBUS IP POINTS (cont)

ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x009C	156	HYD_FC_FC_DSBLE	Free Cooling Disable?	IR		0	1	0
0x009E	158	HYD_FC_wLoopPstV	Water Loop Position	IR				0
0x00A0	160	HYD_FC_fcCapT	Total FC Capacity	IR	PERCENT			0
0x00A2	162	HYD_FC_fc_ev_rq	FC Evap Valve Request	IR		0	1	1
0x00A4	164	HYD_FC_fc_cv_rq	FC Coil Valve Request	IR		0	1	0
0x00A6	166	TEMP_FC_EV_WT	FC Evap Water Temp	IR	°F			0
					°C			–17.78
0x03E8	1000	RUNTIME_hr_mach	Machine Operating Hours	IR	HOURS			0
0x03EA	1002	RUNTIME_st_mach	Machine Starts Number	IR				0
0x03EC	1004	RUNTIME_hr_pump1	Water Pump #1 Hours	IR	HOURS			0
0x03EE	1006	RUNTIME_hr_pump2	Water Pump #2 Hours	IR	HOURS			0
0x03F4	1012	HR_PARTIAL_DOWNTIME	Cumul Time Partial Alm	IR	HOURS			0
0x03F6	1014	HR_TOTAL_DOWNTIME	Cumul Time Tripout Alm	IR	HOURS			0
0x044C	1100	ALARMRST_alarm_1c	Current Alarm 1	IR				0
0x044E	1102	ALARMRST_alarm_2c	Current Alarm 2	IR				0
0x0450	1104	ALARMRST_alarm_3c	Current Alarm 3	IR				0
0x0452	1106	ALARMRST_alarm_4c	Current Alarm 4	IR				0
0x0454	1108	ALARMRST_alarm_5c	Current Alarm 5	IR				0
0x0456	1110	ALARMRST_alarm_1	Current Alarm 1 index	IR				0
0x0458	1112	ALARMRST_alarm_2	Current Alarm 2 index	IR				0
0x045A	1114	ALARMRST_alarm_3	Current Alarm 3 index	IR				0
0x045C	1116	ALARMRST_alarm_4	Current Alarm 4 index	IR				0
0x045E	1118	ALARMRST_alarm_5	Current Alarm 5 index	IR				0
0x0460	1120	UNIT_ALM	Alarm Status	IR				0
0x0462	1122	OUTPUTS_ALARM	Alarm Relay Status	IR		0	1	0
0x0464	1124	OUTPUTS_ALERT	Alert Relay State	IR		0	1	0
0x04B0	1200	PRESSURE_DP_A	Discharge Pressure A	IR	PSI			0
					kPa			0
0x04B2	1202	PRESSURE_SP_A	Main Suction Pressure A	IR	PSI			0
					kPa			0
0x04BA	1210	TEMP_SCT_A	Saturated Cond Tmp cir A	IR	°F			0
					°C			–17.78
0x04BC	1212	TEMP_SST_A	Saturated Suction Temp A	IR	°F			0
					°C			–17.78
0x04BE	1214	TEMP_SUCT_A	Compressor Suction Tmp A	IR	°F			0
					°C			–17.78
0x04C2	1218	TEMP_DGT_A	Discharge Gas Temp A	IR	°F			0
					°C			–17.78
0x04C6	1222	TEMP_SH_A	Suction Superheat Tmp A	IR	^F			0
					^C			0
0x04CA	1226	LOADFACT_pinch_a	Cooler Exchange DT Cir A	IR	^F			0
					^C			0
0x04CC	1228	OUTPUTS_EXV_A	EXV position Circuit A	IR	PERCENT	0	100	0
0x04CE	1230	OUTPUTS_VFAN_A	Variable fan A command	IR	PERCENT			0
0x04D2	1234	GENUNIT_CAPA_T	Cir A Total Capacity	IR	PERCENT			0
0x04D8	1240	DRV_CTRL_drvpwr_5	Pump Drive 1 Power	IR	KW			0
0x04DA	1242	DRV_CTRL_drv_I_5	Pump Drive 1 Current	IR	AMPS			0
0x04DC	1244	DRV_CTRL_drv_V_5	Pump Drive 1 Voltage	IR	VOLTS			0
0x04DE	1246	DRV_CTRL_drv_T_5	Pump Drive 1 Torque	IR				0
0x04E0	1248	DRV_CTRL_drv_F_5	Pump Drive 1 Frequency	IR	HZ			0
0x04E2	1250	DRV_CTRL_drvpwr_1	Fan Drive A Power	IR	KW			0
0x04E4	1252	DRV_CTRL_drvpwr_2	Fan Drive A2 Power	IR	KW			0
0x04E6	1254	DRV_CTRL_drvpwr_3	Fan Drive B Power	IR	KW			0
0x04EE	1262	OUTPUTS_FAN_ST_A	Fan Staging Number Cir A	IR		0	10	0
0x04F0	1264	OUTPUTS_CP_A1	Compressor A1	IR		0	1	0
0x04F2	1266	OUTPUTS_CP_A2	Compressor A2	IR		0	1	0
0x04F4	1268	OUTPUTS_CP_A3	Compressor A3	IR		0	1	0
0x04F6	1270	OUTPUTS_CP_A4	Compressor A4	IR		0	1	0

See Legend on page 235.

APPENDIX E — MODBUS IP POINTS (cont)

ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x0578	1400	PRESSURE_DP_B	Discharge Pressure B	IR	PSI			0
					kPa			0
0x057A	1402	PRESSURE_SP_B	Main Suction Pressure B	IR	PSI			0
					kPa			0
0x0582	1410	TEMP_SCT_B	Saturated Cond Tmp cir B	IR	°F			0
					°C			–17.78
0x0584	1412	TEMP_SST_B	Saturated Suction Temp B	IR	°F			0
					°C			–17.78
0x0586	1414	TEMP_SUCT_B	Compressor Suction Tmp B	IR	°F			0
					°C			–17.78
0x058A	1418	TEMP_DGT_B	Discharge Gas Temp B	IR	°F			0
					°C			–17.78
0x058E	1422	TEMP_SH_B	Suction Superheat Tmp B	IR	^F			0
					^C			0
0x0592	1426	LOADFACT_pinch_b	Cooler Exchange DT Cir B	IR	^F			0
					^C			0
0x0594	1428	OUTPUTS_EXV_B	EXV position Circuit B	IR	PERCENT	0	100	0
0x0596	1430	OUTPUTS_VFAN_B	Variable fan B command	IR	PERCENT			0
0x059A	1434	GENUNIT_CAPB_T	Cir B Total Capacity	IR	PERCENT			0
0x05B6	1462	OUTPUTS_FAN_ST_B	Fan Staging Number Cir B	IR		0	10	0
0x05B8	1464	OUTPUTS_CP_B1	Compressor B1	IR		0	1	0
0x05BA	1466	OUTPUTS_CP_B2	Compressor B2	IR		0	1	0
0x05BC	1468	OUTPUTS_CP_B3	Compressor B3	IR		0	1	0
0x05BE	1470	OUTPUTS_CP_B4	Compressor B4	IR		0	1	0
0x0708	1800	RUNTIME_hr_cp_a1	Compressor A1 Hours	IR	HOURS			0
0x070A	1802	RUNTIME_hr_cp_a2	Compressor A2 Hours	IR	HOURS			0
0x070C	1804	RUNTIME_hr_cp_a3	Compressor A3 Hours	IR	HOURS			0
0x070E	1806	RUNTIME_hr_cp_a4	Compressor A4 Hours	IR	HOURS			0
0x0710	1808	RUNTIME_st_cp_a1	Compressor A1 Starts	IR				0
0x0712	1810	RUNTIME_st_cp_a2	Compressor A2 Starts	IR				0
0x0714	1812	RUNTIME_st_cp_a3	Compressor A3 Starts	IR				0
0x0716	1814	RUNTIME_st_cp_a4	Compressor A4 Starts	IR				0
0x071A	1818	RUNTIME_hr_fana1	Fan A1 Hours	IR	HOURS			0
0x071C	1820	RUNTIME_hr_fana2	Fan A2 Hours	IR	HOURS			0
0x071E	1822	RUNTIME_hr_fana3	Fan A3 Hours	IR	HOURS			0
0x0720	1824	RUNTIME_hr_fana4	Fan A4 Hours	IR	HOURS			0
0x0722	1826	RUNTIME_hr_fana5	Fan A5 Hours	IR	HOURS			0
0x0724	1828	RUNTIME_hr_fana6	Fan A6 Hours	IR	HOURS			0
0x0726	1830	RUNTIME_hr_fana7	Fan A7 Hours	IR	HOURS			0
0x0728	1832	RUNTIME_hr_fana8	Fan A8 Hours	IR	HOURS			0
0x07D0	2000	RUNTIME_hr_cp_b1	Compressor B1 Hours	IR	HOURS			0
0x07D2	2002	RUNTIME_hr_cp_b2	Compressor B2 Hours	IR	HOURS			0
0x07D4	2004	RUNTIME_hr_cp_b3	Compressor B3 Hours	IR	HOURS			0
0x07D6	2006	RUNTIME_hr_cp_b4	Compressor B4 Hours	IR	HOURS			0
0x07D8	2008	RUNTIME_st_cp_b1	Compressor B1 Starts	IR				0
0x07DA	2010	RUNTIME_st_cp_b2	Compressor B2 Starts	IR				0
0x07DC	2012	RUNTIME_st_cp_b3	Compressor B3 Starts	IR				0
0x07DE	2014	RUNTIME_st_cp_b4	Compressor B4 Starts	IR				0
0x07E2	2018	RUNTIME_hr_fanb1	Fan B1 Hours	IR	HOURS			0
0x07E4	2020	RUNTIME_hr_fanb2	Fan B2 Hours	IR	HOURS			0
0x07E6	2022	RUNTIME_hr_fanb3	Fan B3 Hours	IR	HOURS			0
0x07E8	2024	RUNTIME_hr_fanb4	Fan B4 Hours	IR	HOURS			0
0x07EA	2026	RUNTIME_hr_fanb5	Fan B5 Hours	IR	HOURS			0
0x07EC	2028	RUNTIME_hr_fanb6	Fan B6 Hours	IR	HOURS			0
0x07EE	2030	RUNTIME_hr_fanb7	Fan B7 Hours	IR	HOURS			0
0x07F0	2032	RUNTIME_hr_fanb8	Fan B8 Hours	IR	HOURS			0

See Legend on page 235.

APPENDIX E — MODBUS IP POINTS (cont)

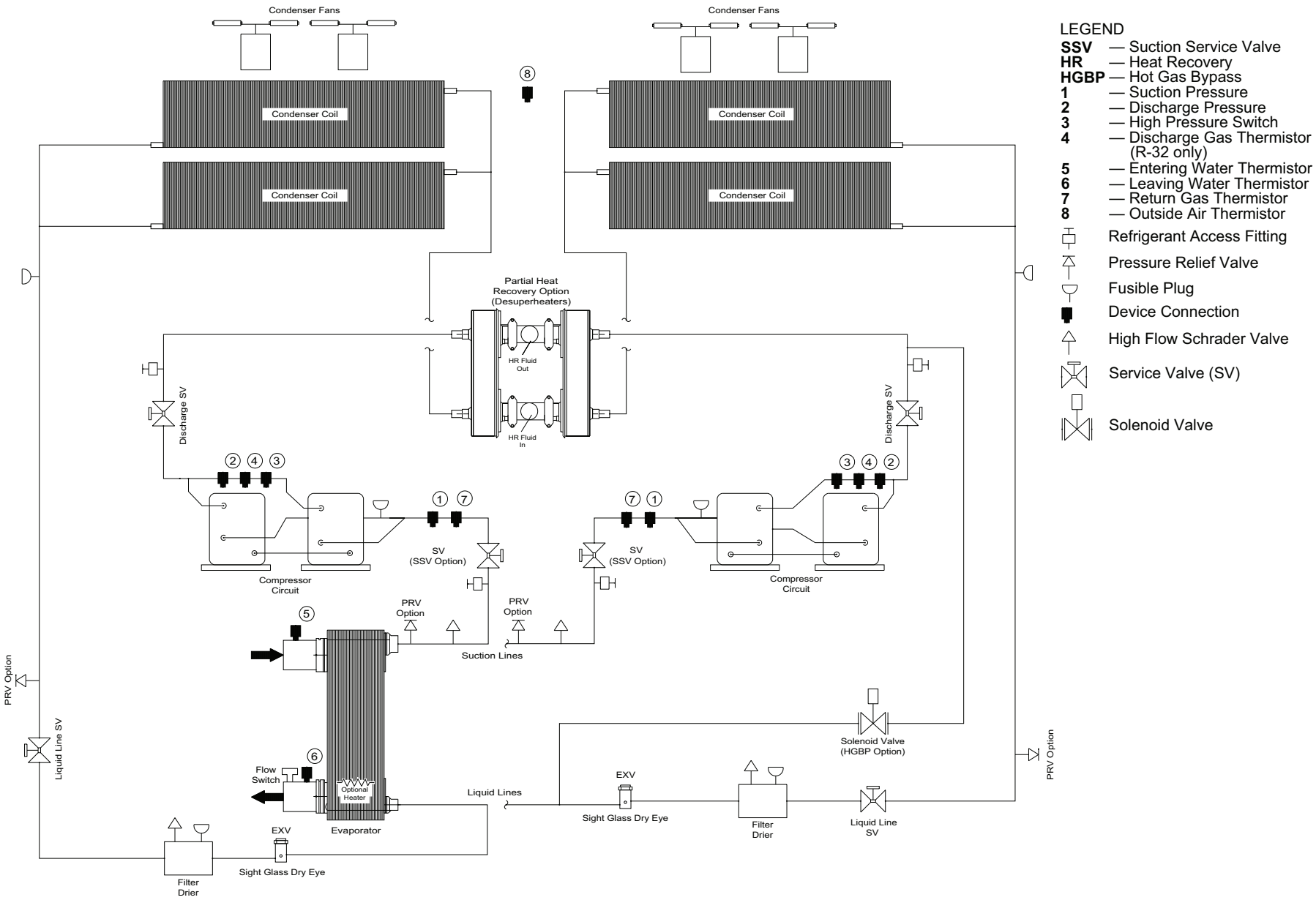
ADDRESS		PARAMETER	DESCRIPTION	TYPE	UNIT	VALUE		
Hex	Dec					Min.	Max.	Default
0x1388	5000	ENERGY_cPwrOut	Cooling Power Output	IR	KW			0
0x138A	5002	ENERGY_cPwrIn	Electical Power Input	IR	KW			0
0x138C	5004	ENERGY_eer	Energy Efficiency (EER)	IR				0
0x138E	5006	ENERGY_cEnergOu	Cooling Energy Output	IR	KWH			0
0x1390	5008	ENERGY_cEnergIn	Electrical Energy Input	IR	KWH			0
0x1392	5010	ENERGY_energEer	Integrated EER	IR				0
0x1394	5012	ENERGY_hPwrOut	Heating Power Output	IR	KW			0
0x1396	5014	ENERGY_hPwrIn	Electical Power Input	IR	KW			0
0x1398	5016	ENERGY_cop	Coef. Of Perf. (COP)	IR				0
0x139A	5018	ENERGY_hEnergOu	Heating Energy Output	IR	KWH			0
0x139C	5020	ENERGY_hEnergIn	Electrical Energy Input	IR	KWH			0
0x139E	5022	ENERGY_energCop	Integrated COP	IR				0
0x2328	9000	FACTORY_unit_typ	Unit Type (Heat Pump=2)	IR		1	2	1
0x232A	9002	FACTORY_unitsize	Unit Capacity	IR		0	3500	0
0x23E8	9192	OPT_SEL_boil_en	Boiler Enable	IR		0	1	0
0x23EA	9194	OPT_SEL_ehs_en	Electrical Heat Stages	IR		0	4	0
0x23EC	9196	OPT_SEL_dcfc_en	DC Free Cooling Enable	IR		0	2	0
0x23EE	9198	DCFC_CFG_vfan_max	Fan speed max	IR	PERCENT	0	100	100
0x23F0	9200	RECLAIM_RECL_SEL	Reclaim Selection	HR		0	1	0
0x23F4	9204	RECLAIM_HR_stat	Reclaim Status	IR				0
0x23F6	9206	RECLAIM_HRCtrPnt	Reclaim control point	IR	°F			0
					°C			–17.78
0x23F8	9208	RECLAIM_HR_FLOW	Heat Reclaim Flow switch	IR		0	1	0
0x23FA	9210	RECLAIM_HRCtrWat	Reclaim controlled water	IR	°F			0
					°C			–17.78
0x23FC	9212	RECLAIM_HR_LWT	HR Leaving Fluid temp	IR	°F			0
					°C			–17.78
0x23FE	9214	RECLAIM_HRheater	Reclaim BPHE Heater	IR		0	1	0
0x2400	9216	RECLAIM_cmd_3WV	3WayValve / VarPump cmd	IR	PERCENT	0	100	0
0x2402	9218	RECLAIM_out_3WV	3WayValve / VarPump outp	IR	VOLTS	0	10	0
0x2404	9220	RECLAIM_mode_3WV	3WayValve / VarPump mode	IR		0	1	0
0x2406	9222	RECLAIM_actiMode	HR active mode (3WV/Fan)	IR		0	1	0
0x2408	9224	RECLAIM_HR_pump	Reclaim pump command	IR		0	1	0
0x240A	9226	HR_CFG_hrVarPmp	HR variable speed pump ?	IR		0	1	0
0x240C	9228	HR_CFG_rev_3WV	HR reverse 3WV cmd ?	IR		0	1	0
0x240E	9230	HR_CFG_HRewtctl	HR Control on EWT ?	IR		0	1	1
0x2410	9232	SETPOINT_hr_stp	Heat Reclaim Setpoint	IR	°F	77	149	122
					°C	25.00	65.00	50.00
0x04F8	1272	DEFROST_def_ac_a	Defrost Active?	IR		0	1	0
0x04FA	1274	DEFROST_def_se_a	Next Sequence Allowed in	IR	MINUTES			0
0x04FC	1276	DEFROST_frost_a	Exchanger Frost Factor	IR	PERCENT			0
0x05C0	1472	DEFROST_def_ac_b	Defrost Active?	IR		0	1	0
0x05C2	1474	DEFROST_def_se_b	Next Sequence Allowed in	IR	MINUTES			0
0x05C4	1476	DEFROST_frost_b	Exchanger Frost Factor	IR	PERCENT			0

LEGEND

CO — Discrete Output (Coil), Read Write access
DI — Discrete Input, Read Only access
HR — Holding Register, Read Write access
IR — Input Register, Read Only access

APPENDIX F — PIPING AND INSTRUMENTATION

30RC 065-152 Units



LEGEND

SSV — Suction Service Valve
HR — Heat Recovery
HGBP — Hot Gas Bypass
1 — Suction Pressure
2 — Discharge Pressure
3 — High Pressure Switch
4 — Discharge Gas Thermistor (R-32 only)
5 — Entering Water Thermistor
6 — Leaving Water Thermistor
7 — Return Gas Thermistor
8 — Outside Air Thermistor

Refrigerant Access Fitting
Pressure Relief Valve
Fusible Plug
Device Connection
High Flow Schrader Valve
Service Valve (SV)
Solenoid Valve

APPENDIX G — MAINTENANCE SUMMARY AND LOG SHEETS

WEEKLY	
Compressor	Check oil level
Condenser	Check condenser coils for debris and clean as necessary
	Periodic clean water rinse, especially in coastal and industrial applications
Controls	Review Alarm/Alert History
MONTHLY	
Cooler	Inspect water pumps
Controls	Check accuracy of thermistors and replace if greater than ±2°F (1.2°C) variance from calibrated thermometer
	Check accuracy of transducers and replace if greater than ±5 psi (34.47 kPa) variance
Refrigerant System	Check refrigerant charge level
	Check moisture-indicating sight glass for possible refrigerant loss and presence of moisture
	Perform leak test
QUARTERLY	
Compressor	Check crankcase heater operation
Controls	Check chilled water flow switch operation
Condenser	Check all condenser fans for proper operation
Refrigerant System	Check all refrigerant joints and valves for refrigerant leaks and repair as necessary
Hydronic System	Inspect pump seal if equipped with a hydronic pump package
	Lubricate pump motor as required
Starter	Inspect all contactors
ANNUALLY	
Cooler	Check to be sure that the proper concentration of antifreeze is present in the chilled water loop, if applicable
	Verify that the chilled water loop is properly treated
	Check chilled water strainers and clean as necessary
	Check cooler heater operation if equipped
Condenser	Check condition of condenser fan blades and that they are securely fastened to the motor shaft
Controls	Perform Service Test to confirm operation of all components
	Check all electrical connections and tighten as necessary
	Inspect all contactors and relays and replace as necessary
Refrigerant System	Check refrigerant filter driers for excessive pressure drop and replace as necessary
Hydronic System	Check pump heater operation if equipped

NOTE: Equipment failures caused by lack of adherence to the Maintenance Interval Requirements are not covered under warranty.

APPENDIX G — MAINTENANCE SUMMARY AND LOG SHEETS (cont)

DATE	OIL LEVEL	CHECK CONDENSER COIL	CHECK ALARMS / FAULTS	OPERATOR INITIALS	REMARKS

NOTE: Equipment failures caused by lack of adherence to the Maintenance Interval Requirements are not covered under warranty.

APPENDIX G — MAINTENANCE SUMMARY AND LOG SHEETS (cont)

30RC Maintenance Log for Monthly, Quarterly, and Annual Checks

Month			1	2	3	4	5	6	7	8	9	10	11	12
Date			/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Operator														

UNIT SECTION	ACTION	UNIT	ENTRY											
Compressor	Check Oil Level	Yes/No												
	Check Crankcase Heater Operation	Yes/No												
	Send Oil Sample Out for Analysis	Yes/No												
Cooler	Check Cooler Heater Operation	Yes/No												
	Check Chiller Water Loop	Yes/No												
	Check Chilled Water Strainers	Yes/No												
	Record Water Pressure Differential (PSI)	PSI												
	Inspect Water Pumps	Yes/No												
Condenser	Inspect and Clean All Coils	Yes/No												
	Check All Condenser Fans for Proper Operation	Yes/No												
	Check Condition of Condenser Fan Blades	Yes/No												
Controls	General Cleaning and Tightening Connections	Yes/No												
	Check Chilled Water Flow Switch Operation	Yes/No												
	Perform Service Test	Yes/No												
	Confirm Accuracy of Pressure Transducers	Yes/No												
	Confirm Accuracy of Thermistors	Yes/No												
Starter	General Tightening and Cleaning Connections	Yes/No												
	Inspect All Contactors	Yes/No												
System	Check Refrigerant Charge Level	Yes/No												
	Verify Operation of EXVs and Record Position	0-100%												
	Record System Superheat	°F												
	Check Moisture Sight Glass	Yes/No												
	Perform Leak Test	Yes/No												
	Check All Refrigerant Joints and Valves for Refrigerant Leaks	Yes/No												
	Check Filter Driers	Yes/No												

LEGEND

EXV — Expansion Valve

— Annually

NOTE: Equipment failures caused by lack of adherence to the Maintenance Interval Requirements are not covered under warranty.

APPENDIX G — MAINTENANCE SUMMARY AND LOG SHEETS (cont)

30RC Seasonal Shutdown Log

Month		1	2	3	4	5	6	7	8	9	10	11	12
Date		/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Operator													

UNIT SECTION	ACTION	ENTRY											
Cooler	Isolate and Drain Cooler												
Controls	Do Not Disconnect Control Power Unless Cooler is Completely Drained												

NOTES:
1. Equipment failures caused by lack of adherence to the Maintenance Interval Requirements are not covered under warranty.
2. Refer to Installation Instructions for proper winterization procedure.

APPENDIX H — CARRIER CONTROLLER WEB AND NETWORK INTERFACE PARAMETERS

Web Interface

The Carrier Controller provides the functionality to access and control unit parameters from the web interface. Three users can be connected simultaneously with no priority between them. The last modification is taken into account. When the interface is used via a PC web browser, the view includes additional functions that appear as buttons at the bottom of the screen. (See Fig A.)

Fig. A — Web User Interface Home Screen

Press the Help button to access the BACnet user guide, Modbus user guide, and open source license information.

Press the Technical Documentation button to access documents related to the product and its parts.

- Spare parts documentation: The list of spare parts included in the unit with reference, description, and drafting.
- Misc: Documents such as electrical plans, dimension plans, etc.
- PED: Pressure Equipment Directive.
- IOM: Installation operation and maintenance manual, controls installation/maintenance manual.

NOTE: Machine Start/Stop is not authorized through a web connection for security reasons.

IMPORTANT: Use firewalls and VPN for a secure connection.

MINIMUM WEB BROWSER CONFIGURATION

Use Google Chrome (Version 65.0 or Higher), Mozilla Firefox (Version 65.0 or Higher), or Internet Explorer (Version 11.0 or Higher). Google Chrome is the recommended browser.

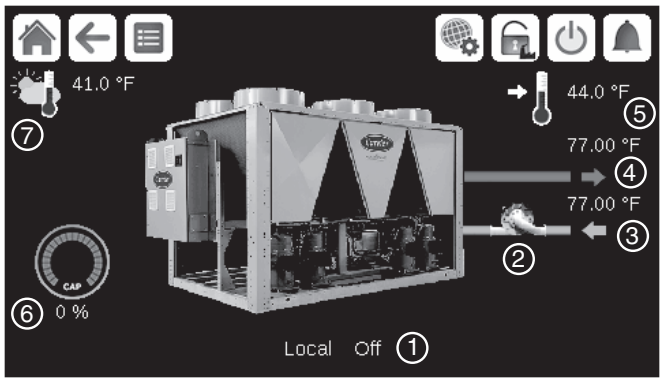
Web Browser Access

To connect the controller to the web interface, it is necessary to know the IP address of the unit.

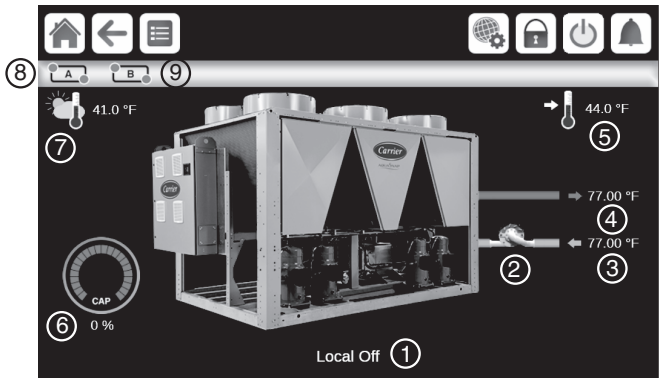
To verify the unit IP address:

1. Begin by navigating to the System Menu on the upper right corner of the display. The System Menu can be accessed from any screen except for the individual login screens: User, Service, and Factory. See Fig. B.

4.3 in. Screen



7 in. Screen



LEGEND

1 — Unit Status Message
2 — Link to Pump Status
3 — Evaporator Entering Fluid Temperature
4 — Evaporator Leaving Fluid Temperature
5 — Active Setpoint and Link to Setpoint Table
6 — Current Total Chiller Capacity
7 — Outside Air Temperature
8 — Link to Circuit A Screen*
9 — Link to Circuit B Screen*

*Feature only available on 7 in. screen. Refer to Fig. 4 on page 9.

Fig. B — Display Home Screens

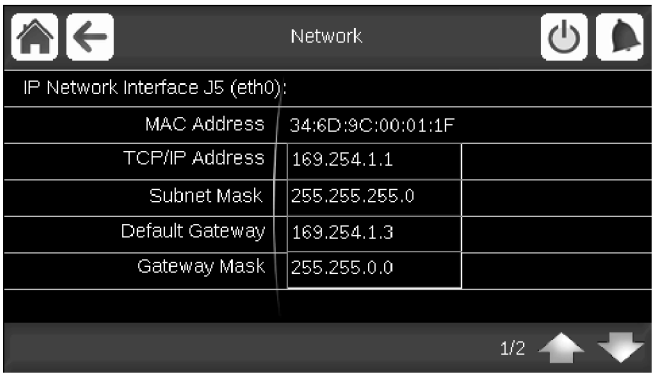
2. Select the Network button from the System Menu screen. See Fig. C.

Fig. C — System Menu Screen

3. For a 4.3 in. controller, verify TCP/IP Address under “IP Network Interface J5 (eth0).” For a 7 in. controller, verify TCP/IP Address under “IP Network Interface J15 (eth0).” See Fig. D for an example from the 4.3 in. display.
   – Unit default address: 169.254.1.1
   – The unit IP address can be changed. See Network Settings below.

   To access the Carrier Controller web interface:
   1. Open the web browser.
   2. Enter the IP address of the unit in the address bar of the web browser.
   3. Start with “https://” followed by the unit IP address. Example: https://169.254.1.1
   4. Press Enter.
   5. The web interface will be loaded.

Page 1



Page 2

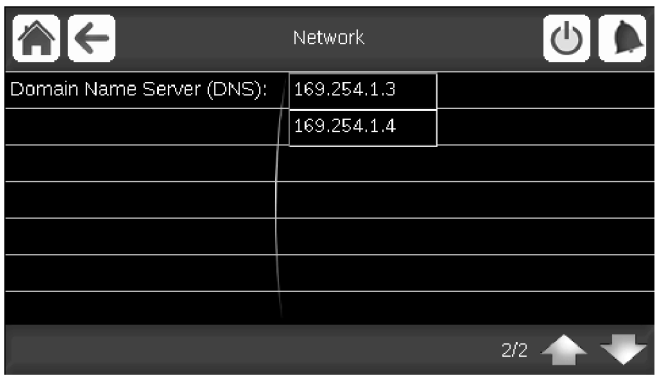


Fig. D — Network Screen

Network Settings

Request an IP address, subnet mask, and default gateway from the system administrator before connecting the unit to the local Ethernet network. The Network Screen (see Fig. D) allows the user to define network parameters, including TCP/IP address. Each parameter is editable and can be changed by selecting the outlined box and entering the desired address once the alpha-numeric keyboard displays. Click the save button after entering address.

Once this is complete, the setup of the Carrier Controller is complete. The computer or network that the Carrier Controller is being connected to may need to have some settings changed in order to communicate between them. See the next section.

ETHERNET/IP CONNECTION

If the unit is point-to-point to a PC and the unit is energized, it may be necessary to check the Ethernet connection and/or configure the PC network board. Refer to the following instructions to verify PC settings and connection to the Carrier Controller.

To verify the unit’s IP address, perform the following steps:

1. From the computer connected to the controller, go to Local Area Connection Properties and select Internet Protocol (TCP/IP). See Fig. E.

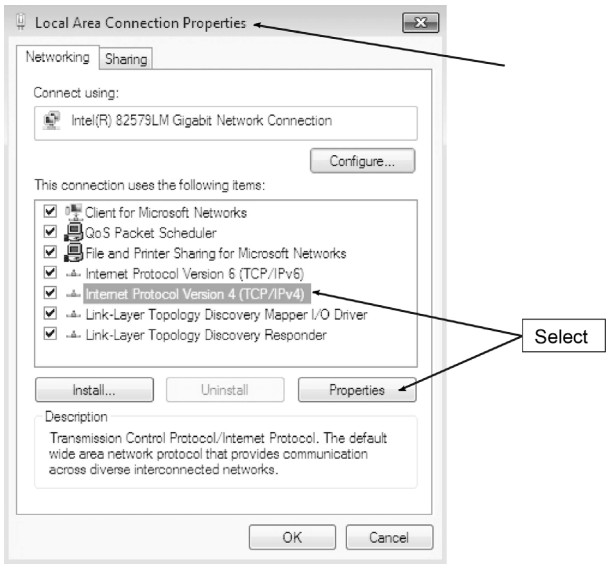


Fig. E — Local Area Connection Properties Screen

2. Once the Properties button is selected the Internet Protocol Properties Window opens. See Fig. F.

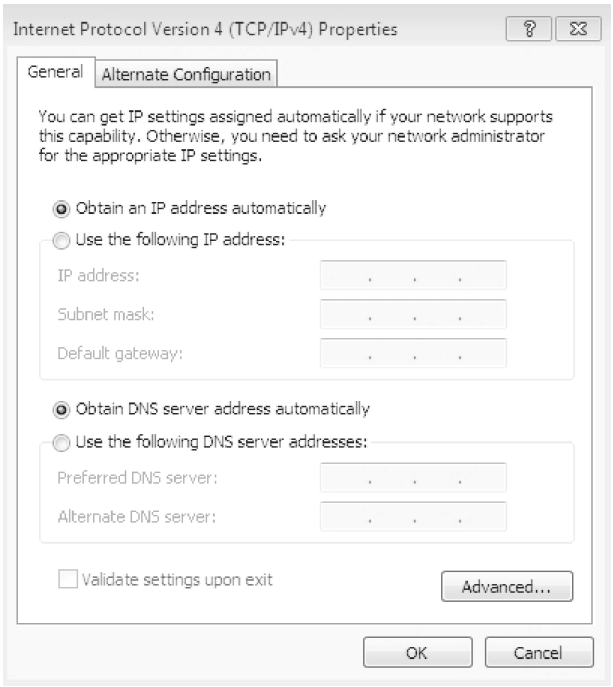


Fig. F — Internet Protocol Properties Screen

3. The IP address of the Carrier Controller must have matching system and subsystem fields in order for the 2 to communicate. In addition the last part of the IP address must be unique for both on the network.
   For example, Carrier Controller IP address: 172.30.101.11 and the PC address: 172.30.101.182.
   In this example 172.30 corresponds to the network and 101 corresponds to the subsystem and they must match. The last part of the IP address, 11 and 182, must be unique on the network.
4. Confirm that the Carrier Controller IP address and the PC IP address meets the above criteria and select OK on the PC.
5. Communication between the Carrier Controller and the PC should be active. Using a standard Web Browser, with minimum versions shown above and with Java installed, type in the IP address of the Carrier Controller. The display on the PC should look very similar to what is on the Carrier Controller display.

If issues still exist with accessing the Carrier Controller using the web browser, try to ping the Carrier Controller by using the following steps:

1. Open a command prompt using one of the following methods:
   a. Window logo key + R to access the run command. Then type CMD and press enter.
   OR
   b. Click start button and then click run. Then type CMD and press enter.
2. At the command prompt, type the ping command followed by the unit IP address.
3. As shown in Fig. G, the device attached to IP address 161.145.71.145 communicated successfully. The IP address for the Carrier Controller should return a similar confirmation if the system is configured properly. If it does not additional IT assistance may be necessary.

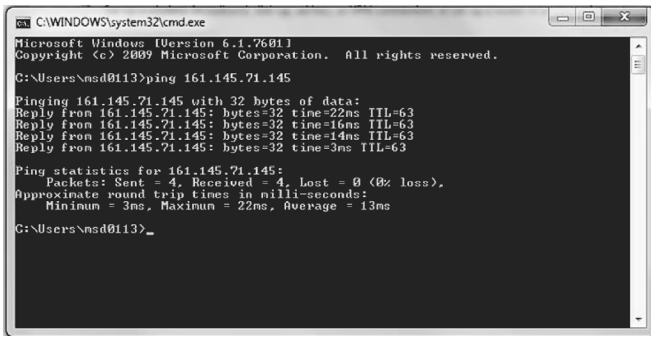


Fig. G — Ping Response Screen

APPENDIX I — FACTORY-SUPPLIED PUMPS

Pump Maintenance

GENERAL CARE

The vertical inline pumps provided with the 30RC products are built to operate without periodic maintenance. An inspection made at regular intervals will ensure years of trouble-free operation. Give special attention to the following:

1. Keep unit clean.
2. Keep refuse, dust, and other loose items away from pump and ventilating openings of the motor.

LUBRICATION

Lubrication is not required. There are no bearings in the pump that need external lubrication service.

MECHANICAL SEAL

Mechanical seals require no special attention. The seal is fitted with a flush line. The seal is flushed from the suction side of the pump.

⚠ CAUTION

Do not run the pump unless properly filled with water, as the seals require a film of liquid between the faces.

Mechanical seals may weep slightly at start-up. Allow the pump to continue operating for several hours and the mechanical seal to seat properly prior to calling for service.

⚠ CAUTION

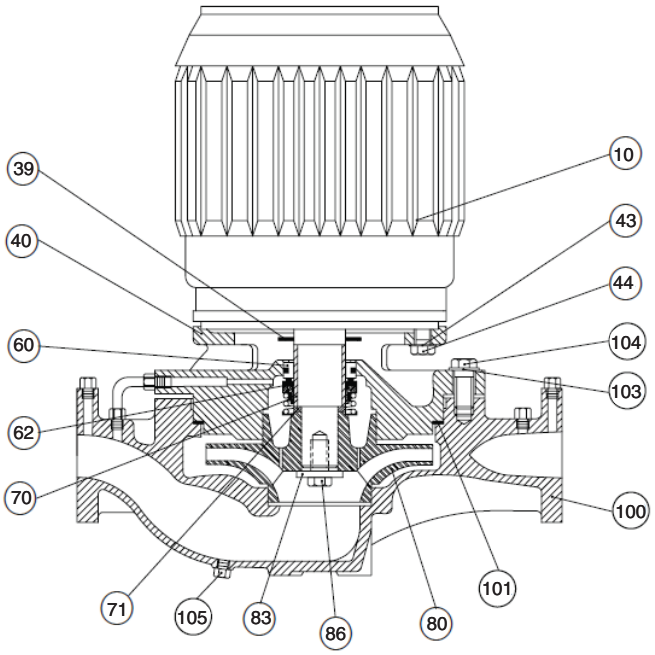
Do not use oil, Vaseline, or other petroleum or silicon-based products for seal elastomer lubrication. This may cause swelling and failure of the seal.

Seal Replacement

See Fig. H for pump seal replacement diagram.

⚠ CAUTION

Exercise extreme care when handling power wiring. Ensure that fuses are removed or breaker disconnected in the power supply to the motor. Power disconnect should be within line of sight to the pump and be tagged with reason for disconnection.



10 — Motor
39 — Water Slinger
40 — Adapter
43 — Washer
44 — Motor Capscrews
60 — Mechanical Seal Seat
62 — Mechanical Seal Rotating Element
70 — Shaft Sleeve
71 — Shaft Key Spacer
80 — Impeller
83 — Impeller Washer
86 — Impeller Fastener
100 — Casing
101 — Casing Gasket
103 — Casing Capscrews
104 — Casing Washers
105 — Drain Plug

Fig. H — Pump Seal Replacement

ELECTRICAL WIRING

If the pump and/or motor assembly is to be serviced on a bench, then the motor wiring must be disconnected.

ISOLATION VALVES

If the system is not drained, ensure that the suction and discharge piping isolation valves are closed. Remove drain plug (105) from the bottom of the casing and drain the pump.

PREPARE ASSEMBLY FOR REMOVAL

Secure the motor (10), by lifting straps, to an overhead chainfall or similar lifting device. The device must be designed to lift the weight of the unit safely. Raise the lifter to bring the lifting straps taut. Disconnect the flush/vent tubing assembly and place carefully to one side. Remove the casing capscrews (103) and washers (104). Pry bars may then be inserted between the casing (100) and adapter (40). Care should be taken not to apply pressure to the outside diameter of the adapter to prevent possible breakage. Outside pressure should be on the casing only.

REMOVE ROTATING ASSEMBLY

The rotating assembly (motor [10], adapter [40], and impeller [80]) may now be lifted out of the casing.

ROTATING ASSEMBLY NOTES

The impeller (80) is fastened directly to the motor shaft and must be removed in order to replace the mechanical seal assembly (60 and 62). This may be accomplished on a safe surface near the installation or, more conveniently, on a workbench.

INDEX

START-UP CHECKLIST FOR 30RC AIR-COOLED CHILLERS

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/information as outlined in preceding sections of this Controls, Start-Up, Operation, Service, and Troubleshooting document.

A. PROJECT INFORMATION

Job Name _____
Address _____
City _____ State _____ Zip _____
Installing Contractor _____
Sales Office _____
Start-Up Performed By _____

UNIT
Model _____
Serial _____

B. PRELIMINARY EQUIPMENT CHECK (This section to be completed by installing contractor)

1. Is there any physical damage?	☐ Yes	☐ No
a. If yes, was it noted on the freight bill and has a claim been filed with the shipper?	☐ Yes	☐ No
b. Will this prevent start-up?	☐ Yes	☐ No
Description _____		
_____		
2. Unit is installed level as per the Installation Instructions.	☐ Yes	☐ No
3. Power supply agrees with the unit nameplate.	☐ Yes	☐ No
4. Correct control voltage _____vac. Check transformer primary on 208/230 v.	☐ Yes	☐ No
5. Electrical power wiring is installed properly.	☐ Yes	☐ No
6. Unit is properly grounded.	☐ Yes	☐ No
7. Electrical circuit protection has been sized and installed properly.	☐ Yes	☐ No
8. Crankcase heaters energized for 24 hours before start-up.	☐ Yes	☐ No
9. Will this machine be controlled by a third party using BACnet/Lon/Modbus?	☐ Yes	☐ No
If yes, will the controls contractor be present at start-up?	☐ Yes	☐ No

Chilled Water System Check (This section to be completed by installing contractor)

1. All chilled water valves are open.	☐ Yes	☐ No
2. All piping is connected properly.	☐ Yes	☐ No
3. All air has been purged from the system.	☐ Yes	☐ No
4. Chilled water pump is operating with the correct rotation.	☐ Yes	☐ No
5. Chilled water pump starter controlled by chiller.	☐ Yes	☐ No
6. For units with hydronic package installed on an open loop and for units equipped with a DX cooler and no hydronic package: inlet piping to evaporator includes a 20 mesh strainer within 10 ft. of unit.	☐ Yes	☐ No
7. Water loop volume greater than 3 gal/ton for air conditioning or 6 gal/ton for process cooling and low ambient operation.	☐ Yes	☐ No
8. Has the water system been cleaned and flushed per the Installation Instructions?	☐ Yes	☐ No
9. For units with R-32 refrigerant, have automatic air separators with vents been installed as required by code?	☐ Yes	☐ No

10. Proper loop freeze protection provided to ____ °F (°C). ☐ Yes ☐ No

    Antifreeze type_____ Concentration _____%.

    (If antifreeze solution is not utilized on 30RC machines, and the minimum outdoor ambient is below 32°F (0°C), then items 10, 11, and 12 have to be completed to provide evaporator freeze protection to –20°F. Refer to Installation Instructions for proper evaporator winterization procedure.)

    IMPORTANT: Adding antifreeze solution is the only certain means of protecting the unit from freeze-up if the heater fails or electrical power is interrupted or lost while temperatures are below 32°F (0°C).

11. Outdoor piping wrapped with electric heater tape. ☐ Yes ☐ No
12. Evaporator heaters installed and operational. ☐ Yes ☐ No
13. Is the unit equipped with low ambient head pressure control? ☐ Yes ☐ No

    If yes, are wind baffles installed? (Required if chiller will run below 32°F and be exposed to the wind.) ☐ Yes ☐ No
14. Are there any VFDs (variable frequency drives) on the chilled water pumps? ☐ Yes ☐ No
    a. Primary loop ☐ Yes ☐ No
    b. Secondary loop ☐ Yes ☐ No
15. Chiller controls the pump(s)? ☐ Yes ☐ No
    a. If yes, have the pump interlocks been wired? ☐ Yes ☐ No

Preliminary start-up complete.

Installing/Mechanical Contractor _____ Date _____

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

C. UNIT START-UP (Qualified individuals only. Factory start-up recommended!)

Evaporator

Model _____

Serial _____

Compressors

A1)

Model _____

Serial _____

A2)

Model _____

Serial _____

A3)

Model _____

Serial _____

B1)

Model _____

Serial _____

B2)

Model _____

Serial _____

B3)

Model _____

Serial _____

Hydronic Package

P1)

Model _____

Serial _____

P2)

Model _____

Serial _____

1. All liquid line service valves located near EXVs are open. ☐ Yes ☐ No
2. All discharge service valves are open. ☐ Yes ☐ No
3. All suction service valves are open. ☐ Yes ☐ No
4. Leak check unit. Locate, repair, and report any refrigerant leaks. ☐ Yes ☐ No
5. All terminals are tight. ☐ Yes ☐ No
6. All plug assemblies are tight. ☐ Yes ☐ No
7. All cables, thermistors, and transducers have been inspected for cross wires. ☐ Yes ☐ No
8. All thermistors are fully inserted into wells. ☐ Yes ☐ No
9. All armatures move freely on contactors. ☐ Yes ☐ No
10. Voltage at terminal block is within unit nameplate range. ☐ Yes ☐ No
11. Check voltage imbalance: A-B_____ A-C_____B-C_____

    Average voltage = _____ (A-B + A-C + B-C)/3
    Maximum deviation from average voltage = _____
    Voltage imbalance = _____% (max. deviation / average voltage) X 100

    Is voltage imbalance less than 2%? ☐ Yes ☐ No

    (DO NOT start chiller if voltage imbalance is greater than 2%.
    Contact local utility for assistance.)
12. Verify evaporator flow rate ☐ Yes ☐ No

    Pressure entering evaporator _____ psig (kpa)
    Pressure leaving evaporator _____ psig (kpa)
    Evaporator pressure drop _____ psig (kpa)
    Psig x 2.31 ft/psi = _____ ft of water
    kPa x 0.334 m/psi = _____ m of water
    Evaporator flow rate _____ gpm (l/s)

    (See Evaporator Pressure Drop Curve provided in the 30RC Installation Instructions.)
13. Verify that isolation valves on factory-installed pump packages are properly positioned and locked prior to start-up (slot in-line with piping on both sides of pump). ☐ Yes ☐ No
14. Chilled water flow switch operational. ☐ Yes ☐ No

Start and operate machine. Complete the following:

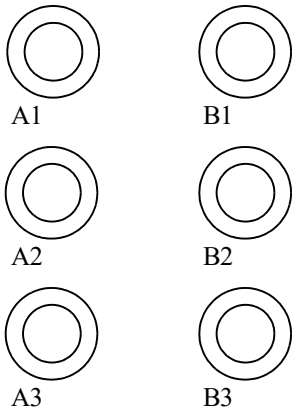
1. Complete component test utilizing Quick Test mode (make sure EXVs are checked after liquid line service valves are opened).
2. For fixed speed units, operate all condenser fans and verify operation and rotation.
3. Check refrigerant and oil charge. Record charge information below.
4. Record compressor and condenser fan motor current.
5. Record operating data.
6. Provide operating instructions to owner's personnel. Instruction time _____ hours

	Circuit A	Circuit B
Refrigerant Charge	_____	_____
Additional charge required	_____	_____

Oil Charge

Indicate level in sight glass of compressors A1 and B1.
Level should be 3/4 to 7/8 of a full sight glass when off.

Additional oil charge required.
Circuit A _____
Circuit B _____



Carrier Controller Software Versions

4.3 in. Controller: ECG-SR-20V4G _____ _____ _____
7 in. Controller: ECG-SR-20W4G _____ _____ _____
To obtain software version, navigate to ***System Menu → Software Info*** and find "Software Version" displayed in the table.

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Record Configuration Information

PATH	CARRIER CONTROLLER DESCRIPTION	DEFAULT	ENTRY
System Menu → Language & Unit	Language	English	
	Units	US Imp	
Main Menu → General Parameters	Heat/Cool Select	0 (Cool)	
	Setpoint Select	0 (Auto)	
Main Menu → Configuration Menu → General Configuration	Cir Priority Sequence	0 (Auto)	
	Staged Loading Sequence	No	
	Ramp Loading Select	0 (No)	
	Unit Off to On Delay	1 min	
	Heating OAT Threshold	1.4°F (–17°C)	
	Demand Limit Type Select	0 (None)	
	Night Mode Start Hour	0	
	Night Mode End Hour	0	
	Night Capacity Limit	100%	
	Ice Mode Enable	0 (No)	
	Both Command Sel (HSM)*	No	
	Auto Changeover Select	No	
	Entering Fluid Control	No	
Main Menu → Configuration Menu → Pump Configuration	Pumps Sequence	0 (No Pump)	
	Pump Auto Rotation Delay	48 hours	
	Pump Sticking Protection	0 (No)	
	Stop Pump During Standby	No	
	Flow Checked If Pump Off	1 (Yes)	
	Flow Control Method*	1 (Constant Speed)	
	Flow Delta T Setpoint*	9.0°F (–12.8°C)	
	Flow Delta P Setpoint*	29.00 psi	
	Pressure Zero Value*	–14.50 psi	
	Pump Minimum Speed*	60%	
	Pump Min Speed Cap = 0%*	60%	
	Pump Maximum Speed*	100%	
	Min Water Press Thres*	15 psig	
	Water Pump Max Delta P*	73 psig	
Main Menu → Configuration Menu → User Configuration	Alarm Relay for Alerts	No	
	Reversed Alarm Relay	0	
Main Menu → Configuration Menu → Reset Configuration	Cooling Reset Select	0 (None)	
	Heating Reset Select	0 (None)	
	OAT No Reset Value	14°F (–10°C)	
	OAT Full Reset Value	14°F (–10°C)	
	Delta T No Reset Value	0°F (0°C)	
	Delta T Full Reset Value	0°F (0°C)	
	Current No Reset Value	0 mA	
	Current Full Reset Value	0 mA	
	Space T No Reset Value	14°F (–10°C)	
	Space T Full Reset Value	14°F (–10°C)	
	Cooling Reset Deg. Value	0°F (0°C)	
	Cooling OAT No Reset Value	14°F (–10°C)0 mA	
	Cooling OAT Full Reset Value	14°F (–10°C)	
	Cooling Delta T No Reset Value	0°F (0°C)	
	Cooling Delta T Full Reset Value	0°F (0°C)	
	Cooling Current No Reset Value	0 mA	
	Cooling Current Full Reset Value	0 mA	
	Cooling Space T No Reset Value	14°F (–10°C)	
	Cooling Space T Full Reset Value	14°F (–10°C)	
	Cooling Reset Deg. Value	0°F (0°C)	
	Heating OAT No Reset Value	14°F (–10°C)	
	Heating OAT Full Reset Value	14°F (–10°C)	
	Heating Delta T No Reset Value	0°F (0°C)	
	Heating Delta T Full Reset Value	0°F (0°C)	
	Heating Current No Reset Value	0 mA	
	Heating Current Full Reset Value	0 mA	
	Heating Space T No Reset Value	14°F (–10°C)	
	Heating Space T Full Reset Value	14°F (–10°C)	
	Heating Reset Deg. Value	0°F (0°C)	

* Not applicable to North America units. Leave as Default value.

LEGEND

HSM — Hydronic System Manager
OAT — Outside Air Temperature

Record Configuration Information (cont)

PATH	CARRIER CONTROLLER DESCRIPTION	DEFAULT	ENTRY
Main Menu → Configuration Menu → Factory Configuration	Unit Type (Heat Pump = 2)	1	
	Unit Capacity	Unit Dependent	
	Fan Type	0 (Fixed Speed)	
	Fan Speed	0 (Fixed Speed)	
	Desuperheater Select	No	
	Exchanger Heater Select	No	
	Energy Management Module	No	
	Pump Type	1 (No Internal Pump)	
	Factory Dual Water Pump	No	
	Pump Control Method*	1	
	QM Code*	0	
	Country, 0 = EU, 1 = US, 2 = CH	0	
	Unit Refrigerant Type	Unit Dependent	
	Exchanger Fluid Type	1 (Water)	
	Leakage Charge Detection*	No	
	DC Free Cooling Select*	No	
	Soft Start Select*	0	
	Fan Low Noise Option*	0	
	Power Frequency 60Hz Sel	No	
	Option 282: CEM*	No	
	Option 119C Selection*	No	
	Heat Reclaim*	No	
	HR Heater*	No	
	Free Cooling Option*	0	
	Exchanger Coil Type	0 (MCHX)	
	Exchanger Family	0 (BPHE)	
	Compact Tier Selection	No	
	Supply_Voltage	Unit Dependent	
	Hot Gas Bypass Selection	No	
Main Menu → Configuration Menu → Service Configuration	High Pressure Threshold	656.0 psi	
	Exch. Heater Delta Spt	3.4°F (1.9°C)	
	Brine Freeze Setpoint	34.0°F (1.1°C)	
	Minimum LWT Setpoint	38.0°F (3.3°C)	
	Auto Start when SM Lost	Disable	
	Auto Z Multiplier Stp	6	
	Maximum Z Multiplier	6.0	
	Flow Setpoint*	0	
	Pump Cycl. Freeze Prot.	No	
	Blackbox in Metric?	Yes	
	Unit Altitude (in meters)	0	
	Leakage Charge Threshold	2.5V	
	Leakage Charge Timer	60 min	
	Free Defr Allowed Period	2 hours	
	OAT Min for Free Defrost	34.7°F (1.5°C)	
	Fast Capacity Recovery	No	
	Glycol in Loop	No	
Main Menu → Configuration Menu → Master Slave Config	Master/Slave Select	0 (disable)	
	Master Control Type	1 (Local)	
	Slave Address	2	
	Lead Lag Select	0 (Always Lead)	
	Lead/Lag Balance Delta	168 hours	
	Lead/Lag Start Timer	10 min	
	Lead Pulldown Time	0 min	
	Start If Error Higher	4°F (2.2°C)	
	Lag Minimum Running Time	0 min	
	Lag Unit Pump Control	0 (Stop if Unit Stops)	
	Chiller In Series	0 (No)	
	Legacy Compatibility?	No	

* Not applicable to North America units. Leave as Default value.

LEGEND

CEM — Controls Expansion Module
HR — Heat Reclaim
LWT — Leaving Water Temperature
OAT — Outdoor Air Temperature
SM — System Manager
Spt — Setpoint

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Record Configuration Information

PATH	CARRIER CONTROLLER DESCRIPTION	DEFAULT	ENTRY
Main Menu → Configuration Menu → Msc Config	Eco Pump Enable	No	
	Pump Off Time	2 min	
	Pump On Time	5 min	
Main Menu → Setpoint Configuration	Cooling Setpoint 1	44°F (6.7°C)	
	Cooling Setpoint 2	44°F (6.7°C)	
	Cooling Ice Setpoint	44°F (6.7°C)	
	Cooling Ramp Loading	1°F (0.6°C)	
	Heating Setpoint 1	100°F (37.8°C)	
	Heating Setpoint 2	100°F (37.8°C)	
	Heating Ramp Loading	1.0°C (–17.2°C)	
	Cool Changeover Setpt	75.0°F (23.9°C)	
	Heat Changeover Setpt	64.0°F (17.8°C)	
	Heat Reclaim Setpoint*	122.0°F (50.0°C)	
	Heat Reclaim Deadband*	3.6°F (–15.8°C)	
	Desuperheat Min SCT	104.0°F (40.0°C)	
	Switch Limit Setpoint 1	100%	
	Switch Limit Setpoint 2	100%	
	Switch Limit Setpoint 3	100%	

* Not applicable to North America units. Leave as Default value.

LEGEND

SCT — Saturated Condensing Temperature

Component Test — Complete the following tests to make sure all peripheral components are operational before the compressors are started.

PATH	CARRIER CONTROLLER DESCRIPTION	CHECK WHEN COMPLETE
Main Menu → Quick Test #1	Quick Test Enable	
	Pump #1 Output	
	Pump #2 Output	
	Exchanger Heater Output	
	Alarm Relay Status	
	Running Relay Status	
	Reverse Vlv Output Cir A	
	Fan A1 Output	
	Fan A2 Output	
	Fan A3 Output	
	Fan A4 Output	
	Fan A5 Output	
	Fan A6 Output	
	Variable Fan Speed A	
	EXV Position Circuit A	
	Compressor Head Heater A*	
	Fan B1 Output	
	Fan B2 Output	
	Fan B3 Output	
	Fan B4 Output	
	Fan B5 Output	
	Fan B6 Output	
	Variable Fan Speed B	
	EXV Position Circuit B	
	Compressor Head Heater B*	
Main Menu → Quick Test #2	Total Capacity Output	
	Compressor A1 Output	
	Compressor A2 Output	
	Compressor A3 Output	
	Compressor A4 Output	
	Compressor B1 Output	
	Compressor B2 Output	
	Compressor B3 Output	
	Compressor B4 Output	
	Alert Relay Switch	
	Shutdown Relay Status	
	Desuperheater Pump	
	Coil Heater A	
	Coil Heater B	

* Not applicable to North America units. Leave as Default value.

LEGEND

EXV — Electronic Expansion Valve
Vlv — Valve

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Operating Data:

Record the following information from the Run Status, Temperatures and Outputs Modes when machine is in a stable operating condition. If cooling load is insufficient, these readings must be obtained by putting the chiller in Quick Test mode and running each compressor.

TEMPERATURES

EVAPORATOR ENTERING FLUID	EWT _____	
EVAPORATOR LEAVING FLUID	LWT _____	
CONTROL POINT	CTPT _____	
CAPACITY	CAP _____	
OUTSIDE AIR TEMPERATURE	OAT _____	
CHWS (CHILLED WATER SUP.) TEMP	CHWS _____	(Dual Chiller Control Only)

Install a manifold gage set to obtain readings and verify these against pressure transducers.

CIRCUIT A	CIRCUIT B
SCT.A _____	SCT.B _____
SST.A _____	SST.B _____
SGT.A _____	SGT.B _____
SUP.A _____	SUP.B _____
EXV.A_____	EXV.B _____

NOTE: EXV A and B positions are found in the output mode.

COMPRESSOR MOTOR CURRENT

	L1	L2	L3
COMPRESSOR A1	_____	_____	_____
COMPRESSOR A2	_____	_____	_____
COMPRESSOR A3	_____	_____	_____
COMPRESSOR B1	_____	_____	_____
COMPRESSOR B2	_____	_____	_____
COMPRESSOR B3	_____	_____	_____

CONDENSER FAN MOTOR CURRENT, FIXED SPEED UNITS

	L1	L2	L3		L1	L2	L3
FAN MOTOR 1	_____	_____	_____	FAN MOTOR 8	_____	_____	_____
FAN MOTOR 2	_____	_____	_____	FAN MOTOR 9	_____	_____	_____
FAN MOTOR 3	_____	_____	_____	FAN MOTOR 10	_____	_____	_____
FAN MOTOR 4	_____	_____	_____	FAN MOTOR 11	_____	_____	_____
FAN MOTOR 5	_____	_____	_____	FAN MOTOR 12	_____	_____	_____
FAN MOTOR 6	_____	_____	_____	FAN MOTOR 13	_____	_____	_____
FAN MOTOR 7	_____	_____	_____	FAN MOTOR 14	_____	_____	_____

CONDENSER FAN MOTOR CURRENT, VARIABLE SPEED UNITS

	Hz	A
VFD A1	_____	_____
VFD A2	_____	_____
VFD B1	_____	_____
VFD B2	_____	_____

HEATER CURRENT

EVAPORATOR HEATER CURRENT _____

COMMENTS:

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

SIGNATURES:

Start-up Technician _____ Date_____

Customer Representative _____ Date_____

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Catalog No. 04-53300228-01 Printed in U.S.A. Form 30RC-1T Pg CL-10 12-22 Replaces: NEW