



# Controls Operation and Troubleshooting

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## 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 mechanics 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, and 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.

## DANGER

### ELECTRICAL SHOCK HAZARD

Failure to follow this warning will result in personal injury or death.

Before performing service or maintenance operations on unit, turn off main power switch to unit and install lock(s) and lockout tag(s). Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate. Unit may have more than one power switch.

## WARNING

Electrical currents cause components to get hot either temporarily or permanently and may cause burns. Handle power cable, electrical cables and conduits, terminal box covers, and motor frames with great care.

## 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. The PIC6 control boards have 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.

## WARNING

This product can expose you to chemicals including lead and lead components, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

## GENERAL

This publication contains operation and troubleshooting information for PIC (Product Integrated Control) 6, a system for controlling 23XRV variable speed screw liquid chillers.

The PIC6 control system monitors and controls all operations of the chiller. The microprocessor control system matches the capacity of the chiller to the cooling load while providing state-of-the-art chiller protection. The system controls cooling load within the set point plus or minus the dead band by sensing the water or brine

temperature and regulating VFD (variable frequency drive) speed of the compressor.

See Fig. 1 for an example of the Login screen.

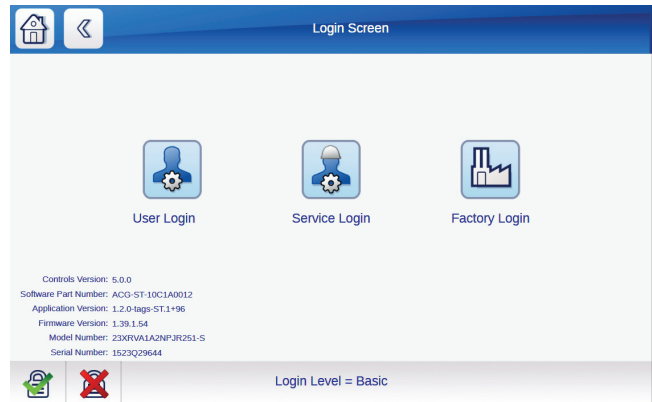


Fig. 1 — Login Screen

The PIC6 control system also provides access to a Quick Test controls function covering all outputs except compressor relay outputs.

## Abbreviations Used in This Manual

The following abbreviations are used in this manual:

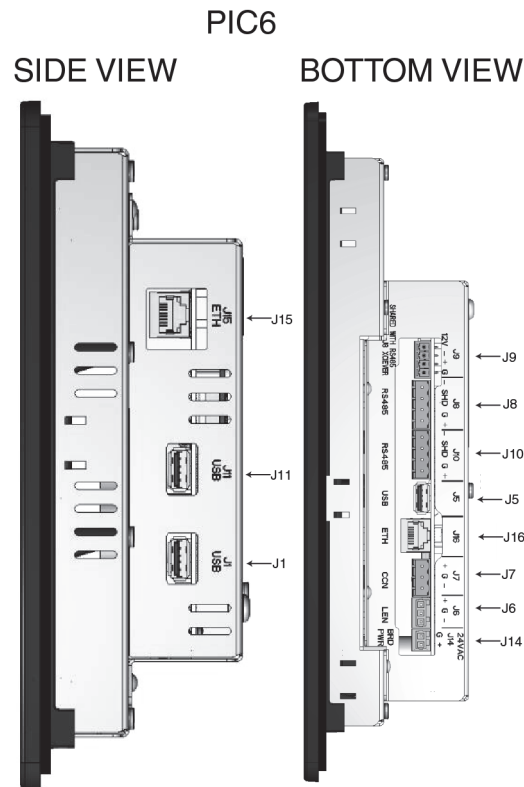
|                 |                                       |
|-----------------|---------------------------------------|
| <b>AWG</b>      | — American Wire Gauge                 |
| <b>CCN</b>      | — Carrier Comfort Network®            |
| <b>CCN mode</b> | — Operating mode: CCN                 |
| <b>DHCP</b>     | — Dynamic Host Configuration Protocol |
| <b>EC</b>       | — Envelope Control (Hot Gas Bypass)   |
| <b>ECDW</b>     | — Entering Condenser Water            |
| <b>ECW</b>      | — Entering Chilled Water              |
| <b>EWT</b>      | — Entering Water Temperature          |
| <b>EXV</b>      | — Electronic Expansion Valve          |
| <b>HGBP</b>     | — Hot Gas Bypass                      |
| <b>HMI</b>      | — Human Machine Interface             |
| <b>I/O</b>      | — Input/Output                        |
| <b>IOB</b>      | — Input/Output Board                  |
| <b>LCDW</b>     | — Leaving Condenser Water             |
| <b>LCW</b>      | — Leaving Chilled Water               |
| <b>LED</b>      | — Light-Emitting Diode                |
| <b>LEN</b>      | — Local Equipment Network             |
| <b>MCB</b>      | — Main Control Board                  |
| <b>NIC</b>      | — Network Interface Card              |
| <b>PIC</b>      | — Product Integrated Control          |
| <b>RLA</b>      | — Rated Load Amps                     |
| <b>RTD</b>      | — Resistance Temperature Detector     |
| <b>SIOB</b>     | — Starfire Input/Output Board         |
| <b>TFT</b>      | — Thin Film Transistor                |
| <b>UI</b>       | — User Interface                      |
| <b>VFD</b>      | — Variable Frequency Drive            |

## HARDWARE

The PIC6 control system consists of one SIOB (Starfire Input/Output Board) module and two IOB modules. All boards communicate via an internal Local Equipment Network (LEN) bus.

## Main PIC6 Control HMI

The main control board is supplied from a 24 VAC supply reference to earth ground. 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. Figure 2 shows the main control interface and connectors.



#### LEGEND

- J1** — USB CONNECTOR
- J5** — USB CONNECTOR
- J6** — LEN CONNECTOR
- J7** — CCN CONNECTOR
- J8** — RS485, BACnet MS/TP OR Modbus RTU (Phoenix 1757035 - not factory supplied)
- J9** — RNET (future)
- J10** — RS485, Modbus/RTU Comm to VFD Starter
- J11** — USB CONNECTOR
- J14** — POWER SUPPLY CONNECTOR (24 VAC)
- J15** — ETHERNET CONNECTOR, PORT 0 (DEFAULT IP: 169.254.1.1, Mask: 255.255.0.0)
- J16** — ETHERNET CONNECTOR, PORT 1 (DEFAULT IP: 192.168.100.100, mask: 255.255.255.0)

#### NOTES:

1. Either BACnet/MSTP or BACnet/IP can be enabled and either Modbus/RTU or Modbus/TCP/IP can be enabled. Controller does not allow both to be enabled at the same time.
2. Modbus RTU can be configured simultaneously with BACnet IP.
3. BACnet MS/TP can be configured simultaneously with Modbus TCP/IP.
4. BACnet MS/TP must be disabled in order to use Modbus RTU and visa versa.

**Fig. 2 — PIC6 Connectors**

#### **CAUTION**

Maintain the correct polarity when connecting the power supply to the boards. Otherwise, the boards may be damaged.

### **SIOB (Starfire Input/Output Board)**

The SIOB is an input output board which is supplied from a 24 VAC supply reference to earth ground. This board controls the EXV stepper motors.

### **IOB (Input/Output Board)**

The IOB is supplied from a 24 VAC supply reference to earth ground.

#### **IOB CONFIGURATION**

The input/output boards are configured for different types of input/output. The IOB boards have two dip switches. Switch 1 sets the board address. For Switch 2, if a channel output for channel 1 through 10 (J16 and J15) is 4-20 mA, the corresponding dip switch 1-10 must be On for the channel.

#### **23XRV IOB COMPONENTS AND WIRING**

The components listed in Tables 1-3 are available at the user's terminal block on the IOB. Many are routed to the 7TB terminal block located on the left side of the low voltage VFD section. For field connections the appropriate connectors are identified in Tables 1-3. Figure 3 is the legend for the IOB and control wiring diagrams; Fig. 4-6 show IOB wiring diagrams; and Fig. 7-9 show additional control wiring.

**Table 1 — SIOB Input/Output Descriptions**

| DESCRIPTION                                                        | CHANNEL | TERMINAL    | TYPE          | OPTIONAL                                          |
|--------------------------------------------------------------------|---------|-------------|---------------|---------------------------------------------------|
| Entering Chilled Water Temperature                                 | AI1     | J25-1,2     | 5K Ohm        | —                                                 |
| Leaving Chilled Water Temperature                                  | AI2     | J25-3,4     | 5K Ohm        | —                                                 |
| Entering Condenser Water Temperature                               | AI3     | J25-5,6     | 5K Ohm        | —                                                 |
| Leaving Condenser Water Temperature                                | AI4     | J25-7,8     | 5K Ohm        | —                                                 |
| Evaporator Saturation Temperature (Refrigerant Liquid Temperature) | AI5     | J25-9,10    | 5K Ohm        | —                                                 |
| Condenser Pressure Sensor                                          | AI6     | J11-1,2,3   | 5VDC          | —                                                 |
| Evaporator Pressure Sensor                                         | AI7     | J19-1,2,3   | 5VDC          | —                                                 |
| Economizer Pressure Sensor                                         | AI8     | J20-1,2,3   | 5VDC          | —                                                 |
| Compressor Discharge Pressure Sensor                               | AI9     | J21-1,J19-3 | 5VDC          | —                                                 |
| Demand Limit Input                                                 | AI10    | J9-1,2      | 4-20 mA       | Optional Field Connections 7TB-7,8                |
| Spare Safety                                                       | DI2     | J1-3,4      | 24 VAC        | Optional Field Connections, 7TB-3,4 (dry contact) |
| Ice Build Contact                                                  | DI3     | J1-5,6      | 24 VAC        | NOTE: 23XRV is not suited for ice duty.           |
| Oil Reclaim Actuator                                               | AO1     | J10-1,2     | 0 to 10V      | Variable                                          |
| Primary Oil Heater Relay                                           | DO1     | J2-1        | 24 VAC        | —                                                 |
| Oil Pump Relay                                                     | DO2     | J2-2        | 24 VAC        | —                                                 |
| Vaporizer Heater Relay                                             | DO3     | J6-2        | 24 VAC        | —                                                 |
| Secondary Oil Heater Relay                                         | DO4     | J6-1        | 24 VAC        | —                                                 |
| Hot Gas Bypass Solenoid                                            | DO5     | J23-1,2     | 24 VAC        | —                                                 |
| Condenser Expansion Valve                                          | STRP1   | J17-2,3,4,5 | Stepper Motor | NOTE: Only for units with TP Compressor           |
| Economizer Expansion Valve                                         | STRP2   | J18-2,3,4,5 | Stepper Motor | NOTE: Only for units with TP Compressor           |

**Table 2 — 23XRV Input/Output Board 1 (IOB1) Connections<sup>a,b,c</sup>**

| DESCRIPTION                                           | CHANNEL | TERMINAL | TYPE   | OPTIONAL                                                                                                                          |
|-------------------------------------------------------|---------|----------|--------|-----------------------------------------------------------------------------------------------------------------------------------|
| Compressor Discharge Temperature                      | AI1     | J16-1,5  | 5K Ohm | —                                                                                                                                 |
| Motor Winding Temperature                             | AI2     | J16-2,6  | 5K Ohm | —                                                                                                                                 |
| Oil Vaporizer Temperature                             | AI3     | J16-3,7  | 5K Ohm | —                                                                                                                                 |
| Oil Sump Temperature                                  | AI4     | J16-4,8  | 5K Ohm | —                                                                                                                                 |
| Remote Reset Sensor                                   | AI5     | J15-6,12 | 5K Ohm | Optional Field Connection 7TB-17, 18                                                                                              |
| Economizer Gas Temperature                            | AI6     | J15-5,11 | 5K Ohm | —                                                                                                                                 |
| Oil Pump Discharge Pressure                           | AI7     | J15-4,10 | 5V     | —                                                                                                                                 |
| Oil Sump Pressure                                     | AI8     | J15-3,9  | 5V     | —                                                                                                                                 |
| Refrigerant Leak Sensor                               | AI9     | J15-2,8  | 4-20mA | Optional Field Connection 7TB-19, 20 (Ensure channel 5 on SW2 dip switch is ON)                                                   |
| Auto Chilled Liquid Reset                             | AI10    | J15-1,7  | 4-20mA | Optional Field Connection 7TB-21, 22 (Ensure channel 9 on SW2 dip switch is ON)                                                   |
| Head Pressure Output                                  | AO3     | J14-3,6  | 4-20mA | Optional Field Connection 7TB-34, 35                                                                                              |
| Remote Contact Input                                  | DI1     | J13-1,5  | 24 VAC | Optional Field Connection 7TB-9,10, Dry contact.<br>Must be configured in "Configure Startup Options" in Chiller Start/Stop Menu. |
| Emergency Stop                                        | DI2     | J13-2,6  | 24 VAC | Optional Field Connection 7TB-11,12; Dry contact                                                                                  |
| Evaporator Flow Switch                                | DI3     | J13-4,7  | 24 VAC | Optional Field Connection 7TB-13,14; Closed indicates flow                                                                        |
| Condenser Flow Switch                                 | DI4     | J13-4,8  | 24 VAC | Optional Field Connection 7TB-15,16; Closed indicates flow                                                                        |
| Chiller Alert                                         | DO1     | J12-6,7  | 24 VAC | Optional Field Connection 7TB-24V, 27                                                                                             |
| Chiller Alarm                                         | DO2     | J12-9,10 | 24 VAC | Optional Field Connection 7TB-24V, 29                                                                                             |
| Discrete Chiller Run Status Output (OFF=0V, ON=24VAC) | DO3     | J12-1,2  | 24 VAC | Optional Field Connection 7TB-24V, 31                                                                                             |
| VFD Run Permissive                                    | DO4     | J12-4,5  | 24 VAC | —                                                                                                                                 |
| Condenser Liquid Level Sensor                         | AI11    | J10-1,7  | 0-5V   | NOTE: For TP compressors only.                                                                                                    |

NOTE(S):

- See Fig. 5 for IOB1 wiring diagram.
- For pressure readings, only Vout (output) terminal is indicated. See Fig. 5 for Vin (+) and ground (—).
- Defaults are shown. In some cases the IOB can be configured differently depending on job requirements.

**Table 3 — 23XRV IOB2 Connections<sup>a,b,c</sup>**

| DESCRIPTION                        | CHANNEL | TERMINAL               | TYPE   | OPTIONAL                                                                      |
|------------------------------------|---------|------------------------|--------|-------------------------------------------------------------------------------|
| Entering Evaporator Water Pressure | AI3     | J16-3,7 Signal, J11-1  | +5V    | Optional Field Connections 7TB-36 (reference), 7TB-37 (Vout), 7TB-64 (Vin)    |
| Leaving Evaporator Water Pressure  | AI4     | J16-4,8 Signal, J11-2  | +5V    | Optional Field Connections 7TB-38 (reference), 7TB-39 (Vout), 7TB-65 (Vin)    |
| Entering Condenser Water Pressure  | AI5     | J15-6,12 Signal, J11-3 | +5V    | Optional Field Connections 7TB-41 (reference) 7TB-40 (Vout), 7TB-66 (Vin)     |
| Leaving Condenser Water Pressure   | AI6     | J15-5,11 Signal, J11-4 | +5V    | Optional Field Connections 7TB-43 (reference), 7TB-42 (Vout), 7TB-67 (Vin)    |
| Common Chilled Water Supply        | AI7     | J15-4,10               | 5K Ohm | Optional Field Connections 7TB-60,61                                          |
| Evaporator Water Flow Measurement  | AI8     | J15-3,9                | 4-20mA | Optional Field Connections 7TB-44,45 (Channel 8 on SW2 dip switch must be ON) |
| Condenser Water Flow Measurement   | AI9     | J15-2,8                | 4-20mA | Optional Field Connections 7TB-46,47 (Channel 9 on SW2 dip switch must be ON) |
| Common Chilled Water Return        | AI10    | J15-1,7                | 5K Ohm | Optional Field Connections 7T-58,59                                           |
| Head Pressure Output 2             | AO3     | J14-3,6                | 4-20mA | Optional Field Connections 7TB-56,57                                          |
| Chilled Water Pump                 | DO1     | J12-6,7                | 24 VAC | —                                                                             |
| Condenser Water Pump               | DO2     | J12-9,10               | 24 VAC | —                                                                             |

NOTE(S):

- See Fig. 6 for IOB2 wiring diagram.
- For pressure readings, only Vout (output) terminal is indicated. See Fig. 6 for Vin (+) and ground (—).
- Defaults are shown. In some cases the IOB can be configured differently depending on job requirements.

**LEGEND**

**IOB** — Input/Output Board

| ABBREVIATION LISTING |                                      |          |                             |
|----------------------|--------------------------------------|----------|-----------------------------|
| ALE                  | CHILLER ALERT                        | REM_CON  | REMOTE CONTACT INPUT        |
| ALM                  | CHILLER ALARM                        | R_RESET  | REMOTE RESET                |
| AUTO_DEM             | AUTO DEMAND LIMIT INPUT              | SIOB     | STANDARD INPUT OUTPUT BOARD |
| AUTO_RES             | AUTO CHILLED LIQUID RESET            | TR       | TRANSFORMER                 |
| CB                   | CIRCUIT BREAKER                      | VAP_HEAT | VAPORIZER HEATER            |
| CDGT                 | COMPRESSOR DISCHARGE TEMPERATURE     | VAP_TEMP | VAPORIZER TEMPERATURE       |
| CDWP                 | CONDENSER WATER PUMP                 | EXV      | EXPANSION VALVE             |
| CHWP                 | CHILLED WATER PUMP                   | RUN_STAT | RUN STATUS                  |
| COND_EWP             | CONDENSER LEAVING WATER PRESSURE     |          |                             |
| COND_FL              | COND WATER FLOW MEASUREMENT          |          |                             |
| COND_FS              | COND WATER FLOW SWITCH               |          |                             |
| COND_LIQ_LVL         | CONDENSER LIQUID LEVEL               |          |                             |
| COND_LWP             | CONDENSER LEAVING WATER PRESSURE     |          |                             |
| COND_P               | CONDENSER PRESSURE                   |          |                             |
| CR_TEMP              | COMMON RETURN TEMPERATURE            |          |                             |
| CS_TEMP              | COMMON SUPPLY TEMPERATURE            |          |                             |
| DISCH_P              | DISCHARGE PRESSURE                   |          |                             |
| ECW                  | ENTERING CHILLED WATER TEMPERATURE   |          |                             |
| ECDW                 | ENTERING CONDENSER WATER TEMPERATURE |          |                             |
| ECON_P               | ECONOMIZER PRESSURE                  |          |                             |
| ECON_GAS             | ECONOMIZER GAS TEMPERATURE           |          |                             |
| EVAP_EWP             | EVAPORATOR ENTERING WATER PRESSURE   |          |                             |
| EVAP_FL              | EVAPORATOR FLOW MEASUREMENT          |          |                             |
| EVAP_FS              | EVAPORATOR FLOW SWITCH               |          |                             |
| EVAP_LWP             | EVAPORATOR LEAVING WATER PRESSURE    |          |                             |
| EVAP_P               | EVAPORATER PRESSURE                  |          |                             |
| EVAP_T               | EVAPORATER TEMPERATURE               |          |                             |
| E_STOP               | EMERGENCY STOP                       |          |                             |
| ES                   | ETHERNET SWITCH                      |          |                             |
| HDPV_OUT             | HEAD PRESSURE OUTPUT                 |          |                             |
| HDPV_OU2             | HEAD PRESSURE OUTPUT 2               |          |                             |
| HGBP                 | HOT GAS BYPASS                       |          |                             |
| HP_SWITCH            | HIGH PRESSURE SWITCH                 |          |                             |
| ICE_CON              | ICE BUILD CONTACT                    |          |                             |
| IOB                  | INPUT OUTPUT BOARD                   |          |                             |
| LCW                  | LEAVING CHILLED WATER TEMPERATURE    |          |                             |
| LCDW                 | LEAVING CONDENSER WATER TEMPERATURE  |          |                             |
| MTRW                 | MOTOR WINDING TEMPERATURE            |          |                             |
| PRI_OIL_HEAT         | PRIMARY OIL HEATER                   |          |                             |
| SEC_OIL_HEAT         | SECONDARY OIL HEATER                 |          |                             |
| OIL_PUMP             | OIL PUMP                             |          |                             |
| OILT_SMP             | OIL SUMP TEMPERATURE                 |          |                             |
| OILP_DIS             | OIL DISCHARGE PRESSURE               |          |                             |
| OILP_SMP             | OIL SUMP PRESSURE                    |          |                             |
| PS                   | POWER SUPPLY                         |          |                             |
| REF_LEAK             | REFRIGERANT LEAK                     |          |                             |

| SYMBOL LEGEND |                       |
|---------------|-----------------------|
|               | TERMINAL BLOCK        |
|               | PRESSURE TRANSDUCER   |
|               | THERMISTOR            |
|               | COIL                  |
|               | NO CONTACT            |
|               | PRESSURE SWITCH       |
|               | PANEL SUPPLIER WIRING |
|               | FACTORY WIRING        |
|               | CIRCUIT BREAKER       |
|               | GROUND                |
|               | CABLE                 |
|               | FEMALE CONNECTOR      |
|               | MALE CONNECTOR        |
|               | FIELD WIRING          |
|               | NC CONTACT            |

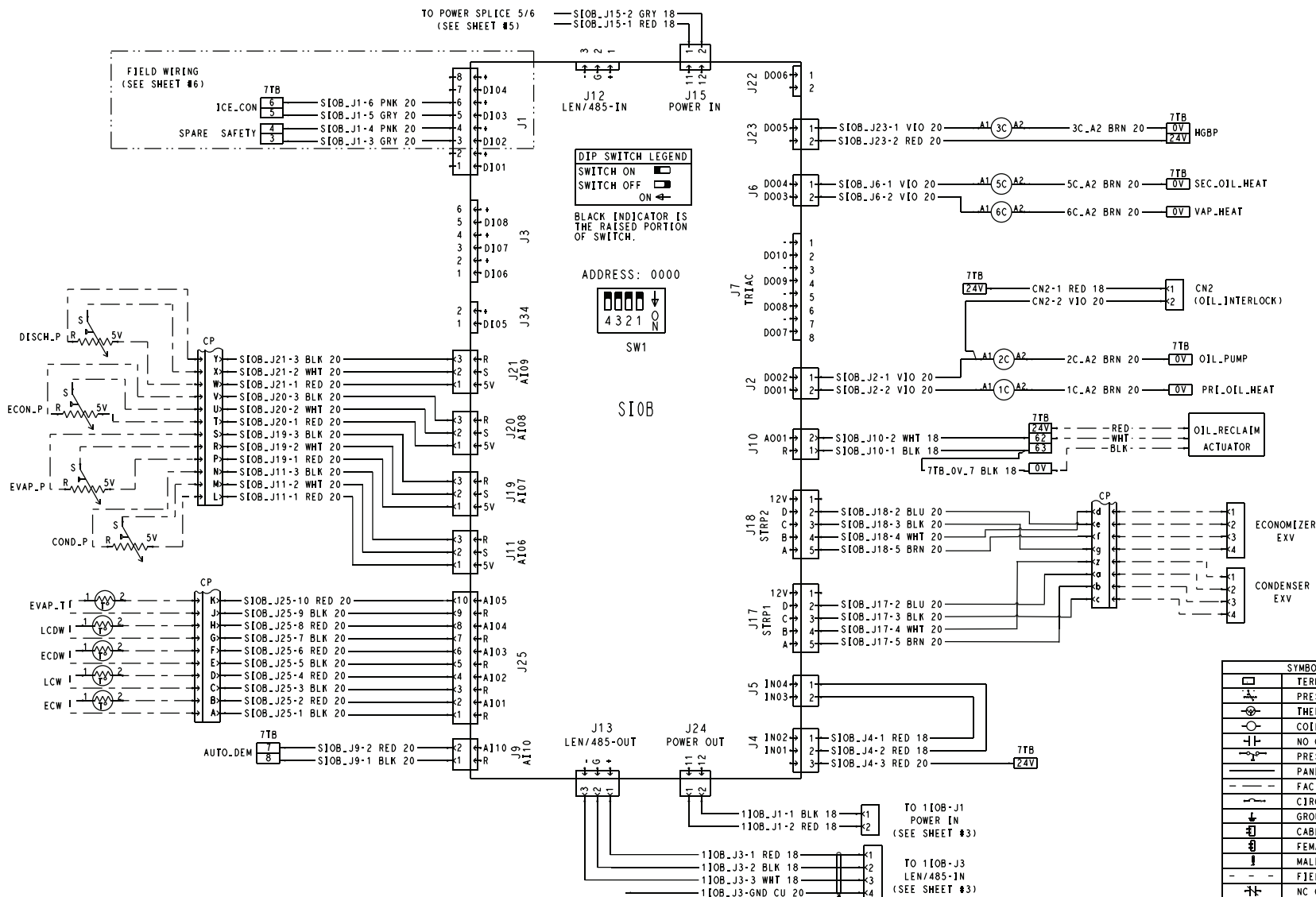
| WIRE COLOR LEGEND |        |
|-------------------|--------|
| BLK               | BLACK  |
| BLU               | BLUE   |
| BRN               | BROWN  |
| GRN               | GREEN  |
| GRY               | GREY   |
| ORG               | ORANGE |
| PNK               | PINK   |
| RED               | RED    |
| VIO               | VIOLET |
| WHT               | WHITE  |
| YEL               | YELLOW |

## NOTES:

1. FIELD-SUPPLIED CONTROL CONDUCTORS TO BE AT LEAST 18AWG (AMERICAN WIRE GAGE) OR LARGER. THE CONTROL CABINET SHOULD ONLY BE USED FOR LOW VOLTAGE FIELD WIRING (50-V MAXIMUM.)
2. EACH DIGITAL OUTPUT LOOP SHALL BE LIMITED TO A MAXIMUM OF 1A AC RMS STEADY-STATE @ 24VAC. LIGHT LOAD RELAY IS RECOMMENDED AND THE COIL VOLTAGE OF RELAY IS 24VAC. POWER SUPPLY SHALL BE PROVIDED BY CUSTOMER FUSED TRANSFORMER.
3. EACH DISCRETE INPUT LOOP IS POWERED BY INTERNAL 24VAC POWER SUPPLY. FIELD OPTIONAL CONTACTS OR SWITCH MUST HAVE 24VAC RATING, MAX CURRENT IS 60MA. NOMINAL CURRENT IS 10MA. SWITCHES WITH GOLD PLATED BIFURCATED CONTACTS ARE RECOMMENDED.
4. THE ANALOG INPUTS SUPPORT 5K/10K NTC THERMISTORS, 0/4-20MA SENSORS AND 5VDC SENSORS. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
5. EACH ANALOG OUTPUT LOOP SUPPORTS 0/4-20MA OR 0/2-10VDC VOLTAGE OUTPUT. THE ANALOG OUTPUT LOOP IS POWERED BY IOB BOARD. DO NOT SUPPLY EXTERNAL POWER. FOR DETAILS REFER TO THE CONTROLS, OPERATIONS, AND TROUBLE SHOOTING MANUAL AND MATCH WITH SOFTWARE.
6. DRY TYPE CONTACT, RATED SWITCHING LOAD 230VAC/5A OR 24VDC/5A .

|  |                     |           |      |
|--|---------------------|-----------|------|
|  | 23XR_PIC6_SCHEMATIC |           | REV. |
|  | 2000767952          | SH.1 OF 7 | D    |

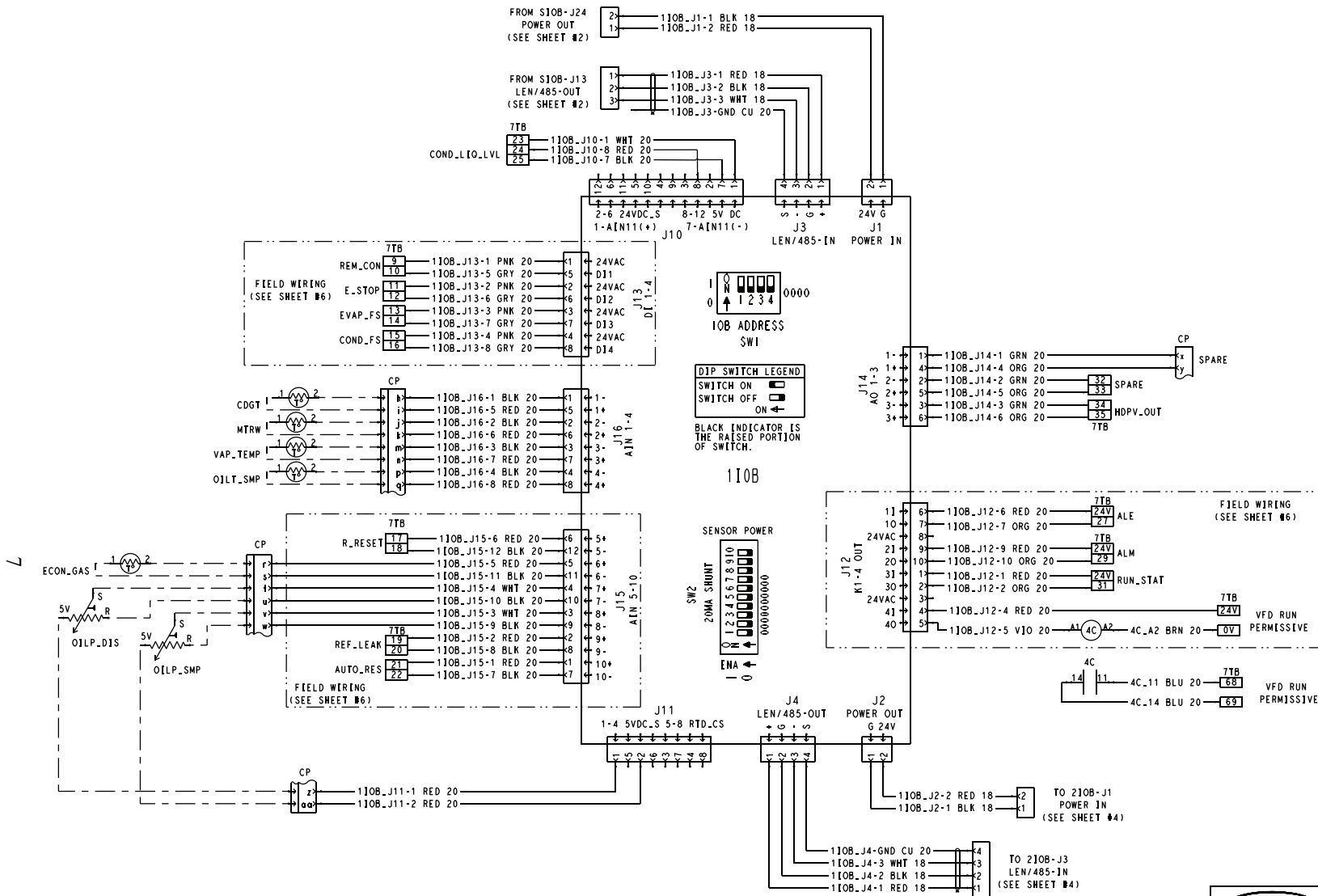
Fig. 3 — Control Panel Abbreviations

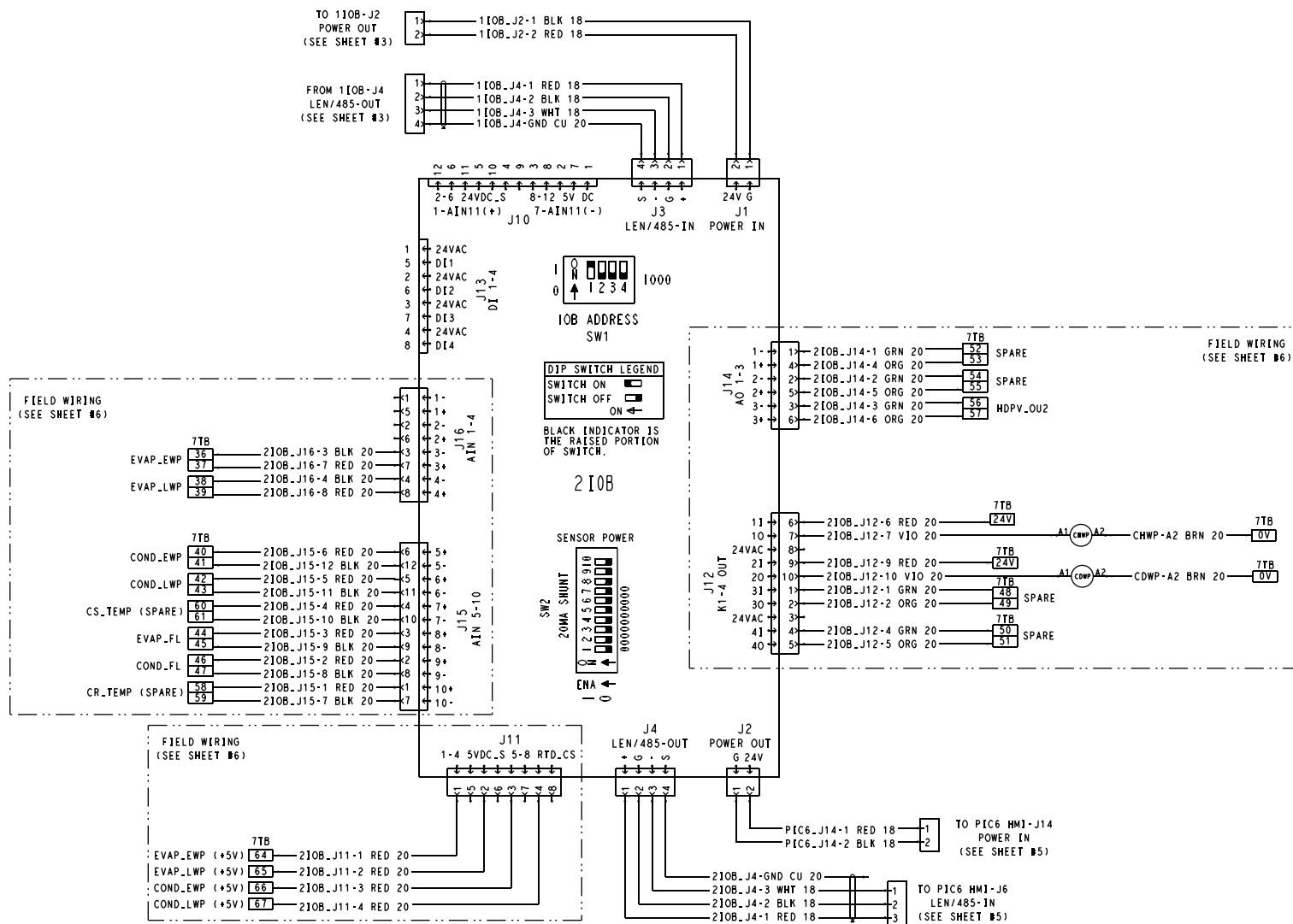


| SYMBOL LEGEND |                       |
|---------------|-----------------------|
|               | TERMINAL BLOCK        |
|               | PRESSURE TRANSDUCER   |
|               | THERMISTOR            |
|               | COIL                  |
|               | NO CONTACT            |
|               | PRESSURE SWITCH       |
|               | PANEL SUPPLIER WIRING |
|               | FACTORY WIRING        |
|               | CIRCUIT BREAKER       |
|               | GROUND                |
|               | CABLE                 |
|               | FEMALE CONNECTOR      |
|               | MALE CONNECTOR        |
|               | FIELD WIRING          |
|               | NC CONTACT            |

**NOTE:** Carrier recommends using a relay with a contact rating of 10 amp sealed RMS or greater with 24VAC coil.

**Fig. 4 — SIOB**





| SYMBOL LEGEND |                       |
|---------------|-----------------------|
|               | TERMINAL BLOCK        |
|               | PRESSURE TRANSDUCER   |
|               | THERMISTOR            |
|               | COIL                  |
|               | NO CONTACT            |
|               | PRESSURE SWITCH       |
|               | PANEL SUPPLIER WIRING |
|               | FACTORY WIRING        |
|               | CIRCUIT BREAKER       |
|               | GROUND                |
|               | CABLE                 |
|               | FEMALE CONNECTOR      |
|               | MALE CONNECTOR        |
|               | FIELD WIRING          |
|               | NC CONTACT            |

**Fig. 6 — 2IOB**

| SYMBOL LEGEND                                                                         |                       |
|---------------------------------------------------------------------------------------|-----------------------|
|    | TERMINAL BLOCK        |
|    | PRESSURE TRANSDUCER   |
|    | THERMISTOR            |
|    | COIL                  |
|    | NO CONTACT            |
|   | PRESSURE SWITCH       |
|  | PANEL SUPPLIER WIRING |
|  | FACTORY WIRING        |
|  | CIRCUIT BREAKER       |
|  | GROUND                |
|  | CABLE                 |
|  | FEMALE CONNECTOR      |
|  | MALE CONNECTOR        |
|  | FIELD WIRING          |
|  | NC CONTACT            |

### Fig. 7 — Control Wiring

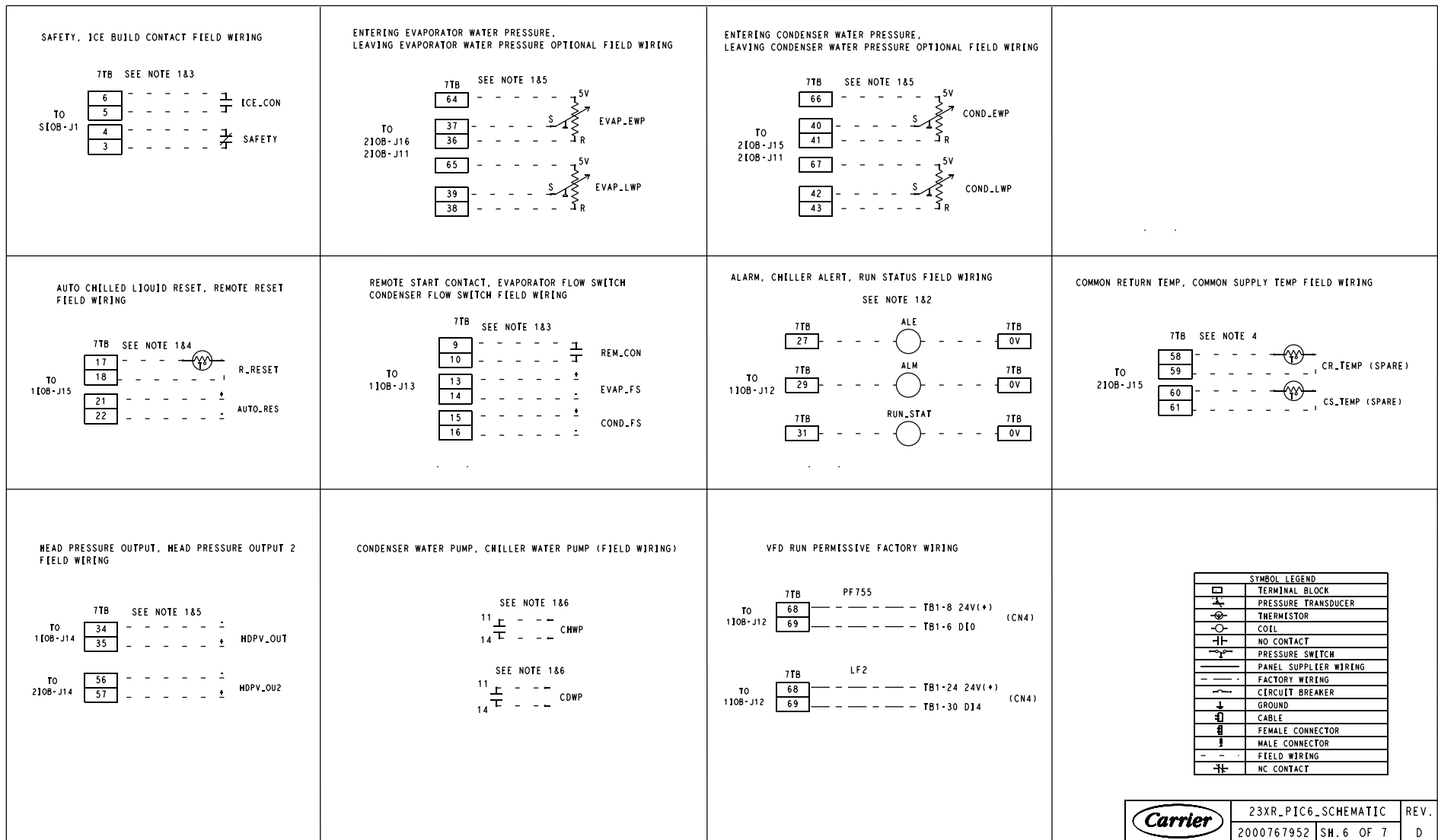
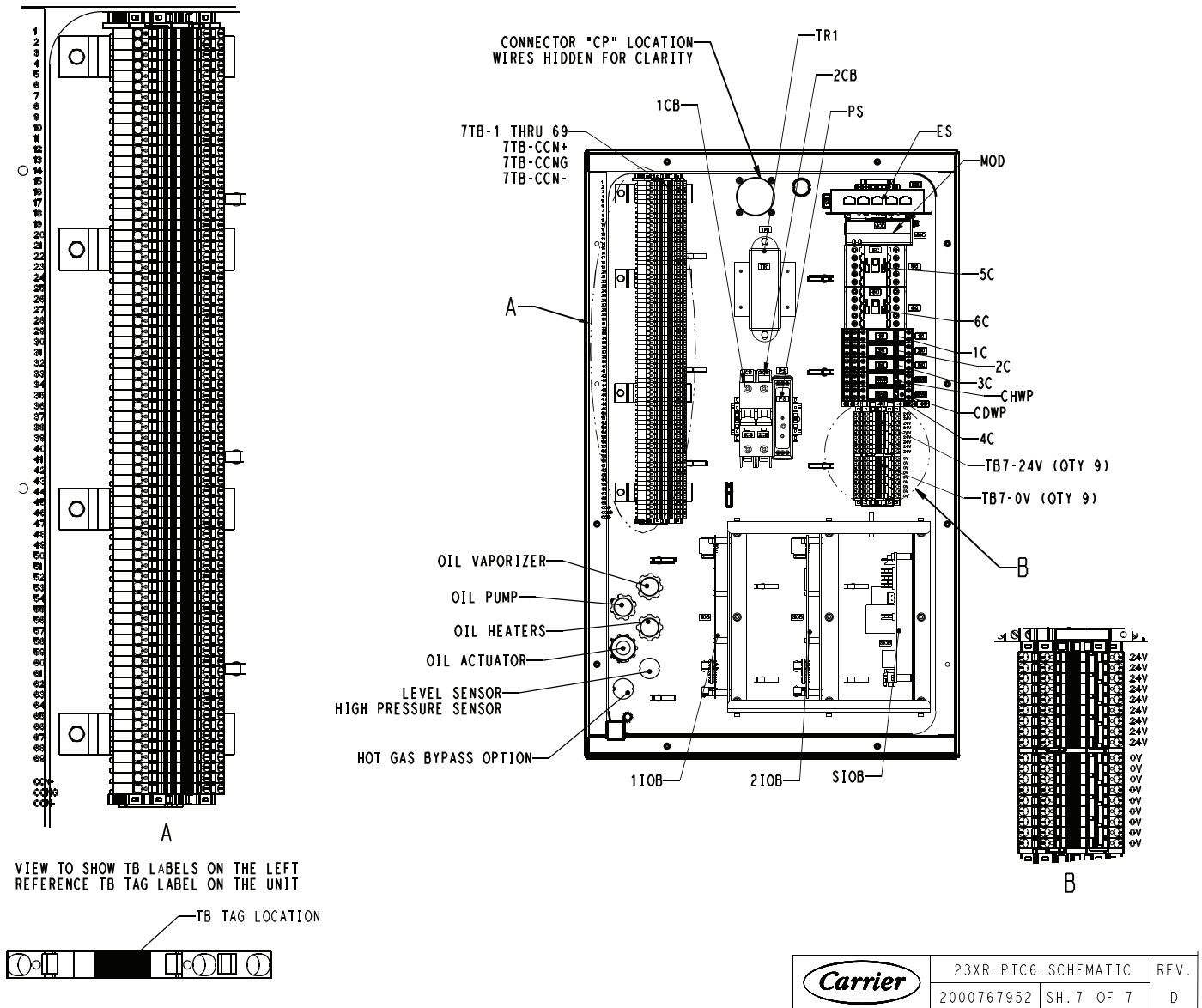


Fig. 8 — 23XRV Controls Schematic



**Fig. 9 — PIC6 Control Component Layout**

## Communication Cables

The communication transmission cables have the following electrical characteristics:

- 2 signal conductors and one ground conductor of 20 AWG or larger, 100% shielded
- One tinned copper braid (65% coverage)

Recommended cables are shown below:

| USAGE                | CABLE        |
|----------------------|--------------|
| Intra-Building       | Belden 8772  |
| High Temperature     | Belden 85240 |
| Plenum               | Belden 89418 |
| Modbus Communication | Belden 3106A |

To avoid potential interference, route communication cables as far away as possible from high voltage cable and other likely disturbances. Always separate communication cables from other cables and always run wiring as directly as possible.

## Sensors

### PRESSURE TRANSDUCERS

Pressure transducers measure and control the pressures in the unit. These electronic sensors deliver 0 to 5 VDC. The pressure transducers are connected to the IOBs/SIOB. See Table 4.

**Table 4 — Pressure Transducers**

| PRESSURE TRANSDUCER                  | PURPOSE                                                                                    |
|--------------------------------------|--------------------------------------------------------------------------------------------|
| Pump Supply Pressure                 | Measures pressure at oil pump discharge.                                                   |
| Pump Sump Pressure                   | Measures oil sump pressure.                                                                |
| Evaporator                           | Measures evaporator pressure.                                                              |
| Condenser                            | Measures condenser pressure.                                                               |
| Economizer                           | Measures economizer pressure.<br>(For unit with TP compressor and economizer option only.) |
| Evaporator Water Pressure Difference | Measures pressure difference between entering and leaving water (optional).                |
| Condenser Water Pressure Difference  | Measures pressure difference between entering and leaving water (optional).                |
| Evaporator Entering Water            | Measures pressure of evaporator entering water (Optional).                                 |
| Evaporator Leaving Water             | Measures pressure of evaporator leaving water (Optional).                                  |
| Condenser Entering Water             | Measures pressure of condenser entering water (Optional).                                  |
| Condenser Leaving Water              | Measures pressure of condenser leaving water (Optional).                                   |

## TEMPERATURE SENSORS

The system uses electronic sensors to measure and control the temperatures in the unit. The temperature sensors are 5K Ohm thermistors. The temperature sensor range is  $-40^{\circ}\text{F}$  ( $-40^{\circ}\text{C}$ ) to  $245^{\circ}\text{F}$  ( $118^{\circ}\text{C}$ ). See Table 5. Pressure transducers and thermistors can be calibrated in the Quick Test Menu. Pressure transducers can be adjusted up to 5 psi (34.5 kPa) and thermistors can be adjusted up to  $\pm 5^{\circ}\text{F}$  ( $2.8^{\circ}\text{C}$ ).

**Table 5 — Temperature Sensors**

| TEMPERATURE SENSOR                           | PURPOSE                                                                                                          |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Entering Chilled Water                       | Measures entering evaporator water temperature.                                                                  |
| Leaving Chilled Water                        | Measures leaving evaporator water temperature.                                                                   |
| Entering Condenser Water                     | Measures entering condenser water temperature.                                                                   |
| Leaving Condenser Water                      | Measures leaving condenser water temperature.                                                                    |
| Evaporator Refrigerant Liquid                | Measures evaporator refrigerant liquid temperature.                                                              |
| Compressor Discharge                         | Measures compressor discharge temperature.                                                                       |
| Oil Sump                                     | Measures oil sump temperature.                                                                                   |
| Vaporizer Temperature                        | Measures temperature of oil leaving vaporizer.                                                                   |
| Chilled Water Supply (Optional) <sup>a</sup> | Measures temperature of chilled water supply.                                                                    |
| Chilled Water Return (Optional) <sup>a</sup> | Measures temperature of chilled water return.                                                                    |
| Motor Winding                                | Measures temperature of each phase of compressor motor.                                                          |
| Economizer Gas                               | Measures gas temperature from economizer to compressor (For unit with TP compressor and economizer option only). |

NOTE(S):

- Separate inputs used when the chiller is in network mode.

## Controls Outputs

### EVAPORATOR/CONDENSER WATER PUMP

The controller regulates the evaporator/condenser water pump. Note that Carrier requires full or parallel pump control since Carrier controls utilize the pumps for freeze protection and high pressure control.

### ENVELOPE/HGBP CONTROL VALVE

The on/off HGBP valve artificially loads the chiller and keeps it running under low load conditions.

### VFD

The VFD modifies motor frequency to allow compressor start-up and capacity control. The VFD controls continually monitor parameters to ensure compressor protection. If a problem occurs, the controller triggers an alarm and the compressor is stopped.

## USER INTERFACE

The PIC6 Human Machine Interface (HMI) is a color 10.4 in. TFT touch screen. Navigation is either direct from the touch screen interface or by connecting to a web interface at the Ethernet IP port of the controller. The navigation menus are the same for both connection methods.

### Web Connection

Two web connections may be authorized at the same time. When two users are connected simultaneously, there is no priority between users; that is, the last modification is in effect regardless of the user. Connection is from a personal computer using a Java-enabled web browser. See “CONTROLLER SETTINGS” on page 36 for configuration instructions.

The minimum browser configuration includes:

- Microsoft Internet Explorer (version 8 or higher) or Mozilla Firefox (version 3.5.2 or higher). In the advanced connection options, add the unit address to the address list. Do not use a proxy server.
- Java platform (version 6 or higher). In the control panel, deselect (uncheck) the option that allows storing temporary internet files and use a direct connection.

To access the PIC6 user interface, enter the IP address of the unit in the address bar of the web browser. The IP address can be viewed or changed from the PIC6 interface. For more information on the web browser and Java platform configuration, see “DIAGNOSTICS AND TROUBLESHOOTING” on page 27.

### General Interface Features

#### ICONS

Table 6 shows general interface icons.

**Table 6 — Interface Icons**

| ICON                                                                               | MEANING                                                                      |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
|   | Green: Indicates unit is running<br>Gray: Indicates unit is off              |
|   | Home                                                                         |
|   | Main menu                                                                    |
|   | Indicates user is logged off                                                 |
|   | Indicates user is logged in                                                  |
|   | Gray: Indicates no alarm or alert is active<br>Red: Indicates alarm or alert |
|   | Back                                                                         |
|  | Previous and next screen                                                     |

#### SCREENS

The Human Machine Interface includes the following screens:

- Home screen, which displays the main parameters
- Menu screens for navigation
- Data/configuration screens, which list the parameters by type
- Operating mode selection screen
- Password entry and language selection screen
- Parameter modification screen
- Time schedule screen

If the interface is not actively used, it goes into screen-saver mode and displays a black screen. However, the control is always active and the unit operating mode remains unchanged. When the user presses the black screen, the Home screen is displayed.

#### *System Overview (Home) Screen*

Figure 10 shows the system overview screen. Press a component image to see current status. For details, see Status Display Screens on page 17.

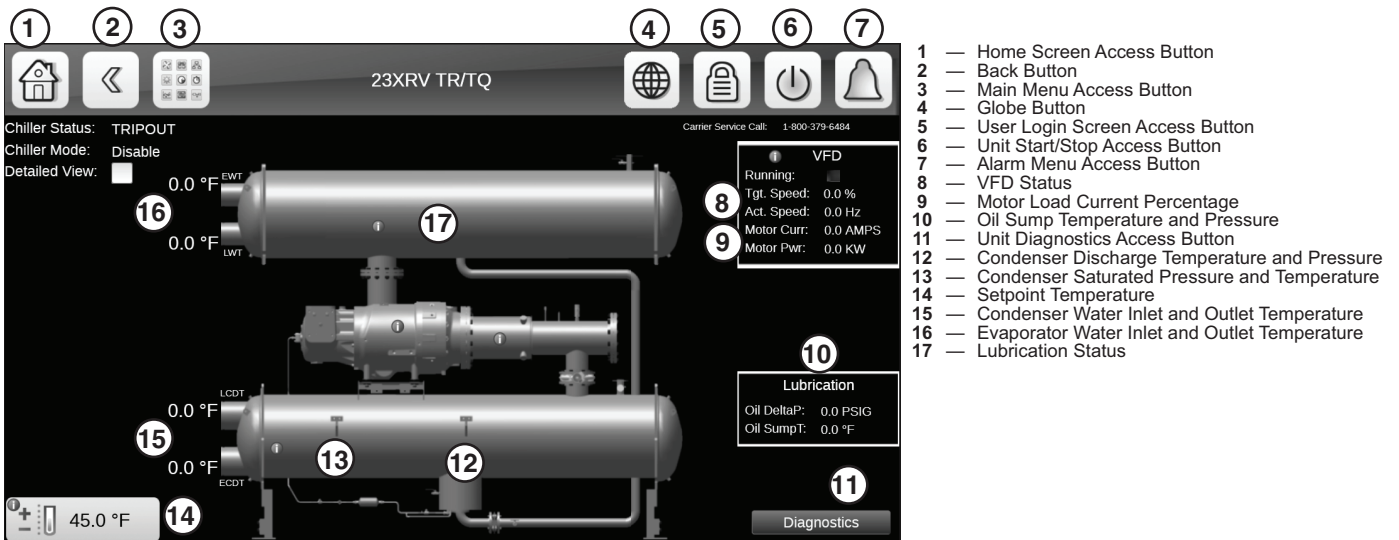
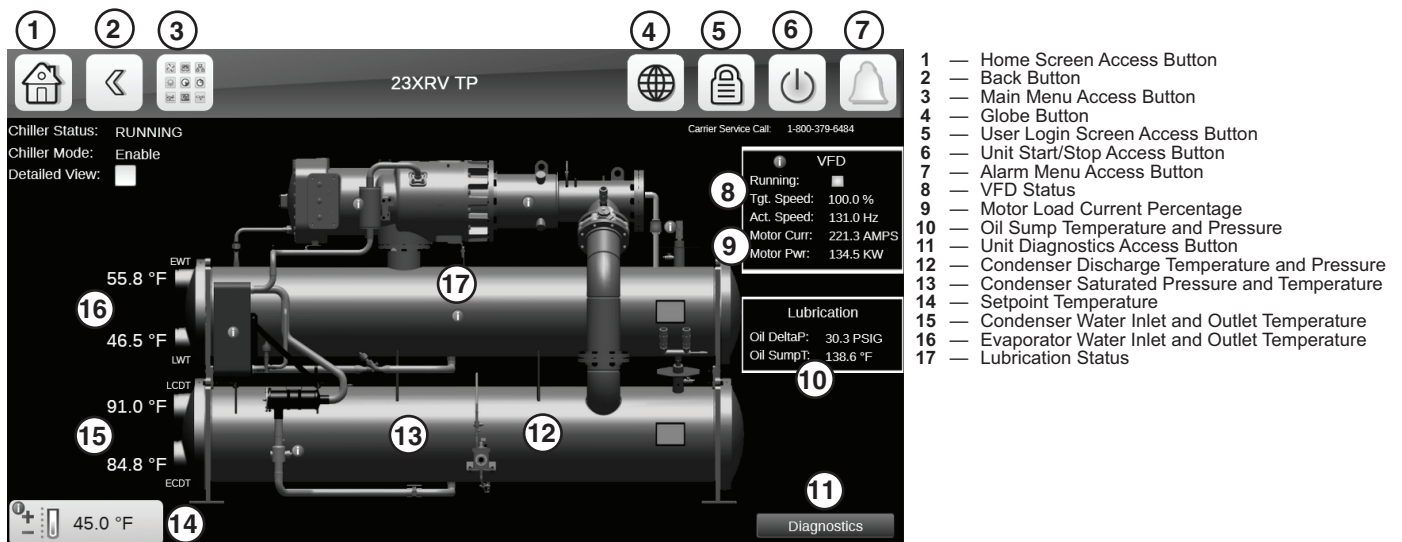


Fig. 10 — System Overview (Home) Screen

## Messages

The Set Point screen, On/Off screen, User Login screen, and Main Menu screens described in the next sections may display status messages at the bottom of the screen. See Table 7.

**Table 7 — Status Messages**

| MESSAGE                 | STATUS                                                                                                                                  |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| COMMUNICATION FAILURE!  | Equipment controller did not respond while reading the table content.                                                                   |
| ACCESS DENIED!          | Equipment controller does not allow access to one of the table data blocks.                                                             |
| LIMIT EXCEEDED!         | The value entered exceeds the table limits.                                                                                             |
| Save changes?           | Modifications have been made. The interface waits to confirm exit; press Save or Cancel.                                                |
| HIGHER FORCE IN EFFECT! | Equipment controller rejected a Force or Auto command because the interface force level is lower than that of the equipment controller. |

## Set Point Screen

The Set Point screen displays the current set point table. See Fig. 11. For more information about these settings, see the Set Point section on page 20.

**Fig. 11 — Set Points Menu**

## Unit Start/Stop Screen

The Unit Start/Stop screen allows the user to select the unit operating mode.

For unit start-up, with the unit in Local Off mode, press the gray Off icon to display the list of operating modes. Select the required mode to start up the chiller. See Fig. 12.

**Fig. 12 — Unit Start/Stop Screen  
(Service/factory Log-in Screen Shown)**

NOTE: If Local start is not desired then Auto Start needs to be configured for user to start as per user configurations. User login or higher is required to access the "Configure Startup Options" Menu. If Network start by CCN, BACnet or Modbus or if remote contacts are to be used for startup they will need to be enabled in the startup menu. To stop chiller each enabled start option must send a stop command.

When a start-up is initiated, a status screen displays the progress of the start-up sequence. See Fig. 13 and 14.

**Fig. 13 — Configure Start-up Options**

**Fig. 14 — Start-Up Sequence Progress**

To stop the unit when running in Local mode, press the green On icon . Then press Disable/Stop Unit to stop the unit. See Fig. 15.

**Fig. 15 — Stop Unit**

## User Login Screen

Use this screen to login or log off and to set interface language and measurement system. There are three levels of password access:

- Basic access allows the user to view all data without a password.
- User access gives the user the additional ability to view and change many configuration settings, including set points and schedules. The default User password is 1111.
- Service access gives access to more tables which are required for typical service setup. In current software, service access is accessible via password 3333 or 1234.
- Factory access (located under Service Login icon) allows access to critical factory configuration settings and only authorized users will have access to these menus using Carrier Smart Service.

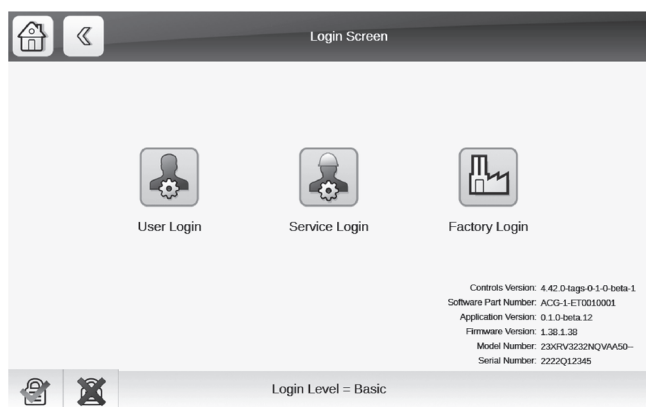
From the Home screen, touching the Globe icon displays the Language and Units Selection screen. See Fig. 16.



NOTE: The active language is bracketed by arrows.

**Fig. 16 — User Login Screen — Language and Units Selection**

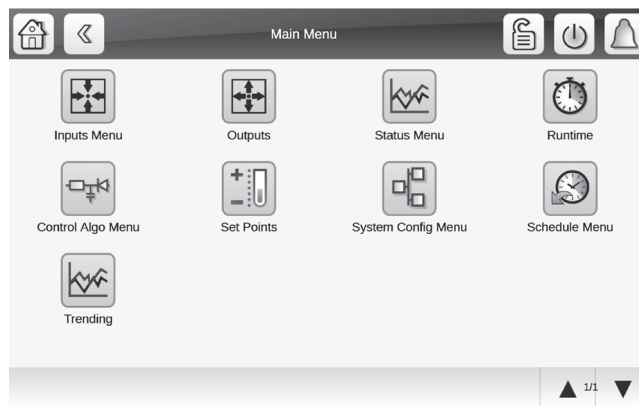
The Lock icon on the Home screen allows access to the password menu and displays current software version. See Fig. 17.



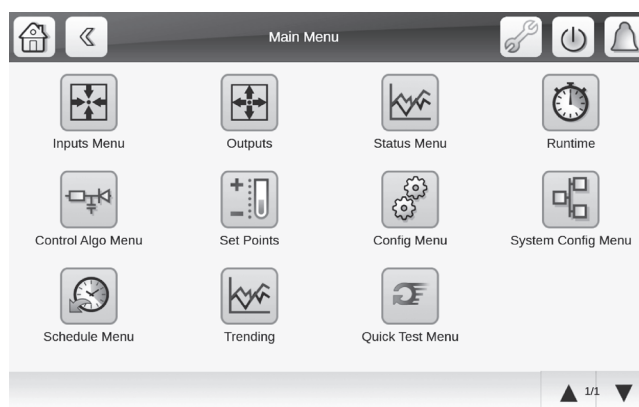
**Fig. 17 — User Login, Login Level = Basic**

## Main Menu Screen

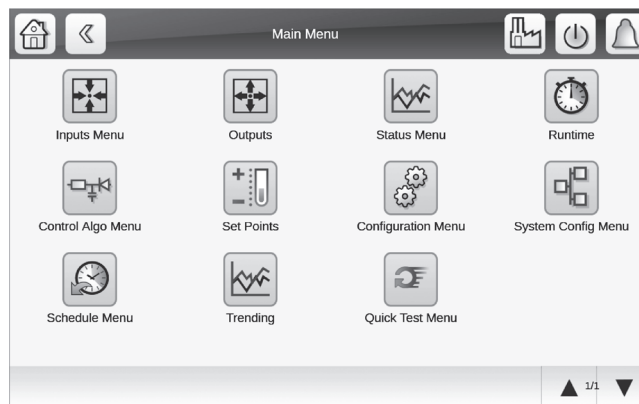
To access the Main Menu screen, press the Main Menu icon. Press the icons on the screen to access the appropriate table or menu. Press the arrows at the bottom right corner, if present, to navigate through pages of tables. The options shown on the Main Menu screen depend on the user's level of access (see the section User Login Screen on page 16). Figure 18 shows the Main Menu screen as it appears for the User level of access, Fig. 19 shows the Main Menu screen for Service level access, and Fig. 20 shows the Main Menu screen for Factory level access.



**Fig. 18 — Main Menu Screen, User Level**



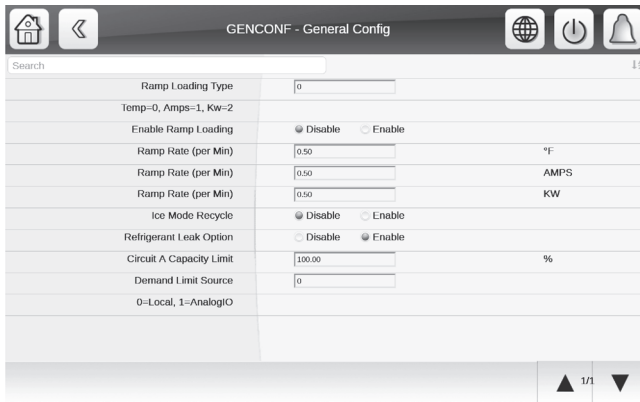
**Fig. 19 — Main Menu Screen, Service Level**



**Fig. 20 — Main Menu Screen, Factory Level**

## Configuration Menu

To access the Configuration menu, press the Configuration icon on the Main Menu (Service or Factory access level). The Configuration menu opens. Then press the General Configuration icon on the Configuration menu. See Fig. 21. (Certain configuration settings are available only for Service or Factory access levels.) Refer to Appendix A, page 41, for more information about Configuration options.



**Fig. 21 — General Configuration Screen**

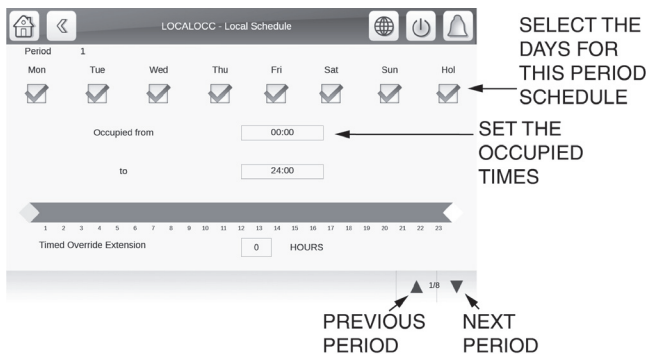
After changing a value, press Return. The Save and Cancel icons are displayed. Press the Save icon to save the changed value.

In the General Configuration menu the ramp loading per time can be limited based on °F, amps, or kW.

In addition the optional 4-20 mA Refrigerant Leak detection by external controller can be enabled here. Alarm limits are configured in the Limits Configuration menu.

### Schedule Menu Screen

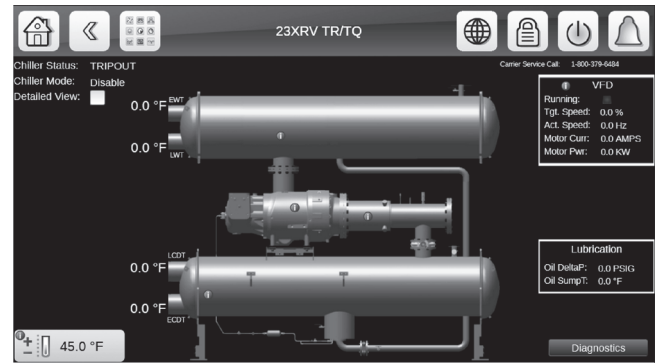
To access the Schedule Menu screen, press Config1 on the Main Menu screen. Select Local Schedule or Schedule as applicable. For Local Schedule control, select the desired time period for the chiller to run in the LOCALOCC - Local Schedule menu shown in Fig. 22. Go to Configure Startup Options (see Fig. 12) and ensure that Enable Schedule Start is checked (see Fig. 13). For Local Schedule Control press AutoStart to activate (do not press Local On as chiller will always initiate startup when Local On is pressed). Upon pressing AutoStart the chiller will now run as per the configured occupancy schedule. Press the arrows at the bottom right corner to navigate through the time periods. See Fig. 22. There is no occupancy schedule for Network.



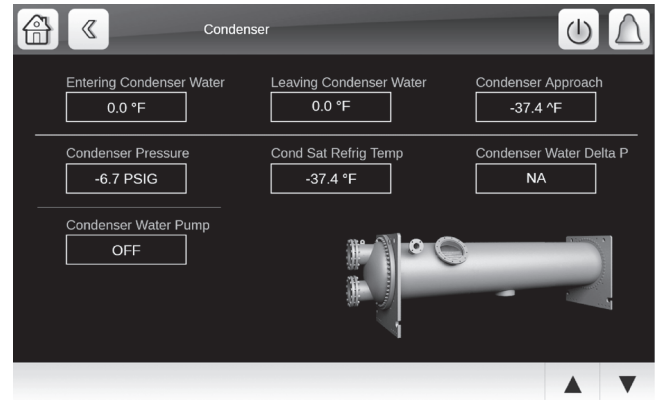
**Fig. 22 — Local Schedule Menu Screen**

### Status Display Screens

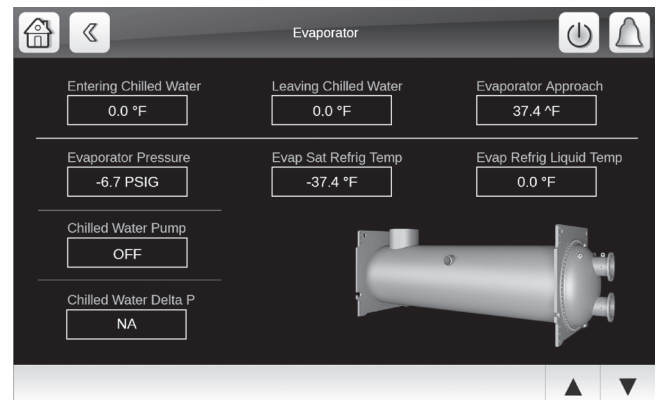
Figure 23 shows the system status overview (home) screen. Press any component on the screen to see the status of that component. Press the arrows at the bottom right corner to navigate through the component status displays. Figures 24-31 show the component status displays.



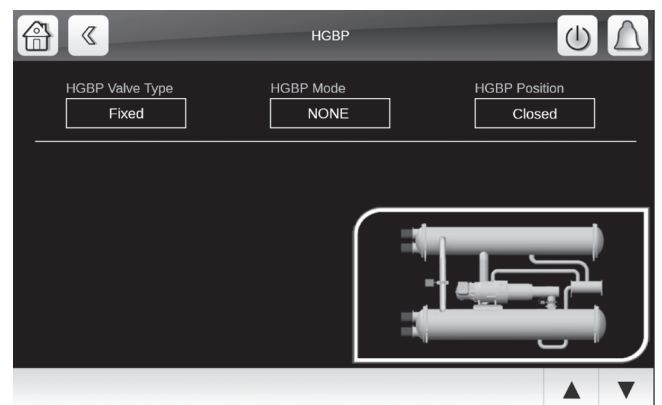
**Fig. 23 — System Overview (Home) Screen**



**Fig. 24 — Condenser Status**



**Fig. 25 — Evaporator Status**



**Fig. 26 — HGBP Status**

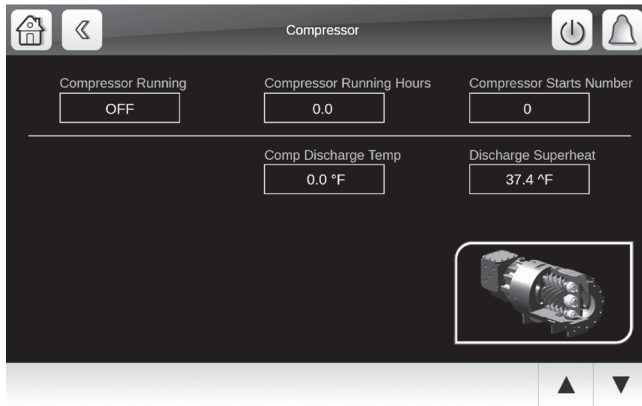


Fig. 27 — Compressor Status

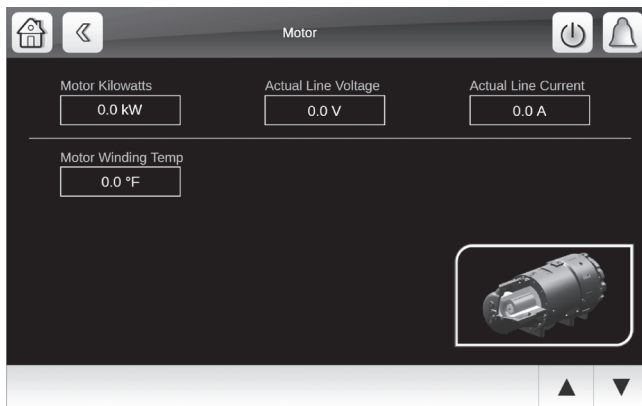


Fig. 28 — Motor Status

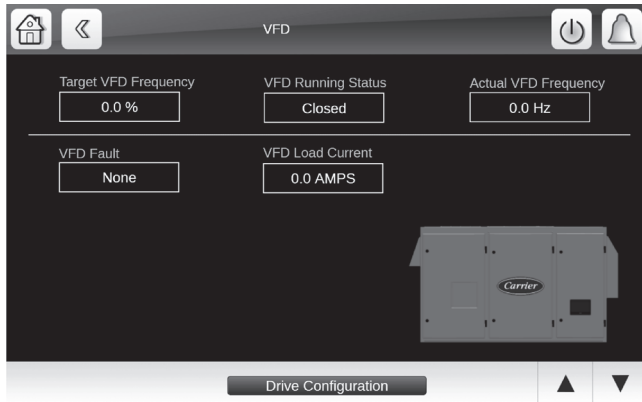


Fig. 29 — VFD Status

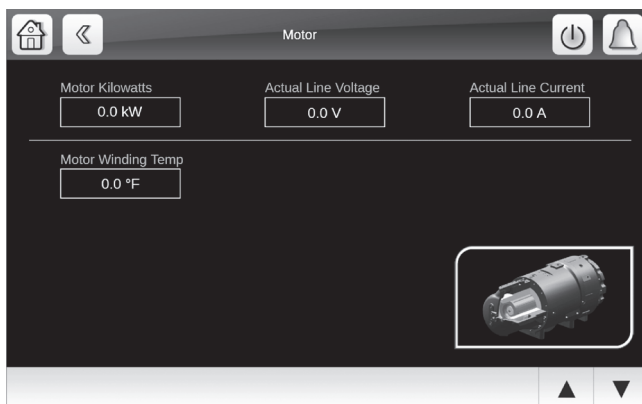


Fig. 30 — Economizer Status

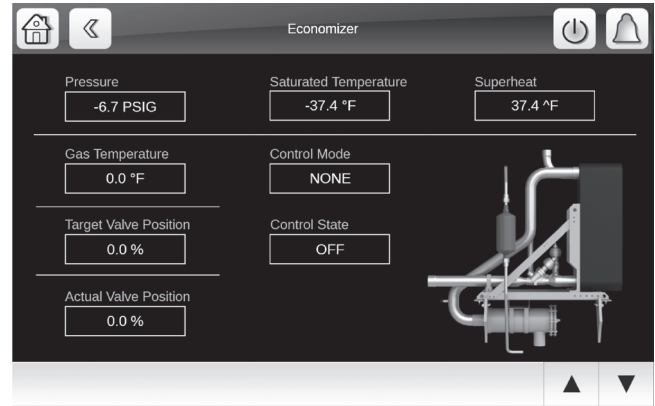


Fig. 31 — Economizer Status (TP Only)

## CONTROL OPERATION

### Start-Stop Control

This function controls the chiller START-STOP command. The selectable control modes are Local or AutoStart. See Unit Start/Stop Screen (Basic log-in). Specific control sources are valid to start or stop the chiller for each control mode. See Fig. 32.

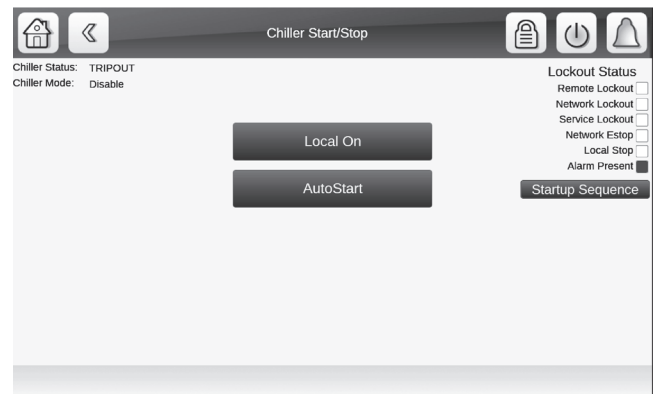


Fig. 32 — Chiller Stop/Start Screen

### LOCAL

When the control mode is LOCAL, the chiller can be started by the "Local ON" button on the PIC6 interface screen, and can be shut down by the Disable / Stop Unit button under the Chiller Start / Stop Menu. Unit can be shut down with the red stop sign icon on the local Start / Stop Menu during emergency stop conditions. Stopping the unit with the red stop icon (EMSTOP) will result in an Emergency Stop alarm and will hard stop the unit.

### AUTOSTART

For autostart the feature must first be configured under "Configure Startup Options"; see Fig. 13.

### REMOTE CONTACTS

When start is desired from closing of a set of contacts, the "Enable Remote Contacts Start" must be checked in the Configure Startup Options. This will allow startup with a dry contact input to REM\_CON (7TB-9,10) in the control panel. The chiller can be shut down by the remote discrete input, the Stop button on the PIC6 interface screen, or the EMSTOP software point.

## NETWORK

When the control mode is NETWORK, the chiller can be started and stopped by the CHIL\_S\_S and CHIL\_OCC software points, which are written by other equipment through network commands and Dual Stpt schedule (both must be TRUE for chiller to start). For quick shutdown of the chiller, use the EMSTOP software point or stop using the HMI. Network Start can be configured for either Modbus, BACnet, or CCN, and must be enabled on the Configure Startup Options screen.

## Compressor Run Status

Compressor run status is shown at the top of the system overview (home) screen. Table 8 lists chiller status names, values, and descriptions.

**Table 8 — Compressor Run Status**

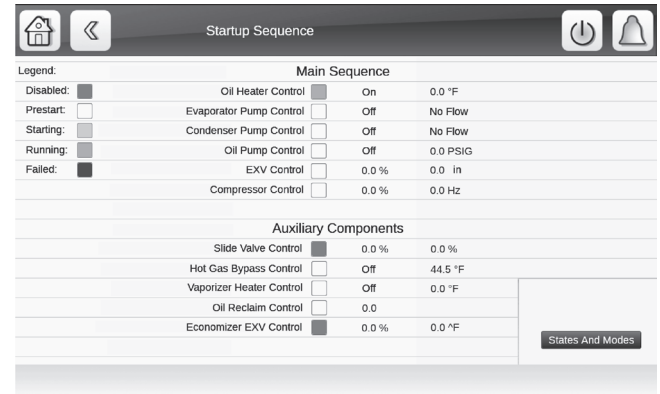
| UNIT STATUS  | VALUE | DESCRIPTION                                                                                                                     |
|--------------|-------|---------------------------------------------------------------------------------------------------------------------------------|
| OFF          | 0     | The unit is OFF.                                                                                                                |
| DELAY        | 1     | The unit is ON but a time delay is counting down.                                                                               |
| READY        | 2     | The unit is ready to run and waiting for a startup command.                                                                     |
| RECYCLE      | 3     | The unit is ON but not running because it has satisfied the setpoint.                                                           |
| PRESTART     | 4     | The unit is about to start. It is performing prestart checks.                                                                   |
| STARTUP      | 5     | The unit is starting.                                                                                                           |
| AUTORESTART  | 6     | Auto restart is enabled and the unit has just powered up and will be restarting.                                                |
| RUNNING      | 7     | The unit is running normally.                                                                                                   |
| DEMAND       | 8     | The unit is running normally but the capacity is being limited by the demand limit setpoint.                                    |
| RAMPING      | 9     | The unit is running normally but the capacity is being limited by the ramp loading ramp rate.                                   |
| STOPPING     | 10    | The unit is stopping.                                                                                                           |
| TRIPOUT      | 11    | The unit has been stopped due to an alarm.                                                                                      |
| SERVICE TEST | 12    | The unit is in service test mode.                                                                                               |
| PUMPDOWN     | 13    | The pumpdown mode has been initiated, and pumpdown process has started.                                                         |
| LOCKOUT      | 14    | The pumpdown process has completed and switched to LOCKOUT, or the unit has been manually set to LOCKOUT from the service menu. |
| RESET        | 15    | The reset button has been pressed and the unit is resetting alarms.                                                             |
| LAB TEST     | 16    | The unit is in lab test mode.                                                                                                   |

## Chiller Start-Up Sequence

### PRE-START CHECK

Once start-up begins, the controller performs a series of pre-start tests to verify that all pre-start alerts and safeties are within limits. Progress is shown on the Startup Sequence screen (see Fig. 33). This screen can be accessed by touching the mode title (top blue bar) of the home screen. Table 9 lists pre-start alert and alarm conditions.

The compressor RUN STATUS parameter on the default screen line now reads PRESTART. If a test is not successful, the start-up is delayed or aborted. If all tests are successful, the chilled water pump relay energizes, and the main screen line now reads STARTUP.



**Fig. 33 — Start-Up Sequence Screen**

**Table 9 — Pre-Start Alerts and Alarms**

| PRE-START ALERT CONDITION                                                                                                                  | STATE NO. | ALARM OR ALERT |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------|
| Condenser Flow not detected during flow verification time                                                                                  | 401       | Alert          |
| Evaporator Flow not detected during flow verification time                                                                                 | 402       | Alert          |
| Number of recycle restarts in the last 4 hours is greater than 5                                                                           | 403       | Alert          |
| Invalid Control Program                                                                                                                    | 404       | Alert          |
| (TP only) Economizer EXV prestart check failure                                                                                            | 405       | Alert          |
| (TP only) EXV prestart check failure                                                                                                       | 407       | Alert          |
| Condenser pressure greater than config limit (default 130 psig)                                                                            | 409       | Alert          |
| Discharge temperature greater than config limit (default 200°F)                                                                            | 411       | Alert          |
| Line Voltage greater than its high limit                                                                                                   | 413       | Alert          |
| Any motor winding temp during prestart >= 190°F (87.8°C)                                                                                   | 415       | Alert          |
| Invalid Compressor Envelope                                                                                                                | 417       | Alert          |
| Line Voltage is below its low limit                                                                                                        | 419       | Alert          |
| Oil sump temp is below 140°F (77.8°C) AND Oil sump temp < Evap Sat Temp + 15°F (8.3°C)                                                     | 421       | Alert          |
| Evaporator liquid temp is below Freeze Setpoint or if applicable Brine Freeze Setpoint (Configuration, Service Configuration=34°F default) | 423       | Alert          |
| Evaporator saturated temp is below Brine Freeze Setpoint (Configuration, Service Configuration=34°F default)                               | 425       | Alert          |
| Oil Delta P greater than 6 psig prior to startup                                                                                           | 429       | Alert          |
| Low Oil Pressure at Startup. Occurs if oil pressure < 18 psig (124.1 kPa) and oil pump on for Oil Pressure Verification Time (default 60s) | 401       | Alarm          |
| Starts in 12 hours exceed Starts Per Period value configured in Service Configuration (default 6)                                          | 431       | Alert          |
| Inverter temp high limit exceeded                                                                                                          | 433       | Alert          |
| Rectifier temp high limit exceeded                                                                                                         | 435       | Alert          |

## START-UP

After a successful pre-start check, the chilled water pump relay is energized. Condenser pump relay is turned on 5 seconds after the evaporator pump relay.

Five seconds later, the control monitors the chilled water and condenser water flow devices to confirm water flow.

After water flow is verified, the water temperature is compared to Setpoint +Recycle Shutdown Offset. If the temperature is less than or equal to this value, the control turns off the condenser pump relay and goes into RECYCLE mode.

If the RECYCLE condition is not satisfied, the start-up sequence continues. Oil pump and, if applicable, main EXV initiate start sequence and a start signal will be given to the oil pump relay.

The oil pump and a oil pressure of 18 psid followed by 20s of pre-lube will have to be achieved for the compressor to start

The Ramp loading feature in General Configuration controls the rate at which the compressor loads up. Ramp loading can be controlled either by temperature, amp, or kilowatts and the desired ramp rate per minute for either can be configured. This can prevent the compressor to load up too fast while the chilled liquid loop is brought down to the set point.

## Chiller Shutdown Sequence

Chiller shutdown begins if any of the following occurs:

- Local Stop Unit button is pressed.
- A RECYCLE condition is present. (See “RECYCLE CONTROL” on page 20.)
- The time schedule has gone into unoccupied mode as defined in the Schedule Menu for either Local or Dual Stpt Schedule (for AutoStart).
- The chiller protective limit has been reached and chiller is in alarm.
- The start/stop status (CHIL\_S S) is overridden to stop from the network when in AutoStart mode.
- If a loss of communication between the PIC6 and the VFD occurs the run permissive relay will energize to start a shutdown sequence.

NOTE: If any safety stop command is active the chiller will perform a hard shutdown and trip the Safety Stop alarm. Safety stop can be triggered from the local Home Screen E-stop icon (red Stop Button) or Network E-Stop point. The unit will not restart until the Safety Stop command and alarm are cleared.

When a stop signal occurs, the controls set Target VFD Speed to 0. This will cause the compressor to reduce speed to the point where line amps equal the configured Soft Stop Threshold (Configuration, Service Configuration = default 50%). At that point, or one minute after the stop signal occurs (whichever is earlier), the VFD is set to Stop. When the VFD is set to Stop, the compressor is turned off.

When the compressor shut down is verified, the oil pump is turned off and VFD STOP is complete. The pumps are deactivated at least 30 seconds after the compressor is Off (for recycle shut down the evaporator pump will remain on).

If the shutdown is due to low evaporator refrigerant temperature, the chilled liquid pump continues to run until the leaving chilled liquid temperature is high enough in an effort to prevent freeze-up.

When a non-recycle, non-alarm shutdown is called for, the soft stop feature unloads the compressor by reducing speed to the point where load amps equal the Soft Stop Threshold at which point the compressor is turned off. If the chiller enters an alarm state or if the compressor enters a RECYCLE mode, the compressor deenergizes immediately.

## COMPRESSOR STOPPING

If a hard stop is requested, such as any E-stop command, the system will remove the compressor request immediately and turn off

all running compressors. Otherwise, the system will ramp compressor down.

## OIL PUMP AND EXV (AS APPLICABLE) STOPPING

Once compressor is stopped, circuit performs oil and EXV stopping. The following actions will be executed:

- Initialize Oil Pump stop sequence
- Initialize Oil Heater, Oil Vaporizer Heater, and Oil Reclaim Valve stop sequence
- Initialize EXV stop sequence

## CONDENSER PUMP STOPPING

Once all the above have stopped, the circuit executes. Once condenser pump is stopped at least 30 seconds after the circuit, stopping is done.

## EVAPORATOR PUMP STOPPING

The evaporator pump must then remain active anytime compressor operation is possible, or there is an active Evaporator freeze Alarm/Alert.

When chiller is shutting down, the Evaporator Pump is deactivated at least 30 seconds after the Compressor is off.

## Control Points

### SET POINT

The set point can be configured at the Setpoint menu, user access level). The set point is determined by Cooling LCW Setpoint, but can be configured for entering water temperature control by enabling the EWT Control Option in which it is controlled by the Cooling ECW Setpoint value. See Fig. 34. The 23XRV chiller is not suited for Ice Build.

| SETPOINT - Set Points   |                                                                       |    |
|-------------------------|-----------------------------------------------------------------------|----|
| Cooling LCW Setpoint    | 45.0                                                                  | *F |
| Ice Build Setpoint      | 40.0                                                                  | *F |
| EWT Control Option      | <input checked="" type="radio"/> Disable <input type="radio"/> Enable |    |
| Cooling ECW Setpoint    | 60.0                                                                  | *F |
| Base Demand Limit       | 100.0                                                                 | %  |
| Recycle Shutdown Offset | 5.0                                                                   | *F |
| Recycle Startup Offset  | 5.0                                                                   | *F |

Fig. 34 — Setpoint Menu, User Access Level

## RECYCLE CONTROL

The chiller may cycle off and wait until the load increases to restart when the compressor is running in a lightly loaded condition. This normal cycling is known as “recycle.”

In cooling mode, a recycle shutdown is initiated when the following conditions are true:

- Leaving chilled water temperature (or entering chilled water temperature, if the EWT CONTROL OPTION is enabled) is more than 5°F (2.8°C) below the CONTROL POINT.
- Leaving chilled water temperature (or entering chilled water temperature) is below the CONTROL POINT, and the chilled water temperature difference is less than the Recycle Shutdown Offset (default 5°F (2.8°C)).

NOTE: Recycle shutdown will not occur if the CONTROL POINT has been changed by more than 1°F (0.56°C) within the previous 5 minutes of operation.

When the chiller is in RECYCLE mode, the chilled water pump relay remains energized so the chilled water temperature can be monitored for increasing load. The recycle control uses Recycle Startup Offset to check when the compressor should be restarted. In cooling mode, the compressor will restart when the leaving chilled water temperature (or entering chilled water temperature, if the EWT CONTROL OPTION is enabled) is greater than the CONTROL POINT plus the Recycle Startup Offset (default 5°F [2.8°C]) for 5 consecutive seconds.

### CONTROL POINT TEMPERATURE

Capacity control is based on achieving and maintaining a control point temperature, which is the sum of a valid set point (from the SETPOINT screen) and a temperature reset value. The control point temperature is equal to the set point plus temperature reset.

The control point can be viewed directly on the main screen in the bottom left corner.

### TEMPERATURE RESET

Three types of chilled water or brine reset are available and can be enabled and modified on the Reset Configuration screen (Fig. 35).

| Temp Reset Type  | Degrees Reset at 20mA | Maximum Deg Temp Reset | Remote Temp Full Reset | Remote Temp No Reset | Deg Reset Water DT Full | Controlled DT Full Reset | Controlled DT No Reset |
|------------------|-----------------------|------------------------|------------------------|----------------------|-------------------------|--------------------------|------------------------|
| None=0, 4-20mA=1 | 10.0                  | 10.0                   | 65.0                   | 85.0                 | 10.0                    | 0.0                      | 10.0                   |

**Fig. 35 — Reset Configuration Screen**

The default screen indicates when the chilled water reset is active. The control point Reset on the General Parameters screen indicates the amount of reset.

To activate a reset type, access the Reset Configuration (RESETCFG) screen in the Configuration menu and input all configuration information for that reset type.

#### Reset Type 1: 4 to 20 mA Temperature Reset

Reset Type 1 is an automatic reset utilizing a 4 to 20 mA analog input signal provided from any external sensor, controller, or other device which is appropriately configured. For this type, Degrees Reset At 20 mA is configured in the RESETCFG table.

#### Reset Type 2: Remote Temperature Reset

Reset Type 2 is an automatic water temperature reset based on a remote temperature sensor input signal. This function can be accessed by setting the following configurations:

1. Configure the remote temperature at which no reset occurs (Remote Temp No Reset).
2. Configure the remote temperature at which full reset occurs (Remote Temp Full Reset).
3. Enter the amount of reset (Deg Reset Water DT Full).

#### Reset Type 3: Controlled Water Temp Delta Reset

Reset Type 3 is an automatic controlled water temperature reset based on chilled water temperature difference. This function can be accessed by setting the following configurations:

1. Configure the controlled water temperature delta T at which no reset occurs (Controlled DT No Reset).
2. Configure the controlled water temperature delta T at which full reset occurs (Controlled DT No Reset).

3. Enter the amount of reset (Deg Reset Water DT Full).

### CAPACITY CONTROL

From the compressor relay closed point to the end of ramp loading, the VFD TARGET SPEED is the configured Motor Start Speed. When the chiller is running normally, the capacity control determines whether and how much to change VFD TARGET SPEED. When the chiller is in the shut-down process, VFD TARGET SPEED will be the minimum VFD speed.

### RAMP LOADING

The ramp loading control slows the rate at which the compressor loads up. This control can prevent the compressor from loading up during the short period of time when the chiller is started and the chilled water loop has to be brought down to CONTROL POINT. Ramp loading helps reduce electrical demand charges by slowly bringing the chilled water to CONTROL POINT.

Two methods of ramp loading are available: temperature ramp loading and motor load ramp loading.

#### Temperature Ramp Loading

Temperature ramp loading limits the rate at which the controlled water temperature decreases. The temperature ramp loading configuration point is located in the General Configuration menu. It is enabled by setting the Ramp Loading Type to "0 = Temp".

#### Motor Load Ramp Loading

Motor load ramp loading limits the rate at which either the load current percentage or motor kilowatt percentage increases by incrementing the ramp demand limit at the configured rate. The Ramp Loading type can be set for either 1=Amps or 2=KW in the General Configuration Menu. The appropriate Ramp Rate per minute for either Amps or KW will also need to be configured in this menu.

### HGBP CONTROL

This function is used to artificially load the chiller and keep it running under low load conditions. Since this also reduces the performance of the machine, HGBP Control is a user-selectable option (**Configuration Menu**→**Cir C Config Menu**→**Hot Gas A Config**). HGBP Control Option has to be enabled in Factory Settings to become visible. See Fig. 36.

| Minimum Load Ctrl | Min Load Ctrl Enable | Fluid Temp Offset | Fluid Temp Deadband | Compressor Speed Ctrl | Comp Speed Ctrl Enable | HGBP Enable Below Speed | Disable Speed Deadband |
|-------------------|----------------------|-------------------|---------------------|-----------------------|------------------------|-------------------------|------------------------|
| 0.50              | 0.50                 | 35.00             | 15.00               |                       |                        |                         |                        |

**Fig. 36 — Hot Gas A Configuration Menu**

The HGBP control valve is an on/off type solenoid control valve. The 23XRV hot gas bypass operation has two different modes when installed and enabled:

- Envelope (HGBP) low load operation. In this condition, the valve will be opened to prevent a recycle shutdown from occurring. The valve will open when the evaporator fluid temp falls below the Control Point by Fluid Temp Offset. The valve will close once the fluid temp rises above the Control Point by the Fluid Temp Deadband.

- Low load operation controlled by compressor speed. This HGBP control mode is the typical 23XRV setting. It activates the HGBP valve when the compressor speed falls below the HGBP Enable Below Speed. This value is typically set to around 30 Hz. The HGBP valve will deenergize once speed exceeds HGBP Enable Below Speed plus Disable Speed Deadband. A typical value for Disable Speed Deadband is 15 Hz.

NOTE: HGBP control based on compressor speed is the typical configuration mode.

## DEMAND LIMIT

The PIC6 controls provide a feature for limiting AVERAGE LOAD CURRENT or MOTOR KILOWATTS by limiting capacity via VFD speed. The limit may be applied in two ways. The first is called ACTIVE DEMAND LIMIT, which is equal to a BASE DEMAND LIMIT value (set in the SETPOINT screen, default value 100%). ACTIVE DEMAND LIMIT may also be forced to be different from BASE DEMAND LIMIT by manually overriding (forcing) the value via a CCN network device. If the DEMAND LIMIT SOURCE exceeds the ACTIVE DEMAND LIMIT by 5% or less, capacity will be inhibited. If the DEMAND LIMIT SOURCE exceeds the ACTIVE DEMAND LIMIT by more than 5%, capacity will be decreased. See Fig. 37.

| Parameter                | Value                                                                 | Unit |
|--------------------------|-----------------------------------------------------------------------|------|
| Ramp Loading Type        | 0                                                                     |      |
| Temp-0, Amps-1, Kw-2     |                                                                       |      |
| Enable Ramp Loading      | <input checked="" type="radio"/> Disable <input type="radio"/> Enable |      |
| Ramp Rate (per Min)      | 0.50                                                                  | °F   |
| Ramp Rate (per Min)      | 0.50                                                                  | AMPS |
| Ramp Rate (per Min)      | 0.50                                                                  | KW   |
| Ice Mode Recycle         | <input checked="" type="radio"/> Disable <input type="radio"/> Enable |      |
| Refrigerant Leak Option  | <input type="radio"/> Disable <input checked="" type="radio"/> Enable |      |
| Circuit A Capacity Limit | 100.00                                                                | %    |
| Demand Limit Source      | 0                                                                     |      |
| 0-Local, 1-AnalogIO      |                                                                       |      |

Fig. 37 — Demand Limit

In the General Configuration menu, the Demand Limit Source set to 0 = Local makes Demand Limit follow the setting in Ramp Loading Type; i.e., either load current or motor kW. A value between 20 and 100% can be entered for Circuit A Capacity Limit and the controls will load to the selected setting.

If Demand Limit Source is selected to be 1=AnalogIO the Demand Limit is controlled by a 4-20 mA input to 7TB-7,8 (AUTO DEM). The Demand Limit at 20 mA is configured in the Service Configuration Menu. See Fig. 38-39.

| Parameter                         | Value                                                         | Unit |
|-----------------------------------|---------------------------------------------------------------|------|
| Evaporator Fluid Type             | 0                                                             |      |
| 0-Water, 1-Med Brine, 3-Low Brine |                                                               |      |
| Brine Freeze Setpoint             | 34.00                                                         | °F   |
| Comp Min Off Time                 | 180                                                           | SEC  |
| Demand Limit At 20 mA             | 40.00                                                         | %    |
| Minimum Fluid Temp                | 34.00                                                         | °F   |
| Maximum Fluid Temp                | 95.00                                                         | °F   |
| Service Password                  | <input type="radio"/> No <input checked="" type="radio"/> Yes |      |
| Service Lockout                   | <input checked="" type="radio"/> No <input type="radio"/> Yes |      |
| Restart Options                   | 0                                                             |      |
| 0=None, 1=Auto, 2=Swift Restart   |                                                               |      |

Fig. 38 — Service Configuration, Screen 1

| Parameter               | Value                                                                 | Unit  |
|-------------------------|-----------------------------------------------------------------------|-------|
| Starts Limit Bypass     | <input checked="" type="radio"/> No <input type="radio"/> Yes         |       |
| Starts Per Period Lim   | 4.00                                                                  |       |
| Comp Start Period       | 3600.00                                                               |       |
| Reset Service Runtime   | <input checked="" type="radio"/> No <input type="radio"/> Yes         |       |
| Soft Stop Enable        | <input checked="" type="radio"/> Disable <input type="radio"/> Enable |       |
| Soft Stop Threshold     | 50                                                                    | %     |
| Emergency Stop Enable   | <input checked="" type="radio"/> Disable <input type="radio"/> Enable |       |
| Spare Safety Enable     | <input checked="" type="radio"/> Disable <input type="radio"/> Enable |       |
| Powerloss Autoreset Lim | 168                                                                   | hours |

Fig. 39 — Service Configuration, Screen 2

## RUNNING TIMERS AND COUNTERS

The PIC6 control maintains several run-time clocks: Service Runtime, Machine Operating Hours, and Compressor Hours. Machine Operating Hours and Compressor Hours are typically the same and indicates to total machine/compressor run hours, but they could be different in the case of a compressor replacement. Service Runtime is a timer that can be used to indicate the hours since the last service visit or any other event. A separate counter tallies compressor starts as Compressor A Starts. All of these can be viewed on the RUNTIME screen. Manual changes to SERVICE ONTIME from the screen are permitted at any time. Runtime timers and counters can be set from **Configuration Menu→Update Runtime**; see Fig. 40. Factory Level Password is required.

| Parameter               | Value | Unit  |
|-------------------------|-------|-------|
| Starts                  |       |       |
| Compressor A Starts     | 0     |       |
| Oil Pump A Starts       | 0     |       |
| Hours                   |       |       |
| Machine Operating Hours | 0.00  | hours |
| Compressor A Hours      | 0.00  | hours |
| Oil Pump A Hours        | 0.00  | hours |
| Evap Pump 1 Hours       | 0.00  | hours |
| Cond Pump 1 Hours       | 0.00  | hours |

Fig. 40 — Update Runtime

The chiller also maintains a start-to-start timer and a stop-to-start timer. These timers limit how soon the chiller can be started. Time Until Start can be viewed in the **Status Menu→Unit Status** table. They must expire before the chiller starts. If the timers have not expired, the Unit Status is Timeout.

## WATER PUMPS CONTROL (FREEZE PREVENTION)

Carrier must have direct or parallel control of the chiller water pumps. Pump control connection must be either hardware or controlled via BMS commands that originates from chiller controller. Pump control is critical for freeze protection and warranty may be voided should freeze-up occur without proper control installation.

### Evaporator Freeze Prevention

Evaporator freeze protection is in effect in all run statuses. Alarm shutdown shall be tripped. If chiller is in recycle mode then it shall transition to trip out.

If any of the CALCEVAP SAT TEMP, EVAP REFRIG LIQUID TEMP, LCW or ECW is less than or equal to the EVAP REFRIG TRIPPOINT plus 1°F (0.55°C), evap freeze flag shall be set to true and the Evaporator Freeze Protection shall be activated and remain on until all are greater than the EVAP REFRIG TRIPPOINT plus 5°F (2.8°C).

Alarm 515 for evaporator freeze protection will be initiated when the sensed water temperature is below the Fluid Freeze Point + 1°F (0.55°C). Default Fluid Freeze Point = 34°F (1.1°C). Alarm 531 for low refrigerant temp is activated when the calculated evaporator suction temperature or measured liquid temperature is less than the Fluid Freeze Point + 1°F (0.55°C). Cooler pump will remain on in the case of either alarm.

NOTE: If the chiller is in recycle mode, it will transition to TRIPOUT, and the CHILLED WATER PUMP will remain on.

The alarm will be clearable when the evaporator saturated refrigerant temperature, evaporator refrigerant temperature, leaving chilled water temperature, and entering chilled water temperature rise 5°F (2.8°C) above the Fluid Freeze Point.

**Condenser Freeze Prevention**

This control helps prevent condenser tube freezing by energizing the condenser pump relay. The PIC6 module controls the pump and, by starting it, helps to prevent the water in the condenser from freezing.

When the chiller is off and condenser saturated refrigerant temperature is less than or equal to the condenser freeze point (same as Brine Freeze Point for 23XRV since unit is not rated for ice duty), the condenser water pump will be energized (Alarm State 511, Protective Limit - Condenser Freeze). The fault state will clear and the pump will turn off when the condenser saturated refrigerant temperature is more than 5°F (2.7°C) above the condenser freeze point and the entering condenser water temperature is greater than the condenser freeze point. If the chiller is in recycle shutdown mode when the condition occurs, the controls will transition to a non-recycle shutdown.

**CONTROL TEST- QUICK TEST**

This feature allows the operator to quick-test the controls and related hardware, including all unit-controlled outputs.

The unit must be off to run the test function. If the unit is on, the test function cannot be accessed. The test function requires Service or Factory access. To access Quick Test the function must first be activated under the Start / Stop Menu. See Fig. 41.

Upon selection of QuickTest, the Chiller Status and Mode goes to Service Test; see Fig. 42.

Select QuickTest Menu on the Chiller Start/Stop Screen as a shortcut to access the Quick Test Menu (an alternate path is **Main Menu→Quick**). See Fig. 43. All control test parameters are accessible through the Quick Test Menu. To perform the control test function, turn appropriate parameter On or set to desired value and then verify output. See Fig. 44.

Unless otherwise noted, all protective limits remain active during the controls test.

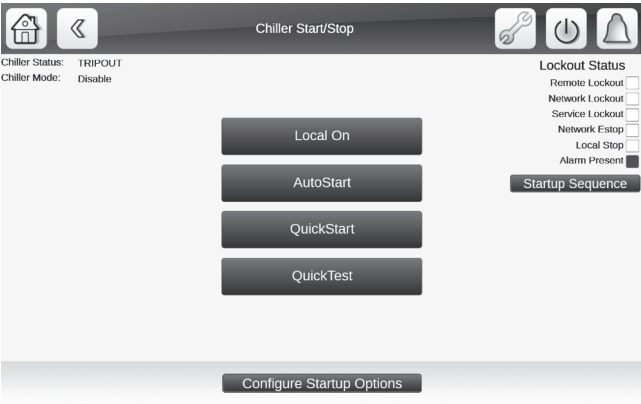


Fig. 41 — Quick Test

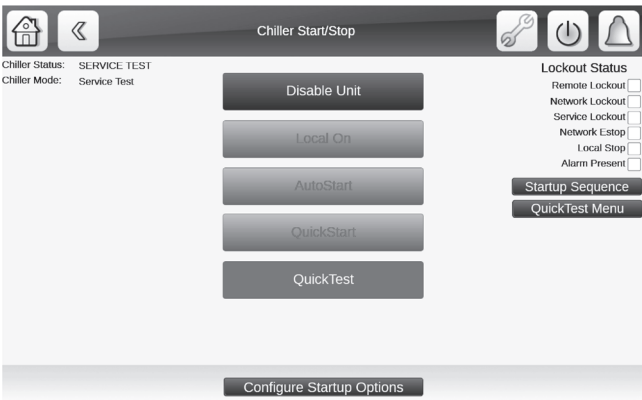


Fig. 42 — Quick Test — Service Test

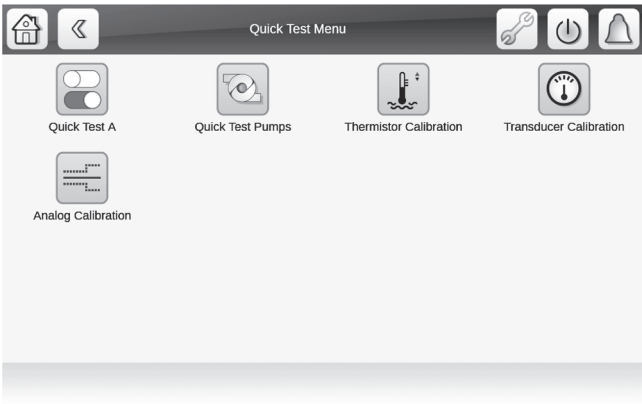


Fig. 43 — Quick Test Menu



Fig. 44 — Quick Test A

### Discrete Outputs

The Quick Test Menu allows testing of the following discrete outputs: Hot Gas Bypass, Oil Pump, Oil Heater - Primary, Oil Heater - Secondary, Vaporizer Heater, Alert Relay, Alarm Relay, Running Relay, Evap Pump, Condenser Pump.

### Analog Output

The Quick Test Menu allows testing of the following analog outputs: Main EXV, Economizer EXV, Oil Reclaim Valve position, Unit Status, and Head Pressure Output.

Once the controls testing is completed, disable the Quick Test from the Chiller Start / Stop menu.

### AUTO RESTART AND SWIFT RESTART

Controls have two restart options. Auto Restart can be selected for automatic restart after power failure. When selected the unit will automatically turn back on when power is returned to normal. Swift Restart is designed for data center or other applications. It allows the chiller to be restarted quickly to meet building load requirements.

To enable this function, user must navigate to **Configuration Menu**→**Service Configuration**. In the Service Configuration Menu set Restart Options to 1=Auto Restart and 2=Swift Restart. See Fig. 38 and 39.

For Swift Restart, the water flow verification time, refrigerant prelub time and other delays will be decreased compared to a normal start-up. It is recommended to set the unit for 1=Auto Restart unless there are special circumstances that require faster than normal startup after power failure.

### WATER PUMP CONTROL

Note that the chiller must always maintain pump control or warranty may be voided. Carrier pump control is required to help safeguard the chiller from evaporator and condenser freeze conditions. In addition condenser pump control is required for condenser pressure override.

### HEAD PRESSURE CONTROL

If the chiller system is equipped with a head pressure control valve, and the HEAD PRESSURE VALVE option in the Head Pressure Config table is configured, the PIC6 control system will control the opening of the head pressure valve to maintain the pressure difference between condenser and evaporator. The output of this valve is 4 to 20 mA type and is based on the configurable Delta P (Condenser Pressure-Evaporator Pressure) reference curve. Delta P at 100%, Delta P at 0%, and Head Pressure Minimum Output are configurable parameters for this algorithm. The output is designed for use with non-grounded controllers with a maximum impedance of 500 ohms. Head pressure reference output will be active whenever the condenser pump is operating. If a condenser freeze condition is detected the head pressure valve will automatically go to 100% (20 mA).

Before using this function, the pressure difference values for 20 mA and 4 mA should be set. See Fig. 45 and 46.

The head pressure valve should be in fully closed position when chiller is in OFF mode.

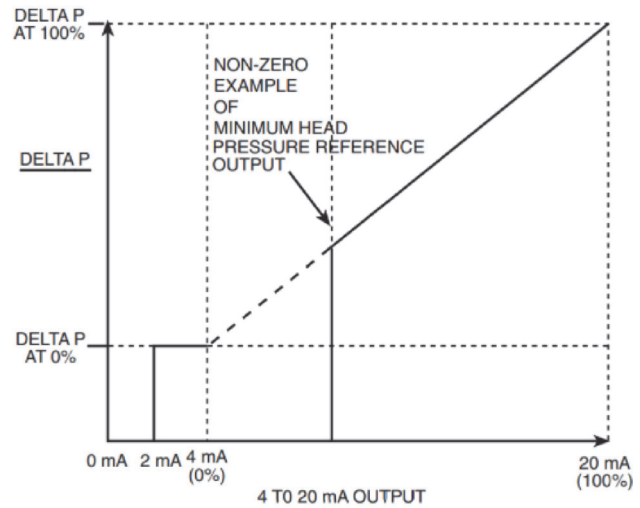


Fig. 45 — Minimum Head Pressure Reference Output

| HDPRCFG - Head Pressure Config |       |      |
|--------------------------------|-------|------|
| Head Pressure Valve            |       |      |
| Head Press ^P 0%               | 25.00 | PSIG |
| Head Press ^P 100%             | 50.00 | PSIG |
| Head Press Min Output          | 0.00  | %    |

Fig. 46 — Head Pressure Configuration Menu

### TIME SCHEDULE

The PIC6 control has the following schedules:

- Local schedule
- Holiday Schedule

Each schedule has 8 time segments. If two time segments overlap, the unoccupied time segment takes priority.

There are 16 holiday time segments. Each holiday time segment is determined by three parameters—month, start date, and holiday days. The controller will be in unoccupied mode when a holiday time segment is active. For Network and Remote Contact Starts there are no Time Schedule tables. These are enabled at the Configure Startup Options menu found at the Chiller Start/Stop Menu.

## BLACK BOX

The black box task continuously stores parameters in memory every 5 seconds. Reporting of a chiller operation alarm triggers the controller to generate a collection of data records. Each collection contains up to 180 records that consist of 168 records (corresponding to 14 min.) before the alarm and 12 records (corresponding to 1 min.) after the alarm. Each record is associated with a time stamp. Files are saved as csv files; up to 20 files can be stored. Any Alarm (not Alert) will trigger a Black Box recording and data will be overwritten once 20 files are reached.

The black box file can be uploaded with the Carrier Service Tool or the USB Log Export feature (**Main Menu**→**System Config Menu**→**USB Log Export**). For Black Box data select Export Technical Data = Yes and install USB stick in the PIC6 controller and then select Export Data.. Once the upload is done, the original files are automatically deleted. See Fig. 47.

USB Log Export

Chiller Name:

Export technical Data: ☒ Yes ☐ No

Export Developer Data: ☐ Yes ☒ No

Status:

**Export Data**

Fig. 47 — USB Log Export Menu

Black box data can be triggered manually which is useful for troubleshooting. Login level is Service or higher and the black box data can be generated from the "Trigger BlackBox" icon near the bottom right corner of the 23XRV Diagnostics Menu (Fig. 48).

23XRV Diagnostics Menu

|                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Compression:</b><br>Comm Stat: NO COMS<br>Speed Cmd: 0.0 %<br>Actual Hz: 0.0 Hz<br>Actual RPM: 0.0 rpm<br>Line Volts: 0.0 Volts<br>Motor Amps: 0.0 AMPS<br>Motor Power: 0.0 KW<br>Motor Temp: 0.0 °F<br>Disch Press: -6.7 PSIG<br>Disch Sat T: -37.4 °F<br>Disch Gas T: 0.0 °F<br>HGBP Cmd: <input checked="" type="checkbox"/> | <b>Evaporator:</b><br>ECW Temp: 0.0 °F<br>LCW Temp: 0.0 °F<br>Evap DeltaP: 0.0 PSIG<br>Evap Press: -6.7 PSIG<br>Evap Sat T: -37.4 °F<br><b>Condenser:</b><br>ECDW Temp: 0.0 °F<br>LCDW Temp: 0.0 °F<br>Cond DeltaP: 0.0 PSIG<br>Cond Press: -6.7 PSIG<br>Cond Sat T: -37.4 °F<br>Liq Level: 0.0 in<br>EXV Fbk: 0.0 % | <b>Oil System:</b><br>Vaporizer T: 0.0 °F<br>Sump T: 0.0 °F<br>Oil DeltaP: 0.0 PSIG<br>Oil Pump: <input checked="" type="checkbox"/><br>Reclaim Vlv: 0.0<br>Stage1 Htr: <input checked="" type="checkbox"/><br>Stage2 Htr: <input checked="" type="checkbox"/><br>Vap. Htr: <input checked="" type="checkbox"/><br><b>Fluid Pumps:</b><br>Evap Flow: <input checked="" type="checkbox"/><br>Cond Flow: <input checked="" type="checkbox"/><br>Evap Pump: <input checked="" type="checkbox"/><br>Cond Pump: <input checked="" type="checkbox"/> | <b>Economizer:</b><br>Eco Press: -6.7 PSIG<br>Eco Sat T: -37.4 °F<br>Eco EXV Fbk: 0.0 % |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|

**QuickTest**  
**States And Modes**  
**Startup Sequence**  
☐ Trigger BlackBox

12:35 PM  
05/03/2022

Fig. 48 — 23XRV Diagnostics Menu

## PRESSURE TRANSDUCER CALIBRATION

The HMI pressure readings are displayed in the **Main Menu** → **Inputs Menu**→**Pressure** screen. See Fig. 49.

Pressure - Pressure

|                          |       |      |
|--------------------------|-------|------|
| Entering Evap Water Pres | 0.00  | PSIG |
| Leaving Evap Water Pres  | 0.00  | PSIG |
| Entering Cond Water Pres | 0.00  | PSIG |
| Leaving Cond Water Pres  | 0.00  | PSIG |
| Evaporator Pressure A    | -6.69 | PSIG |
| Discharge Pressure A     | -6.69 | PSIG |
| Condenser Pressure A     | -6.69 | PSIG |
| Economizer Pressure A    | -6.69 | PSIG |
| Oil Sump Pressure A      | -6.69 | PSIG |
| Oil Discharge Pressure A | -6.69 | PSIG |
| Oil Press Diff A         | 0.00  | PSIG |

Fig. 49 — Pressure Screen

Once a year the pressure transducers should be checked against a pressure gauge. Attach a set of accurate refrigeration gauges to the transducer being checked and compare the two readings. If there is a difference the transducer can be calibrated as described below. Calibration requires Service level or higher access to the HMI.

NOTE: It is usually not necessary to calibrate at initial start-up unless chiller is at high altitude.

1. Go to **Main Menu** → **Quick Test Menu** → **Transducer Calibration**. See Fig. 50.

Transducer Calibration

|                               |            |                                |
|-------------------------------|------------|--------------------------------|
| Evaporator Refrigerant Press  | -6.69 PSIG | Calibration (+/-5psi)0.00 PSIG |
| Condenser Refrigerant Press   | -6.69 PSIG | Calibration (+/-5psi)0.00 PSIG |
| Economizer Refrigerant Press  | 0.00 PSIG  | Calibration (+/-5psi)0.00 PSIG |
| Discharge Refrigerant Press   | -6.69 PSIG | Calibration (+/-5psi)0.00 PSIG |
| Oil Sump Press                | -6.69 PSIG | Calibration (+/-5psi)0.00 PSIG |
| Oil Pressure Differential     | 0.00 PSIG  | Calibration (+/-5psi)0.00 PSIG |
| Evap Entering Water Press     | 0.00 PSIG  | Calibration (+/-5psi)0.00 PSIG |
| Evap Leaving Water Press      | 0.00 PSIG  | Calibration (+/-5psi)0.00 PSIG |
| Cond Entering Water Press     | 0.00 PSIG  | Calibration (+/-5psi)0.00 PSIG |
| Condenser Leaving Water Press | 0.00 PSIG  | Calibration (+/-5psi)0.00 PSIG |

Fig. 50 — Transducer Calibration Menu

2. Each transducer is supplied with 5 vdc from the IIOB and SIOB. Calibration is done by adjusting the appropriate Pressure Sensor on the Transducer Calibration screen. If required calibration is more than 5 psig (34.5 KPa) the transducer needs to be replaced.

## TEMPERATURE SENSOR CALIBRATION

The thermistors can be calibrated to have their temperature readings offset by a specified amount (up to  $\pm 5^{\circ}\text{F}$  ( $2.8^{\circ}\text{C}$ )). Follow these steps for each sensor:

1. Go to **Main Menu** → **Quick Test Menu** → **Thermistor Calibration**. See Fig. 51-53.  
Temperature readings are conveniently available at **Main Menu**→**Inputs Menu**→**Temperature**.

| Sensor                        | Value   | Calibration (+/-5°F) |
|-------------------------------|---------|----------------------|
| Entering Chilled Water Temp   | 0.00 °F | 0.00 °F              |
| Leaving Chilled Water Temp    | 0.00 °F | 0.00 °F              |
| Entering Condenser Water Temp | 0.00 °F | 0.00 °F              |
| Leaving Condenser Water Temp  | 0.00 °F | 0.00 °F              |
| Evaporator Refrigerant Temp   | 0.00 °F | 0.00 °F              |
| Motor Winding Temp            | 0.00 °F | 0.00 °F              |
| Remote Reset Temp             | 0.00 °F | 0.00 °F              |
| Economizer Refrigerant Temp   | 0.00 °F | 0.00 °F              |
| Discharge Refrigerant Temp    | 0.00 °F | 0.00 °F              |
| Vaporizer Temp                | 0.00 °F | 0.00 °F              |
| Oil Sump Temp                 | 0.00 °F | 0.00 °F              |

Fig. 51 — Thermistor Calibration Menu

| Temp                     | Value  | Unit |
|--------------------------|--------|------|
| Ent Chill Water Temp     | 0.00   | °F   |
| Leaving Chill Water Temp | 0.00   | °F   |
| Entering Cond Water Temp | 0.00   | °F   |
| Leaving Cond Water Temp  | 0.00   | °F   |
| Remote Reset Temp        | 0.00   | °F   |
| Evap Rfrg Liq Temp A     | 0.00   | °F   |
| Evap Saturated Temp A    | -37.38 | °F   |
| Discharge Gas Temp A     | 0.00   | °F   |
| Discharge Sat Temp A     | -37.38 | °F   |
| Cond Sat Temp A          | -37.38 | °F   |
| Discharge Superheat A    | 37.38  | °F   |
| Motor Winding Temp A     | 0.00   | °F   |
| Economizer Gas Temp A    | 0.00   | °F   |

Fig. 52 — Temperature Input Menu, Page 1

| Temp                  | Value | Unit |
|-----------------------|-------|------|
| Econ Saturated Temp A | 0.00  | °F   |
| Econ Superheat A      | 0.00  | °F   |
| Oil Sump Temp A       | 0.00  | °F   |
| Oil Vaporizer Temp    | 0.00  | °F   |

Fig. 53 — Temperature Input Menu, Page 2

- Place the temperature sensor in a 32°F (0°C) water solution or other known temperature in range where the sensor is used.
- Read the sensor raw temperature on the Temperature screen.
- Calculate the offset to be applied as follows:  
Actual temperature (F) 32 – sensor raw temp (°F)  
Example:  
ECW sensor raw temperature reads 32.6°F.  
ECW temperature offset must be set to –0.6°F  
(32 – 32.6 = –0.6)
- In the Thermistor Calibration screen, enter the temperature offset for the appropriate sensor as calculated in Step 4. See Fig. 51.

- Verify that the measured temperature value is the same as the controlled temperature.

## ALARM EMAIL

The alarm email function sends automatic email messages to specified service personnel for remote maintenance purposes. This function can be set up from the second page of **Main Menu** → **System Config** → **Menu** → **Alarm Email Config**. Subsequently if there is an alarm the function will send an e-mail message. Another message is sent when all alarms return to normal. See Fig. 54.

Enable Alarm Email

SMTP Server

SMTP Port

Sender Email

Account Password

Recipient 1

Recipient 2

Attach Blackbox Log

Email Status

Fig. 54 — Alarm Email Configuration Screen

The alarm task runs periodically. At each alarm task run time, the status change of each alarm is checked and one email message is sent to each specified recipient when one or more alarms are switched on.

The e-mail message provides the unit device name and location stored in the Controller ID table, available from the System Configuration Menu. See Fig. 55.

| Field                | Value                    |
|----------------------|--------------------------|
| Device Name          |                          |
| Device Location      |                          |
| Software Part Number | ACC-1-E-T0010001         |
| Model Number         | 23XRV4042NRVAAS--        |
| Serial Number        | 1234Q12345               |
| Reference Number     |                          |
| Controls Version     | 4.28.0-tags-0.1.0-beta-9 |
| Application Version  | 0.1.0-beta.9             |
| Firmware Version     | 1.36.15                  |
| IOT Version          | 3.2                      |

Fig. 55 — Controller ID Screen

## Displaying Data Trends

The PIC6 control system offers the ability to configure and display color-coded system trends. Select **Main Menu** → **Trending**.

On the Trending screen (see Fig. 56), check the data points which are to be tracked, and set the beginning and end points for the selected data. To change a data color, select the colored square and choose a new color from the pop-up color bar. To view data trends, select the down arrow at the bottom right of the Trending screen. The next page displays the selected data in the chosen colors. See Fig. 57.



Fig. 56 — Trending Screen Set-Up Page



Fig. 57 — Trending Screen Display Page

## Hydraulic Option

The 23XR unit can be equipped with two normally open flow switches; one for the evaporator and the other for the condenser. The evaporator/condenser water flow will indicate the flow status (see wiring schematic). In Option 2, Water Flow Determination must be set to "1=Flow Switch" for this option to be active. Connections are 7TB-44/45 for evaporator and 7TB-46/47 for condenser.

## WATER PRESSURE OPTION

When entering and leaving water pressure transducers (Delta P) are installed, the PIC6 control system can compute or read the water pressure difference between entering and leaving water pressure, and thereby determine if the water is flowing. After the water pump is switched on, if the water pressure difference reaches the threshold, the water flow check is passed and the chiller can start. Otherwise there will be an alarm shutdown.

## HYDRONICS CONFIGURATION

Flow detection method can be modified in **Main Menu**→**Configuration**→**Hydronics Configuration**. Default selection is based on water temps.

Evap Flow Detection

0 = Calculated (default)

1=Discrete (Field supplied flow switch)

2=Delta P (Field supplied pressure transducers in inlet and outlet nozzles)

Cond Flow Detection

0 = Calculated (default)

1= Discrete (Field supplied flow switch)

2=Delta P (Field supplied pressure transducers in inlet and outlet nozzles)

For flow selection 2 the minimum flow delta P must be configured for minimum acceptable flow. See Fig. 58.

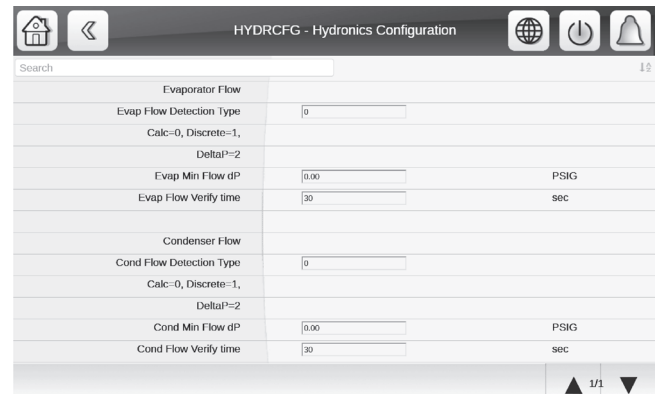


Fig. 58 — Hydronics Configuration Menu

## DIAGNOSTICS AND TROUBLESHOOTING

The 23XR PIC6 control system has many fault tracing aid functions. The local interface and its various menus give access to all unit operating conditions.

If an operating fault is detected, an alert or alarm is activated. The alarm code is displayed in the Alarms menu, sub-menus Reset alarms and Current alarms. The control displays alarms and alerts at the bottom of the Home Screen. See Fig. 59. For diagnostics, always check Current Alarms and History Alarm menus since multiple alarms may be active at the same time.

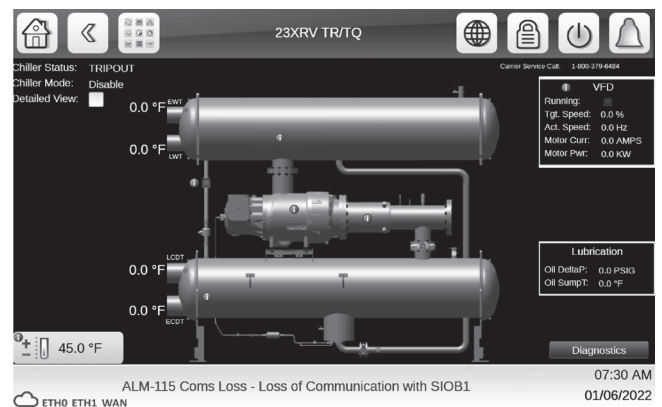
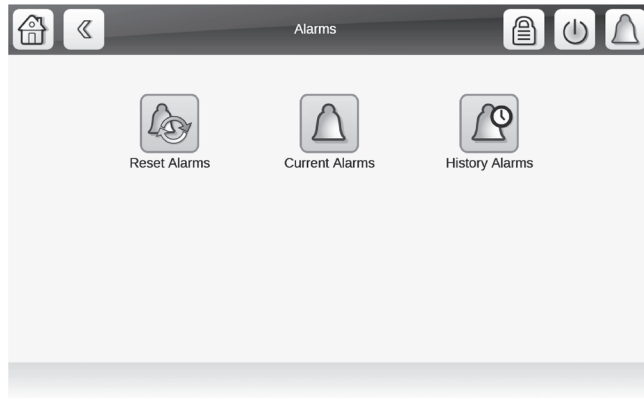


Fig. 59 — Example of Alarm on Home Screen

## Alarm/Alert Codes

Table 10 lists PIC6 alert codes. Table 11 lists PIC6 alarm codes. Alerts do not cause machine shutdown and are typically automatically reset when the situation returns to normal, while alarms typically result in machine shutdown. See the Alarms menu in Fig. 60.



**Fig. 60 — Alarm Menu**

## Displaying Alarms

The alarm icon  on the interface (see the section Icons on page 13) indicates unit status as follows:

- A flashing red icon shows that the unit is operating but there is an alert.
- A steady red icon shows that the unit has been shut down due to a fault.

The Current Alarms menu displays up to eight alarm codes that are active on the unit. Table 11 lists alarm codes.

## Resetting Alarms

When the cause of the alarm has been identified and corrected, the alarm can be reset either automatically or manually (depending on the type of alarm). To reset the alarms, enter the Reset Alarm menu, select the Alarm Reset icon, select Yes in the pop-up window, and execute.

In the event of a power supply interrupt, if Auto Restart Option is set to ENABLE in the Option Configuration menu, the unit restarts automatically without the need for an external command.

A manual reset must be run from the main menu via the Reset Alarms Feature.

All information regarding solved alarms is stored in the Alarm History. Alarm History stores last 50 alarms even after alarms have been corrected or reset.

**Table 10 — PIC6 Alert Codes**

| CODE   | HITS TO ACTIVATE | HITS TO RESET | RESET TYPE | RESPONSE | MESSAGE                                             | TRIP CONDITION                                                                                                                                                                                                                       | TROUBLESHOOTING                                                                                                                           |
|--------|------------------|---------------|------------|----------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| ALT003 | 10               | 10            | AUTOMATIC  | Notify   | ALT-003 Sensor Alert - Entering Cond Water Temp     | Entering condenser water temperature (TEMP_ECDW) is outside range.                                                                                                                                                                   | Verify continuity to SIOB. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. |
| ALT004 | 10               | 10            | AUTOMATIC  | Notify   | ALT-004 Sensor Alert - Entering Cond Water Press    | Tested when the compressor is on all of the run status:<br>If condenser flow detection type (HYDRCFG_condfdtp) is set to DeltaP (2)<br>AND<br>If entering condenser water transducers voltage is outside the range of 0.3V to 4.75V  | Check 5V supply from IOB. Check transducer output and ground. Replace transducer if voltage checks out good.                              |
| ALT005 | 10               | 10            | AUTOMATIC  | Notify   | ALT-005 Sensor Alert - Entering Chilled Water Press | Tested when the compressor is on all of the run status:<br>If evaporator flow detection type (HYDRCFG_evapfdtp) is set to DeltaP (2)<br>AND<br>If entering condenser water transducers voltage is outside the range of 0.3V to 4.75V | Check 5V supply from IOB. Check transducer output and ground. Replace transducer if voltage checks out good.                              |
| ALT007 | 10               | 10            | AUTOMATIC  | Notify   | ALT-007 Sensor Alert - Leaving Cond Water Temp      | Leaving condenser water temperature (TEMP_LCDW) is outside range.                                                                                                                                                                    | Verify continuity to SIOB. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. |
| ALT008 | 10               | 10            | AUTOMATIC  | Notify   | ALT-008 Sensor Alert - Leaving Cond Water Press     | Tested when the compressor is on all of the run status:<br>If condenser flow detection type (HYDRCFG_condfdtp) is set to DeltaP (2)<br>AND<br>If entering condenser water transducers voltage is outside the range of 0.3V to 4.75V. | Check 5V supply from IOB. Check transducer output and ground. Replace transducer if voltage checks out good.                              |
| ALT009 | 10               | 10            | AUTOMATIC  | Notify   | ALT-009 Sensor Alert - Leaving Chilled Water Press  | Tested when the compressor is on all of the run status, If evaporator flow detection type (HYDRCFG_evapfdtp) is set to DeltaP (2) AND If the entering chilled water transducers voltage is outside range.                            | Check 5V supply from IOB. Check transducer output and ground. Replace transducer if voltage checks out good.                              |

**Table 10 – PIC6 Alert Codes (cont)**

| CODE   | HITS TO<br>ACTIVATE | HITS TO<br>RESET | RESET TYPE | RESPONSE                | MESSAGE                                                      | TRIP CONDITION                                                                                                                                                                                                                                                                                                                             | TROUBLESHOOTING                                                                                                                                                                                    |
|--------|---------------------|------------------|------------|-------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALT011 | 10                  | 10               | AUTOMATIC  | Notify                  | ALT-011 Sensor Alert - Remote Temperature Out of Range       | Remote reset temperature (TEMP_R_RESET) is outside range.                                                                                                                                                                                                                                                                                  | Verify continuity to SIOB. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. Verify 1IOB dipswitch setting.                           |
| ALT013 | 0                   | 0                | AUTOMATIC  | Notify                  | ALT-013 Sensor Alert - VFD Speed Out Of Range                | VLT Drive Actual Frequency > (VFD Speed Command + VFD Speed Alert Deadband) for 75 sec                                                                                                                                                                                                                                                     | Check VFD actual speed.                                                                                                                                                                            |
| ALT101 | 0                   | 0                | MANUAL     | Notify                  | ALT-101 Coms Alert - LEN Scan Warning                        | LEN scan warning (the traffic is a little bad) but still works                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                    |
| ALT201 | 0                   | 0                | AUTOMATIC  | Notify                  | ALT-201 Configuration Error - Controlled Water Delta T Reset |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                    |
| ALT202 | 0                   | 0                | AUTOMATIC  | Notify                  | ALT-202 Configuration Error - Head Pressure                  |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                    |
| ALT203 | 0                   | 0                | AUTOMATIC  | Notify                  | ALT-203 Configuration Error - Temp Reset                     |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                    |
| ALT401 | 0                   | 0                | AUTOMATIC  | Prevent Unit Startup    | ALT-401 Prestart Alert - Low Condenser Flow                  | No flow detected during Flow Verification Time                                                                                                                                                                                                                                                                                             | Verify that with no flow there is 24 VAC across 7TB-15,16. Verify that with flow there is 0 VAC across 7TB-15,16. Verify continuity from 7TB to 1IOB.                                              |
| ALT402 | 0                   | 0                | AUTOMATIC  | Prevent Unit Startup    | ALT-402 Prestart Alert - Low Evaporator Flow                 | No flow detected during Flow Verification Time                                                                                                                                                                                                                                                                                             | Verify that with no flow there is 24 VAC across 7TB-13,14. Verify that with flow there is 0 VAC across 7TB-13,14. Verify continuity from 7TB to 1IOB.                                              |
| ALT403 | 0                   | 0                | AUTOMATIC  | Prevent Unit Startup    | ALT-403 Prestart Alert - Excessive Recycle Starts            | Number of recycle restarts in the last 4 hours is greater than 5                                                                                                                                                                                                                                                                           | Verify that there is sufficient load to run the unit. Repeated recycle result in oil dilution.                                                                                                     |
| ALT404 | 0                   | 0                | AUTOMATIC  | Prevent Unit Startup    | ALT-404 Prestart Alert - Invalid Control Program             | Compressor envelope control logic is set to 0                                                                                                                                                                                                                                                                                              | Install new software package.                                                                                                                                                                      |
| ALT405 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-405 Prestart Alert - Eco EXV Prestart Check Cir A        | One or more of the following are TRUE: Cir A Eco EXV is not in manual testing mode; Cir A Eco EXV is not overridden by invalid force readiness conditions; Cir A Eco EXV failed precheck movement and not responsive; Cir A Eco EXV is not at zero position; Cir A Eco EXV is not overridden by invalid external readiness conditions      | Power cycle EXV. Verify EXV wiring per wiring schematic. Replace EXV.                                                                                                                              |
| ALT407 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-407 Prestart Alert - EXV Prestart Check Cir A            | One or more of the following are TRUE: Cir A Main EXV is not in manual testing mode; Cir A Main EXV is not overridden by invalid force readiness conditions; Cir A Main EXV failed precheck movement and not responsive; Cir A Main EXV is not at zero position; Cir A Main EXV is not overridden by invalid external readiness conditions | Power cycle EXV. Verify EXV wiring per wiring schematic. Replace EXV.                                                                                                                              |
| ALT409 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-409 Prestart Alert - High Condenser Pressure Cir A       | Check condenser saturated temperature is above its high limit (TEMP_CND_ST_A)                                                                                                                                                                                                                                                              | Check the condenser pressure. Check for high condenser water temperature, low water flow, tube fouling. Check c sensor resistance and voltage drop. Check for wiring in accordance with schematic. |
| ALT411 | 5                   | 4                | AUTOMATIC  | Prevent Circuit Startup | ALT-411 Prestart Alert - High Discharge Temp Cir A           | Discharge temperature is above its high limit (TEMP_DGT_A)                                                                                                                                                                                                                                                                                 | Check the condenser pressure. Check for high condenser water temperature, low water flow, tube fouling. Check sensor resistance and voltage drop. Check wiring in accordance with schematic.       |
| ALT413 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-413 Prestart Alert - High Line Voltage Cir A             | VFD or STARTER line voltage is above its high limit (DRVA1STS_hi_volt)                                                                                                                                                                                                                                                                     | Check actual line voltage and match against VFD nameplate and jobsite requirements. Consult power utility if voltage is high.                                                                      |
| ALT415 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-415 Prestart Alert - High Motor Temperature Cir A        | Tested only on prestart condition if all of the motor temperature sensors are in the range AND if one of the COMP MOTOR WINDING TEMP is greater than 190°F (88°C)                                                                                                                                                                          | Check thermistor temperature. Check sensor wiring per unit schematic. Check motor cooling line and isolation valves for possible restrictions including refrigerant filter drier.                  |

**Table 10 — PIC6 Alert Codes (cont)**

| CODE   | HITS TO<br>ACTIVATE | HITS TO<br>RESET | RESET TYPE | RESPONSE                | MESSAGE                                                        | TRIP CONDITION                                                                                                                                                                                                                                                                  | TROUBLESHOOTING                                                                                                                                                                                                                                                                     |
|--------|---------------------|------------------|------------|-------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALT417 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-417 Prestart Alert - Invalid Compressor Envelope - Cir A   | Compressor envelope selection is invalid                                                                                                                                                                                                                                        | Reload software                                                                                                                                                                                                                                                                     |
| ALT419 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-419 Prestart Alert - Low Line Voltage Cir A                | VFD or STARTER line voltage is below its high limit (DRVA1STS_low_volt)                                                                                                                                                                                                         | Check actual line voltage and match against VFD nameplate and jobsite requirements.                                                                                                                                                                                                 |
| ALT421 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-421 Prestart Alert - Low Oil Temperature Cir A             | Oil sump temp is below 140°F (77.8°C) AND Oil sump temp < Evap Sat Temp + 15°F (8.3°C)                                                                                                                                                                                          | Check oil temperature. Check that oil heater contactor/relay is energized and that there is voltage present on secondary of contactor. Check if temperature is still rising to determine if additional time will solve the issue. Check wiring. Check resistance across the sensor. |
| ALT423 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-423 Prestart Alert - Low Refrigerant Sensor Temp Cir A     | Check evaporator liquid temp > freeze temp limit (SERVICE1_freezesp)                                                                                                                                                                                                            | Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. Check Verify freeze temp limit setting in Configuration Service menu. Verify that isolation valves are open.                                                         |
| ALT425 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-425 Prestart Alert - Low Saturated Refrigerant Temp Cir A  | Check evaporator saturated temp > freeze temp limit (SERVICE1_freezesp)                                                                                                                                                                                                         | Check 5V supply from IOB to evaporator pressure transducer. Check pressure transducer reference and ground. Replace transducer if voltage checks out good. Check freeze set point in Service Configuration.                                                                         |
| ALT429 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-429 Prestart Alert - Oil Transducers Calibration Cir A     | Oil Delta P is greater than 6 psi before startup                                                                                                                                                                                                                                | Verify oil sump pressure and oil discharge pressure sensors individually. Verify wiring and that each have 5V supply and check pressure transducers output and ground.                                                                                                              |
| ALT431 | 0                   | 0                | AUTOMATIC  | Prevent Circuit Startup | ALT-431 Prestart Alert - Starts Limit Exceeded Comp A          | Tested only on prestart run status, if number of compressor starts is greater than Starts Per Period Lim (SERVICE1_stpperlim_A) within Comp Start Period (SERVICE1_cmpstper_A) time.; NOTE: This alarm can be bypassed when Starts Limit Bypass (SERVICE1_stlim_by) is set (1). | Verify that there is sufficient load to run the unit. Default is 4 starts per hour.                                                                                                                                                                                                 |
| ALT433 | 5                   | 4                | AUTOMATIC  | Prevent Circuit Startup | ALT-433 Prestart Alert - VFD Fault - Inverter Overtemp Cir A   | Inverter temperature is below its high limit (DRVA1STS_inv_ot)                                                                                                                                                                                                                  | Check drive inverter temperature. Check Drive Configuration. Check VFD cooling fan operation. If applicable check refrigerant cooling line for flow.                                                                                                                                |
| ALT435 | 5                   | 4                | AUTOMATIC  | Prevent Circuit Startup | ALT-435 Prestart Alert - VFD Fault - Rectifier Overtemp Cir A  | Rectifier temperature is below its high limit (DRVA1STS_rect_ot)                                                                                                                                                                                                                | Check drive rectifier temperature. Check Drive Configuration. Check VFD cooling fan operation. If applicable check refrigerant cooling line for flow. Check drive PWM setting.                                                                                                      |
| ALT501 | 0                   | 0                | AUTOMATIC  | Notify                  | ALT-501 Process Alert - High Oil Pressure Differential Cir A   | Oil Pump is ON (OUTPUTS_OILR_A) AND OIL PRESSURE DELTA (PRESSURE_OIL_PD_A) > 45 PSI; Conditions persist (with PRESSURE_OIL_PD_A > 40 PSI) for 55 sec.                                                                                                                           | Check oil pump. Check oil filter.                                                                                                                                                                                                                                                   |
| ALT505 | 10                  | 0                | AUTOMATIC  | Notify                  | ALT-505 Process Alert - High Condenser Press Chiller Off Cir A | Saturated condenser temp (TEMP_CND_ST_A) >= SATURATED CONDENSER TEMP LIMIT (130°F/54°C) AND ENTERING CONDENSER WATER TEMP (TEMP_ECDW) < 115°F/46°C AND chiller is OFF (GENUNIT_STATUS = 0)                                                                                      | Check for high condenser water temperatures. Check for low water flow, tube fouling, division plate/gasket bypass or plugged condenser water strainers. Check condenser pressure sensor measurement.                                                                                |

**Table 10 — PIC6 Alert Codes (cont)**

| CODE   | HITS TO ACTIVATE | HITS TO RESET | RESET TYPE | RESPONSE | MESSAGE                                                   | TRIP CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TROUBLESHOOTING                                                                                                                                                                                                                    |
|--------|------------------|---------------|------------|----------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALT511 | 0                | 4             | AUTOMATIC  | Notify   | ALT-511 Process Alert - Condenser Freeze Cir A            | <p>System maintains CRT(TEMP_CND_ST_A) at or above the Condenser Freeze Point subject to ALL of the following:</p> <ul style="list-style-type: none"> <li>Unit is not in pumpdown (GENUNIT_STATUS != 11)</li> <li>Unit is not in pumpdown lockout (GENUNIT_STATUS != 12) with Condenser Freeze Protection disabled (HYDRCFG_cnd_fz_d)</li> <li>CRT &lt; Condenser Freeze Point (34°F); If evaporator fluid type is set to med or low brine (SERVICE1_flui_typ &gt; 0) this generates an alert</li> </ul> | Check condenser pressure transducer for accuracy. Check condenser pressure transducer wiring. Check refrigerant charge. Check configuration value in Service configuration.                                                        |
| ALT517 | 0                | 0             | AUTOMATIC  | Notify   | ALT-517 Process Alert - Low Discharge Superheat Cir A     | Compressor is ON AND running at least 10 min AND Discharge Superheat (TEMP_DSH) ≤ Discharge Superheat low limit (EXV_STP_dShLStpt) (default 2°F)                                                                                                                                                                                                                                                                                                                                                         | Review configurations in in "Comp A Config". Check oil level. Check for excess refrigerant charge.                                                                                                                                 |
| ALT519 | 10               | 10            | AUTOMATIC  | Notify   | ALT-519 Process Alert - Low Oil Pressure Difference Cir A | Oil pressure difference is between 15 and 18 psid AND STARTUP COMPLETE (4 < GENUNIT_STATUS < 9)                                                                                                                                                                                                                                                                                                                                                                                                          | Check oil pump operation, check oil level, check oil filters, check for frequent start/stop of unit which will prevent proper oil recovery.                                                                                        |
| ALT521 | 0                | 0             | MANUAL     | Notify   | ALT-521 Process Alert - Low Refrigerant Charge Cir A      | Compressor is running but not in ramp loading status AND Condenser approach (TEMP_CNDAPP_A) > low refrigerant charge condenser approach threshold (LIMITCFG_rch_cath) AND Evaporator approach (TEMP_EVPAPP_A) is 2°F greater than design approach (LIMITCFG_ap_dgap)                                                                                                                                                                                                                                     | Check evaporator pressure, evaporator saturation refrigerant temp, and evaporator refrigerant liquid temp. Verify pressure transducer and thermistor wiring. Check for low chilled water supply temperature. Add charge and check. |
| ALT523 | 0                | 0             | MANUAL     | Notify   | ALT-523 Process Alert - Oil Filter Replacement Cir A      | Oil pump control test is active (only during start verify time) AND If the oil pressure differential (PRESSURE_PD) < alert threshold (startDiffPressMin) default startDiffPressMin = 18psig <15-20 psig>, 2psig hysteresis                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                    |
| ALT525 | 0                | 0             | MANUAL     | Notify   | ALT-525 Process Alert - Transducer Calibration Cir A      | Compressor is OFF for at least 5 min AND Differences in the evaporator (PRESSURE_CRP), condenser (PRESSURE_CRP), and economizer (PRESSURE_ECON_P) refrigerant pressure transducer readings are greater than the Trans Calibration Required Limit (default 2 psig)                                                                                                                                                                                                                                        | Recalibrate transducers. Replace transducer if calibration cannot be resolved.                                                                                                                                                     |
| ALT527 | 0                | 0             | AUTOMATIC  | Notify   | ALT-527 Process Alert - High Discharge Gas Temp Cir A     | Compressor is running AND Discharge Gas Temp (TEMP_DGT_A) > Discharge Gas Temp Alert (LIMITCFG_dgt_alrt)                                                                                                                                                                                                                                                                                                                                                                                                 | Check discharge gas temp thermistor and wiring. Check for excessive starts. Check compressor discharge alert setting in Limit configuration.                                                                                       |
| ALT800 | 2                | 10            | Automatic  | Notify   | ALT-800 - VFD Alert - VFD A1 Loss of Feedback             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                    |

**Table 11 — PIC6 Alarm Codes**

| CODE   | HITS TO<br>ACTIVATE | HITS TO<br>RESET | RESET TYPE | RESPONSE                             | MESSAGE                                               | TRIP CONDITION                                                                                     | TROUBLESHOOTING                                                                                                                                        |
|--------|---------------------|------------------|------------|--------------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALM002 | 5                   | 5                | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-002 Sensor Fault - Entering Chilled Water         | Entering chilled water temperature (TEMP_ECW) is outside range.                                    | Verify continuity to appropriate board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. |
| ALM004 | 5                   | 5                | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-004 Sensor Fault - Leaving Chilled Water          | Leaving chilled water temperature (TEMP_LCW) is outside range.                                     | Verify continuity to appropriate board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. |
| ALM005 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-005 Sensor Fault - Comp Discharge Temp A          | Compressor discharge temperature (TEMP_DGT_A) is outside range.                                    | Verify continuity to appropriate board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. |
| ALM007 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-007 Sensor Fault - Compressor Motor Temp A        | Compressor motor temperature (TEMP_MTRW_A) is outside range.                                       | Verify continuity to appropriate board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature. |
| ALM009 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-009 Sensor Fault - Condenser Pressure A           | Condenser pressure (PRESSURE_CND_P_A) is outside range.                                            | Check 5V supply from board. Check transducer output and ground. Replace transducer if voltage checks out good.                                         |
| ALM011 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-011 Sensor Fault - Discharge Pressure A           | Discharge pressure (PRESSURE_DIS_P_A) is outside range.                                            | Check 5V supply from board. Check transducer output and ground. Replace transducer if voltage checks out good.                                         |
| ALM013 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-013 Sensor Fault - Economizer Pressure A          | Economizer pressure (PRESSURE_ECO_P_A) is outside range.                                           | Check 5V supply from board. Check transducer output and ground. Replace transducer if voltage checks out good.                                         |
| ALM015 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-015 Sensor Fault - Economizer Temp A              | Economizer temperature (TEMP_ECO_T_A) is outside range.                                            | Verify continuity to circuit board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature.     |
| ALM017 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-017 Sensor Fault - Evaporator Pressure A          | Evaporator pressure (PRESSURE_EVAP_P_A) is outside range.                                          | Check 5V supply from board. Check transducer output and ground. Replace transducer if voltage checks out good.                                         |
| ALM019 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-019 Sensor Fault - Evap Refrig Liquid Temp A      | Evaporator refrigerant temperature (TEMP_EVAP_T_A) is outside range.                               | Verify continuity to circuit board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature.     |
| ALM023 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-023 Sensor Fault - Liquid Line Press A            | Liquid line pressure (PRESSURE_LIQ_P_A) is outside range.                                          | Check 5V supply from board. Check transducer output and ground. Replace transducer if voltage checks out good.                                         |
| ALM025 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-025 Sensor Fault - Liquid Line Temp A             | Liquid line temperature (TEMP_LIQ_T_A) is outside range.                                           | Verify continuity to circuit board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature.     |
| ALM029 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-029 Sensor Fault - Oil Supply Pressure A          | Oil Supply Pressure (PRESSURE_OIL_DP_A) is outside range.                                          | Check 5V supply from board. Check transducer output and ground. Replace transducer if voltage checks out good.                                         |
| ALM033 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-033 Sensor Fault - Oil Sump Pressure A            | Oil Sump Pressure (PRESSURE_OILPSMPA) is outside range.                                            | Check 5V supply from board. Check transducer output and ground. Replace transducer if voltage checks out good.                                         |
| ALM035 | 5                   | 5                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-035 Sensor Fault - Oil Sump Temp A                | Oil Sump temperature (TEMP_OILTSMPTA) is outside range.                                            | Verify continuity to circuit board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature.     |
| ALM041 | 5                   | 5                | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-041 Sensor Fault - Vaporizer Temp Cir A           | Vaporizer temperature (TEMP_VAP_TEMP) is outside range.                                            | Verify continuity to circuit board. Verify voltage and ohm reading across sensor. Replace sensor if ohm reading is incorrect based on temperature.     |
| ALM042 | 5                   | 5                | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-042 Sensor Fault - Condenser Liquid Level Input A | Units with TP compressors only. Condenser liquid level sensor voltage is outside the normal range. | Verify level sensor resistance. Resistance between red and black wires across the sensor should be approximately 1800 ohms when unconnected.           |

**Table 11 — PIC6 Alarm Codes (cont)**

| CODE   | HITS TO<br>ACTIVATE | HITS TO<br>RESET | RESET TYPE | RESPONSE                             | MESSAGE                                                                                                                       | TRIP CONDITION                                                                                                                                                                                                                                                                                                        | TROUBLESHOOTING                                                                                                                                                                                                      |
|--------|---------------------|------------------|------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ALM101 | 0                   | 0                | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-101 LEN Scan Error                                                                                                        | An error was detected in the LEN serial driver                                                                                                                                                                                                                                                                        | Cycle power.                                                                                                                                                                                                         |
| ALM102 | 5                   | 2                | AUTOMATIC  | Prevent Circuit Startup or Hard Stop | ALM-102 VFD Fault - Lost Communication With VFDA1<br>OR<br>Configuration Error DRVA1<br>OR<br>Partial Loss of Coms with DRVA1 | Communication between main controller with VFDA1 lost for 10 consecutive seconds                                                                                                                                                                                                                                      | Verify comm wiring. Verify correct terminations at VFD. Verify grounding to comm wire leg. Enable auto restart so unit restarts automatically once comm has been reestablished. Power Cycle VFD and PIC6 controller. |
| ALM107 | 10                  | 10               | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-107 Coms Loss - Lost Communication With IOB1                                                                              | Communication between main controller with IOB1 lost for 10 consecutive seconds                                                                                                                                                                                                                                       | Verify that green LED on board does not flash. Inspect LEN wiring between SIOB and 1IOB. Power cycle boards. Verify address on board.                                                                                |
| ALM108 | 10                  | 10               | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-108 Coms Loss - Lost Communication With IOB2                                                                              | Communication between main controller with IOB2 lost for 10 consecutive seconds                                                                                                                                                                                                                                       | Verify that green LED on board does not flash. Inspect LEN wiring between 1IOB and 2IOB. Power cycle boards. Verify address of board.                                                                                |
| ALM115 | 10                  | 10               | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-115 Coms Loss - Lost Communication With SIOB1                                                                             | Communication between main controller with SIOB1 lost for 10 consecutive seconds                                                                                                                                                                                                                                      | Verify that green LED on board does not flash. Inspect LEN wiring to SIOB.                                                                                                                                           |
| ALM117 | 10                  | 10               | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-117 Modbus Client Coms Error                                                                                              | An error was detected in the Modbus Client driver                                                                                                                                                                                                                                                                     | Power cycle PIC6 controller.                                                                                                                                                                                         |
| ALM118 | 10                  | 10               | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-118 Modbus Server Coms Error                                                                                              | An error was detected in the Modbus Server driver                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                      |
| ALM202 | 0                   | 0                | AUTOMATIC  | Prevent Unit Startup or Hard Stop    | ALM-202 Invalid Model/Serial Number                                                                                           | Model number or serial number does not pass validation checks                                                                                                                                                                                                                                                         | Retype model and serial number in accordance with chiller nameplate.                                                                                                                                                 |
| ALM302 | 10                  | 10               | MANUAL     | Prevent Circuit Startup or Hard Stop | ALM-302 ECO EXV Motor Fault Cir A                                                                                             | The Motor Failure can occur in the following cases: Overcurrent protection; Thermal shutdown; Undervoltage Lockout                                                                                                                                                                                                    | EXV motor windings resistance should be 52 Ohms ( $\pm 10\%$ ) for coil A and coil B. If motor is faulty a new part is required.                                                                                     |
| ALM304 | 0                   | 0                | MANUAL     | Prevent Circuit Startup or Hard Stop | ALM-304 EXV Motor Fault Cir A                                                                                                 | The Motor Failure can occur in the following cases: Overcurrent protection; Thermal shutdown; Undervoltage Lockout:                                                                                                                                                                                                   | EXV motor windings resistance should be 52 Ohms ( $\pm 10\%$ ) for coil A and coil B. If motor is faulty a new part is required.                                                                                     |
| ALM401 | 0                   | 0                | MANUAL     | Prevent Circuit Startup              | ALM-401 Prestart Failure - Low Oil Pressure at Startup Cir A                                                                  | The system shall prevent the unit from starting if ALL of the following are TRUE:<br><ul style="list-style-type: none"> <li>Oil Differential Pressure (PRESSURE_OIL_PD_A) &lt; 18 psi (124.1 kPa)</li> <li>Oil Pump is ON (OUTPUTS_OILR) for Oil Pressure Verification Time*</li> </ul> * Default value is 60 seconds | Check oil pump operation, check oil level, check oil filters, check for frequent start/stop of unit which will prevent proper oil recovery.                                                                          |
| ALM501 | 0                   | 0                | MANUAL     | Prevent Circuit Startup or Hard Stop | ALM-501 Protective Limit - Compressor Reverse Rotation Cir A                                                                  | Discharge pressure (PRESSURE_DIS_P_A) drops more than 2 psi for five consecutive seconds after VFDSTART (CMPA1CTL_cmd) > 0. This alarm checking occurs up to 20 seconds after the start command.                                                                                                                      | Reverse connections of any two VFD load connections.                                                                                                                                                                 |
| ALM503 | 3                   | 4                | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-503 Protective Limit - Emergency Stop                                                                                     | When any of the emergency stop sources are set to TRUE. Local Emergency Stop (APP_LocalEstop); CCN Emergency Stop (PROTOCOL_CCNESTOP); BACnet Emergency Stop (PROTOCOL_BACESTOP); Modbus Emergency Stop (PROTOCOL_MODESTOP); Remote Emergency Stop (INPUTS_E_STOP).                                                   | Emergency Stop Input. Investigate cause of emergency stop prior to restart of unit.                                                                                                                                  |
| ALM505 | 0                   | 4                | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-505 Protective Limit - Low Chilled Water Flow                                                                             | Compressor operation is allowed AND (HYDRCFG_eflo_vt) has expired<br>AND IF (HYDRCFG_evapfdtp) = 1 and (INPUTS_EVAP_FSW) is FALSE<br>OR IF (HYDRCFG_evapfdtp) = 2 and (PRESSURE_EVAP_WDP) < (HYDRCFG_evapfldp)<br>OR IF (HYDRCFG_evapfdtp) = 3 and (INPUTS_EVAP_FL) < (HYDRCFG_evapfgpm)                              | Verify setting in Hydronics Configuration.                                                                                                                                                                           |

**Table 11 — PIC6 Alarm Codes (cont)**

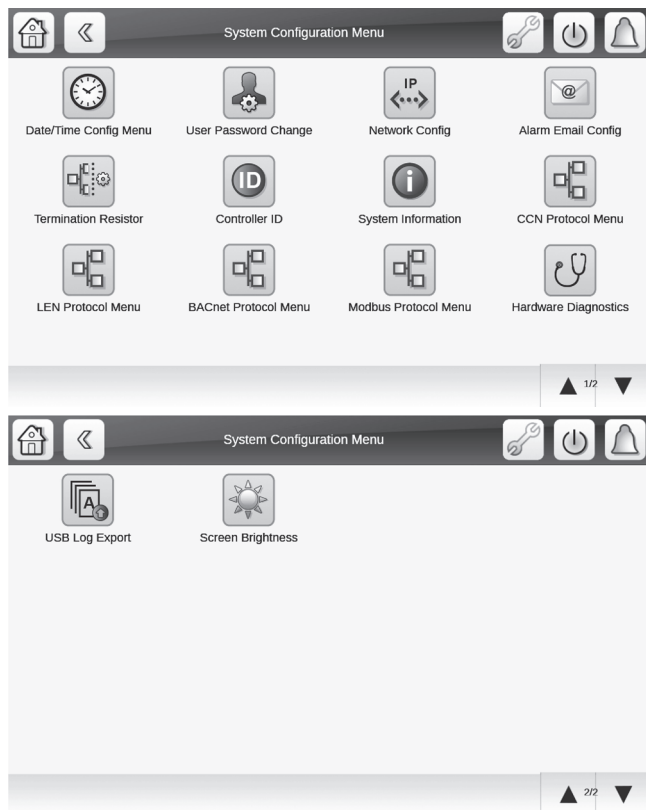
| CODE   | HITS TO ACTIVATE | HITS TO RESET | RESET TYPE | RESPONSE                             | MESSAGE                                                  | TRIP CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | TROUBLESHOOTING                                                                    |
|--------|------------------|---------------|------------|--------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| ALM506 | 0                | 4             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-506 Protective Limit - Low Condenser Water Flow      | Compressor operation is allowed AND (HYDRCFG_cflo_vt) has expired AND IF (HYDRCFG_condfdtp) = 1 and (INPUTS_COND_FSW) is FALSE OR IF (HYDRCFG_condfdtp) = 2 and (PRESSURE_COND_WDP) < (HYDRCFG_condfldp) OR IF (HYDRCFG_condfdtp) = 3 and (INPUTS_COND_FL) < (HYDRCFG_condfgpm)                                                                                                                                                                                                                | Verify setting in Hydronics Configuration. Verify flow pressure drop through unit. |
| ALM507 | 10               | 4             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-507 Protective Limit - Refrigerant Leak              | REFRIGERANT LEAK OPTION is ENABLED and REFRIGERANT LEAK SENSOR > REFRIG LEAK ALARM mA (leak_ma)                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                    |
| ALM508 | 10               | 4             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-508 Protective Limit - Spare Safety Device           | Spare safety input on SIOB goes to Open when Spare Safety Option Enabled Service Config menu                                                                                                                                                                                                                                                                                                                                                                                                   | Spare Safety is Normally Closed i.e., Alarm if input is open                       |
| ALM509 | 0                | 0             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-509 Protective Limit - Stop Override                 | Stop override (stp_over) is enabled                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                    |
| ALM510 | 0                | 0             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-510 Protective Limit - Swift Restarts Limit Exceeded | Chiller swift restart counter > 4 in one hour                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                    |
| ALM511 | 0                | 0             | MANUAL     | Prevent Circuit Startup or Hard Stop | ALM-511 Protective Limit - Compressor Motor Stall Cir A  | A compressor stall is detected when the MOTOR CURRENT (DRVA1STS_MOT_CUR) OR (STRTSTS_MOT_CUR) increases by DELTA AMPS PERCENT over a 1 second interval. If COMPRESSOR STALL COUNT (CMPA1CTL_stall_ct) = 5 in STALL TIME PERIOD chiller will shut down. DELTA AMPS PERCENT = 10% and STALL TIME PERIOD = 8 min.                                                                                                                                                                                 |                                                                                    |
| ALM513 | 0                | 4             | MANUAL     | Prevent Circuit Startup or Hard Stop | ALM-513 Protective Limit - Condenser Freeze Cir A        | System maintains CRT (TEMP_CND_ST_A) at or above the Condenser Freeze Point subject to ALL of the following:<br><ul style="list-style-type: none"> <li>Unit is not in pumpdown (GENUNIT_STATUS != 11)</li> <li>Unit is not in pumpdown lockout (GENUNIT_STATUS != 12) with Condenser Freeze Protection disabled (HYDRCFG_cnd_fz_d)</li> <li>CRT &lt; Condenser Freeze Point (34°F). If evaporator fluid type is set to water (SERVICE1_flui_typ = 0), this alarm will be generated.</li> </ul> |                                                                                    |
| ALM515 | 0                | 4             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-515 Protective Limit - Evaporator Freeze Cir A       | System prevents unit from operating if ANY of the following are TRUE:<br><ul style="list-style-type: none"> <li>EEFT (TEMP_ECW) &lt; Fluid Freeze Point + 0.55°C (1°F)</li> <li>ELFT (TEMP_LCW) &lt; Fluid Freeze Point + 0.55°C (1°F)</li> </ul>                                                                                                                                                                                                                                              |                                                                                    |
| ALM517 | 0                | 0             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-517 Protective Limit - High Discharge Pressure Cir A | System maintains DST (TEMP_DIS_ST_A) at or below the maximum value given by the Compressor Envelope (CMPA1CTL_eDSTMx) at all times during compressor operation.                                                                                                                                                                                                                                                                                                                                |                                                                                    |
| ALM519 | 0                | 0             | MANUAL     | Prevent Unit Startup or Hard Stop    | ALM-519 Protective Limit - High Suction Pressure Cir A   | System maintains SST (TEMP_EVP_ST_A) at or below the maximum value given by the Compressor Envelope subject to operation above compressor envelope maximum SST (CMPA1CTL_eSSTMx) ≥ 1 hour cumulative                                                                                                                                                                                                                                                                                           |                                                                                    |
| ALM521 | 10               | 4             | MANUAL     | Prevent Circuit Startup or Hard Stop | ALM-521 Protective Limit - High Condenser Pressure Cir A | System maintains Condenser Pressure (PRESSURE_CND_P_A) at or below Condenser Maximum Pressure* subject to ALL of the following:<br><ul style="list-style-type: none"> <li>Unit is not in pumpdown (GENUNIT_STATUS != 11)</li> <li>Unit is not in pumpdown lockout (GENUNIT_STATUS != 12) with Condenser Freeze Protection (HYDRCFG_cnd_fz_d) disabled</li> </ul> *Default 1000 kPa (145 psi) - FIXED                                                                                           |                                                                                    |

**Table 11 — PIC6 Alarm Codes (cont)**

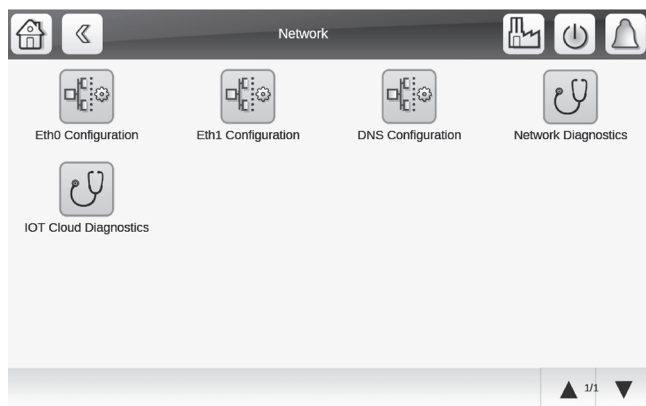
| CODE   | HITS TO<br>ACTIVATE | HITS TO<br>RESET | RESET TYPE | RESPONSE                                | MESSAGE                                                            | TRIP CONDITION                                                                                                                                                                                                                                                                                                                                                 | TROUBLESHOOTING |
|--------|---------------------|------------------|------------|-----------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| ALM523 | 10                  | 4                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-523 Protective<br>Limit - High Discharge<br>Temp Cir A         | Chiller is running AND compressor<br>discharge temperature sensor is in<br>range AND compressor discharge<br>temp (TEMP_DGT_A) > 140°F.<br>System maintains DT at or below<br>Compressor Maximum Discharge<br>Temperature* at all times** during<br>compressor operation.<br>* Default 60°C (140°F)<br>** Except for 30 seconds following<br>compressor start. |                 |
| ALM525 | 10                  | 4                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-525 Protective<br>Limit - High Motor<br>Temperature Cir A      | System maintains Compressor Motor<br>Temperature* (TEMP_MTRW_A) at<br>or below Compressor Motor<br>Maximum Temperature at all times<br>during compressor operation.<br>* Default 93.3°C (200°F). Threshold,<br>hysteresis, and persistence are<br>configurable.                                                                                                |                 |
| ALM529 | 0                   | 0                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-529 Protective<br>Limit - Low Disch<br>Pressure Cir A          | System maintains DST<br>(TEMP_DIS_ST_A) at or above the<br>lower limit given by the Compressor<br>Envelope (CMPA1CTL_eDSTMn)<br>subject to operation below<br>compressor envelope minimum<br>DST(CMPA1CTL_eDSTMn) ≥<br>10 minutes                                                                                                                              |                 |
| ALM531 | 10                  | 4                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-531 Protective<br>Limit - Low Evap<br>Refrigerant Temp Cir A   | System maintains ERT<br>(TEMP_EVAP_T_A) no less than<br>0.55°ΔC [1.0°ΔF] above the freeze<br>point (SERVICE1_freezesp) of the<br>chilled fluid subject to operation<br>below (fluid freeze point<br>(SERVICE1_freezesp) + 0.55°ΔC<br>[1.0°ΔF]) ≥ 60 seconds at startup                                                                                         |                 |
| ALM535 | 0                   | 4                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-535 Protective<br>Limit - Low Oil Pressure<br>Difference Cir A | System ceases operation when the<br>Oil Differential Pressure<br>(PRESSURE_OIL_PD_A) <<br>(PRESSURE_OILPA1RQ) while the<br>following is TRUE:<br>• Oil Pump is ON (23XRV ONLY); -<br>Compressor is ON<br>• PRESSURE_OILPA1RQ is fixed<br>at 15 psi                                                                                                             |                 |
| ALM545 | 0                   | 0                | MANUAL     | Hard Stop                               | ALM-545 Protective<br>Limit - Evap Reverse<br>Flow                 | TEMP_ECW < TEMP_LCW after<br>running for 60 sec                                                                                                                                                                                                                                                                                                                |                 |
| ALM546 | 0                   | 0                | MANUAL     | Hard Stop                               | ALM-546 Protective<br>Limit - Cond Reverse<br>Flow                 | TEMP_LCDW < TEMP_ECDW after<br>running for 60 sec                                                                                                                                                                                                                                                                                                              |                 |
| ALM547 | 0                   | 0                | MANUAL     | Hard Stop                               | ALM-547 Protective<br>Limit - Compressor A<br>Feedback             | Feedback from compressor has not<br>been received after 10 seconds of<br>sending command. This could be a<br>signal that there is a communication<br>issue to starter or VFD.                                                                                                                                                                                  |                 |
| ALM550 | 0                   | 0                | MANUAL     | Hard Stop                               | ALM-550 Protective<br>Limit - VFD A Speed<br>Out Of Range          | This fault detection is enabled only<br>during steady state conditions; hence<br>this fault is not monitored during<br>compressor speed ramp up and<br>ramp down.<br>(DRVA1STS_SPD) ><br>((CMPA1CTL_cmd) + VFD Speed<br>Alert Dead band*) for 75 sec.<br>* Default 10%                                                                                         |                 |
| ALM801 | 0                   | 0                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-801 VFD Fault -<br>VFD A1 Fault1                               | First fault detected in VFDA1.                                                                                                                                                                                                                                                                                                                                 |                 |
| ALM802 | 0                   | 0                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-802 VFD Fault -<br>VFD A1 Fault2                               | Second fault detected in VFDA1.                                                                                                                                                                                                                                                                                                                                |                 |
| ALM803 | 0                   | 0                | MANUAL     | Prevent Circuit Startup<br>or Hard Stop | ALM-801 VFD Fault -<br>VFD A1 Fault3                               | Third fault detected in VFDA1.                                                                                                                                                                                                                                                                                                                                 |                 |
| ALM901 | 0                   | 0                | MANUAL     | Prevent Unit Startup or<br>Hard Stop    | ALM-901 JSON Error -<br>Parsing Error                              |                                                                                                                                                                                                                                                                                                                                                                |                 |
| ALM902 | 0                   | 0                | MANUAL     | Prevent Unit Startup or<br>Hard Stop    | ALM - 902 Software<br>Exception [populated at<br>runtime]          | Any exception from the application<br>(variable text)                                                                                                                                                                                                                                                                                                          |                 |
| ALM903 | 0                   | 0                | MANUAL     | Prevent Unit Startup or<br>Hard Stop    | ALM-903 Protective<br>Limit - UI Freeze<br>Reboot                  | UI is frozen more than 60 seconds.                                                                                                                                                                                                                                                                                                                             |                 |

## CONTROLLER SETTINGS

The controller settings are accessible through the System Config Menu (Service password access required). See Fig. 61 and 62.



**Fig. 61 — System Configuration Menu**



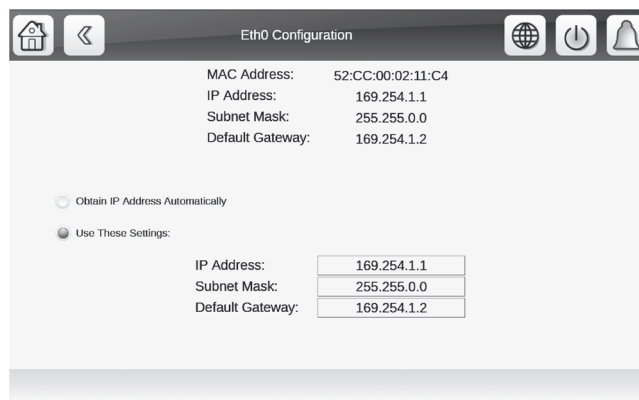
**Fig. 62 — Network Menu**

### Unit IP Address

On the System Config Menu screen, press Network Configuration to display the network parameters. See Fig. 63.

NOTE: You must request an IP address, the subnet mask, and the default gateway from the system administrator before connecting the unit to the local Ethernet network.

To change IP address manually, select the applicable ethernet configuration port from the Network Menu. See Fig. 63.

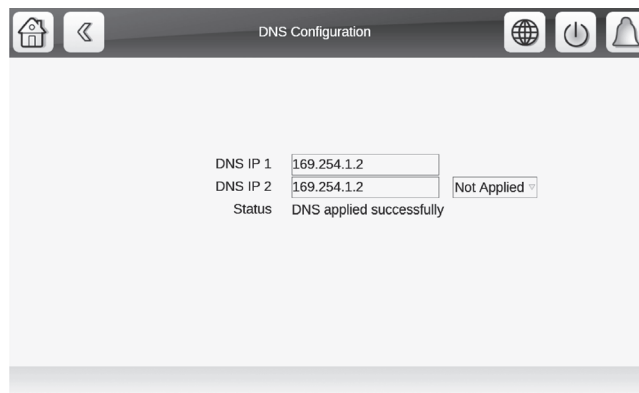


**Fig. 63 — Ethernet Configuration**

Enter the new address, Subnet Mask, and Default Gateway and validate it by pressing OK and Save. Return to the Network screen and enter the subnet mask and default gateway using the same method. Then return to the application and save the changes.

### DNS Configuration

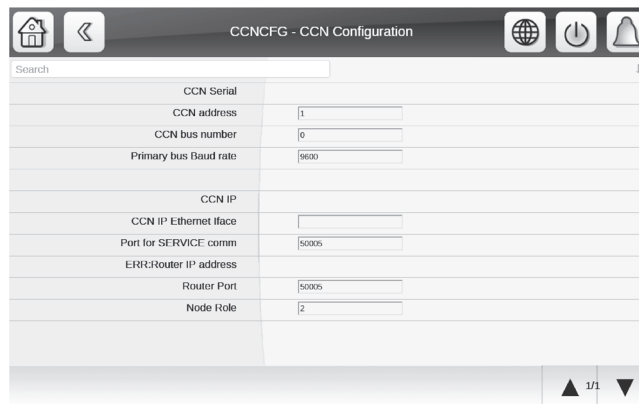
Select DNS Configuration from the Network Menu and change the DNS IP to desired value and then select OK and then Apply. Status will be updated accordingly. See Fig. 64.



**Fig. 64 — DNS Configuration**

### CCN Configuration

To modify the CCN configuration, select CCN Protocol Menu from the System Configuration Menu. The PIC6 CCN address, bus number and baud rate and be adjusted as per requirements. See Fig. 65.



**Fig. 65 — Control Identification Screen**

Building Automation System Communication

The PIC6 controller has onboard interface capability to communicate with building automation systems without the need for a third party translator. The controller can communicate via the following protocols: BACnet MS/TP (Master-Slave/Token-Passing), BACnet/IP (internet protocol), Modbus RTU (remote terminal unit) and Modbus TCP/IP (Transmission Control Protocol/Internet Protocol).

Establishing communication between a site building automation system and the PIC6 controller is not part of the standard Carrier startup process. If it is necessary to support chiller control integration with the site building automation system, it will require a request from the Carrier Service Office/Distributor for a control technician to complete this task and additional charges will apply.

Both BACnet and Modbus configuration menus can be selected from System Configuration Menu.

BACnet MS/TP and Modbus RTU interface with PIC6 Port J8.

BACNET MS/TP

Adjust MS\_TP MAC address. The MAC (media address control), MS\_TP Baud Rate as required and keep MS\_TP Max Masters as low as possible to limit the associated bandwidth with master polling. See Fig. 66.

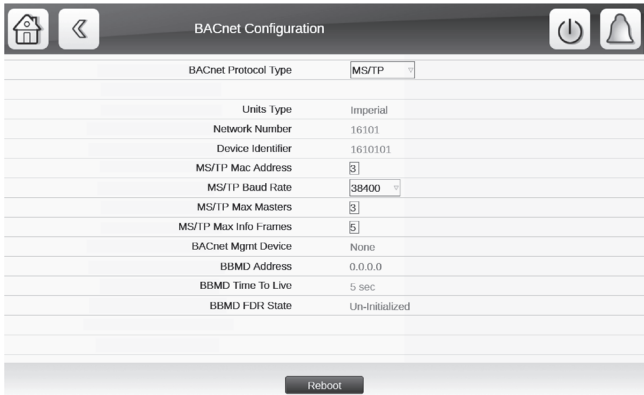


Fig. 66 — BACnet MS/TP

BACNET IP

Adjust IP Config and DNS servers for proper communication and if an IP BACnet Broadcast Management Device (BBMD) is utilized configure this as well. Select Reboot to configure the selected parameters. See Fig. 67.

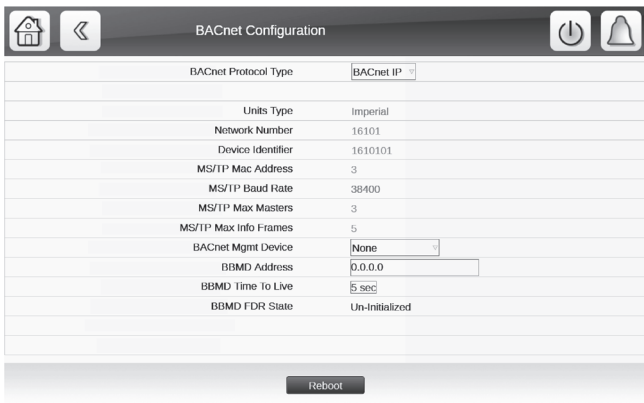


Fig. 67 — BACnet IP

MODBUS RTU

Select Baudrate, parity, stop bit, units, Register Bit Mode, Real Type, Swap Endian and click Reboot. See Fig. 68.

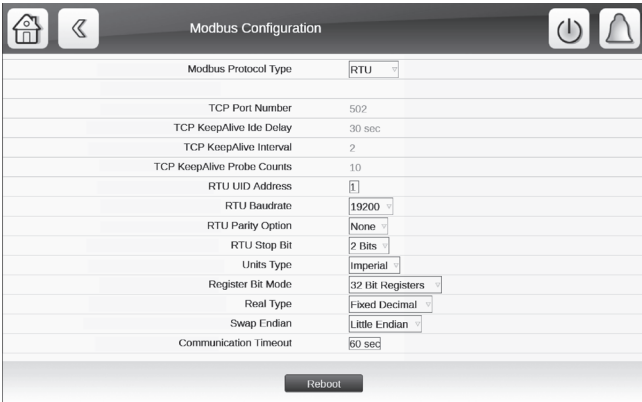


Fig. 68 — Modbus RTU

MODBUS TCP

Adjust IP Config and DNS servers for proper communication. Adjust TCP Port Number, Units, Register Bit Mode, Real Type, Swap Endian as required and click Reboot to configure. See Fig. 69.

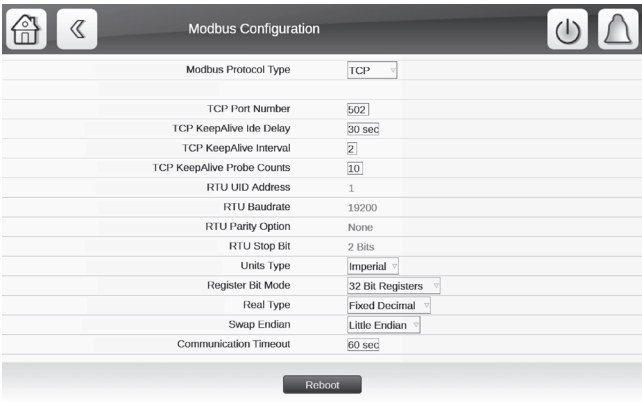


Fig. 69 — Modbus TCP

TOUCH SCREEN CALIBRATION

Depending on the user and the position of the panel, it may be necessary to calibrate the touch screen if the cursor does not move precisely with the user’s touch. When the user presses and holds an inactive part of the screen for 10 seconds, the screen will turn black with white text displaying “Calibrating Touch Screen” and white cross hairs. Touch the center of the cross-hair sight with a touch pen or similar blunt-ended stylus (do not use a metal object). When the cross-hair sight is touched, it moves to a new position; touch the center of the cross hairs again. When all positions have been configured, the calibration is complete and the screen returns to the Home Screen.

COMMUNICATION PROBLEMS

Hardware Problems

See Table 12 for potential communication issues caused by hardware problems.

Web Interface Problems

See Table 13 for potential communication issues caused by web interface issues. The intranet site of the unit is the IP address (see Unit IP Address on page 36).

NOTE: The unit cannot automatically obtain the network parameters via a DHCP server.

**Table 12 — Hardware Problems**

| SYMPTOMS                                                                                 | POSSIBLE CAUSES                                                                              | CHECKS                                                                                                            | SOLUTIONS                                                |
|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| The unit does not respond to the instructions sent by the supervision PC on the CCN bus. | Problem at the RS485 converter level of the PC or connection problem on the primary CCN bus. | Check the CCN cable connections. The unit CCN address is 0.1 and the communication speed is 9600 baud by default. | Replace the RS485 connector.                             |
| Communication problem when connecting two buses (primary bus and secondary bus).         | Electrical problem between 0-v CCN of the primary bus and 0-v CCN of the secondary bus.      | Check the connection of the metal part of the interface casing to earth.                                          | Connect the metal part of the interface casing to earth. |

**Table 13 — Web Interface Problems<sup>a,b</sup>**

| SYMPTOMS                                                                                                          | POSSIBLE CAUSES                                                                                                                              | CHECKS                                                                                                                                                     | SOLUTIONS                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Start-up page loads, then goes to fault state.                                                                    | Network property details are not valid.                                                                                                      | Check the network parameters (see the section Ethernet/IP Connection Problems on page 38).                                                                 | Contact your system administrator.                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                   | Ethernet network is not available.                                                                                                           | Check to see if the orange LED on the unit is flashing.                                                                                                    | Check the Ethernet connection to the local network if the orange LED does not flash.                                                                                                                                                                                                                                                                                                                          |
| While accessing the unit via the web browser, the Java platform launches, but remains blocked. No file is loaded. | Proxy server problem in the local network.                                                                                                   | Contact your system administrator.                                                                                                                         | In agreement with the system administrator, open the Runtime Java control panel and select Direct Connection in the system parameters and/or request in the web browser ( <b>Tools</b> → <b>Options</b> → <b>Connection</b> → <b>System parameters</b> ) that no proxy server is used to go to the local addresses. If possible, uncheck "use of an automatic configuration script." Restart the web browser. |
| The application has been launched, but the screens are not shown in the web browser.                              | A proxy server is used to access the unit and this supplies the old screens to the browser. Incorrect configuration of the Java application. | Check that the web browser does not go via a proxy server to access the unit. Check that the Java application does not store the internet files on the PC. | Open the browser and in the system connection parameters add the IP address of the unit in the proxy exceptions. ( <b>Tools</b> → <b>Options</b> → <b>Connection</b> → <b>System parameters</b> → <b>"No proxy for"</b> ). See the section Java Application Configuration on page 40.                                                                                                                         |

NOTE(S):

- a. The unit cannot automatically obtain the network parameters via a DHCP (Dynamic Host Configuration Protocol) server.
- b. The intranet site address of the unit is the IP address.

## Ethernet/IP Connection Problems

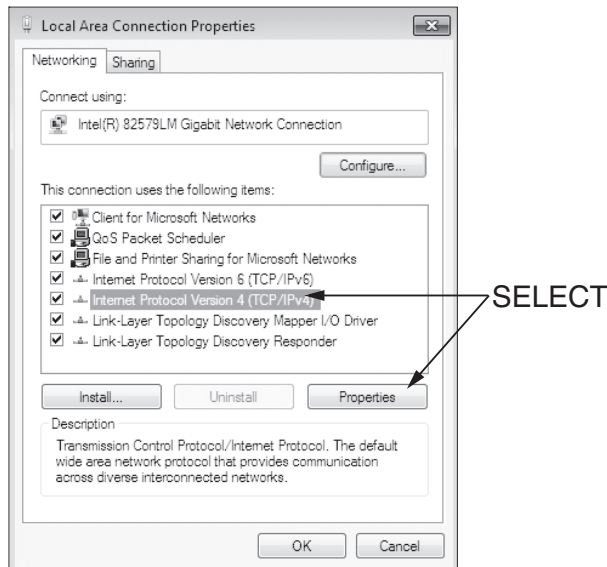
Use the following methods to troubleshoot:

### UNIT IS POINT-TO-POINT CONNECTED TO A PC

Ensure controller is powered on prior to configuration and check Ethernet connection and PC Network Interface Card (NIC).

NOTE: In addition to the following procedure, it may be necessary to check the Ethernet connection and/or configure the PC network board.

In Network Settings, open Local Area Connection Properties. Select Internet Protocol and click Properties. See Fig. 70.

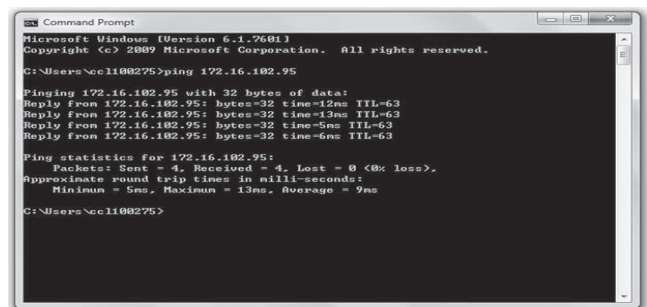


**Fig. 70 — Local Area Connection Properties**

The Internet Protocol Properties window is displayed.

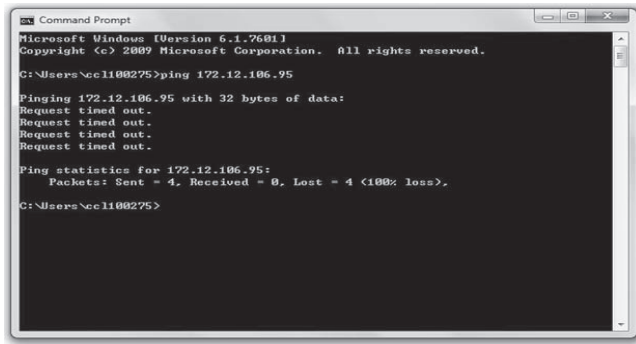
- If no IP address is configured in the General and Alternative Configuration tabs, the unit IP address must be configured to 169.254.xxx.xxx. Modify the unit IP address and then restart the system.
- If the PC has a fixed IP address configured in one of the two tabs (General and Alternative Configuration), the IP address of the PC and the unit IP address must have the system and sub-system fields in common. The last part of the IP address is the host number and must be unique on the sub-system. For example: Unit address — 172.30.101.11 and PC address — 172.30.101.182. In this example, 172.30 corresponds to the network, and 101 corresponds to the sub-system. Carry out the necessary modifications and try to access the unit again.

In the case of a problem, open a Windows command window (Start, Execute, type **cmd** and press Enter), then type the command **ping**, followed by the unit IP address. In the example shown in Fig. 71, the PC receives four positive responses (replies).



**Fig. 71 — Ping — Positive Replies**

In the example shown in Fig. 72, the PC receives four negative responses (request timed out).



**Fig. 72 — Ping — Negative Responses**

If the PC receives four negative responses, check the internet browser parameters to determine if a proxy server or an automatic configuration script has been configured. If this is the case:

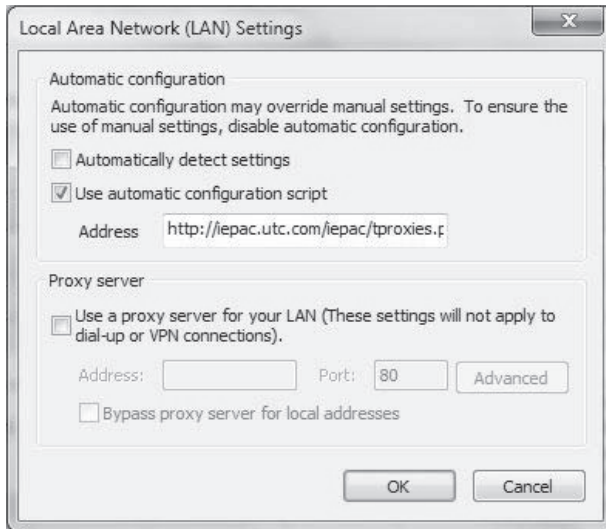
- Deselect the proxy server or the configuration script and restart the browser,
- Or refer to the section Java Application Configuration (page 40).

Try to access the unit again. If the PC still does not receive a response from the unit, restart the unit. Contact your system administrator.

#### UNIT IS CONNECTED TO THE LOCAL NETWORK

The unit is connected to the local network by an uncrossed cable, and the unit is energized. Open a Windows command window (Start, Execute, type **cmd** and press Enter), then type the command **ping**, followed by the unit IP address.

If the responses are positive (see Fig. 71), the internet browser configuration is faulty. Check the system parameters of the internet browser to determine if a proxy server or an automatic configuration script has been configured (**Tools**→**Internet Options**→**Connections**→**System Parameters**). See Fig. 73.

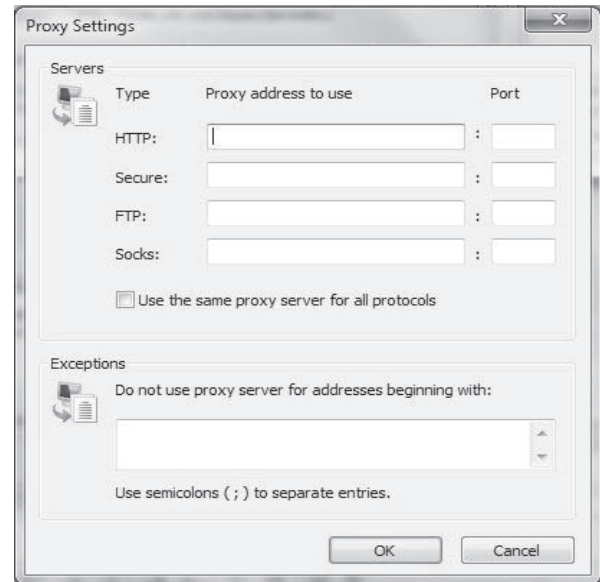


**Fig. 73 — Local Area Network Settings**

If a proxy server is used, add the unit IP address to the exceptions list of the proxy server (advanced proxy configuration). See Fig. 74.

If a configuration script is used, it is not possible to add the unit IP address to the exceptions list. In this case, see the section Java Application Configuration below.

If the response to the “ping” command is negative, verify the IP address of the PC and the IP address of the unit. They must have the system network and sub-system in common. The last part of the IP address is the host number and must be unique on the sub-system; for example: Unit address — 172.30.101.11 and PC address — 172.30.101.182. In this example, 172.30 corresponds to the system network, and 101 corresponds to the sub-system. The host numbers are 11 and 182 respectively.



**Fig. 74 — Proxy Settings**

#### ETHERNET CONNECTION ON THE PC

Open the network configuration window of the PC and double-click Network Connections. Find the system interface board and check that no red “X” appears on the icon.

The connection to the local network must be authorized and in the connected status. If this is not the case, check the connections and authorize/repair the network connection.

## JAVA APPLICATION CONFIGURATION

Open the Internet configuration window of the PC and double-click the Java application icon. If Java is not installed, a free download is available at <http://www.java.com>.

If Java has already been installed, check if it is used by other applications. If so, check that these are compatible with the following settings in the Java control panel. See Fig. 75.

- Network settings: In the Java Control Panel, click Network Settings. Select a direct connection to bypass the proxy server or select the automatic configuration script. See Fig. 76.
- Temporary internet files: In the Java Control Panel, click Settings in the Temporary Internet Files section. Be sure the setting **Keep temporary files on my computer** is unchecked (clear). See Fig. 77.

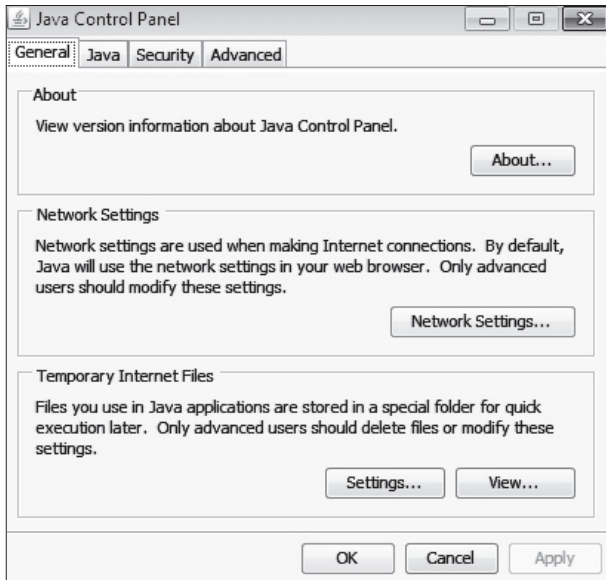


Fig. 75 — Java Control Panel



Fig. 76 — Network Settings

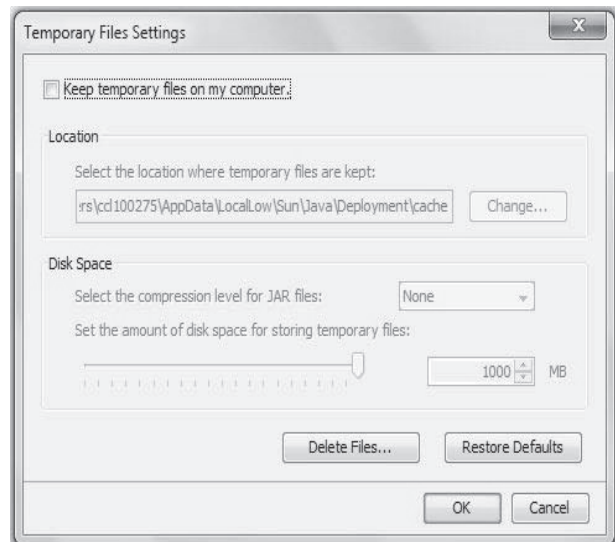
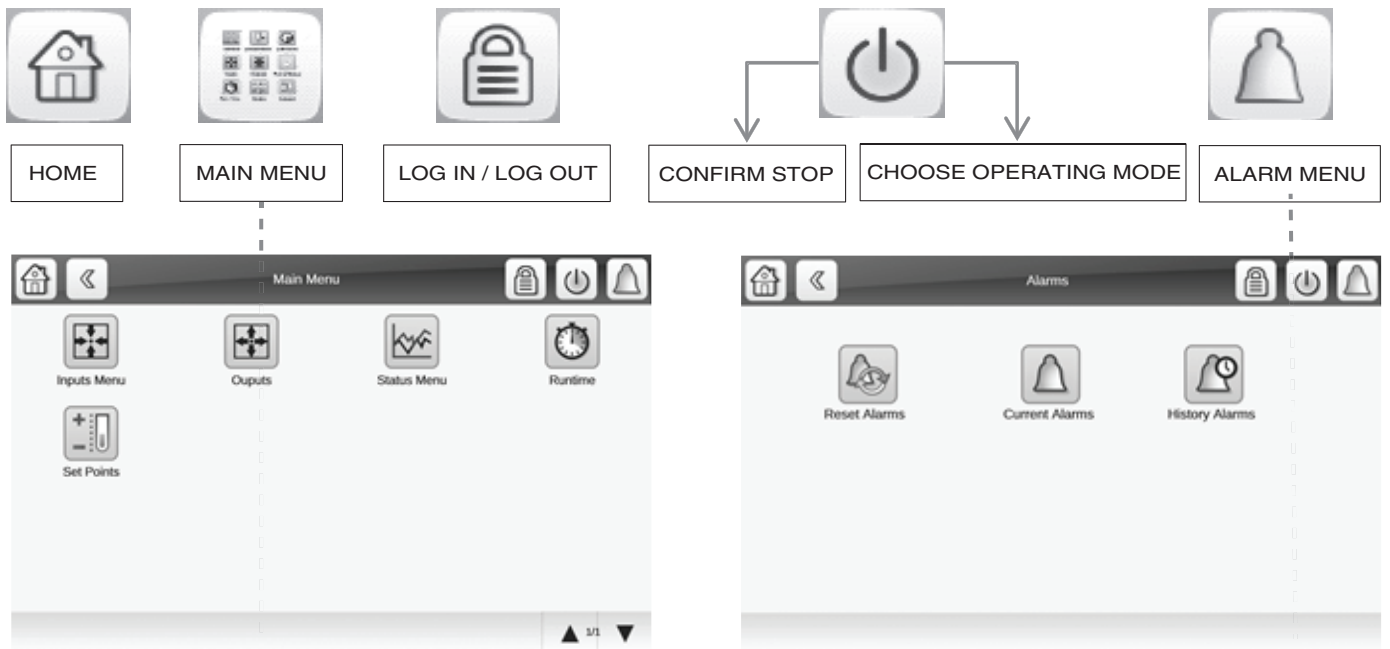
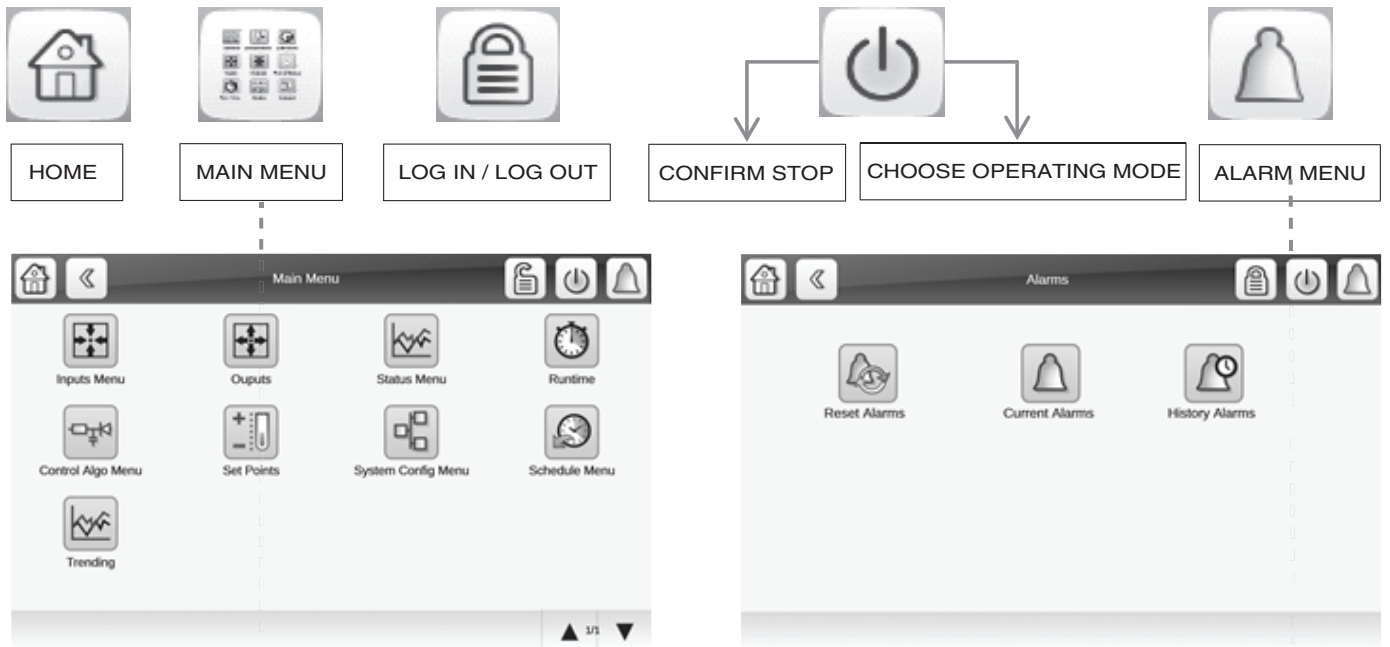


Fig. 77 — Temporary File Settings

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE

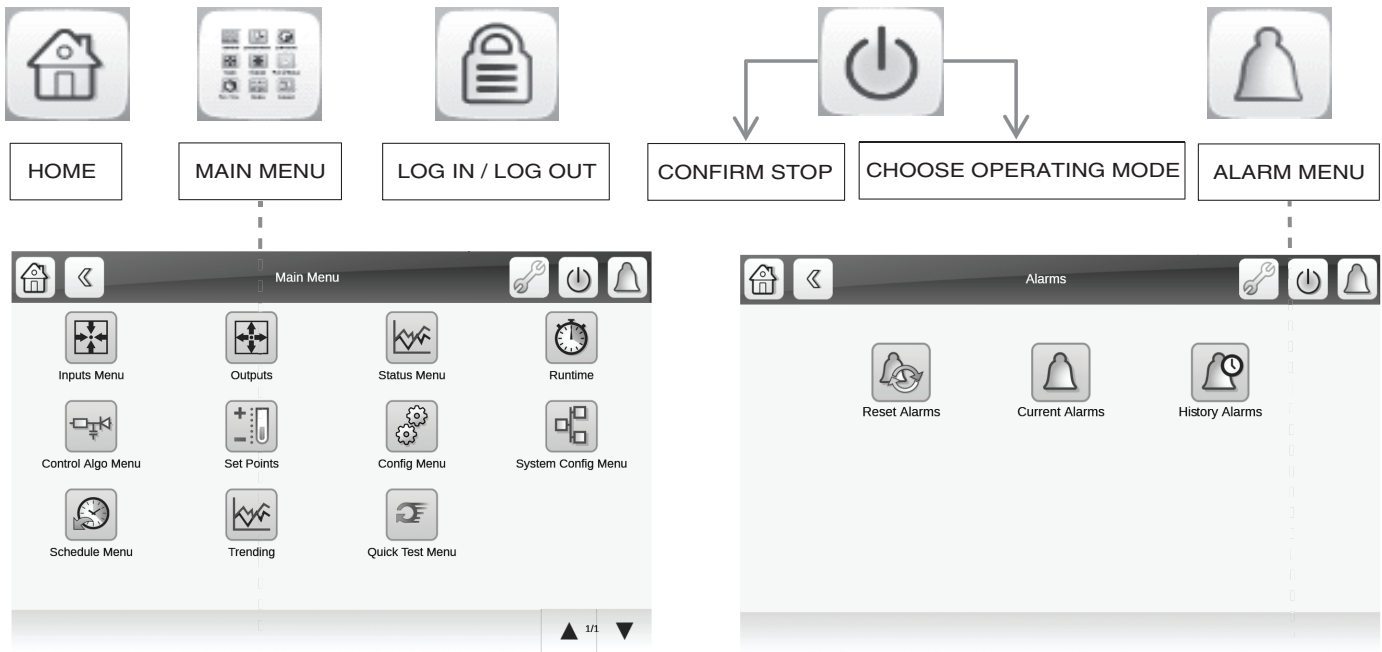


**Fig. A — Screen Structure, Basic Level (All) Access  
(No Password Required)**

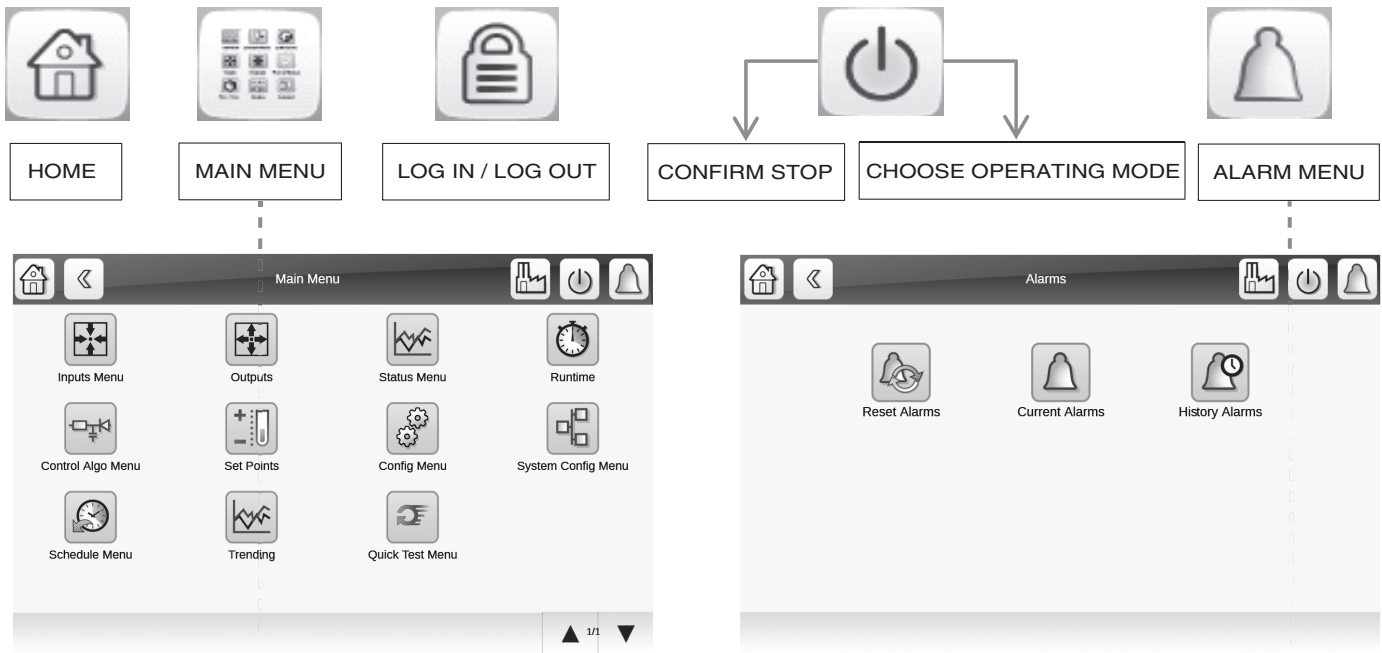


**Fig. B — Screen Structure, User Level Access  
(User Password 1111 Required)**

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)



**Fig. C — Screen Structure, Service Level Access  
(Service Password 1234 or 3333 Required)**



**Fig. D — Screen Structure, Factory User Level Access  
(Factory Password Required; must be deciphered using QR Code after initial 48 hours of powerup)**

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

**Main Menu Description<sup>a</sup>**

| ICON                                                                                | DISPLAYED TEXT <sup>b</sup> | ACCESS           | ASSOCIATED TABLE          |
|-------------------------------------------------------------------------------------|-----------------------------|------------------|---------------------------|
|    | Inputs Menu                 | All              | Inputs Menu               |
|    | Outputs                     | All              | OUTPUTS                   |
|    | Status                      | All              | Status                    |
|    | Runtime                     | All              | RUNTIME                   |
|    | Control Algo Menu           | User             | Control Algorithm Menu    |
|    | Setpoint                    | All              | SETPOINT                  |
|    | Configuration Menu          | Service, Factory | Configuration Menu        |
|    | System Configuration Menu   | User, Service    | System Configuration Menu |
|    | Schedule Menu               | User             | Occupancy Schedule        |
|   | Trending                    | User             | TRENDING                  |
|  | Quick Test Menu             | Service          | Quick Test Menu           |

NOTE(S):

- a. In most cases User login does not gain access to all configurations screens in a given menu.
- b. Displayed text depends on the selected language (default is English).

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

NOTE: The PIC6 controls platform is utilized across multiple product lines. In this appendix, all PIC6 software lines are shown, as configured for 23XR software. Not all lines may be applicable for the 23XR product.

### Temperature

CCN TABLE NAME: TEMP

PIC6 PATH: Main Menu → Inputs Menu → Temperature



| LINE | PIC6 DESCRIPTION          | CCN NAME   | RANGE | DEFAULT VALUE | UNIT | READ/WRITE |
|------|---------------------------|------------|-------|---------------|------|------------|
| 1    | Entering Chill Water Temp | ECW        | —     | —             | °F   | RO         |
| 2    | Leaving Chill Water Temp  | LCW        | —     | —             | °F   | RO         |
| 3    | Entering Cond Water Temp  | ECDW       | —     | —             | °F   | RO         |
| 4    | Leaving Cond Water Temp   | LCDW       | —     | —             | °F   | RO         |
| 5    | Remote Reset Temp         | R_RESET    | —     | —             | °F   | RO         |
| 6    | Evap Rfrg Liq Temp A      | EVAP_T_A   | —     | —             | °F   | RO         |
| 7    | Evap Saturated Temp A     | EVP_ST_A   | —     | —             | °F   | RO         |
| 8    | Evaporator Approach A     | EVPAPP_A   | —     | —             | °F   | RO         |
| 9    | Discharge Gas Temp A      | DGT_A      | —     | —             | °F   | RO         |
| 10   | Discharge Sat Temp A      | DIS_ST_A   | —     | —             | °F   | RO         |
| 11   | Cond Sat Temp A           | CND_ST_A   | —     | —             | °F   | RO         |
| 12   | Discharge Superheat A     | DSH_A      | —     | —             | °F   | RO         |
| 13   | Condenser Approach A      | CNDAPP_A   | —     | —             | °F   | RO         |
| 14   | Motor Winding Temp A      | MTRW_A     | —     | —             | °F   | RO         |
| 15   | Economizer Gas Temp A     | ECO_T_A    | —     | —             | °F   | RO         |
| 16   | Econ Saturated Temp A     | ECOST_A    | —     | —             | °F   | RO         |
| 17   | Econ Superheat A          | ECO_SH_A   | —     | —             | °F   | RO         |
| 18   | Oil Sump Temp A           | OILTSMPL_A | —     | —             | °F   | RO         |
| 19   | Oil Vaporizer Temp        | VAP_TEMP   | —     | —             | °F   | RO         |

LEGEND

RO — Read Only

### Pressure

CCN TABLE NAME: PRESSURE

PIC6 PATH: Main Menu → Inputs Menu → Pressure



| LINE | PIC6 DESCRIPTION             | CCN NAME | RANGE | DEFAULT VALUE | UNIT | READ/WRITE |
|------|------------------------------|----------|-------|---------------|------|------------|
| 1    | Entering Evap Water Pressure | EVAP_EWP | —     | —             | PSIG | RO         |
| 2    | Leaving Evap Water Pressure  | EVAP_LWP | —     | —             | PSIG | RO         |
| 3    | Evap Water Delta P           | EVAP_WDP | —     | —             | PSIG | RO         |
| 4    | Entering Cond Water Pressure | COND_EWP | —     | —             | PSIG | RO         |
| 5    | Leaving Cond Water Pressure  | COND_LWP | —     | —             | PSIG | RO         |
| 6    | Cond Water Delta P           | COND_WDP | —     | —             | PSIG | RO         |
| 7    | Evaporator Pressure A        | EVAP_P_A | —     | —             | PSIG | RO         |
| 8    | Discharge Pressure A         | DIS_P_A  | —     | —             | PSIG | RO         |
| 9    | Condenser Pressure A         | CND_P_A  | —     | —             | PSIG | RO         |
| 10   | Economizer Pressure A        | ECO_P_A  | —     | —             | PSIG | RO         |
| 11   | Oil Sump Pressure A          | OILPSMPA | —     | —             | PSIG | RO         |
| 12   | Oil Discharge Pressure A     | OIL_DP_A | —     | —             | PSIG | RO         |
| 13   | Oil Press Diff A             | OIL_PD_A | —     | —             | PSIG | RO         |

LEGEND

RO — Read Only

### Inputs

CCN TABLE NAME: INPUTS

PIC6 PATH: Main Menu → Inputs Menu → Inputs



| LINE | PIC6 DESCRIPTION        | CCN NAME | RANGE         | DEFAULT VALUE | UNIT | READ/WRITE |
|------|-------------------------|----------|---------------|---------------|------|------------|
| 1    | Auto Demand Limit Input | AUTO_DEM | 0 to 100      | —             | %    | RO         |
| 2    | Emergency Stop Contact  | E_STOP   | ENABLE_EMSTOP | —             | —    | RO         |
| 3    | Ice Build Contact       | ICE_CON  | NO_YES        | —             | —    | RO         |
| 4    | Refrig Leakage Sensor   | REF_LEAK | 4 to 20       | —             | mA   | RO         |
| 5    | Remote Start/Stop       | REM_CON  | STOP_START    | —             | —    | RO         |
| 6    | Spare Safety Input      | SAFETY   | CLOSE_OPEN    | —             | —    | RO         |
| 7    | Condenser Flow Switch   | COND_FSW | OPEN_CLOSE    | —             | —    | RO         |
| 8    | Evaporator Flow Switch  | EVAP_FSW | NO_YES        | —             | —    | RO         |
| 9    | Cond Liq Lev A          | CNDLVL_A | 0 to 5        | —             | —    | RO         |
| 10   | High Pressure Switch A  | HPS_A    | OPEN_CLOSE    | —             | —    | RO         |

LEGEND

RO — Read Only

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Outputs

CCN TABLE NAME: OUTPUTS

PIC6 PATH: Main Menu → Outputs

| LINE | PIC6 DESCRIPTION       | CCN NAME | RANGE    | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|------------------------|----------|----------|----------------------------|------|------------|
| 1    | Alert Relay            | ALE      | OFF_ON   | —                          | —    | RO         |
| 2    | Alarm Relay            | ALM      | OFF_ON   | —                          | —    | RO         |
| 3    | Running Relay          | RUN      | OFF_ON   | —                          | —    | RO         |
| 4    | Chiller Stat Output    | CHST_OUT | —        | —                          | %    | RO         |
| 5    | Head Pres Output       | HDPV_OUT | —        | —                          | %    | RO         |
| 6    | Tower Fan Relay High   | TFR_HIGH | OFF_ON   | —                          | —    | RO         |
| 7    | Tower Fan Relay Low    | TFR_LOW  | OFF_ON   | —                          | —    | RO         |
| 8    | VFD Tower Fan          | TOW_FAN  | 0 to 100 | —                          | %    | RO         |
| 9    | Economizer EXV A       | ECOEXV_A | 0 to 100 | —                          | %    | RO         |
| 10   | Main EXV A             | EXV_A    | 0 to 100 | —                          | %    | RO         |
| 11   | HGBP Solenoid A        | HGBP_A   | OFF_ON   | —                          | —    | RO         |
| 12   | VFD Coolant Solenoid A | VFDSOL_A | OFF_ON   | —                          | —    | RO         |
| 13   | Comp A VFD Lockout     | CPA_LOCK | OFF_ON   | —                          | —    | RO         |
| 14   | Vaporizer Heater       | VAP_HEAT | OFF_ON   | —                          | —    | RO         |
| 15   | Oil Heater - Primary   | OILHEAT1 | OFF_ON   | —                          | —    | RO         |
| 16   | Oil Heater - Secondary | OILHEAT2 | OFF_ON   | —                          | —    | RO         |
| 17   | Oil Reclaim Valve      | OIL_RECL | 0 to 100 | —                          | —    | RO         |
| 18   | Oil Pump Relay         | OILR     | OFF_ON   | —                          | —    | RO         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RO — Read Only

### Unit Status

CCN TABLE NAME: GENUNIT

PIC6 PATH: Main Menu → Status Menu → Unit Status



| LINE | PIC6 DESCRIPTION                                                   | CCN NAME | RANGE     | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|--------------------------------------------------------------------|----------|-----------|----------------------------|------|------------|
| 1    | Unit Status                                                        | STATUS   | 0 to 16   | —                          | —    | RO         |
| 2    | Unit Status Text                                                   | sts_txt  | CHARS24   | —                          | —    | RO         |
| 3    | Time Until Start                                                   | min_left | —         | —                          | min  | RO         |
| 4    | Minimum Runtime Timer                                              | min_run  | —         | —                          | min  | RO         |
| 5    | BACnet Occupied                                                    | BAC_OCC  | OFF_ON    | —                          | —    | RO         |
| 6    | Unit Mode<br>0=Disabled, 1=Enabled, 2=Serv Strt, 3=Serv Tst        | ONOFFSVC | 0 to 3    | —                          | —    | RO         |
| 7    | HMI Start/Stop Cmd                                                 | LCL_S_S  | OFF_ON    | —                          | —    | RO         |
| 8    | Cmd Start/Stop                                                     | CHIL_S_S | OFF_ON    | —                          | —    | RO         |
| 9    | Control Point                                                      | CTRL_PNT | –4 to 153 | —                          | °F   | RO         |
| 10   | Emergency Stop                                                     | EMSTOP   | NO_YES    | —                          | —    | RO         |
| 11   | Active Demand Limit                                                | DEM_LIM  | 0 to 100  | —                          | %    | RO         |
| 12   | Lag Demand Limit                                                   | LAG_LIM  | 0 to 100  | —                          | %    | RO         |
| 13   | Local Sched Occupied                                               | LOC_OCC  | NO_YES    | —                          | —    | RO         |
| 14   | Ice Build Occupied                                                 | ICE_OCC  | NO_YES    | —                          | —    | RO         |
| 15   | Ice Building                                                       | ice_bld  | 0 to 3    | —                          | —    | RO         |
| 16   | System State<br>0=Off, 1=Delay, 2=On, 3=Tripout                    | SYS_STAT | 0 to 3    | —                          | —    | RO         |
| 17   | Swift Restart State Text                                           | rrst_txt | CHARS24   | —                          | —    | RO         |
| 18   | Swift Restart State<br>0=Disabled, 1=Enabled, 2=Active, 3=Complete | rprdstst | 0 to 3    | —                          | —    | RO         |
| 19   | Ramp Loading Active                                                | ramp_act | NO_YES    | —                          | —    | RO         |
| 20   | Ramp Rate (per Min)                                                | ramprate | —         | —                          | —    | RO         |
| 21   | Ramp Type                                                          | rmptyptx | CHARS24   | —                          | —    | RO         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RO — Read Only

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Drive A Status

CCN TABLE NAME: DRVA1STS

PIC6 PATH: Main Menu → Status Menu → Drive A Status



| LINE | PIC6 DESCRIPTION                              | CCN NAME | RANGE  | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|-----------------------------------------------|----------|--------|----------------------------|------|------------|
| 1    | VFD Coms Status<br>0=OK, 1=PARTIAL, 2=NO COMS | COMS     | 0 to 2 | —                          | —    | RO         |
| 2    | VFD Coms Status Text                          | coms_txt | CHARS8 | —                          | —    | RO         |
| 3    | VFD Average Line Voltage                      | LINE_V   | —      | —                          | V    | RO         |
| 4    | VFD Average Line Current                      | LINE_CUR | —      | —                          | A    | RO         |
| 5    | VFD Average Line KW                           | LINE_KW  | —      | —                          | kW   | RO         |
| 6    | VFD Bus Voltage                               | BUS_V    | —      | —                          | V    | RO         |
| 7    | VFD Motor Current                             | MOT_CUR  | —      | —                          | A    | RO         |
| 8    | VFD Motor Curr Pct Rated                      | AMPS_PCT | —      | —                          | %    | RO         |
| 9    | VFD Motor KW                                  | MOT_KW   | —      | —                          | kW   | RO         |
| 10   | VFD Capacity                                  | PCT      | —      | —                          | %    | RO         |
| 11   | VFD Speed                                     | SPD      | —      | —                          | Hz   | RO         |
| 12   | VFD Inverter Temp                             | INV_T    | —      | —                          | °F   | RO         |
| 13   | VFD IGBT Temp                                 | IGBT_T   | —      | —                          | °F   | RO         |
| 14   | VFD Rectifier Temp                            | RECT_T   | —      | —                          | °F   | RO         |
| 15   | VFD Motor Rpm                                 | MOT_RPM  | —      | —                          | rpm  | RO         |
| 16   | VFD Last Fault Code                           | LAST_FLT | —      | —                          | —    | RO         |
| 17   | VFD Status Word1                              | STAT_WD1 | —      | —                          | —    | RO         |
| 18   | VFD Status Word2                              | STAT_WD2 | —      | —                          | —    | RO         |
| 19   | VFD Alert Word1                               | ALT_WD1  | —      | —                          | —    | RO         |
| 20   | VFD Alert Word2                               | ALT_WD2  | —      | —                          | —    | RO         |
| 21   | VFD Alarm Word1                               | ALM_WD1  | —      | —                          | —    | RO         |
| 22   | VFD Alarm Word2                               | ALM_WD2  | —      | —                          | —    | RO         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RO — Read Only

### Hydronics Status

CCN TABLE NAME: HYDRSTS

PIC6 PATH: Main Menu → Status Menu → Hydronics Status



| LINE       | PIC6 DESCRIPTION         | CCN NAME | RANGE  | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------------|--------------------------|----------|--------|----------------------------|------|------------|
| Evaporator |                          |          |        |                            |      |            |
| 1          | Chill Water Pump         | CHWP1    | NO_YES | —                          | —    | RO         |
| 2          | Flow Established         | ehas_flo | 0 to 1 | —                          | —    | RO         |
| 3          | Evaporator Flow Switch   | EVAP_FSW | OFF_ON | —                          | —    | RO         |
| 4          | Entering Evap Water Pres | EVAP_EWP | OFF_ON | —                          | PSIG | RO         |
| 5          | Leaving Evap Water Pres  | EVAP_LWP | NO_YES | —                          | PSIG | RO         |
| 6          | Evap Water Delta P       | EVAP_WDP | NO_YES | —                          | PSIG | RO         |
| 7          | Actual Evap GPM          | aegpm    | —      | —                          | GPM  | RO         |
| Condenser  |                          |          |        |                            |      |            |
| 1          | Cond Water Pump          | CDWP1    | NO_YES | —                          | —    | RO         |
| 2          | Flow Established         | chas_flo | NO_YES | —                          | —    | RO         |
| 3          | Condenser Flow Switch    | COND_FSW | 0 to 1 | —                          | —    | RO         |
| 4          | Entering Cond Water Pres | COND_EWP | 0 to 0 | —                          | PSIG | RO         |
| 5          | Leaving Cond Water Pres  | COND_LWP | —      | —                          | PSIG | RO         |
| 6          | Cond Water Delta P       | COND_WDP | —      | —                          | PSIG | RO         |
| 7          | Actual Cond GPM          | acgpm    | —      | —                          | GPM  | RO         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RO — Read Only

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Protocol Commands

CCN TABLE NAME: PROTOCOL

PIC6 PATH: Main Menu → Status Menu → Protocol Commands



| LINE          | PIC6 DESCRIPTION    | CCN NAME | RANGE         | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|---------------|---------------------|----------|---------------|----------------------------|------|------------|
| <b>CCN</b>    |                     |          |               |                            |      |            |
| 1             | CCN Occupy          | CCNOCC   | OFF_ON        | OFF                        | —    | RW         |
| 2             | CCN Demand Limit    | CCNDEML  | 40 to 100     | —                          | %    | RO         |
| 3             | CCN Estop           | CCNESTOP | ENABLE_EMSTOP | —                          | —    | RW         |
| 4             | CCN Fire Safety     | CCNSFTY  | OFF_ON        | OFF                        | —    | RW         |
| 5             | CCN Start/Stop      | CCN_S_S  | STOP_START    | —                          | —    | RW         |
| 6             | CCN Lockout         | CCNLKOUT | OFF_ON        | OFF                        | —    | RW         |
| <b>BACNET</b> |                     |          |               |                            |      |            |
| 1             | BACNET Occupy       | BACOCC   | OFF_ON        | —                          | —    | RO         |
| 2             | BACNET Demand Limit | BACDEML  | 40 to 100     | —                          | %    | RO         |
| 3             | BACNET Estop        | BACESTOP | ENABLE_EMSTOP | —                          | —    | RO         |
| 4             | BACNET Fire Safety  | BACSFTY  | OFF_ON        | —                          | —    | RO         |
| 5             | BACNET Start/Stop   | BAC_S_S  | STOP_START    | —                          | —    | RO         |
| 6             | BACNET Lockout      | BACLKOUT | OFF_ON        | —                          | —    | RO         |
| 7             | BACNET Alarm Flag   | BACALARM | OFF_ON        | —                          | —    | RO         |
| 8             | BACNET Alert Flag   | BACALERT | OFF_ON        | —                          | —    | RO         |
| <b>MODBUS</b> |                     |          |               |                            |      |            |
| 1             | MODBUS Occupy       | MODOCC   | OFF_ON        | —                          | —    | RO         |
| 2             | MODBUS Demand Limit | MODDEML  | 40 to 100     | —                          | %    | RO         |
| 3             | MODBUS Estop        | MODESTOP | ENABLE_EMSTOP | —                          | —    | RO         |
| 4             | MODBUS Fire Safety  | MODSFTY  | OFF_ON        | —                          | —    | RO         |
| 5             | MODBUS Start/Stop   | MOD_S_S  | STOP_START    | —                          | —    | RO         |
| 6             | MODBUS Lockout      | MODLKOUT | OFF_ON        | —                          | —    | RO         |

NOTE(S):

a. Default value is shown only if configurable.

### Runtime<sup>a</sup>

CCN TABLE NAME: RUNTIME

PIC6 PATH: Main Menu → Runtime

| LINE                  | PIC6 DESCRIPTION          | CCN NAME | RANGE | DEFAULT VALUE <sup>b</sup> | UNIT              | READ/WRITE |
|-----------------------|---------------------------|----------|-------|----------------------------|-------------------|------------|
| <b>Starts</b>         |                           |          |       |                            |                   |            |
| 1                     | Compressor A Starts       | st_compa |       |                            | —                 | RO         |
| 2                     | Oil Pump A Starts         | st_oilpa |       |                            | —                 | RO         |
| 3                     | CompA Starts in 12 Hrs    | st12_a   |       |                            | —                 | RO         |
| 4                     | CompA Recy Strts in 4 Hrs | rcycst_a |       |                            | —                 | RO         |
| 5                     | Swift Restarts in 1 Hr    | swiftcnt |       |                            | —                 | RO         |
| 6                     | Comp A Start to Start     | stst_a   |       |                            | —                 | RO         |
| 7                     | Comp A Stop to Start      | spst_a   |       |                            | —                 | RO         |
| <b>Hours</b>          |                           |          |       |                            |                   |            |
| 1                     | Service Runtime           | hr_svc   |       |                            | hours             | RO         |
| 2                     | Machine Operating Hours   | hr_mach  |       |                            | hours             | RO         |
| 3                     | Compressor A Hours        | hr_compa |       |                            | hours             | RO         |
| 4                     | Oil Pump A Hours          | hr_oilpa |       |                            | hours             | RO         |
| 5                     | Evap Pump 1 Hours         | hr_epmp1 |       |                            | hours             | RO         |
| 6                     | Cond Pump 1 Hours         | hr_cpmp1 |       |                            | hours             | RO         |
| <b>Controller</b>     |                           |          |       |                            |                   |            |
| 1                     | PIC6 Uptime               | uptime   |       |                            | day-hour-min      | RO         |
| 2                     | Last Reboot Reason        | last_rr  |       |                            |                   | RO         |
| <b>Power On Reset</b> |                           |          |       |                            |                   |            |
| 1                     | Power On Reset Time 1     | por_tm1  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 2                     | Power On Reset Time2      | por_tm2  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 3                     | Power On Reset Time 3     | por_tm3  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 4                     | Power On Reset Time 4     | por_tm4  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 5                     | Power On Reset Time 5     | por_tm5  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 6                     | Power On Reset Time 6     | por_tm6  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 7                     | Power On Reset Time 7     | por_tm7  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 8                     | Power On Reset Time 8     | por_tm8  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 9                     | Power On Reset Time 9     | por_tm9  |       |                            | mo-dy-yr-hr-mn-sc | RO         |
| 10                    | Power On Reset Time 10    | por_tm10 |       |                            | mo-dy-yr-hr-mn-sc | RO         |

NOTE(S):

a. The displayed runtime is updated every hour. To avoid the loss of data in case of disruption, the values are backed up.

b. Default value is shown only if configurable.

#### LEGEND

**RO** — Read Only  
**RW** — Read/Write

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Control Algo

CCN TABLE NAME: CONTROL

PIC6 PATH: Main Menu → Control Algo Menu

|   | MENU NAME | MENU TEXT DESCRIPTION  | ACCESS | MENU ICONS                                                                          |
|---|-----------|------------------------|--------|-------------------------------------------------------------------------------------|
| 1 | CIRACTL   | Circuit A Control Menu | USER   |  |
| 2 | CAPCTL    | Capacity Control       | USER   |  |
| 3 | EPMPCTL   | Evap Pump Control      | USER   |  |
| 4 | CPMPCTL   | Cond Pump Control      | USER   |  |
| 5 | OILVCTL   | Oil Viscosity Control  | USER   |  |
| 6 | HDPRCTL   | Head Pressure Control  | USER   |  |

### Set Points

CCN TABLE NAME: SETPOINT

PIC6 PATH: Main Menu → Set Points

| LINE | PIC6 DESCRIPTION        | CCN NAME | RANGE         | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|-------------------------|----------|---------------|----------------------------|------|------------|
| 1    | Cooling LCW Setpoint    | lcw_sp   | 10 to 120     | 45                         | °F   | RW         |
| 2    | Ice Build Setpoint      | ice_sp   | 15 to 60      | 40                         | °F   | RW         |
| 3    | EWT Control Option      | EWT_OPT  | DSABLE_ENABLE | 0                          | —    | RW         |
| 4    | Cooling ECW Setpoint    | ecw_sp   | 15 to 120     | 60                         | °F   | RW         |
| 5    | Base Demand Limit       | dem_base | 25 to 100     | 100                        | %    | RW         |
| 6    | Recycle Shutdown Offset | rcyc_lo  | 0 to 10       | 5                          | °F   | RW         |
| 7    | Recycle Startup Offset  | rcyc_hi  | 0 to 10       | 5                          | °F   | RW         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RW — Read/Write

### General Configuration

CCN TABLE NAME: GENCONF

PIC6 PATH: Main Menu → Config Menu → General Config



| LINE | PIC6 DESCRIPTION                           | CCN NAME | RANGE         | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|--------------------------------------------|----------|---------------|----------------------------|------|------------|
| 1    | Ramp Loading Type<br>Temp=0, Amps=1, Kw=2  | rampsel  | 0 to 2        | 0                          | —    | RW         |
| 2    | Enable Ramp Loading                        | ramp_en  | DSABLE_ENABLE | —                          | —    | RW         |
| 3    | Ramp Rate (per Min)                        | rrate_t  | 0.5 to 32     | 0.5                        | °F   | RW         |
| 4    | Ramp Rate (per Min)                        | rrate_a  | 0.5 to 100    | 0.5                        | A    | RW         |
| 5    | Ramp Rate (per Min)                        | rrate_k  | 0.5 to 100    | 0.5                        | kW   | RW         |
| 6    | Ice Mode Enable                            | ice_cnfg | DSABLE_ENABLE | —                          | —    | RW         |
| 7    | Ice Mode Recycle                           | ice_rec  | DSABLE_ENABLE | —                          | —    | RW         |
| 8    | Refrigerant Leak Option                    | leak_en  | DSABLE_ENABLE | —                          | —    | RW         |
| 9    | Circuit A Capacity Limit                   | caplim_a | 20 to 100     | 100                        | %    | RW         |
| 10   | Demand Limit Source<br>0=Local, 1=AnalogIO | dem_sel  | 0 to 1        | 0                          | —    | RW         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RW — Read/Write

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Reset Configuration

CCN TABLE NAME: RESETCFG

PIC6 PATH: Main Menu → Configuration Menu → Reset Config



| LINE | PIC6 DESCRIPTION                                               | CCN NAME | RANGE      | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|----------------------------------------------------------------|----------|------------|----------------------------|------|------------|
| 1    | Temp Reset Type<br>None=0, 4-20mA=1, Remote Temp=2, Water DT=3 | res_sel  | 0 to 3     | 0                          | —    | RW         |
| 2    | Degrees Reset at 20mA                                          | der_20ma | -30 to 30  | 10.0                       | ^F   | RW         |
| 3    | Maximum Deg Temp Reset                                         | deg_rset | -30 to 30  | 10.0                       | ^F   | RW         |
| 4    | Remote Temp Full Reset                                         | remtm_fu | -40 to 245 | 65.0                       | °F   | RW         |
| 5    | Remote Temp No Reset                                           | remtm_no | -40 to 245 | 85.0                       | °F   | RW         |
| 6    | Deg Reset Water DT Full                                        | drwdt_fu | -30 to 30  | 10.0                       | ^F   | RW         |
| 7    | Controlled DT Full Reset                                       | ctldt_fu | 0 to 15    | 0                          | ^F   | RW         |
| 8    | Controlled DT No Reset                                         | ctldt_no | 0 to 15    | 10                         | ^F   | RW         |

NOTE(S):

a. Default value is shown only if configurable.

### Service Configuration

CCN TABLE NAME: SERVICE

PIC6 PATH: Main Menu → Configuration Menu →  
Service Config → CFG



| LINE | PIC6 DESCRIPTION                                           | CCN NAME | RANGE         | DEFAULT VALUE <sup>a</sup> | UNIT  | READ/WRITE |
|------|------------------------------------------------------------|----------|---------------|----------------------------|-------|------------|
| 1    | Evaporator Fluid Type<br>0=Water, 1=Med Brine, 3=Low Brine | flui_typ | 0 to 2        | 0                          | —     | RW         |
| 2    | Brine Freeze Setpoint                                      | freezesp | -20 to 34     | 34                         | °F    | RW         |
| 3    | Comp Min Off Time                                          | min_off  | 60 to 1200    | 120                        | sec   | RW         |
| 4    | Demand Limit At 20 mA                                      | dem_20ma | 10 to 100     | 40                         | %     | RW         |
| 5    | Minimum Fluid Temp                                         | min_lwt  | -20 to 38     | 38                         | °F    | RW         |
| 6    | Maximum Fluid Temp                                         | max_lwt  | 38 to 153     | 95                         | °F    | RW         |
| 7    | Service Password                                           | ser_pass | NO_YES        | —                          | —     | RW         |
| 8    | Service Lockout                                            | lockout  | NO_YES        | —                          | —     | RW         |
| 9    | Restart Options<br>0=None, 1=Auto, 2=Swift Restart         | rstropt  | 0 to 2        | 0                          | —     | RW         |
| 10   | Starts Limit Bypass                                        | stlim_by | NO_YES        | —                          | —     | RW         |
| 11   | Starts Per Period                                          | stperp   | 0 to 255      | 6                          | —     | RW         |
| 12   | Comp Starts Period                                         | cmp_stp  | 0 to 255      | 12                         | —     | RW         |
| 13   | Recy Starts Per Period                                     | rstperp  | 0 to 255      | 5                          | —     | RW         |
| 14   | Comp Rcyc Starts Period                                    | cmp_rstp | 0 to 255      | 4                          | —     | RW         |
| 15   | Oil Pressure Verify Time                                   | oilpvr_t | 15 to 300     | 40                         | sec   | RW         |
| 16   | Soft Stop Enable                                           | sftst_en | DSABLE_ENABLE | —                          | —     | RW         |
| 17   | Soft Stop Threshold                                        | sftst_th | 0 to 100      | 50                         | %     | RW         |
| 18   | Emergency Stop Enable                                      | emstopen | DSABLE_ENABLE | —                          | —     | RW         |
| 19   | Spare Safety Enable                                        | spstopen | DSABLE_ENABLE | —                          | —     | RW         |
| 20   | Powerloss Autoreset Lim                                    | pwaulim  | 4 to 168      | 168                        | hours | RW         |

NOTE(S):

a. Default value is shown only if configurable.

### Factory Configuration

CCN TABLE NAME: FACTORY

PIC6 PATH: Menu → Config Menu → Factory Config



| LINE | PIC6 DESCRIPTION                        | CCN NAME | RANGE         | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|-----------------------------------------|----------|---------------|----------------------------|------|------------|
| 1    | Refrigerant Type<br>4=R-134a, 11=R-513A | refrig   | 0 to 15       | 4                          | —    | RW         |
| 2    | Chiller Tons                            | tons     | 100 to 600    | 100                        | TONS | RW         |
| 3    | HGBP Control Option                     | hgbp_opt | DSABLE_ENABLE | —                          | —    | RW         |
| 4    | Design Input kW                         | din_kw   | 0 to 0        | 0                          | kW   | RW         |
| 5    | Design Input kW/Ton                     | dkw_ton  | 0 to 0        | 0                          | kW   | RW         |
| 6    | Design Ent Evap Temp                    | dewt     | 0 to 0        | 0                          | °F   | RW         |
| 7    | Design Lvg Evap Temp                    | dlwt     | 0 to 0        | 0                          | °F   | RW         |
| 8    | Design Evap GPM                         | degpm    | 0 to 0        | 0                          | GPM  | RW         |
| 9    | Design Evap Press Drop                  | depdft   | 0 to 0        | 0                          | Feet | RW         |
| 10   | Design Evap Refrig Temp                 | dert     | 0 to 0        | 0                          | °F   | RW         |
| 11   | Design Ent Cond Temp                    | decwt    | 0 to 0        | 0                          | °F   | RW         |
| 12   | Design Lvg Cond Temp                    | dclwt    | 0 to 0        | 0                          | °F   | RW         |
| 13   | Design Cond GPM                         | dcpm     | 0 to 0        | 0                          | GPM  | RW         |
| 14   | Design Cond Press Drop                  | dcpdft   | 0 to 0        | 0                          | Feet | RW         |
| 15   | Design Cond Refrig Temp                 | dcrt     | 0 to 0        | 0                          | °F   | RW         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RW — Read/Write

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Comp A Configuration

CCN TABLE NAME: CMPA1CFG

PIC6 PATH: Main Menu → Configuration Menu →  
Circuit A Config Menu → Comp A Config



| LINE | PIC6 DESCRIPTION        | CCN NAME | RANGE   | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|-------------------------|----------|---------|----------------------------|------|------------|
| 1    | Cmp A LowSatSuctOffset  | CSSTLa   | 0 to 10 | 2                          | °F   | RW         |
| 2    | Cmp A HiDischTempOffset | hiDSTOff | 0 to 10 | 10                         | °F   | RW         |
| 3    | Cmp A HiDischSatOffset  | hiDSTOff | 0 to 10 | 5                          | °F   | RW         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

**RW** — Read/Write

### Hot Gas A Configuration

CCN TABLE NAME: HGBPACFG

PIC6 PATH: Main Menu → Configuration Menu →  
Circuit A Config Menu → Hot Gas A Config



| LINE | PIC6 DESCRIPTION         | CCN NAME | RANGE         | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|--------------------------|----------|---------------|----------------------------|------|------------|
| 1    | Minimum Load Ctrl        |          | —             | —                          | —    | —          |
| 2    | Minimum Load Ctrl Enable | flt_en   | DSABLE_ENABLE | —                          | —    | RW         |
| 3    | Fluid Temp Offset        | flt_off  | Real to 0     | −0.5                       | °F   | RW         |
| 4    | Fluid Temp Deadband      | fltdband | 0 to Real     | 0.5                        | °F   | RW         |
| 5    | Compressor Speed Ctrl    |          | —             | —                          | —    | —          |
| 6    | Comp Speed Ctrl Enable   | cpspd_en | DSABLE_ENABLE | —                          | Hz   | RW         |
| 7    | HGBP Enable Below Pos    | maxcpspd | 15 to Real    | 30                         | Hz   | RW         |
| 8    | Disable Speed Deadband   | cpspbdnd | 0 to Real     | 15                         | Hz   | RW         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

**RW** — Read/Write

### EXV A Configuration

CCN TABLE NAME: EXVACFG

PIC6 PATH: Main Menu → Configuration Menu →  
Circuit A Config Menu → EXV A Config



| LINE | PIC6 DESCRIPTION         | CCN NAME | RANGE   | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|--------------------------|----------|---------|----------------------------|------|------------|
| 1    | EXV Cond Liq Lvl Stpt    | cll_stpt | 0 to 0  | 1                          | —    | RW         |
| 2    | EXV Approach Setpoint    | aTStpt   | 0 to 0  | 5                          | —    | RW         |
| 3    | EXV Lo Disch Superh Stpt | lo_dshsp | 0 to 0  | 1                          | —    | RW         |
| 4    | EXV Lo Disch Superh Ofst | lo_dshof | 0 to 0  | 0                          | —    | RW         |
| 5    | EXV Max Disch Temp Stpt  | max_dist | 0 to 0  | 180                        | —    | RW         |
| 6    | EXV Subcooling Min Stpt  | sbk_min  | 0 to 0  | 0                          | —    | RW         |
| 7    | EXV Subcooling Min Ofst  | sbk_of   | 0 to 0  | 0                          | —    | RW         |
| 8    | EXV LowSatSuctOffset     | sSTLeMOa | 0 to 10 | 3                          | °F   | RW         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

**RW** — Read/Write

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Drive A Configuration

CCN TABLE NAME: DRVA1CFG

PIC6 PATH: Main Menu → Configuration Menu →  
Circuit A Config Menu → Drive A Config



| LINE | PIC6 DESCRIPTION         | CCN NAME | RANGE        | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|--------------------------|----------|--------------|----------------------------|------|------------|
| 1    | Rated Line Voltage       | rlv_i    | 208 to 600   | 460                        | V    | RW         |
| 2    | Motor Rated Load Amps    | rla_m    | 10 to 5000   | 200                        | A    | RW         |
| 3    | Motor Nameplate Voltage  | rlv      | 340 to 480   | 460                        | V    | RW         |
| 4    | Motor Nameplate Current  | rla      | 10 to 5000   | 200                        | A    | RW         |
| 5    | Motor Nameplate RPM      | rlrpm    | 1500 to 3960 | 3750                       | rpm  | RW         |
| 6    | Motor Nameplate KW       | rlkw     | 0 to 65535   | 1500                       | kW   | RW         |
| 7    | Compressor 100% Speed    | rlhz     | 54 to 140    | 90                         | Hz   | RW         |
| 8    | Compressor Minimum Speed | min_spd  | 20 to 50     | 20                         | Hz   | RW         |
| 9    | Compressor Start Speed   | strt_spd | 20 to 50     | 20                         | Hz   | RW         |
| 10   | Torque Limit Percent     | torq_lim | 0 to 120     | 115                        | %    | RW         |
| 11   | Current Limit Percent    | curr_lim | 0 to 115     | 108                        | %    | RW         |
| 12   | PWM Switch Frequency     | pwm_freq | 0 to 4       | 2                          | kHz  | RW         |
| 13   | Skip Frequency 1         | skipfrq1 | 0 to 102     | 30                         | Hz   | RW         |
| 14   | Skip Frequency 2         | skipfrq2 | 0 to 102     | 30                         | Hz   | RW         |
| 15   | Skip Frequency 3         | skipfrq3 | 0 to 102     | 30                         | Hz   | RW         |
| 16   | Skip Frequency Band      | skipband | 0 to 102     | 0                          | Hz   | RW         |
| 17   | Increase Ramp Time       | ramp_inc | 10 to 255    | 100                        | sec  | RW         |
| 18   | Decrease Ramp Time       | ramp_dec | 10 to 600    | 10                         | sec  | RW         |

NOTE(S):

a. Default value is shown only if configurable.

### Lube A Configuration

CCN TABLE NAME: LUBECFGA

PIC6 PATH: Main Menu → Configuration Menu →  
Circuit A Config Menu → Lube A Config



| LINE | PIC6 DESCRIPTION     | CCN NAME | RANGE | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|----------------------|----------|-------|----------------------------|------|------------|
| 1    | Vaporizer Heater On  | vphton   | —     | 100                        | —    | RW         |
| 2    | Vaporizer Heater Off | vphtoff  | —     | 120                        | —    | RW         |
| 3    | Sump1 Heater On      | smp1on   | —     | 140                        | —    | RW         |
| 4    | Sump1 Heater Off     | smp1off  | —     | 145                        | —    | RW         |
| 5    | Sump2 Heater On      | smp2on   | —     | 125                        | —    | RW         |
| 6    | Sump2 Heater Off     | smp2off  | —     | 140                        | —    | RW         |
| 7    | Turn On HGBP         | hgbpon   | —     | 200                        | —    | RW         |
| 8    | Turn Off HGBP        | hgbpoff  | —     | 5                          | —    | RW         |
| 9    | Minimum Lift         | minlift  | —     | 200                        | —    | RW         |
| 10   | Minimum Hz           | minhz    | —     | 24                         | —    | RW         |

NOTE(S):

a. Default value is shown only if configurable.

LEGEND

RW — Read/Write

### Hydronics Configuration

CCN TABLE NAME: HYDRCFG

PIC6 PATH: Main Menu → Configuration Menu → Hydronics Config

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Update Runtime

CCN TABLE NAME: UPDRUNT

PIC6 PATH: Main Menu → Configuration Menu → Update Run Time

| Starts              |   |
|---------------------|---|
| Compressor A Starts | 0 |
| Oil Pump A Starts   | 0 |

| Hours                   |            |
|-------------------------|------------|
| Machine Operating Hours | 0.00 hours |
| Compressor A Hours      | 0.00 hours |
| Oil Pump A Hours        | 0.00 hours |
| Evap Pump 1 Hours       | 0.00 hours |
| Cond Pump 1 Hours       | 0.00 hours |

### Limits Configuration

CCN TABLE NAME: LIMITCFG

PIC6 PATH: Main Menu → Configuration Menu → Limits Config

|                          |         |      |
|--------------------------|---------|------|
| Evap Approach Alert      | 5.00    | °F   |
| Cond Approach Alert      | 6.00    | °F   |
| Comp Discharge Alert     | 200.00  | °F   |
| Cond Press Alert         | 130.00  | PSIG |
| Refr Charge Cond Alert   | 20.00   | °F   |
| Design Evap Appr         | 2.00    | °F   |
| VFD Speed Alrt Dband     | 10.00   | %    |
| Ref Leak PPM at 20 mA    | 1000.00 | PPM  |
| Refrig Leak Alarm PPM    | 500.00  | PPM  |
| Lo Oil Press Trip Thresh | 18.00   | PSIG |

### Head Pressure Configuration

CCN TABLE NAME: HDPRCFG

PIC6 PATH: Main Menu → Configuration Menu → Head Pressure Config

|                       |       |      |
|-----------------------|-------|------|
| Head Pressure Valve   |       |      |
| Head Press *P 0%      | 25.00 | PSIG |
| Head Press *P 100%    | 50.00 | PSIG |
| Head Press Min Output | 0.00  | %    |

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Date/Time Config Menu

CCN TABLE NAME: TIMECFG

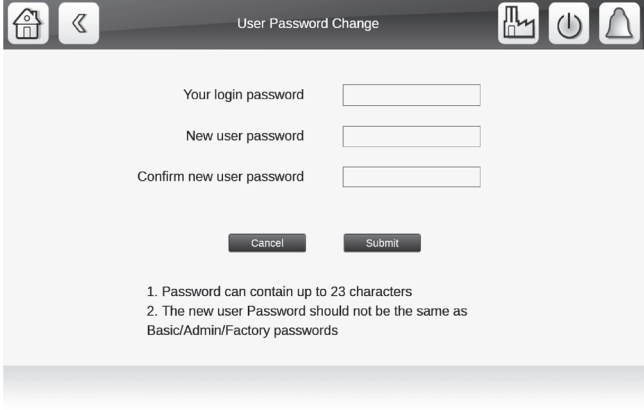
PIC6 PATH: Main Menu → System Configuration Menu → Date/Time Configuration Menu

|   | MENU NAME               | MENU TEXT DESCRIPTION | ACCESS | MENU ICONS                                                                          |
|---|-------------------------|-----------------------|--------|-------------------------------------------------------------------------------------|
| 1 | Date/Time Configuration | DATETIME              | USER   |  |
| 2 | NTP Time Sync           | NPCTIME               | USER   |  |

### User Password Change

CCN TABLE NAME: USERPASS

PIC6 PATH: Main Menu → System Configuration Menu → User Password Change

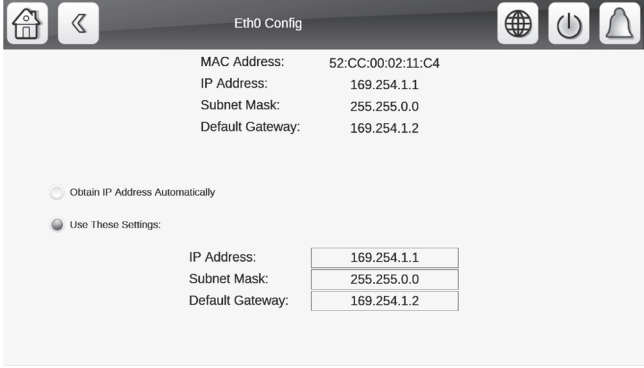


The screen displays the 'User Password Change' interface. At the top, there is a header bar with a home icon, a back arrow, the title 'User Password Change', and three status icons (factory, power, and bell). Below the header, there are three input fields labeled 'Your login password', 'New user password', and 'Confirm new user password'. At the bottom of the input section are 'Cancel' and 'Submit' buttons. Below the buttons, there are two numbered instructions: '1. Password can contain up to 23 characters' and '2. The new user Password should not be the same as Basic/Admin/Factory passwords'.

### Network Configuration - Eth0 Configuration

CCN TABLE NAME: ETH0CONF

PIC6 PATH: Main Menu → Systems Configuration Menu → Network → Eth0 Config



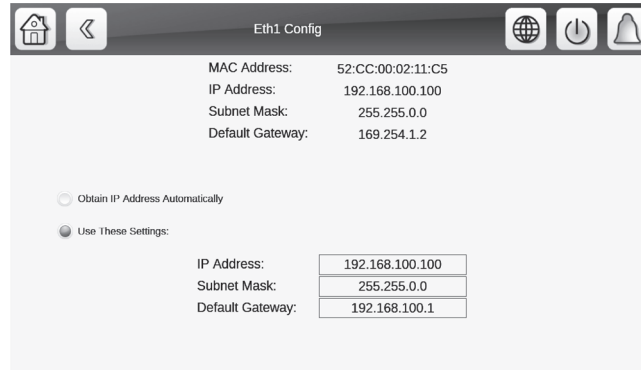
The screen displays the 'Eth0 Config' interface. At the top, there is a header bar with a home icon, a back arrow, the title 'Eth0 Config', and three status icons (globe, power, and bell). Below the header, the current configuration is displayed: MAC Address: 52:CC:00:02:11:C4, IP Address: 169.254.1.1, Subnet Mask: 255.255.0.0, and Default Gateway: 169.254.1.2. Below this, there are two radio button options: 'Obtain IP Address Automatically' (which is currently selected) and 'Use These Settings:'. Under the 'Use These Settings:' option, there are three input fields for IP Address (169.254.1.1), Subnet Mask (255.255.0.0), and Default Gateway (169.254.1.2).

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Network Configuration - Eth1 Configuration

CCN TABLE NAME: ETH1CONF

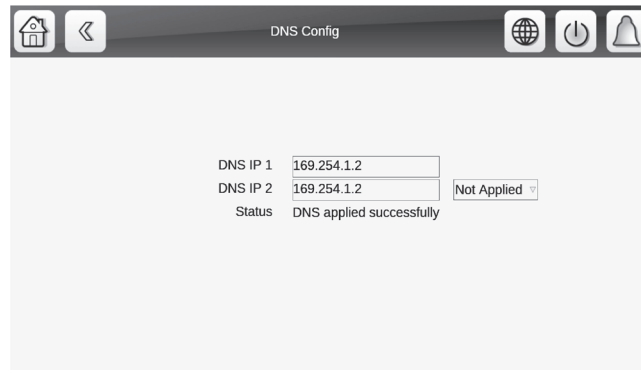
PIC6 PATH: Main Menu → Systems Configuration Menu → Network → Eth1 Config



### Network Configuration - DNS Configuration

CCN TABLE NAME: DNS

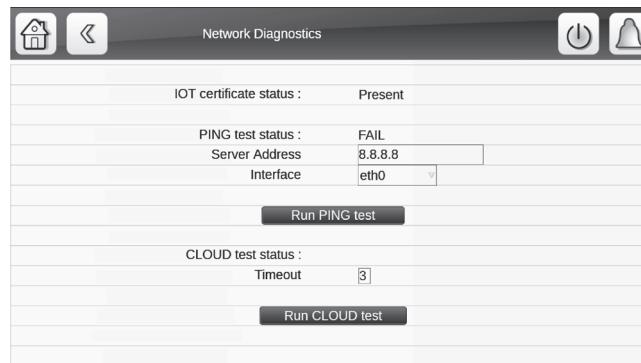
PIC6 PATH: Main Menu → Systems Configuration Menu → Network → DNS Config



### Network Configuration - Network Diagnostics

CCN TABLE NAME: NETDIAG

PIC6 PATH: Main Menu → Systems Configuration Menu → Network → Network Diagnostics



APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

Network Configuration - IOT Cloud Diagnostics

CCN TABLE NAME: IOTCLDDG

PIC6 PATH: Main Menu → Systems Configuration Menu → Network → IOT Cloud Diagnostics



IOT Cloud Diagnostics



|                 |             |
|-----------------|-------------|
| DPS URL         | Unavailable |
| Ping DPS URL    | Failed      |
| IOT URL         | Unavailable |
| Ping IOT URL    | Failed      |
| Last Reach Node | DPS 0.0.0.0 |

Alarm Email Configuration

CCN TABLE NAME: EMAILCFG

PIC6 PATH: Main Menu → Systems Configuration Menu → Alarm Email Config



Alarm Email Config



☐ Enable Alarm Email

SMTP Server

SMTP Port

0

Sender Email

@

Account Password

Recipient 1

@

Recipient 2

@

☐ Attach Blackbox Log

Termination Resistor

CCN TABLE NAME: TERMRES

PIC6 PATH: Main Menu → Systems Configuration Menu → Termination Resistor



TERMRES - Termination Resistor



Search

LEN Port J6 Term Res

☒ Disable ☐ Enable

CCN Port J7 Term Res

☒ Disable ☐ Enable

Mod Master J10 Term Res

☒ Disable ☐ Enable

BMS Port J8 Term Res

☒ Disable ☐ Enable

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Controller ID

CCN TABLE NAME: CTRLID

PIC6 PATH: Main Menu → Systems Configuration Menu → Controller ID

|                      |                          |
|----------------------|--------------------------|
| Device Name          |                          |
| Device Location      |                          |
| Software Part Number | ACG-1-ET0010001          |
| Model Number         | Z3XRVA1A1EP1R350--       |
| Serial Number        | Z22Q12345                |
| Reference Number     |                          |
| Controls Version     | 4.37.0-tags-0-1-0-beta-1 |
| Application Version  | 0.1.0-beta.11            |
| Firmware Version     | 1.38.1.38                |
| IOT Version          | 3.2                      |

### System Information

CCN TABLE NAME: SYSINFO

PIC6 PATH: Main Menu → Systems Configuration Menu → System Information

|                                     |                                          |
|-------------------------------------|------------------------------------------|
| Software Version                    | ACG-1-ET0010001                          |
| APP Version                         | 0.1.0-beta.11                            |
| SDK Version                         | 1.38.1.38                                |
| UI Version                          | 38                                       |
| IOT Version                         | 3.2                                      |
| Rootfs Version                      | 1.38.1.12                                |
| Core board - OS Version             | Linux 4.9.28-pic6-gce4d43d1050           |
| Core board - OS Build info          | #12 PREEMPT Tue Sep 11 14:17:49 EDT 2018 |
| Core board - Boot loader Version    | U-Boot 2013.10                           |
| Core board - Boot loader Build info | Aug 26 2020 - 08:54:34                   |
| UI board - OS Version               | Linux 3.14.28-itsi                       |
| UI board - OS Build info            | #101 Thu Jan 11 16:28:17 EST 2018        |
| UI board - Boot loader Version      | U-Boot 2013.10                           |
| UI board - Boot loader Build info   | Mar 09 2018 - 13:40:40                   |

### CCN Protocol Menu - CCN Configuration

CCN TABLE NAME: CNN

PIC6 PATH: Main Menu → Systems Configuration Menu → CCN Protocol Menu

CCN Config Broadcast Menu

▲ 1/1 ▼

APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

BACnet Protocol Menu

CCN TABLE NAME: BACNET

PIC6 PATH: Main Menu → System Configuration Menu → BACnet Protocol Menu → BACnet Config



BACnet Config



|                       |           |
|-----------------------|-----------|
| BACnet Protocol Type  | BACnet IP |
| Units Type            | Imperial  |
| Network Number        | 16101     |
| Device Identifier     | 1610101   |
| MS/TP Mac Address     | 1         |
| MS/TP Baud Rate       | 38400     |
| MS/TP Max Masters     | 3         |
| MS/TP Max Info Frames | 5         |
| BACnet Mgmt Device    | None      |
| BBMD Address          | 0.0.0.0   |
| BBMD Time To Live     | 5 sec     |
| BBMD FDR State        | Disabled  |

BACnet IP



BACnet Config



|                       |          |
|-----------------------|----------|
| BACnet Protocol Type  | MS/TP    |
| Units Type            | Imperial |
| Network Number        | 16101    |
| Device Identifier     | 1610101  |
| MS/TP Mac Address     | 1        |
| MS/TP Baud Rate       | 9600     |
| MS/TP Max Masters     | 3        |
| MS/TP Max Info Frames | 5        |
| BACnet Mgmt Device    | None     |
| BBMD Address          | 0.0.0.0  |
| BBMD Time To Live     | 5 sec    |
| BBMD FDR State        | Disabled |

BACnet MS/TP

Modbus Protocol Menu

CCN TABLE NAME: MODBUS

PIC6 PATH: Main Menu → Systems Configuration Menu → Modbus Protocol Menu → Modbus Config



Modbus Config



|                            |                  |
|----------------------------|------------------|
| Modbus Protocol Type       | TCP              |
| TCP Port Number            | 502              |
| TCP KeepAlive Idle Delay   | 30 sec           |
| TCP KeepAlive Interval     | 2                |
| TCP KeepAlive Probe Counts | 10               |
| RTU UID Address            | 1                |
| RTU Baudrate               | 19200            |
| RTU Parity Option          | None             |
| RTU Stop Bit               | 2 Bits           |
| Units Type                 | Imperial         |
| Register Bit Mode          | 32 Bit Registers |
| Real Type                  | Fixed Decimal    |
| Swap Endian                | Little Endian    |
| Communication Timeout      | 60 sec           |

Modbus TCP



Modbus Config



|                            |                  |
|----------------------------|------------------|
| Modbus Protocol Type       | RTU              |
| TCP Port Number            | 502              |
| TCP KeepAlive Idle Delay   | 30 sec           |
| TCP KeepAlive Interval     | 2                |
| TCP KeepAlive Probe Counts | 10               |
| RTU UID Address            | 1                |
| RTU Baudrate               | 9600             |
| RTU Parity Option          | None             |
| RTU Stop Bit               | 2 Bits           |
| Units Type                 | Imperial         |
| Register Bit Mode          | 32 Bit Registers |
| Real Type                  | Fixed Decimal    |
| Swap Endian                | Little Endian    |
| Communication Timeout      | 60 sec           |

Modbus RTU

APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

USB Log Export

CCN TABLE NAME: USBEXPRT

PIC6 PATH: Main Menu → Systems Configuration Menu → USB Log Export

USB Log Export

Chiller Name

Chiller Name

Export technical Data

☒ Yes

☐ No

Export Developer Data

☐ Yes

☒ No

Status

Export Data

Local Schedule

CCN TABLE NAME: LOCALOCC

PIC6 PATH: Main Menu → Schedule Menu → Local Schedule

LOCALOCC - Local Schedule

Period 1

Mon

Tue

Wed

Thu

Fri

Sat

Sun

Hol

Occupied from

00:00

to

24:00

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

Timed Override Extension

0

HOURS

1/8

Holiday Schedule

CCN TABLE NAME: HOLIDAY

PIC6 PATH: Main Menu → Schedule Menu → Holiday Schedule

Holiday Schedule

HOLDY01

HOLDY02

HOLDY03

HOLDY04

HOLDY05

HOLDY06

HOLDY07

HOLDY08

HOLDY09

HOLDY10

HOLDY11

HOLDY12

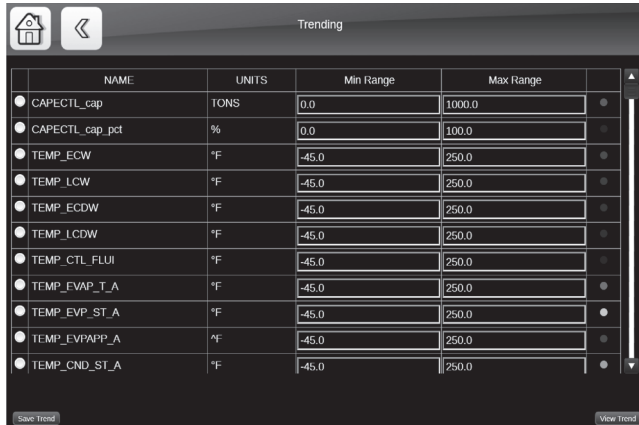
1/2

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Trending

CCN TABLE NAME: TRENDING

PIC6 PATH: Main Menu → Trending



|   | NAME            | UNITS | Min Range | Max Range |
|---|-----------------|-------|-----------|-----------|
| ● | CAPECTL_cap     | TONS  | 0.0       | 1000.0    |
| ● | CAPECTL_cap_pct | %     | 0.0       | 100.0     |
| ● | TEMP_ECW        | *F    | -45.0     | 250.0     |
| ● | TEMP_LCW        | *F    | -45.0     | 250.0     |
| ● | TEMP_ECDW       | *F    | -45.0     | 250.0     |
| ● | TEMP_LCDW       | *F    | -45.0     | 250.0     |
| ● | TEMP_CTL_FLUI   | *F    | -45.0     | 250.0     |
| ● | TEMP_EVAP_T_A   | *F    | -45.0     | 250.0     |
| ● | TEMP_EVP_ST_A   | *F    | -45.0     | 250.0     |
| ● | TEMP_EVPAPP_A   | *F    | -45.0     | 250.0     |
| ● | TEMP_CND_ST_A   | *F    | -45.0     | 250.0     |

### Quick Test A

CCN TABLE NAME: QCKTESTA

PIC6 PATH: Main Menu → Quick Test Menu → Quick Test A



| LINE | PIC6 DESCRIPTION         | CCN NAME | RANGE      | DEFAULT VALUE <sup>a</sup> | UNIT | READ/WRITE |
|------|--------------------------|----------|------------|----------------------------|------|------------|
| 1    | Elapsed Time in Svc Test | ELAPSED  | 0 to 65535 | 0                          | min  | RW         |
| 2    | Main EXV A               | TR_EXVA  | 0 to 100   | 0                          | %    | RW         |
| 3    | Econ EXV A               | TR_EEXVA | 0 to 100   | 0                          | %    | RW         |
| 4    | Hot Gas Bypass A         | TR_HGBPA | OFF_ON     | —                          | —    | RW         |
| 5    | Oil Pump                 | TR_OILR  | OFF_ON     | —                          | —    | RW         |
| 6    | Oil Reclaim Valve        | TR_OILMA | 0 to 100   | 0                          | %    | RW         |
| 7    | Oil Heater - Primary     | TR_OLHT1 | OFF_ON     | —                          | —    | RW         |
| 8    | Oil Heater - Secondary   | TR_OLHT2 | OFF_ON     | —                          | —    | RW         |
| 9    | Vaporizer Heater         | TR_VHEAT | OFF_ON     | —                          | —    | RW         |
| 10   | Alert Relay              | TR_ALE   | OFF_ON     | —                          | —    | RW         |
| 11   | Alarm Relay              | TR_ALM   | OFF_ON     | —                          | —    | RW         |
| 12   | Running Relay            | TR_RUN   | OFF_ON     | —                          | —    | RW         |
| 13   | Unit Status              | TR_STAT  | 0 to 20    | 0                          | mA   | RW         |
| 14   | Tower Fan Speed          | TR_T_FAN | 0 to 100   | 0                          | %    | RW         |
| 15   | Tower Fan High           | TR_T_F_H | OFF_ON     | —                          | —    | RW         |
| 16   | Tower Fan Low            | TR_T_F_L | OFF_ON     | —                          | —    | RW         |
| 17   | Head Pressure Output mA  | TR_HDPV  | 0 to 100   | 0                          | %    | RW         |
| 18   | Evap Pump 1              | TR_CHWP1 | OFF_ON     | —                          | —    | RW         |
| 19   | Evap Pump 1 Speed        | TRCHWPV1 | 0 to 100   | 0                          | %    | RW         |
| 20   | Cond Water Pump 1        | TR_CDWP1 | OFF_ON     | —                          | —    | RW         |
| 21   | Cond Water Pump 1 Speed  | TRCDWPV1 | 0 to 100   | 0                          | %    | RW         |

NOTE(S):

a. Default value is shown only if configurable.

## APPENDIX A — PIC6 SCREEN AND TABLE STRUCTURE (cont)

### Thermistor Calibration

CCN TABLE NAME: THRMALB

PIC6 PATH: Main Menu → Quick Test Menu → Thermistor Calibration

| Thermistor Calibration        |         |                              |
|-------------------------------|---------|------------------------------|
| Entering Chilled Water Temp   | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Leaving Chilled Water Temp    | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Entering Condenser Water Temp | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Leaving Condenser Water Temp  | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Evaporator Refrigerant Temp   | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Motor Winding Temp            | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Remote Reset Temp             | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Economizer Refrigerant Temp   | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Discharge Refrigerant Temp    | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Vaporizer Temp                | 0.00 °F | Calibration (+/-5°F) 0.00 °F |
| Oil Sump Temp                 | 0.00 °F | Calibration (+/-5°F) 0.00 °F |

### Transducer Calibration

CCN TABLE NAME: TRNSCALB

PIC6 PATH: Main Menu → Quick Test Menu → Transducer Calibration

| Transducer Calibration        |            |                                  |
|-------------------------------|------------|----------------------------------|
| Evaporator Refrigerant Press  | -6.69 PSIG | Calibration (+/-5psig) 0.00 PSIG |
| Condenser Refrigerant Press   | -6.69 PSIG | Calibration (+/-5psig) 0.00 PSIG |
| Economizer Refrigerant Press  | -6.69 PSIG | Calibration (+/-5psig) 0.00 PSIG |
| Discharge Refrigerant Press   | -6.69 PSIG | Calibration (+/-5psig) 0.00 PSIG |
| Oil Sump Press                | -6.69 PSIG | Calibration (+/-5psig) 0.00 PSIG |
| Oil Pressure Differential     | 0.00 PSIG  | Calibration (+/-5psig) 0.00 PSIG |
| Evap Entering Water Press     | 0.00 PSIG  | Calibration (+/-5psig) 0.00 PSIG |
| Evap Leaving Water Press      | 0.00 PSIG  | Calibration (+/-5psig) 0.00 PSIG |
| Cond Entering Water Press     | 0.00 PSIG  | Calibration (+/-5psig) 0.00 PSIG |
| Condenser Leaving Water Press | 0.00 PSIG  | Calibration (+/-5psig) 0.00 PSIG |

### Alarms Menu Description

| ICON                                                                                | DISPLAYED TEXT | ACCESS | ASSOCIATED TABLE | PAGE NO. |
|-------------------------------------------------------------------------------------|----------------|--------|------------------|----------|
|  | Reset Alarms   | All    | ALARMRST         | 60       |
|  | Current Alarms | All    | CUR_ALM          |          |
|  | History Alarms | All    | ALMHIST1         |          |

### Alarm Reset<sup>a</sup>

CCN TABLE NAME: ALARMRST

PIC6 PATH: Main Menu → Alarm Menu → Alarm Reset

| LINE | PIC6 DESCRIPTION | CCN NAME | RANGE  | DEFAULT VALUE <sup>b</sup> | UNIT | READ/WRITE |
|------|------------------|----------|--------|----------------------------|------|------------|
| 1    | Alarm Reset      | RST_ALM  | NO/YES | NO                         | —    | RW         |
| 2    | Alarm State      | ALM_STAT |        |                            | —    | 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         |

NOTE(S):

- For more information about viewing and resetting alarms, see the Diagnostics and Troubleshooting section on page 27.
- Default value is shown only if configurable.

#### LEGEND

RO — Read Only  
RW — Read/Write

## APPENDIX B — CONTROL PANEL PCB BOARD STATUS INDICATORS

### INPUT/OUTPUT BOARD (IOB)

All IOB boards have LED indicators that show control board and communication status.

A red LED on each control module operates in the following manner:

- Power not present or power supply failure: LED is off
- Power present but microprocessor in Reset: LED is off
- Microprocessor operational but not communicating: LED flashes 3 seconds on, 3 seconds off
- Microprocessor operational and communicating with control system: LED flashes at 0.5 Hz rate (1 second on, 1 second off) in sync ( $\pm 100$  ms) with all other new control modules on the same communication bus
- Microprocessor in boot mode: LED flashes at 0.2 seconds on, 0.2 seconds off

Each independent communication port has a green status LED. The green LED is on when data is being transmitted by the board. All RS485 ports have a green LED.

### SIOB BOARD

For diagnostic purposes the SIOB can visually be checked as follows:

- While data is transmitted on the LEN bus a green LED will flash
- If no data is transmitted on the LEN bus the green LED will be OFF

## APPENDIX C — NETWORK CONFIGURATION

### BACnet Points List

| OBJECT NAME        | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|--------------------|------|----------|--------|--------|-----------|--------------------------|
| ALARMRST_alarm_1   | AV   | 411      | Type 6 | 0      | RO        | Jbus Current Alarm 1     |
| ALARMRST_alarm_2   | AV   | 412      | Type 6 | 0      | RO        | Jbus Current Alarm 2     |
| ALARMRST_alarm_3   | AV   | 413      | Type 6 | 0      | RO        | Jbus Current Alarm 3     |
| ALARMRST_alarm_4   | AV   | 414      | Type 6 | 0      | RO        | Jbus Current Alarm 4     |
| ALARMRST_alarm_5   | AV   | 415      | Type 6 | 0      | RO        | Jbus Current Alarm 5     |
| ALARMRST_RST_ALM   | BV   | 161      | Type 4 | 0      | RO        | Alarm Reset              |
| ALARMRST_SYS_ALM   | AV   | 410      | Type 6 | 0      | RO        | System Alert/Alarm       |
| CAPDCTL_actstpt    | AV   | 313      | Type 6 | 0      | RW        | Active Fluid Temp Setpt  |
| CAPDCTL_ck1capmn   | AV   | 314      | Type 6 | 0      | RW        | cirVarSpdCapLimMinArray  |
| CAPDCTL_ck1capmx   | AV   | 315      | Type 6 | 0      | RW        | cirVarSpdCapLimMaxArray  |
| CAPDCTL_ck1caprq   | AV   | 316      | Type 6 | 0      | RW        | Circ Cap Req Array       |
| CAPDCTL_compldrq   | AV   | 317      | Type 6 | 0      | RW        | Comp Load Required       |
| CAPDCTL_dem_act    | BV   | 131      | Type 4 | 0      | RW        | Demand Limit Active      |
| CAPDCTL_ramp_act   | BV   | 130      | Type 4 | 0      | RW        | Ramp Loading Active      |
| CAPDCTL_scstptof   | AV   | 318      | Type 6 | 0      | RW        | Short Cycle Setpt Offset |
| CAPDCTL_stptbst    | AV   | 319      | Type 6 | 0      | RW        | Setpoint Boost           |
| CAPDCTL_syscapmx   | AV   | 320      | Type 6 | 0      | RW        | sysVarSpdCapLimMax       |
| CAPDCTL_syscaprq   | AV   | 321      | Type 6 | 0      | RW        | System Capacity Req      |
| CAPECTL_act_ccap   | AV   | 322      | Type 6 | 0      | RW        | System Actual Comp Cap   |
| CAPECTL_act_fcapp  | AV   | 323      | Type 6 | 0      | RW        | sysActualFixSpdComprCap  |
| CAPECTL_act_vcapp  | AV   | 324      | Type 6 | 0      | RW        | sysActualVarSpdComprCap  |
| CAPECTL_avl_cap    | AV   | 325      | Type 6 | 0      | RW        | System Avail Comp Cap    |
| CAPECTL_avl_fcapp  | AV   | 326      | Type 6 | 0      | RW        | SysAvailFixSpdComprCap   |
| CAPECTL_avl_vcapp  | AV   | 327      | Type 6 | 0      | RW        | SysAvailVarSpdComprCap   |
| CAPECTL_cap        | AV   | 328      | Type 6 | 0      | RW        | System Capacity          |
| CAPECTL_cap_pct    | AV   | 329      | Type 6 | 0      | RW        | System Capacity Percent  |
| CAPECTL_run_fcapp  | AV   | 330      | Type 6 | 0      | RW        | sysRunFixSpdComprCap     |
| CAPECTL_run_vcapp  | AV   | 331      | Type 6 | 0      | RW        | sysRunVarSpdComprCap     |
| CIRCACTL_cap_tons  | AV   | 332      | Type 6 | 0      | RW        | System Capacity Tons     |
| CIRCACTL_circ_wrd  | AV   | 333      | Type 6 | 0      | RW        | Circuit A Diag Word      |
| CIRCACTL_ck1_acap  | AV   | 334      | Type 6 | 0      | RW        | Circ A Avail Comp Cap    |
| CIRCACTL_ck1_cap   | AV   | 335      | Type 6 | 0      | RW        | Circuit A Capacity       |
| CIRCACTL_ck1_capp  | AV   | 336      | Type 6 | 0      | RW        | Circuit A Capacity Pct   |
| CIRCACTL_ck1accap  | AV   | 337      | Type 6 | 0      | RW        | Circ A Actual Comp Cap   |
| CIRCACTL_ck1afcapp | AV   | 338      | Type 6 | 0      | RW        | cirAAvailFixSpdComprCap  |
| CIRCACTL_ck1afscap | AV   | 339      | Type 6 | 0      | RW        | cirAAvailFixSpdComprCap  |
| CIRCACTL_ck1avcap  | AV   | 340      | Type 6 | 0      | RW        | cirAAvailVarSpdComprCap  |
| CIRCACTL_ck1avscap | AV   | 341      | Type 6 | 0      | RW        | cirAAvailVarSpdComprCap  |
| CIRCACTL_ck1rfcap  | AV   | 342      | Type 6 | 0      | RW        | cirARunFixSpdComprCap    |
| CIRCACTL_ck1rvcap  | AV   | 343      | Type 6 | 0      | RW        | cirARunVarSpdComprCap    |
| CIRCACTL_cmpn_wrd  | AV   | 344      | Type 6 | 0      | RW        | Compression A Diag Word  |
| CIRCACTL_status    | AV   | 345      | Type 6 | 0      | RW        | Circuit A Status         |
| CIRCACTL_stdystat  | BV   | 132      | Type 4 | 0      | RW        | Circ A Steady State Flag |
| CMPA1CTL_aDSTMn    | AV   | 179      | Type 6 | 0      | RO        | CmpA AbsDischSatTMin     |
| CMPA1CTL_aDSTMx    | AV   | 180      | Type 6 | 0      | RO        | CmpA AbsDischSatTMax     |
| CMPA1CTL_aSSTMn    | AV   | 181      | Type 6 | 0      | RO        | CmpA AbsSuctSat TMin     |
| CMPA1CTL_aSSTMx    | AV   | 182      | Type 6 | 0      | RO        | CmpA AbsSuctSatTMax      |
| CMPA1CTL_cAN       | AV   | 183      | Type 6 | 0      | RO        | CmpA Act Nom Capacity    |
| CMPA1CTL_cANp      | AV   | 184      | Type 6 | 0      | RO        | CmpA Act Nom Cap Pct     |
| CMPA1CTL_cASp      | AV   | 185      | Type 6 | 0      | RO        | CmpA Act Scal Cap pct    |
| CMPA1CTL_cMax      | AV   | 186      | Type 6 | 0      | RO        | CmpA Capacity Max        |
| CMPA1CTL_cmd       | AV   | 189      | Type 6 | 0      | RO        | CmpA Command             |
| CMPA1CTL_cMin      | AV   | 187      | Type 6 | 0      | RO        | CmpA Capacity Min        |
| CMPA1CTL_cObj      | AV   | 188      | Type 6 | 0      | RO        | CmpA Current Obj         |
| CMPA1CTL_dSTS      | AV   | 190      | Type 6 | 0      | RO        | CmpA SatDischTempSetpt   |
| CMPA1CTL_dTS       | AV   | 191      | Type 6 | 0      | RO        | CmpA DischTempSetpt      |
| CMPA1CTL_eDSTMn    | AV   | 193      | Type 6 | 0      | RO        | CmpA EnvDischSatTMin     |
| CMPA1CTL_eDSTMx    | AV   | 194      | Type 6 | 0      | RO        | CmpA EnvDischSatTMax     |
| CMPA1CTL_elubsp    | AV   | 205      | Type 6 | 0      | RO        | CmpA Oil Guidance Setpt  |
| CMPA1CTL_envvrd    | AV   | 206      | Type 6 | 0      | RO        | CmpA Env Diag Word       |
| CMPA1CTL_eSSTMn    | AV   | 195      | Type 6 | 0      | RO        | CmpA EnvSuctSatTMin      |
| CMPA1CTL_eSSTMx    | AV   | 196      | Type 6 | 0      | RO        | CmpA EnvSuctSatTMax      |
| CMPA1CTL_ftStp     | AV   | 197      | Type 6 | 0      | RO        | CmpA Fluid Temp Setpt    |
| CMPA1CTL_fWd       | AV   | 198      | Type 6 | 0      | RO        | CmpA Fault Word          |
| CMPA1CTL_isEnable  | BV   | 89       | Type 4 | 0      | RO        | CmpA Enable              |
| CMPA1CTL_isNom     | BV   | 90       | Type 4 | 0      | RO        | CmpA Nominal             |
| CMPA1CTL_isRd2Go   | BV   | 91       | Type 4 | 0      | RO        | CmpA Ready to Start      |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME       | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|-------------------|------|----------|--------|--------|-----------|--------------------------|
| CMPA1CTL_isRd2St  | BV   | 92       | Type 4 | 0      | RO        | CmpA Ready to Stop       |
| CMPA1CTL_isStart  | BV   | 93       | Type 4 | 0      | RO        | CmpA Started             |
| CMPA1CTL_isStop   | BV   | 94       | Type 4 | 0      | RO        | CmpA Stopped             |
| CMPA1CTL_iTS      | AV   | 199      | Type 6 | 0      | RO        | CmpA Inverter Temp Setpt |
| CMPA1CTL_mTS      | AV   | 200      | Type 6 | 0      | RO        | CmpA Motor Temp Setpt    |
| CMPA1CTL_oVS      | AV   | 201      | Type 6 | 0      | RO        | CmpA Oil Viscosity Setpt |
| CMPA1CTL_rTS      | AV   | 202      | Type 6 | 0      | RO        | CmpA RectifierTemp Setpt |
| CMPA1CTL_shrt_cyc | BV   | 95       | Type 4 | 0      | RO        | CmpA Short Cycle Prevent |
| CMPA1CTL_sSTS     | AV   | 203      | Type 6 | 0      | RO        | CmpA Sat Suct Temp Setpt |
| CMPA1CTL_stall_ct | AV   | 204      | Type 6 | 0      | RO        | CmpA Stall Count         |
| CMPA1CTL_statwrd  | AV   | 192      | Type 6 | 0      | RO        | CmpA State Diag Word     |
| CMPA1CTL_vi_cmd   | BV   | 96       | Type 4 | 0      | RO        | CmpA Vi Command          |
| CMPA1CTL_vi_cObj  | AV   | 209      | Type 6 | 0      | RO        | CmpA Vi Curr Objective   |
| CMPA1CTL_vi_dword | AV   | 210      | Type 6 | 0      | RO        | CmpA Vi Diag Word        |
| CMPA1CTL_vi_sp1   | AV   | 207      | Type 6 | 0      | RO        | CmpA Vi Stp1             |
| CMPA1CTL_vi_sp2   | AV   | 208      | Type 6 | 0      | RO        | CmpA Vi Stp2             |
| CPMPCTL_disc_cmd  | BV   | 123      | Type 4 | 0      | RO        | Cond Pump Cmd            |
| CPMPCTL_dWd       | AV   | 290      | Type 6 | 0      | RO        | Diagnostic Word          |
| CPMPCTL_fWd       | AV   | 291      | Type 6 | 0      | RO        | Fault Word               |
| CPMPCTL_has_flo   | BV   | 55       | Type 4 | 0      | RO        | Flow Established         |
| CPMPCTL_isEnable  | BV   | 124      | Type 4 | 0      | RO        | Enable                   |
| CPMPCTL_isNom     | BV   | 125      | Type 4 | 0      | RO        | Nominal                  |
| CPMPCTL_isRd2Go   | BV   | 126      | Type 4 | 0      | RO        | Ready to Start           |
| CPMPCTL_isRd2St   | BV   | 127      | Type 4 | 0      | RO        | Ready to Stop            |
| CPMPCTL_isStart   | BV   | 128      | Type 4 | 0      | RO        | Started                  |
| CPMPCTL_isStop    | BV   | 129      | Type 4 | 0      | RO        | Stopped                  |
| CTLSTATE_ice_bld  | AV   | 38       | Type 6 | 0      | RO        | Ice Building             |
| DRVA1CFG_curr_lim | AV   | 396      | Type 6 | 0      | RW        | Current Limit Percent    |
| DRVA1CFG_min_spd  | AV   | 393      | Type 6 | 0      | RW        | Compressor Unload Spd    |
| DRVA1CFG_pwm_freq | AV   | 397      | Type 6 | 0      | RW        | PWM Switch Frequency     |
| DRVA1CFG_ramp_dec | AV   | 403      | Type 6 | 0      | RW        | Decrease Ramp Time       |
| DRVA1CFG_ramp_inc | AV   | 402      | Type 6 | 0      | RW        | Increase Ramp Time       |
| DRVA1CFG_ria      | AV   | 389      | Type 6 | 0      | RW        | Motor Nameplate Current  |
| DRVA1CFG_ria_m    | AV   | 387      | Type 6 | 0      | RW        | Motor Rated Load Amps    |
| DRVA1CFG_rlh      | AV   | 392      | Type 6 | 0      | RW        | Compressor 100% Speed    |
| DRVA1CFG_rlk      | AV   | 391      | Type 6 | 0      | RW        | Motor Nameplate KW       |
| DRVA1CFG_rlrpm    | AV   | 390      | Type 6 | 0      | RW        | Motor Nameplate RPM      |
| DRVA1CFG_rlv      | AV   | 388      | Type 6 | 0      | RW        | Motor Nameplate Voltage  |
| DRVA1CFG_rlv_i    | AV   | 386      | Type 6 | 0      | RW        | Rated Line Voltage       |
| DRVA1CFG_skipband | AV   | 401      | Type 6 | 0      | RW        | Skip Frequency Band      |
| DRVA1CFG_skipfrq1 | AV   | 398      | Type 6 | 0      | RW        | Skip Frequency 1         |
| DRVA1CFG_skipfrq2 | AV   | 399      | Type 6 | 0      | RW        | Skip Frequency 2         |
| DRVA1CFG_skipfrq3 | AV   | 400      | Type 6 | 0      | RW        | Skip Frequency 3         |
| DRVA1CFG_strt_spd | AV   | 394      | Type 6 | 0      | RW        | Compressor Start Spd     |
| DRVA1CFG_torq_lim | AV   | 395      | Type 6 | 0      | RW        | Torque Limit Percent     |
| DRVA1STS_ALM_WD1  | AV   | 174      | Type 6 | 0      | RO        | VFD Alarm Word1          |
| DRVA1STS_ALM_WD2  | AV   | 175      | Type 6 | 0      | RO        | VFD Alarm Word2          |
| DRVA1STS_ALT_WD1  | AV   | 172      | Type 6 | 0      | RO        | VFD Alert Word1          |
| DRVA1STS_ALT_WD2  | AV   | 173      | Type 6 | 0      | RO        | VFD Alert Word2          |
| DRVA1STS_AMPS_PCT | AV   | 161      | Type 6 | 0      | RO        | VFD Motor Curr Pct Rated |
| DRVA1STS_BUS_V    | AV   | 159      | Type 6 | 0      | RO        | VFD Bus Voltage          |
| DRVA1STS_COMS     | MV   | 8        | Type 5 | 0      | RO        | VFD Coms Status          |
| DRVA1STS_IGBT_T   | AV   | 166      | Type 6 | 0      | RO        | VFD IGBT Temp            |
| DRVA1STS_INV_T    | AV   | 165      | Type 6 | 0      | RO        | VFD Inverter Temp        |
| DRVA1STS_LAST_FLT | AV   | 169      | Type 6 | 0      | RO        | VFD Last Fault Code      |
| DRVA1STS_LINE_CUR | AV   | 157      | Type 6 | 0      | RO        | VFD Average Line Current |
| DRVA1STS_LINE_KW  | AV   | 158      | Type 6 | 0      | RO        | VFD Average Line KW      |
| DRVA1STS_LINE_V   | AV   | 156      | Type 6 | 0      | RO        | VFD Average Line Voltage |
| DRVA1STS_MOT_CUR  | AV   | 160      | Type 6 | 0      | RO        | VFD Motor Current        |
| DRVA1STS_MOT_KW   | AV   | 162      | Type 6 | 0      | RO        | VFD Motor KW             |
| DRVA1STS_MOT_RPM  | AV   | 168      | Type 6 | 0      | RO        | VFD Motor Rpm            |
| DRVA1STS_PCT      | AV   | 163      | Type 6 | 0      | RO        | VFD Capacity             |
| DRVA1STS_RECT_T   | AV   | 167      | Type 6 | 0      | RO        | VFD Rectifier Temp       |
| DRVA1STS_SPD      | AV   | 164      | Type 6 | 0      | RO        | VFD Speed                |
| DRVA1STS_STAT_WD1 | AV   | 170      | Type 6 | 0      | RO        | VFD Status Word1         |
| DRVA1STS_STAT_WD2 | AV   | 171      | Type 6 | 0      | RO        | VFD Status Word2         |
| ECOACTL_cObj      | AV   | 226      | Type 6 | 0      | RO        | Current Objective        |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME       | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|-------------------|------|----------|--------|--------|-----------|--------------------------|
| ECOACTL_dTStpt    | AV   | 227      | Type 6 | 0      | RO        | Econ Disch Temp Setpoint |
| ECOACTL_dWd       | AV   | 228      | Type 6 | 0      | RO        | Diag Word                |
| ECOACTL_fWd       | AV   | 229      | Type 6 | 0      | RO        | Fault Word               |
| ECOACTL_isEnable  | BV   | 104      | Type 4 | 0      | RO        | Enable                   |
| ECOACTL_isNom     | BV   | 105      | Type 4 | 0      | RO        | Nominal                  |
| ECOACTL_isRd2Go   | BV   | 106      | Type 4 | 0      | RO        | Ready to Start           |
| ECOACTL_isRd2St   | BV   | 107      | Type 4 | 0      | RO        | Ready to Stop            |
| ECOACTL_isStart   | BV   | 108      | Type 4 | 0      | RO        | Started                  |
| ECOACTL_isStop    | BV   | 109      | Type 4 | 0      | RO        | Stopped                  |
| ECOACTL_shTStpt   | AV   | 230      | Type 6 | 0      | RO        | Econ Superheat Setpoint  |
| ENERGY_acgpm      | AV   | 139      | Type 6 | 0      | RO        | Actual Cond GPM          |
| ENERGY_aegpm      | AV   | 138      | Type 6 | 0      | RO        | Actual Evap GPM          |
| ENERGY_dcgpm      | AV   | 377      | Type 6 | 0      | RW        | Design Cond GPM          |
| ENERGY_dcpdft     | AV   | 378      | Type 6 | 0      | RW        | Design Cond Press Drop   |
| ENERGY_dcrt       | AV   | 379      | Type 6 | 0      | RW        | Design Cond Refrig Temp  |
| ENERGY_decwt      | AV   | 375      | Type 6 | 0      | RW        | Design Ent Cond Temp     |
| ENERGY_degpm      | AV   | 372      | Type 6 | 0      | RW        | Design Evap GPM          |
| ENERGY_depdt      | AV   | 373      | Type 6 | 0      | RW        | Design Evap Press Drop   |
| ENERGY_dert       | AV   | 374      | Type 6 | 0      | RW        | Design Evap Refrig Temp  |
| ENERGY_dewt       | AV   | 370      | Type 6 | 0      | RW        | Design Ent Evap Temp     |
| ENERGY_din_kw     | AV   | 368      | Type 6 | 0      | RW        | Design Input kW          |
| ENERGY_dkw_ton    | AV   | 369      | Type 6 | 0      | RW        | Design Input kW/Ton      |
| ENERGY_dlcwt      | AV   | 376      | Type 6 | 0      | RW        | Design Lvg Cond Temp     |
| ENERGY_dlwt       | AV   | 371      | Type 6 | 0      | RW        | Design Lvg Evap Temp     |
| EPMPCTL_disc_cmd  | AV   | 348      | Type 6 | 0      | RO        | Evap Pump Cmd            |
| EPMPCTL_dWd       | AV   | 349      | Type 6 | 0      | RO        | Diagnostic Word          |
| EPMPCTL_fWd       | AV   | 350      | Type 6 | 0      | RO        | Fault Word               |
| EPMPCTL_has_flo   | AV   | 137      | Type 6 | 0      | RO        | Flow Established         |
| EPMPCTL_isEnable  | BV   | 140      | Type 4 | 0      | RO        | Enable                   |
| EPMPCTL_isNom     | BV   | 141      | Type 4 | 0      | RO        | Nominal                  |
| EPMPCTL_isRd2Go   | BV   | 142      | Type 4 | 0      | RO        | Ready to Start           |
| EPMPCTL_isRd2St   | BV   | 143      | Type 4 | 0      | RO        | Ready to Stop            |
| EPMPCTL_isStart   | BV   | 144      | Type 4 | 0      | RO        | Started                  |
| EPMPCTL_isStop    | BV   | 145      | Type 4 | 0      | RO        | Stopped                  |
| EXVACFG_aTStpt    | AV   | 7        | Type 6 | 0      | RW        | EXV Approach Setpoint    |
| EXVACFG_cll_stpt  | AV   | 6        | Type 6 | 0      | RW        | EXV Cond Liq Lvl Stpt    |
| EXVACFG_lo_dshof  | AV   | 9        | Type 6 | 0      | RW        | EXV Lo Disch Superh Ofst |
| EXVACFG_lo_dshsp  | AV   | 8        | Type 6 | 0      | RW        | EXV Lo Disch Superh Stpt |
| EXVACFG_max_dist  | AV   | 10       | Type 6 | 0      | RW        | EXV Max Disch Temp Stpt  |
| EXVACFG_sbc_min   | AV   | 11       | Type 6 | 0      | RW        | EXV Subcooling Min Stpt  |
| EXVACFG_sbc_of    | AV   | 12       | Type 6 | 0      | RW        | EXV Subcooling Min Ofst  |
| EXVACFG_spsSTLeMO | AV   | 13       | Type 6 | 0      | RW        | EXV LowSatSuctOffset     |
| EXVACTL_aTStpt    | AV   | 211      | Type 6 | 0      | RO        | Approach Setpoint        |
| EXVACTL_cll_stpt  | AV   | 213      | Type 6 | 0      | RO        | Cond Liq Level Setpoint  |
| EXVACTL_cObj      | AV   | 212      | Type 6 | 0      | RO        | Current Objective        |
| EXVACTL_dPHStpt   | AV   | 214      | Type 6 | 0      | RO        | Hi Disch Sat Temp Stpt   |
| EXVACTL_dWd       | AV   | 215      | Type 6 | 0      | RO        | Diag Word                |
| EXVACTL_ecliqlvl  | AV   | 223      | Type 6 | 0      | RO        | Est Cond Liq Level       |
| EXVACTL_estcflo   | AV   | 225      | Type 6 | 0      | RO        | Est Cond Flow            |
| EXVACTL_esteflo   | AV   | 224      | Type 6 | 0      | RO        | Est Evap Flow            |
| EXVACTL_estflag   | BV   | 103      | Type 4 | 0      | RO        | Cond Lvl Est Flag        |
| EXVACTL_fWd       | AV   | 216      | Type 6 | 0      | RO        | Fault Word               |
| EXVACTL_hi_dtsp   | AV   | 221      | Type 6 | 0      | RO        | Disch Temp Hi Stpt       |
| EXVACTL_isEnable  | BV   | 97       | Type 4 | 0      | RO        | Enable                   |
| EXVACTL_isNom     | BV   | 98       | Type 4 | 0      | RO        | Nominal                  |
| EXVACTL_isRd2Go   | BV   | 99       | Type 4 | 0      | RO        | Ready to Start           |
| EXVACTL_isRd2St   | BV   | 100      | Type 4 | 0      | RO        | Ready to Stop            |
| EXVACTL_isStart   | BV   | 101      | Type 4 | 0      | RO        | Started                  |
| EXVACTL_isStop    | BV   | 102      | Type 4 | 0      | RO        | Stopped                  |
| EXVACTL_lo_dshsp  | AV   | 217      | Type 6 | 0      | RO        | Low Disch S/H Stpt       |
| EXVACTL_lo_sbcsp  | AV   | 222      | Type 6 | 0      | RO        | Subcool Low Stpt         |
| EXVACTL_max_dist  | AV   | 218      | Type 6 | 0      | RO        | Max Discharge Temp       |
| EXVACTL_sPHStpt   | AV   | 219      | Type 6 | 0      | RO        | suctSatTempHighStpt      |
| EXVACTL_sPLStpt   | AV   | 220      | Type 6 | 0      | RO        | suctSatTempLowStpt       |
| FACTORY_aux_io    | AV   | 366      | Type 6 | 0      | RW        | Auxiliary IO Location    |
| FACTORY_comp_typ  | MV   | 11       | Type 5 | 0      | RW        | Compressor Type          |
| FACTORY_econ_opt  | MV   | 15       | Type 5 | 0      | RW        | Economizer Option        |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME       | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|-------------------|------|----------|--------|--------|-----------|--------------------------|
| FACTORY_exv_opt   | MV   | 14       | Type 5 | 0      | RW        | EXV Control Type         |
| FACTORY_hgbp_opt  | BV   | 159      | Type 4 | 0      | RW        | HGBP Control Option      |
| FACTORY_oilassy   | AV   | 367      | Type 6 | 0      | RW        | Oil Assembly Option      |
| FACTORY_refrig    | MV   | 12       | Type 5 | 0      | RW        | Refrigerant Type         |
| FACTORY_tons      | AV   | 365      | Type 6 | 0      | RW        | Chiller Tons             |
| FACTORY_vfd_opt   | MV   | 13       | Type 5 | 0      | RW        | VFD Option               |
| GENCONF_caplim_a  | AV   | 4        | Type 6 | 0      | RW        | Circuit A Capacity Limit |
| GENCONF_caplim_b  | AV   | 5        | Type 6 | 0      | RW        | Circuit B Capacity Limit |
| GENCONF_dem_sel   | MV   | 3        | Type 5 | 0      | RW        | Demand Limit Source      |
| GENCONF_ice_rec   | BV   | 2        | Type 4 | 0      | RW        | Ice Mode Recycle         |
| GENCONF_lead_ck   | MV   | 2        | Type 5 | 0      | RW        | Lead Circuit Selection   |
| GENCONF_leak_en   | BV   | 3        | Type 4 | 0      | RW        | Refrigerant Leak Option  |
| GENCONF_ramp_en   | BV   | 1        | Type 4 | 0      | RW        | Enable Ramp Loading      |
| GENCONF_rampsel   | MV   | 1        | Type 5 | 0      | RW        | Ramp Loading Type        |
| GENCONF_rrate_a   | AV   | 2        | Type 6 | 0      | RW        | Ramp Rate (per Min)      |
| GENCONF_rrate_k   | AV   | 3        | Type 6 | 0      | RW        | Ramp Rate (per Min)      |
| GENCONF_rrate_t   | AV   | 1        | Type 6 | 0      | RW        | Ramp Rate (per Min)      |
| GENUNIT_BAC_OCC   | BV   | 4        | Type 4 | 0      | RO        | BACnet Occupied          |
| GENUNIT_CHIL_S_S  | BV   | 6        | Type 4 | 0      | RO        | Cmd Start/Stop           |
| GENUNIT_CTRL_PNT  | AV   | 35       | Type 6 | 0      | RO        | Control Point            |
| GENUNIT_DEM_LIM   | AV   | 36       | Type 6 | 0      | RO        | Active Demand Limit      |
| GENUNIT_EMSTOP    | BV   | 7        | Type 4 | 0      | RO        | Emergency Stop           |
| GENUNIT_ICE_OCC   | BV   | 9        | Type 4 | 0      | RO        | Ice Build Occupied       |
| GENUNIT_LAG_LIM   | AV   | 37       | Type 6 | 0      | RO        | Lag Demand Limit         |
| GENUNIT_LCL_S_S   | BV   | 5        | Type 4 | 0      | RO        | HMI Start/Stop Cmd       |
| GENUNIT_LOC_OCC   | BV   | 8        | Type 4 | 0      | RO        | Local Sched Occupied     |
| GENUNIT_min_left  | AV   | 33       | Type 6 | 0      | RO        | Time Until Start         |
| GENUNIT_min_run   | AV   | 34       | Type 6 | 0      | RO        | Minimum Runtime Timer    |
| GENUNIT_ONOFFSVC  | MV   | 5        | Type 5 | 0      | RO        | Unit Mode                |
| GENUNIT_ramp_act  | BV   | 10       | Type 4 | 0      | RO        | Ramp Loading Active      |
| GENUNIT_ramprate  | AV   | 39       | Type 6 | 0      | RO        | Ramp Rate (per Min)      |
| GENUNIT_rpdrstst  | MV   | 7        | Type 5 | 0      | RO        | Swift Restart State      |
| GENUNIT_STATUS    | MV   | 4        | Type 5 | 0      | RO        | Unit Status              |
| GENUNIT_SYS_STAT  | MV   | 6        | Type 5 | 0      | RO        | System State             |
| HGBPACTL_cmd      | AV   | 233      | Type 6 | 0      | RO        | HGBPA Command            |
| HGBPACTL_cObj     | AV   | 231      | Type 6 | 0      | RO        | HGBPA Current Obj        |
| HGBPACTL_cSS      | AV   | 235      | Type 6 | 0      | RO        | HGBPA Comp Spd Stpt      |
| HGBPACTL_do_cmd   | BV   | 110      | Type 4 | 0      | RO        | HGBPA Disc Out Cmd       |
| HGBPACTL_dWd      | AV   | 237      | Type 6 | 0      | RO        | HGBPA Diag Word          |
| HGBPACTL_fts      | AV   | 234      | Type 6 | 0      | RO        | HGBPA Fluid T Stpt       |
| HGBPACTL_fWd      | AV   | 238      | Type 6 | 0      | RO        | HGBPA Fault Word         |
| HGBPACTL_hgbpa_pt | AV   | 232      | Type 6 | 0      | RO        | HGBPA Process Temp       |
| HGBPACTL_isEnable | BV   | 111      | Type 4 | 0      | RO        | HGBPA Enable             |
| HGBPACTL_isNom    | BV   | 112      | Type 4 | 0      | RO        | HGBPA Nominal            |
| HGBPACTL_isRd2Go  | BV   | 113      | Type 4 | 0      | RO        | HGBPA Ready to Start     |
| HGBPACTL_isRd2St  | BV   | 114      | Type 4 | 0      | RO        | HGBPA Ready to Stop      |
| HGBPACTL_isStart  | BV   | 115      | Type 4 | 0      | RO        | HGBPA Started            |
| HGBPACTL_isStop   | BV   | 116      | Type 4 | 0      | RO        | HGBPA Stopped            |
| HGBPACTL_svPS     | AV   | 236      | Type 6 | 0      | RO        | HGBPA SV Pos Stpt        |
| HYDRCFG_cflo_vt   | AV   | 385      | Type 6 | 0      | RW        | Cond Flow Verify time    |
| HYDRCFG_condfdtp  | AV   | 383      | Type 6 | 0      | RW        | Cond Flow Detection Type |
| HYDRCFG_condfldp  | AV   | 384      | Type 6 | 0      | RW        | Cond Min Flow dP         |
| HYDRCFG_eflo_vt   | AV   | 382      | Type 6 | 0      | RW        | Evap Flow Verify time    |
| HYDRCFG_evapfdtp  | AV   | 380      | Type 6 | 0      | RW        | Evap Flow Detection Type |
| HYDRCFG_evapfldp  | AV   | 381      | Type 6 | 0      | RW        | Evap Min Flow dP         |
| INPUTS_AUTO_DEM   | AV   | 127      | Type 6 | 0      | RO        | Auto Demand Limit Input  |
| INPUTS_AUTO_RES   | AV   | 128      | Type 6 | 0      | RO        | Auto Water Temp Reset    |
| INPUTS_CNDLVL_A   | AV   | 133      | Type 6 | 0      | RO        | Cond Liq Lev A           |
| INPUTS_CNDLVL_B   | AV   | 136      | Type 6 | 0      | RO        | Cond Liq Lev B           |
| INPUTS_COND_FSW   | BV   | 49       | Type 4 | 0      | RO        | Condenser Flow Switch    |
| INPUTS_E_STOP     | BV   | 42       | Type 4 | 0      | RO        | Emergency Stop Contact   |
| INPUTS_ECOA_FBK   | AV   | 131      | Type 6 | 0      | RO        | Econ A EXV Feedback      |
| INPUTS_ECOB_FBK   | AV   | 135      | Type 6 | 0      | RO        | Econ B EXV Feedback      |
| INPUTS_EVAP_FSW   | BV   | 50       | Type 4 | 0      | RO        | Evaporator Flow Switch   |
| INPUTS_EXVA_FBK   | AV   | 130      | Type 6 | 0      | RO        | Main EXV A Feedback      |
| INPUTS_EXVB_FBK   | AV   | 134      | Type 6 | 0      | RO        | Main EXV B Feedback      |
| INPUTS_FS_LOCK    | BV   | 43       | Type 4 | 0      | RO        | Fire Security Interlock  |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME       | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|-------------------|------|----------|--------|--------|-----------|--------------------------|
| INPUTS_HPS_A      | BV   | 52       | Type 4 | 0      | RO        | High Pressure Switch A   |
| INPUTS_HPS_B      | BV   | 54       | Type 4 | 0      | RO        | High Pressure Switch B   |
| INPUTS_ICE_CON    | BV   | 44       | Type 4 | 0      | RO        | Ice Build Contact        |
| INPUTS_ICE_SW     | BV   | 45       | Type 4 | 0      | RO        | Ice Done Storage Switch  |
| INPUTS_OIL_L_A    | BV   | 51       | Type 4 | 0      | RO        | Oil Level Input A        |
| INPUTS_OIL_L_B    | BV   | 53       | Type 4 | 0      | RO        | Oil Level Input B        |
| INPUTS_REF_LEAK   | AV   | 129      | Type 6 | 0      | RO        | Refrig Leakage Sensor    |
| INPUTS_REM_CON    | BV   | 46       | Type 4 | 0      | RO        | Remote Start/Stop        |
| INPUTS_REM_LOCK   | BV   | 47       | Type 4 | 0      | RO        | Remote Lockout           |
| INPUTS_SAFETY     | BV   | 48       | Type 4 | 0      | RO        | Spare Safety Input       |
| INPUTS_SVA_FBK    | AV   | 132      | Type 6 | 0      | RO        | Slide Valve A Feedback   |
| LIMITCFG_ap_dgap  | AV   | 29       | Type 6 | 0      | RW        | Design Evap Appr         |
| LIMITCFG_cdp_alrt | AV   | 27       | Type 6 | 0      | RW        | Cond Press Alert         |
| LIMITCFG_cond_al  | AV   | 25       | Type 6 | 0      | RW        | Cond Approach Alert      |
| LIMITCFG_dgt_alrt | AV   | 26       | Type 6 | 0      | RW        | Comp Discharge Alert     |
| LIMITCFG_evap_al  | AV   | 24       | Type 6 | 0      | RW        | Evap Approach Alert      |
| LIMITCFG_PpmLim   | AV   | 32       | Type 6 | 0      | RW        | Refrig Leak Alarm PPM    |
| LIMITCFG_rch_cath | AV   | 28       | Type 6 | 0      | RW        | Refr Charge Cond Alert   |
| LIMITCFG_RefPpm20 | AV   | 31       | Type 6 | 0      | RW        | Ref Leak PPM at 20 mA    |
| LIMITCFG_vfdsptad | AV   | 30       | Type 6 | 0      | RW        | VFD Speed Alrt Dband     |
| LUBECFG_hgbpoff   | AV   | 21       | Type 6 | 0      | RW        | Turn Off HGBP            |
| LUBECFG_hgbpon    | AV   | 20       | Type 6 | 0      | RW        | Turn On HGBP             |
| LUBECFG_minhz     | AV   | 23       | Type 6 | 0      | RW        | Minimum Hz               |
| LUBECFG_minlift   | AV   | 22       | Type 6 | 0      | RW        | Minimum Lift             |
| LUBECFG_smp1off   | AV   | 17       | Type 6 | 0      | RW        | Sump1 Heater Off         |
| LUBECFG_smp1on    | AV   | 16       | Type 6 | 0      | RW        | Sump1 Heater On          |
| LUBECFG_smp2off   | AV   | 19       | Type 6 | 0      | RW        | Sump2 Heater Off         |
| LUBECFG_smp2on    | AV   | 18       | Type 6 | 0      | RW        | Sump2 Heater On          |
| LUBECFG_vphtoff   | AV   | 15       | Type 6 | 0      | RW        | Vaporizer Heater Off     |
| LUBECFG_vphton    | AV   | 14       | Type 6 | 0      | RW        | Vaporizer Heater On      |
| OILHCTL_fWd       | AV   | 264      | Type 6 | 0      | RO        | Fault Word               |
| OILHCTL_isEnable  | AV   | 265      | Type 6 | 0      | RO        | Enable                   |
| OILHCTL_isNom     | AV   | 266      | Type 6 | 0      | RO        | Nominal                  |
| OILHCTL_isRd2Go   | AV   | 267      | Type 6 | 0      | RO        | Ready to Start           |
| OILHCTL_isRd2St   | AV   | 268      | Type 6 | 0      | RO        | Ready to Stop            |
| OILHCTL_isStart   | AV   | 269      | Type 6 | 0      | RO        | Started                  |
| OILHCTL_isStop    | AV   | 270      | Type 6 | 0      | RO        | Stopped                  |
| OILPCTL_fWd       | AV   | 271      | Type 6 | 0      | RO        | Fault Word               |
| OILPCTL_isEnable  | AV   | 272      | Type 6 | 0      | RO        | Enable                   |
| OILPCTL_isNom     | AV   | 273      | Type 6 | 0      | RO        | Nominal                  |
| OILPCTL_isRd2Go   | AV   | 274      | Type 6 | 0      | RO        | Ready to Start           |
| OILPCTL_isRd2St   | AV   | 275      | Type 6 | 0      | RO        | Ready to Stop            |
| OILPCTL_isStart   | AV   | 276      | Type 6 | 0      | RO        | Started                  |
| OILPCTL_isStop    | AV   | 277      | Type 6 | 0      | RO        | Stopped                  |
| OILRCTL_isEnable  | AV   | 278      | Type 6 | 0      | RO        | Enable                   |
| OILRCTL_isNom     | AV   | 279      | Type 6 | 0      | RO        | Nominal                  |
| OILRCTL_isRd2Go   | AV   | 280      | Type 6 | 0      | RO        | Ready to Start           |
| OILRCTL_isRd2St   | AV   | 281      | Type 6 | 0      | RO        | Ready to Stop            |
| OILRCTL_isStart   | AV   | 282      | Type 6 | 0      | RO        | Started                  |
| OILRCTL_isStop    | AV   | 283      | Type 6 | 0      | RO        | Stopped                  |
| OILVCTL_oil_visc  | AV   | 346      | Type 6 | 0      | RO        | Oil Viscosity            |
| OUTPUTS_ALE       | BV   | 11       | Type 4 | 0      | RO        | Alert Relay              |
| OUTPUTS_ALM       | BV   | 12       | Type 5 | 0      | RO        | Alarm Relay              |
| OUTPUTS_BP_ECO_A  | BV   | 26       | Type 4 | 0      | RO        | Econ Bypass Solenoid A   |
| OUTPUTS_BP_ECO_B  | BV   | 40       | Type 4 | 0      | RO        | Econ Bypass Solenoid B   |
| OUTPUTS_CAPOUT_A  | AV   | 120      | Type 6 | 0      | RO        | Analog Capacity Output A |
| OUTPUTS_CAPOUT_B  | AV   | 124      | Type 6 | 0      | RO        | Analog Capacity Output B |
| OUTPUTS_CAPT      | AV   | 116      | Type 6 | 0      | RO        | Capacity Output Total    |
| OUTPUTS_CDWP1     | BV   | 16       | Type 4 | 0      | RO        | Cond Water Pump          |
| OUTPUTS_CHST_OUT  | AV   | 117      | Type 6 | 0      | RO        | Unit Status Output       |
| OUTPUTS_CHWP1     | BV   | 17       | Type 4 | 0      | RO        | Chill Water Pump         |
| OUTPUTS_CP_A_LOCK | BV   | 27       | Type 4 | 0      | RO        | Comp A VFD Interlock     |
| OUTPUTS_CP_B_LOCK | BV   | 41       | Type 4 | 0      | RO        | Comp B VFD Interlock     |
| OUTPUTS_ECOEXV_A  | AV   | 121      | Type 6 | 0      | RO        | Economizer EXV A         |
| OUTPUTS_ECOEXV_B  | AV   | 125      | Type 6 | 0      | RO        | Economizer EXV B         |
| OUTPUTS_EXV_A     | AV   | 122      | Type 6 | 0      | RO        | Main EXV A               |
| OUTPUTS_EXV_B     | AV   | 126      | Type 6 | 0      | RO        | Main EXV B               |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME           | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|-----------------------|------|----------|--------|--------|-----------|--------------------------|
| OUTPUTS_HDPV_OUT      | AV   | 118      | Type 6 | 0      | RO        | Head Pres Output         |
| OUTPUTS_HGBP_A        | BV   | 20       | Type 4 | 0      | RO        | HGBP Soleniod A          |
| OUTPUTS_HGBP_B        | BV   | 34       | Type 4 | 0      | RO        | HGBP Soleniod B          |
| OUTPUTS_MTR_CL_A      | BV   | 22       | Type 4 | 0      | RO        | Motor Cooling Solenoid A |
| OUTPUTS_MTR_CL_B      | BV   | 36       | Type 4 | 0      | RO        | Motor Cooling Solenoid B |
| OUTPUTS_OIL_DL_A      | BV   | 23       | Type 4 | 0      | RO        | Dual Oil Flow Solenoid A |
| OUTPUTS_OIL_DL_B      | BV   | 37       | Type 4 | 0      | RO        | Dual Oil Flow Solenoid B |
| OUTPUTS_OIL_RECL      | AV   | 123      | Type 6 | 0      | RO        | Oil Reclaim Valve        |
| OUTPUTS_OILHEAT1      | BV   | 31       | Type 4 | 0      | RO        | Oil Heater - Primary     |
| OUTPUTS_OILHEAT2      | BV   | 32       | Type 4 | 0      | RO        | Oil Heater - Secondary   |
| OUTPUTS_OILR          | BV   | 33       | Type 4 | 0      | RO        | Oil Pump Relay           |
| OUTPUTS_OILSOL_A      | BV   | 21       | Type 4 | 0      | RO        | Oil Solenoid A           |
| OUTPUTS_OILSOL_B      | BV   | 35       | Type 4 | 0      | RO        | Oil Solenoid B           |
| OUTPUTS_RUN           | BV   | 13       | Type 4 | 0      | RO        | Running Relay            |
| OUTPUTS_SET_FLOW      | BV   | 14       | Type 4 | 0      | RO        | Cooler Flow SP Out       |
| OUTPUTS_SHTDN         | BV   | 15       | Type 4 | 0      | RO        | Shutdown Relay           |
| OUTPUTS_SLV_LD_A      | BV   | 28       | Type 4 | 0      | RO        | Slide Valve Load A       |
| OUTPUTS_SLV_UL_A      | BV   | 29       | Type 4 | 0      | RO        | Slide Valve Unload A     |
| OUTPUTS_TFR_HIGH      | BV   | 18       | Type 4 | 0      | RO        | Tower Fan Relay High     |
| OUTPUTS_TFR_LOW       | BV   | 19       | Type 4 | 0      | RO        | Tower Fan Relay Low      |
| OUTPUTS_TOW_FAN       | AV   | 119      | Type 6 | 0      | RO        | VFD Tower Fan            |
| OUTPUTS_VAP_HEAT      | BV   | 30       | Type 4 | 0      | RO        | Vaporizer Heater         |
| OUTPUTS_VFDSOL_A      | BV   | 24       | Type 4 | 0      | RO        | VFD Coolant Solenoid A   |
| OUTPUTS_VFDSOL_B      | BV   | 38       | Type 4 | 0      | RO        | VFD Coolant Solenoid B   |
| OUTPUTS_VI_CMP_A      | BV   | 25       | Type 4 | 0      | RO        | VI Piston Solenoid A     |
| OUTPUTS_VI_CMP_B      | BV   | 39       | Type 4 | 0      | RO        | VI Piston Solenoid B     |
| PLTSPRT_rs485_u1_tres | BV   | 146      | Type 4 | 0      | RW        | LEN Port J6 Term Res     |
| PLTSPRT_rs485_u3_tres | BV   | 147      | Type 4 | 0      | RW        | CCN Port J7 Term Res     |
| PLTSPRT_rs485_u4_tres | BV   | 148      | Type 4 | 0      | RW        | Mod Master J10 Term Res  |
| PLTSPRT_rs485_u5_tres | BV   | 149      | Type 4 | 0      | RW        | BMS Port J8 Term Res     |
| PRESSURE_CND_P_A      | AV   | 97       | Type 6 | 0      | RO        | Condenser Pressure A     |
| PRESSURE_CND_P_B      | AV   | 108      | Type 6 | 0      | RO        | Condenser Pressure B     |
| PRESSURE_COND_EWP     | AV   | 91       | Type 6 | 0      | RO        | Entering Cond Water Pres |
| PRESSURE_COND_LWP     | AV   | 92       | Type 6 | 0      | RO        | Leaving Cond Water Pres  |
| PRESSURE_COND_WDP     | AV   | 93       | Type 6 | 0      | RO        | Cond Water Delta P       |
| PRESSURE_DIS_P_A      | AV   | 96       | Type 6 | 0      | RO        | Discharge Pressure A     |
| PRESSURE_DIS_P_B      | AV   | 107      | Type 6 | 0      | RO        | Discharge Pressure B     |
| PRESSURE_ECO_P_A      | AV   | 98       | Type 6 | 0      | RO        | Economizer Pressure A    |
| PRESSURE_ECO_P_B      | AV   | 109      | Type 6 | 0      | RO        | Economizer Pressure B    |
| PRESSURE_EVAP_EWP     | AV   | 88       | Type 6 | 0      | RO        | Entering Evap Water Pres |
| PRESSURE_EVAP_LWP     | AV   | 89       | Type 6 | 0      | RO        | Leaving Evap Water Pres  |
| PRESSURE_EVAP_P_A     | AV   | 94       | Type 6 | 0      | RO        | Evaporator Pressure A    |
| PRESSURE_EVAP_P_B     | AV   | 105      | Type 6 | 0      | RO        | Evaporator Pressure B    |
| PRESSURE_EVAP_WDP     | AV   | 90       | Type 6 | 0      | RO        | Evap Water Delta P       |
| PRESSURE_LIQ_P_A      | AV   | 103      | Type 6 | 0      | RO        | Liquid Line Press A      |
| PRESSURE_LIQ_P_B      | AV   | 114      | Type 6 | 0      | RO        | Liquid Line Press B      |
| PRESSURE_MTR_P_A      | AV   | 104      | Type 6 | 0      | RO        | Motor Injection Press A  |
| PRESSURE_MTR_P_B      | AV   | 115      | Type 6 | 0      | RO        | Motor Injection Press B  |
| PRESSURE_OIL_DP_A     | AV   | 100      | Type 6 | 0      | RO        | Oil Discharge Pressure A |
| PRESSURE_OIL_DP_B     | AV   | 111      | Type 6 | 0      | RO        | Oil Discharge Pressure B |
| PRESSURE_OIL_PD_A     | AV   | 101      | Type 6 | 0      | RO        | Oil Press Diff A         |
| PRESSURE_OIL_PD_B     | AV   | 112      | Type 6 | 0      | RO        | Oil Press Diff B         |
| PRESSURE_OILPA1RQ     | AV   | 102      | Type 6 | 0      | RO        | Oil Pressure Required A  |
| PRESSURE_OILPB1RQ     | AV   | 113      | Type 6 | 0      | RO        | Oil Pressure Required B  |
| PRESSURE_OILPSMPA     | AV   | 99       | Type 6 | 0      | RO        | Oil Sump Pressure A      |
| PRESSURE_OILPSMPB     | AV   | 110      | Type 6 | 0      | RO        | Oil Sump Pressure B      |
| PRESSURE_SUCT_P_A     | AV   | 95       | Type 6 | 0      | RO        | Suction Pressure A       |
| PRESSURE_SUCT_P_B     | AV   | 106      | Type 6 | 0      | RO        | Suction Pressure B       |
| PROTOCOL_BAC_S_S      | BV   | 136      | Type 4 | 0      | RO        | BACNET Start/Stop        |
| PROTOCOL_BACALARM     | BV   | 138      | Type 4 | 0      | RO        | BACNET Alarm Flag        |
| PROTOCOL_BACALERT     | BV   | 139      | Type 4 | 0      | RO        | BACNET Alert Flag        |
| PROTOCOL_BACDEML      | AV   | 347      | Type 6 | 0      | RO        | BACNET Demand Limit      |
| PROTOCOL_BACESTOP     | BV   | 134      | Type 4 | 0      | RO        | BACNET Estop             |
| PROTOCOL_BACLKOUT     | BV   | 137      | Type 4 | 0      | RO        | BACNET Lockout           |
| PROTOCOL_BACOCC       | BV   | 133      | Type 4 | 0      | RO        | BACNET Occupy            |
| PROTOCOL_BACSFTY      | BV   | 135      | Type 4 | 0      | RO        | BACNET Fire Safety       |
| RUNTIME_hr_comp_a     | AV   | 307      | Type 6 | 0      | RO        | Compressor A Hours       |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME          | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|----------------------|------|----------|--------|--------|-----------|--------------------------|
| RUNTIME_hr_comp_b    | AV   | 308      | Type 6 | 0      | RO        | Compressor B Hours       |
| RUNTIME_hr_cpmp1     | AV   | 312      | Type 6 | 0      | RO        | Cond Pump 1 Hours        |
| RUNTIME_hr_epmp1     | AV   | 311      | Type 6 | 0      | RO        | Evap Pump 1 Hours        |
| RUNTIME_hr_mach      | AV   | 306      | Type 6 | 0      | RO        | Machine Operating Hours  |
| RUNTIME_hr_oilpa     | AV   | 309      | Type 6 | 0      | RO        | Oil Pump A Hours         |
| RUNTIME_hr_oilpb     | AV   | 310      | Type 6 | 0      | RO        | Oil Pump B Hours         |
| RUNTIME_hr_svc       | AV   | 305      | Type 6 | 0      | RO        | Service Runtime          |
| RUNTIME_rcycst_a     | AV   | 298      | Type 6 | 0      | RO        | CompA Recy Strts in 4 Hr |
| RUNTIME_rcycst_b     | AV   | 299      | Type 6 | 0      | RO        | CompB Recy Strts in 4 Hr |
| RUNTIME_spst_a       | AV   | 303      | Type 6 | 0      | RO        | Comp A Stop to Start     |
| RUNTIME_spst_b       | AV   | 304      | Type 6 | 0      | RO        | Comp B Stop to Start     |
| RUNTIME_st_oilpa     | AV   | 294      | Type 6 | 0      | RO        | Oil Pump A Starts        |
| RUNTIME_st_oilpb     | AV   | 295      | Type 6 | 0      | RO        | Oil Pump B Starts        |
| RUNTIME_st12_a       | AV   | 296      | Type 6 | 0      | RO        | CompA Starts in 12 Hrs   |
| RUNTIME_st12_b       | AV   | 297      | Type 6 | 0      | RO        | CompB Starts in 12 Hrs   |
| RUNTIME_str_comp_a   | AV   | 292      | Type 6 | 0      | RO        | Compressor A Starts      |
| RUNTIME_str_comp_b   | AV   | 293      | Type 6 | 0      | RO        | Compressor B Starts      |
| RUNTIME_stst_a       | AV   | 301      | Type 6 | 0      | RO        | Comp A Start to Start    |
| RUNTIME_stst_b       | AV   | 302      | Type 6 | 0      | RO        | Comp B Start to Start    |
| RUNTIME_swifcmt      | AV   | 300      | Type 6 | 0      | RO        | Swift Restarts in 1 Hr   |
| SERVICE1_CirA_En     | BV   | 155      | Type 4 | 0      | RW        | Enable Circuit A         |
| SERVICE1_CirB_En     | BV   | 156      | Type 4 | 0      | RW        | Enable Circuit B         |
| SERVICE1_cmpstper_A  | AV   | 359      | Type 6 | 0      | RW        | Comp Start Period        |
| SERVICE1_cmpstper_B  | AV   | 361      | Type 6 | 0      | RW        | Comp Start Period        |
| SERVICE1_dem_20ma    | AV   | 353      | Type 6 | 0      | RW        | Demand Limit At 20 mA    |
| SERVICE1_emstopen    | BV   | 150      | Type 4 | 0      | RW        | Emergency Stop Enable    |
| SERVICE1_flui_typ    | MV   | 9        | Type 5 | 0      | RW        | Evaporator Fluid Type    |
| SERVICE1_freezesp    | AV   | 351      | Type 6 | 0      | RW        | Brine Freeze Setpoint    |
| SERVICE1_lockout     | BV   | 151      | Type 4 | 0      | RW        | Service Lockout          |
| SERVICE1_max_lwt     | AV   | 355      | Type 6 | 0      | RW        | Maximum Fluid Temp       |
| SERVICE1_min_lwt     | AV   | 354      | Type 6 | 0      | RW        | Minimum Fluid Temp       |
| SERVICE1_min_off     | AV   | 352      | Type 6 | 0      | RW        | Comp Min Off Time        |
| SERVICE1_oilsw_by_A  | BV   | 153      | Type 4 | 0      | RW        | Oil Switch Bypass A      |
| SERVICE1_oilsw_by_B  | BV   | 154      | Type 4 | 0      | RW        | Oil Switch Bypass B      |
| SERVICE1_pwautlim    | AV   | 364      | Type 6 | 0      | RW        | Powerloss Autoreset Lim  |
| SERVICE1_rspdmaxA    | AV   | 356      | Type 6 | 0      | RW        | Comp Speed Max A         |
| SERVICE1_rspdmaxB    | AV   | 357      | Type 6 | 0      | RW        | Comp Speed Max B         |
| SERVICE1_rsthrsvc    | BV   | 157      | Type 4 | 0      | RW        | Reset Service Runtime    |
| SERVICE1_rstrtopt    | MV   | 10       | Type 5 | 0      | RW        | Restart Options          |
| SERVICE1_sftst_en    | BV   | 158      | Type 4 | 0      | RW        | Soft Stop Enable         |
| SERVICE1_sftst_th    | AV   | 362      | Type 6 | 0      | RW        | Soft Stop Threshold      |
| SERVICE1_spstopen    | AV   | 363      | Type 6 | 0      | RW        | Spare Safety Enable      |
| SERVICE1_stlim_by    | BV   | 152      | Type 4 | 0      | RW        | Starts Limit Bypass      |
| SERVICE1_stpperlim_A | AV   | 358      | Type 6 | 0      | RW        | Starts Per Period Lim    |
| SERVICE1_stpperlim_B | AV   | 360      | Type 6 | 0      | RW        | Starts Per Period Lim    |
| SETPOINT_dem_base    | AV   | 407      | Type 6 | 0      | RW        | Base Demand Limit        |
| SETPOINT_ecw_sp      | AV   | 406      | Type 6 | 0      | RW        | Cooling ECW Setpoint     |
| SETPOINT_EWT_OPT     | BV   | 160      | Type 4 | 0      | RW        | EWT Control Option       |
| SETPOINT_ice_sp      | AV   | 405      | Type 6 | 0      | RW        | Ice Build Setpoint       |
| SETPOINT_icw_sp      | AV   | 404      | Type 6 | 0      | RW        | Cooling LCW Setpoint     |
| SETPOINT_rcyc_hi     | AV   | 409      | Type 6 | 0      | RW        | Recycle Startup Offset   |
| SETPOINT_rcyc_lo     | AV   | 408      | Type 6 | 0      | RW        | Recycle Shutdown Offset  |
| SLVA1CTL_cAN         | AV   | 247      | Type 6 | 0      | RO        | SVA Act Nom Capacity     |
| SLVA1CTL_cANp        | AV   | 248      | Type 6 | 0      | RO        | SVA Actual Nom Cap Pct   |
| SLVA1CTL_cASp        | AV   | 249      | Type 6 | 0      | RO        | SVA Actual Scal Cap Pct  |
| SLVA1CTL_cMax        | AV   | 250      | Type 6 | 0      | RO        | SVA Capacity Max         |
| SLVA1CTL_cmd         | AV   | 239      | Type 6 | 0      | RO        | SVA Command              |
| SLVA1CTL_cMin        | AV   | 251      | Type 6 | 0      | RO        | SVA Capacity Min         |
| SLVA1CTL_cObj        | AV   | 252      | Type 6 | 0      | RO        | SVA Current Objective    |
| SLVA1CTL_dstcmd      | AV   | 240      | Type 6 | 0      | RO        | Hi Disch Sat Temp PI     |
| SLVA1CTL_dSTS        | AV   | 253      | Type 6 | 0      | RO        | SVA SatDischTempSetpt    |
| SLVA1CTL_dtcmd       | AV   | 241      | Type 6 | 0      | RO        | Hi Disch Temp PI         |
| SLVA1CTL_dTS         | AV   | 254      | Type 6 | 0      | RO        | SVA Disch Temp Setpt     |
| SLVA1CTL_dty_cyc     | AV   | 256      | Type 6 | 0      | RO        | SVA Duty Cycle           |
| SLVA1CTL_dWd         | AV   | 255      | Type 6 | 0      | RO        | SVA Diag Word            |
| SLVA1CTL_ftcmd       | AV   | 242      | Type 6 | 0      | RO        | Fluid Temp PI            |
| SLVA1CTL_fTStp       | AV   | 257      | Type 6 | 0      | RO        | SVA Fluid Temp Setpt     |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME       | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|-------------------|------|----------|--------|--------|-----------|--------------------------|
| SLVA1CTL_fWd      | AV   | 258      | Type 6 | 0      | RO        | SVA Fault Word           |
| SLVA1CTL_isEnable | BV   | 117      | Type 4 | 0      | RO        | SVA Enable               |
| SLVA1CTL_isNom    | BV   | 118      | Type 4 | 0      | RO        | SVA Nominal              |
| SLVA1CTL_isRd2Go  | BV   | 119      | Type 4 | 0      | RO        | SVA Ready to Start       |
| SLVA1CTL_isRd2St  | BV   | 120      | Type 4 | 0      | RO        | SVA Ready to Stop        |
| SLVA1CTL_isStart  | BV   | 121      | Type 4 | 0      | RO        | SVA Started              |
| SLVA1CTL_isStop   | BV   | 122      | Type 4 | 0      | RO        | SVA Stopped              |
| SLVA1CTL_iTS      | AV   | 259      | Type 6 | 0      | RO        | SVA Inverter Temp Setpt  |
| SLVA1CTL_mCS      | AV   | 260      | Type 6 | 0      | RO        | SVA Motor Current Setpt  |
| SLVA1CTL_mcurcmd  | AV   | 243      | Type 6 | 0      | RO        | Motor Curr PI            |
| SLVA1CTL_mtmpmd   | AV   | 244      | Type 6 | 0      | RO        | Motor Temp PI            |
| SLVA1CTL_mTS      | AV   | 261      | Type 6 | 0      | RO        | SVA Motor Temp Setpt     |
| SLVA1CTL_oilrecmd | AV   | 245      | Type 6 | 0      | RO        | Oil Recovery PI          |
| SLVA1CTL_oVS      | AV   | 262      | Type 6 | 0      | RO        | SVA Oil Viscosity Setpt  |
| SLVA1CTL_sstcmd   | AV   | 246      | Type 6 | 0      | RO        | Lo Sat Evap Temp PI      |
| SLVA1CTL_sSTS     | AV   | 263      | Type 6 | 0      | RO        | SVA Sat Suct Temp Setpt  |
| STGECTL_cmp1cknb  | AV   | 176      | Type 6 | 0      | RO        | Cmp 1 Circ Num           |
| STGECTL_cmp1hgbp  | BV   | 83       | Type 4 | 0      | RO        | Cmp 1 HGBP               |
| STGECTL_cmp1ldrq  | BV   | 84       | Type 4 | 0      | RO        | Cmp1 Load Required       |
| STGECTL_comp_id   | BV   | 85       | Type 4 | 0      | RO        | Cmp Load                 |
| STGECTL_comp_ul   | BV   | 86       | Type 4 | 0      | RO        | Cmp Unload               |
| STGECTL_id_alwd   | BV   | 87       | Type 4 | 0      | RO        | Loading Allowed          |
| STGECTL_leadck    | AV   | 177      | Type 6 | 0      | RO        | Lead Circ Num            |
| STGECTL_stat_wrd  | AV   | 178      | Type 6 | 0      | RO        | Stage Status Word        |
| STGECTL_ul_alwd   | BV   | 88       | Type 4 | 0      | RO        | Unloading Allowed        |
| STRSTS_accelflt   | BV   | 76       | Type 4 | 0      | RO        | Starter Accel Fault      |
| STRSTS_amp_unb    | BV   | 62       | Type 4 | 0      | RO        | Current Imbalance        |
| STRSTS_AMPS_AVG   | AV   | 147      | Type 6 | 0      | RO        | Average Line Current     |
| STRSTS_AMPS_H1    | AV   | 144      | Type 6 | 0      | RO        | Line Current Phase 1     |
| STRSTS_AMPS_H2    | AV   | 145      | Type 6 | 0      | RO        | Line Current Phase 2     |
| STRSTS_AMPS_H3    | AV   | 146      | Type 6 | 0      | RO        | Line Current Phase 3     |
| STRSTS_ampstop    | BV   | 79       | Type 4 | 0      | RO        | Motor Amps When Stopped  |
| STRSTS_calfc_er   | BV   | 81       | Type 4 | 0      | RO        | Calibration Factor Error |
| STRSTS_conf_err   | BV   | 82       | Type 4 | 0      | RO        | Invalid Configuration    |
| STRSTS_cycle_1    | BV   | 58       | Type 4 | 0      | RO        | Single Cycle Dropout     |
| STRSTS_FREQ_H     | AV   | 148      | Type 6 | 0      | RO        | Line Frequency           |
| STRSTS_freqflt    | BV   | 69       | Type 4 | 0      | RO        | Frequency Out of Range   |
| STRSTS_GRFT_H1    | AV   | 149      | Type 6 | 0      | RO        | Ground Fault Phase 3     |
| STRSTS_GRFT_H2    | AV   | 150      | Type 6 | 0      | RO        | Ground Fault Phase 2     |
| STRSTS_GRFT_H3    | AV   | 151      | Type 6 | 0      | RO        | Ground Fault Phase 1     |
| STRSTS_grnd_flt   | BV   | 67       | Type 4 | 0      | RO        | Ground Fault             |
| STRSTS_hardware   | BV   | 80       | Type 4 | 0      | RO        | Hardware Failure         |
| STRSTS_highamps   | BV   | 77       | Type 4 | 0      | RO        | Excessive Motor Amps     |
| STRSTS_ism_por    | BV   | 70       | Type 4 | 0      | RO        | ISM Power On Reset       |
| STRSTS_KW         | AV   | 155      | Type 6 | 0      | RO        | Motor KW                 |
| STRSTS_lrtrip     | BV   | 65       | Type 4 | 0      | RO        | Locked Rotor Trip        |
| STRSTS_m1_flt     | BV   | 71       | Type 4 | 0      | RO        | 1M Start/Run Fault       |
| STRSTS_m1m2stop   | BV   | 78       | Type 4 | 0      | RO        | 1M/2M Stop Fault         |
| STRSTS_m2_flt     | BV   | 72       | Type 4 | 0      | RO        | 2M Start/Run Fault       |
| STRSTS_no_amps    | BV   | 75       | Type 4 | 0      | RO        | Motor Amps Not Sensed    |
| STRSTS_ov_volt    | BV   | 60       | Type 4 | 0      | RO        | Over Voltage             |
| STRSTS_overload   | BV   | 64       | Type 4 | 0      | RO        | Overload Trip            |
| STRSTS_ph_loss    | BV   | 59       | Type 4 | 0      | RO        | Phase Loss               |
| STRSTS_ph_rev     | BV   | 68       | Type 4 | 0      | RO        | Phase Reversal           |
| STRSTS_prs_trip   | BV   | 73       | Type 4 | 0      | RO        | Pressure Trip Contact    |
| STRSTS_slrtrip    | BV   | 66       | Type 4 | 0      | RO        | Starter Lock Rotor Trip  |
| STRSTS_start_ok   | BV   | 56       | Type 4 | 0      | RO        | 1CR Start Complete       |
| STRSTS_stop_ok    | BV   | 57       | Type 4 | 0      | RO        | 1CR Stop Complete        |
| STRSTS_strt_flt   | BV   | 74       | Type 4 | 0      | RO        | Starter Fault            |
| STRSTS_sum1ht_h   | AV   | 152      | Type 6 | 0      | RO        | I2T Sum Heat Phase 1     |
| STRSTS_sum2ht_h   | AV   | 153      | Type 6 | 0      | RO        | I2T Sum Heat Phase 2     |
| STRSTS_sum3ht_h   | AV   | 154      | Type 6 | 0      | RO        | I2T Sum Heat Phase 3     |
| STRSTS_un_volt    | BV   | 61       | Type 4 | 0      | RO        | Under Voltage            |
| STRSTS_VOLT_AVG   | AV   | 143      | Type 6 | 0      | RO        | Average Line Voltage     |
| STRSTS_VOLT_H1    | AV   | 140      | Type 6 | 0      | RO        | Line Voltage Phase 1     |
| STRSTS_VOLT_H2    | AV   | 141      | Type 6 | 0      | RO        | Line Voltage Phase 2     |
| STRSTS_VOLT_H3    | AV   | 142      | Type 6 | 0      | RO        | Line Voltage Phase 3     |

## APPENDIX C — NETWORK CONFIGURATION (CONT)

### BACnet Points List (cont)

| OBJECT NAME     | TYPE | INSTANCE | OPTION | COVINC | PV ACCESS | DESCRIPTION              |
|-----------------|------|----------|--------|--------|-----------|--------------------------|
| STRSTS_volt_unb | BV   | 63       | Type 4 | 0      | RO        | Voltage Imbalance        |
| TEMP_CND_ST_A   | AV   | 55       | Type 6 | 0      | RO        | Cond Sat Temp A          |
| TEMP_CND_ST_B   | AV   | 76       | Type 6 | 0      | RO        | Cond Sat Temp B          |
| TEMP_CNDAPP_A   | AV   | 57       | Type 6 | 0      | RO        | Condenser Approach A     |
| TEMP_CNDAPP_B   | AV   | 78       | Type 6 | 0      | RO        | Condenser Approach       |
| TEMP_CTL_FLUI   | AV   | 45       | Type 6 | 0      | RO        | Control Fluid Temp       |
| TEMP_DGT_A      | AV   | 53       | Type 6 | 0      | RO        | Discharge Gas Temp A     |
| TEMP_DGT_B      | AV   | 74       | Type 6 | 0      | RO        | Discharge Gas Temp B     |
| TEMP_DIS_ST_A   | AV   | 54       | Type 6 | 0      | RO        | Discharge Sat Temp A     |
| TEMP_DIS_ST_B   | AV   | 75       | Type 6 | 0      | RO        | Discharge Sat Temp B     |
| TEMP_DSH_A      | AV   | 56       | Type 6 | 0      | RO        | Discharge Superheat A    |
| TEMP_DSH_B      | AV   | 77       | Type 6 | 0      | RO        | Discharge Superheat B    |
| TEMP_ECDW       | AV   | 42       | Type 6 | 0      | RO        | Entering Cond Water Temp |
| TEMP_ECO_SH_A   | AV   | 61       | Type 6 | 0      | RO        | Econ Superheat A         |
| TEMP_ECO_SH_B   | AV   | 82       | Type 6 | 0      | RO        | Econ Superheat B         |
| TEMP_ECO_T_A    | AV   | 59       | Type 6 | 0      | RO        | Economizer Gas Temp A    |
| TEMP_ECO_T_B    | AV   | 80       | Type 6 | 0      | RO        | Economizer Gas Temp B    |
| TEMP_ECOST_A    | AV   | 60       | Type 6 | 0      | RO        | Econ Saturated Temp A    |
| TEMP_ECOST_B    | AV   | 81       | Type 6 | 0      | RO        | Econ Saturated Temp B    |
| TEMP_ECW        | AV   | 40       | Type 6 | 0      | RO        | Ent Chill Water Temp     |
| TEMP_EVAP_T_A   | AV   | 46       | Type 6 | 0      | RO        | Evap Rfrg Liq Temp A     |
| TEMP_EVAP_T_B   | AV   | 68       | Type 6 | 0      | RO        | Evap Rfrg Liq Temp B     |
| TEMP_EVP_ST_A   | AV   | 47       | Type 6 | 0      | RO        | Evap Saturated Temp A    |
| TEMP_EVP_ST_B   | AV   | 69       | Type 6 | 0      | RO        | Evap Saturated Temp B    |
| TEMP_EVPAPP_A   | AV   | 48       | Type 6 | 0      | RO        | Evaporator Approach A    |
| TEMP_EVPAPP_B   | AV   | 70       | Type 6 | 0      | RO        | Evaporator Approach B    |
| TEMP_LCDW       | AV   | 43       | Type 6 | 0      | RO        | Leaving Cond Water Temp  |
| TEMP_LCW        | AV   | 41       | Type 6 | 0      | RO        | Leaving Chill Water Temp |
| TEMP_LIQ_T_A    | AV   | 62       | Type 6 | 0      | RO        | Liquid Line Temp A       |
| TEMP_LIQ_T_B    | AV   | 83       | Type 6 | 0      | RO        | Liquid Line Temp B       |
| TEMP_LLS_A      | AV   | 64       | Type 6 | 0      | RO        | Liquid Line Subcool A    |
| TEMP_LLS_B      | AV   | 85       | Type 6 | 0      | RO        | Liquid Line Subcool B    |
| TEMP_MTRW_A     | AV   | 58       | Type 6 | 0      | RO        | Motor Winding Temp A     |
| TEMP_MTRW_B     | AV   | 79       | Type 6 | 0      | RO        | Motor Winding Temp B     |
| TEMP_OIL_A      | AV   | 67       | Type 6 | 0      | RO        | Oil Temp A               |
| TEMP_OIL_B      | AV   | 87       | Type 6 | 0      | RO        | Oil Temp B               |
| TEMP_OILTSMIPA  | AV   | 65       | Type 6 | 0      | RO        | Oil Sump Temp A          |
| TEMP_OILTSMIPB  | AV   | 86       | Type 6 | 0      | RO        | Oil Sump Temp B          |
| TEMP_R_RESET    | AV   | 44       | Type 6 | 0      | RO        | Remote Reset Temp        |
| TEMP_ROT_T_A    | AV   | 50       | Type 6 | 0      | RO        | Rotor Inlet Temp A       |
| TEMP_SLT_A      | AV   | 63       | Type 6 | 0      | RO        | Saturated Liquid Temp A  |
| TEMP_SLT_B      | AV   | 84       | Type 6 | 0      | RO        | Saturated Liquid Temp B  |
| TEMP_SSH_A      | AV   | 52       | Type 6 | 0      | RO        | Suction Superheat A      |
| TEMP_SSH_B      | AV   | 73       | Type 6 | 0      | RO        | Suction Superheat B      |
| TEMP_SST_A      | AV   | 51       | Type 6 | 0      | RO        | Suct Saturated Temp A    |
| TEMP_SST_B      | AV   | 72       | Type 6 | 0      | RO        | Suct Saturated Temp B    |
| TEMP_SUCT_T_A   | AV   | 49       | Type 6 | 0      | RO        | Suction Temperature A    |
| TEMP_SUCT_T_B   | AV   | 71       | Type 6 | 0      | RO        | Suction Temperature B    |
| TEMP_VAP_TEMP   | AV   | 66       | Type 6 | 0      | RO        | Oil Vaporizer Temp       |
| VAPCTL_isEnable | AV   | 284      | Type 6 | 0      | RO        | Enable                   |
| VAPCTL_isNom    | AV   | 285      | Type 6 | 0      | RO        | Nominal                  |
| VAPCTL_isRd2Go  | AV   | 286      | Type 6 | 0      | RO        | Ready to Start           |
| VAPCTL_isRd2St  | AV   | 287      | Type 6 | 0      | RO        | Ready to Stop            |
| VAPCTL_isStart  | AV   | 288      | Type 6 | 0      | RO        | Started                  |
| VAPCTL_isStop   | AV   | 289      | Type 6 | 0      | RO        | Stopped                  |

#### LEGEND

**AV** — Analog Value  
**BV** — Binary Value  
**RO** — Read Only  
**RW** — Read Write

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup>

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE  |         |         | COMMENT                       |
|----------|------|---------|-------------------|--------------------------|-----------------------|------|------|--------|---------|---------|-------------------------------|
| HEXADEC. | DEC. |         |                   |                          |                       |      |      | MIN.   | MAX.    | DEFAULT |                               |
| 0x0001   | 1    | 1       | GENCONF_rampsel   | Ramp Loading Type        | UINT                  | IR   |      | 0      | 2       | 0       | MV:0=Temp,<br>1=Current, 2=KW |
| 0x0002   | 2    | 1       | GENCONF_ramp_en   | Enable Ramp Loading      | UINT                  | IR   |      | 0      | 1       | 0       |                               |
| 0x0003   | 3    | 2       | GENCONF_rrate_t   | Ramp Rate (per Min)      | FLOAT                 | IR   | °F   | 0.5    | 32      | 0.5     |                               |
|          |      |         |                   |                          |                       |      | °C   | -17.5  | 0.00    | -17.5   |                               |
| 0x0004   | 4    | 2       | GENCONF_rrate_a   | Ramp Rate (per Min)      | FLOAT                 | IR   | amp  | 0.5    | 100     | 0.5     |                               |
| 0x0005   | 5    | 2       | GENCONF_rrate_k   | Ramp Rate (per Min)      | FLOAT                 | IR   | kW   | 0.5    | 100     | 0.5     |                               |
| 0x0006   | 6    | 1       | GENCONF_ice_cnfg  | Ice Mode Enable          | UINT                  | IR   |      | 0      | 1       | 0       |                               |
| 0x0007   | 7    | 1       | GENCONF_ice_rec   | Ice Mode Recycle         | UINT                  | IR   |      | 0      | 1       | 0       |                               |
| 0x0008   | 8    | 1       | GENCONF_leak_en   | Refrigerant Leak Option  | UINT                  | IR   |      | 0      | 1       | 0       |                               |
| 0x0009   | 9    | 1       | GENCONF_lead_ck   | Lead Circuit Selection   | UINT                  | IR   |      | 0      | 2       | 0       | MV:0=auto, 1=cka,<br>2=ckb    |
| 0x000A   | 10   | 2       | GENCONF_caplim_a  | Circuit A Capacity Limit | FLOAT                 | IR   | %    | 20     | 100     | 100     |                               |
| 0x000B   | 11   | 2       | GENCONF_caplim_b  | Circuit B Capacity Limit | FLOAT                 | IR   | %    | 20     | 100     | 100     |                               |
| 0x000C   | 12   | 1       | GENCONF_dem_sel   | Demand Limit Source      | UINT                  | IR   |      | 0      | 1       | 0       | MV:0=Local,<br>1=Analog,      |
| 0x000D   | 13   | 2       | EXVACFG_cli_stpt  | EXV Cond Liq Lvl Stpt    | FLOAT                 | IR   |      |        |         | 0       |                               |
| 0x000E   | 14   | 2       | EXVACFG_aTstpt    | EXV Approach Setpoint    | FLOAT                 | IR   |      |        |         | 3       |                               |
| 0x000F   | 15   | 2       | EXVACFG_lo_dshsp  | EXV Lo Disch Superh Stpt | FLOAT                 | IR   |      |        |         | 1       |                               |
| 0x0010   | 16   | 2       | EXVACFG_lo_dshof  | EXV Lo Disch Superh Ofst | FLOAT                 | IR   |      |        |         | 0       |                               |
| 0x0011   | 17   | 2       | EXVACFG_max_dist  | EXV Max Disch Temp Stpt  | FLOAT                 | IR   |      |        |         | 210     |                               |
| 0x0012   | 18   | 2       | EXVACFG_sbc_min   | EXV Subcooling Min Stpt  | FLOAT                 | IR   |      |        |         | 1       |                               |
| 0x0013   | 19   | 2       | EXVACFG_sbc_of    | EXV Subcooling Min Ofst  | FLOAT                 | IR   |      |        |         | 0       |                               |
| 0x0014   | 20   | 2       | EXVACFG_spsSTLeMO | EXV LowSatSuctOffset     | FLOAT                 | IR   | °F   | 0      | 10      | 3       |                               |
|          |      |         |                   |                          |                       |      | °C   | -17.78 | -12.22  | -16.11  |                               |
| 0x0015   | 21   | 2       | LUBECFG_vphton    | Vaporizer Heater On      | FLOAT                 | IR   | °F   |        |         | 100     |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | 37.78   |                               |
| 0x0016   | 22   | 2       | LUBECFG_vphtoff   | Vaporizer Heater Off     | FLOAT                 | IR   | °F   |        |         | 120     |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | 48.89   |                               |
| 0x0017   | 23   | 2       | LUBECFG_smp1on    | Sump1 Heater On          | FLOAT                 | IR   | °F   |        |         | 140     |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | 60.00   |                               |
| 0x0018   | 24   | 2       | LUBECFG_smp1off   | Sump1 Heater Off         | FLOAT                 | IR   | °F   |        |         | 145     |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | 62.78   |                               |
| 0x0019   | 25   | 2       | LUBECFG_smp2on    | Sump2 Heater On          | FLOAT                 | IR   | °F   |        |         | 125     |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | 51.67   |                               |
| 0x001A   | 26   | 2       | LUBECFG_smp2off   | Sump2 Heater Off         | FLOAT                 | IR   | °F   |        |         | 140     |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | 60.00   |                               |
| 0x001B   | 27   | 2       | LUBECFG_hgbpon    | Turn On HGBP             | FLOAT                 | IR   | °F   |        |         | 20      |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | -6.67   |                               |
| 0x001C   | 28   | 2       | LUBECFG_hgbpoff   | Turn Off HGBP            | FLOAT                 | IR   | °F   |        |         | 5       |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | -15     |                               |
| 0x001D   | 29   | 2       | LUBECFG_minlift   | Minimum Lift             | FLOAT                 | IR   | °F   |        |         | 20      |                               |
|          |      |         |                   |                          |                       |      | °C   |        |         | 11.11   |                               |
| 0x001E   | 30   | 2       | LUBECFG_minhz     | Minimum Hz               | FLOAT                 | IR   | Hz   |        |         | 24      |                               |
| 0x001F   | 31   | 2       | LIMITCFG_evap_al  | Evap Approach Alert      | FLOAT                 | IR   | °F   | 0.5    | 15      | 5       |                               |
|          |      |         |                   |                          |                       |      | °C   | 0.28   | 8.33    | 2.78    |                               |
| 0x0020   | 32   | 2       | LIMITCFG_cond_al  | Cond Approach Alert      | FLOAT                 | IR   | °F   | 0.5    | 15      | 6       |                               |
|          |      |         |                   |                          |                       |      | °C   | 0.28   | 8.33    | 3.33    |                               |
| 0x0021   | 33   | 2       | LIMITCFG_dgt_alrt | Comp Discharge Alert     | FLOAT                 | IR   | °F   | 125    | 300     | 200     |                               |
|          |      |         |                   |                          |                       |      | °C   | 51.67  | 148.89  | 93.33   |                               |
| 0x0022   | 34   | 2       | LIMITCFG_cdp_alrt | Cond Press Alert         | FLOAT                 | IR   | psig | 125    | 300     | 130     |                               |
|          |      |         |                   |                          |                       |      | kPa  | 861.88 | 2068.50 | 896.35  |                               |
| 0x0023   | 35   | 2       | LIMITCFG_rch_cath | Refr Charge Cond Alert   | FLOAT                 | IR   | °F   | 20     | 40      | 20      |                               |
|          |      |         |                   |                          |                       |      | °C   | -6.67  | 4.44    | -6.67   |                               |
| 0x0024   | 36   | 2       | LIMITCFG_ap_dgap  | Design Evap Appr         | FLOAT                 | IR   | °F   | 0      | 10      | 2       |                               |
|          |      |         |                   |                          |                       |      | °C   | -17.78 | -12.22  | -16.67  |                               |
| 0x0025   | 37   | 2       | LIMITCFG_vfdsptad | VFD Speed Alrt Dband     | FLOAT                 | IR   | %    | 0      | 20      | 10      |                               |
| 0x0026   | 38   | 2       | LIMITCFG_RefPpm20 | Ref Leak PPM at 20 mA    | FLOAT                 | IR   | ppm  | 4      | 9999    | 1000    |                               |
| 0x0027   | 39   | 2       | LIMITCFG_PpmLim   | Refrg Leak Alarm PPM     | FLOAT                 | IR   | ppm  | 4      | 9999    | 500     |                               |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER        | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE |       |         | COMMENT                                                                                                                                                                                             |
|----------|------|---------|------------------|--------------------------|-----------------------|------|------|-------|-------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HEXADEC. | DEC. |         |                  |                          |                       |      |      | MIN.  | MAX.  | DEFAULT |                                                                                                                                                                                                     |
| 0x0028   | 40   | 1       | GENUNIT_STATUS   | Unit Status              | UINT                  | HR   |      | 0     | 16    | 0       | MV: 0=OFF, 1=DELAY, 2=READY, 3=RECYCLE, 4=PRESTART, 5=STARTUP, 6=AUTORESTART, 7=RUNNING, 8=DEMAND, 9=RAMPING, 10=STOPPING, 11=TRIPOUT, 12=SERV_TEST, 13=PUMPDOWN, 14=LOCKOUT, 15=RESET, 16=LAB_TEST |
| 0x002A   | 42   | 2       | GENUNIT_min_left | Time Until Start         | FLOAT                 | HR   | min  | 0     | 0     | 0       |                                                                                                                                                                                                     |
| 0x002B   | 43   | 2       | GENUNIT_min_run  | Minimum Runtime Timer    | FLOAT                 | HR   | min  | 0     | 0     | 0       |                                                                                                                                                                                                     |
| 0x002C   | 44   | 1       | GENUNIT_BAC_OCC  | BACnet Occupied          | UINT                  | HR   |      | 0     | 1     | 0       |                                                                                                                                                                                                     |
| 0x002D   | 45   | 1       | GENUNIT_ONOFFSVC | Unit Mode                | UINT                  | HR   |      | 0     | 3     | 0       | MV: 0=Disabled, 1=Enabled, 2=Serv Strt, 3=Serv Tst                                                                                                                                                  |
| 0x002E   | 46   | 1       | GENUNIT_LCL_S_S  | HMI Start/Stop Cmd       | UINT                  | HR   |      | 0     | 1     | 0       |                                                                                                                                                                                                     |
| 0x002F   | 47   | 1       | GENUNIT_CHIL_S_S | Cmd Start/Stop           | UINT                  | HR   |      | 0     | 1     | 0       |                                                                                                                                                                                                     |
| 0x0030   | 48   | 2       | GENUNIT_CTRL_PNT | Control Point            | FLOAT                 | HR   | °F   | -4    | 153   | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   | -20   | 67.22 | -17.78  |                                                                                                                                                                                                     |
| 0x0031   | 49   | 1       | GENUNIT_EMSTOP   | Emergency Stop           | UINT                  | HR   |      | 0     | 1     | 0       |                                                                                                                                                                                                     |
| 0x0032   | 50   | 1       | GENUNIT_DEM_LIM  | Active Demand Limit      | UINT                  | HR   | %    | 0     | 100   | 0       |                                                                                                                                                                                                     |
| 0x0033   | 51   | 1       | GENUNIT_LAG_LIM  | Lag Demand Limit         | UINT                  | HR   | %    | 0     | 100   | 0       |                                                                                                                                                                                                     |
| 0x0034   | 52   | 1       | GENUNIT_LOC_OCC  | Local Sched Occupied     | UINT                  | HR   |      | 0     | 1     | 0       |                                                                                                                                                                                                     |
| 0x0035   | 53   | 1       | GENUNIT_ICE_OCC  | Ice Build Occupied       | UINT                  | HR   |      | 0     | 1     | 0       |                                                                                                                                                                                                     |
| 0x0036   | 54   | 1       | GENUNIT_SYS_STAT | System State             | UINT                  | HR   |      | 0     | 3     | 0       | MV: 0=Off, 1=Delay, 2=On, 3=Tripout                                                                                                                                                                 |
| 0x0038   | 56   | 1       | GENUNIT_rpdrrst  | Swift Restart State      | UINT                  | HR   |      | 0     | 3     | 0       | MV: 0=Disabled, 1=Enabled, 2=Active, 3=Complete                                                                                                                                                     |
| 0x0039   | 57   | 1       | GENUNIT_ramp_act | Ramp Loading Active      | UINT                  | HR   |      | 0     | 1     | 0       |                                                                                                                                                                                                     |
| 0x003A   | 58   | 2       | GENUNIT_ramprate | Ramp Rate (per Min)      | FLOAT                 | HR   |      |       |       | 0       |                                                                                                                                                                                                     |
| 0x003B   | 59   | 2       | TEMP_ECW         | Ent Chill Water Temp     | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x003C   | 60   | 2       | TEMP_LCW         | Leaving Chill Water Temp | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x003D   | 61   | 2       | TEMP_ECDW        | Entering Cond Water Temp | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x003E   | 62   | 2       | TEMP_LCDW        | Leaving Cond Water Temp  | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x003F   | 63   | 2       | TEMP_R_RESET     | Remote Reset Temp        | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0040   | 64   | 2       | TEMP_CTL_FLUI    | Control Fluid Temp       | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0041   | 65   | 2       | TEMP_EVAP_T_A    | Evap Rfrg Liq Temp A     | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0042   | 66   | 2       | TEMP_EVP_ST_A    | Evap Saturated Temp A    | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0043   | 67   | 2       | TEMP_EVPAPP_A    | Evaporator Approach A    | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | 0       |                                                                                                                                                                                                     |
| 0x0044   | 68   | 2       | TEMP_SUCT_T_A    | Suction Temperature A    | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0045   | 69   | 2       | TEMP_ROT_T_A     | Rotor Inlet Temp A       | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0046   | 70   | 2       | TEMP_SST_A       | Suct Saturated Temp A    | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0047   | 71   | 2       | TEMP_SSH_A       | Suction Superheat A      | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | 0       |                                                                                                                                                                                                     |
| 0x0048   | 72   | 2       | TEMP_DGT_A       | Discharge Gas Temp A     | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x0049   | 73   | 2       | TEMP_DIS_ST_A    | Discharge Sat Temp A     | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |
| 0x004A   | 74   | 2       | TEMP_CND_ST_A    | Cond Sat Temp A          | FLOAT                 | IR   | °F   |       |       | 0       |                                                                                                                                                                                                     |
|          |      |         |                  |                          |                       |      | °C   |       |       | -17.78  |                                                                                                                                                                                                     |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE |      |         | COMMENT |
|----------|------|---------|-------------------|--------------------------|-----------------------|------|------|-------|------|---------|---------|
| HEXADEC. | DEC. |         |                   |                          |                       |      |      | MIN.  | MAX. | DEFAULT |         |
| 0x004B   | 75   | 2       | TEMP_DSH_A        | Discharge Superheat A    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x004C   | 76   | 2       | TEMP_CNDAPP_A     | Condenser Approach A     | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x004D   | 77   | 2       | TEMP_MTRW_A       | Motor Winding Temp A     | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x004E   | 78   | 2       | TEMP_ECO_T_A      | Economizer Gas Temp A    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x004F   | 79   | 2       | TEMP_ECOST_A      | Econ Saturated Temp A    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0050   | 80   | 2       | TEMP_ECO_SH_A     | Econ Superheat A         | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x0051   | 81   | 2       | TEMP_LIQ_T_A      | Liquid Line Temp A       | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0052   | 82   | 2       | TEMP_SLT_A        | Saturated Liquid Temp A  | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0053   | 83   | 2       | TEMP_LLS_A        | Liquid Line Subcool A    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x0054   | 84   | 2       | TEMP_OILTSMPA     | Oil Sump Temp A          | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0055   | 85   | 2       | TEMP_VAP_TEMP     | Oil Vaporizer Temp       | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0056   | 86   | 2       | TEMP_OIL_A        | Oil Temp A               | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0057   | 87   | 2       | TEMP_EVAP_T_B     | Evap Rfrg Liq Temp B     | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0058   | 88   | 2       | TEMP_EVP_ST_B     | Evap Saturated Temp B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0059   | 89   | 2       | TEMP_EVPAPP_B     | Evaporator Approach B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x005A   | 90   | 2       | TEMP_SUCTION_T_B  | Suction Temperature B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x005B   | 91   | 2       | TEMP_SST_B        | Suct Saturated Temp B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x005C   | 92   | 2       | TEMP_SSH_B        | Suction Superheat B      | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x005D   | 93   | 2       | TEMP_DGT_B        | Discharge Gas Temp B     | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x005E   | 94   | 2       | TEMP_DIS_ST_B     | Discharge Sat Temp B     | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x005F   | 95   | 2       | TEMP_CND_ST_B     | Cond Sat Temp B          | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0060   | 96   | 2       | TEMP_DSH_B        | Discharge Superheat B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x0061   | 97   | 2       | TEMP_CNDAPP_B     | Condenser Approach       | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x0062   | 98   | 2       | TEMP_MTRW_B       | Motor Winding Temp B     | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0063   | 99   | 2       | TEMP_ECO_T_B      | Economizer Gas Temp B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0064   | 100  | 2       | TEMP_ECOST_B      | Econ Saturated Temp B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0065   | 101  | 2       | TEMP_ECO_SH_B     | Econ Superheat B         | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x0066   | 102  | 2       | TEMP_LIQ_T_B      | Liquid Line Temp B       | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0067   | 103  | 2       | TEMP_SLT_B        | Saturated Liquid Temp B  | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x0068   | 104  | 2       | TEMP_LLS_B        | Liquid Line Subcool B    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | 0       |         |
| 0x0069   | 105  | 2       | TEMP_OILTSMPB     | Oil Sump Temp B          | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x006A   | 106  | 2       | TEMP_OIL_B        | Oil Temp B               | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |         |
| 0x006B   | 107  | 2       | PRESSURE_EVAP_EWP | Entering Evap Water Pres | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | kPa  |       |      | 0       |         |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER            | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE |      |         | COMMENT |
|----------|------|---------|----------------------|--------------------------|-----------------------|------|------|-------|------|---------|---------|
| HEXADEC. | DEC. |         |                      |                          |                       |      |      | MIN.  | MAX. | DEFAULT |         |
| 0x006C   | 108  | 2       | PRESSURE_EVAP_LWP    | Leaving Evap Water Pres  | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x006D   | 109  | 2       | PRESSURE_EVAP_WDP    | Evap Water Delta P       | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x006E   | 110  | 2       | PRESSURE_COND_EWP    | Entering Cond Water Pres | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x006F   | 111  | 2       | PRESSURE_COND_LWP    | Leaving Cond Water Pres  | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0070   | 112  | 2       | PRESSURE_COND_WDP    | Cond Water Delta P       | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0071   | 113  | 2       | PRESSURE_EVAP_P_A    | Evaporator Pressure A    | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0072   | 114  | 2       | PRESSURE_SUCTION_P_A | Suction Pressure A       | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0073   | 115  | 2       | PRESSURE_DIS_P_A     | Discharge Pressure A     | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0074   | 116  | 2       | PRESSURE_CND_P_A     | Condenser Pressure A     | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0075   | 117  | 2       | PRESSURE_ECO_P_A     | Economizer Pressure A    | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0076   | 118  | 2       | PRESSURE_OILPSMPA    | Oil Sump Pressure A      | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0077   | 119  | 2       | PRESSURE_OIL_DP_A    | Oil Discharge Pressure A | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0078   | 120  | 2       | PRESSURE_OIL_PD_A    | Oil Press Diff A         | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0079   | 121  | 2       | PRESSURE_OILPA1RQ    | Oil Pressure Required A  | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x007A   | 122  | 2       | PRESSURE_LIQ_P_A     | Liquid Line Press A      | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x007B   | 123  | 2       | PRESSURE_MTR_P_A     | Motor Injection Press A  | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x007C   | 124  | 2       | PRESSURE_EVAP_P_B    | Evaporator Pressure B    | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x007D   | 125  | 2       | PRESSURE_SUCTION_P_B | Suction Pressure B       | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x007E   | 126  | 2       | PRESSURE_DIS_P_B     | Discharge Pressure B     | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x007F   | 127  | 2       | PRESSURE_CND_P_B     | Condenser Pressure B     | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0080   | 128  | 2       | PRESSURE_ECO_P_B     | Economizer Pressure B    | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0081   | 129  | 2       | PRESSURE_OILPSMPB    | Oil Sump Pressure B      | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0082   | 130  | 2       | PRESSURE_OIL_DP_B    | Oil Discharge Pressure B | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0083   | 131  | 2       | PRESSURE_OIL_PD_B    | Oil Press Diff B         | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0084   | 132  | 2       | PRESSURE_OILPB1RQ    | Oil Pressure Required B  | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0085   | 133  | 2       | PRESSURE_LIQ_P_B     | Liquid Line Press B      | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0086   | 134  | 2       | PRESSURE_MTR_P_B     | Motor Injection Press B  | FLOAT                 | IR   | psig |       |      | 0       |         |
|          |      |         |                      |                          |                       |      | kPa  |       |      | 0       |         |
| 0x0087   | 135  | 1       | OUTPUTS_ALE          | Alert Relay              | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0088   | 136  | 1       | OUTPUTS_ALM          | Alarm Relay              | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0089   | 137  | 1       | OUTPUTS_RUN          | Running Relay            | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x008A   | 138  | 2       | OUTPUTS_CAPT         | Capacity Output Total    | FLOAT                 | IR   |      | 0     | 100  | 0       |         |
| 0x008B   | 139  | 2       | OUTPUTS_CHST_OUT     | Unit Status Output       | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x008C   | 140  | 2       | OUTPUTS_HDPV_OUT     | Head Pres Output         | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x008D   | 141  | 1       | OUTPUTS_SET_FLOW     | Cooler Flow SP Out       | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x008E   | 142  | 1       | OUTPUTS_SHTDN        | Shutdown Relay           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x008F   | 143  | 1       | OUTPUTS_CDWP1        | Cond Water Pump          | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0090   | 144  | 1       | OUTPUTS_CHWP1        | Chill Water Pump         | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0091   | 145  | 1       | OUTPUTS_TFR_HIGH     | Tower Fan Relay High     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0092   | 146  | 1       | OUTPUTS_TFR_LOW      | Tower Fan Relay Low      | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0093   | 147  | 2       | OUTPUTS_TOW_FAN      | VFD Tower Fan            | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE |      |         | COMMENT |
|----------|------|---------|-------------------|--------------------------|-----------------------|------|------|-------|------|---------|---------|
| HEXADEC. | DEC. |         |                   |                          |                       |      |      | MIN.  | MAX. | DEFAULT |         |
| 0x0094   | 148  | 2       | OUTPUTS_CAPOUT_A  | Analog Capacity Output A | FLOAT                 | IR   |      | 0     | 100  | 0       |         |
| 0x0095   | 149  | 2       | OUTPUTS_ECOEXV_A  | Economizer EXV A         | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x0096   | 150  | 2       | OUTPUTS_EXV_A     | Main EXV A               | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x0097   | 151  | 1       | OUTPUTS_HGBP_A    | HGBP Solenoid A          | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0098   | 152  | 1       | OUTPUTS_OILSOL_A  | Oil Solenoid A           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0099   | 153  | 1       | OUTPUTS_MTR_CL_A  | Motor Cooling Solenoid A | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x009A   | 154  | 1       | OUTPUTS_OIL_DL_A  | Dual Oil Flow Solenoid A | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x009B   | 155  | 1       | OUTPUTS_VFDSOL_A  | VFD Coolant Solenoid A   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x009C   | 156  | 1       | OUTPUTS_VI_CMP_A  | VI Piston Solenoid A     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x009D   | 157  | 1       | OUTPUTS_BP_ECO_A  | Econ Bypass Solenoid A   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x009E   | 158  | 1       | OUTPUTS_CP_A_LOCK | Comp A VFD Interlock     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x009F   | 159  | 1       | OUTPUTS_SLV_LD_A  | Slide Valve Load A       | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00A0   | 160  | 1       | OUTPUTS_SLV_UL_A  | Slide Valve Unload A     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00A1   | 161  | 1       | OUTPUTS_VAP_HEAT  | Vaporizer Heater         | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00A2   | 162  | 1       | OUTPUTS_OILHEAT1  | Oil Heater - Primary     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00A3   | 163  | 1       | OUTPUTS_OILHEAT2  | Oil Heater - Secondary   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00A4   | 164  | 2       | OUTPUTS_OIL_RECL  | Oil Reclaim Valve        | FLOAT                 | IR   |      | 0     | 100  | 0       |         |
| 0x00A5   | 165  | 1       | OUTPUTS_OILR      | Oil Pump Relay           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00A6   | 166  | 2       | OUTPUTS_CAPOUT_B  | Analog Capacity Output B | FLOAT                 | IR   |      | 0     | 100  | 0       |         |
| 0x00A7   | 167  | 2       | OUTPUTS_ECOEXV_B  | Economizer EXV B         | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x00A8   | 168  | 2       | OUTPUTS_EXV_B     | Main EXV B               | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x00A9   | 169  | 1       | OUTPUTS_HGBP_B    | HGBP Solenoid B          | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00AA   | 170  | 1       | OUTPUTS_OILSOL_B  | Oil Solenoid B           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00AB   | 171  | 1       | OUTPUTS_MTR_CL_B  | Motor Cooling Solenoid B | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00AC   | 172  | 1       | OUTPUTS_OIL_DL_B  | Dual Oil Flow Solenoid B | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00AD   | 173  | 1       | OUTPUTS_VFDSOL_B  | VFD Coolant Solenoid B   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00AE   | 174  | 1       | OUTPUTS_VI_CMP_B  | VI Piston Solenoid B     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00AF   | 175  | 1       | OUTPUTS_BP_ECO_B  | Econ Bypass Solenoid B   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00B0   | 176  | 1       | OUTPUTS_CP_B_LOCK | Comp B VFD Interlock     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00B1   | 177  | 2       | INPUTS_AUTO_DEM   | Auto Demand Limit Input  | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x00B2   | 178  | 2       | INPUTS_AUTO_RES   | Auto Water Temp Reset    | FLOAT                 | IR   | mA   |       |      | 0       |         |
| 0x00B3   | 179  | 1       | INPUTS_E_STOP     | Emergency Stop Contact   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00B4   | 180  | 1       | INPUTS_FS_LOCK    | Fire Security Interlock  | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00B5   | 181  | 1       | INPUTS_ICE_CON    | Ice Build Contact        | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00B6   | 182  | 1       | INPUTS_ICE_SW     | Ice Done Storage Switch  | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00B7   | 183  | 2       | INPUTS_REF_LEAK   | Refrig Leakage Sensor    | FLOAT                 | IR   | mA   |       |      | 0       |         |
| 0x00B8   | 184  | 1       | INPUTS_REM_CON    | Remote Start/Stop        | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00B9   | 185  | 1       | INPUTS_REM_LOCK   | Remote Lockout           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00BA   | 186  | 1       | INPUTS_SAFETY     | Spare Safety Input       | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00BB   | 187  | 1       | INPUTS_COND_FSW   | Condenser Flow Switch    | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00BC   | 188  | 1       | INPUTS_EVAP_FSW   | Evaporator Flow Switch   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00BD   | 189  | 2       | INPUTS_EXVA_FBK   | Main EXV A Feedback      | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x00BE   | 190  | 2       | INPUTS_ECOA_FBK   | Econ A EXV Feedback      | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x00BF   | 191  | 2       | INPUTS_SVA_FBK    | Slide Valve A Feedback   | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x00C0   | 192  | 2       | INPUTS_CNDLVL_A   | Cond Liq Lev A           | FLOAT                 | IR   |      |       |      | 0       |         |
| 0x00C1   | 193  | 1       | INPUTS_OIL_L_A    | Oil Level Input A        | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00C2   | 194  | 1       | INPUTS_HPS_A      | High Pressure Switch A   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00C3   | 195  | 2       | INPUTS_EXVB_FBK   | Main EXV B Feedback      | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x00C4   | 196  | 2       | INPUTS_ECOB_FBK   | Econ B EXV Feedback      | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x00C5   | 197  | 2       | INPUTS_CNDLVL_B   | Cond Liq Lev B           | FLOAT                 | IR   |      |       |      | 0       |         |
| 0x00C6   | 198  | 1       | INPUTS_OIL_L_B    | Oil Level Input B        | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00C7   | 199  | 1       | INPUTS_HPS_B      | High Pressure Switch B   | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00C8   | 200  | 1       | EPMPCTL_has_flo   | Flow Established         | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00C9   | 201  | 1       | CPMPCTL_has_flo   | Flow Established         | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x00CA   | 202  | 2       | STRTSTS_VOLT_H1   | Line Voltage Phase 1     | FLOAT                 | IR   | V    |       |      | 0       |         |
| 0x00CB   | 203  | 2       | STRTSTS_VOLT_H2   | Line Voltage Phase 2     | FLOAT                 | IR   | V    |       |      | 0       |         |
| 0x00CC   | 204  | 2       | STRTSTS_VOLT_H3   | Line Voltage Phase 3     | FLOAT                 | IR   | V    |       |      | 0       |         |
| 0x00CD   | 205  | 2       | STRTSTS_VOLT_AVG  | Average Line Voltage     | FLOAT                 | IR   | V    |       |      | 0       |         |
| 0x00CE   | 206  | 2       | STRTSTS_AMPS_H1   | Line Current Phase 1     | FLOAT                 | IR   | amp  |       |      | 0       |         |
| 0x00CF   | 207  | 2       | STRTSTS_AMPS_H2   | Line Current Phase 2     | FLOAT                 | IR   | amp  |       |      | 0       |         |
| 0x00D0   | 208  | 2       | STRTSTS_AMPS_H3   | Line Current Phase 3     | FLOAT                 | IR   | amp  |       |      | 0       |         |
| 0x00D1   | 209  | 2       | STRTSTS_AMPS_AVG  | Average Line Current     | FLOAT                 | IR   | amp  |       |      | 0       |         |
| 0x00D2   | 210  | 2       | STRTSTS_FREQ_H    | Line Frequency           | FLOAT                 | IR   | Hz   |       |      | 0       |         |
| 0x00D3   | 211  | 2       | STRTSTS_GRFT_H1   | Ground Fault Phase 3     | FLOAT                 | IR   | amp  |       |      | 0       |         |
| 0x00D4   | 212  | 2       | STRTSTS_GRFT_H2   | Ground Fault Phase 2     | FLOAT                 | IR   | amp  |       |      | 0       |         |
| 0x00D5   | 213  | 2       | STRTSTS_GRFT_H3   | Ground Fault Phase 1     | FLOAT                 | IR   | amp  |       |      | 0       |         |
| 0x00D6   | 214  | 2       | STRTSTS_sum1ht_h  | I2T Sum Heat Phase 1     | FLOAT                 | IR   | %    |       |      | 0       |         |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE |      |         | COMMENT                        |
|----------|------|---------|-------------------|--------------------------|-----------------------|------|------|-------|------|---------|--------------------------------|
| HEXADEC. | DEC. |         |                   |                          |                       |      |      | MIN.  | MAX. | DEFAULT |                                |
| 0x00D7   | 215  | 2       | STRTSTS_sum2ht_h  | I2T Sum Heat Phase 2     | FLOAT                 | IR   | %    |       |      | 0       |                                |
| 0x00D8   | 216  | 2       | STRTSTS_sum3ht_h  | I2T Sum Heat Phase 3     | FLOAT                 | IR   | %    |       |      | 0       |                                |
| 0x00D9   | 217  | 2       | STRTSTS_KW        | Motor KW                 | FLOAT                 | IR   | kW   |       |      | 0       |                                |
| 0x00DA   | 218  | 1       | STRTSTS_start_ok  | 1CR Start Complete       | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00DB   | 219  | 1       | STRTSTS_stop_ok   | 1CR Stop Complete        | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00DC   | 220  | 1       | STRTSTS_cycle_1   | Single Cycle Dropout     | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00DD   | 221  | 1       | STRTSTS_ph_loss   | Phase Loss               | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00DE   | 222  | 1       | STRTSTS_ov_volt   | Over Voltage             | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00DF   | 223  | 1       | STRTSTS_un_volt   | Under Voltage            | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E0   | 224  | 1       | STRTSTS_amp_unb   | Current Imbalance        | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E1   | 225  | 1       | STRTSTS_volt_unb  | Voltage Imbalance        | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E2   | 226  | 1       | STRTSTS_overload  | Overload Trip            | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E3   | 227  | 1       | STRTSTS_lratrip   | Locked Rotor Trip        | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E4   | 228  | 1       | STRTSTS_slratrip  | Starter Lock Rotor Trip  | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E5   | 229  | 1       | STRTSTS_grndflt   | Ground Fault             | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E6   | 230  | 1       | STRTSTS_ph_rev    | Phase Reversal           | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E7   | 231  | 1       | STRTSTS_freqflt   | Frequency Out of Range   | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E8   | 232  | 1       | STRTSTS_ism_por   | ISM Power On Reset       | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00E9   | 233  | 1       | STRTSTS_m1flt     | 1M Start/Run Fault       | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00EA   | 234  | 1       | STRTSTS_m2flt     | 2M Start/Run Fault       | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00EB   | 235  | 1       | STRTSTS_prs_trip  | Pressure Trip Contact    | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00EC   | 236  | 1       | STRTSTS_strtflt   | Starter Fault            | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00ED   | 237  | 1       | STRTSTS_no_amps   | Motor Amps Not Sensed    | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00EE   | 238  | 1       | STRTSTS_accelflt  | Starter Accel Fault      | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00EF   | 239  | 1       | STRTSTS_highamps  | Excessive Motor Amps     | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00F0   | 240  | 1       | STRTSTS_m1m2stop  | 1M/2M Stop Fault         | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00F1   | 241  | 1       | STRTSTS_ampstop   | Motor Amps When Stopped  | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00F2   | 242  | 1       | STRTSTS_hardware  | Hardware Failure         | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00F3   | 243  | 1       | STRTSTS_calfc_er  | Calibration Factor Error | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00F4   | 244  | 1       | STRTSTS_conf_err  | Invalid Configuration    | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x00F5   | 245  | 1       | DRVA1STS_COMS     | VFD Coms Status          | UINT                  | IR   |      | 0     | 2    | 0       | MV: 0=OK, 1=PARTIAL, 2=NO COMS |
| 0x00F7   | 247  | 2       | DRVA1STS_LINE_V   | VFD Average Line Voltage | FLOAT                 | IR   | V    |       |      | 0       |                                |
| 0x00F8   | 248  | 2       | DRVA1STS_LINE_CUR | VFD Average Line Current | FLOAT                 | IR   | amp  |       |      | 0       |                                |
| 0x00F9   | 249  | 2       | DRVA1STS_LINE_KW  | VFD Average Line KW      | FLOAT                 | IR   | kW   |       |      | 0       |                                |
| 0x00FA   | 250  | 2       | DRVA1STS_BUS_V    | VFD Bus Voltage          | FLOAT                 | IR   | V    |       |      | 0       |                                |
| 0x00FB   | 251  | 2       | DRVA1STS_MOT_CUR  | VFD Motor Current        | FLOAT                 | IR   | amp  |       |      | 0       |                                |
| 0x00FC   | 252  | 2       | DRVA1STS_AMPS_PCT | VFD Motor Curr Pct Rated | FLOAT                 | IR   | %    |       |      | 0       |                                |
| 0x00FD   | 253  | 2       | DRVA1STS_MOT_KW   | VFD Motor KW             | FLOAT                 | IR   | kW   |       |      | 0       |                                |
| 0x00FE   | 254  | 2       | DRVA1STS_PCT      | VFD Capacity             | FLOAT                 | IR   | %    |       |      | 0       |                                |
| 0x00FF   | 255  | 2       | DRVA1STS_SPD      | VFD Speed                | FLOAT                 | IR   | Hz   |       |      | 0       |                                |
| 0x0100   | 256  | 2       | DRVA1STS_INV_T    | VFD Inverter Temp        | FLOAT                 | IR   | °F   |       |      | 0       |                                |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |                                |
| 0x0101   | 257  | 2       | DRVA1STS_IGBT_T   | VFD IGBT Temp            | FLOAT                 | IR   | °F   |       |      | 0       |                                |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |                                |
| 0x0102   | 258  | 2       | DRVA1STS_RECT_T   | VFD Rectifier Temp       | FLOAT                 | IR   | °F   |       |      | 0       |                                |
|          |      |         |                   |                          |                       |      | °C   |       |      | -17.78  |                                |
| 0x0103   | 259  | 2       | DRVA1STS_MOT_RPM  | VFD Motor Rpm            | FLOAT                 | IR   | rpm  |       |      | 0       |                                |
| 0x0104   | 260  | 2       | DRVA1STS_LAST_FLT | VFD Last Fault Code      | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x0105   | 261  | 2       | DRVA1STS_STAT_WD1 | VFD Status Word1         | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x0106   | 262  | 2       | DRVA1STS_STAT_WD2 | VFD Status Word2         | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x0107   | 263  | 2       | DRVA1STS_ALT_WD1  | VFD Alert Word1          | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x0108   | 264  | 2       | DRVA1STS_ALT_WD2  | VFD Alert Word2          | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x0109   | 265  | 2       | DRVA1STS_ALM_WD1  | VFD Alarm Word1          | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x010A   | 266  | 2       | DRVA1STS_ALM_WD2  | VFD Alarm Word2          | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x010B   | 267  | 1       | STGECTL_cmp1cknb  | Cmp 1 Circ Num           | UINT                  | IR   |      |       |      | 0       |                                |
| 0x010C   | 268  | 1       | STGECTL_cmp1hgbbp | Cmp 1 HGBP               | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x010D   | 269  | 1       | STGECTL_cmp1ldrq  | Cmp1 Load Required       | UINT                  | IR   |      |       |      | 0       |                                |
| 0x010E   | 270  | 1       | STGECTL_comp_ld   | Cmp Load                 | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x010F   | 271  | 1       | STGECTL_comp_ul   | Cmp Unload               | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x0110   | 272  | 1       | STGECTL_ld_alwd   | Loading Allowed          | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x0111   | 273  | 1       | STGECTL_leadck    | Lead Circ Num            | UINT                  | IR   |      |       |      | 0       |                                |
| 0x0112   | 274  | 1       | STGECTL_stat_wrd  | Stage Status Word        | UINT                  | IR   |      |       |      | 0       |                                |
| 0x0114   | 276  | 1       | STGECTL_ul_alwd   | Unloading Allowed        | UINT                  | IR   |      | 0     | 1    | 0       |                                |
| 0x0115   | 277  | 2       | CMPA1CTL_aDSTMn   | CmpA AbsDischSatTMin     | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x0116   | 278  | 2       | CMPA1CTL_aDSTMx   | CmpA AbsDischSatTMax     | FLOAT                 | IR   |      |       |      | 0       |                                |
| 0x0117   | 279  | 2       | CMPA1CTL_aSSTMn   | CmpA AbsSuctSatTMin      | FLOAT                 | IR   |      |       |      | 0       |                                |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT  | VALUE |      |         | COMMENT |
|----------|------|---------|-------------------|--------------------------|-----------------------|------|-------|-------|------|---------|---------|
| HEXADEC. | DEC. |         |                   |                          |                       |      |       | MIN.  | MAX. | DEFAULT |         |
| 0x0118   | 280  | 2       | CMPA1CTL_aSSTMx   | CmpA AbsSuctSatTMax      | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0119   | 281  | 2       | CMPA1CTL_cAN      | CmpA Act Nom Capacity    | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x011A   | 282  | 2       | CMPA1CTL_cANp     | CmpA Act Nom Cap Pct     | FLOAT                 | IR   | %     | 0     | 100  | 0       |         |
| 0x011B   | 283  | 2       | CMPA1CTL_cASp     | CmpA Act Scal Cap pct    | FLOAT                 | IR   | %     | 0     | 100  | 0       |         |
| 0x011C   | 284  | 2       | CMPA1CTL_cMax     | CmpA Capacity Max        | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x011D   | 285  | 2       | CMPA1CTL_cMin     | CmpA Capacity Min        | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x011E   | 286  | 2       | CMPA1CTL_cObj     | CmpA Current Obj         | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0120   | 288  | 2       | CMPA1CTL_cmd      | CmpA Command             | FLOAT                 | IR   | %     |       |      | 0       |         |
| 0x0121   | 289  | 2       | CMPA1CTL_dSTS     | CmpA SatDischTempSetpt   | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0122   | 290  | 2       | CMPA1CTL_dTS      | CmpA DischTempSetpt      | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0123   | 291  | 1       | CMPA1CTL_statwrđ  | CmpA State Diag Word     | UINT                  | IR   |       |       |      | 0       |         |
| 0x0125   | 293  | 2       | CMPA1CTL_eDSTMn   | CmpA EnvDischSatTMin     | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0126   | 294  | 2       | CMPA1CTL_eDSTMx   | CmpA EnvDischSatTMax     | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0127   | 295  | 2       | CMPA1CTL_eSSTMn   | CmpA EnvSuctSatTMin      | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0128   | 296  | 2       | CMPA1CTL_eSSTMx   | CmpA EnvSuctSatTMax      | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0129   | 297  | 2       | CMPA1CTL_fTStp    | CmpA Fluid Temp Setpt    | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x012A   | 298  | 1       | CMPA1CTL_fWđ      | CmpA Fault Word          | UINT                  | IR   |       |       |      | 0       |         |
| 0x012B   | 299  | 2       | CMPA1CTL_iTS      | CmpA Inverter Temp Setpt | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x012C   | 300  | 1       | CMPA1CTL_isEnable | CmpA Enable              | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x012D   | 301  | 1       | CMPA1CTL_isNom    | CmpA Nominal             | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x012E   | 302  | 1       | CMPA1CTL_isRđ2Go  | CmpA Ready to Start      | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x012F   | 303  | 1       | CMPA1CTL_isRđ2St  | CmpA Ready to Stop       | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0130   | 304  | 1       | CMPA1CTL_isStart  | CmpA Started             | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0131   | 305  | 1       | CMPA1CTL_isStop   | CmpA Stopped             | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0132   | 306  | 2       | CMPA1CTL_mTS      | CmpA Motor Temp Setpt    | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0133   | 307  | 2       | CMPA1CTL_oVS      | CmpA Oil Viscosity Setpt | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0134   | 308  | 2       | CMPA1CTL_rTS      | CmpA RectifierTemp Setpt | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0135   | 309  | 2       | CMPA1CTL_sSTS     | CmpA Sat Suct Temp Setpt | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0136   | 310  | 1       | CMPA1CTL_shrt_cyc | CmpA Short Cycle Prevent | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0137   | 311  | 1       | CMPA1CTL_stall_ct | CmpA Stall Count         | UINT                  | IR   |       |       |      | 0       |         |
| 0x0138   | 312  | 2       | CMPA1CTL_elubsp   | CmpA Oil Guidance Setpt  | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0139   | 313  | 1       | CMPA1CTL_envwrđ   | CmpA Env Diag Word       | UINT                  | IR   |       |       |      | 0       |         |
| 0x013B   | 315  | 2       | CMPA1CTL_vi_sp1   | CmpA Vi Stpt 1           | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x013C   | 316  | 2       | CMPA1CTL_vi_sp2   | CmpA Vi Stpt 2           | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x013D   | 317  | 2       | CMPA1CTL_vi_cObj  | CmpA Vi Curr Objective   | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x013E   | 318  | 1       | CMPA1CTL_vi_cmd   | CmpA Vi Command          | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x013F   | 319  | 1       | CMPA1CTL_vi_dword | CmpA Vi Diag Word        | UINT                  | IR   |       |       |      | 0       |         |
| 0x0140   | 320  | 2       | EXVACTL_aTStpt    | Approach Setpoint        | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0141   | 321  | 2       | EXVACTL_cObj      | Current Objective        | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0142   | 322  | 2       | EXVACTL_cl_stpt   | Cond Liq Level Setpoint  | FLOAT                 | IR   |       | 0     | 2.25 | 0       |         |
| 0x0143   | 323  | 2       | EXVACTL_dPHStpt   | Hi Disch Sat Temp Stpt   | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0144   | 324  | 1       | EXVACTL_dWđ       | Diag Word                | UINT                  | IR   |       |       |      | 0       |         |
| 0x0145   | 325  | 1       | EXVACTL_fWđ       | Fault Word               | UINT                  | IR   |       |       |      | 0       |         |
| 0x0146   | 326  | 1       | EXVACTL_isEnable  | Enable                   | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0147   | 327  | 1       | EXVACTL_isNom     | Nominal                  | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0148   | 328  | 1       | EXVACTL_isRđ2Go   | Ready to Start           | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0149   | 329  | 1       | EXVACTL_isRđ2St   | Ready to Stop            | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x014A   | 330  | 1       | EXVACTL_isStart   | Started                  | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x014B   | 331  | 1       | EXVACTL_isStop    | Stopped                  | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x014C   | 332  | 2       | EXVACTL_lo_dshsp  | Low Disch S/H Stpt       | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x014D   | 333  | 2       | EXVACTL_max_dist  | Max Discharge Temp       | FLOAT                 | IR   |       | 0     | 250  | 0       |         |
| 0x014E   | 334  | 2       | EXVACTL_sPHStpt   | suctSatTempHighStpt      | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x014F   | 335  | 2       | EXVACTL_sPLStpt   | suctSatTempLowStpt       | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0150   | 336  | 2       | EXVACTL_hi_dtsp   | Disch Temp Hi Stpt       | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0151   | 337  | 2       | EXVACTL_lo_sbcs   | Subcool Low Stpt         | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0152   | 338  | 2       | EXVACTL_edclvl    | Est Cond Liq Level       | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0153   | 339  | 1       | EXVACTL_estflag   | Cond Lvl Est Flag        | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x0154   | 340  | 2       | EXVACTL_esteflo   | Est Evap Flow            | FLOAT                 | IR   | gpm   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | l/min |       |      | 0       |         |
| 0x0155   | 341  | 2       | EXVACTL_estcflo   | Est Cond Flow            | FLOAT                 | IR   | gpm   |       |      | 0       |         |
|          |      |         |                   |                          |                       |      | l/min |       |      | 0       |         |
| 0x0156   | 342  | 2       | EOACTL_cObj       | Current Objective        | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0157   | 343  | 2       | EOACTL_dTStpt     | Econ Disch Temp Setpoint | FLOAT                 | IR   |       |       |      | 0       |         |
| 0x0158   | 344  | 1       | EOACTL_dWđ        | Diag Word                | UINT                  | IR   |       |       |      | 0       |         |
| 0x0159   | 345  | 1       | EOACTL_fWđ        | Fault Word               | UINT                  | IR   |       |       |      | 0       |         |
| 0x015A   | 346  | 1       | EOACTL_isEnable   | Enable                   | UINT                  | IR   |       | 0     | 1    | 0       |         |
| 0x015B   | 347  | 1       | EOACTL_isNom      | Nominal                  | UINT                  | IR   |       | 0     | 1    | 0       |         |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION             | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE |      |         | COMMENT |
|----------|------|---------|-------------------|-------------------------|-----------------------|------|------|-------|------|---------|---------|
| HEXADEC. | DEC. |         |                   |                         |                       |      |      | MIN.  | MAX. | DEFAULT |         |
| 0x015C   | 348  | 1       | ECOACTL_isRd2Go   | Ready to Start          | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x015D   | 349  | 1       | ECOACTL_isRd2St   | Ready to Stop           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x015E   | 350  | 1       | ECOACTL_isStart   | Started                 | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x015F   | 351  | 1       | ECOACTL_isStop    | Stopped                 | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0160   | 352  | 2       | ECOACTL_shTSpt    | Econ Superheat Setpoint | FLOAT                 | IR   |      |       |      | 0       |         |
| 0x0161   | 353  | 2       | HGBPACTL_cObj     | HGBPA Current Obj       | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0162   | 354  | 2       | HGBPACTL_hgbpa_pt | HGBPA Process Temp      | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0163   | 355  | 2       | HGBPACTL_cmd      | HGBPA Command           | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0164   | 356  | 1       | HGBPACTL_do_cmd   | HGBPA Disc Out Cmd      | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0165   | 357  | 2       | HGBPACTL_fTS      | HGBPA Fluid T Stpt      | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0166   | 358  | 2       | HGBPACTL_cSS      | HGBPA Comp Spd Stpt     | FLOAT                 | IR   | Hz   |       |      | 0       |         |
| 0x0167   | 359  | 2       | HGBPACTL_svPS     | HGBPA SV Pos Stpt       | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0168   | 360  | 1       | HGBPACTL_dWd      | HGBPA Diag Word         | UINT                  | IR   |      |       |      | 0       |         |
| 0x0169   | 361  | 1       | HGBPACTL_fWd      | HGBPA Fault Word        | UINT                  | IR   |      |       |      | 0       |         |
| 0x016A   | 362  | 1       | HGBPACTL_isEnable | HGBPA Enable            | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x016B   | 363  | 1       | HGBPACTL_isNom    | HGBPA Nominal           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x016C   | 364  | 1       | HGBPACTL_isRd2Go  | HGBPA Ready to Start    | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x016D   | 365  | 1       | HGBPACTL_isRd2St  | HGBPA Ready to Stop     | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x016E   | 366  | 1       | HGBPACTL_isStart  | HGBPA Started           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x016F   | 367  | 1       | HGBPACTL_isStop   | HGBPA Stopped           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0172   | 370  | 2       | SLVA1CTL_cmd      | SVA Command             | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0173   | 371  | 2       | SLVA1CTL_dstcmd   | Hi Disch Sat Temp PI    | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0174   | 372  | 2       | SLVA1CTL_dtcmd    | Hi Disch Temp PI        | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0175   | 373  | 2       | SLVA1CTL_ftcmd    | Fluid Temp PI           | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0176   | 374  | 2       | SLVA1CTL_mcurcmd  | Motor Curr PI           | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0177   | 375  | 2       | SLVA1CTL_mtmprmd  | Motor Temp PI           | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0178   | 376  | 2       | SLVA1CTL_oilrecmd | Oil Recovery PI         | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x0179   | 377  | 2       | SLVA1CTL_sstcmd   | Lo Sat Evap Temp PI     | FLOAT                 | IR   | %    |       |      | 0       |         |
| 0x017A   | 378  | 2       | SLVA1CTL_cAN      | SVA Act Nom Capacity    | FLOAT                 | IR   | ton  |       |      | 0       |         |
| 0x017B   | 379  | 2       | SLVA1CTL_cANp     | SVA Actual Nom Cap Pct  | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x017C   | 380  | 2       | SLVA1CTL_cASp     | SVA Actual Scal Cap Pct | FLOAT                 | IR   | %    | 0     | 100  | 0       |         |
| 0x017D   | 381  | 2       | SLVA1CTL_cMax     | SVA Capacity Max        | FLOAT                 | IR   | ton  |       |      | 0       |         |
| 0x017E   | 382  | 2       | SLVA1CTL_cMin     | SVA Capacity Min        | FLOAT                 | IR   | ton  |       |      | 0       |         |
| 0x017F   | 383  | 2       | SLVA1CTL_cObj     | SVA Current Objective   | FLOAT                 | IR   |      |       |      | 0       |         |
| 0x0180   | 384  | 2       | SLVA1CTL_dSTS     | SVA SatDischTempSetpt   | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0181   | 385  | 2       | SLVA1CTL_dTS      | SVA Disch Temp Setpt    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0182   | 386  | 1       | SLVA1CTL_dWd      | SVA Diag Word           | UINT                  | IR   |      |       |      | 0       |         |
| 0x0183   | 387  | 2       | SLVA1CTL_dty_cyc  | SVA Duty Cycle          | FLOAT                 | IR   |      |       |      | 0       |         |
| 0x0184   | 388  | 2       | SLVA1CTL_ftStp    | SVA Fluid Temp Setpt    | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0185   | 389  | 1       | SLVA1CTL_fWd      | SVA Fault Word          | UINT                  | IR   |      |       |      | 0       |         |
| 0x0186   | 390  | 2       | SLVA1CTL_iTS      | SVA Inverter Temp Setpt | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0187   | 391  | 1       | SLVA1CTL_isEnable | SVA Enable              | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0188   | 392  | 1       | SLVA1CTL_isNom    | SVA Nominal             | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0189   | 393  | 1       | SLVA1CTL_isRd2Go  | SVA Ready to Start      | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x018A   | 394  | 1       | SLVA1CTL_isRd2St  | SVA Ready to Stop       | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x018B   | 395  | 1       | SLVA1CTL_isStart  | SVA Started             | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x018C   | 396  | 1       | SLVA1CTL_isStop   | SVA Stopped             | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x018D   | 397  | 2       | SLVA1CTL_mCS      | SVA Motor Current Setpt | FLOAT                 | IR   | amp  |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °F   |       |      | 0       |         |
| 0x018E   | 398  | 2       | SLVA1CTL_mTS      | SVA Motor Temp Setpt    | FLOAT                 | IR   | °C   |       |      | -17.78  |         |
|          |      |         |                   |                         |                       |      |      |       |      |         |         |
| 0x018F   | 399  | 2       | SLVA1CTL_oVS      | SVA Oil Viscosity Setpt | FLOAT                 | IR   |      |       |      | 0       |         |
| 0x0190   | 400  | 2       | SLVA1CTL_sSTS     | SVA Sat Suct Temp Setpt | FLOAT                 | IR   | °F   |       |      | 0       |         |
|          |      |         |                   |                         |                       |      | °C   |       |      | -17.78  |         |
| 0x0191   | 401  | 1       | OILHCTL_fWd       | Fault Word              | UINT                  | IR   |      |       |      | 0       |         |
| 0x0192   | 402  | 1       | OILHCTL_isEnable  | Enable                  | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0193   | 403  | 1       | OILHCTL_isNom     | Nominal                 | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0194   | 404  | 1       | OILHCTL_isRd2Go   | Ready to Start          | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0195   | 405  | 1       | OILHCTL_isRd2St   | Ready to Stop           | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0196   | 406  | 1       | OILHCTL_isStart   | Started                 | UINT                  | IR   |      | 0     | 1    | 0       |         |
| 0x0197   | 407  | 1       | OILHCTL_isStop    | Stopped                 | UINT                  | IR   |      | 0     | 1    | 0       |         |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER          | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT  | VALUE |          |         | COMMENT |
|----------|------|---------|--------------------|--------------------------|-----------------------|------|-------|-------|----------|---------|---------|
| HEXADEC. | DEC. |         |                    |                          |                       |      |       | MIN.  | MAX.     | DEFAULT |         |
| 0x0198   | 408  | 1       | OILPCTL_fwD        | Fault Word               | UINT                  | IR   |       |       |          | 0       |         |
| 0x019A   | 410  | 1       | OILPCTL_isEnable   | Enable                   | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x019B   | 411  | 1       | OILPCTL_isNom      | Nominal                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x019C   | 412  | 1       | OILPCTL_isRd2Go    | Ready to Start           | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x019D   | 413  | 1       | OILPCTL_isRd2St    | Ready to Stop            | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x019E   | 414  | 1       | OILPCTL_isStart    | Started                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x019F   | 415  | 1       | OILPCTL_isStop     | Stopped                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A0   | 416  | 1       | OILRCTL_isEnable   | Enable                   | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A1   | 417  | 1       | OILRCTL_isNom      | Nominal                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A2   | 418  | 1       | OILRCTL_isRd2Go    | Ready to Start           | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A3   | 419  | 1       | OILRCTL_isRd2St    | Ready to Stop            | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A4   | 420  | 1       | OILRCTL_isStart    | Started                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A5   | 421  | 1       | OILRCTL_isStop     | Stopped                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A6   | 422  | 1       | VAPCTL_isEnable    | Enable                   | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A7   | 423  | 1       | VAPCTL_isNom       | Nominal                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A8   | 424  | 1       | VAPCTL_isRd2Go     | Ready to Start           | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01A9   | 425  | 1       | VAPCTL_isRd2St     | Ready to Stop            | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01AA   | 426  | 1       | VAPCTL_isStart     | Started                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01AB   | 427  | 1       | VAPCTL_isStop      | Stopped                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01AE   | 430  | 1       | CPMPCTL_disc_cmd   | Cond Pump Cmd            | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01AF   | 431  | 1       | CPMPCTL_dWd        | Diagnostic Word          | UINT                  | IR   |       |       |          | 0       |         |
| 0x01B0   | 432  | 1       | CPMPCTL_fwD        | Fault Word               | UINT                  | IR   |       |       |          | 0       |         |
| 0x01B1   | 433  | 1       | CPMPCTL_isEnable   | Enable                   | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01B2   | 434  | 1       | CPMPCTL_isNom      | Nominal                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01B3   | 435  | 1       | CPMPCTL_isRd2Go    | Ready to Start           | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01B4   | 436  | 1       | CPMPCTL_isRd2St    | Ready to Stop            | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01B5   | 437  | 1       | CPMPCTL_isStart    | Started                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01B6   | 438  | 1       | CPMPCTL_isStop     | Stopped                  | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01B7   | 439  | 2       | RUNTIME_str_comp_a | Compressor A Starts      | FLOAT                 | IR   |       |       |          | 0       |         |
| 0x01B8   | 440  | 2       | RUNTIME_str_comp_b | Compressor B Starts      | FLOAT                 | IR   |       |       |          | 0       |         |
| 0x01B9   | 441  | 2       | RUNTIME_hr_svc     | Service Runtime          | FLOAT                 | IR   | HOURS |       |          | 0       |         |
| 0x01BA   | 442  | 2       | RUNTIME_hr_mach    | Machine Operating Hours  | FLOAT                 | IR   | HOURS | 0     | 99999999 | 0       |         |
| 0x01BB   | 443  | 2       | RUNTIME_hr_comp_a  | Compressor A Hours       | FLOAT                 | IR   | HOURS |       |          | 0       |         |
| 0x01BC   | 444  | 2       | RUNTIME_hr_comp_b  | Compressor B Hours       | FLOAT                 | IR   | HOURS |       |          | 0       |         |
| 0x01BD   | 445  | 2       | RUNTIME_hr_epmp1   | Evap Pump 1 Hours        | FLOAT                 | IR   | HOURS |       |          | 0       |         |
| 0x01BE   | 446  | 2       | RUNTIME_hr_cpmp1   | Cond Pump 1 Hours        | FLOAT                 | IR   | HOURS |       |          | 0       |         |
| 0x01BF   | 447  | 2       | CAPDCTL_actstpt    | Active Fluid Temp Setpt  | FLOAT                 | IR   | °F    |       |          | 0       |         |
|          |      |         |                    |                          |                       |      | °C    |       |          | -17.78  |         |
| 0x01C0   | 448  | 2       | CAPDCTL_ck1capmn   | cirVarSpdCapLimMinArray  | FLOAT                 | IR   |       |       |          | 0       |         |
| 0x01C1   | 449  | 2       | CAPDCTL_ck1capmx   | cirVarSpdCapLimMaxArray  | FLOAT                 | IR   |       |       |          | 0       |         |
| 0x01C2   | 450  | 2       | CAPDCTL_ck1caprq   | Circ Cap Req Array       | FLOAT                 | IR   |       |       |          | 0       |         |
| 0x01C3   | 451  | 1       | CAPDCTL_compldrq   | Comp Load Required       | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01C4   | 452  | 2       | CAPDCTL_scstptof   | Short Cycle Setpt Offset | FLOAT                 | IR   |       |       |          | 0       |         |
| 0x01C5   | 453  | 2       | CAPDCTL_stptbst    | Setpoint Boost           | FLOAT                 | IR   |       |       |          | 0       |         |
| 0x01C6   | 454  | 2       | CAPDCTL_syscapmx   | sysVarSpdCapLimMax       | FLOAT                 | IR   | %     |       |          | 0       |         |
| 0x01C7   | 455  | 2       | CAPDCTL_syscaprq   | System Capacity Req      | FLOAT                 | IR   | %     |       |          | 0       |         |
| 0x01C8   | 456  | 1       | CAPDCTL_ramp_act   | Ramp Loading Active      | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01C9   | 457  | 1       | CAPDCTL_dem_act    | Demand Limit Active      | UINT                  | IR   |       | 0     | 1        | 0       |         |
| 0x01CA   | 458  | 2       | CAPECTL_act_ccap   | System Actual Comp Cap   | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01CB   | 459  | 2       | CAPECTL_act_fcacp  | sysActualFixSpdComprCap  | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01CC   | 460  | 2       | CAPECTL_act_vcap   | sysActualVarSpdComprCap  | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01CD   | 461  | 2       | CAPECTL_avl_cap    | System Avail Comp Cap    | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01CE   | 462  | 2       | CAPECTL_avl_fcacp  | SysAvailFixSpdComprCap   | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01CF   | 463  | 2       | CAPECTL_avl_vcap   | SysAvailVarSpdComprCap   | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01D0   | 464  | 2       | CAPECTL_cap        | System Capacity          | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01D1   | 465  | 2       | CAPECTL_cap_pct    | System Capacity Percent  | FLOAT                 | IR   | %     |       |          | 0       |         |
| 0x01D2   | 466  | 2       | CAPECTL_run_fcacp  | sysRunFixSpdComprCap     | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01D3   | 467  | 2       | CAPECTL_run_vcap   | sysRunVarSpdComprCap     | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01D4   | 468  | 2       | CIRCACTL_cap_tons  | System Capacity Tons     | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01D5   | 469  | 1       | CIRCACTL_circ_wrd  | Circuit A Diag Word      | UINT                  | IR   |       |       |          | 0       |         |
| 0x01D7   | 471  | 2       | CIRCACTL_ck1_acap  | Circ A Avail Comp Cap    | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01D8   | 472  | 2       | CIRCACTL_ck1_cap   | Circuit A Capacity       | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01D9   | 473  | 2       | CIRCACTL_ck1_capp  | Circuit A Capacity Pct   | FLOAT                 | IR   | %     |       |          | 0       |         |
| 0x01DA   | 474  | 2       | CIRCACTL_ck1accap  | Circ A Actual Comp Cap   | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01DB   | 475  | 2       | CIRCACTL_ck1afcap  | cirAAvailFixSpdComprCap  | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01DC   | 476  | 2       | CIRCACTL_ck1afscap | cirAAvailFixSpdComprCap  | FLOAT                 | IR   | ton   |       |          | 0       |         |
| 0x01DD   | 477  | 2       | CIRCACTL_ck1avcap  | cirAAvailVarSpdComprCap  | FLOAT                 | IR   | ton   |       |          | 0       |         |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER             | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE  |       |         | COMMENT                                                                                                                                             |
|----------|------|---------|-----------------------|--------------------------|-----------------------|------|------|--------|-------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| HEXADEC. | DEC. |         |                       |                          |                       |      |      | MIN.   | MAX.  | DEFAULT |                                                                                                                                                     |
| 0x01DE   | 478  | 2       | CIRCACTL_ck1avscp     | cirAActualVarSpdComprCap | FLOAT                 | IR   | ton  |        |       | 0       |                                                                                                                                                     |
| 0x01DF   | 479  | 2       | CIRCACTL_ck1rfcap     | cirARunFixSpdComprCap    | FLOAT                 | IR   | ton  |        |       | 0       |                                                                                                                                                     |
| 0x01E0   | 480  | 2       | CIRCACTL_ck1rvcap     | cirARunVarSpdComprCap    | FLOAT                 | IR   | ton  |        |       | 0       |                                                                                                                                                     |
| 0x01E1   | 481  | 1       | CIRCACTL_cmpn_wrd     | Compression A Diag Word  | UINT                  | IR   |      |        |       | 0       |                                                                                                                                                     |
| 0x01E3   | 483  | 1       | CIRCACTL_status       | Circuit A Status         | UINT                  | IR   |      |        |       | 0       |                                                                                                                                                     |
| 0x01E4   | 484  | 1       | CIRCACTL_stdstat      | Circ A Steady State Flag | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01E5   | 485  | 2       | OILVCTL_oil_visc      | Oil Viscosity            | FLOAT                 | IR   |      |        |       | 0       |                                                                                                                                                     |
| 0x01E6   | 486  | 1       | PROTOCOL_MODDOCC      | MODBUS Occupy            | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01E7   | 487  | 2       | PROTOCOL_MODDEML      | MODBUS Demand Limit      | FLOAT                 | HR   | %    | 40     | 100   | 100     |                                                                                                                                                     |
| 0x01E8   | 488  | 1       | PROTOCOL_MODESTOP     | MODBUS Estop             | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01E9   | 489  | 1       | PROTOCOL_MODSFTY      | MODBUS Fire Safety       | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01EA   | 490  | 1       | PROTOCOL_MOD_S_S      | MODBUS Start/Stop        | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01EB   | 491  | 1       | PROTOCOL_MODLKOUT     | MODBUS Lockout           | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01EE   | 494  | 1       | EPMPCTL_disc_cmd      | Evap Pump Cmd            | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01EF   | 495  | 1       | EPMPCTL_dWd           | Diagnostic Word          | UINT                  | IR   |      |        |       | 0       |                                                                                                                                                     |
| 0x01F0   | 496  | 1       | EPMPCTL_fWd           | Fault Word               | UINT                  | IR   |      |        |       | 0       |                                                                                                                                                     |
| 0x01F1   | 497  | 1       | EPMPCTL_isEnable      | Enable                   | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F2   | 498  | 1       | EPMPCTL_isNom         | Nominal                  | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F3   | 499  | 1       | EPMPCTL_isRd2Go       | Ready to Start           | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F4   | 500  | 1       | EPMPCTL_isRd2St       | Ready to Stop            | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F5   | 501  | 1       | EPMPCTL_isStart       | Started                  | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F6   | 502  | 1       | EPMPCTL_isStop        | Stopped                  | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F7   | 503  | 1       | PLTSPRT_rs485_u1_tres | LEN Port J6 Term Res     | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F8   | 504  | 1       | PLTSPRT_rs485_u3_tres | CCN Port J7 Term Res     | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01F9   | 505  | 1       | PLTSPRT_rs485_u4_tres | Mod Master J10 Term Res  | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01FA   | 506  | 1       | PLTSPRT_rs485_u5_tres | BMS Port J8 Term Res     | UINT                  | HR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x01FB   | 507  | 1       | SERVICE1_flui_typ     | Evaporator Fluid Type    | UINT                  | IR   |      | 0      | 2     | 0       | MV: 1=Water, 2=Med Brine, 3=Low Brine                                                                                                               |
| 0x01FC   | 508  | 2       | SERVICE1_freezep      | Brine Freeze Setpoint    | FLOAT                 | IR   | °F   | -20    | 34    | 34      |                                                                                                                                                     |
|          |      |         |                       |                          |                       |      | °C   | -28.89 | 1.11  | 1.11    |                                                                                                                                                     |
| 0x01FD   | 509  | 2       | SERVICE1_min_off      | Comp Min Off Time        | FLOAT                 | IR   | sec  | 60     | 1200  | 120     |                                                                                                                                                     |
| 0x01FE   | 510  | 2       | SERVICE1_dem_20ma     | Demand Limit At 20 mA    | FLOAT                 | IR   | %    | 10     | 100   | 40      |                                                                                                                                                     |
| 0x01FF   | 511  | 2       | SERVICE1_min_lwt      | Minimum Fluid Temp       | FLOAT                 | IR   | °F   | -20    | 38    | 38      |                                                                                                                                                     |
|          |      |         |                       |                          |                       |      | °C   | -28.89 | 3.33  | 3.33    |                                                                                                                                                     |
| 0x0200   | 512  | 2       | SERVICE1_max_lwt      | Maximum Fluid Temp       | FLOAT                 | IR   | °F   | 38     | 153   | 95      |                                                                                                                                                     |
|          |      |         |                       |                          |                       |      | °C   | 3.33   | 67.22 | 35      |                                                                                                                                                     |
| 0x0201   | 513  | 1       | SERVICE1_emstopen     | Emergency Stop Enable    | UINT                  | IR   |      | 0      | 1     | 1       |                                                                                                                                                     |
| 0x0202   | 514  | 2       | SERVICE1_rspdmaxA     | Comp Speed Max A         | FLOAT                 | IR   | Hz   |        |       | 132     |                                                                                                                                                     |
| 0x0203   | 515  | 2       | SERVICE1_rspdmaxB     | Comp Speed Max B         | FLOAT                 | IR   | Hz   |        |       | 132     |                                                                                                                                                     |
| 0x0204   | 516  | 1       | SERVICE1_ser_pass     | Service Password         | UINT                  | IR   |      | 0      | 9999  | 88      |                                                                                                                                                     |
| 0x0205   | 517  | 1       | SERVICE1_lockout      | Service Lockout          | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x0206   | 518  | 1       | SERVICE1_rstrtopt     | Restart Options          | UINT                  | IR   |      | 0      | 2     | 0       | MV: 0=None, 1=Auto-Restart, 2=Rapid-Restart                                                                                                         |
| 0x0207   | 519  | 1       | SERVICE1_stlim_by     | Starts Limit Bypass      | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x0208   | 520  | 2       | SERVICE1_stpperlim_A  | Starts Per Period Lim    | FLOAT                 | IR   |      |        |       | 8       |                                                                                                                                                     |
| 0x0209   | 521  | 2       | SERVICE1_cmpstper_A   | Comp Start Period        | FLOAT                 | IR   |      |        |       | 3800    |                                                                                                                                                     |
| 0x020A   | 522  | 2       | SERVICE1_stpperlim_B  | Starts Per Period Lim    | FLOAT                 | IR   |      |        |       | 8       |                                                                                                                                                     |
| 0x020B   | 523  | 2       | SERVICE1_cmpstper_B   | Comp Start Period        | FLOAT                 | IR   |      |        |       | 3800    |                                                                                                                                                     |
| 0x020C   | 524  | 1       | SERVICE1_oilsw_by_A   | Oil Switch Bypass A      | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x020D   | 525  | 1       | SERVICE1_oilsw_by_B   | Oil Switch Bypass B      | UINT                  | IR   |      | 0      | 1     | 0       |                                                                                                                                                     |
| 0x020E   | 526  | 1       | SERVICE1_CirA_En      | Enable Circuit A         | UINT                  | IR   |      | 0      | 1     | 1       |                                                                                                                                                     |
| 0x020F   | 527  | 1       | SERVICE1_CirB_En      | Enable Circuit B         | UINT                  | IR   |      | 0      | 1     | 1       |                                                                                                                                                     |
| 0x0210   | 528  | 1       | SERVICE1_rsthrsvc     | Reset Service Runtime    | UINT                  | IR   |      | 0      | 1     | 1       |                                                                                                                                                     |
| 0x0211   | 529  | 1       | SERVICE1_sftst_en     | Soft Stop Enable         | UINT                  | IR   |      | 0      | 1     | 1       |                                                                                                                                                     |
| 0x0212   | 530  | 2       | SERVICE1_sftst_th     | Soft Stop Threshold      | FLOAT                 | IR   | %    | 0      | 100   | 50      |                                                                                                                                                     |
| 0x0213   | 531  | 1       | FACTORY_comp_typ      | Compressor Type          | UINT                  | IR   |      | 0      | 4     | 1       | MV: 1=P, 2=Q/IR, 3=TC, 4=TD                                                                                                                         |
| 0x0214   | 532  | 1       | FACTORY_refrig        | Refrigerant Type         | UINT                  | IR   |      | 0      | 15    | 4       | MV: 0=R11, 1=R12, 2=R123, 3=R22, 4=R134A, 5=R404A, 6=R407C, 7=R410A, 8=R454B, 9=R500, 10=R507, 11=R513A, 12=R515A, 13=R515B, 14=R1233ZD, 15=R1234ZE |
| 0x0215   | 533  | 1       | FACTORY_tons          | Chiller Tons             | UINT                  | IR   | ton  | 100    | 600   | 100     |                                                                                                                                                     |
|          |      |         |                       |                          |                       |      | ton  | 90.7   | 544.2 | 90.7    |                                                                                                                                                     |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION              | DISPLAY MODE (16BITS) | TYPE | UNIT  | VALUE  |       |         | COMMENT                                                                                    |
|----------|------|---------|-------------------|--------------------------|-----------------------|------|-------|--------|-------|---------|--------------------------------------------------------------------------------------------|
| HEXADEC. | DEC. |         |                   |                          |                       |      |       | MIN.   | MAX.  | DEFAULT |                                                                                            |
| 0x0216   | 534  | 1       | FACTORY_vfd_opt   | VFD Option               | UINT                  | IR   |       | 0      | 7     | 0       | MV: 0=None, 1=FS VFD, 2=Carrier, 3=Rockwell LF2, 4=Eaton, 5=Rockwell STD, 6=ABB, 7=Danfoss |
| 0x0217   | 535  | 1       | FACTORY_exv_opt   | EXV Control Type         | UINT                  | IR   |       | 0      | 3     | 0       | MV: 0=Disabled, 1=ApprCtrl, 2=EvapLvl, 3=CondLvl                                           |
| 0x0218   | 536  | 1       | FACTORY_econ_opt  | Economizer Option        | UINT                  | IR   |       | 0      | 2     | 0       | MV: 0=None, 1=Float, 2=EXV                                                                 |
| 0x0219   | 537  | 1       | FACTORY_hgbp_opt  | HGBP Control Option      | UINT                  | IR   |       | 0      | 1     | 0       |                                                                                            |
| 0x021A   | 538  | 1       | FACTORY_aux_io    | Auxiliary IO Location    | UINT                  | IR   |       | 0      | 1     | 0       | 0=IOB, 1=Starter                                                                           |
| 0x021B   | 539  | 1       | FACTORY_oilassy   | Oil Assembly Option      | INT                   | IR   |       | 1      | 2     | 1       | 1=one piece vap, 2=two piece vap                                                           |
| 0x021C   | 540  | 2       | ENERGY_din_kw     | Design Input kW          | FLOAT                 | IR   | kW    |        |       | 0       |                                                                                            |
| 0x021D   | 541  | 2       | ENERGY_dkw_ton    | Design Input kW/Ton      | FLOAT                 | IR   | kW    |        |       | 0       |                                                                                            |
| 0x021E   | 542  | 2       | ENERGY_dewt       | Design Ent Evap Temp     | FLOAT                 | IR   | °F    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    |        |       | -17.78  |                                                                                            |
| 0x021F   | 543  | 2       | ENERGY_dlwt       | Design Lvg Evap Temp     | FLOAT                 | IR   | °F    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    |        |       | -17.78  |                                                                                            |
| 0x0220   | 544  | 2       | ENERGY_degpm      | Design Evap GPM          | FLOAT                 | IR   | gpm   |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | l/min |        |       | 0       |                                                                                            |
| 0x0221   | 545  | 2       | ENERGY_depdt      | Design Evap Press Drop   | FLOAT                 | IR   | ft    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | m     |        |       | 0       |                                                                                            |
| 0x0222   | 546  | 2       | ENERGY_dert       | Design Evap Refrig Temp  | FLOAT                 | IR   | °F    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    |        |       | -17.78  |                                                                                            |
| 0x0223   | 547  | 2       | ENERGY_decwt      | Design Ent Cond Temp     | FLOAT                 | IR   | °F    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    |        |       | -17.78  |                                                                                            |
| 0x0224   | 548  | 2       | ENERGY_dlcwt      | Design Lvg Cond Temp     | FLOAT                 | IR   | °F    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    |        |       | -17.78  |                                                                                            |
| 0x0225   | 549  | 2       | ENERGY_dcgpm      | Design Cond GPM          | FLOAT                 | IR   | gpm   |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | l/min |        |       | 0       |                                                                                            |
| 0x0226   | 550  | 2       | ENERGY_dcpdt      | Design Cond Press Drop   | FLOAT                 | IR   | ft    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | m     |        |       | 0       |                                                                                            |
| 0x0227   | 551  | 2       | ENERGY_dcrt       | Design Cond Refrig Temp  | FLOAT                 | IR   | °F    |        |       | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    |        |       | -17.78  |                                                                                            |
| 0x0228   | 552  | 1       | HYDRCFG_evapfdtp  | Evap Flow Detection Type | UINT                  | IR   |       | 0      | 2     | 0       |                                                                                            |
| 0x0229   | 553  | 2       | HYDRCFG_evapfldp  | Evap Min Flow dP         | FLOAT                 | IR   | psig  | 0      | 0     | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | kPa   | 0      | 0     | 0       |                                                                                            |
| 0x022A   | 554  | 1       | HYDRCFG_eflo_vt   | Evap Flow Verify time    | UINT                  | IR   | sec   | 30     | 300   | 30      |                                                                                            |
| 0x022B   | 555  | 1       | HYDRCFG_condfdtp  | Cond Flow Detection Type | UINT                  | IR   |       | 0      | 2     | 0       |                                                                                            |
| 0x022C   | 556  | 2       | HYDRCFG_condfldp  | Cond Min Flow dP         | FLOAT                 | IR   | psig  | 0      | 0     | 0       |                                                                                            |
|          |      |         |                   |                          |                       |      | kPa   | 0      | 0     | 0       |                                                                                            |
| 0x022D   | 557  | 1       | HYDRCFG_cflo_vt   | Cond Flow Verify time    | UINT                  | IR   | sec   | 30     | 300   | 30      |                                                                                            |
| 0x022E   | 558  | 1       | DRVA1CFG_rlv_i    | Rated Line Voltage       | UINT                  | IR   | V     |        |       | 460     |                                                                                            |
| 0x022F   | 559  | 1       | DRVA1CFG_rla_m    | Motor Rated Load Amps    | UINT                  | IR   | amp   | 10     | 5000  | 200     |                                                                                            |
| 0x0230   | 560  | 1       | DRVA1CFG_rlv      | Motor Nameplate Voltage  | UINT                  | IR   | V     |        |       | 460     |                                                                                            |
| 0x0231   | 561  | 1       | DRVA1CFG_rla      | Motor Nameplate Current  | UINT                  | IR   | amp   |        |       | 200     |                                                                                            |
| 0x0232   | 562  | 1       | DRVA1CFG_rlrpm    | Motor Nameplate RPM      | UINT                  | IR   | rpm   |        |       | 3000    |                                                                                            |
| 0x0233   | 563  | 1       | DRVA1CFG_rlkW     | Motor Nameplate KW       | UINT                  | IR   | kW    |        |       | 1500    |                                                                                            |
| 0x0234   | 564  | 1       | DRVA1CFG_rlhZ     | Compressor 100% Speed    | UINT                  | IR   | Hz    | 0      | 200   | 90      |                                                                                            |
| 0x0235   | 565  | 1       | DRVA1CFG_min_spd  | Compressor Unload Spd    | UINT                  | IR   | Hz    |        |       | 25      |                                                                                            |
| 0x0236   | 566  | 1       | DRVA1CFG_strt_spd | Compressor Start Spd     | UINT                  | IR   | Hz    |        |       | 25      |                                                                                            |
| 0x0237   | 567  | 2       | DRVA1CFG_torq_lim | Torque Limit Percent     | FLOAT                 | IR   | %     |        |       | 115     |                                                                                            |
| 0x0238   | 568  | 2       | DRVA1CFG_curr_lim | Current Limit Percent    | FLOAT                 | IR   | %     |        |       | 110     |                                                                                            |
| 0x0239   | 569  | 2       | DRVA1CFG_pwm_freq | PWM Switch Frequency     | FLOAT                 | IR   |       | 0      | 0     | 2       |                                                                                            |
| 0x023A   | 570  | 2       | DRVA1CFG_skipfrq1 | Skip Frequency 1         | FLOAT                 | IR   | Hz    |        |       | 102     |                                                                                            |
| 0x023B   | 571  | 2       | DRVA1CFG_skipfrq2 | Skip Frequency 2         | FLOAT                 | IR   | Hz    |        |       | 102     |                                                                                            |
| 0x023C   | 572  | 2       | DRVA1CFG_skipfrq3 | Skip Frequency 3         | FLOAT                 | IR   | Hz    |        |       | 102     |                                                                                            |
| 0x023D   | 573  | 2       | DRVA1CFG_skipband | Skip Frequency Band      | FLOAT                 | IR   | Hz    |        |       | 0       |                                                                                            |
| 0x023E   | 574  | 1       | DRVA1CFG_ramp_inc | Increase Ramp Time       | UINT                  | IR   | sec   |        |       | 30      |                                                                                            |
| 0x023F   | 575  | 1       | DRVA1CFG_ramp_dec | Decrease Ramp Time       | UINT                  | IR   | sec   |        |       | 30      |                                                                                            |
| 0x0240   | 576  | 2       | SETPOINT_icw_sp   | Cooling LCW Setpoint     | FLOAT                 | HR   | °F    | 10     | 120   | 45      |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    | -12.22 | 48.89 | 7.22    |                                                                                            |
| 0x0241   | 577  | 2       | SETPOINT_ice_sp   | Ice Build Setpoint       | FLOAT                 | HR   | °F    | 15     | 60    | 40      |                                                                                            |
|          |      |         |                   |                          |                       |      | °C    | -9.44  | 15.56 | 4.44    |                                                                                            |
| 0x0242   | 578  | 1       | SETPOINT_EWT_OPT  | EWT Control Option       | UINT                  | HR   |       | 0      | 1     | 0       |                                                                                            |

## APPENDIX D — MODBUS CONFIGURATION<sup>a</sup> (cont)

| ADDRESS  |      | REG. N° | PARAMETER         | DESCRIPTION             | DISPLAY MODE (16BITS) | TYPE | UNIT | VALUE  |        |         | COMMENT |
|----------|------|---------|-------------------|-------------------------|-----------------------|------|------|--------|--------|---------|---------|
| HEXADEC. | DEC. |         |                   |                         |                       |      |      | MIN.   | MAX.   | DEFAULT |         |
| 0x0243   | 579  | 2       | SETPOINT_ecw_sp   | Cooling ECW Setpoint    | FLOAT                 | HR   | °F   | 15     | 120    | 60      |         |
|          |      |         |                   |                         |                       |      | °C   | -9.44  | 48.89  | 15.56   |         |
| 0x0244   | 580  | 2       | SETPOINT_dem_base | Base Demand Limit       | FLOAT                 | HR   | %    | 25     | 100    | 100     |         |
| 0x0245   | 581  | 2       | SETPOINT_rcyc_lo  | Recycle Shutdown Offset | FLOAT                 | HR   | °F   | 0      | 10     | 5       |         |
|          |      |         |                   |                         |                       |      | °C   | -17.78 | -12.22 | -15     |         |
| 0x0246   | 582  | 2       | SETPOINT_rcyc_hi  | Recycle Startup Offset  | FLOAT                 | HR   | °F   | 0      | 10     | 5       |         |
|          |      |         |                   |                         |                       |      | °C   | -17.78 | -12.22 | -15     |         |
| 0x0247   | 583  | 1       | ALARMRST_RST_ALM  | Alarm Reset             | UINT                  | IR   |      | 0      | 1      | 0       |         |
| 0x0249   | 585  | 1       | ALARMRST_alarm_1  | Jbus Current Alarm 1    | UINT                  | IR   |      |        |        | 0       |         |
| 0x024A   | 586  | 1       | ALARMRST_alarm_2  | Jbus Current Alarm 2    | UINT                  | IR   |      |        |        | 0       |         |
| 0x024B   | 587  | 1       | ALARMRST_alarm_3  | Jbus Current Alarm 3    | UINT                  | IR   |      |        |        | 0       |         |
| 0x024C   | 588  | 1       | ALARMRST_alarm_4  | Jbus Current Alarm 4    | UINT                  | IR   |      |        |        | 0       |         |
| 0x024D   | 589  | 1       | ALARMRST_alarm_5  | Jbus Current Alarm 5    | UINT                  | IR   |      |        |        | 0       |         |

NOTE(S):

- a. Not all points are applicable to 23XRV; this list is common between products sharing the same software platform.

### LEGEND

|                |   |                   |
|----------------|---|-------------------|
| <b>CO</b>      | — | COILS_MEDIA       |
| <b>DEC</b>     | — | Decimal           |
| <b>DI</b>      | — | DISCR_INPUT_MEDIA |
| <b>HEXIDEC</b> | — | Hexadecimal       |
| <b>HR</b>      | — | HOLDING_REG_MEDIA |
| <b>IR</b>      | — | INPUT_REG_MEDIA   |
| <b>MV</b>      | — | Multi-State Value |



