

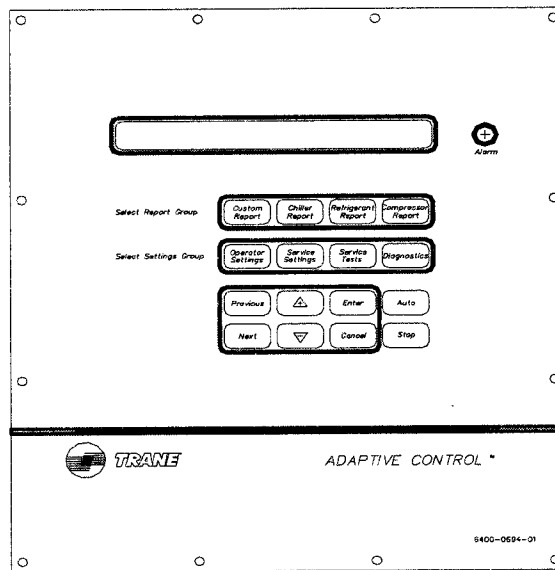


**TRANE®**

# Information Manual

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## Clear Language Display Water-Cooled, Hermetic CenTraVac® Clear Language Display for UCP2 and FastPak™ Control Panels



### Models

CVHE, CVHF, CVHG, CVRB, CVRC

50 and 60 Hz

Cooling-Only and Heat Recovery, Direct-Drive CenTraVacs  
with UCP2 Control panels

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X39470756-02

**CVHE-CLD-1A**

June 2000



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## General

### Literature Change History

CVHE-CLD-1 (February 1995)

Application of the Clear Language Display to the UCP2 Centravac

CVHE-CLD-1A (June 2000)

Updated information and incorporated FastPak™ items.

### About This Manual

This manual describes the application of the Clear Language Display (CLD) to the UCP2 Centravac. It describes its use as a machine-mounted human interface.

A description of the UCP2 reports and message displays are provided along with additional "Help Notes" to clarify the display messages. In addition, a Diagnostics section is also included.

### LCD Display

The display on the Clear Language Display is a 2-line by 40-character liquid crystal display (LCD). Upper and lower case alphabetic characters can be displayed, along with numeric and special characters.

### LCD Backlight

The LCD display has an LED backlight so it can be read in low light conditions.

### Keypad

A sealed dirt-proof keypad is used on the unit mount Clear Language Display. Metal dome switch actuators respond when any key is pressed. See *Figure 1*.

**Important!** *FACTORY DEFAULT SETTINGS: Menu items that are programmable using the keypad may have a selectable choice that is listed as Factory Default. This Factory Default setting is the software default that is initially factory-programmed for a new module assembly and may NOT be the correct setting for a specific operating chiller. Always review all settings when any module is replaced to verify that the settings agree with the desired settings that were selected at initial startup or programmed at the factory.*

### LED Alarm

In addition to the alpha-numeric LCD display, there's a single discrete LED on the human interface. The red LED flashes on-off whenever a latching diagnostic is present and a manual reset is required to restore full unit operation. The LED is also used to indicate that a function or control has been set to manual from within the **Service Test** Menu. If a control has been set to manual, the LED is on and non-flashing. A diagnostic supersedes a manual operation. As a result, the unit could have a manual mode set and be in a latching diagnostic. In this case the LED would flash on-off. The LED is off otherwise.

**Figure 1**  
**Keypad Matrix**

CUSTOM REPORT	CHILLER REPORT	REFRIGERANT REPORT	COMPRESSOR REPORT
OPERATOR SETTINGS	SERVICE SETTINGS	SERVICE TESTS	DIAGNOSTICS
Previous	+	Enter	Auto
Next	-	Cancel	Stop

### Local Clear Language

The Local CLD "Clear Language Display" resides at the Chiller providing display of chiller data and access to operator/service controls, setpoints, and chiller set-up information. All information is stored in non-volatile memory in the Chiller module. The Local CLD and the Chiller module work together to display and store information requiring non-volatility.

## Control System

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### Unit Control Panel

Safety and operating controls are housed in the UCP2 unit control panel, the starter panel, and the purge control panel.

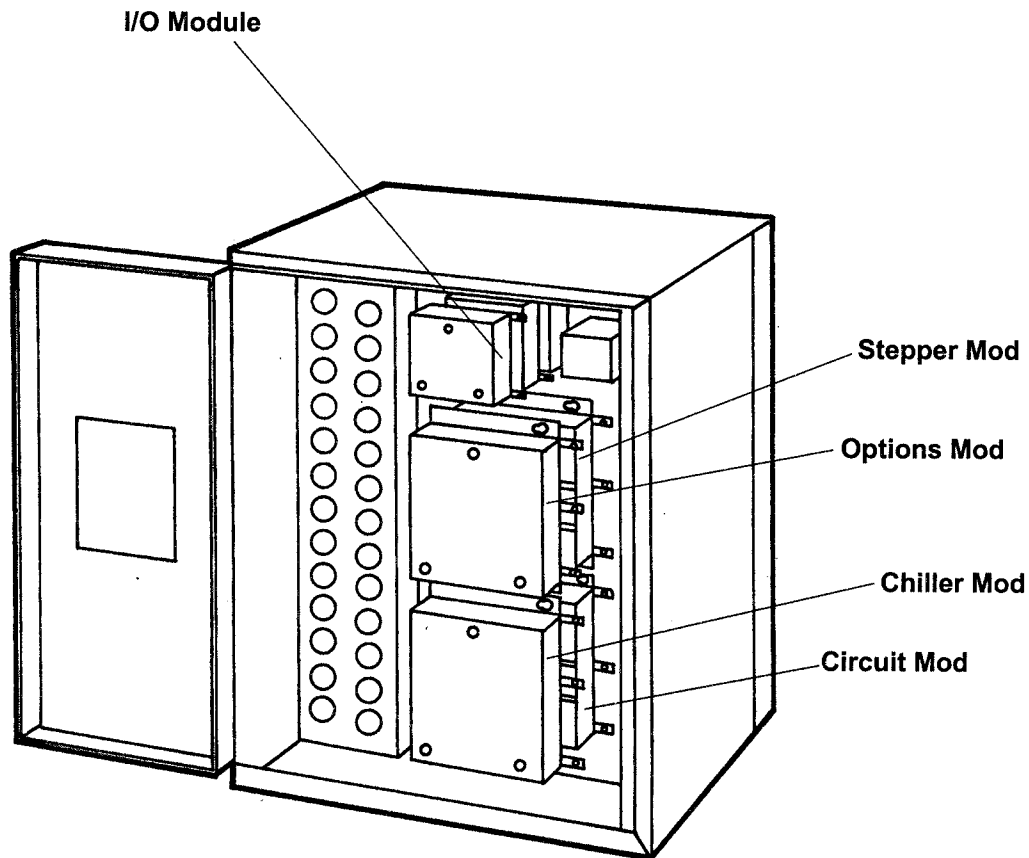
The UCP2 control is a modular design partitioned by major function or group of functions. All modules (see *Figure 2*) communicate with each other through the Interprocessor Communication Circuit (IPC).

Major components within each control group are shown in the figure.

Unit-mounted temperature sensors, pressure transducers, and functional switches provide analog and binary inputs to the various modules.

The microcomputer-based modules are illustrated in the figure. All wiring to the modules are to pluggable terminal blocks.

*Figure 2*  
UCP2 Control Panel



## Custom Report

---

### Custom Report Group

Reports are added to the custom report group by pressing the <+> key when the desired report is being displayed from its normal report location. Reports are removed from the custom report group by pressing the <-> key when the desired custom report is being displayed. The Custom report group can contain a maximum of 20 reports. When adding a report to the Custom Report, if the <+> key is pressed when the Custom Report already contains 20 reports, a message, "Custom Report Is Full, Report Not Added," indicating that the Custom Report is full, will be displayed for 2 seconds. If an attempt is made to add a report to the Custom Report that is already in the Custom Report, a message, "Report Already In Custom Menu", will be displayed for 2 seconds.

The Custom Report sequence is as follows:

#### Report Heading

User Defined Custom Report
Press (Next) (Previous) To Continue

If no entries are selected for the Custom Report, see Empty List Display.

#### Empty Display List

If no entries are selected for the Custom Report, the second entry is:

No Items Are Selected For Custom Report:
See Operators Manual To Select Entries

The report then wraps around to the report heading when <Next> is pressed.

If there are items selected for the Custom Report, then the empty list display is not used. Instead, the report heading and the selected items are displayed sequentially as <Next> or <Previous> are pressed.

# ASHRAE Guideline 3 Report

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Press (Enter) For ASHRAE Guideline 3 Rpt
Press (Next)(Previous) To Continue

If <Enter> is pressed the ASHRAE Guideline 3 Report Menu is entered, shown at the end of the Standard Report below. Otherwise, if <Next> is pressed the Standard Report is entered. The ASHRAE Guideline 3 Report Entry screen may be added to Custom Report by pressing the <+> key. Adding it to the Custom Report allows the user to access the ASHRAE Guideline 3 Report from the Custom Menu.

The following are the Standard Report screens, e.g. not part of the ASHRAE Guideline 3 Report.

### ASHRAE Guideline 3 Reports

ASHRAE Guideline 3 Report
Press (Next)(Previous) To Continue

### Time Of Day/Refrigerant Type

Current Time/Date HH:MM xm Mon, XX XXXX
Refrigerant Type: [type]

Possible values for refrigerant type are: R11, R123, R12, R134a, R22, R113, R114, R500, or R502.

### Chiller Operating Mode

The chiller operating modes display comes up first in the standard report:

[Operating mode line 1]
[Operating mode line 2]

Line 1 (and 2 if needed) indicates a current condition of the unit as shown in the following table (Table 1). In some cases, an associated timer or system parameter will be displayed that assures the transition to an expected mode is in progress, particularly during the unit start-up sequence.

Table 1  
Operating Modes

Unit Operation	Operating Mode Display* (First Line/Second Line)	Unit Operation	Operating Mode Display* (First Line/Second Line)
Stop	Resetting	Run	Unit Is Running Capacity Limited By Phase Unbalance
	Local Stop: Cannot Be Overridden By Any External Or Remote Device		Unit Is Running Capacity Limited By High Cond Press
	Remote Display Stop: Chiller May Be Set To Auto By Any Ext Or Rmt Device		Unit Is Running Capacity Limited By Low Evap Temp
	Remote Run Inhibit From External Source		Unit is Running Capacity Limited By Vane Open Travel Stop
	Remote Run Inhibit From Tracer		Unit Is Running Minimum Capacity Due To Vane Closed Travel Stop
	Heat Sink Temp Start Inhibit		Unit Is Running in Surge Condition
	Diagnostic Shutdown Stop		Unit Is Running; Capacity Limited By Pulldown Rate Based Soft Loading
Diagnostic Shutdown Auto	Unit Is Running; Capacity Limited By Current Based Soft Loading		
Auto	Auto Waiting For Evaporator Water Flow	Auto	Auto Waiting For Condenser Water Flow
	Auto Waiting For A Need To Cool	Run	Establishing Evap Water Flow Establishing Oil Pressure
	Waiting For Tracer Communications To Establish Operating Status		Establishing Evap Water Flow Prelubrication Time: MIN:SEC
	Starting Is Inhibited By Staggered Start Time Remaining: MIN:SEC		Evap Water Is Flowing Prelubrication Time: MIN:SEC
	Starting Is Inhibited By Restart Inhibit Timer: Time Remaining MIN:SEC		Evap Water Is Flowing Performing IGV BPI Search & Calibration
Establishing Cond Water Flow Establishing Oil Pressure	Establishing Evap Water Flow Performing IGV BPI Search & Calibration		
Initialize	Establishing Cond Water Flow Prelubrication Time: MIN:SEC	Run	Unit is Running; Base Loaded
	Cond Water Is Flowing Prelubrication Time: MIN:SEC		Unit is Running; Base Loaded Capacity Limited By High Current
	Cond Water Is Flowing Establishing Oil Pressure		Unit is Running; Base Loaded Capacity Limited By Phase Unbalance
	Cond Water Is Flowing Performing IGV BPI Search and Calibration		Unit Is Running; Base Loaded Capacity Limited By High Cond Press
	Cond Water Is Flowing PreStart Unload Time Remaining: MIN:SEC		Unit Is Running; Base Loaded Capacity Limited By Low Evap Temp
	Starting Compressor		Unit is Running; Base Loaded At Vane Open Travel Stop
Run	Unit Is Running	Run	Unit is Running; Base Loaded At Vane Closed Travel Stop
	Unit Is Running Capacity Limited By High Current		Unit Is Running; Base Loaded In Surge Condition

Unit Operation	Operating Mode Display* (First Line/Second Line)	Unit Operation	Operating Mode Display* (First Line/Second Line)
Run	Unit Is Running; Base Loaded Current Based Soft Loading	Run-Ice Build	Unit Is Building Ice Capacity Limited By High Cond Press
	Unit Is Running In Minimum Capacity		Unit Is Building Ice Capacity Limited By Low Evap Temp
Run-Unload	Unit Is Running In Minimum Capacity Time Remaining: MIN:SEC		Unit Is Building Ice Surge Has Been Detected
	Unit Is Preparing To Shutdown		Ice Building Is Complete
Run-Ice Build	Unit Is Building Ice Capacity Limited By Vane Open Travel Stop		Unit Is Running; Transitioning Ice Building To Normal MIN:SEC
	Unit Is Building Ice		Post-Lube Time Remaining: MIN:SEC
	Unit Is Building Ice Capacity Limited By High Current	Panic Stop	
	Unit Is Building Ice Capacity Limited By Phase Unbalance	Stop Starter Dry Run	

\* Displays are not in any sequence. Some displays will never appear, depending on options and situation

**Active Chilled Water Setpoint/Chilled Water Setpoint Source**

Active Chilled Water Setpoint: xxx.x f/c
[settings source] CWS: xxx.x f/c

Settings source will be one of the following: Front Panel, Tracer, or External Source.

**Active Current Limit Setpt/Current Limit Setpt Source**

Active Current Limit Setpoint: xxx %
[settings source] CLS: xxx %

Settings source will be one of the following: Front Panel, Tracer, External Source, or Ice Building.

**Refrigerant Monitor**

The following item will be displayed if the Analog Rfgt Monitor is installed.

Refrigerant Monitor: xxx.x PPM
Press (Next) (Previous) To Continue

The following item will be displayed if the IPC Rfgt Monitor option is installed.

Refrigerant Monitor: xxxxx PPM R-YYYY
Press (Next) (Previous) To Continue

Where (Y) can equal 123, 11, 22, 134a, or 12.

**Purge Pumpout Rate/Purge Max Pumpout Rate**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Pumpout Rate: xxx.x Min/24Hrs
Purge Max Pumpout Rate: xxx.x Min/24Hrs

**Purge Total Pumpout Time/ Purge Total Run Time**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Total Pumpout Time: xx,xxx.x Min
Purge Total Run Time: xx,xxx.x Hrs

**Purge Operating Mode/Purge Status**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Operating Mode: [Mode]
Purge Status: [Status]

Possible values of [Mode] are: Auto, Stop, On, or Adaptive.

Possible values of [Status] are:

Idle	(Condensing Unit is Off)
Running	(Condensing Unit is On)
Pumpout	(Temperature initiated Pumpout)
Service Pumpout	(Pumpout initiated by the service switch)
Running - Pumpout Inhibited By Low Temp.	(Pumpout inhibited by low liquid temp)
Pumpout Maximum Rate Disabled	(Max. Pumpout Rate alarm disabled)

**Saturated Evap Temperature/Evap Refrigerant Pressure Compressor Discharge Temp**

Compressor Discharge Temperature shown only if discharge temperature is installed.

Saturated Evap Rfgt Temp: xxx.x f/c
Compressor Discharge Temp: xxx.x f/c

**Compressor Starts and Running Time**

The starts and hours counters are displayed as follows:

Compressor Starts: xxxxx
Compressor Running Time: HRS:MIN:SEC

**Discharge Oil Pressure, Oil Tank Pressure**

This screen is only displayed if the "Oil Pressure Protection" setpoint is set to "Transducer" or "Xducer & Switch."

Discharge Oil Pressure: xxx.x psig
Oil Tank Pressure: xxx.x psig

**Differential Oil Pressure, Oil Temperature**

This screen is only displayed if the "Oil Pressure Protection" setpoint is set to "Transducer" or "Xducer & Switch."

Differential Oil Pressure: xxx.x [units]
Oil Tank Temperature: xxx.x f/c

' Differential Oil Pressure: xxx.x [units]' is only displayed if the "Oil Pressure Protection" setpoint is set to "Transducer" or "Xducer & Switch." If 'Switch' is selected as the setpoint, then ' Differential Oil Pressure Switch: [Status]' is displayed where Status is open or closed.

For FastPak, Differential Oil Pressure: xxx.x [units], this screen is only displayed if the "Oil Pressure Protection Setpoint" is set to "Diff Xducer" If 'Switch' is selected as the setpoint, then ' Differential Oil Pressure Switch: [Status]' is displayed where Status is open or closed.

The Possible value for [units] is "psid" or "kPa" dependent upon whether English or SI units are selected.

**Bearing Temperatures #1 and #2**

The following will be displayed only if the Bearing Temp Sensors Option is Installed.

Bearing Temperature 1: xxx.x f/c
Bearing Temperature 2: xxx.x f/c

**Evaporator Entering and Leaving Water Temperatures**

Evap Entering Water Temp: xxx.x f/c
Evap Leaving Water Temp: xxx.x f/c

**Saturated Evap Temperature/Evap Refrigerant Pressure**

Saturated Evap Rfgt Temp: xxx.x f/c
Evap Rfgt Pressure: xxx.x psig

**Evaporator Approach Temp.**

Evaporator Approach Temp.: xx.x f/c
Press (Next) (Previous) To Continue

**Evaporator Entering/Leaving Water Pressure**

The following will be displayed only if the low pressure (< or = to 150 psig) Differential Water Pressure Sensor Option is Installed.

Evap Entering Water Pressure:xx.x psid/kPa
Evap Leaving Water Pressure: xx.x psid/kPa

**Evaporator Differential Water Pressure**

The following will be displayed only if the Differential Water Pressure Sensor Option is Installed.

Evap Differential Wtr Press: xx.x psid/kPa
Press (Next) (Previous) To Continue

**Evaporator Water Flow**

The following is displayed only if the Differential Water Sensing Option is installed.

Approx Evaporator Water Flow:xxx.x gpm/lpm
Press (Next) (Previous) To Continue

The possible values for units are "gpm" or "lpm."

**Chilled Water Flow Switch Status**

The following will be displayed only if the Differential Water Sensing Option is not installed. This screen displays the status of the chilled water flow switch status at the input to the UCM.

Chilled Water Flow Switch Status:
[y]

Possible values for [y] are: Flow Switch is Open/No Flow or Flow Switch is Closed/Flow.

**Chiller Tons**

The following will be displayed only if the Differential Water Sensing Option is installed.

Approximate Chiller Capacity: xxxx Tons/KW
Press (Next) (Previous) To Continue

The possible values for units are "Tons" or "KW."

**Cond Entering and Leaving Water Temps**

Dashes will be displayed for condenser entering or leaving water temperature if the corresponding input is open or shorted.

Cond Entering Water Temp: xxx.x f/c
Cond Leaving Water Temp: xxx.x f/c

**Saturated Cond Temperature/Cond Refrigerant Press**

Saturated Cond Temp: xxx.x f/c
Cond Rfgt Pressure: xxx.x psig

**Condenser Approach Temp.**

Condenser Approach Temp.: xx.x f/c
Press (Next) (Previous) To Continue

**Condenser Entering/Leaving Water Pressure**

The following will be displayed only if the low pressure (< or = to 150 psig) Differential Water Pressure Sensor Option is Installed.

Cond Entering Water Pressure:xx.x psid/kPa
Cond Leaving Water Pressure: xx.x psid/kPa

**Condenser Differential Water Pressure**

The following will be displayed only if the Differential Water Pressure Sensor Option is Installed.

Cond Differential Wtr Press: xx.x psid/kPa
Press (Next) (Previous) To Continue

**Condenser Water Flow**

The following will be displayed only if the Differential Water Sensing Option is installed.

Approx Condenser Water Flow: xxx.x gpm/lpm
Press (Next) (Previous) To Continue

The possible values for units are "gpm" or "lpm."

**Condenser Water Flow Switch Status**

The following screen is displayed only if the Differential Water Pressure Sensor Option is not Installed. This screen displays the status of the condenser water flow switch status at the input to the UCM.

Condenser Water Flow Switch Status:
[y]

Possible values for [y] are Flow Switch is Open/No Flow or Flow Switch is Closed/Flow

**Aux. Bundle or Heat Recovery Temps**

The following will be displayed only if either the Heat Recovery Option or Aux Condenser Option is installed.

Aux/Heat Rcvy Ent Wtr Temp: xxx.x f/c
Aux/Heat Rcvy Lvg Wtr Temp: xxx.x f/c

# Chiller Report

The Chiller Report sequence is as follows:

Friendly mode line 2

Chiller Status, Water Temps & Setpts  
 Press (Next) (Previous) To Continue

Friendly mode line 1 is indicative of a unit mode. Friendly mode line 2 is usually a verbal continuation of line 1 and can be viewed as a continuous message along with line 1. In some cases Friendly mode line 2 is the display of an associated timer or system parameter.

## Chiller Operating Mode

Friendly mode line 1

[Friendly mode] will be one of the following:

<b>Friendly Mode (First Line/second Line)</b>
<i>Display Is Blank</i>
<i>Resetting</i>
<i>Local Stop: Cannot Be Overridden By Any External Or Remote Device</i>
<i>Remote Display Stop: Chiller May Be Set To Auto By Any Ext Or Rmt Device</i>
<i>Remote Run Inhibit From Remote Computer</i>
<i>Remote Run Inhibit From External Source</i>
<i>Remote Run Inhibit From Tracer</i>
<i>Run Inhibit From DCM</i>
<i>Heat Sink Temperature Start Inhibit</i>
<i>Diagnostic Shutdown Stop</i>
<i>Diagnostic Shutdown Auto</i>
<i>Auto</i>
<i>Waiting For Evaporator Water Flow</i>
<i>Auto</i>
<i>Waiting For A Need To Cool</i>
<i>Auto</i>
<i>Waiting For A Need To Heat</i>
<i>Waiting For Tracer Communications To Establish Operating Status</i>
<i>Starting Is Inhibited By Staggered Start</i>
<i>Time Remaining: MIN:SEC</i>
<i>Transitioning To Free Cooling</i>
<i>Waiting For Cond Water Flow</i>
<i>Opening Free Cooling Valves</i>
<i>Cond Water Is Flowing</i>
<i>Closing Free Cooling Valves</i>
<i>Unit Running; Last Mode Free Cooling Limit</i>
<i>Time Remaining To End Of Limit: MIN:SEC</i>
<i>Transitioning To Free Cooling</i>
<i>Waiting For IGV Positioning To Complete</i>
<i>Unit Is Free Cooling</i>
<i>Starting Is Inhibited By Restart</i>
<i>Inhibit Timer: Time Remaining MIN:SEC</i>
<i>Establishing Cond Water Flow</i>
<i>Establishing Oil Pressure</i>
<i>Establishing Cond Water Flow</i>
<i>PreLubrication Time: MIN:SEC</i>
<i>Cond Water Is Flowing</i>
<i>Establishing Oil Pressure</i>
<i>Starting</i>
<i>Unit Is Running</i>

Unit Is Running
Capacity Limited By High Current
Unit Is Running
Capacity Limited By Phase Unbalance
Unit Is Running
Capacity Limited By High Cond Press
Unit Is Running
Capacity Limited By Low Evap Temp
Unit Is Running; Capacity Limited By
Vane Open Travel Stop
Unit is Running; Minimum Capacity
Due To Vane Closed Travel Stop
Unit Is Running In Surge Condition
Unit Is Running; Capacity Limited By
Pulldown Rate Based Soft Loading
Unit Is Running; Capacity Limited By
Current Based Soft Loading
Unit Is Running; Hot Water Control
Unit Is Running; Hot Water Control
Capacity Limited By High Current
Unit Is Running; Hot Water Control
Capacity Limited By Phase Unbalance
Unit Is Running; Hot Water Control
Capacity Limited By High Cond Press
Unit Is Running; Hot Water Control
Capacity Limited By Low Evap Temp
Unit Is Running; Hot Water Control
At Vane Open Travel Stop
Unit is Running; Hot Water Control
At Vane Closed Travel Stop
Unit Is Running; Hot Water Control
In Surge Condition
Unit Is Running; Hot Water Control
Pulldown Rate Based Soft Loading
Unit Is Running; Hot Water Control
Current Based Soft Loading
Unit Is Running; Base Loaded
Unit is Running; Base Loaded
Capacity Limited By High Current
Unit is Running; Base Loaded
Capacity Limited By Phase Unbalance
Unit Is Running; Base Loaded
Capacity Limited By High Cond Press
Unit Is Running; Base Loaded
Capacity Limited By Low Evap Temp
Unit Is Running; Base Loaded
At Vane Open Travel Stop
Unit is Running; Base Loaded
At Vane Closed Travel Stop
Unit Is Running; Base Loaded
In Surge Condition
Unit Is Running; Base Loaded
Pulldown Rate Based Soft Loading
Unit Is Running; Base Loaded
Current Based Soft Loading
Unit Is Running In Hot Gas Bypass
Unit Is Running In Minimum Capacity
Time Remaining: HR:MIN:SEC
Unit Is Preparing To Shutdown

### Chiller Operating Mode

The chiller operating modes display comes up first in the standard report:

[Operating mode line 1]
[Operating mode line 2]

Line 1 (and 2 if needed) indicates a current condition of the unit as shown in the preceding table (Table 1). In some cases, an associated timer or system parameter will be displayed that assures the transition to an expected mode is in progress, particularly during the unit start-up sequence.

### Active Chilled Water Setpoint/Evap Leaving Water Temp

Active Chilled Water Setpoint: xxx.x f/c
Evap Leaving Water Temp: xxx.x f/c

If the chiller is in the Ice Making or Ice Making Complete state, the following display is substituted for the above display:

Active Ice Termination Setpoint: xxx.x f/c
Evap Entering Water Temp: xxx.x f/c

If the chiller is in the hot water control state, the following display is substituted for the above display:

Active Hot Water Setpoint: xxx.x f/c
Cond Leaving Water Temp: xxx.x f/c

### Active Chilled Water Setpoint/Chilled Water Setpoint Source

Active Chilled Water Setpoint: xxx.x f/c
[settings source] CWS: xxx.x f/c

Settings source will be one of the following: Front Panel, Tracer, External Source, or Duplex Control.

### Active Ice Termination Setpoint/Ice Termination Setpoint Source

The following will be displayed only if the Ice Building Option is installed.

Active Ice Termination Setpoint: xxx.x f/c
[settings source] ITS: xxx.x f/c

Settings source will be one of the following: Front Panel or Tracer.

### Active Hot Wtr Setpoint/Hot Wtr Setpoint Source

The following will be displayed only if the Hot Water Control Option is Installed.

Active Hot Water Setpoint: xxx.x f/c
[settings source] HWS: xxx.x f/c

Settings source will be one of the following: Front Panel, Tracer, or External Source.

### Evaporator Entering and Leaving Water Temperatures

Evap Entering Water Temp: xxx.x f/c
Evap Leaving Water Temp: xxx.x f/c

### Cond Entering and Leaving Water Temps

Dashes will be displayed for condenser entering or leaving water temperature if the corresponding input is open or shorted.

Cond Entering Water Temp: xxx.x f/c
Cond Leaving Water Temp: xxx.x f/c

### Active Current Limit Setpoint

Active Current Limit Setpoint: xxx %
Press (Next) (Previous) To Continue

### Active Current Limit Setpoint/Current Limit Setpoint Source

Active Current Limit Setpoint: xxx %
[settings source] CLS: xxx %

Settings source will be one of the following: Front Panel, Tracer, External Source, or Ice Building.

### Evaporator Water Flow/ Condenser Water Flow

The following will be displayed only if the Differential Water Sensing Option is installed.

Approx Evaporator Water Flow: xxx.x gpm/lpm
Approx Condenser Water Flow: xxx.x gpm/lpm

The possible values for units are "gpm" or "lpm."

### Chiller Tons

The following will be displayed only if the Differential Water Sensing Option is installed.

Approximate Chiller Capacity: xxxx Tons/KW
Press (Next) (Previous) To Continue

The possible values for units are "Tons" or "KW."

### Outdoor Temperature

If the outdoor air temperature input is open or shorted and neither Outdoor Air Reset nor Low Ambient Lockout is enabled, display "-----" in place of "xxx.x F." Otherwise the temperature received from the chiller module is displayed.

Outdoor Air Temperature: xxx.x f/c
Press (Next) (Previous) To Continue

### Aux. Bundle or Heat Recovery Temps

The following will be displayed only if either the Heat Recovery Option or Aux Condenser Option is installed.

Aux/Heat Rcvy Ent Wtr Temp: xxx.x f/c
Aux/Heat Rcvy Lvg Wtr Temp: xxx.x f/c

### Chilled Water Setpoint Source

Chld Wtr Setpt Source: [settings source]
Reset Condition: [reset condition]

Settings source will be one of the following: Front Panel, Tracer, or External Source.

Reset condition will be one of the following: None, Outdoor Temp, or Return Wtr Temp.

## Current Limit Setpoint Source

Cur Lim Setpt Source: [settings source]
Press (Next) (Previous) To Continue

Settings source will be one of the following: Front Panel, Tracer, External Source, or Ice Building.

## Hot Water Setpoint Source

The following will be displayed only if Hot Water Control is Installed.

Hot Water Setpt Source: [settings source]
Press (Next) (Previous) To Continue

Settings source will be one of the following: Front Panel, Tracer, or External Source.

## Ice Termination Setpoint Source

The following will be displayed when/if remote computer is installed.

Ice Termn Setpt Source: [settings source]
Press (Next) (Previous) To Continue

Settings source will be one of the following: Front Panel or Tracer.

## Refrigerant Report

### Report Heading

Refrigerant Temp & Pressure Report
Press (Next) (Previous) To Continue

### Evaporator and Condenser Refrigerant Pressure

Evap Rfgt Pressure: xxx.x psig
Cond Rfgt Pressure: xxx.x psig

### Saturated Evap Temperature/Evap Refrigerant Pressure

Saturated Evap Temp: xxx.x f/c
Evap Rfgt Pressure: xxx.x psig

### Saturated Cond Temperature/Cond Refrigerant Press

Saturated Cond Temp: xxx.x f/c
Cond Rfgt Pressure: xxx.x psig

### Saturated Evap Temp. and Discharge Temp.

The Discharge Temp will be displayed only if the Discharge Sensor Option is installed.

Saturated Evap Rfgt Temp: xxx.x f/c
Compressor Discharge Temp: xxx.x f/c

### Purge Operating Mode/Purge Status

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Operating Mode:	[Mode]
Purge Status:	[Status]

Possible values of [Mode] are: Auto, Stop, On, or Adaptive.

Possible values of [Status] are:

<i>Idle</i>	<i>(Condensing Unit is Off)</i>
<i>Running</i>	<i>(Condensing Unit is On)</i>
<i>Pumpout</i>	<i>(Temperature Initiated pumpout)</i>
<i>Service Pumpout</i>	<i>(Pumpout initiated by service switch)</i>
<i>Running - Pumpout inhibited by low temp.</i>	<i>(Pumpout inhibited by low liquid temp)</i>
<i>Pumpout Maximum Rate Disabled</i>	<i>(Max. pumpout rate alarm disabled)</i>

### Purge Alarm Message

The following screen(s) is not displayed if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Alarm Msg: [Status]
[Help Message]

Possible values for [Status] are: No Diagnostics Present (the [Help Message] is: Press (Next) (Previous) To Continue) or Diagnostic Alarm (the [Help Message] is: Go to Diag. Menu for Description/Reset).

**Purge Suction Temp/Purge Liquid Temp.**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Suction Temp:	xxx.x f/c
Purge Liquid Temp:	xxx.x f/c

**Purge Pumpout Rate/Purge Max Pumpout Rate**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Pumpout Rate:	xxx.x Min/24Hrs
Purge Max Pumpout Rate:	xx.x Min/24Hrs

**Purge Total Pumpout Time/ Purge Total Run Time**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Total Pumpout Time:	xx,xxx.x Min
Purge Total Run Time:	xx,xxx.x Hrs

**Purge Adaptive Cycle Time w/Chlr On/ Time to Purge Remaining**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Adapt Cycle T w/Chlr On:	xxx.x Hrs
Time To Purge Remaining:	xxx.x Hrs

If the mode selected is not Adaptive, then the time in the bottom line is dashed out.

**Purge Adaptive Cycle Time w/Chlr Off/ Time to Purge Remaining**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Adapt Cycle T w/Chlr Off:	xxx.x Hrs
Time To Purge Remaining:	xxx.x Hrs

If the mode selected is not Adaptive, then the time in the bottom line is dashed out.

**Purge Service Log**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Service Log: Reset Log In Field Start_Up
Purge Pumpout Time: xxxxxxxx.x Pumpout Min

Service Log: Reset Log In Field Start_Up
Time Since Last Rst: xxxx Cal Days

**Pumpout Avg, Last 30 Days**

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

30 Day Purge Pumpout Avg:	xxx.x Min
Chiller Average Run Time:	xxx.x Hr/Day

30 Day Pumpout Avg,
Chiller Running: xxx.x Min

Last 5 Cycle Pumpout Avg, Interval From Shtdn To 3 Hrs After Shtdn:	xxx.x Min
---	-----------

30 Day Pumpout Avg, Interval From 3Hrs After Shtdn To Next Start:	xxx.x Min
---	-----------

## Refrigerant Monitor

The following item is displayed if the Analog Refrigerant Monitor option is installed.

Refrigerant Monitor: xxx.x PPM
Press (Next) (Previous) To Continue

The following items are displayed if the IPC Refrigerant Monitor option is installed.

The following screen is displayed if the refrigerant monitor scanner is installed:

Refrigerant Monitor Mode: [Mode]
Scanner Channel X XXXX PPM [Rfgt Type]

The following screen is displayed if the channel scanner is not installed:

Refrigerant Monitor Mode: [Mode]
XXXX PPM [Rfgt Type]

Possible values of Mode are: Warmup, Ready, Monitor Check, Trouble.

If the PPM is out of range low or high “-Err” and “++++” respectively are displayed. If the concentration has not been determined, or the refrigerant monitor is in “Monitor Check” mode, “-----” is displayed.

The following is displayed if the channel scanner option is installed.

Last Rfgt Conc	Chan1	Chan2	Chan3	Chan4
PPM [Rfgt Type]	XXXX	XXXX	XXXX	XXXX

If the PPM is out of range low or high “-Err” and “++++” respectively are displayed. If a channel is inactive, “-----” is displayed.

Refrigerant Monitor Case Temp: XXX.X F
Refrigerant Monitor Bench Temp: XXX.X F

The following is displayed if the IPC Refrigerant Monitor Auxiliary input option is installed.

Rfgt Mon Auxiliary Input: XX.X mA
Press (Next) (Previous) To Continue

## Approach Temperature

Evaporator Approach Temp: XXX.X F
Condenser Approach Temp: XXX.X F

# Compressor Report

The Compressor Report Group sequence is as follows.

## Report Heading

Compressor Hours, Starts & Amps
Press (Next) (Previous) To Continue

## Differential Oil Pressure, Oil Temperature

Differential Oil Pressure: xxx.x [units]
Oil Tank Temperature: xxx.x f/c

The possible value for [units] is "psid" or "kPa" dependent upon whether English or SI units are selected.

## Discharge Oil Pressure, Oil Tank Pressure

Discharge Oil Pressure:	xxx.x psig
Oil Tank Pressure:	xxx.x psig

## AF Compressor Speed Command

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator and Adaptive Speed Control Algorithm is Enabled.

AF Compressor Speed Command:	xx Hz
AF Compressor Speed Command:	xxxx RPM

Range of values is 2520 to 3600 rpm in increments of 1 rpm. Factory default is 3600 rpm.

## AF Boundary Pressure Coefficient/AF Press. Coefficient

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator and Adaptive Speed Control Algorithm is Enabled.

AF Boundary Press Coefficient:	x.xxx
AF Pressure Coefficient:	x.xxx

*Note: This is a Report only for Troubleshooting purposes.*

## AF Re-Optimization Timer Time Remaining

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator and Adaptive Speed Control Algorithm is Enabled.

AF Re-Optimization Time Remaining:xx:xxHrs
Press (Next) (Previous) to Continue

*Note: This is a Report only for Troubleshooting purposes.*

## Inlet Guide Vane Position

This screen does not appear if "Inlet Guide Vane Output" is set to "Pulsed."

Inlet Guide Vane Position xxx.x % Open
Inlet Guide Vane Position xx.x degrees

**Compressor Phase Currents % RLA**

Compressor Phase Currents - % RLA		
A xxxx.x %	B xxxx.x %	C xxxx.x %

**Compressor Line Currents Amps**

Compressor Phase Currents - Amps		
A xxxx amps	B xxxx amps	C xxxx amps

**Compressor Line Voltages**

Compressor Line Voltages		
AB xxxx v	BC xxxx v	CA xxxx v

This data is displayed only if the line voltage sensing option is installed. if not installed, no screen is displayed.

**Compressor Power Factor and Watts**

The following is displayed only if the Line Voltage Sensing Option is Installed AND the starter type is Not "Adaptive Frequency" or AFD AND Compressor Power Source is Utility AND External KW is Not Installed.

Compressor Power Factor:	xx %
Compressor KiloWatts:	xxxx KW

**Compressor Winding Temperatures**

Compressor Winding Temperatures		
W1 xxx f/c	W2 xxx f/c	W3 xxx f/c

**Compressor Starts and Running Time**

The starts and hours counters are displayed as follows:

Compressor Starts: xxxxx
Compressor Running Time: HRS:MIN:SEC

**Bearing Temperatures #1 and #2**

The following will be displayed only if the Bearing Temp Sensors Option is Installed.

Bearing Temperature 1:	xxx.x f/c
Bearing Temperature 2:	xxx.x f/c

**Solid State Starter Heat Sink Temp.**

The following will be displayed only if the Solid State Starter is installed.

Solid State Starter Heat Sink: xxx.x f/c
Press (Next) (Previous) To Continue

**HGBP Time**

If HGBP is installed in the unit the following screen is displayed:

HGBP Time: HRS:MIN:SEC
Press (Next) (Previous) To Continue

## Operator Settings

---

### Settings Group Keys

The four settings Group Keys for CVHE/CVHF/ CVHG are as follows:

- Operator Settings** - non-password protected menu items that can be changed by the operator
- Service Settings** - menu items that should only be changed by a qualified service technician
- Service Tests** - activate outputs of Chiller (e.g. oil pump)
- Diagnostics** - abnormal operating conditions, informational warnings, automatic reset, and manual reset types and other information.

### Operator Settings Group Heading

**Important!** *FACTORY DEFAULT SETTINGS: Menu items that are programmable using the keypad may have a selectable choice that is listed as Factory Default. This Factory Default setting is the software default that is initially factory-programmed for a new module assembly and may NOT be the correct setting for a specific operating chiller. Always review all settings when any module is replaced to verify that the settings agree with the desired settings that were selected at initial startup or programmed at the factory.*

The Operator Settings Group sequence follows.

Chilled Water & Current Limit Setpts
Press (Next) (Previous) To Continue

If the Menu Settings Password feature is Enabled in the Service Setup Group following each setting group heading the following is displayed:

Settings In This Menu Are [status]
[password message]

Likewise, if the Menu Settings Password is Disabled in the Service Setup Group, the above screen will not appear.

The possible values for status are "Locked" or "Unlocked". If the password status is locked, the password message will be "Enter Password to Unlock". The user will then depress (-)(+)(-)(+)(-)(+) followed by the <Enter> key. The password keystrokes will be echoed to the screen as a visual aide. The last six keystrokes represent the current password, and up to twenty keystrokes can be entered. An incorrect password, or the twenty-first keystroke will result in the password message "Invalid Password".

If the password status is unlocked, the password message will be "Press (Enter) to Lock". Pressing <Enter> locks the settings in ALL the menus. If the password is entered to unlock the settings, this unlocks the settings in ALL menus.

Whenever a password is in use the "Press (+)(-) to change setting" message will be suppressed on setpoint screens. Any attempt to change the setting will result in the message "Setting is Locked". The password once entered will remain valid until canceled.

### Set Contrast - Applies to CCCLD Display Only.

Set Contrast: Press (√) to Save
Press (+)(-) to Change Setting

### Purge Operating Mode

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Operating Mode: [Mode]
Press (+)(-) to Change Setting

Possible values of [Mode] are: Stop, On, Auto (Factory Default) and Adaptive.

## Time Of Day Setting

Current Time/Date HH:MM xm Mon,XX XXXX
(Enter) to Change : (Next) to Continue

The top level "CurrentTime/Date" will be displayed when this screen is first selected. Pressing the <Next> or <Previous> key will go to the next or previous screen as usual.

If the <Enter> key is selected, five separate screens can be displayed with which the time may be set. The "Current Time/Date" will be displayed on line one of each of these screens. Each of these screens will change one element of the current time/date. The second line of each screen will indicate which element of the current time/date is being changed.

If the first time changing screen is being displayed and the <Previous> key is pressed, the top level "Current Time/Date" screen will be displayed and the <Enter> key will have to be selected to re-enter the time changing screens. If the fifth time changing screen is being displayed and the <Next> key is pressed, the next screen will be displayed. If <Previous> is selected at this point, the top level "Current Time/Date" screen will be displayed and the <Enter> key will have to be selected to re-enter the time changing screens

To change an element of the current time/date, select <Enter> from the top level "Current Time/Date" screen to enter the time changing screens. Hit <Next> or <Previous> to get to the proper screen. Press the <+> <-> keys to change the element to it's proper value and press the <Enter> key to store the new time/date. A message "Updating Chiller Clock, Please Wait" is displayed for two seconds after the <Enter> key is pressed.

The five time changing screens are as follows:

Current Time/Date HH:MM xm Mon XX,XXXX
To Change Hour, Press (+) (-) & (Enter)

Current Time/Date HH:MM xm Mon XX,XXXX
To Change Minute, Press (+) (-) & (Enter)

Current Time/Date HH:MM xm Mon XX,XXXX
To Change Month, Press (+) (-) & (Enter)

Current Time/Date HH:MM xm Mon XX,XXXX
To Change Day, Press (+) (-) & (Enter)

Current Time/Date HH:MM xm Mon XX,XXXX
To Change Year, Press (+) (-) & (Enter)

## Front Panel Chilled Water Setpoint

Front Panel Chilled Wtr Setpt:xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 0 to 65°F (-17.8 to 18.3°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 44.0°F (6.7°C).

As shown above, the second line of a setting display normally says:

### "Press (+)(-) to Change Setting"

However, the following is displayed as the second line of the display if an attempt is made to increment the setpoint above the end of the setpoint range:

### "Top of Range, Press (-) to Change"

The following is displayed as the second line of the display if an attempt is made to decrement the display below the end of the setpoint range:

### "Bottom of Range, Press (+) to Change"

The following is displayed as the second line of the display if a key other than <+>, <->, <Enter>, or <Cancel> is pressed after <+> or <-> is pressed:

### "Press (+)(-)(Enter)(Cancel) to Advance"

The exception to the above message is when the <Stop> key is pressed. <Stop> is always active.

Other messages are displayed on the second line of the display for special cases as noted below in association with the affected setpoint display.

When the Front Panel Chilled Water Setpoint is within 1.7°F of the Leaving Water Temperature Cutout Setpoint, the second line of this display will read:

**“Limited by Cutout Setpt, (+) to Change”**

### Front Panel Hot Water Setpoint

The Front Panel Hot Water Setpoint is only displayed when the Hot water option is Installed.

Front Panel Hot Wtr Setpt: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 85 to 140°F (37.8 to 60.0°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 130°F (54.4°C).

### Front Panel Current Limit Setpoint

Front Panel Current Limit Stpt: xxx %
Press (+) (-) to Change Setting

Range of values is 40 to 100% in increments of 1 %. Factory Default is 100%.

### Print Report

This screen is shown only when the Printer Option is Installed.

Press (Enter) to Print Report
Press (Next) (Previous) To Continue

When <Enter> is pushed, a 2 second message appears as shown below and then returns to the above screen.

The Print Command is Being Sent to the Printer
--

### Control Type

The following will be displayed only if the Hot Water Control Option is Installed.

Control Type is: [control]
Press (+) (-) to Change Setting

Possible values of [control] are: Chilled Water (Factory Default), Hot Water, and Ext. Hot/Chilled Wtr Input.

### Free Cooling

The free cooling enable screen is displayed only if the free cooling option is installed.

Free Cooling: [Status]
Press (+) (-) to Change Setting

Possible values are: Disable (Factory Default) and Enable.

### Chilled Water Reset Type

Chilled Water Reset Type: [type]
Press (+) (-) to Change Setting

The possible values for [type] are: Disable (Factory Default), Return, Constant Return, and Outdoor Air.

If either Disable or Constant Return are selected, the remaining chilled water reset displays are skipped by the CLD. If either Return or Outdoor Air are selected, the first word of the remaining chilled water reset displays will be the type of reset.

#### Help Notes:

- 1 When CWR is enabled, the UCM will step to CWS at a rate of 1°F every five minutes.
- 2 Constant Return is a short version of Return CWR; it will reset the leaving chilled water setpoint to provide a constant entering water temperature. The reset ratio defaults to 100%, start rest point to design delta T and max reset setpoint to design.
- 3 Chilled water is reset based on either return water temperature or outdoor air temperature.
- 4 This screen does not appear when the chiller is under Duplex Control and it is Compressor B.

## Reset Ratio

This is the aggressive value. A higher number is a quicker response.

[type] Reset Ratio: xxx %
Press (+) (-) to Change Setting

The values for Reset Ratio for each of the reset types are:

Reset Type	Reset Ratio Range	Increment (Eng. units)	Increment (SI)	Default Value
Return	10 to 120%	1%	1%	50%
Outdoor	80 to -80%	1%	1%	10%

## Start Reset Setpoint

This is the Delta T the unit is trying to maintain.

[type] Start Reset Setpoint: xxx.x F
Press (+) (-) to Change Setting

The values for Start Reset for each of the reset types are:

Reset Type	Start Reset Range	Increment (Eng. units)	Increment (SI)	Default Value
Return	4 to 30°F (2.2 to 16.7°C)	1°F	1°C	10°F (5.6°C)
Outdoor	50 to 130°F (10 to 54.4°C)	1°F	1°C	90°F (32.2°C)

## Maximum Reset Setpoint

Controllable Maximum Reset value. Allows a reset "Up" of this value. The chilled water is maintained between the leaving chilled water setpoint and the new reset value.

[type] Max Reset Setpoint: xxx.x F
Press (+) (-) to Change Setting

The values for Maximum Reset for each of the reset types are:

Reset Type	Maximum Reset Range	Increment (Eng. units)	Increment (SI)	Default Value
Return	0 to 20°F (0.1 to 11.1°C)	1°F	1°C	5°F (2.8°C)
Outdoor	0 to 20°F (0.1 to 11.1°C)	1°F	1°C	5°F (2.8°C)

## Ice Building Enable

The following will be displayed only if the ice building option is installed.

Ice Building: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable.

## Front Panel Ice Termination Setpoint

The following will be displayed only if ice building option is installed.

Panel Ice Termination Setpoint: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 20.0 to 32.0°F (-6.7 to 0.0°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 27.0°F (-2.8°C).

## Ice Making To Normal Cooling Transition Timer

The following will be displayed only if the ice building option is installed. This allows for a timed idle/stop period for (X) minutes when coming out of ice before going into the cooling mode (timed by Chiller).

Ice-To-Normal Cooling Timer: xx min
Press (+) (-) to Change Setting

Range of values is 0 to 10 min. Factory Default is 5 min.

### Chilled Water Setpoint Source

If the Tracer Option is installed, the word "Default" will appear in front of the setpoint source.

[Default] Chilled Water Setpoint Source:
[source]

Possible values of [source] are: Front Panel (Factory Default) and External Source (This choice shows up only if the External Chilled Water Setpoint is Installed at the Machine Configuration menu.).

*Note: There is a Tracer installed screen in the Machine configuration menu. If Tracer does not choose to write a setpoint then the "default" setpoint source is used, e.g. Front Panel.*

### Current Limit Setpoint Source

If the Tracer Option is installed, the word "Default" will appear in front of the setpoint source.

[Default] Current Limit Setpoint Source:
[source]

Possible values of [source] are: Front Panel (Factory Default), and External Source. (This choice shows up only if the External Current Limit Setpoint is Installed at the Machine Configuration menu.)

*Note: There is a Tracer installed screen in the Machine configuration menu. If Tracer does not choose to write a setpoint then the "default" setpoint source is used, e.g. Front Panel.*

### Hot Water Setpoint Source

If the Tracer Option is installed, the word "Default" will appear in front of the setpoint source.

[Default] Hot Water Setpoint Source:
[source]

Possible values of [source] are: Front Panel (Factory Default) and External Source (This choice shows up only if the External Hot Water Setpoint is Installed at the Machine Configuration menu.)

*Note: There is a Tracer installed screen in the Machine configuration menu. If Tracer does not choose to write a setpoint then the "default" setpoint source is used, e.g. Front Panel.*

### Ice Termination Setpoint Source

The following will be displayed only if the Ice Building Option is installed.

If the Tracer Option is installed, the word "Default" will appear in front of the setpoint source.

[Default] Ice Termination Setpoint Source:
[source]

Possible values of [source] are: Front Panel (Factory Default).

*Note: There is a Tracer installed screen in the Machine configuration menu. If Tracer does not choose to write a setpoint then the "default" setpoint source is used, e.g. Front Panel.*

### Outdoor Air Temperature Source

If the Tracer is installed the Tracer Outdoor Air Temp. is both used and displayed. If no Tracer is installed the chiller module outdoor air temperature sensor is used. If no sensor is installed, dashes are displayed on the display of Outdoor Air Temperature.

### Setpoint Source Override

Setpoint Source Override:
[source]

Possible values of [source] are: "None" (Factory Default), "Use Front Panel Setpoints", "Override Tracer, and Use Default Setpoints" (Available only if Tracer Option installed).

## Service Settings (Non Password Protected Service Settings Group)

**Important! FACTORY DEFAULT SETTINGS:** Menu items that are programmable using the keypad may have a selectable choice that is listed as *Factory Default*. This *Factory Default* setting is the software default that is initially factory-programmed for a new module assembly and may NOT be the correct setting for a specific operating chiller. Always review all settings when any module is replaced to verify that the settings agree with the desired settings that were selected at initial startup or programmed at the factory.

The Service settings menu has three distinct grouping of items within it. The first group is the non-password protected group that consists of all of the settings, feature enables, setpoints etc., that are benign; while they are unlikely to be changed often by a user or operator, changes in them do not seriously effect the standard protection or reliability of the chiller.

The other two groupings are protected, each with a separate password. These two groups are for changing parameters and settings regarding field commissioning and fundamental protection and control of the chiller subsystems (Field Startup) or for programming of the UCM as to how the specific chiller was built in the Factory (Machine Configuration). Once properly set, the items in these protected menus should never be changed again without specific knowledge of the effects of the changes. In rare instances, certain field problems may be corrected by making changes in these protected menus but certain aspects of chiller reliability may be compromised. The main reason these are accessible at all, is for field commissioning and to allow for the field programming of service replacement UCMs.

Two additional password protected menus are available in the Service Settings group if the IPC Refrigerant Monitor is installed. The Refrigerant Monitor Settings Group and the Refrigerant Monitor Calibration Group are used to configure the IPC Refrigerant Monitor.

### Service Setting Group Heading

Service Settings: Basic Setups
Press (Next) (Previous) To Continue

### Menu Settings Password

If the Menu Settings Password is Enabled in the Service Setup Group, following each setting group heading the following will be displayed:

Settings In This Menu Are [status]
[password message]

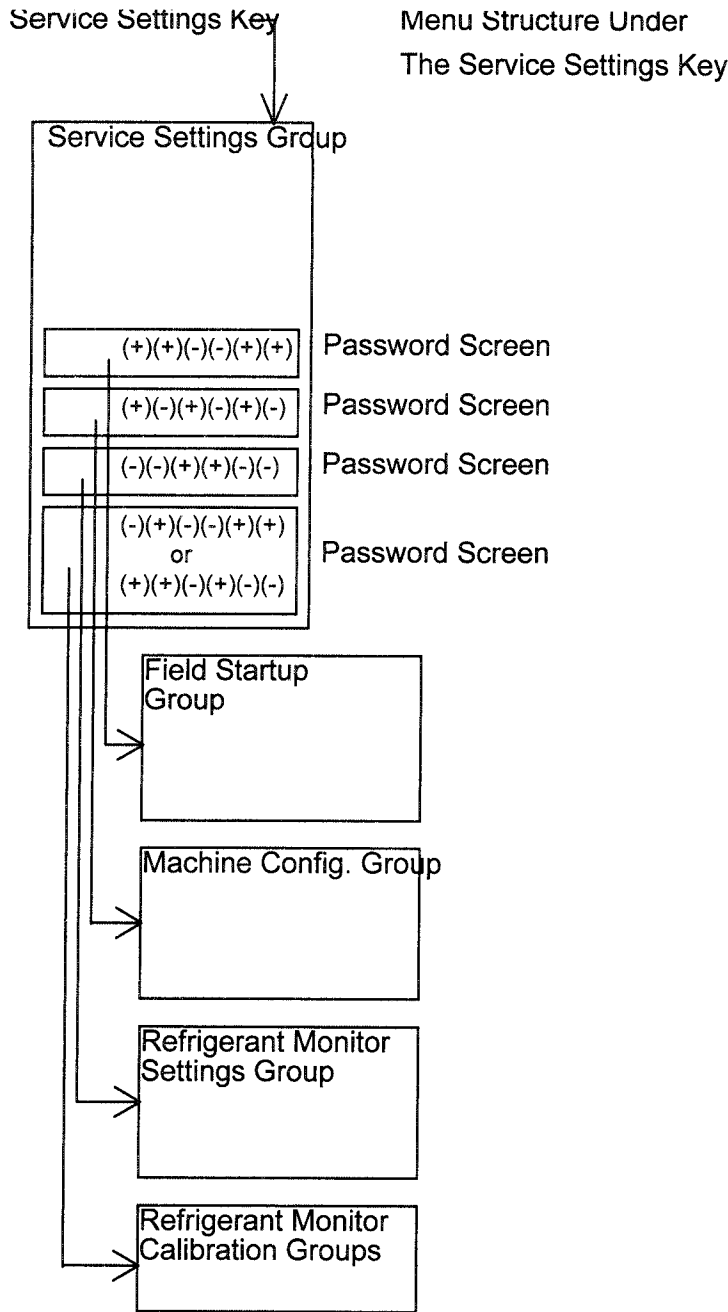
Likewise, if the Menu Settings Password is Disabled in the Service Setup Group, the above screen will not appear.

The possible values for status are "Locked" or "Unlocked". If the password status is locked, the password message will be "Enter Password to Unlock". The user will then depress (-)(+)(-)(+)(-)(+) followed by the <Enter> key. The password keystrokes will be echoed to the screen as a visual aide. The last six keystrokes represent the current password, and up to twenty keystrokes can be entered. An incorrect password, or the twenty-first keystroke will result in the password message "Invalid Password".

If the password status is unlocked, the password message will be "Press (Enter) to Lock". Pressing <Enter> will lock all of the setpoint menus. Likewise, if the password status is locked and the correct password is entered, all of the setpoint menus will be unlocked.

Whenever a password is in use the "Press (+)(-) to change setting" message will be suppressed on all setpoint screens. Any attempt to change a setpoint will result in the message "Setting is Locked" being displayed for 1 second. The password once entered will remain valid until canceled.

Figure 3



### Keypad/Display Lockout

This display only appears if the keypad lockout feature is enabled.

If the <Enter> key is pressed to lock the keypad, the following message is displayed, and all further input from the keypad is ignored, including the <Stop> key, until the password is entered. The password consists

Press (Enter) to Lock Display & Keypad
Password will be required to Unlock

of pressing the <Previous> and <Enter> keys at the same time.

*****DISPLAY AND KEYPAD ARE LOCKED*****
*****ENTER PASSWORD TO UNLOCK*****

If the keypad is locked and the password is entered, the display will go to the Chiller Operating Mode display of the Chiller Report.

## Language Setting

Language: xxxxxxxxx
Press (+) (-) to Change Setting

Possible Language Selections for the CLD are: English (Factory Default), Francais, Deutsche, Espanol, Nippon (also known as Katakana (uses Japanese Characters), Italian, Nederland, and CODED. Possible Language Selections for the CCCLD are: English (Factory Default), Traditional Chinese, Simplified Chinese, Korean, Thai, and Japanese.

## Display Units

Display Units: [Type]
Press (+) (-) to Change Setting

Possible values of [Type] are: English (Factory Default) and SI.

## Decimal Places Displayed Setpoint

Decimal Places Displayed: [Status]
Press (+) (-) to Change Setting

The choices for Status are: XXX.X (Factory Default) and XXX.

## Display Menu Headings Enable

Display Menu Headings: [d/e]
Press (+) (-) to Change Setting

The Factory Default value is Enabled. If disabled the Menu Headings in each Menu or Group do not appear.

## Clear Custom Menu

Press (Enter) To
Clear The Custom Menu

When <Enter> is pushed a 2 second message appears as shown below and then returns to above screen.

Custom Menu Has Been Cleared
------------------------------

## Differential to Start Setpoint

Differential to Start Setpoint: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 1 to 10°F (0.5 to 5.5°C) in increments of 1 or 0.1°F or C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 5°F (2.8°C).

## Differential to Stop Setpoint

Differential to Stop Setpoint: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 1 to 10°F (0.5 to 5.5°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 5°F (2.8°C).

## Evap/Cond Pump Off Delay Time

Evap Pump Off Delay:	xxx Min
Press (+) (-) to Change Setting	

Range of values is 0 to 30 minutes in increments of 1 Minute. Factory Default is 1 Minute.

If the current running mode is hot water control state the following display is substituted for the above display:

Cond Pump Off Delay:	xxx Min
Press (+) (-) to Change Setting	

## Printer Setups

This screen is shown only when the Printer Option is Installed.

Printer Setups
(Enter) to Change : (Next) to Continue

If <Next> is pressed the following printer setup screens are skipped. If <Enter> is pressed the following screens are displayed to permit modification of the printer setups.

Print on Time Interval:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: Enable (Factory Default) and Disable.

Print Time Interval:	xxx Hours
Press (+) (-) to Change Setting	

Range of values is 1 to 24 Hours in increments of 1 Hour. Factory Default is 8 Hours.

Print on Diagnostic:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: Enable (Factory Default) and Disable.

### Help Note:

This will print every time a diagnostic happens.

Number of Pre-Diag Reports:	xx
Press (+) (-) to Change Setting	

Range of values is 1 to 5 in increments of 1. Factory Default is 5.

Diagnostic Report Interval:	xx sec
Press (+) (-) to Change Setting	

Range of values is 2 to 120 seconds in increments of 1 second. Factory Default is 5 seconds.

Printer, Baud Rate:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: 300, 1200, 2400, 4800, 9600 (Factory Default), and 19,200.

Printer, Parity:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: None (Factory Default), Odd, and Even.

Printer, Data Bits:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: 8 (Factory Default) and 7.

Printer, Stop Bits:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: 1 (Factory Default) and 2.

Printer Handshaking:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: XON/XOFF (Factory Default), DTR, RTS, and None.

## Clear Restart Inhibit Timer

Press (Enter) to
Clear the Restart Inhibit Timer

When <Enter> is pushed, a 2 second message appears as shown below and then returns to above screen.

Restart Inhibit Timer Has Been Cleared
--

## Field Start-up

**Important! FACTORY DEFAULT SETTINGS:** Menu items that are programmable using the keypad may have a selectable choice that is listed as Factory Default. This Factory Default setting is the software default that is initially factory-programmed for a new module assembly and may NOT be the correct setting for a specific operating chiller. Always review all settings when any module is replaced to verify that the settings agree with the desired settings that were selected at initial startup or programmed at the factory.

### Field Startup

The Field Startup Group password is + + - - + + <Enter>. The Field Startup Group contains items that are primarily associated with Field Commissioning of the chiller as well as the fundamental control and protection of the chiller subsystems. If the field startup password is entered, the display goes to the menu defined below. If a key is not pressed every 10 minutes in this password protected menu, the display returns to the Chiller Operating Mode display of the Chiller Report, and the password must be entered again to return to this menu.

### Field Start-up Group Heading

Field Start-up Group Settings
Press (Next) (Previous) To Continue

This header appears when the headers do not appear in the Service Settings menu.

### Keypad/Display Lock Feature Enable

This feature permits the entire Keypad and Display to be locked out. A message appears on the screen to describe this condition. No access is permitted to either the Report screens or the Setting Screens when this feature is both Enabled here and Locked at the Service Settings Menu. It is important to note that

in this condition, both the <Stop> and <Auto> keys do not function.

Keypad/Display Lock Feature: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable.

When the keypad lock feature is Disabled, the keypad lock display does not appear in the non-password protected area of the Service Settings menu and the Keypad/Display cannot be locked. When the keypad/display lock feature is Enabled, the keypad lock display does appear in the Service Settings menu so the keypad can be locked.

### Menu Settings Password Enable

The Menu Settings Password permits the Settings in each of the menus to be password protected. All Report Menus and Setting Menus can still be viewed at any time if this feature is either Enabled or Disabled; the <Stop> and <Auto> keys also remain active. If this feature is Enabled, then all Menu Settings are password protected.

Menu Settings Password Feature: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable.

When the feature is Disabled, the Menu Setting Password display does not appear at the top of each of the Settings Menus and the Menu Settings cannot be password protected. When the Menu Setting Password feature is Enabled, the Menu Settings Password display appears just below each of the Settings Menu Headers so the settings can be changed if the proper password is entered.

## ICS Address

ICS Address:	xx
Press (+) (-) to Change Setting	

Range of values is 1 to 127 in increments of 1.  
Factory Default is 65.

## Power Up Start Delay Time

### Help Note:

Used primarily for scheduling multiple units or to minimize current inrush.

Power Up Start Delay Time: xxx sec
Press (+) (-) to Change Setting

Range of values is 0 to 600 seconds in increments of 1. Factory Default is 0 sec.

## Design Delta Temperature Setpoint

Design Delta Temp Setpoint: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 4 to 30°F (2.2 to 16.7°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 10°F (5.5°C).

## Leaving Water Temperature Cutout Setpoint

Lvg Wtr Temp Cutout Setpoint: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is -10 to 36°F (-23.3 to 2.2°C) in increments of 1 or 0.1 °F or °C depending on the Service Setup Screen xxx or xxx.x. The Factory Default is 36.0°F (2.2°C).

When this setpoint is within 1.7°F of the Front Panel Chilled Water Setpoint, the Front Panel Chilled Water Setpoint is increased along with this setpoint to maintain the differential. A message will be displayed for 2 seconds to indicate that the FPCW setpoint has been increased.

When this setpoint is adjusted below 35.3°F the following is displayed on the second line:

"Warning: Adequate Antifreeze Required".
--

## Low Refrigerant Temperature Cutout Setpoint

Low Rfgt Temp Cutout Setpt: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is -35 to 36°F (-37.2 to 2.2°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. The Factory Default is 32.0°F (0.0°C).

## Low Evaporator Water Flow Warning Setpoint

The following will be displayed only if the Differential Water Sensing Option is installed.

Low Evap Flow Warning: xx.x gpm/ton
Press (+) (-) to Change Setting

Range of values is 0.0 to 4.0 gpm/ton (0.0 to 15.1 lpm/ton) in increments of 0.1. Factory Default is 1.2 gpm/ton (4.5 lpm/ton).

## Condenser Limit Setpoint

### Help Note:

This limits load by vane closure.

Condenser Limit Setpoint: xx % HPC
Press (+) (-) to Change Setting

Range of values is 80 to 120% in increments of 1%. Factory Default is 93%.

## Maximum Restart Inhibit (RI) Timer Setting

Maximum RI Timer: xxx Minutes
Press (+) (-) to Change Setting

The Range of values is 30 to 60 Minutes in increments of 1 Minute. Factory Default is 60 Minutes.

### Purge Control/Type

Purge Control/Type: [Type]
Press (+) (-) to Change Setting

Possible values of [Type] are: Micro Purge (Factory Default) and Stand-Alone Purge.

### Purge Service Log Reset

The following screen(s) shall be suppressed if the selected Purge Control/Type is "Stand-Alone Purge".

Service Log: Press (Enter) to Reset
Purge Pumpout Time: xxxxxxxx.x Pumpout Min

Service Log: Press (Enter) to Reset
Time Since Last Reset: xxxxx Cal Days

Note: Resetting in either screen above will reset both fields of data to Zero.

### Purge Maximum Pumpout Rate

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Max Pumpout Rate: xx Min/24 Hrs
Press (+) (-) to Change Setting

Range of values is 1 to 100 Minutes/24 Hrs in increments of 1 Minute/24 Hrs. Factory Default is 20 Minutes/24 Hrs.

### Purge Service Excessive Pumpout Override Timer

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Disable Pumpout Alarm for: xx Hrs
Press (+) (-) to Change Setting

Range of values is 1 to 72 Hours in increments of 1 Hour. Factory Default is 0 Hours.

### Purge Low Chiller Sat. Cond. Liquid Temp. Protection Enable

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Purge Low Liquid Temp Inhibit: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable.

### Purge Low Chiller Sat. Cond. Temp Setpoint

The following screen(s) does not appear if the selected Purge Control/Type is "Stand-Alone Purge."

Prg Low Liquid Temp Inhibit Setpt xx.x f/c
Press (+) (-) to Change Setting

Range of values is 32 to 50°F(0.0 to 10.0°C) in increments of 1 or 0.1°F or°C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 40°F (4.4°C).

### Surge Protection Enable

Help Note:  
This detects gas surge as een through current.

Surge Protection: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable and Enable (Factory Default). Surge protection is based on motor current fluctuation.

## Under/Over Voltage Protection Enable

This screen does not appear if the Line Voltage Sensing Option is not installed or Compressor Power Source is Engine/Generator.

Line voltage above + 10% of nominal. (Must hold = + 10 % of nominal. Must trip = + 15 % of nominal. Reset differential = min. of 2% and max. of 4%. Time to trip = minimum of 1 min. 10 sec. and maximum of 5 min. 20 seconds).

Under/Over Voltage Protection: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable.

### Help Note:

*Holds at ±10% of nominal voltage. Trips at ±15% nominal voltage. Trips in 60 seconds at ±12% nominal. The trip timer resets at ±9% nominal (ie. if you are in the 12%-60 second trip window and the voltage drops to +9% from +12%, the trip timer resets.)*

*Note: Under/Over Voltage Protection is activated only if Under/Over Voltage Protection is enabled and Line Voltage Sensing Option is Installed.*

## Phase Reversal Protection Enable

This screen does not appear if the starter type is "Adaptive Frequency" or "AFDB."

Phase Reversal Protection: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable and Enable (Factory Default).

A phase reversal is detected on the incoming current. On a compressor startup, the phase reversal logic must detect and trip in 0.7 seconds.

### Help Note:

*Rotation must be clockwise (ABC) from the thrustbearing end.*

## Phase Unbalance Limit Enable

Phase Unbalance Limit: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable and Enable (Factory Default).

The RLA of the motor is derated by resetting the active current limit. The trip point is a 30% phase unbalance for 90 seconds.

## Momentary Power Loss (MPL) Protection Enable

This screen does not appear if the starter type is "Adaptive Frequency" or "AFDB." or Compressor Power Source is Engine/Generator.

Momentary Power Loss Protection: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable and Enable (Factory Default).

For MPL, on every power down, the reset inhibit timer is reset to 30 seconds if the motor temperature is <165°F and 15 minutes if the motor temperature is > or = to 165°F.

## Enhanced Oil Temp. Protection

This screen does not appear if the starter type is "Adaptive Frequency" or "AFDB."

When enhanced oil protection is enabled, the oil heater relay is energized at 140.5°F (60.3°C) and de-energized at 145.5°F (63.1°C). The low oil temperature cutout "setpoint" is equal to the saturated evaporator refrigerant temperature plus 30°F (16.6°C) or 100 °F (37.8°C) which ever is larger."

Enhanced Oil Temp Protection: [option]
Press (+) (-) to Change Setting

Possible options are: Disable and Enable (Factory Default).

### Help Note:

*Enhanced oil protection **must** be enabled for all refrigerant pump units to sense the "Low Oil Temperature Running" diagnostics.*

### Oil Temp Setpoint

This screen does not appear when Enhanced Oil Temperature Protection is enabled.

Oil Temp SetPoint: xxx.x f/c
Press (+) (-) to Change Setting

The range of values is 100°F to 160°F (37.8 to 71.1°C) in increments of 1 or 0.1°F or °C, depending on the Service Setup Screen xxx or xxx.x. Factory Default is 143°F (61.9°C).

### Low Oil Temp Cutout

This screen does not appear when Enhanced Oil Temperature Protection is enabled.

Low Oil Temp Cutout: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 80 to 140°F (26.7 to 60.0°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 95°F (35.0°C).

### Low Oil Temp Start Inhibit Differential

This screen only appears when Enhanced Oil Temperature Protection is enabled.

Low Oil Temp Start Inhibit Diff: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 20 to 30°F (11.1 to 16.7°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 27.5°F (15.3°C).

### High Discharge Temp Cutout

This screen is displayed only if the Discharge Sensor Option is installed.

High Discharge Temp Cutout: xxx.x f/c
Press (+) (-) to Change Setting

Range of values is 170 to 220°F (76.6 to 104.4°C) in increments of 1 or 0.1°F or °C depending on the Service Setup Screen xxx or xxx.x. Factory Default is 200°F (93.3°C).

### External Base Loading Enable

External Base Loading: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable.

### Soft Load Control Enable

Soft Load Control: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable.

### Soft Load Starting Current Limit

Soft Load Starting Current Limit: xx %
Press (+) (-) to Change Setting

Range of values is 40 to 100% in increments of 1%. Factory Default is 100%.

*Help Note:*

*The unit will start using the set number, i.e. 60% and SLOWLY ramp up to 100%.*

### Soft Load Current Limit Rate Of Change

Soft Load Current Limit Rate: x.x %/min
Press (+) (-) to Change Setting

Range of values is 0.5 to 5%/Min in increments of 1 or 0.1%/Min depending on the Service Setup Screen xxx or xxx.x. Factory Default is 5%/Min.

*Help Note:*

*This controls the soft load rate of change.*

## Soft Load Lvng Wtr Temp Rate of Change

Soft Load Lvng Water Rate: x.x f/c/min
--

Press (+) (-) to Change Setting
---------------------------------

Range of values is 0.5 to 5°F/Min (0.3 to 2.8°C/Min) in increments of 1 or 0.1°F/Min depending on the Service Setup Screen xxx or xxx.x. Factory Default is 5°F/Min (2.8°C/Min).

## Hot Gas Bypass Enable

This screen does not appear when the hot gas bypass option is not installed.

Hot Gas Bypass Control: [d/e]
-------------------------------

Press (+) (-) to Change Setting
---------------------------------

Possible values of [d/e] are: Disable (Factory Default) and Enable.

## HGBP Timer Enable

The following will be displayed only if HGBP is installed.

HGBP Timer: [Status]
----------------------

Press (+) (-) to Change Setting
---------------------------------

The choices for Status are: Enable (Factory Default) and Disable (Unlmted Time).

## Maximum HGBP Time

The following will be displayed only if HGBP is installed and the HGBP Timer is Enabled.

Maximum HGBP Time: xxx Min
----------------------------

Press (+) (-) to Change Setting
---------------------------------

Range of values is 1 to 480 minutes in increments of 1 Minute. Factory Default is 30 Minutes.

### Help Note:

Turns off the unit at the maximum time, i.e. 30 minutes

## HGBP Mode, Vane Target

This screen does not appear when the hot gas bypass option is not installed.

Hot Gas Bypass Mode IGV Target:xx %
-------------------------------------

Press (+) (-) to Change Setting
---------------------------------

Range of values is 0 to 30% in increments of 1%. Factory Default is 10%. This setting drives the IGVs to the target when HGBP is entered.

## LWT Control Proportional Gain (Kp) Setpt

LWT Proportional Gain: xxx.x %/F
----------------------------------

Factory Dflt is 10.0 %/F & 18.0 %/C
-------------------------------------

The range of valves is 0 to 100%/°F (0 to 180%/°C) in increments of 0.1.

### Help Note:

Looks at how far from setpoint and how fast we move the vanes. Higher number is faster.

## LWT Control Integral Gain (Ki) Setpt

LWT Integral Gain:x.xxx %/F
-----------------------------

Factory Dflt is 0.110 %/F & 0.198 %/C
---------------------------------------

The range of valves is 0 to 1%/°F (0 to 1.8%/°C) in increments of 0.001. The Factory Default is 0.110%/°F (0.198%/°C).

### Help Note:

Looks at error from setpoint, how long we have been away (Time) from setpoint. A higher number means the faster we converge on the setpoint, but may make the control oscillatory.

### LWT Control Derivative Gain (Kd) Setpt

LWT Derivative Gain: xx.x %/F
Factory Dflt is 00.0 %/F & 00.0 %/C

The range of valves is 0 to 10.0%/F (0 to 18.0%/C) in increments of 0.1. The Factory Default is 00.0%/F (00.0%/C).

*Help Note:*

*Rate of change. Higher number settles out an oscillating system.*

### IGV Maximum Travel Setpt

This screen is displayed only if "Inlet Guide Vane Output" is "Stepper Motor."

IGV Maximum Travel: xx,xxx Steps
Press (+) (-) to Change Setting

Range of values is 0 to 60,000 Steps in increments of 100 Steps. Factory Default is 50,000 Steps.

*Note: this is also known as the 90 degree vane setting. You must use the value determined at the factory. Each unit is unique and must be individually set. If the factory setting cannot be determined, it must be field-supplied by following the procedure in Trane CVHF-CSB-2B.*

### Guide Vane Closed Travel Stop

This screen is displayed only if "Inlet Guide Vane Output" is "Stepper Motor."

Guide Vane Closed Travel Stop: xx.x %
Press (+) (-) to Change Setting

Range of values is 0 to 100% in increments of 1%. Factory Default is 0%.

### AF Adjustable Speed Control Algorithm Enable

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Adaptive Speed Control Alg: d/e
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable and Enable (Factory Default).

### AF Leaving Water Standard Deviation

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Leaving Water Standard Deviation: x.x
Press (+) (-) to Change Setting

Range of values is 0.5 to 4.0 in increments of 0.1. Factory Default is 1.0.

### AF Pressure Coefficient Constant

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Pressure Coefficient Constant: xxxx
Press (+) (-) to Change Setting

Range of values is 0 to 2000 in increments of 1. Factory Default is 800.

*Note: The above value entered is  $1.316 \times 10^9 / (\# \text{ Stages} \times (\text{Impeller Dia}^2))$  all divided by 1000 for the purpose of display and IPC data transmission (e.g. the actual range is 0-2,000,000 in increments of 1000). In the chiller module it is multiplied by 1000 again so it is properly scaled.*

### AF Re-Optimization Factor

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Re-Optimization Factor: x.xx
Press (+) (-) to Change Setting

Range of values is 0.03 to 1.00 in increments of 0.01.  
Factory Default is 0.30.

### AF Re-Optimization Timer

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Re-Optimization Timer: xxx Hrs
Press (+) (-) to Change Setting

Range of values is 1 to 255 in increments of 1.  
Factory Default is 24.

### AF Boundary Pressure Coefficient Y Intercept

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Boundary PC Y-Intercept: x.xx
Press (+) (-) to Change Setting

Range of values is 0.01 to 2.00 in increments of 0.01.  
Factory Default is 0.40. This setpoint is settable from this screen but also changes as the Adjustable Frequency Control Algorithm runs. It is similar to a clock setting where you set it and then it runs from there.

### AF Boundary Pressure Coefficient Y Intercept Max

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Boundary PC Y-Intercept Maximum: x.xx
Press (+) (-) to Change Setting

Range of values is 0.01 to 2.00 in increments of 0.01.  
Factory Default is 2.00.

### AF Pressure Error Deadband

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Pressure Error Deadband: x.xxx
Press (+) (-) to Change Setting

Range of values is 0.001 to 1.000 in increments of 0.001. Factory Default is 0.030.

### AF Proportional Speed Gain

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Proportional Speed Gain:	xxx
Press (+) (-) to Change Setting	

Range of values is 1 to 100 in increments of 1. Factory Default is 50.

### Minimum Capacity Timer Enable

Min Capacity Timer:	[Status]
Press (+) (-) to Change Setting	

The choices for Status are: Enable (Factory Default) and Disable (Unlmted Time).

*Note: On Non-Adaptive Frequency chillers this Timer times out when the chiller is at minimum IGV position and the Leaving Water Temp is below the CWS. On Adaptive Frequency chillers this Timer times out when the chiller is at minimum IGV position or minimum AF speed and LWT < CWS.*

### Time Permitted at Minimum Capacity

The following will be displayed only if the Minimum Capacity Timer setpoint is Enabled.

Time Permitted at Min Cap:	xxx Min
Press (+) (-) to Change Setting	

Range of values is 1 to 480 minutes in increments of 1 Minute. Factory Default is 30 Minutes.

### Evaporator Flow Coefficient

The following is displayed only if the Differential Water Press Sensor Option is Installed.

Evap Flow Coefficient:	xxxx
Press (+) (-) to Change Setting	

Range of values is 0 to 3000 in increments of 5. Factory Default is 1000.

*Help Note:*

*Flow coefficients and flow exponents screens are factory-set and used only for differential water pressure sensing option.*

### Evaporator Flow Equation Exponent

The following is displayed only if the Differential Water Press Sensor Option is Installed.

Evap Flow Equation Exponent:	xxxx
Press (+) (-) to Change Setting	

Range of values is 0 to 1000 in increments of 1. Factory Default is 600.

*Note: The desired range for the above is 0.5000 to 0.6000. To put in this kind of range into the CLD, the fact that it does not start at zero represents a special case. To minimize special cases it is preferred that a multiplier of 10,000 and a offset of 5000 be used in the computer that generates the number.*

### Evaporator Fluid Coefficient

The following is displayed only if the Differential Water Press Sensor Option is Installed.

Evap Fluid Coefficient:	xxxx
Press (+) (-) to Change Setting	

Range of values is 0 to 1000 in increments of 1. Factory Default is 400.

*Note: The desired range for the above is 0.0000 to 0.1000. To put in this kind of range into the CLD, the fact that it does not start at zero represents a special case. To minimize special cases it is preferred that a multiplier of 10,000 be used in the computer that generates the number.*

### Condenser Flow Coefficient

The following is displayed only if the Differential Water Press Sensor Option is Installed.

Cond Flow Coefficient:	xxxx
Press (+) (-) to Change Setting	

Range of values is 0 to 2000 in increments of 5.  
Factory Default is 500.

### Condenser Flow Equation Exponent

The following is displayed only if the Differential Water Press Sensor Option is Installed.

Cond Flow Equation Exponent: xxxx
Press (+) (-) to Change Setting

Range of values is 0 to 1000 in increments of 1.  
Factory Default is 600.

#### Help Notes:

Flow coefficients and flow exponents screens are factory-set and used only for differential water pressure sensing option. The desired range for the above is 0.5000 to 0.6000. To put in this kind of range into the CLD, the fact that it does not start at zero represents a special case. To minimize special cases it is preferred that a multiplier of 10,000 and a offset of 5000 be used in the computer that generates the number.

### Local Atmospheric Pressure

Local Atmospheric Pressure: xx.x psia/kpa
Press (+) (-) to Change Setting

The range of settings is 10 to 16 psig in increments of 1 or 0.1 psig or kPa depending on the Service Setup Screen xxx or xxx.x. The Factory Default is 14.7 psig.

#### Help Note:

This is important for correct temperature to pressure conversion

### Refrigerant Pressure Analog Output Option

Rfght Pressure Output Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: % Cond (Factory Default) and Delta.

### Min Delta Pressure Calibration

The following is displayed only if the "Refrigerant Pressure Analog Output Option" is set to "Delta".

Min Delta Press Calib (2 VDC):XXXXPSID/kPa
Press (+) (-) to Change Setting

The range of values is 0-400 psid (0-2758 kPa) in increments of 1 psid/kPa. Factory Default is 0 psid (0 kPa).

Note: 6.8948 kPa = 1 psi.

### Max Delta Pressure Calibration

The following is displayed only if the "Refrigerant Pressure Analog Output Option" is set to "Delta".

Max Delta PressCalib (10 VDC):XXXXPSID/kPa
Press (+) (-) to Change Setting

The range of values is 1-400 psid (7-2758 kPa) in increments of 1 psid/kPa. Factory Default is 30 psid (207 kPa).

Note: 6.8948 kPa = 1 psi.

### IGV Stroke Time

The following is displayed only if the "Inlet Guide Vane Output" is set to "Pulsed".

Inlet Guide Vane Stroke Time: XXX Sec
Press (+) (-) to Change Setting

The range of values is 15 to 100 seconds in increments of 1 second. Default is 45 seconds.

### Low Differential Oil Pressure Cutout

This screen is displayed only if the "Oil Pressure Protection" is "Transducer".

Low Diff Oil Press Cutout: XX psid/kpa
Press (+) (-) to Change Setting

The range of values is 9 to 35 psid in increments of 1 psid. Default is 12 psid.

### Check Oil Filter Diagnostic

This screen is available only if differential oil pressure transducer(s) are installed.

Check Oil Filter Diagnostic: [setting]
Press (+) (-) to Change Setting

Possible values of [setting] are: Disable (Factory Default) and Enable.

### Check Oil Filter Setpoint

This screen is displayed only if differential oil pressure transducer(s) are installed and check oil filter diagnostic is enabled.

Check Oil Filter Setpt: [setting]
Press (+) (-) to Change Setting

Possible values of [setting] are: 9 to 60 psid in 1 psid increments. Factory Default is 15 psid.

### Evap Leaving Water Temp Offset

Evap Leaving Water Temp Offset: [setting]
Press (+) (-) to Change Setting

Possible values of [setting] are: -2.0°F to 2.0°F in 0.1°F increments (-/+ 1.1°C in 0.1°C increments). Factory Default is 0.0°F.

### Saturated Evap Rfgt Temp Offset

Saturated Evap Rfgt Temp Offset: [setting]
Press (+) (-) to Change Setting

Possible values of [setting] are: -2.0°F to 2.0°F in 0.1°F increments (-/+ 1.1°C in 0.1°C increments). Factory Default is 0.0°F.

### Water Pressure Calibration

The following menus is displayed only if the "Diff Wtr Press Sensor" setpoint is set to "Installed, <= 150 psig."

Water Pressure Calibration: [setting]
Press (+) (-) to Change Setting

Possible values of [setting] are: Auto (Factory Default) and Manual

If the above menu is set to "Manual," the following two menus are displayed.

Measured Evap Diff Wtr Press: X.X PSID/kPa
Press (+) (-) to Change Setting

Possible values is 0 to 25 psid (0 to 172.4 kPa) in 0.1 psid (kPa) increments. Factory Default is 0.0 psid (kPa).

Measured Cond Diff Wtr Press: X.X PSID/kPa
Press (+) (-) to Change Setting

Possible values is 0 to 25 psid (0 to 172.4 kPa) in 0.1 psid (kPa) increments. Factory Default is 0.0 psid (kPa).

The value displayed in the preceding two menus shall normally be 0.0 psid (kPa). When a manual calibration of the evaporator or condenser water pressure is desired, the measured differential pressure shall be entered in the appropriate menu. This non-zero value shall return to 0.0 psid (kPa) when the water pressure calibration is completed.

## Machine Configuration

**Important!** **FACTORY DEFAULT SETTINGS:** Menu items that are programmable using the keypad may have a selectable choice that is listed as Factory Default. This Factory Default setting is the software default that is initially factory-programmed for a new module assembly and may NOT be the correct setting for a specific operating chiller. Always review all settings when any module is replaced to verify that the settings agree with the desired settings that were selected at initial startup or programmed at the factory.

### Service Settings - Machine Configuration

The Machine Configuration password is + - + - + - <Enter>. If the machine configuration password is entered, the display goes to the menu defined below. If a key is not pressed every 10 minutes in this password protected menu, the display returns to the Chiller Operating Mode display of the Chiller Report, and the password must be entered again to return to this menu.

### Machine Configuration Group Heading

Machine Configuration Group Settings
Press (Next) (Previous) To Continue

This header appears when the headers do not appear in the Service Settings menu.

### Unit Frequency

Unit Frequency: [Freq]
Press (+) (-) to Change Setting

Possible values of Frequency are: 60 Hz (Factory Default) and 50 Hz.

### Unit Type

Unit Type: [type]
Press (+) (-) to Change Setting

Unit type will default to one of three chiller types. The default unit type will limit the selections to chillers of that type.

When the Factory Default is CVHE, possible values of unit type are: CVHE, CVGF, FastPak water-cooled, FastPak air cooled, CVHG, CVHF, CVHB, CVGE, and CVGG.

### Nominal Unit Tons

*Help Note:*  
Used for ton display resolution

Nominal Unit Tons: [tons]
Press (+) (-) to Change Setting

Possible values of [tons] are "100" through "1800" in 10 ton increments. Factory Default is 500 tons.

### Refrigerant Type

Refrigerant Type: [type]
Press (+) (-) to Change Setting

Possible values for type are: R11, R123 (Factory Default), R12, R134a, Water, R22, and R113.

*Help Note:*  
This is important for correct temperature to pressure conversion

### Refrigerant Monitor Type

Refrigerant Monitor Type: [type]
Press (+) (-) to Change Setting

Possible values for type are: None (Factory Default), Analog interface, and IPC Interface.

## Starter Type

Starter Type: [type]
Press (+) (-) to Change Setting

Possible values for type are: Undefined, Adaptive Frequency (AFDA), Y Delta (Factory Default), X Line, Solid State (C515 Series), Auto Transformer, and Primary Reactor, AFDB, Solid State (SMCPP) (Standalone for FastPak only).

## Startup Contactor Test - Y-D Starters Only

This screen shall be displayed only when the starter type is Y-Delta.

Level 2 ContactorIntegrityTest: [d/e]
Press (+) (-) to Change Setting

Possible values of [d/e] are: Disable (Factory Default) and Enable. This test checks for welded contactors before every start.

## Rated Load Amps

Rated Load Amps: xxxx Amps
Press (+) (-) to Change Setting

The range of values is 0-2500 in 1 amp increments. Factory Default is 500 Amps.

## Motor Heating Constant

Motor Heating Constant Setpt: xxx Min
Press (+) (-) to Change Setting

The range of values XXX is 0 to 100 Minutes in 1 Minute increments. Factory Default is 25 Minutes.

Select the Motor Heating Constant using the following table:

NTON		Motor Heating Constant
60 Hz	50 Hz	
230-320	190-270	30 Min
360-500	300-420	35 Min
560-800	470-660	40 Min
890-1280	740-1040	45 Min

### Current Overload Setting #1

Current Overload Setting #1: xxxxxxxx
Press (+) (-) to Change Setting

The range of values is Decimal 00 through 31.  
 Factory Default is 00. Factory set per nameplate.

### Current Overload Setting #2

Current Overload Setting #2: xxxxxxxx
Press (+) (-) to Change Setting

The range of values is Decimal 224 through 255.  
 Factory Default is 255. For security purposes the second setting is the 8-bit one's complement of the first setting above. The current overload settings establish the running current protection.

### Procedure For Selecting Current Overload Settings for UCP2

- 1 Determine the Rated Load Amps (RLA) from the Unit Nameplate.
- 2 Refer to *Table 2* or *Table 3* as follows:

Select *Table 2* if any of the following conditions are met:

- the unit has a unit mounted starter with an RLA less than 936 Amps.
- The unit has a 24" wide control panel; no unit mounted starter, and RLA less the 936 Amps.
- The starter has a single CT/phase wired directly to the starter module.

Select *Table 3* if any of the following conditions are met:

- The unit has an RLA over 935 Amps.
- The unit has a 38" wide "Starter By Others" control panel.
- The starter has two CTs/phase wired to the starter module (greater than 600 volts).

- 3 Using *Table 2* or *Table 3* (determined from Step 2), determine the CT Meter Scale Rating based on the RLA from Step 1.

- 4 Calculate the CT factor using one of the following two equations:

If *Table 2* was used:  $CT\ Factor = (Motor\ RLA / CT\ Meter\ Scale\ Rating) \times 100$

If *Table 3* was used:  $CT\ Factor = (Motor\ RLA / CT\ Meter\ Scale\ Rating) \times 139$

- 5 Refer to *Table 4* . Determine Current Overload Settings #1 and #2 based on the CT Factor calculated in Step 4.

Verify Current Overload Setting #1.

Verify Current Overload Setting #2.

**Table 2**  
**CT Factor = (Motor RLA/CT Meter Scale Rating) X 100**

Motor RLA	CT Part No.	Ext	CT Meter Scale Rating
34-50A	x13580253	09	50A
51-67A		10	75A
68-100A		01	100A
101-134A		02	150A
135-184A		03	200A
185-267A		04	275A
268-334A		05	400A
335-467A		06	500A
468-667A		07	700A
668-935A		08	1000A

**Table 3**  
**CT Factor = (Motor RLA/CT Meter Scale Rating) X 139**

Line CT Part No.	Ext	Line CT Ratio	CT Ter. Conn	No. of Prim. Turns	RLA Ranges	Meter Scale
X13580272	-01	50:5	X1 to X2	3	8.0 – 11.9	16.7
				2	12.0 – 17.9	25.0
	-02	75:5		2	18.0 – 23.9	37.5
					24.0 – 35.9	50
	-01	50:5			36.0 – 47.9	75
					48.0 – 72.0	100
X13580271	-01	100:5			72.0 – 86.3	150
X13580048		150:5			86.4 – 95.9	180
		180:5	X1 to X3		96.0 – 119.9	200
					200:5	X1 to X4
	-02	250:5	X1 to X2		144.0 – 167.9	300
		300:5	X1 to X3		168.0 – 191.9	350
		350:5	X1 to X4		192.0 – 239.9	400
					400:5	X1 to X2
	-03	500:5	X1 to X3	1	288.0 – 335.9	600
		600:5	X1 to X4		336.0 – 383.9	700
	-04	700:5	X1 to X2		384.0 – 479.9	800
		800:5	X1 to X3		480.0 – 575.9	1000
		1000:5	X1 to X4		576.0 – 719.9	1200
					720.0 – 863.9	1500
	-05	1200:5	X1 to X2		864.0 – 1007.9	1800
		1500:5	X1 to X3		1008.0 – 1199.9	2100
X13580047	-01	1800:5	X1 to X2		1200.0 – 1800	2500
		2100:5	X1 to X3		480.0 – 575.9	1000
		2500:5	X1 to X4		576.0 – 719.9	1200
					1000:5	X1 to X2
	-02	1200:5	X1 to X3			
		1500:5	X2 to X4			

**Table 4**  
**CT Factor, Current Overload Settings #1 and #2**

CT Factor	Current Overload Setting #1	Current Overload Setting #2	CT Factor	Current Overload Setting #1	Current Overload Setting #2	CT Factor	Current Overload Setting #1	Current Overload Setting #2
66	0	255	77	12	243	88	23	232
67	0	255	78	14	241	89	23	232
68	2	253	79	15	240	90	24	231
69	3	252	80	16	239	91	25	230
70	4	251	81	16	239	92	26	229
71	6	249	82	17	238	93	26	229
72	7	248	83	18	237	94	27	228
73	8	247	84	19	236	95	28	227
74	9	246	85	20	235	96	28	227
75	10	245	86	21	234	97	29	226
76	11	244	87	22	233	98	30	225
						99	30	225

## Maximum Acceleration Timer #1

Maximum Accel Timer Setpt #1: xx Sec

Press (+) (-) to Change Setting

The range of values is 6 to 64 seconds. Factory default is 27 seconds.

Starter Type	Recommended Max. Accel. Timer #1 Setting
Undefined	Contact Factory
Variable Speed	20
Y-Delta	27 (Factory Default)
X-Line	6
Sold State	20
Auto-transformer	16
Primary Reactor	11

## Maximum Acceleration Timer #2

The maximum acceleration timers establish the starting overcurrent protection.

Maximum Accel Timer Setpt #2: xx Sec

Press (+) (-) to Change Setting

The range of values is 191 to 249 Sec. Factory Default is 228 Seconds. For security purposes the second setting is the 8-bit one's complement of the Timer #1 setting above. Both the Maximum Accel. Timers and the Overload Settings are not adjustable from either the Remote CLD or Tracer or any other Remote/External Device.

## Hot Water Control Option

This screen does not appear if compressor power source is "Engine/Generator."

Hot Water Control Option: [status]

Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

## Heatsink Start Inhibit Temperature Setpoint (FastPak)

Heatsink Start Inhibit Temp: xxx.x f/c

Press <+> <-> To Change Setting

The range of values shall be 100.0 to 200.0 °F (37.8 to 93.3 °C) in increments of .1°F/°C. Default shall be 100 °F (93.3 °C).

## External Chilled Water Setpoint Option

External Chilled Wtr Setpoint: [Status]

Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

## External Current Limit Setpoint Option

External Current Limit Setpt: [Status]

Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

## External Hot Water Setpoint Option

External Hot Water Setpoint: [Status]

Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

## Acceleration Time Out Action

Acceleration Time Out Action: [action]

Press (+) (-) to Change Setting

Possible values for "action" include: Shutdown (Factory Default) and Transition. Transition results in an IFW diagnostic.

### Motor Over Temperature Protection

Motor Temp Protection: [input]
Press <+> <-> to Change Setting

Possible value of [input] are: 3 Winding Sensors, MTC Switch. Factory default is 3 Winding Sensors

### Motor Winding RTD Type

Motor Winding RTD Type: [type]
Press (+) (-) to Change Setting

Possible values for type are: 75 Ohm at 75°F (Factory Default) and 100 Ohm at 0°C

### High Pressure Cutout Setting

High Pressure Cutout Setting:xxxx Psig/kPa
Press (+) (-) to Change Setting

The range of values is -5-500 psig (350-3447 kPa) in increments of 5 psig/kPa. Factory Default is 15 psig (103 kPa) from -5 to 5 psig in increments of 1.

*Help Note:*

*This is the pressure limit algorithm that will, in sequence, Limit-Hold-Close vane opening.*

### Line Voltage Sensing Option

Line Voltage Sensing Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Unit Line Voltage

This screen will not appear if the Line Voltage Sensing Option is not installed.

Unit Line Voltage: [volt]
Press (+) (-) to Change Setting

Possible values of [volt] are "180" through "6600" in 5 volt increments. Factory Default is 460 volts.

### Auxiliary Condenser Option

Auxiliary Condenser Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Heat Recovery Option

Heat Recovery Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Hot Gas Bypass Option

Hot Gas Bypass Option : [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Free Cooling Option

Inlet Guide Vane Output
Has been Set to Stepper Motor

Free Cooling Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Condenser Pressure Sensor Option

Condenser Press Sensor Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Bearing Temperature Sensors Option

Bearing Temp Sensors Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Discharge Temperature Sensor Option

Discharge Temp Sensor Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Ice Building Option

Ice Building Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Differential Water Press Sensing Option

Diff Wtr Press Sensor Opt: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed,  $\leq 150$  psig (1035 kPa), Installed,  $> 150$  psig (1035 kPa), and Not Installed (Factory Default).

This option screen applies to both the Evap and Cond differential water pressure sensors for both systems less than or equal to 150 psig (Sensors at the Chiller Module) and systems greater than 150 psig (Sensors at the Options Module).

### External Analog Input Type Selection, 4-20 ma/2-10 VDC

External Setpoint Inputs: [type]
Press (+) (-) to Change Setting

Possible values for status are: 4-20ma (Factory Default) and 2-10 VDC.

### Tracer Option

Tracer Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### TCI Option

TCI Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Printer Option

Printer Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### Duplex Control Module (DCM) Option

DCM Option: [status]
Press (+) (-) to Change Setting

Possible values for status are: Installed and Not Installed (Factory Default).

### IGV Output Type

Inlet Guide Vane Output: [Y]
Press (+) (-) to Change Setting

Possible values for Y are: Stepper Motor (Factory Default) and Pulsed.

If Inlet Guide Vane Output is set to Pulsed and the Hot Gas Bypass Option is currently set to Installed, the Hot Gas Bypass Option will be set to Not Installed and the following will be displayed for 3 sec to indicate the change.

Hot Gas Bypass Option
Has Been Set to Not Installed

### Oil Pressure Protection

Oil Pressure Protection: [status]
Press (+) (-) to Change Setting

Possible values for [status] are: Transducer (Factory Default), and Diff Switch, Xducer & Switch.

### Programmable Analog Output

Program Analog Output: [Output]
Press <+> <-> To Change Setting

Possible values of [Output] are:

- Not Used
- % RLA
- % Cond Pres
- Refrig Diff Pres

Factory Default is % RLA.

### Programmable Relay Outputs

The following represents three menu items and is repeated for [N] = 1, 2, or 3.

Program Relay [N]: [Relay]
Press <+> <-> To Change Setting

Possible values of [Relay] are:

- Not Used
- Comp Running
- MMR Alarm
- MAR Alarm
- MMR + MAR Alarm
- Limit Warning
- Ice Making
- Head Relief Request
- Tracer Controlled
- Max Capacity

Factory Default for

- [N] = 1 is MMR + MAR Alarm.
- [N] = 2 is Comp Running.
- [N] = 3 is Not Used.

### Current Transducer Setpoint

The following will only be displayed if starter type is set to "Stand Alone - No Starter Module".

Current Xducer: [Setting]
Press <+> <-> To Change Setting

Possible values for [Setting] are: Cutler Hammer; Other Factory Default is "Cutler Hammer"

*Note: Select "Cutler Hammer" if starter has an A-1 module, otherwise select "Other".*

### Current Transducer at 100% RLA

The following will only be displayed if Current Transducer is set to "Other".

Current Xducer at 100% RLA: XX.X VDC
Press <+> <-> To Change Setting

Range of values is -10.0 to -5.0 VDC in increments of 0.1 VDC

Note: Calculate setpoint as follows:

**Current Transducer at 100% RLA =**

$$\frac{\text{Machine LRA}}{\text{CT Span}} \times (-10)$$

### Compressor Power Source

Cprsr Power Source: [status]
------------------------------

Press (+) (-) to Change Setting
---------------------------------

Possible settings for [status] are: Utility (Factory Default) and Engine/Generator.

## Refrigerant Monitor Settings Group

---

The Refrigerant Monitor Settings password is -- + + - - <Enter>. If the refrigerant monitor settings password is entered, the display goes to the menu defined below. If a key is not pressed every 10 minutes in this password protected menu, the display returns to the Chiller Operating Mode display of the Chiller Report, and the password must be entered again to return to this menu.

### Refrigerant Monitor Settings Group Heading

Refrigerant Monitor Group Settings
Press (Next) (Previous) To Continue

### Alarm Level 1

Alarm Level 1: XXXX PPM [Rfgt Type]
Press (+) (-) to Change Setting

Range of values are 3 to Alarm Level 2 minus 1 in increments of 1. The maximum value for R-123 is 30.

### Alarm Level 2

Alarm Level 2: XXXX PPM [Rfgt Type]
Press (+) (-) to Change Setting

Range of values are Alarm Level 1 plus 1 to Alarm Level 3 minus 1 in increments of 1.

### Alarm Level 3

Alarm Level 3: XXXX PPM [Rfgt Type]
Press (+) (-) to Change Setting

Range of values are Alarm Level 2 plus 1 to 1000 in increments of 1.

### Refrigerant Audible Alarm

Refrigerant Audible Alarm: [Setting]
Press (+) (-) to Change Setting

Possible values are: Disable, Alarm 1, Alarm 2, Alarm 3.

### Trouble Audible Alarm

Trouble Audible Alarm: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Disable, Enable.

### Alarm 1 Latching Status

Alarm 1 Latching Status: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Latching, Non-Latching.

### Alarm 2 Latching Status

Alarm 2 Latching Status: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Latching, Non-Latching.

### Alarm 3 Latching Status

Alarm 3 Latching Status: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Latching, Non-Latching.

### Channel Scanner

This item shall be displayed only when the refrigerant monitor mode is Warmup.

Channel Scanner: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Installed, Not Installed.

### Scanner Channel 1

Scanner Channel 1: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Active, Inactive.

### Scanner Channel 2

Scanner Channel 2: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Active, Inactive.

### Scanner Channel 3

Scanner Channel 3: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Active, Inactive.

### Scanner Channel 4

Scanner Channel 4: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Active, Inactive.

### Scanner Dwell Threshold

Scanner Dwell Threshold: XX %
Press (+) (-) to Change Setting

The range of values for Scanner Dwell Threshold is 30 to 70 in increments of 1.

### Auxiliary Input

Auxiliary Input: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Installed, Not Installed.

### Auxiliary Input Alarm

Auxiliary Input Alarm: [Status]
Press (+) (-) to Change Setting

Possible values of status are: Enable, Disable.

Auxiliary Input Alarm Level: XX.X mA
Press (+) (-) to Change Setting

Range of values is 4.0 to 20.0 in increments of 0.1.

Auxiliary Input Alarm Direction: [Direction]
Press (+) (-) to Change Setting

Possible values of Direction are: Above, Below.

Auxiliary Input Audible Alarm: [Status]
Press (+) (-) to Change Setting

Possible values of Status are: Disable, Enable.

### Analog Output Range

Analog Output Range: [Range] PPM
Press (+) (-) to Change Setting

## Refrigerant Monitor Calibration

The Refrigerant Monitor Calibration password is - + - + + <Enter> for the field calibration menu. If a refrigerant monitor calibration password is entered, the display goes to the menu items defined below. If a key is not pressed every 20 minutes in this password protected menu, the display returns to the Chiller Operating Mode display of the Chiller Report, and a refrigerant monitor calibration password must be entered again to return to this menu.

### Refrigerant Monitor Settings Group Heading

This header is displayed if the field calibration password was entered.

Rfgt Monitor Field Calibration Group
Press (Next) (Previous) To Continue

This header is displayed if the factory calibration password was entered.

Rfgt Monitor Factory Calibration Group
Press (Next) (Previous) To Continue

### Refrigerant Monitor Mode

Refrigerant Monitor Mode: [Mode]
Scanner Channel X XXXX PPM [Rfgt Type]

This item is displayed if the Channel Scanner is not installed.

Refrigerant Monitor Mode: [Mode]
XXXX PPM [Rfgt Type]

### Refrigerant Zero Calibration

Refrigerant Zero Calibration
(Enter) to Start, (Next) to Continue

If <Next> is pressed the following refrigerant zero calibration screens are skipped. If <Enter> is pressed the following screens are displayed to permit refrigerant zero calibration.

Starting The Calibration Procedure
Please Wait

If the refrigerant monitor is unable to calibrate, the following item is displayed.

Unable to Calibrate
---------------------

Otherwise, continue with the following screens.

Connect Refrigerant Zero Gas
(Next) To Continue, (Cancel) To Exit

Open Gas Sample Valve
(Next) To Continue, (Cancel) To Exit

XXXX PPM [Rfgt Type]
(Enter) To Adjust Conc, (Cancel) to Exit

Locking The Reading
Please Wait

If the refrigerant monitor is unable to calibrate, the following item is displayed.

Unable to Calibrate
---------------------

Otherwise, the following screens continue.

Refrigerant Zero Calibration XXXX
Press (Enter) (Cancel) (+) (-) To Continue

Starting The Calibration Procedure
Please Wait

This item is followed by one of the following two items.

Successful Calibration
------------------------

Calibration Failed
(Enter) To Retry, (Cancel) To Exit

If the <Enter> key is pressed, the display will return to the second menu item above. If the <Cancel> key is pressed, the display continues to the next display.

### Refrigerant Span Calibration

Refrigerant Span Calibration
(Enter) to Start, (Next) to Continue

If <Next> is pressed the following refrigerant span calibration screens are skipped. If <Enter> is pressed the following screens are displayed to permit refrigerant span calibration.

Starting The Calibration Procedure
Please Wait

If the refrigerant monitor is unable to calibrate, the following item is displayed.

Unable to Calibrate
---------------------

Otherwise, the following screens continue.

Connect Refrigerant Span Gas
(Next) To Continue, (Cancel) To Exit

Open Gas Sample Valve
(Next) To Continue, (Cancel) To Exit

XXXX PPM [Rfgt Type]
(Enter) To Adjust Conc, (Cancel) to Exit

Locking The Reading
Please Wait

If the refrigerant monitor is unable to calibrate, the following item is displayed.

Unable to Calibrate
---------------------

Otherwise, the following screens continue.

Refrigerant Span Calibration XXXX
Press (Enter) (Cancel) (+) (-) To Continue

Starting The Calibration Procedure
Please Wait

*Refrigerant Monitor Calibration*

This item is followed by one of the following two items.

Successful Calibration
------------------------

Calibration Failed
(Enter) To Retry, (Cancel) To Exit

If the <Enter> key is pressed, the display returns to the second menu item above. If the <Cancel> key is pressed, the display continues to the next display.

## Service Tests Group

**Important!** *FACTORY DEFAULT SETTINGS:* Menu items that are programmable using the keypad may have a selectable choice that is listed as Factory Default. This Factory Default setting is the software default that is initially factory-programmed for a new module assembly and may NOT be the correct setting for a specific operating chiller. Always review all settings when any module is replaced to verify that the settings agree with the desired settings that were selected at initial startup or programmed at the factory.

Password Request screen is displayed will send you to the CLD-Chiller IPC communications screen shown below. This screen can be used as a debugging tool when CLD-Chiller IPC communications are suspect. The first line on the comm screen indicates which Chiller packets the CLD is checking. The second line on the comm screen indicates how many times in a 15 second interval the particular packet was received by the CLD. If a packet is received more than 9 times in the interval, a "+" is displayed. The counters are reset to 0 every 15 seconds. Hitting any key while on this screen will cause an exit.

### Service Tools Group Password Request

```
Pswd Reqd to Access Service ToolsGroup
Please Enter Password
```

```
Packet#:2 3 4 5 6 7 8 9 10 11 12 14 15
Received:x x x x x x x x x x x x x
```

The Service Tools Password is ++--++ <Enter>. Successfully entering the password sends you to the Service Tools Group Heading Screen as defined below.

If any item in the Service Tools Group is in manual override, the alarm LED will be on and non-flashing. The following table contains the Service Tools setpoints which affect the alarm light. To turn the alarm light off (from an on and non-flashing state), all the conditions applicable to the unit type must be satisfied.

Pressing the <Next> and Increment keys simultaneously while the Service Tools Group

Unit Type:	Function / Setpoint:	Condition to Turn Off manual Alarm LED:
ALL	"Chilled Water Pump:"	Auto
ALL except CVAE	"Condenser Water Pump:"	Auto
CTV	"Oil Pump:"	Auto
CTV with IGV Output set to Stepper Motor.	"Vane Control:"	Auto
CTV with HGBP installed:	"HGBP Valve Control Is:"	Auto
CTV with IGV Output set to Pulsed.	"IGV Control Is:"	Auto
CTV with AF starter:	"AF Manual Speed Control:"	Disable

### Service Tools Group Heading

Service Tests & Overrides
Press (Next) (Previous) To Continue

This header appears when the headers do not appear in the Service Settings menu.

### Chilled Water Pump

Chilled Water Pump: [Status]
Press (+) (-) to Change Setting

Possible values for Status are: Auto (Factory Default) and On.

### Chilled Water Flow Switch Status

This screen displays the status of the chilled water flow switch status at the input to the UCM.

Chilled Water Flow Switch Status:
[y]

Possible values for [y] are: Flow Switch is Open/No Flow and Flow Switch is Closed/Flow.

### Evaporator Differential Water Pressure

The following will be displayed only if the Differential Water Pressure Sensor Option is Installed.

Evap Differential Wtr Press: xx.x psid/kPa
Press (Next) (Previous) To Continue

### Evaporator Entering/Leaving Water Pressure

The following will be displayed only if the low pressure (< or = to 150 psig) Differential Water Pressure Sensor Option is Installed.

Evap Entering Water Pressure:xx.x psid/kPa
Evap Leaving Water Pressure: xx.x psid/kPa

### Condenser Water Pump

Condenser Water Pump: [Status]
[y]

Possible values for Status are: Auto (Factory Default) and On.

Possible values for [y] are: Press (+)(-) to Change Setting.

### Condenser Water Flow Switch Status

This screen displays the status of the condenser water flow switch status at the input to the UCM.

Condenser Water Flow Switch Status:
[y]

Possible values for [y] are: Flow Switch is Open/No Flow and Flow Switch is Closed/Flow.

### Condenser Differential Water Pressure

The following will be displayed only if the Differential Water Pressure Sensor Option is Installed.

Cond Differential Wtr Press: xx.x psid/kPa
Press (Next) (Previous) To Continue

### Condenser Entering/Leaving Water Pressure

The following will be displayed only if the low pressure (< or = to 150 psig) Differential Water Pressure Sensor Option is Installed.

Cond Entering Water Pressure:xx.x psid/kPa
Cond Leaving Water Pressure: xx.x psid/kPa

## Starter Dry Run

Use the following screen when [xx] = "Disabled".

Starter Dry Run:	[xx]
Press +/- to Change	

Use the following screen when [xx] Not equal to "Disabled".

Starter Dry Run:	[xx]
(+)(-) (Enter): Trans Compl Inp: [y]	

Possible values of [xx] are: Disabled (Factory Default), Shorting Relay On, Run Relay On, Start Relay On, Transition Relay On, and Start and Run Relays On.

Possible values of [y] are:

*Closed* This denotes that the Transition Complete input is seeing a contact closure.

*Open* This denotes that the Transition Complete input is seeing a contact open.

If the unit is not in the local Stop mode the following is displayed.

Starter Dry Run:	Disabled
Unit Must Be In Local Stop To Execute	

## Oil Pump Status

This screen is displayed only if "Oil Pressure Protection" is set to "Transducer" or "Xducer & Switch."

Oil Pump: [Status]
Differential Oil Pressure: xx.x psid

Possible values for Status are: Auto (Factory Default) and On.

Differential Oil Pressure is not a setpoint but a status display.

## Vane Control Status/Vane Position Commands

The following screens will be displayed only when the "Inlet Guide Vane Output" is set to "Stepper Motor".

Vane Control Is:	[Status]
Press (+) (-) to Change Setting	

The possible values of [status] are "Auto" or "Manual". Factory Default is "Auto".

If the vane control status is "Auto" the following is displayed:

Inlet Guide Vane Position: xxx.x %Open
[Limit mode]

If the vane control status is "Manual" the following is displayed. When the Vane Control Status is transitioned from "Auto" to "Manual", the manual target is initialized to the current vane position.

Vane Pos xxx.x %	Target xxx.x % Open
LWT = xx.x	[limit mode]

The possible values of limit mode are: "Current Limit", "Condenser Limit", "Evap Limit", and "(+) (-) and <Enter>".

## Vane Position

The following screen will be displayed only when the "Inlet Guide Vane Output" is set to "Stepper Motor".

Inlet Guide Vane Position: xxxxx steps
Inlet Guide Vane Position:xx.x degrees

## HGBP Valve Control Status/Manual Open and Close Commands

If HGBP is installed in the unit, the following screen is displayed:

HGBP Valve Control Is: [Status]	
LWT = xx.x f/c	[Y]

The possible values of [status] are "Auto", "Hold", "Open", or "Close". Factory Default is "Auto".

The possible values of Y are: "Current Limit", "Condenser Limit", "Evap Limit", and (+)- and <Enter>. The latter is displayed when there are no limits operating.

### HGBP Valve Manual Opening/Closing Duty Cycle

If HGBP is installed in the unit, the following screen is displayed:

Manual Opening/Closing Duty Cycle: xx%
Press (+) (-) to Change Setting

Range of values is 0 to 50% in increments of 1%. Factory Default is 30%.

### Vane Control Status/Manual Load and Unload Commands

The following screen will be displayed only when the "Inlet Guide Vane Output" is set to "Pulsed".

IGV Control Is: [Status]
LWT = xx.x f/c [Y]

The possible values of [status] are "Auto", "Hold", "Load", or "Unload". Factory Default is "Auto".

The possible values of Y are: "Current Limit", "Condenser Limit", "Evap Limit", and "(+)(-)" and <Enter>. The latter is displayed when there are no limits operating.

### Manual Loading/Unloading Duty Cycle

The following screen will be displayed only when the "Inlet Guide Vane Output" is set to "Pulsed".

Manual Loading/Unloading Duty Cycle: xx%
Press (+) (-) to Change Setting

Range of values is 0 to 50% in increments of 1%. Factory Default is 30%.

Condenser Fan 3 [Status]
Fan 1 [x] Fan 2 [y] Fan 3 [z].....

Possible values for Status are: Auto (Factory Default) and On

Fan 1, Fan 2, and Fan 3 are not setpoints but a status display.

Possible values for x,y,z are Auto/On and On/Off.

*Note: status display (2nd line) does not appear while in free cooling mode.*

### AF Manual Speed Control - CVHE/F/G Only

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Manual Speed Control: [d/e]
Press (+) (-) to Change Setting

The possible values of [d/e] are: Disable (Factory Default) and Enable.

### AF Compressor Speed Command - CVHE/F/G Only

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB", or the Compressor Power Source is Engine/Generator, and AF Manual Speed Control is Enabled.

AF Compressor Speed Command: xxxx RPM
Press (+) (-) to Change Setting

Range of values is 2520 to 3600 RPM for "Adaptive Frequency" Starter Type (2280 to 3600 RPM for "AFDB" Starter Type) in increments of 1 RPM. Factory Default is 3600 RPM.

### AF Compressor Speed Command - CVHE/F/G Only

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Compressor Speed Command: xx.x Hz
AF Compressor Speed Command:xxxx.x RPM

*Note This is a Report only for Troubleshooting purposes.*

### AF Boundary Pressure Coefficient/AF Pressure Coefficient - CVHE/F/G Only

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Boundary Press Coefficient: x.xxx
AF Pressure Coefficient: x.xxx

*Note This is a Report only for Troubleshooting purposes.*

### AF Re-Optimization Timer Time Remaining- CVHE/F/G Only

The following is displayed only if the Starter Type is "Adaptive Frequency" or "AFDB" or the Compressor Power Source is Engine/Generator.

AF Re-Optimization Time Remaining:x.xx Hrs
Press (+) (-) to Change Setting

*Note This is a Report only for Troubleshooting purposes.*

### Module Software Revision Levels

Press (Enter) To Display Software Revision Levels Or (Next) To Continue
---

If <Enter> is selected the following screen can be displayed 5 times with 5 different pairs of modules.

[Module 1:] [Revision Level]
[Module 2:] [Revision Level]

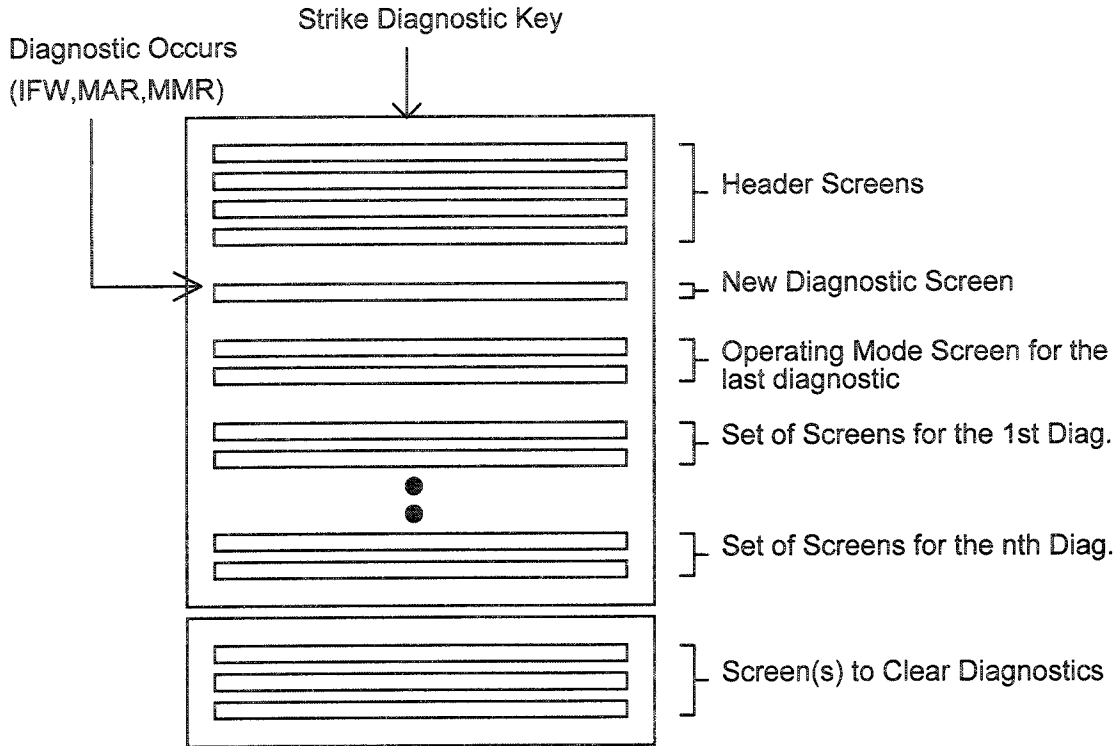
Module 1/2 will be one of the following: Chiller, Circuit, Starter, Options, Stepper 1, Stepper 2, TCI, Purge, LCLD, RCLD, I/O, Refrigerant Monitor, Scorpio, DCM.

Revision Level will either be an integer representing the software version number of the particular module or occurrence of a diagnostic, the display will automatically go to this menu and display certain messages as explained in the next section "Diagnostics Menu."

## Diagnostics Menu

The Diagnostics Group is where all diagnostics, both historical and active are presented. The group also contains the facility to clear active diagnostics, historic diagnostics, and purge diagnostics as individual groups. To clearly announce the

occurrence of a diagnostic, the display will automatically go to this menu and display certain messages as explained below. The following illustration gives an overview of how the diagnostic key and screens below it work.



### Diagnostics Group Heading

Active & Historic Diagnostics
Press (Next) (Previous) To Continue

### Menu Settings Password

If the Menu Settings Password is Enabled in the Service Setup Group, following each setting group heading the following will be displayed:

Settings In This Menu Are [status]
[password message]

Likewise, if the Menu Settings Password is Disabled in the Service Setup Group, the above screen will not appear.

The possible values for status are "Locked" or "Unlocked". If the password status is locked, the password message will be "Enter Password to Unlock". The user will then depress "-+--+-" followed by the <Enter> key. The password keystrokes will be echoed to the screen as a visual aide. The last six keystrokes represent the current password, and up to twenty keystrokes can be entered. An incorrect password, or the twenty-first keystroke will result in the password message "Invalid Password".

If the password status is unlocked, the password message will be "Press (Enter) to Lock". Any attempt to change the setting will result in the message "Setting is Locked". The password, once entered, will remain valid until canceled.

## Diagnostics and Annunciation

If there are no diagnostics present, only the following screen will be displayed under the Diagnostics Group heading screen.

No Diagnostics Present
Press (Next) (Previous) To Continue

If there are any diagnostics present, the following 3 screens are displayed sequentially when the <Next> key is pressed. The first screen is:

Diagnostic Report Follows
Press (Next) For More

The second screen is:

Press (Enter) To Display Operating Mode
At Time Of Last Diagnostic or (Next) For More

The third screen is the chiller operating mode display that was present at the time that the most recent diagnostic occurred.

If there are one or more diagnostics present, the following displays will be inserted into the display sequence. Diagnostics will be listed in order of occurrence from newest to oldest. Diagnostics will be displayed on 2 screens. The two screens will vary slightly depending on whether the diagnostic is active or historic.

The first active diagnostic screen will be:

[sequence number] [diagnostic]
(Next) [diagnostic type]

The sequence number will run from 1 through n ( $n \leq 20$ ) and number the diagnostics sequentially where the most recent diagnostic is sequence number [01].

The possible replacements for "diagnostic type" are:

Warning Only - Reset Not Req'd (Applies to all IFW diagnostics.)

Unit Shutdown - Reset Req'd (Applies to all MMR diagnostics)

Unit Shutdown - Automatic Reset (Applies to all MAR diagnostics)

The second active diagnostic display screen will contain the diagnostic sequence number, a time and date stamp, and a help message suggesting possible service procedures. The second active diagnostic display screen will be:

[sn] occurred at HH:MM xm Mon xx, 199x
[help message]

The time will be displayed as xx:xx am/pm.

The date will be displayed as month - date- year.

The month will use a standard 3-letter abbreviation. The year will not be abbreviated.

Depressing the next key will advance the display to the next diagnostic in the sequence.

The first historic diagnostic screen will be:

[sequence number] [Diagnostic]
Historic Only, Press (Next) For More

The definitions of diagnostic and sequence number are the same as for the active diagnostic messages. If <Next> is pressed the second historic diagnostic screen is displayed. The second historic diagnostic screen will be:

[sn] occurred at HH:MM xm Mon xx, 199x
Historic Only, Reset At End Of Diag Menu

Up to 20 diagnostics will be displayed.

## Clearing Diagnostics

At the end of the diagnostic menu, there will be 4 screens that allow the user to Clear/Reset the different diagnostic groups.

If any active diagnostics are present, the following screen will be displayed:

Press (Enter) To Clr Active Diagnostics
And Shutdown / Reset System

If the <Enter> key is pressed, the following message is displayed for 2 seconds:

Active Diagnostics Have Been Cleared
System Is Resetting

The display will be reset to the operating mode screen of the chiller report after this message clears.

If any historic diagnostics are present, the following screen will be displayed:

Press (Enter) To
Clear Historic Diagnostics

If the <Enter> key is pressed, the following message is displayed for 4 seconds:

Historic Diagnostics Have Been Cleared
Diagnostic Report Is Being Reset

The display will be reset to the top of the Diagnostic Menu after this message clears.

If any purge diagnostics are present, the following screen will be displayed:

Press (Enter) To
Clear Purge Diagnostics

If the <Enter> key is pressed, the following message is displayed for 4 seconds:

Purge Diagnostics Have Been Cleared
Diagnostic Report Is Being Reset

The display will be reset to the top of the Diagnostic Menu after this message clears.

If any IPC refrigerant monitor diagnostics are present, the following screen will be displayed:

Press (+) To
Silence Rfgt Mon Audible Alarm

Note: Pressing <+> will silence the audible alarm. The IPC refrigerant monitor will cause all the refrigerant monitor alarms (diagnostics) to become

non-latching for approximately 7.5 seconds. This allows any latching alarms to clear if the trip condition has been removed. This clearing function differs from the balance of UCP2 in that the balance of UCP2 diagnostics are cleared on reset and reestablished if the trip condition is still present.

If the <+> key is pressed, the following message is displayed for 4 seconds:

Silencing Rfgt Mon Audible Alarm
Clearing Nonactive Rfgt Alarms

### New Diagnostic Display

When a new diagnostic is sensed by the system, the display will reset to the diagnostic menu. A "one-time" screen will be displayed to inform the user that a new diagnostic has been detected. This screen will vary depending on the type of diagnostic detected. The two major categories of diagnostics are those which are informational only, and those which have resulted in machine shutdown.

If the diagnostic is an MMR/MAR, the screen will be:

*** A MACHINE SHUTDOWN HAS OCCURRED ***
Press (Next) For More

Otherwise, the screen will be:

A New Warning Has Been Detected
Press (Next) For More

This screen will be inserted into the diagnostic menu directly after the "Diagnostic Report Follows" screen. Pressing <Next> will therefore take the user to the "Press (Next) to display operating mode at time of last diagnostic" screen. If <Next> or <Previous> is pressed, this screen will no longer be in the display sequence.

## Diagnostics

In the table following, a "Latching" diagnostic is a condition which will cause the machine or a portion of the machine as noted to shut down and will require a manual reset to restore operation. A diagnostic that is non-latching is reset automatically when the condition causing the diagnostic goes away. A non-latching diagnostic will shut down the machine or a part of the machine if so indicated. If a diagnostic is information only, no machine action is taken.

Unless otherwise stated, all active diagnostics will be lost on loss of power.

Table 5

DIAGNOSTIC DESCRIPTION	Diag Type	Can Be Remotely Reset
Starter Contactor Interrupt Failure	MMR	No
Low Evap Rfgt Pressure	MMR	No
Phase Loss	MMR	No
Phase Reversal	MMR	No
High Bearing #1 Temp	MMR	No
High Bearing #2 Temp	MMR	No
Current Overload	MMR	No
Cprsr did not Accelerate: Shutdown	MMR	No
Starter did not Transition	MMR	No
High Pressure Cutout Tripped	MMR	No
Low Evap Rfgt Temp.	MMR	No
Emergency Stop Input	MMR	No
Starter Dry Run Test	MMR	No
Solid State Starter Fault Rly Open	MMR	No
Adapt Freq Drive Fault Relay Open	MMR	No
High Motor Temp Position #1	MMR	No
High Motor Temp Position #2	MMR	No

## Diagnostic Types And Action

MMR = Machine Shutdown - Manual Reset

MAR = Machine Shutdown - Auto Reset

IFW = Information Warning - May affect machine operation; lowest level of diagnostic

### Remotely Resettable Diagnostics:

Except for the following, all diagnostics can be reset remotely from either the Remote Clear Language Display, the Tracer, or the External Diagnostic Reset input at the Options Module. The following diagnostics shall only be resettable ONLY at the Local Clear Language Display, e.g. with the operator standing at the unit.

DIAGNOSTIC DESCRIPTION	Diag Type	Can Be Remotely Reset
High Motor Temp Position #3	MMR	No
Severe Phase Unbalance	MMR	No
Starter Fault Type I	MMR	No
Starter Fault Type II	MMR	No
Starter Fault Type III	MMR	No
Cprsr did not Accelerate Fully	MMR	No
High Cprsr Discharge Temp.	MMR	No
Phase Seq Monitor: Phase Reversal	MMR	No
Transition Complete Input Shorted	MMR	No
At Speed Input Shorted	MMR	No
Transition Complete Input Opened	MMR	No
At Speed Input Opened	MMR	No

**Table 6**  
**Diagnostic Table**

<b>DIAGNOSTIC DESCRIPTION</b>	<b>Diag Type</b>	<b>Module that Called Diag.</b>	<b>Diag. Active Modes</b>	<b>CAUSE</b>	<b>Help Message</b>
Adapt Freq Drive Fault Relay Open	MMR	Starter	All Start and Run Mode	The Adaptive Frequency Drive fault relay is open.	See Adaptive Frequency Drive Service Bulletin, check for an open wire.
At Speed Input Shorted	MMR	Starter	Pre-Start	a. Using either a Solid State Starter or an Adaptive Frequency Drive, the Up to Speed/At Speed input was found to be shorted before the compressor was started. b. Applies only to Solid State Starters and Adaptive Frequency Drives.	Check End of Limit/At Speed Input
At Speed Input Opened	MMR	Starter	All Running Modes	a. The At Speed input was found to be opened with the compressor motor running after successfully obtaining at speed condition. b. Applies only to Solid State Starters.	Check End of Limit/At Speed Input
Aux/Ht Rcvry Ent Water Temp Sensor	IFW	Options	All	Open or shorted and Heat Recovery is installed (at the CLD).	Check Sensor, Wiring, and Connections
Aux/Ht Rcvry Lvg Water Temp Sensor	IFW	Options	All	Open or shorted and Heat Recovery is installed (at the CLD).	Check Sensor, Wiring, and Connections
Bearing Temp Sensor #1	MMR	Stepper	All	Open or Short, only if this option is enabled at the Human Interface.	Check Sensor, Wiring And Connections
Bearing Temp Sensor #2	MMR	Stepper	All	Open or Short, only if this option is enabled at the Human Interface.	Check Sensor, Wiring And Connections
Check Clock	IFW	Chiller	All	On loss of power the clock does not keep time, if there is an extended power loss (greater than 15 seconds) this diag. is also generated to alert the operator to check the clock.	Check Main Power Supply, Reset Clock
Check Oil Filter	IFW	Chiller	All Running Modes	a. The differential oil pressure fell below the Check Oil Filter Setpoint for 1000 psid-seconds and the Check Oil Filter Diagnostic setpoint is enabled. b. This diagnostic shall not be active for 15 minutes after the compressor is started. c. This IFW diagnostic will automatically reset when the differential oil pressure rise above the Check Oil Filter Setpoint for 1000 psid-seconds or the compressor is not running.	

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Chilled Water Flow Lost	MAR	Chiller	Chilled Water Control: (All Stop modes) All modes except STOP (00) and EXTERNAL STOP (100)  Hot Water Control: Start and All Run Modes.	a. The chilled water flow switch input was open for more than 6-10 contiguous seconds. b. 6-10 seconds of contiguous flow shall clear this diagnostic. c. Even though the pump times out in the STOP modes, this diagnostic shall not be called out in the STOP modes.	Check Pump, Valves, Flow Switch
Chiller: Loss of Comm with Purge	IFW	Chiller	All	The chiller module lost communications with the Purge module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Chiller: Loss of Comm with Starter	MMR	Chiller	All	The chiller module lost communications with the Starter module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Chiller: Loss of Comm with Options	IFW	Chiller	All	The chiller module lost communications with the Options module for 15 contiguous seconds. This IFW diagnostic is generated if Free Cooling is Not Installed, otherwise this is an MMR diag. under code 2F6	Check IPC Wiring/ Connections
Chiller: Loss of Comm with Circuit	MMR	Chiller	All	The chiller module lost communications with the Circuit module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Chiller: Loss of Comm with I/O Mod	IFW	Chiller	All	The chiller module lost communications with the I/O module for 15 contiguous seconds; And HGBP is installed (at the CLD).	Check IPC Wiring/ Connections
Chiller: Loss of Comm with I/O Mod	MMR	Chiller	All	The chiller module lost communications with the I/O module for 15 contiguous seconds; And Pulsed IGV is installed (at the CLD).	Check IPC Wiring/ Connections
Chiller: Loss of Comm with DCM	IFW	Chiller	All	The DCM was setup as "installed" at the CLD and the chiller module lost communications with the DCM module for 15 contiguous seconds	Check IPC Wiring/ Connections
Chiller: Loss of Comm with Stepper #1	MMR	Chiller	All	The chiller module lost communications with the Stepper #1 module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Chiller: Loss of Comm with Local CLD Note: As implemented this is a latching IFW diagnostic. That is, once generated it cannot be re-generated until a manual reset is done.	IFW-AR	Chiller	All	The chiller module lost communications with the LCLD module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Chiller: Loss of Comm with Options	MMR	Chiller	All	The chiller module lost communications with the Options module for 15 contiguous seconds. This MMR diagnostic is generated if Free Cooling is Installed, otherwise this is an IFW diag. under code 2AE	Check IPC Wiring/ Connections

<b>DIAGNOSTIC DESCRIPTION</b>	<b>Diag Type</b>	<b>Module that Called Diag.</b>	<b>Diag. Active Modes</b>	<b>CAUSE</b>	<b>Help Message</b>
Chiller: Loss of Comm with Rfgt Monitor	IFW-AR	Chiller	All	The Chiller module lost communications with the Refrigerant Monitor for 15 contiguous seconds.	Check IPC Wiring/ Connections
Chiller: Loss of Comm with TCI	IFW	Chiller	All	The Tracer was setup as "installed" at the CLD and the chiller module lost communications with the TCI (comm 3 or comm 4) module for 15 contiguous seconds	Check IPC Wiring/ Connections
Chiller Mod Off-Brd 5V Range	IFW	Chiller	All	An improper Off Board 5v voltage was detected at the Chiller Module. A 5vdc is used for off-board devices such as the pressure transducers. The micro checks to see that the A/D value falls within an acceptable range.	Check Chiller Module Voltages
Chiller Mod Ref Voltage Calibration	IFW	Chiller	All	An improper reference voltage was detected at the Chiller Module. A 2.5 vdc reference is used to calibrate the non-ratiometric analog I/O such as 2-10vdc and 4-20ma inputs as well as PWM Analog outputs. The micro checks to see that the A/D value falls within an acceptable range.  This diagnostic has not been implemented	Check Chiller Module Voltages
Chlr Sat Cond Temp Sensor (Purge) (As Sensed by the Purge module in Retrofit applications)	IFW	Purge	All	Open or Shorted Sensor a. Applies to Retrofit applications of the Purge Only. Does not apply to UCP2 applications. b. IFW to the chiller, MMR to the Purge.	Purge Inop: See Purge O & M Manual
Circuit: Loss of Comm with Starter	MMR	Circuit	All	The circuit module lost communications with the Starter module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Circuit: Loss of Comm with Chiller	MMR	Circuit	All	The circuit module lost communications with the Chiller module for 15 contiguous seconds. On loss of communications, the circuit module shall run the oil pump for the post lube time and then turn the oil pump off. On loss of communications, the circuit module shall continue to control the oil heater.	Check IPC Wiring/ Connections
Circuit Module 24 Vdc Ref Missing	IFW	Circuit	All	24vdc reference missing and the Rfgt monitor is installed.	Check Rfgt Monitor Wiring/ 24 Vdc Supply.
Circuit Mod Off-Brd 5V Range	MMR	Circuit	All	An improper Off Board 5v voltage was detected at the Circuit Module. A 5vdc is used for off-board devices such as the pressure transducers. The micro checks to see that the A/D value falls within an acceptable range.	Check Circuit Module Voltages
Circuit Mod Ref Voltage Calibration	IFW	Circuit	All	An improper reference voltage was detected at the Circuit Module. A 2.5 vdc reference is used to calibrate the non-ratiometric analog I/O such as 2-10vdc and 4-20ma inputs as well as PWM Analog outputs. The micro checks to see that the A/D value falls within an acceptable range.	See Troubleshooting Service Bulletin
Cond Diff Water Press Transducer	IFW	Options	All	Input Shorted or Open and the Diff. water pressure sensing option, > 150 psig, is "installed" at the CLD.	Check Sensor, Wiring, and Connections
Cond Entering Wtr Temp Sensor	IFW	Chiller	All	Open or Short	Check Sensor, Wiring And Connections
Cond Leaving Wtr Temp Sensor	See Description	Chiller	All	Open or Short. a. IFW on Chilled Water Control b. MMR on Heat Pump (Hot Water) Control.	Check Sensor, Wiring And Connections

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Condenser Rfght Pressure Sensor	MMR	Circuit	All	Open or Short. Must Hold on open AND short input is 2.0 Psia. Design: Both opens and shorts result in the pressure going to the low end of the scale. Therefore a Must Hold on the high pressure end is not required.	Check Sensor, Wiring And Connections
Condenser Rfght Temp Sensor	MMR	Stepper	All	Open or Short	Check Sensor, Wiring And Connections
Condenser Water Flow Lost	MAR	Chiller	Chilled Water Control: Start and All Run Modes. Hot Water Control: (All Stop modes)	a. The chilled water flow switch input was open for more than 6-10 contiguous seconds. b. 6-10 seconds of contiguous flow shall clear this diagnostic. c. Even though the pump times out in the STOP modes, this diagnostic shall not be called out in the STOP modes.	Check Pumps, Valves, Flow Switch
Condenser Water Flow Overdue	MAR	Chiller	Estab. Cond Water Flow	Condenser water flow was not proven within 4.25 minutes of the condenser pump relay being energized.	Check Pump, Valves, Flow Switch
Condenser Water Pressure Sensor	IFW	Chiller	All	Open or Short and the Cond Water Pressure Sensor is setup as installed at the Clear Language Display.	Check Sensor, Wiring, and Connections
Cprsr did not Accelerate: Shutdown	MMR	Starter	Start Mode	a. The compressor did not come up to speed in the allotted time defined by the Maximum Acceleration Timer. b. The Human Interface setups defined "Shutdown" as the action when the Maximum Acceleration Timer was exceeded.	Check Main Power Supply & Wiring
Cprsr did not Accelerate Fully	MMR	Starter	Starting	a. Using either a Solid State Starter or an Adaptive Frequency. Drive the UCM did not receive an Up to Speed or At Speed Signal within the Maximum Acceleration Timer Setting. b. Applies only to Solid State Starters and Adaptive Frequency. Drives.	Check End of Limit/At Speed Input
Cprsr Did Not Accelerate: Transition (The Motor is put across the line.)	IFW	Starter	Start Mode	a. The compressor did not come up to speed in the allotted time defined by the Maximum Acceleration Timer. b. The Human Interface setups defined "Transition" as the action when the Maximum Acceleration Timer was exceeded.	See Troubleshooting Service Bulletin
Current Overload	MMR	Starter	All Running Modes	Motor current exceeded overload time vs. trip characteristic.	Check Main Power Supply & Wiring
Current Overload Setpts Error	IFW	Starter	All	a. The redundant overload settings did not agree for 30 contiguous seconds. (Continue to use the previous value for the 30 second timeout.) When this diagnostic occurs the affected Starter Module shall use the minimum (00000 binary, 00 decimal) overload setting as a default until either the UCM is reset or, if the redundant settings agree again, the starter module can go back to using the actual setting.	Review Overload Set Up

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
CWS/Leaving Wtr Temp. Cutout Setpt Overlap  also overlap of CWS and Low Refrigerant Temp Cutout.	None	None	All	No diagnostic, limit value to last legal value and tell the operator about it on the second line of the display. NOTE: The above is not a diagnostic because you don't want the display vectoring you to a different display state when you are trying to set either the chilled water setpoint or the leaving water temp. cutout setpoint as it will in the case of a diagnostic.	N/A
DCM: Loss of Comm with Chiller A	IFW	Chiller	All	The DCM module lost communications with the chiller A Chiller module for 15 contiguous seconds	Check IPC Wiring/ Connections
DCM: Loss of Comm with Chiller B	IFW	Chiller	All	The DCM module lost communications with the chiller B Chiller module for 15 contiguous seconds	Check IPC Wiring/ Connections
DCM: Loss of Comm with Starter A	IFW	Chiller	All	The DCM module lost communications with the chiller A Starter module for 15 contiguous seconds	Check IPC Wiring/ Connections
DCM: Loss of Comm with Starter B	IFW	Chiller	All	The DCM module lost communications with the chiller B Starter module for 15 contiguous seconds	Check IPC Wiring/ Connections
DCM: Loss of Comm with TCI A	IFW	Chiller	All	The DCM module lost communications with the chiller A TCI module for 15 contiguous seconds	Check IPC Wiring/ Connections
DCM: Loss of Comm with Stepper A	IFW	Chiller	All	The DCM module lost communications with the chiller A Stepper module for 15 contiguous seconds	Check IPC Wiring/ Connections
Differential Oil Pressure Overdue	MMR	Circuit	Pre-Lube	A differential oil pressure Of 9 psid was not established within 3 minutes of starting the Oil Pump in the Pre-Lube Mode. Design: Some hysteresis was introduced into this diagnostic. 9 psid is the criteria to establish pre-lube oil flow and 8 psid is used to define a loss of oil flow on pre-lube.	See Troubleshooting Service Bulletin
Differential Oil Pressure Switch (CVGD and CVAD units only)	MMR	Circuit	Pre-Lube	Just prior to starting the oil pump the Differential Oil Pressure Switch is checked to be sure it's contacts are open (not stuck or jumpered), if not set this diagnostic.	Check Oil Pressure Switch/Wiring.
Discharge Temp Sensor	MMR	Stepper	All	Open or Short, only if HGBP and the Discharge Temp. Sensor is called out as "Installed" at the Human Interface.	Check Sensor Wiring And Connections
Emergency Stop Input	MMR	Chiller	All	a. EMERGENCY STOP input is open. An external interlock has tripped. Time to trip from input opening to unit stop shall be 0.1 to 1.0 seconds.	Check Emergency Stop Input Device
Evap Diff Water Press Transducer	IFW	Options	All	input Shorted or Open and the Diff. water pressure sensing option, > 150 psig, is "installed" at the CLD.	Check Sensor, Wiring, and Connections
Evap Entering Wtr Temp Sensor	IFW	Chiller	All	Open or Short a. Normal operation, no effects on control. b. Chilled Water Reset, Will just run at either normal CWS or will run at maximum reset permitted.	Check Sensor, Wiring And Connections
Evap Leaving Water Temp Sensor	MMR	Chiller	All	Open or Short	Check Sensor, Wiring And Connections

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Evap Rfgt Temp Sensor	MMR	Stepper	All	Open or Short	Check Sensor, Wiring And Connections
Evap Water Pressure Sensor	IFW	Chiller	All	Open or Short and the Evap Water Pressure Sensor is setup as installed at the Clear Language Display.	Check Sensor, Wiring, and Connections
Evaporator Water Flow Overdue	MAR	Chiller	Estab. Evap. Water Flow on going from STOP to AUTO.	Evaporator water flow was not proven within 4.25 minutes of the Evaporator pump relay being energized.	Check Pump, Valves, Flow Switch
Extended Compressor Surge	MMR	Starter	All Running Modes	An extended Surge condition was detected and the Surge protection feature was Enabled at the Clear Lang. Display. An extended Surge condition is defined being in a "continuous" surge condition for 15 ± 10% minutes.	Check Condenser Water Temp.
Extended Power Loss  Note: This diagnostic and the functions tied to it are handled by the Check Clock diagnostic.	IFW	Starter	All	The unit lost power for an extended period of time. On CTV units if power is lost for an extended period of time the oil pump is not run on Power Up. If a power loss is determined to be a Momentary Power Loss the Oil Pump is run on the Power Up to Post Lube the bearings. The deciding factor determining if a power loss is Extended or Momentary is TBD.	Check Main Power Supply & Wiring
External Base Load Setpoint	IFW-AR	Chiller	All	a. Not "Enabled": no diagnostics. b. "Enabled": Out-Of-Range Low or Hi, set diagnostic, Terminate external base loading function. This IFW diagnostic will automatically reset if the input returns to the normal range.	Check Signal At Input
External Chilled Water Setpoint	IFW-AR	Options	All	a. Not "Enabled": no diagnostics. b. "Enabled": Out-Of-Range Low or Hi, set diagnostic, default CWS to next level of priority (e.g. Front Panel SetPoint). This IFW diagnostic will automatically reset if the input returns to the normal range.	Check Signal At Input
External Current Limit Setpoint	IFW-AR	Options	All	a. Not "Enabled": no diagnostics. b. "Enabled": Out-Of-Range Low or Hi, set diagnostic, default CLS to next level of priority (e.g. Front Panel SetPoint). This IFW diagnostic will automatically reset if the input returns to the normal range.	Check Signal At Input
External Hot Water Setpoint	IFW-AR	Options	All	a. Not "Enabled": no diagnostics. b. "Enabled": Out-Of-Range Low or Hi, set diagnostic, default HWS to next level of priority (e.g. Front Panel SetPoint). This IFW diagnostic will automatically reset if the input returns to the normal range.	Check Signal At Input
External Vane Position Setpoint	MMR	Chiller	All	a. Not "Enabled": no diagnostics. b. "Enabled": Out-Of-Range Low or Hi, set diagnostic.	Check Signal at Input

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Free Cooling Valves	MMR	Options	When exiting Free cooling	a. The Free Cooling Valves were commanded to close and did not close in the three minutes allowed for closure. And FC is installed (at the CLD) and commanded off. b. The Free Cooling Valves were commanded to open and did not open in the three minutes allowed for closure. And FC is installed (at the CLD) and commanded On.	Check Clsd End-Switches, Valves, Wiring
Heat Sink Temp Sensor	IFW	Starter	All	Open or Short and Solid State Starter installed. Note: The Solid State Starter is expected to be protected from overheating via a thermal cutout. Since this sensor is not used to protect the starter, the failure of the sensor is treated as an IFW.	Check Sensor Wiring And Connections
HGBP Valve Closure Overdue	IFW			a. The HGBP Valve was commanded to close and did not close in the three minutes allowed for closure	Check Clsd End-Switches, Valves, Wiring
High Bearing #1 Temp	MMR	Stepper	All starting and running modes	a. The bearing temperature at sensor #1 exceeded 180 + or - 5 °F (82.2 °C) for 0.5 - 2 seconds (Note: BT, WT, and DT may be "instantaneous trip" but consistent with the analog input filtering function.), and b. This function is enabled at the CLD.	Check Oil System
High Bearing #2 Temp	MMR	Stepper	All starting and running modes	a. The bearing temperature at sensor #2 exceeded 180 + or - 5 °F (82.2 °C) for 0.5 - 2 seconds (Note: BT, WT, and DT may be "instantaneous trip" but consistent with the analog input filtering function.), and b. This function is enabled at the Human Interface.	Check Oil System
High Cprsr Discharge Temp.	MAR	Stepper	All	a. The discharge temp. exceeded the trip value; 200°F + or - 5°F for CVHE/F, CVG and CVA. The Discharge Temp Cutout is adjustable at the Human Interface. See also section P4_CPRSR.Doc of this Functional Specification. b. Time to trip from trip value exceeded shall be 0.5 to 2.0 seconds. (Note: BT, WT, and DT may be "instantaneous trip" but consistent with the analog input filtering function.) d. The diag. shall reset automatically 50 °F below the trip point.	See Troubleshooting Service Bulletin
High Motor Temp Position #1	MMR	Circuit	Any Start and Run Mode	The Motor winding temp. at sensor #1 exceeded 265 °F + or - 15°F for 0.5 - 2 seconds. (Note: BT, WT, and DT may be "instantaneous trip" but consistent with the analog input filtering function.)	See Troubleshooting Service Bulletin
High Motor Temp Position #2	MMR	Circuit	Any Start and Run Mode	The Motor Winding Temp. at sensor #2 exceeded 265 °F + or - 15 °F for 0.5 - 2 seconds. (Note: BT, WT, and DT may be "instantaneous trip" but consistent with the analog input filtering function.)	See Troubleshooting Service Bulletin
High Motor Temp Position #3	MMR	Circuit	Any Start and Run Mode	The Motor Winding Temp. at sensor #3 exceeded 265° F + or - 15° F for 0.5 - 2 seconds. (Note: BT, WT, and DT may be "instantaneous trip" but consistent with the analog input filtering function.)	See Troubleshooting Service Bulletin

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
High Oil Temp	MMR	Circuit	All starting and running Modes	UCP2 shall provide a fixed High Oil Temperature Cutout of 180 °F (82.2°C). If the oil temperature violates the cutout by 120 degree F seconds (66.6 degree C seconds) an MMR diagnostic shall be generated.	Check Oil System
High Pressure Cutout Tripped	MMR	Circuit	All	A high pressure cutout was detected. See the trip points for the various products under the HPC switch description of this specification.	Check Condenser Water Temp.
High Restart Inhibit Timer Warning	IFW	Starter	All	The Restart Inhibit timer has reached a maximum threshold for the host chiller. For CTV chillers this is 45 minutes. This indicates excessive chiller cycling, steps should be taken to correct this.	Check for Excessive Chiller Cycling
High Vacuum Lockout	MMR	Circuit	Pre-Start	The Oil Tank Pressure transducer shall be used to sense for very low pressures in all Non-running cprsr modes.	See Troubleshooting Service Bulletin
IGV BPI Not Found During Search	IFW	Stepper	All	The Inlet Guide Vane Actuator Binary Position Indicator was not found over the entire stroke of the IGV during the BPI search.	See Troubleshooting Service Bulletin
IGV BPI Found Low During Search	IFW	Stepper	All	The Inlet Guide Vane Actuator Binary Position Indicator was found too low in the stroke of the IGV during the BPI search.	Check Stepper Module, Wiring, & Motor
IGV BPI Shorted	IFW	Stepper	Pre-Start	At what is believed to be a closed position, the IGV BPI was found to be shorted.	Check Sensor, Wiring, and Connections
IGV Electrical Drive Circuit Open	MMR	Stepper	On Demand and Pre-Start	Run the IGV Actuator electrical drive circuit test both on demand from the human interface and just before the chiller starts.	See Troubleshooting Service Bulletin
Incorrect Chiller Software Installed	MMR	Chiller	All	The incorrect Eprom was loaded into this module. This diagnostic is detected when a factory test computer sets the unit type to something other than what the Eprom software was intended for.	(No message is required.)
Incorrect Stepper Software Installed	MMR	Stepper	All	The incorrect Eprom was loaded into this module. This diagnostic is detected when a factory test computer sets the unit type to something other than what the Eprom software was intended for.	(No message is required.)
Inlet Guide Vane Closure Overdue	IFW	I/O	All Non-running modes, Starting, Pre-Stop (IGV manual modes)	a. The inlet guide vanes were commanded to close and did not close in the three minutes allowed for closure.	Check Clsd End-Switches, Vanes, Wiring
I/O Mod: Loss of Comm with Chiller	IFW	I/O	All	The I/O module lost communications with the Chiller module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Invalid Starter Selection	MMR	Starter	All Modes	The Clid has been setup for an AFD starter type, however the starter module is not AFD compatible. <b>(Note: This feature is not supported by hardware.)</b> (Special Note not for Publishing; See Starter Module Design Specification for requirements to enable AFD operation.)	Call Local Trane Service Agency

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
<p>Low Chilled Water Temp: Unit Off</p> <p>(Unit in Auto but not Starting or Running)</p>	IFW-AR	Chiller	Unit in Auto and No Ckt's Energized (Any Ckt(s) Energized)	<p>a. The chilled water temp. fell below the cutout setpoint while the compressor (or Solution Pump) was not running for 30 degree F Seconds. Automatic Reset of the IFW dig shall occur 2 degrees F (1.1 °C) above the cutout setpoint.</p>	Check Flow, Sensor, & Wiring
<p>Low Chilled Water Temp: Unit On</p> <p>(Unit Starting or Running)</p>	MAR	Chiller	Any Ckt(s) Energized (No Ckt's Energized)	<p>a. The chilled water temp. fell below the cutout setpoint while the compressor (or Solution Pump) was running for 30 degree F Seconds. Automatic Reset of the MAR diag shall occur 2 degrees F (1.1 °C) above the cutout setpoint.</p>	Check Flow, Sensor, & Wiring
<p>Low Differential Oil Pressure</p>	MMR	Circuit	All starting and running Modes	<p><b>Pre-Lube Mode on CVHE/F Chillers:</b> a. See Diagnostic 1FF.</p> <p><b>Start &amp; Run Mode on CVHE/F Chillers:</b> a. If during these modes the Differential oil pressure drops below 9 PSID for more than 90 Psid Seconds, an MMR diagnostic shall be generated. The 90 Psid Seconds integral shall be reset to zero when the differential pressure rises above 9 psid.</p> <p><b>Pre-Lube Mode on CVGD/CVAD Chillers:</b> a. See Diagnostic 1FF.</p> <p><b>Start &amp; Run Mode on CVGD/CVAD Chillers:</b> a. While Starting and Running, if the differential oil pressure switch opens for more than 3-5 seconds, generate an MMR diagnostic.</p>	Check Oil System
<p>Low Evap Rfgt Temp.</p>	MMR	Stepper	Starter Contactor Energized or in Free Cooling	<p>a. The Saturated Evap Rfgt Temp dropped below the Low Rfgt Temp. Cutout Setpoint when the circuit was running for 30 °F seconds.</p>	Check Operation, Call Service
<p>Low Evap. Water Flow (To be implemented in CTV Phase C release and ABS Phase B release.)</p>	IFW-AR	Chiller	Chiller Auto and All Running Modes	<p>a. The evap. water flow measurement option was installed and the flow dropped to a setpoint set at the CLD. This IFW shall be Auto Reset and reset 0.1 gpm/ton above the adjustable trip point or when the Evaporator pump is turned off.</p> <p>b. There shall be a 2 minute delay in permitting this diagnostic to be called out from the time the evap pump has been turned on AND flow has been established/confirmed via the flow switch input.</p> <p>c. This is not necessarily active in a Manual On of the Evaporator pump. That is, if the chiller is in the Stop mode and the Evap. Relay is manually turned on, this diagnostic shall not be active. (Manual On is not taken into account.)</p>	See Troubleshooting Service Bulletin
<p>Low Oil Temp</p>	MAR	Circuit	All Non-running Modes.	<p>The oil temperature dropped below it's adjustable Low Oil Temp. Cutout. ("Instantaneous trip" but consistent with the analog input filtering function.) See Section P4_CPRSR for further description of this diagnostic. Automatic Reset of the MAR diag shall occur 5 degrees F (2.8 °C) above the cutout setpoint.</p>	See Troubleshooting Service Bulletin

<b>DIAGNOSTIC DESCRIPTION</b>	<b>Diag Type</b>	<b>Module that Called Diag.</b>	<b>Diag. Active Modes</b>	<b>CAUSE</b>	<b>Help Message</b>
Max Acceleration Setpts Error	IFW	Starter	All	a. The redundant Maximum Acceleration settings did not agree for 30 contiguous seconds. (Continue to use the previous value for the 30 second timeout.) When this diagnostic occurs the affected Starter Module shall use 6 seconds as a default until either the UCM is reset or, if the redundant settings agree again, the starter module can go back to using the actual setting.	Review Max Acceleration Set Up
Max Pumpout Rate Exceeded-Svc (Prg)	IFW	Purge	All	a. IFW to the chiller, MAR to the Purge.	Purge Inop: See Purge O & M Manual
Max Pumpout Rate Exceeded (Prg)	IFW	Purge	All	a. IFW to the chiller, MAR to the Purge.	Purge Inop: See Purge O & M Manual
Memory Error Type I: NOVRAM	MMR	Chiller	On UCM Power Up or following a Type II Memory error diag.	a. On UCM either power up or following a Type II Memory Error a NOVRAM memory error was detected. The UCM is operating on all Engineering Factory defaults for all setup parameters. Check all setup parameters and continue to run chiller. Replace the Chiller Module as soon as a replacement is available. Note: It is expected that this diagnostic will be detected on the very first power up of the Chiller Module at the Manufacturer since the NOVRAM will not contain valid data on first power up.	Call Service to Check all Settings
Memory Error Type IV	IFW	Chiller	All	A page timeout error was detected while trying to write data into EEPROM. There will likely be a recall of Engineering Factory defaults on the next reset or power transition. Replace the Chiller Module as soon as a replacement is available.	Call Service to Check all Settings
Memory Error Type II: Shadow RAM	IFW	Chiller	All	a. A Shadow RAM memory error was detected. The UCM is operating on all last valid values (pulled from NOVRAM) for all setup parameters. No setup parameter changes were pending to be loaded into NOVRAM, a complete recovery of all setup parameters was made and there is no need to check unit setup parameters. Compressor starts and hour were lost for not more than the last 24 hours. This is expected to be an isolated event and repair or replacement is not required. If this diagnostic does occur repeatedly, then replace the Chiller module.	No Settings Were Lost
Memory Error Type III	IFW	Chiller	All	a. A Shadow Ram memory error was detected. The UCM is operating on all last valid values (pulled from NOVRAM) for all setup parameters. Setup parameter changes less than 24 hours old pending to be loaded into NOVRAM were lost. Check all setup parameters made in the last 24 hours. Compressor starts and hours were lost for not more than the last 24 hours. This is expected to be an isolated event and repair or replacement is not required. If this diagnostic does occur repeatedly, then replace the Chiller module.	Settings Changed in The Last 24 Hours Lost

<b>DIAGNOSTIC DESCRIPTION</b>	<b>Diag Type</b>	<b>Module that Called Diag.</b>	<b>Diag. Active Modes</b>	<b>CAUSE</b>	<b>Help Message</b>
Momentary Power Loss	MAR	Starter	All Running Modes (Start Mode, e.g. Before Transition)		Determine Cause Of Power Interruption
Motor Temp Sensor #1	MMR	Circuit	All	Open or Short	Check Sensor, Wiring And Connections
Motor Temp Sensor #2	MMR	Circuit	All	Open or Short	Check Sensor, Wiring And Connections
Motor Temp Sensor #3	MMR	Circuit	All	Open or Short	Check Sensor, Wiring And Connections
MPL Detect Circuit Inoperative	MMR	Starter	All	A failure was detected in the Momentary Power Loss detect circuit. If there are no zero cross interrupts on Vab for 637.5 msec (Prior to Centravac Upgrade 4: approx. 3 half line cycles), the timer interrupt will trip and generate a diagnostic that indicates that our ability to detect MPL is gone. If Vab was truly gone the module would be powered down so if we can detect that Vab is gone then there must be a hardware failure on the board.	See Troubleshooting Service Bulletin
Oil Pressure Sensor Calibration	MMR	Circuit	All Non-running Modes and not for 5 minutes after running.	The recalibration of the Differential Oil Pressure sensors resulted in an error correction of greater than 3 PSID.	See Troubleshooting Service Bulletin
Oil Pump Discharge Pressure Sensor	MMR	Circuit	All	Open or shorted input. Must Hold on open AND short input is 2.0 Psia. Design: Both opens and shorts result in the pressure going to the low end of the scale. Therefore a Must Hold on the high pressure end is not required.	Check Sensor, Wiring, and Connections
Oil Sump Pressure Sensor	MMR	Circuit	All	Open or shorted input. Must Hold on open AND short input is 2.0 Psia. Design: Both opens and shorts result in the pressure going to the low end of the scale. Therefore a Must Hold on the high pressure end is not required.	Check Sensor, Wiring, and Connections
Oil Temp Sensor	MMR	Circuit	All	Open or Short	Check Sensor, Wiring And Connections
Options: Loss of Comm with Starter	IFW	Options	All	The options module lost communications with the Starter module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Options: Loss of Comm with Chiller	IFW	Options	All	The options module lost communications with the Chiller module for 15 contiguous seconds.	Check IPC Wiring/ Connections

<b>DIAGNOSTIC DESCRIPTION</b>	<b>Diag Type</b>	<b>Module that Called Diag.</b>	<b>Diag. Active Modes</b>	<b>CAUSE</b>	<b>Help Message</b>
Options Module 24 Vdc Ref Missing	IFW	Options	All	24Vdc reference missing and the differential water pressure transducers are installed.	Check Press Xducer Wiring/ 24 Vdc Supply.
Options Module 24 Vdc Ref Missing	MMR	Options	All	24Vdc reference missing and the differential water pressure transducers are installed and <b>Adaptive Frequency Drive</b> installed.	Check Press Xducer Wiring/ 24 Vdc Supply.
Options Mod Off-Brd 5V Range	IFW	Options	All	An improper Off Board 5v voltage was detected at the Options Module. A 5vdc is used for off-board devices such as the External CWS and CLS, and pressure transducers. The micro checks to see that the A/D value falls within an acceptable range.	Check Options Module Voltages
Options Mod Ref Voltage Calibration	IFW	Options	All	An improper reference voltage was detected at the Options Module. A 2.5 vdc reference is used to calibrate the non-ratiometric analog I/O such as 2-10vdc and 4-20ma inputs as well as PWM Analog outputs. The micro checks to see that the A/D value falls within an acceptable range.	See Troubleshooting Service Bulletin
Outdoor Air Temp Sensor  See Also 3d3 diag. (Either Outdoor Air Reset or Low Ambient Lockout Selected)	IFW	Chiller	All	Open or Short a. Use end of range value (whatever value the open or short gives). b. Clear diag. when the resistance returns to normal range.	Check Sensor, Wiring And Connections
Outdoor Air Temp Sensor  See Also 3d3 diag. (Both Outdoor Air Rst and Low Ambient Lockout not selected.)	None	None	All	Open or Short a. Display end of range value. (dashes "-----")	N/A
Outdoor Air Temp Sensor  See also A1 and A2 diag.	MMR	Chiller	All	Open or Short	Check Sensor, Wiring And Connections
Over Voltage	MAR	Starter	Pre-Start and Any Ckt(s) Energzd	a. Line voltage above + 10% of nominal. (Must hold = + 10% of nominal. Must trip = + 15% of nominal. Reset differential = min. of 2% and max. of 4%. Time to trip = minimum of 1 min. 10 sec. and maximum of 5 min. 20 seconds)	Check Main Power Supply & Wiring
Phase Loss	MMR	Starter	Contacto Energzd or all Start, and Run modes.	a. No current was sensed on one or more of the current xformer inputs. (Must hold = 20% RLA. Must trip = 5% RLA.) Time to trip shall be 1 second minimum, 3 seconds maximum. Actual design trip point is 10%. b. Phase rotation protection is enabled and either the Phase A current signal or the Phase C current is less than approximately 5% of the CT rating. Time to trip is 0.7 seconds for CTV/ABS.	Check Main Power Supply & Wiring
Phase Reversal	MMR	Starter	Contacto energized to transition command	a. A phase reversal was detected on the incoming current. On a compressor startup the phase reversal logic must detect and trip in 0.7 seconds.	Check Main Power Supply & Wiring
Phase Reversal Protection Lost	MMR	Starter	Starter Contacto energized to transition command	a. The phase reversal protection on the compressor has become inoperative. The phase rotation protection system failed to detect 2 in a row of one of the four phase circuit states; Phase reversal, Phase rotation OK, Phase A lost, Phase B lost.	Check Starter Module.

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Purge Cprsr Suction Temp Sensor	IFW	Purge	All	Open or Shorted Sensor a. IFW to the chiller, MMR to the Purge.	Purge Inop: See Purge O & M Manual
Purge Liquid Level Too High	IFW	Purge	All	a. The Level Switch at the purge opened for 6 to 10 Seconds. Note: This was implemented as tripping in 2 A/D samples, which are 0.4 seconds apart. Prior to 2/2/95 only 1 A/D sample could trigger this diagnostic. b. IFW to the chiller, MMR to the Purge.	Purge Inop: See Purge O & M Manual
Purge: Loss of Comm with Chiller	IFW	Purge	All	The purge module lost communications with the chiller module for 15 contiguous seconds. a. IFW to the chiller, MAR to the Purge.	Check IPC Wiring/ Connections
Purge: Loss of Comm with Starter	IFW	Purge	All	The purge module lost communications with the starter module for 15 contiguous seconds. a. IFW to the chiller, MAR to the Purge.	Check IPC Wiring/ Connections
Purge: Loss of Comm with Stepper	IFW	Purge	All	The purge module lost communications with the stepper module for 15 contiguous seconds. a. IFW to the chiller, MAR to the Purge.	Check IPC Wiring/ Connections
Purge: Loss of Comm with Options	IFW	Purge	All	The purge module lost communications with the chiller module for 15 contiguous seconds. a. IFW to the chiller, IFW to the Purge.	Check IPC Wiring/ Connections
Purge: Loss of Comm w/ Retrofit CLD	IFW	Purge	All	The purge module lost communications with the retrofit Human Interface module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Purge: Loss of Comm with Stepper #1	IFW	Purge	All	The purge module lost communications with the chiller module for 15 contiguous seconds. a. IFW to the chiller, MAR to the Purge.	Check IPC Wiring/ Connections
Purge: Loss of Comm with Stepper #2	IFW	Purge	All	The purge module lost communications with the chiller module for 15 contiguous seconds. a. IFW to the chiller, MAR to the Purge.	Check IPC Wiring/ Connections
<p>Purge Memory Error Type I: NOVRAM</p> <p>This diag. should be seen in both UCP2 and retrofit applications only.</p>	MMR	Purge	On Purge Power Up or following a Type II Memory error diag.	<p>a. On either Purge Module power up or following a Type II Memory Error, a NOVRAM memory error was detected. The Purge Module is operating on all Engineering Factory defaults for all setup parameters. Check all setup parameters and continue to run purge. Replace the Purge Module as soon as a replacement is available.</p> <p>Note: It is expected that this diagnostic will be detected on the very first power up of the Purge Module at the Manufacturer since the NOVRAM will not contain valid data on first power up.</p>	Purge Inop: See Purge O & M Manual
<p>Purge Memory Error Type II: Shadow RAM</p> <p>This diag. should be seen in retrofit applications only.</p>	IFW	Purge	All	<p>a. A Shadow RAM memory error was detected. The Purge Module is operating on all last valid values (pulled from NOVRAM) for all setup parameters. No setup parameter changes were pending to be loaded into NOVRAM, a complete recovery of all setup parameters was made and there is no need to check unit setup parameters. Purge pumpout times Compressor starts and hour were lost for not more than the last 24 hours. This is expected to be an isolated event and repair or replacement is not required. If this diagnostic does occur repeatedly, then replace the Purge module.</p>	No Setting Were Lost

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Purge Memory Error Type III <i>This diag. should be seen in retrofit applications only.</i>	IFW	Purge	All	a. A Shadow Ram memory error was detected. The Purge Module is operating on all last valid values (pulled from NOVRAM) for all setup parameters. Setup parameter changes less than 24 hours old pending to be loaded into NOVRAM were lost. Check all setup parameters made in the last 24 hours. Purge pumpout times Compressor starts and hours were lost for not more than the last 24 hours. This is expected to be an isolated event and repair or replacement is not required. If this diagnostic does occur repeatedly, then replace the Purge module.	Settings Changed in The Last 24 Hours Lost
Purge Memory Error Type IV	IFW	Purge	All	A page timeout error was detected while trying to write data into EEP Factory. There will likely be a recall of Engineering Factory defaults or a corruption of pumpout data on the next power transition. Replace the Purge Module as soon as a replacement is available.	See Purge O & M Manual
Purge Memory Error III <i>This diag will be seen in UCP2 applications of the Purge Module. This diag will not be seen in retrofit applications of the Purge Module. See also diag 385-387.</i>	IFW	Purge	All	a. A Shadow Ram memory error was detected. Compressor starts and hours were lost for not more than the last 24 hours. This is expected to be an isolated event and repair or replacement is not required. If this diagnostic does occur repeatedly, then replace the Purge module. This is an IFW diagnostic to both the Purge and Chiller.	No Settings Lost
Purge Misconfigured as Retrofit	IFW	Purge	All	The Purge module is configured as a Retrofit application instead of an UCP2 application. Chiller module remaps Purge Retrofit Only diagnostics to this diagnostic. Check Purge input J1 pins 5,6. Open = UCP2 application, Short = Retrofit application	See Purge O & M Manual
Purge Misconfigured as UCP2	IFW	Purge	All	The Purge module is configured as an UCP2 application instead of a Retrofit application. Check Purge input J1 pins 5,6. Open = UCP2 application, Short = Retrofit application	See Purge O & M Manual
Refrigerant Monitor Sensor	IFW-AR	Circuit	All	Open or Shorted input and the Rfgt Monitor is setup as installed at the Clear Language Display.	Check Sensor, Wiring, and Connections
Rfgt Monitor Memory Lost	IFW	Rfgt Mon	All	Refrigerant Monitor lost battery backed-up RAM. a. IFW to the chiller, MMR/MAR to the Refrigerant Monitor.	See Refrigerant Monitor IOM Manual
Rfgt Monitor IR Source	IFW	Rfgt Mon	All	Refrigerant Monitor infrared optical source failure. a. IFW to the chiller, MAR to the Refrigerant Monitor.	Check IR Source Wiring And Connections
Rfgt Monitor Chopper	IFW	Rfgt Mon	All	Refrigerant Monitor optical bench photo-interrupter failure. a. IFW to the chiller, MAR to the Refrigerant Monitor.	Check Chopper Wiring And Connections
Rfgt Monitor Temp Sensor	IFW	Rfgt Mon	All	Refrigerant Monitor bench temperature sensor failure. a. IFW to the chiller, MAR to the Refrigerant Monitor.	Check Sensor, Wiring, Connections
Rfgt Monitor Bench Flow Loss	IFW	Rfgt Mon	All	Air flow loss to the Refrigerant Monitor optical bench. a. IFW to the chiller, MMR/MAR to the Refrigerant Monitor.	See Refrigerant Monitor IOM Manual

<b>DIAGNOSTIC DESCRIPTION</b>	<b>Diag Type</b>	<b>Module that Called Diag.</b>	<b>Diag. Active Modes</b>	<b>CAUSE</b>	<b>Help Message</b>
Rfgt Monitor Scanner Flow Loss	IFW	Rfgt Mon	All	Air flow loss to the Refrigerant Monitor scanner. a. IFW to the chiller, MMR/MAR to the Refrigerant Monitor.	See Refrigerant Monitor IOM Manual
Rfgt Monitor Out Of Temp Range	IFW	Rfgt Mon	All	Out of temperature range for measuring refrigerant concentration.	Check Bench Heater, Wiring, Connections
Rfgt Monitor Refrig Level Too Low	IFW	Rfgt Mon	All	The Refrigerant Monitor read less than or equal to -5 ppm refrigerant concentration.	Recalibrate Refrigerant Monitor
Rfgt Monitor Fault	IFW	Rfgt Mon	All	A undefined diagnostic detected by the Refrigerant Monitor. a. IFW to the chiller, MMR to the Refrigerant Monitor.	See Refrigerant Monitor IOM Manual.
Rfgt Monitor Calibration Error (This diagnostic is currently ignored by UCP2)	IFW	Rfgt Mon	All	The Refrigerant Monitor calibration failed. a. IFW to the chiller, IFWMMR to the Refrigerant Monitor.	See Refrigerant Monitor IOM Manual
Rfgt Monitor Aux Input Error	IFW	Rfgt Mon	All	The Refrigerant Monitor auxiliary input is outside the 4-20 mA range.	Check Signal At Input
Rfgt Monitor External Reset	IFW	Rfgt Mon	All	The Refrigerant Monitor external reset switch (Normally Closed) is stuck in the "reset" state or the switch/jumper is missing.	See Refrigerant Monitor IOM Manual.
Rfgt Monitor Level 3 Rfgt Refrigerant Alarm	IFW	Rfgt Mon	All	The Refrigerant Monitor has read a refrigerant concentration greater or equal to the level 3 setpoint.	N/A
Rfgt Monitor Auxiliary Alarm	IFW	Rfgt Mon	All	The Refrigerant Monitor auxiliary input signal indicates an alarm condition.	N/A
Rfgt Monitor Level 2 Rfgt Refrigerant Alarm	IFW	Rfgt Mon	All	The Refrigerant Monitor has read a refrigerant concentration greater or equal to the level 2 setpoint.	N/A
Rfgt Monitor Level 1 Rfgt Refrigerant Alarm	IFW	Rfgt Mon	All	The Refrigerant Monitor has read a refrigerant concentration greater or equal to the level 1 setpoint.	N/A
<b>Safety String Input Opened***</b>	MMR	Scorpio	All	Safety string input opened on the Scorpio module	N/A
Severe Phase Unbalance	MMR	Starter	All Running Modes	a. A 30% Phase Unbalance diagnostic has been detected. Items to check are the Current Transformer Part Numbers (they should all match), The Current Transformer resistances, line voltage phase balance, all power wiring connections, the contactor pole faces, and the motor. If all these are OK, replace the Starter module.	Check Main Power Supply & Wiring
Solid State Starter Fault Rly Open	MMR	Starter	All Start and Run Mode	The SSS fault relay is open.	See Solid State Starter Service Bulletin, check for an open wire.
Soln Pump Winding Thermostat Open	MMR	Circuit	All	a. The motor winding temperature thermostat opened; nominally 230°F (110 °C). b. The motor temp. thermostat or wiring is open. c. Time to trip from input open to Solution Pump shutdown shall be 0.5 to 2.0 seconds.	Check Machine Operation

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Starter Contactor Interrupt Failure	MMR	Starter	Starter Contact not Energized (Starter Contact Energized)	a. Welded Starter contactor. b. Detected a welded compressor contactor when the compressor was commanded off but the current did not go to zero. Detection time shall be 5 second minimum and 10 seconds maximum for all Electromechanical and Solid State Starters. Detection time for Adaptive Frequency. Drives shall be 12 seconds minimum and 20 seconds maximum. On detection, generate the diagnostic, energize the appropriate alarm relay, continue to command the affected compressor off.	Complete Starter Checkout Required
Starter did not Transition	MMR	Starter	On the first check after transition.	a. The UCM did not receive a transition complete signal in the designated time from the UCM command to transition. The must hold time from the UCM transition command is 1 second. The Must trip time from the transition command is 6 seconds. Actual design is 2.5 seconds. b. Item a. above is active only for Y-Delta, Auto-Transformer, and Primary Reactor, and X-Line Starters.	Complete Starter Checkout Required
Starter Dry Run Test	MMR	Starter	Starter Dry Run Mode	While in the Starter Dry Run Mode either 50% Line Voltage was sensed at the Potential Transformers or 10% RLA Current was sensed at the Current Transformers.	Current or Voltage Detected
Starter Fault Type I	MMR	Starter	Starting	a. This is a specific starter test where 1M(2k1) is closed first and a check is made to ensure that there are no currents detected by the CT's. If currents are detected when only 1M is closed first at start, then one of the other contactors is shorted. b. This test applies only to factory installed Y-Delta Closed Transition Starters.	See Troubleshooting Service Bulletin
Starter Fault Type II	MMR	Starter	Starting	a. This is a specific starter test where the Shorting Contactor (S)(2K3) is individually energized and a check is made to ensure that there are no currents detected by the CTs. If current is detected when only S is energized at Start, then 1M is shorted. b. This test in a. above applies to all forms of starters (Note: It is understood that many starters do not connect to the Shorting Contactor.).	See Troubleshooting Service Bulletin
Starter Fault Type III	MMR	Starter	Starting	a. As part of the normal start sequence to apply power to the compressor the Shorting Contactor (S) and then the Main Contactor (1M) were energized. 1.6 seconds later there were no currents detected by the CT's for the last 1.2 Seconds on all three phases. b. This test in a. above applies to all forms of starters except Adaptive Frequency. Drives (Note: It is understood that many starters do not connect to the Shorting Contactor.). c. For Adaptive Frequency Drives, TBD	See Troubleshooting Service Bulletin
Starter: Loss of Comm with Circuit	MMR	Starter	All	The starter module lost communications with the Circuit module for 15 contiguous seconds.	Check IPC Wiring/ Connections

DIAGNOSTIC DESCRIPTION	Diag Type	Module that Called Diag.	Diag. Active Modes	CAUSE	Help Message
Starter: Loss of Comm with Chiller	MMR	Starter	All	The starter module lost communications with the Chiller module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Starter Mod Ref Voltage Calibration	IFW	Starter	All	An improper reference voltage was detected at the Starter Module. A 2.5 vdc reference is used to calibrate the non-ratiometric analog I/O such as 2-10vdc and 4-20ma inputs as well as PWM Analog outputs. The micro checks to see that the A/D value falls within an acceptable range.	See Troubleshooting Service Bulletin
Stepper #1:Loss of Comm with Starter	MMR	Stepper	All	The Stepper #1 module lost communications with the Starter module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Stepper #1:Loss of Comm with Chiller	MMR	Stepper	All	The Stepper #1 module lost communications with the Chiller module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Surge Shutdown: Ice Building	MAR	Starter	All Ice Building Modes	An extended Surge condition was detected while in Ice Building Mode. This diagnostic shall clear when the Ice Building command is withdrawn.	See Troubleshooting Service Bulletin
TCI: Loss of Comm with Purge	IFW	TCI	All	The TCI module lost communications with the Purge module for 15 contiguous seconds.	Check IPC Wiring/ Connections
TCI: Loss of Comm with Starter	IFW	TCI	All	The TCI module lost communications with the Starter module for 15 contiguous seconds.	Check IPC Wiring/ Connections
TCI: Loss of Comm with Options	IFW	TCI	All	The TCI module lost communications with the Options module for 15 contiguous seconds.	Check IPC Wiring/ Connections
TCI: Loss of Comm with Circuit	IFW	TCI	All	The TCI module lost communications with the Circuit module for 15 contiguous seconds.	Check IPC Wiring/ Connections
TCI: Loss of Comm with Chiller	IFW	TCI	All	The TCI module lost communications with the Chiller module for 15 contiguous seconds.	Check IPC Wiring/ Connections
TCI: Loss of Comm with Stepper #1	IFW	TCI	All	The TCI module lost communications with the Stepper #1 module for 15 contiguous seconds.	Check IPC Wiring/ Connections
Tracer Communications Lost	IFW	TCI	All	The Tracer was setup as "installed" at the CLD and the TCI lost communications with the Tracer for 15 contiguous minutes after it had been established. Continue to run the chiller with the last valid Tracer Setpoints/Mode.	Check Tracer to UCP Wiring/ Connections
Tracer failed to Establish Comm	IFW	TCI	At power-up	The Tracer was setup as "installed" at the CLD and the Tracer did not communicate with the TCI within 2 minutes after power-up.	Check Tracer Wiring/ Connections/ Power
Tracer Outdoor Air Temp Sensor Fail	IFW	Chiller	All		Check Sensor, Wiring, and Connections
Tracer Temperature Sensor	IFW	Options	All	Input Shorted.	Check Sensor, Wiring, and Connections
Transition Complete Input Shorted	MMR	Starter	Pre-Start	a. The Transition Complete input was found to be shorted before the compressor was started. b. This is active for all electromechanical starters.	Check transition complete contact

<b>DIAGNOSTIC DESCRIPTION</b>	<b>Diag Type</b>	<b>Module that Called Diag.</b>	<b>Diag. Active Modes</b>	<b>CAUSE</b>	<b>Help Message</b>
Transition Complete Input Opened	MMR	Starter	All Running Modes	a. The Transition Complete input was found to be opened with the compressor motor running after a successful completion of transition. b. This is active only for Y-Delta, Auto-Transformer, and Primary Reactor Starters.	Complete Starter Checkout Required
Under Voltage	MAR	Starter	Pre-Start and Any Ckt(s) Energzd	a. Line voltage below - 10% of nominal or the Under/Overvoltage transformer is not connected. (Must hold = - 10% of nominal. Must trip = - 15% of nominal. Reset differential = min. of 2% and max. of 4%. Time to trip = min. of 1 min. and max. of 5 min.)	Check Main Power Supply & Wiring

NOTE: For FastPak, the "module that called the diagnostic" is Scorpio if Circuit or Stepper is listed

\*\*\* FastPak-only Diagnostic

# FastPak™ “Settings Group” Menu Record

## Operator Settings Group:

	<i>Menu item</i>	<i>Choices</i>	<i>Default</i>	<i>Design/Actual</i>
1	<i>Purge Operating Mode</i>	<i>Stop, On, Auto, Adaptive</i>	<i>Auto</i>	
2	<i>Front Panel Chilled Wtr Setpt</i>	<i>0-65 Deg F, -17.8-18.3 Deg C</i>	<i>44.0 °F, 6.7 °C</i>	
3	<i>Front Panel Current Limit Setpt</i>	<i>40 to 100%</i>	<i>100%</i>	
4	<i>Chilled Water Reset Type</i>	<i>Return, Constant Return, Disable</i>	<i>Disable</i>	
5	<i>Reset Ratio</i>	<i>10 to 120%</i>	<i>50%</i>	
6	<i>Start Reset Setpoint</i>	<i>4 to 30 °F, 2.2 to 16.7 °C</i>	<i>10 °F, 5.6 °C</i>	
7	<i>Max Reset Setpoint</i>	<i>0 to 20 °F, 0.0 to 11.1 °C</i>	<i>5 °F, 2.8 °C</i>	
8	<i>Ice Building</i>	<i>Disable, Enable</i>	<i>Disable</i>	
9	<i>Panel Ice Termination Setpoint (Displayed if Ice Building Enabled)</i>	<i>20 to 32 °F, -6.7 to 0 °C</i>	<i>27 °F, -2.8 °C</i>	
10	<i>Ice to Normal Cooling Timer (Displayed only if Ice Building Option™ is installed)</i>	<i>0 to 10 mm.</i>	<i>5 minutes</i>	
11	<i>Chilled Water Setpoint Source</i>	<i>Front Panel, External Source, Future 1, Future 2</i>	<i>Front Panel</i>	
12	<i>Current Limit Setpoint Source</i>	<i>Front Panel, External Source, Future 1, Future 2</i>	<i>Front Panel</i>	
13	<i>Ice Termination Setpoint Source (Displayed only if “Ice Building Option” is installed)</i>	<i>Front Panel, Future 1, Future 2, Future 3</i>	<i>Front Panel</i>	
14	<i>Setpoint Source Override</i>	<i>None, Use Front Panel Setpoints, Override Tracer-Use Default Setpoints (available only if Tracer Option is installed)</i>	<i>None</i>	

# FastPak™ “Settings Group” Menu Record

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## Service Settings Group: Basic Setups

	<i>Menu Item</i>	<i>Choices</i>	<i>Default</i>	<i>Design/Actual</i>
1	<i>Language</i>	<i>English, Francais, Deutch, Espanol, Nippon, Italiano, Nederland, Portuguese, Coded</i>	<i>English</i>	
2	<i>Display Units</i>	<i>English, SI XXX.X, XXX</i>	<i>English</i>	
3	<i>Decimal Places Displayed</i>		<i>XXX.X</i>	
4	<i>Display Menu Headings</i>	<i>Enable, Disable</i>	<i>Enable</i>	
5	<i>Differential To Start Setpoint</i>	<i>1 to 10 °F, 0.5 to 5.5 °C</i>	<i>5 °F, 2.8 °C</i>	
6	<i>Differential To Stop Setpoint</i>	<i>1 to 10 °F, 0.5 to 55 °C</i>	<i>5 °F, 2.8 °C</i>	
7	<i>Evap Pump Off Delay</i>	<i>0 to 30 Minutes</i>	<i>1 Minute</i>	
8	<i>Printer Setups</i>			
	<i>Print Time Interval</i>	<i>Enable, Disable</i>	<i>Enable</i>	
	<i>Print on Time Interval</i>	<i>1 to 24 hrs.</i>	<i>8 hrs.</i>	
	<i>Print on Diagnostic</i>	<i>Enable, Disable</i>	<i>Enable</i>	
	<i>Number of Pre-Diag Reports</i>	<i>1 to 5</i>	<i>5</i>	
	<i>Diagnostic Report Interval</i>	<i>2 to 120 seconds</i>	<i>5 seconds</i>	
	<i>Printer, Baud Rate</i>	<i>300, 4800, 1200, 9600, 2400, 19,200</i>	<i>9600</i>	
	<i>Printer, Parity</i>	<i>None, Odd, Even</i>	<i>None</i>	
	<i>Printer, Data Bits</i>	<i>8,7</i>	<i>8</i>	
	<i>Printer, Stop Bits</i>	<i>1,2</i>		
	<i>Printer, Handshaking</i>	<i>XON/XOFF, DTR, RTS, None</i>	<i>XON/XOFF</i>	

# FastPak™ “Settings Group” Menu Record

## Field Startup Group:

	<b>Menu item</b>	<b>Choices</b>	<b>Default</b>	<b>Design/Actual</b>
1	Keypad/Display Lock Feature Enable	Disable, Enable	Disable	
2	Menu Settings Password Enable	Disable, Enable	Disable	
3	ICS Address:	1 to 127	65	
4	Power Up Start Delay Time	0 to 60 °Seconds	0 Seconds	
5	Design Delta Temp Setpoint:	4 to 30 °F, 2.2 to 16.7 °C	100 °F, 5.5 °C	
6	Lvg Wtr Temp Cutout Setpoint: (When this setpoint is within 1.7 °F of the Front Panel Chilled Water Setpoint, the Front Panel Chilled Water Setpoint is increased along with this setpoint to maintain the differential)	-10 to 360 °F, -23.2 to 2.2 °C	36 °F, 2.2 °C	
7	Low Rfqt Temp Cutout Setpt: (When this setpoint is within 6 °F of the Front Panel Chilled Water Setpoint, the Front Panel Chilled Water Setpoint is increased along with this setpoint to maintain the differential.)	-35 to 360 °F, -37.2 to 2.2 °C	32 °F, 0.0 °C	
8	Condenser Limit Setpoint:	80 to 120%	93%	
9	Maximum RI Timer Setting	30 to 60 Minutes	60 Minutes	
10	Purge Control/Type:	Micro Purge, Stand-Alone Purge	Micro Purge	
11	Purge Max Pumpout Rate:	1 to 100 minutes/24 hrs	20 Minutes /24 Hours	
12	Purge Service Excessive Pumpout Override Timer	1 to 72 Hours	0 Hours	
13	Prg Low Liq Temp Inhibit	Enable, Disable	Disable	
14	Prg Low Liq Temp Inhibit Setpt: (Does not display unless above feature = Enable")	32 to 50 °F, 0.0 to 10 °C	40 °F, 4.4 °C	
15	Surge Protection:	Disable, Enable	Enable	
16	Under/Over Voltage Protection: (Permits "Enable only if Option Installed)	Disable, Enable	Enable	
17	Phase Reversal Protection:	Disable, Enable	Enable	
18	Phase Unbalance Protection:	Disable, Enable	Enable	
19	Momentary Power Loss Protection:	Disable, Enable	Enable	
20	Enhanced Oil Temp Protection	Disable, Enable	Enable	
21	Oil Temp Setpoint:	100 to 160 °F, 37.8 to 71.1 °C	143.5 °F, 61.9 °C	
22	Low Oil Temp Cutout:	80 to 140 °F, 26.7 to 60 °C	95 °F, 35 °C	
23	High Discharge Temp Cutout:	170 to 220 °F, 76.6 to 104.4 °C	200 °F, 93.3 °C	
24	Soft Load Control:	Disable, Enable	Disable	
25	Soft Load Starting current Limit:	40 to 100%	100%	
26	Soft Load Current Limit Rate:	0.5 to 5.0% /Minute	5.0% /Minute	
27	Soft Load Lvg Water Rate:	0.5 to 5.0 °F/Minute 0.3 to 2.8 °C/Minute	5.0 °F/Minute 2.8 °C/Minute	

28	Hot Gas Bypass Control	Disable, Enable	Enable	
29	HGBP Timer	Disable, Enable; Unlimited Time	Enable	

	Menu Item	Choices	Default	Design/Actual
30	Maximum HGBP Time (Displayed only if HGBP is installed and HGBP Timer is enabled)	1 to 480 minutes	30 minutes	
31	HGBP Vane Position	0 to 30%	10%	
32	LWT Proportional Gain Setpoint	0 to 100%/ °F 0 to 180%/ °C	10%/ °F 18%/ °C	
33	LWT Integral Gain Setpoint	0 to 1%/ °F 0 to 1.8%/ °C	0.1 10%/ °F 0.198%/ °C	
34	LWT Derivative Gain Setpoint	0 to 10%/ °F 0 to 18%/ °C	0.00%/ °F 0.00%/ °C	
28	IGV MAXIMUM Travel Setpt:	0 to 60,000 Steps	50,000 Steps	
29	Guide Vane Closed Travel Stop	0 to 100%	0%	
30	AF Adjustable Speed Control Algorithm	Disable, Enable	Enable	
31	AF Leaving Water Standard Deviation	0.5 to 4.0	1.0	
32	AF Pressure Coefficient Constant	0 to 2000	800	
33	AF Re-Optimization Factor	0.03 to 1.00	0.30	
34	AF Re-Optimization Timer	1 to 255	24	
35	AF Boundary PC Y-Intercept	0.01 to 2.00	0.40	
36	AF Boundary PC Y-Intercept Maximum	0.01 to 2.00	2.00	
37	AF Pressure Error Deadband	0.001 to 1.000	0.030	
38	AF Proportional Speed Gain	1 to 100	50	
39	Minimum Capacity Timer	Disable, Enable; Unlimited Time	Enable	
40	Time Permitted at Mm Cap	1 to 480 minutes	30 minutes	
41	Local Atmospheric Pressure	10 to 16 psig 68.9 to 110.3 kPa	14.7 psig 101.3 kPa	
42	Mm Delta Press Calib (2 VDC)	0 to 400 psid 0 to 2758 kPa	0 psid 0 kPa	
43	Max Delta Press Calib (10 VDC)	1 to 400 psid 7 to 2758 kPa	30 psid 207 kPa	
44	Inlet Guide Vane Stroke Time	15 to 100 seconds	45 seconds	
45	Low Diff Oil Pressure Cutout	9 to 35 psid 62 to 241 kPa	12 psid 64 kPa	
46	Pre Lube Setpt	20 to 60 seconds	60 seconds	
47	Post Lube Setpt	30 to 420 seconds	180 seconds	
48	Check Oil Filter Diagnostic	Disable, Enable	Disable	
49	Check Oil Filter Setpt	Diag Disabled, 9 to 60 psid, 62 to 414 kPa	15 psid, 103 kPa	

# FastPak™ “Settings Group” Menu Record

## Machine Configuration Group:

	Menu Item	Choices	Default	Design/Actual
1	Unit Frequency	60 HZ, 50 HZ	60 HZ	
2	Unit Type	CVHE & CVHG, CVHF, CVHB, CVGE, CVAE, FastPak Water Cooled, FastPak Air Cooled	CVHE	
3	Nominal Unit Tons	100 to 1800 Tons	300 Tons	
4	Refrigerant Type	R114, R500, R502	R123	
5	Refrigerant Monitor Type	None, PC	None	
6	Starter Type	Undefined, Adaptive Frequency, Y-Delta, X-Line, Solid State, Auto, Transformer, Primary Reactor, AFDB, SMCDP, Stand Alone No Str Module	Y-Delta	
7	Level 2 Contactor Integrity Test (Startup Contactor Test-Y-D only)	Disable, Enable (Not available on any FastPak models)	Disable	
8	Rated Load Amps	0 to 2,500	500	
9	Motor Heating Constant	0 to 100 Minutes	25 Minutes	
10	Current Overload Setting #1 (See Manual for Setup Procedure)	00 to 31	00	
11	Current Overload Setting # 2 (See Manual for Setup Procedure)	224 to 255	255	
12	Maximum Accel Time Setpt# 1 (See Manual for Recommend Setpt)	6 to 64 Seconds	27 Seconds	
13	(255 Minus Timer Setpt #1 above)	191 to 249 Seconds	226 Seconds	
14	Heatsink Start Inhibit Temperature Setpoint	100.0 to 200.0 °F (37.8 to 93.3 °C), in increments of 0.1 °F/°C	100 °F (93.3 °C)	
15	External Chilled Wtr Setpoint	Installed, Not Installed	Not Installed	
16	External Current Limit Setpt	Installed, Not Installed	Not Installed	
17	Acceleration Time Out Action	Shutdown, Transition	Shutdown	
18	Motor Temp Protection	3 Winding Sensors, MTC Switch	3 Winding Sensors	
19	Motor Winding RTD Type	100 Ohm/ 0 °C, 75 Ohm/ 75 °C	75 Ohm /75 °C	
20	High Pressure Cutout setting	-5 to 500 PSIG	15 PSIG for standard unit 25 PSIG for ASME unit	
21	Line Voltage Sensing Option	Installed, Not Installed	Not Installed	
22	Unit Line Voltage	180 to 6600	460	
23	Hot Gas Bypass Option	Installed, Not Installed	Not Installed	
24	Condenser Press. Sensor Option	Installed, Not Installed	Not installed	
25	Bearing Temp Sensors Option	Installed, Not Installed	Not installed	
26	Discharge Temp Sensor Option	Installed, Not Installed	Not installed	
27	Ice Building Option	Installed, Not Installed	Not installed	
28	External Analog Inputs	4-20 mA, 2-10 VDC	4-20 mA	
29	Tracer Option	Installed, Not Installed	Not Installed	
30	TCI Option	Installed, Not Installed	Not Installed	

# FastPak™ “Settings Group” Menu Record

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## Machine Configuration Group:

	<i>Menu Item</i>	<i>Choices</i>	<i>Default</i>	<i>Design/Actual</i>
31	<i>Printer Option</i>	<i>Installed, Not Installed</i>	<i>Not Installed</i>	
32	<i>Duplex Control Module (DCM) Option</i>	<i>Installed, Not Installed</i>	<i>Not Installed</i>	
33	<i>IGV Output Type</i>	<i>Stepper Motor, Pulsed</i>	<i>Stepper Motor</i>	
34	<i>Oil Pressure Protection</i>	<i>Xducer; Diff Switch</i>	<i>Xducer</i>	
35	<i>Programmable Analog Output</i>	<i>Not Used;% RLA;% Cond Press; Refrig Diff Press</i>	<i>% RLA</i>	
36	<i>Program Relay [N] where [N] = 1, 2 or 3</i>	<i>Not Used; Comp Running; MMR Alarm; MAR Alarm; MMR + MAR Alarm; Limit Warning; Ice Making; Head Relief Request; Tracer Controlled; Max Capacity</i>	<i>1 = MMR + MAR Alarm 2 = Comp Running 3 = Not Used</i>	
37	<i>Current Transducer</i>	<i>Cutler Hammer, Other</i>	<i>Cutler Hammer</i>	
38	<i>Current Transducer at 100% RLA (Displayed only if Current Transducer is set to "Other")</i>	<i>-10.0 to -5.0 VDC in 0.1 VDC Increments</i>		
39	<i>Outdoor Air Temp Sensor</i>	<i>Installed, Not Installed</i>	<i>Installed</i>	

# FastPak™ “Settings Group” Menu Record

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## Refrigerant Monitor Settings Group:

	<i>Menu item</i>	<i>Choices</i>	<i>Design/Actual</i>
1	Alarm Level 1		
2	Alarm Level 2		
3	Alarm Level 3		
4	Refrigerant Audible Alarm	Disable, Alarm 1, Alarm 2 Alarm 3	
5	Trouble Audible Alarm	Disable, Enable	
6	Alarm 1 Latching Status	Latching, Non-Latching	
7	Alarm 2 Latching Status	Latching, Non-Latching	
8	Alarm 3 Latching Status	Latching, Non-Latching	
9	Channel Scanner (Displayed only when refrigerant monitor mode is in "Warm-up".)	Installed, Not Installed	
10	Scanner Channel 1	Active, Inactive	
11	Scanner Channel 2	Active, Inactive	
12	Scanner Channel 3	Active, Inactive	
13	Scanner Channel 4	Active, Inactive	
14	Scanner Dwell Threshold	30 to 70	
15	Auxiliary Input	Installed, Not Installed	
16	Auxiliary Input Alarm	Disable, Enable	
17	Auxiliary Input Alarm Level	4.0 to 20.0	
18	Auxiliary Input Alarm Direction	Above, Below	
19	Auxiliary Input Audible Alarm	Off, On	
20	Analog Output Range	0 to 100, 0 to 1000	

# FastPak™ “Settings Group” Menu Record

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## Service Tests Group:

	<b>Menu item</b>	<b>Choices</b>	<b>Default</b>	<b>Design/Actual</b>
1	<i>Chilled Water Pump</i>	<i>Auto, On</i>	<i>Auto</i>	
2	<i>Condenser Water Pump</i>	<i>Auto, On</i>	<i>Auto</i>	
5	<i>Starter Dry Run: (Starter Dry Run Contactor Test - Y - D Only)</i>	<i>(Not available on any FastPak models)</i>	<i>Disabled</i>	
6	<i>Oil Pump (Set to Differential Transducer)</i>	<i>Auto, On</i>	<i>Auto</i>	
7	<i>Oil Pump (Set to Differential Switch)</i>	<i>Auto, On</i>	<i>Auto</i>	
	<i>Vane Control Status Vane Position Commands (Displayed when "Inlet Guide Vane Output" is set to "Stepper Motor".)</i>	<i>Manual, Auto</i>	<i>Auto</i>	
8	<i>Vane Control Status Vane Position Commands (Displayed when "Inlet Guide Vane Output" is set to "Pulsed".)</i>	<i>Auto, Hold, Load, Unload</i>	<i>Auto</i>	
9	<i>Manual Loading/Unloading Duty Cycle</i>	<i>0 to 50%</i>	<i>30%</i>	
10	<i>HGBP Valve Control is</i>	<i>Auto, Open, Close</i>	<i>Auto</i>	
11	<i>HGBP Valve Opening /Closing Duty Cycle (Displayed when "Inlet Guide Vane Output" is set to "Pulsed".)</i>	<i>0 to 50%</i>	<i>30%</i>	



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