



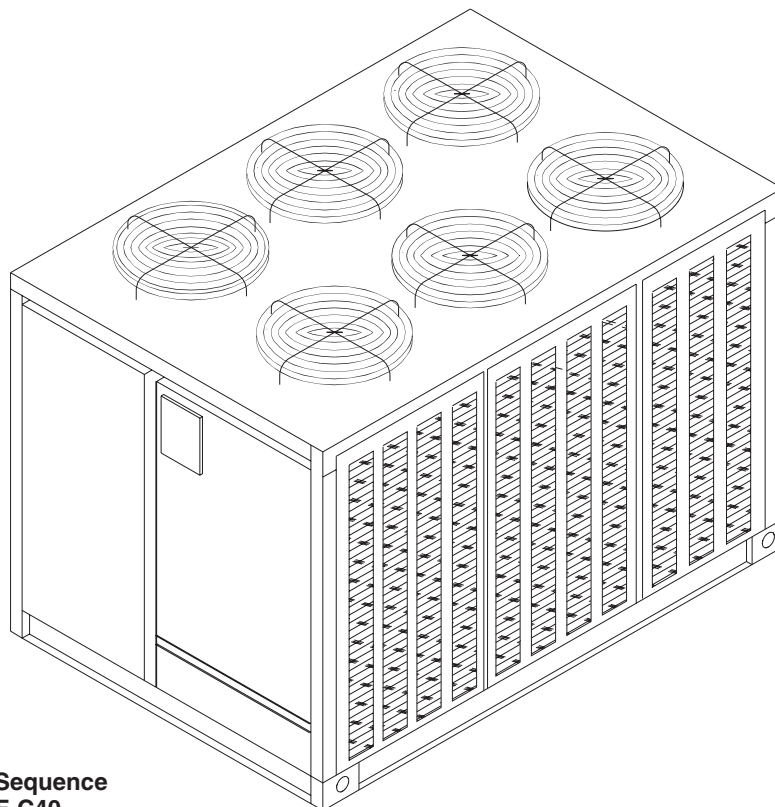
**TRANE®**

# Programming Troubleshooting Guide

**CG-SVP01B-EN**

Library	Service Literature
Product Section	Refrigeration
Product	Hermetic Scroll Liquid Chillers, Air Cooled
Model	CG
Literature Type	Programming, Trouble Shooting Guide
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## IntelliPak™ Air-Cooled Cold Generator



### Models

"H" and Later Design Sequence

CGAF-C20	CGAF-C40
CGAF-C25	CGAF-C50
CGAF-C30	CGAF-C60

With 3-D™ Scroll Compressors

Trane has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice. Only qualified technicians should perform the installation and servicing of equipment referred to in this publication.

## About The Manual

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### Literature Change History

#### CG-SVP01B-EN (January 2005)

Original issue of this manual; provides specific programming, diagnostic, and troubleshooting information CGAF units with “K” and later design sequence.

### Overview of Manual

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***Note: One copy of this document ships inside the control panel of each unit and is customer property. It must be retained by the unit's maintenance personnel.***

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These units are equipped with electronic control modules which provides operating functions that are significantly different than conventional units.

The manual is divided into 6 sections. Each section provides the operator with specific information about the system operating parameters and their related screens. By carefully following the screen layout within this manual while scrolling through the Human Interface, the operator can monitor operating status, set specific operating parameters, and diagnose system problems.

Before attempting to operate or service this equipment, refer to the “Start-Up” and “Test Mode” procedures in the applicable Installation, Operation and Maintenance manual, listed on the unit nameplate.

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***Note: The procedures discussed in this manual should only be performed by qualified, experienced HVAC technicians.***

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Refer to the Table of Contents and Index for specific topics contained in this manual and supporting manuals.

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# General Information

## Model Number Description

All Trane products are identified by a multiple-character model number that precisely identifies a particular type of unit. An explanation of the alphanumeric identification code is provided below. Its use will enable the owner/operator, installing contractors, and service engineers to define the op-

eration, specific components, and other options for any specific unit.

When ordering replacement parts or requesting service, be sure to refer to the specific model number, serial number, and DL number (if applicable) stamped on the unit nameplate.

**Sample Model Number:** CGAF - C30 4 A A B 0 D etc.  
**Digit Number:** 1,2,3,4 5,6,7 8 9 10 11 12 13 +

**Digit 1,2 - Unit Function**  
 CG = Cold Generator

**Digit 9 - Heating Capacity**  
 A = Standard

**Digit 13, etc. Miscellaneous**  
 A = Communications Interface (TCI)  
 B = No Unit Heat Tape (50 Hz Units Only)  
 C = Compressor Current Sensing (CSM)  
 D = Non-Fused Unit-Mounted Disconnect  
 E = \*Unit Isolators - Neoprene P/S  
 F = \*Unit Isolators - Spring P/S  
 G = Superheat / Subcooling  
 H = Hot Gas Bypass  
 J = Generic BAS Module 0-5 VDC Input, Binary O.P  
 K = Stock Unit  
 L = LonTalk® Communication Interface Module  
 M = \*Remote Human Interface  
 N = Generic BAS Module 0-10 VDC Analog Output  
 P = Remote Setpoint Potentiometer P/S  
 Q = \*Zone Sensor (Chilled Solution Reset) P/S  
 S = Special  
 V = Copper Fin Condenser Coil  
 W = \*\*Electronic Low Ambient Dampers P/S  
 Y = \*Inter-Processor Comm Bridge (IPCB)  
 9 = Packed Stock Unit  
 \* = Field Installed Options  
 \*\* = Factory or Field Installed Option  
 \*\*\* Available on Pack Stock Units

**Digit 3 - Unit Type**  
 A = Air-Cooled Condenser

**Digit 10 - Design Sequence**  
 H = Brazed Plate Chiller

**Digit 4 - Development Sequence**  
 F = Sixth

**Digit 11 - Leaving Water Setpoint**

A = 40 - 50 F w/o Ice Machine  
 B = 30 - 39 F w/o Ice Machine  
 D = 51 - 65 F w/o Ice Machine  
 E = 20 - 29 F w/o Ice Machine  
 1 = 40 - 50 F w Ice Machine  
 2 = 30 - 39 F w Ice Machine  
 3 = 51 - 65 F w Ice Machine  
 4 = 20 - 29 F w Ice Machine  
 S = Special

**Digit 5,6,7 - Nominal Capacity**  
 C20 = 20 Tons  
 C25 = 25 Tons  
 C30 = 30 Tons  
 C40 = 40 Tons  
 C50 = 50 Tons  
 C60 = 60 Tons

**Digit 8 - Power Supply**  
 E = 200/60/3 P/S\*\*\*  
 F = 230/60/3  
 4 = 460/60/3 P/S\*\*\*  
 5 = 575/50/3  
 9 = 380/50/3  
 D = 415/50/3  
 S = Special

**Digit 12 - Agency Approval**  
 0 = None  
 1 = UL/CSA

### Unit Nameplate

One Mylar unit nameplate is located on the outside upper left corner of the control panel door. It includes the unit model number, serial number, electrical characteristics, weight, refrigerant charge, as well as other pertinent unit data. A small metal nameplate with the Model Number, Serial Number, and Unit Weight is located just above the Mylar nameplate, and a third nameplate is located on the inside of the control panel door.

### Hazard Identification



**WARNING** – Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION** – Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

**CAUTION** - Indicates a situation that may result in equipment or property damage only accidents.

### Commonly Used Acronyms

For convenience, a number of acronyms and abbreviations are used throughout this manual. These acronyms are alphabetically listed and defined below.

A/D = Analog/Digital  
 BAS = Building Automation System  
 CAR = Circuit shutdown - Auto Reset  
 Cf = Evaporator limit control integrator  
 CGA = Air cooled - Cold Generator  
 UCM = Cold generator module. Contains I/O for most chilled solution functions.  
 Comp(s) = compressor(s)  
 Cond = condenser  
 Ckt = circuit  
 CLE = Chilled solution flow integrator  
 CMR = Circuit shutdown - Manual Reset  
 CRS = Control response setpoint  
 CSA = Canadian Standards Association  
 CCW = counterclockwise  
 CW = clockwise  
 DBZ = Width of Dead Band Zone  
 DDT = Design Delta-T setpoint  
 Delta T = The temperature difference between EST & LST  
 Diag = diagnostics  
 EST = Entering solution temperature  
 Ent = Entering

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# General Information

Evap = Evaporator  
Ext = External  
GBAS = Generic Building Automation System Module  
gfm = gallons per minute  
HGBP = Hot gas bypass  
HI = Human Interface  
HO = History Only  
HSLLS = Hot Start Load Limit setpoint  
HVAC = Heating, Ventilation and Air Conditioning  
IAR = Information only Auto Reset  
IBTS = Ice Build Terminate Setpoint  
ICS = Integrated Comfort System  
IFW = Informational Warning  
INFO = Information Only [Diagnostic]  
I/O = Inputs/outputs  
IOM = installation/operation/maintenance manual  
IPC = Interprocessor communications  
IPCB Module = Interprocessor communications bridge module  
IRDT = Ice Rebuild Delay Timer  
LCD = Liquid Crystal Display  
LCI = LonTalk® Communication Interface  
LCI-I = LonTalk® Communication Interface for Intellipak  
LED = Light Emitting Diode  
LH = left-hand  
LonTalk = An open, device networking communications protocol for controls. This protocol is defined in ANSI approved standard EIA/CEA-709.1-A-1999.  
LSC = Low Solution Temperature Cutout Setpoint  
LPC = Low Pressure Cutout [Switch]  
LST = Leaving solution temperature  
MAR = Machine shutdown - Auto Reset  
Max = maximum  
MCM = Multiple circuit compressor module  
Min = minimum  
Misc = miscellaneous  
MMR = Machine shutdown - Manual Reset  
Mod = module  
Mon = monitor  
NCS = Number of capacity steps  
num = number  
OA = Outdoor air  
OAT = Outdoor air Temperature  
PAR = Partial System Disable, Auto Reset [Diagnostic]  
PMR = Partial System Disable, Manual Reset [Diagnostic]  
PRT = Pump Run Timer  
PSIG = pounds-per-square-inch gauge pressure  
PWM = Pulse width modulated  
RAM = Random Access Memory  
RTM = rooftop module  
ROM = Read Only Memory  
S/W = Software  
Sat - saturated  
SCM = single circuit compressor module  
SCT = Saturated Condensing Temperature  
Soln = solution  
STP = setpoint  
TCI Module = Trane communications interface module  
Temp = temperature  
UCM = Unit Control Modules  
UL = Underwriter's Laboratories  
VFD = Variable Frequency Drive  
w.c. = water column  
XL = across-the-line start

## Glossary of Terms

Carefully review these definitions since they are used throughout this document and the I.O.M.. Knowledge of these terms is essential in gaining an understanding of how these units operate.

### Active Setpoint

The setpoint which is currently being used for control by the setpoint source selection.

### Comm3

Trane proprietary network communication protocol.

### Comm5

Trane's implementation of LonTalk (an open network communication protocol.)

### Chilled Solution Temperature Reset

A function that shifts the Leaving Solution Temp Setpoint an amount based on the value of another parameter—typically ZoneTemp, Entering Solution Temp or Outdoor Air Temp. The purpose of this function is to lower unit capacity to better meet load requirements.

### Compressor Protection Switch

A pressure switch installed on the suction line that prevents compressor operation below the switch's setpoint.

### Control Band

The range of temperatures or pressures which would normally be maintained by the various control functions.

### Control Point

The value of a setpoint that an algorithm is using at any given time.

### Deadband

As applied to LST control, this refers to a range of temperatures equally spaced above and below the CSS in which the control algorithm is satisfied. There is not adjustment of machine capacity within the deadband.

### Emergency Stop

UCM binary input. Can be used for emergency shutdown of the unit by field-installed contacts. A diagnostic is produced when this input is open.

### External Auto/Stop

A binary input on the UCM that allows the use of a field-supplied switch to perform normal unit on/off action.

### Leaving Solution Setpoint

Active leaving solution setpoint. This setpoint is the control setpoint for process and comfort cooling.

### Leaving Solution Temperature Control Point

The revised temperature setpoint after chilled solution temp reset has been applied.

### LonTalk®

An open, device networking communications protocol for controls. This protocol is defined in ANSI approved standard EIA/CEA-709.1-A-1999.

### Low Ambient Compressor Lockout

A function which prevents compressor operation at low outdoor ambient temperatures.

### Remote Human Interface

A human interface module designed to be mounted remotely from the unit. There will be some functional differences between a unit mounted and a remote mounted human interface module.

### Reset Amount Maximum

The maximum amount of reset allowed.

### Reset End Temperature

The temperature at which the maximum reset amount will occur.

### Reset Start Temperature

The temperature at which reset will begin.

### Unit Control Module

This term is used to describe the set of electronic modules which make up the unit control system.

# General Information

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## UCM Control System

Trane Large Commercial Cold Generator Units are controlled by a microelectronic control system that consists of a network of modules and are referred to as Unit Control Modules (UCM).

The unit size, peripheral devices, options, etc... determine the number and type of modules that a particular unit may employ.

The UCM receives analog and binary inputs, then processes this information and supplies outputs in the form of modulating voltages, contact closures, etc... to control damper actuators, fan motors, compressors, valves, and other electrical devices in the system to maintain set temperature levels.

The UCM provides some equipment protection functions both directly and indirectly, such as chilled water flow and compressor lockouts.

Listed below are the various modules that may be employed in a UCM control system.

### **Cold Generator Module (1U48) (CGM - Standard)**

The Cold Generator Module (CGM) responds to cooling requests by energizing the proper unit components based on information received from other unit modules, sensors, remote panels, and customer supplied binary inputs. It initiates unit operation based on that information.

### **Compressor Module (1U49) (MCM)**

The Compressor module, (Single Circuit & Multiple Circuit), upon receiving a request for mechanical cooling, energizes the appropriate compressors and condenser fans. It monitors the compressor operation through feedback information it receives from various protection devices. It also provides heat tape output control for heat exchanger protection.

### **Interprocessor Communications Board (1U55) (IPCB - used with Optional Remote Human Interface)**

The Interprocessor Communication Board expands communications from the unit's UCM network to a Remote Human Interface Panel. DIP switch settings on the IPCB module for this application should be; Switches 1 and 2 "Off", Switch 3 "On".

### **Trane Communications Interface Module (1U54) (TCI - Optional - used with Trane ICS™)**

The Trane Communication Interface module expands communications from the unit's UCM network to a Trane Tracer 100™ or a Tracer Summit™ system and allows external setpoint adjustment and monitoring of status and diagnostics.

DIP Switch settings on the TCI module for these applications should be:

Switches 1, 2, and 3 are "Off"

### **Generic Building Automation System Module (1U51 = GBAS 0-5V, 1U98 = GBAS 0-10V) (Optional - used with Non-Trane Building Control System)**

The Generic Building Automation System (GBAS) module allows a non-Trane building control system to communicate with the unit and accepts external setpoints in form of analog inputs (0 - 5 DCV or 0 - 10 DCV depending on the module selected) and a binary Input for demand limit. Five (5) binary outputs are available on 0 - 5 DCV modules. One (1) binary output and four (4) analog outputs are available on the 0 - 10 DCV modules. Refer to the "Field Installed Control Wiring" section for the control wiring to the GBAS module and the various desired setpoints with the corresponding DC voltage inputs.

### **Lontalk Communication Interface Module (1U54)**

(LCI Optional - used on units with Trane ICS™ or 3rd party Building Automation Systems)

The LonTalk Communication Interface module expands communications from the unit's UCM network to a Trane Tracer Summit™ or a 3rd party building automation system, that utilizes LonTalk, and allows external setpoint and configuration adjustment and monitoring of status and diagnostics.

### **Current Sensing Module (1U90) (CSM - Optional)**

Current transformers located around two (2) of the main power leads for each compressor monitors the running current during compressor operation. The information is sent to the UCM and can be accessed through the "Compressor Status" submenu displayed at the Human Interface Module.

### **Superheat & Subcooling Module (1U91) (SSM - Optional)**

Monitors the system operating superheat and subcooling through the use of pressure transducers, liquid line, and suction line temperature sensors. The information is sent to the SSM and can be accessed through the "Compressor Status" submenu displayed at the Human Interface Module.

## Power Disconnecting Switches

### **Manual Disconnect Switch**

(Optional 1S14) Manual disconnect switch 1S14, located in the unit control panel, instead of the power terminal block 1TB1, allows the operator to disconnect power from the unit's "high" voltage (200V-575V) section, the 115V section, and the 24V section without having to open the control panel door. A description of its features and operation are given in the Installation, Operation, & Maintenance manual.

### **115V Control Circuit Switch (1S1)**

Control circuit switch (1S1) is provided on all units and is located downstream of the 115V transformer 1T1. It allows the operator to disconnect power from the unit's 115V control components by placing the switch in the "Off" position.

### **24V Transformer Switch (1S70)**

Transformer switch 1S70 is provided on all units and is located downstream of 24V transformers 1T2 and 1T3. It allows the operator to disconnect (24V) power from all of the unit's control modules by placing the switch in the "Off" position.

For a complete description of the 24V components and operation, refer to the latest edition of the applicable Installation, Operation and Maintenance manual listed on the unit nameplate.

# General Information

## Human Interface Module

### (1U65 = Local 6U66 = Remote)

The Human Interface (HI) Module illustrated in Figure 1 is the device which enables the customer, building owner, or contractor, to communicate to the unit the necessary parameters for unit operation.

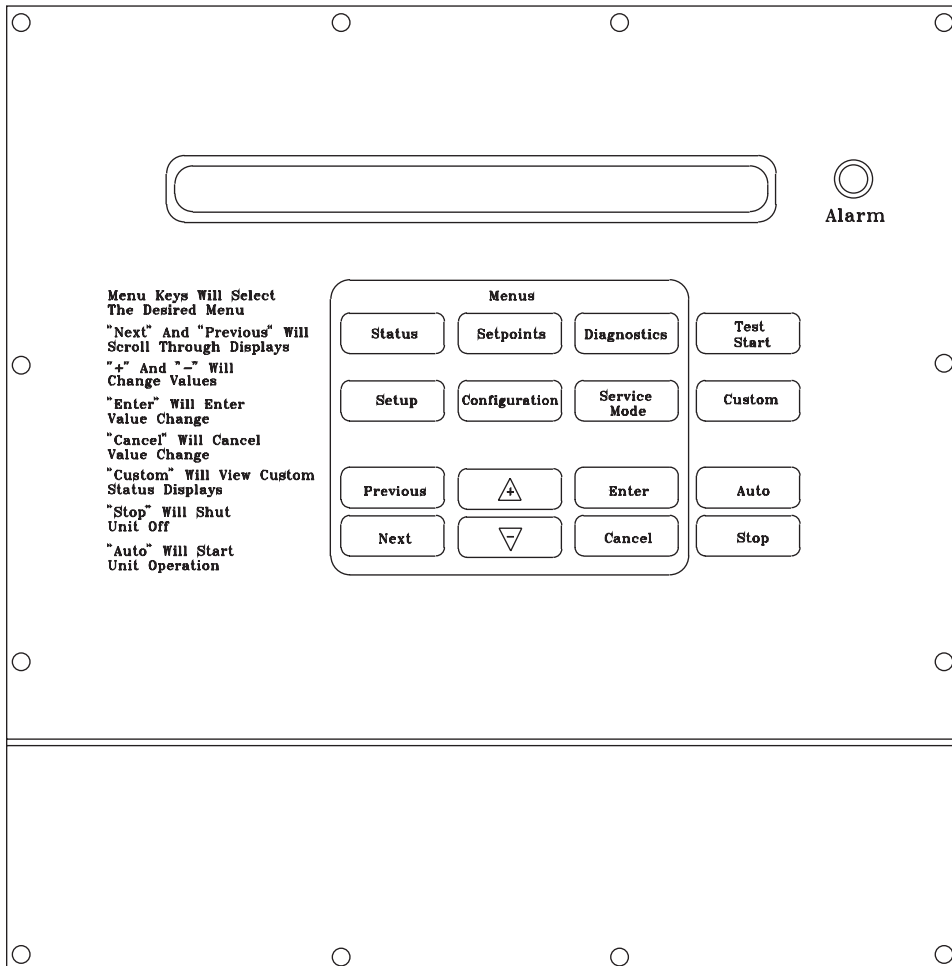
The local (unit mounted) Human Interface and the Remote Human Interface Panels' functions are identical, except for Service mode which is not available on the Remote Human Interface Panel.

The local HI Module is located in the unit's main control panel. A small door located in the unit's control panel door allows access to the HI Module's keypad and display window.

There is a 2 line by 40 character LCD screen which provides status information for the various unit functions as well as menus used to set or modify the operating parameters. There is a 16 key keypad adjacent to the LCD screen which allows the operator to scroll through the various menus and make adjustments to the setpoints, etc...

The information displayed in the LCD window will be top level unit status information unless the operator initiates other displays.

**Figure 1**  
Human Interface Module



## General Operation

At power-up, the Human Interface LCD will display one of three initial screens illustrated in the "General Status" section.

1. Unit Status (Unit Off or Stopped) (The unit is configured and operational, but is not running). This screen shows state, mode, and function information when the unit is off or stopped.
2. Unit Status (Unit On) (The unit is configured and operational, and is running). This screen shows state, mode, and function information when the unit is on.
3. No Configuration (the unit needs to be configured). This screen shows that required configuration data is missing.

The LCD screen has a backlight that makes the information easier to read. The light will go out if no keys are pressed for 30 minutes. If it goes out, simply press the STATUS key.



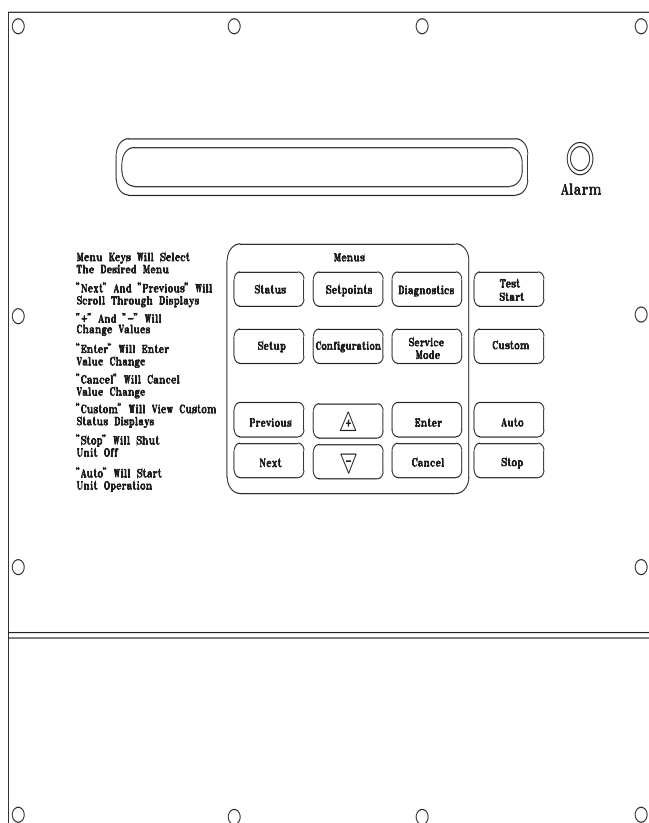
# General Information

## Menu Keys

The six keys illustrated in Figure 2 in the MENU area (STATUS, SETPOINTS, SETUP, CONFIGURATION, DIAGNOSTICS, and SERVICE MODE) are used to bring up the various interactive menus where the user inputs and accesses unit operating data. Pressing these keys will display the initial screen for the menu designated by the key's name. The following information describes the keys and their functions when viewing the various menus.

If no key is pressed for 30 minutes while the LCD is displaying a menu screen, it will revert back to the unit operating status screen.

**Figure 2**  
Human Interface Keypad



## STATUS Key

Pressing the STATUS key causes the LCD to display the operating status screen; i.e. "On", "Unit Stop", "External Stop", "Emergency Stop", "Service Mode". Pressing the NEXT key allows the operator to scroll through the screens which provide information such as air and refrigerant temperatures, pump operation, compressor operation, as well as active cooling and compressor lockout setpoints. Pressing the STATUS key while viewing any of the data screens will cause the LCD to go back to the operating status screen.

## SETPOINTS Key

Pressing the SETPOINTS key will cause the LCD screen to display the first of the setpoint screens where the operator will designate default temperature setpoints and setpoint source information. While scrolling through the setpoint screens, pressing this key again will cause the LCD to display the first setpoint screen.

## DIAGNOSTICS Key

Pressing the DIAGNOSTICS key at any time will allow the operator to view any unit function failures. The LCD screen will display one of the diagnostic screens (depending on which diagnostic, if any, is present). If no key is pressed for 30 minutes while the screen is displaying diagnostic information, it will revert back to the operating status display.

## CONFIGURATION Key

Pressing the CONFIGURATION key will cause the LCD screen to display the first of the configuration screens where the operator will designate unit configuration data such as unit type, capacity, installed options, etc...

This information was programmed at the factory. Pressing the configuration key at any level in the configuration menu will display the first configuration screen.

---

**Note: This key should be used if the unit's configuration data is lost or new options are added in the field, and to view current configuration.**

---

## SETUP Key

Pressing the SETUP key will cause the LCD screen to display screens where the operator will designate various operating parameters such as temperature ranges, limits, percentages, etc. for the control of the unit's various operating modes. Pressing the SETUP key at any level in the SETUP menu will display the first SETUP screen.

## SERVICE MODE Key

Pressing the SERVICE MODE key causes the LCD to display the first of the service test mode screens showing various unit components which may be turned on or off for the particular test being performed. Once the status of these components is designated, the LCD will display screens that allow the operator to designate the TEST START time delay for each test.

## Data Manipulation Keys

The six data manipulation keys illustrated in Figure 2, (ENTER, CANCEL, + (Plus), - (Minus), PREVIOUS, and NEXT) are used to modify the data within the screens (change values, move the cursor, confirm choices, etc...)

## ENTER Key

This key will confirm the new values that were designated by pressing the + (Plus) or - (Minus) keys at all edit points. When viewing status and diagnostics screens, it has no function.

## CANCEL Key

After changing data, at an editable screen, but before confirming it with the ENTER key, pressing the CANCEL key will return the data to its previous value. This key shall also function to clear active diagnostics.

# General Information

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## **+ (Plus) Key**

When viewing a setpoint screen, this key will increase the temperature or pressure value of the setpoint. When working with a status menu, it will add the current status display to the custom menu. When viewing the setup or service test screens, it will increase setpoints or toggle choices On or Off at each edit point.

## **- (Minus) Key**

This key when viewing the setpoint screen will decrease the temperature or pressure value of the setpoint. When viewing the setup or service test screens, it will decrease setpoints or toggle choices On or Off at each edit point. When viewing the custom menu, pressing the - (Minus) key will remove the status screen from the custom menu. When viewing diagnostics screens it has no function.

## **PREVIOUS Key**

Pressing the PREVIOUS key causes the LCD to scroll backwards through the various displays for each menu. At displays with multiple edit points, it moves the cursor from one edit point to another.

## **NEXT Key**

Pressing the NEXT key causes the LCD to scroll forward through the various displays for each menu. At displays with multiple edit points it moves the cursor from one edit point to another.

## **Unit Operation Keys**

### **AUTO Key**

Pressing the AUTO key at any time will cause the display to go to the top level status display and, if the unit is shut-down, will cause the unit to begin operation in the appropriate mode no matter what level in the menu structure is currently being displayed. If the current display is an editable display, the AUTO key will confirm the desired edit.

### **STOP Key**

Pressing the STOP key will cause the unit to transition to the stop state. If the current display is editable, pressing the STOP key will cancel the desired edit.

### **TEST START Key (SERVICE)**

Pressing this key while viewing any screen in the SERVICE Mode menu will start the service test. When viewing status, setup, setpoint, and diagnostics screens, it has no function.

### **CUSTOM Key**

The Custom menu is simply a status menu that contains screens that the user monitors most frequently. The Custom menu can only contain five status screens. To create the Custom menu, press the STATUS key, followed by the NEXT key (this brings up the initial status screen). If you want to add this screen to the Custom menu, press the + (Plus) key, if not, press the Next key again until a status screen appears that you would like to add to the Custom menu. Pressing the + (Plus) key while viewing any of the various status screens will add that screen to the Custom menu. Once the Custom menu is programmed it can be accessed by pressing the CUSTOM key. To remove a status screen from the Custom menu, press the CUSTOM key, then press the NEXT key until the status screen that you want to remove appears, then press the - (Minus) key.

After adding a screen to the Custom menu, the following screen is displayed:

"Item Added to Custom Menu"

If the + (PLUS) key is pressed and the Custom menu is full, the following screen is displayed:

"Custom Menu Is Full"

After deleting a screen from the Custom Menu, the following screen is displayed:

"Item Deleted from Custom Menu"

If the CUSTOM key is pressed and there are no entries, the following screen is displayed:

No items are selected for Custom Report  
See Operators Manual to select entries

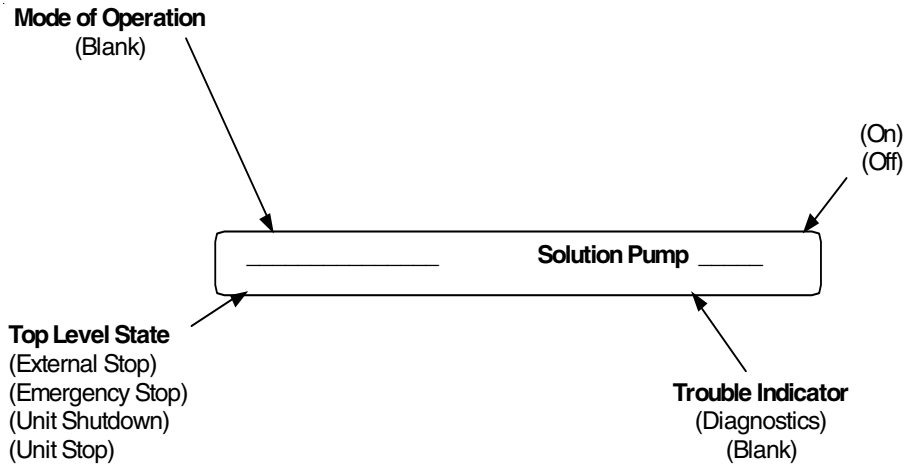
# General Information

## General Status Display

Anytime the unit is powered up, or the STATUS, AUTO, or STOP keys are pressed, the unit mounted Human Interface will display one of the following three general status display screens. The operator will then be able to enter keystrokes which will allow him to navigate through a set of menus and submenus in order to provide/access various monitoring, setup, and configuration information. The Human Interface will not display screens or parts of screens for which the unit is not configured.

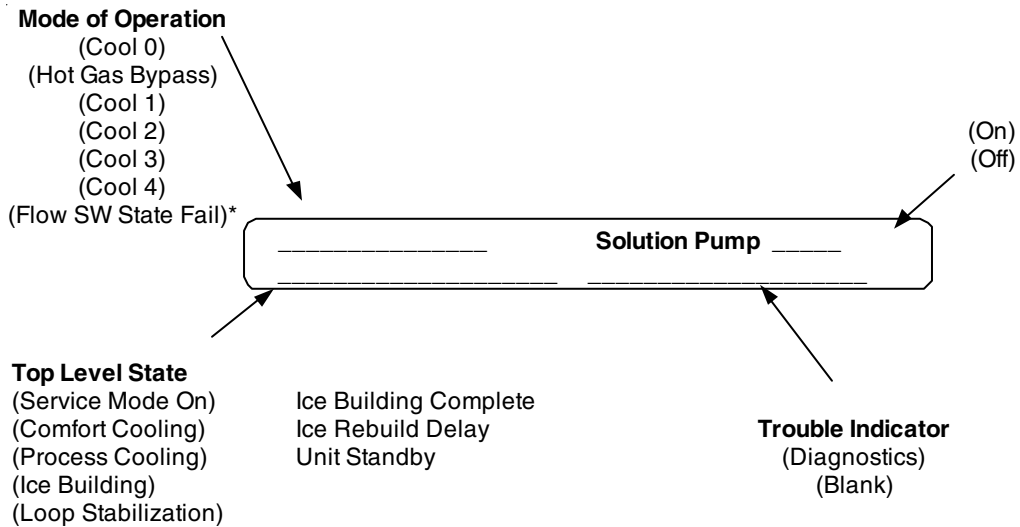
### Unit "Off" or "Stopped"

If at power up the unit is not running, the following display will appear on the Human Interface LCD screen. When this screen is being displayed, the only functional keys are the six menu keys (STATUS, SETPOINTS, DIAGNOSTICS, SETUP, CONFIGURATION, AND SERVICE MODE), the AUTO key, the CUSTOM key, and the STOP key.



### Unit "On"

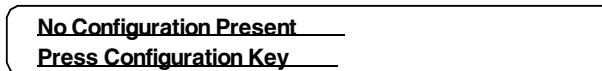
If the unit has entered an operating state (running), the following display will appear on the Human Interface LCD screen. When this screen is being displayed, the only functional keys are the six menu keys (STATUS, SETPOINTS, DIAGNOSTICS, SETUP, CONFIGURATION, AND SERVICE MODE), the AUTO key, the CUSTOM key, and the STOP key.



\*Service Test Mode Only - Flow switch failed to open after solution pump turned off.

### No Configuration

If at power up the unit has not been programmed with the necessary configuration data for normal unit operation, the following display will appear on the Human Interface LCD screen. When this screen is being displayed, the only functional key is the CONFIGURATION key.



**Note: This screen will only appear when the CGM has been field replaced. Refer to the Configuration Menu.**

# General Information

## Factory Presets

The CGM controlled unit has many operating functions whose settings are preset at the factory, but may be modified to meet the unique requirements of each job. The following list identifies each of the unit's adjustable functions and the value assigned to it. If these factory presets match your application's requirements and the "System Start-Up" procedures in the Installation, Operation & Maintenance manual has been completed, simply press the AUTO key at the Human Interface module to begin unit operation.

If your application requires different settings, turn to the listed page beside the function, press the designated function menu key, then press and hold the NEXT or PREVIOUS key until its screen appears on the LCD. Once the proper screen appears, simply follow the programming instructions given below the applicable screen in this manual.

**Note: Record any changes made to the factory preset values in the corresponding space provided.**

	Factory Preset	Changed To	See page... to adjust	To adjust Press....
<b>Setpoints</b>				
Leaving Solution Setpoint	44 deg F	_____	34	SETPOINTS
Low Ambient Compressor Lockout Temperature Setpoint	40 deg F	_____	34	SETPOINTS
Heat Tape Temperature Setpoint	40 deg F	_____	34	SETPOINTS
Hot Start Load Limit Setpoint	71 deg F	_____	34	SETPOINTS
Ice Building Terminate Temperature	27 deg F	_____	34	SETPOINTS
Low Solution Cutout Temperature	35 deg F	_____	34	SETPOINTS
Low Ambient Pump Override Temperature	35 deg F	_____	34	SETPOINTS
Use Leaving Solution Setpoint From:	HI STP Menu	_____	34	SETPOINTS
Use Ice Building Terminate Setpoint From:	HI STP Menu	_____	34	SETPOINTS
Use Hot Start Load Limit Setpoint From:	HI STP Menu	_____	35	SETPOINTS
Use Capacity Limit Setpoint From:	No Source Selected	_____	35	SETPOINTS
<b>Information format</b>				
Display Text in	English Language	_____	23	SETUP
Display Units in	English	_____	23	SETUP
Unit Control	Local	_____	23	SETUP
Unit Address	49	_____	23	SETUP
<b>General Unit Functions Setup</b>				
Delay unit Start	0 Seconds	_____	23	SETUP
Demand Limit Definition	None	_____	24	SETUP
Hot Gas Bypass Function	Disabled	_____	24	SETUP
Hot Gas Bypass Max Run Time	30 Minutes	_____	24	SETUP
Hot Start Time Interval	60 Minutes	_____	24	SETUP
Hot Operation Response Option	50% Capacity (Auto Reset Diag.)	_____	24	SETUP
Pumpdown Function	Disabled	_____	24	SETUP
Compressor Lead/Lag Function	Disabled	_____	24	SETUP
Default Chiller Solution Pump Mode	Auto	_____	24	SETUP
Evaporator Solution Pump Off Delay Time	30 Seconds	_____	25	SETUP
Loop Stabilization Time	120 Seconds	_____	25	SETUP
Low Ambient Compressor Lockout	Enabled	_____	25	SETUP
Leaving Solution Reset Type	None	_____	25	SETUP
Chiller Application	Comfort	_____	25	SETUP
Evaporator Solution Flow Switch Proving	Disabled	_____	25	SETUP
OA Temp Reset Type: Start Temp	70 deg F	_____	25	SETUP
OA Temp Reset Type: End Temp	50 deg F	_____	25	SETUP
OA Temp Reset Type: Max Amount of Reset	5 deg F	_____	25	SETUP
Zone Temp Reset Type: Start Temp	78 deg F	_____	25	SETUP
Zone Temp Reset Type: End Temp	75 deg F	_____	25	SETUP
Zone Temp Reset Type: Max Amount of Reset	5 deg F	_____	25	SETUP
Entering Solution Temp Reset Type: Start Temp	45 deg F	_____	25	SETUP
Entering Solution Temp Reset Type: End Temp	40 deg F	_____	25	SETUP
Entering Solution Temp Reset Type: Max Amount	5 deg F	_____	25	SETUP

# General Information

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## Factory Presets (Continued)

	Factory Preset	Changed To	See page... to adjust	To adjust Press....
<b>Ice Building Control Functions</b>				
Ice Building Function	Disabled	_____	26	SETUP
Ice Building Mode	One Time	_____	26	SETUP
Ice Rebuild Delay Time	360 Minutes	_____	26	SETUP
<b>GBAS 0-5 VDC Module I/O Assignments</b>				
GBAS (0-5 VDC) Analog Input 1 Assignment	Not Assigned	_____	27	SETUP
GBAS (0-5 VDC) Analog Input 2 Assignment	Not Assigned	_____	27	SETUP
GBAS (0-5 VDC) Analog Input 3 Assignment	Not Assigned	_____	27	SETUP
GBAS (0-5 VDC) Analog Input 4 Assignment	Not Assigned	_____	27	SETUP
GBAS (0-5 VDC) Binary Output 1 Definition	Indicate any comp is running	_____	28	SETUP
GBAS 0-5 V Output 1 Alarm Assignments	Any active diagnostic	_____	28	SETUP
GBAS (0-5 VDC) Binary Output 2 Definition	Indicate selected diagnostics	_____	29	SETUP
GBAS 0-5 V Output 2 Alarm Assignments	Comp protection LPC Open Ckt 1	_____	29	SETUP
	Comp protection LPC Open Ckt 2 (40-60 Ton)	_____	29	SETUP
	Compressor Trip Ckt 1	_____	29	SETUP
	Compressor Trip Ckt 2 (40 - 60 Ton)	_____	29	SETUP
	Comp Contactor Fail Ckt 1	_____	29	SETUP
	Comp Contactor Fail Ckt 2 (40 - 60 Ton)	_____	29	SETUP
	Low Press Control Open - Ckt 1	_____	29	SETUP
	Low Press Control Open - Ckt 2 (40-60 Ton)	_____	29	SETUP
GBAS (0-5 VDC) Binary Output 3 Definition	Indicate Unit at Max capacity	_____	29	SETUP
GBAS (0-5 VDC) Output 3 Alarm Assignments	Any active diagnostic	_____	29	SETUP
GBAS (0-5 VDC) Binary Output 4 Definition	Indicate selected diag alarms	_____	29	SETUP
GBAS (0-5 VDC) Output 4 Alarm Assignments	Any active diagnostic	_____	29	SETUP
GBAS (0-5 VDC) Binary Output 5 Definition	Indicate selected diag alarms	_____	29	SETUP
GBAS (0-5 VDC) Output 5 Alarm Assignments	Any active diagnostic	_____	29	SETUP
<b>GBAS 0-10 VDC Module I/O Assignments</b>				
GBAS (0-10 VDC) Analog Input 1 Assignment	Not Assigned	_____	29	SETUP
GBAS (0-10 VDC) Analog Input 2 Assignment	Not Assigned	_____	29	SETUP
GBAS (0-10 VDC) Analog Input 3 Assignment	Not Assigned	_____	29	SETUP
GBAS (0-10 VDC) Analog Input 4 Assignment	Not Assigned	_____	29	SETUP
GBAS (0-10 VDC) Binary Output Definition	Indicate selected diag alarms	_____	29	SETUP
GBAS (0-10 VDC) Output Alarm Assignments	Any active diagnostic	_____	30	SETUP
GBAS (0-10 VDC) Analog Output 1 Assignment	Leaving solution temp	_____	30	SETUP
GBAS (0-10 VDC) Analog Output 2 Assignment	Entering solution temp	_____	30	SETUP
GBAS (0-10 VDC) Analog Output 3 Assignment	Active cooling capacity	_____	30	SETUP
GBAS (0-10 VDC) Analog Output 4 Assignment	Outside air temperature	_____	30	SETUP
<b>CGM alarm output definitions</b>	Any Active Diagnostic	_____	30	SETUP

# General Information

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## Factory Presets (Continued)

	Factory Preset	Changed To	See page... to adjust	To adjust Press....
<b>Actuator Setup Definitions</b>				
Number 1 Low Ambient Maximum Stroke	30 seconds	_____	31	SETUP
Number 1 Low Ambient Minimum Voltage	2.0v	_____	31	SETUP
Number 1 Low Ambient Maximum Voltage	10.0v	_____	31	SETUP
Number 1 Low Ambient Acting	Direct	_____	31	SETUP
Number 2 Low Ambient Maximum Stroke	30 seconds	_____	31	SETUP
Number 2 Low Ambient Minimum Voltage	2.0v	_____	31	SETUP
Number 2 Low Ambient Maximum Voltage	10.0v	_____	31	SETUP
Number 2 Low Ambient Acting	Direct	_____	31	SETUP
Ckt 1 Suction Line Pressure Transducer -- voltage at 0 PSIG	0.118 V	_____	32	SETUP
Ckt 1 Suction Line Pressure Transducer -- voltage at 100 PSIG	4.847 V	_____	32	SETUP
Ckt 2 Suction Line Pressure Transducer -- voltage at 0 PSIG	0.118 V	_____	32	SETUP
Ckt 2 Suction Line Pressure Transducer -- voltage at 100 PSIG	4.847 V	_____	32	SETUP
Ckt 1 Liquid Line Pressure Transducer -- voltage at 0 PSIG	0.118 V	_____	32	SETUP
Ckt 1 Liquid Line Pressure Transducer -- voltage at 400 PSIG	4.847 V	_____	32	SETUP
Ckt 2 Liquid Line Pressure Transducer -- voltage at 0 PSIG	0.118 V	_____	32	SETUP
Ckt 2 Liquid Line Pressure Transducer -- voltage at 400 PSIG	4.847 V	_____	32	SETUP
<b>Head Pressure Control Setup</b>				
Saturated condenser Temp Control Band (Lower Limit)	85 deg F	_____	26	SETUP
Saturated condenser Temp Control Band (Upper Limit)	125 deg F	_____	26	SETUP
Saturated condenser Temp Control Band (Temporary Low Limit Suppression)	10 deg F	_____	27	SETUP
Saturated condenser Temp (Efficiency Check Point)	110 deg F	_____	27	SETUP
Saturated condenser Temp (Low Ambient Control Point)	100 deg F	_____	27	SETUP
Saturated condenser Temp (Low Ambient Control Deadband)	4.0 deg F	_____	27	SETUP
Saturated condenser Temp (OA Temp Suppression Setpoint)	40 deg F	_____	27	SETUP

# General Information

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## Password Protected Screens

Some of the operating displays on the Human Interface LCD screen are intended to be accessed by qualified users only, and require a password to change. The following screens display the various programming sections that require a password in order to view or to modify the preset operating parameters. The password for each screen is a different series of + (Plus) or - (Minus) key strokes in a predefined sequence. Shown below are the password protected screens, and the passwords for accessing them.

The following screens display the various programming sections that require a specific PASSWORD to be entered by a qualified operator in order to view or to modify the operating parameters.

The following screen will appear if the PASSWORD is not entered within approximately 15 seconds.

**Password Entry Time Limit Exceeded**

1. Press the NEXT key until the following screen is displayed.

**Configuration is Password Protected**  
**Please Enter Password:**

2. Press the + or - keys in this sequence ( + - - ) to access this restricted screen.
3. Press the ENTER key to confirm the password and enter the menu.
4. Press the NEXT key until the following screen is displayed.

**Diagnostic Reset is Password Protected**  
**Please Enter Password:**

1. Press the + or - keys in this sequence ( - + + ) to access this restricted screen.
2. Press the ENTER key to confirm the password and Lock the definitions.
3. Press the NEXT key until the following screen is displayed.

**Diagnostic Log is Password Protected**  
**Please Enter Password:** \_\_\_\_\_

1. Press the + or - keys in this sequence ( - + + - ) to access this restricted screen.
2. Press the ENTER key to confirm the password and Lock the definitions.
3. Press the NEXT key until the following screen is displayed.

# System Operating Status

## STATUS Menu

The STATUS menu is used to view various operating conditions such as temperatures and humidity levels. It's used to view unit component status such as fan, compressor, heater, and economizer operation, as well as setpoint status.

Press the STATUS key to enter into the status menu. The "STATUS MODE" will automatically return to the power up screen after 30 minutes, if no keys are pressed.

<b>Cool 0</b>	<b>Solution Pump Off</b>
<b>Standby</b>	<b>Diagnostics</b>

1. Press the NEXT key to scroll forward through the status screens.
2. Press the PREVIOUS key to scroll backwards to view previously displayed status screens.
3. Press the + (Plus) key while viewing any status screen to add that screen to the custom menu. Refer to the custom menu for the creation and maintenance of customized menus.

<b>Active Leaving Solution Setpoint</b>	<b>55.0 F</b>
<b>Temp: Entering</b>	<b>55.0 F</b>
<b>Leaving</b>	<b>50.0 F</b>

OR

This screen is displayed when the unit is in Ice Building.

<b>Active Ice Build Terminate STP</b>	<b>55.0 F</b>
<b>Temp: Entering</b>	<b>55.0 F</b>
<b>Leaving</b>	<b>50.0 F</b>

<b>Compressor Status Submenu</b>
<b>Press ENTER to View Data in This Submenu</b>

1. Press the ENTER key to advance to the following screen.
2. Press the NEXT key to bypass this menu and advance to "General Status Submenu"

The screens shown in this section are for example only. Pressing the + (Plus) key while viewing any of the status display screens will add that screen to the Custom menu. When a status screen is displayed for 30 minutes without a key being pressed, the LCD screen will revert to the general operating status display. If this happens, press the STATUS key again to return to the status menu. The following are examples of status screens that may be viewed by pressing the STATUS key.

**Used on Units:** All Units

**Possible Values:** See "General Status" Display Description

**Used on Units:** All Units

**Possible Values:** Active Solution Setpoint = 0 - 99 F

Entering = 0 - 99.9 F

Leaving = 0 - 99.9 F

**Used on Units:** All Units

**Possible Values:** Active Ice Build Terminate STP = 0 - 99 F

Entering = 0 - 99.9 F

Leaving = 0 - 99.9 F

**Note:** The range for all temperature inputs are 0 to 99.9 F. "ERR" will appear if the temperature is out of range.

**Used on Units:** All Units



# System Operating Status

---

The following screens are displayed for 20 through 60 Ton units.

<b>Compressor Relay K11</b> Enabled	<b>Off</b>
--	------------

1. Press the NEXT key until the following screen is displayed.

<b>Compressor Relay K12</b> Enabled	<b>Off</b>
--	------------

1. Press the NEXT key until the following screen is displayed.

The following screens are displayed for 40 through 60 Ton units.

<b>Compressor Relay K3</b> Enabled	<b>Off</b>
---------------------------------------	------------

1. Press the NEXT key until the following screen is displayed.

<b>Compressor Relay K4</b> Enabled	<b>Off</b>
---------------------------------------	------------

**Disabled By:**

- |                        |                      |
|------------------------|----------------------|
| Bad Cond Temp Sensor   | Hot Start Operation  |
| Bad Ent Soln Sensor    | Low Ambient Lockout  |
| Bad Leav Soln Sensor   | Low Leav Soln Cutout |
| Compressor Protection  | Low Pressure Cutout  |
| Compressor Protect LPC | LPC Delay            |
| Contactors Failure     | Minimum Off Time     |
| Demand/Capacity Limit  | Over/Under Voltage   |
| Evap Flow Protection   | Phase Loss/Reversal  |
| Evap Limit Control     | Tracer Lockout       |

1. Press the NEXT key until the following screen is displayed.

<b>Compressor Module Ckt 1</b> <b>Saturated Condensor Temperature</b>	<b>81.0 F</b>
--	---------------

1. Press the NEXT key until the following screen is displayed.  
The following three screens are applicable when Superheat/  
Subcool Module is installed.

<b>Refrigerant Ckt 1 - Temperature Data</b>			
<b>Suction</b>	<b>75.0 F</b>	<b>Sat Liquid</b>	<b>81.0 F</b>

1. Press the NEXT key until the following screen is displayed.

<b>Refrigerant Ckt 1 - Pressure Data</b>			
<b>Suction</b>	<b>72 PSIG</b>	<b>Liquid</b>	<b>265 PSIG</b>

1. Press the NEXT key until the following screen is displayed.

<b>Refrigerant Circuit 1</b>			
<b>Superheat</b>	<b>28.0 F</b>	<b>Subcooling</b>	<b>18.0 F</b>

1. Press the NEXT key until the following screen is displayed.

The following screens are displayed for 40 through 60 Ton units.

<b>Compressor Module Ckt 2</b> <b>Saturated Condenser Temperature</b>	<b>97.0 F</b>
--	---------------

**Used on Units:** 20 thru 60 Ton Units  
**Possible Values:** K3 - On, Off, Locked,  
K4 - On, Off, Locked,  
K11 - On, Off, Locked, or  
K12 - On, Off, Locked

**Used on Units:** All Units  
**Possible Values:** -40 to 200 F

**Used on Units:** With superheat/subcool module  
**Possible Values:** -40 to 200 F

**Used on Units:** With superheat/subcool module  
**Possible Values:** Suction range 0 - 100 PSIG  
Liquid range 0 - 400 PSIG  
Comp Off

**Used on Units:** With superheat/subcool module  
**Possible Values:** 0 - 99.9 F  
Comp Off

**Used on Units:** 40 Thru 60 Ton Units  
**Possible Values:** -40 to 200 F

# System Operating Status

1. Press the NEXT key until the following screen is displayed.  
The following three screens are applicable when Superheat/  
Subcool Module is installed.

**Refrigerant Ckt 2 - Temperature Data**  
Suction 72.0 F Sat Liquid 97.0 F

1. Press the NEXT key until the following screen is displayed.

**Refrigerant Ckt 2 - Pressure Data**  
Suction 65 PSIG Liquid 251 PSIG

1. Press the NEXT key until the following screen is displayed.

**Refrigerant Circuit 2**  
Superheat 28.0 F Subcooling 18.0 F

1. Press the NEXT key until the following screen is displayed.

**Ckt 1 Liquid Line Solenoid Valve: OPEN**

OR

The following screen is displayed for 40 through 60 Ton units.

**Ckt 1 Liquid Line Solenoid Valve: OPEN**  
**Ckt 2 Liquid Line Solenoid Valve: CLOSED**

1. Press the NEXT key until the following screen is displayed.

**Compressor 1A Phase Currents - Amps**  
Phase A 86 Phase B 84

1. Press the NEXT key until the following screen is displayed.

**Compressor 1B Phase Currents - Amps**  
Phase A 81 Phase C 78

1. Press the NEXT key until the following screen is displayed.  
The following screens are displayed for 40 through 60 Ton units.

**Compressor 2A Phase Currents - Amps**  
Phase B 88 Phase C 90

1. Press the NEXT key until the following screen is displayed.

**Compressor 2B Phase Currents - Amps**  
Phase A 93 Phase C 89

1. Press the NEXT key until the following screen is displayed.

**End of Submenu (NEXT) to Re-enter STATUS**

2. Pressing the NEXT key will display the beginning of  
the Submenu.
3. Press the NEXT key again to advance to the following screen.

**General System Status Submenu**  
Press ENTER to View Data in This Submenu

1. Press the ENTER key until the following screen is displayed.
2. Press the NEXT key to bypass this menu and advance to  
"Controlling Setpoint Status Submenu"

**CGM Evap Solution Pump Relay: OFF**  
**Evap Soln Flow Switch Proving: FLOW**

1. Press the NEXT key until the following screen is displayed.

**Used on Units:** 40-60 Ton Units with superheat/subcool module  
**Possible Values:** -40 to 200 F

**Used on Units:** 40-60 Ton Units with superheat/subcool module  
**Possible Values:** Suction range 0 - 100 PSIG  
Liquid range 0 - 400 PSIG  
Comp Off

**Used on Units:** 40-60 Ton Units with superheat/subcool module  
**Possible Values:** 0 - 99.9 F  
Comp Off

**Used on Units:** 20, 25 & 30 Ton Units  
**Possible Values:** Open, Closed

**Used on Units:** 40 Thru 60 Ton Units  
**Possible Values:** Open, Closed

**Used on Units:** All Units with Current Sensing Module  
**Possible Values:** 0 - 255

**Used on Units:** All Units with Current Sensing Module  
**Possible Values:** 0 - 255

**Used on Units:** 40-60 Ton Units with Current Sensing Module  
**Possible Values:** 0 - 255

**Used on Units:** 40-60 Ton Units with Current Sensing Module  
**Possible Values:** 0 - 255

**Used on Units:** All Units  
**Possible Values:** CGM Evap Solution Pump Relay = On, Off  
Evap Soln Flow Switch Proving = Flow, No Flow

# System Operating Status

This screen is displayed on units with Brazed Plate.

**MCM Heat Tape Control Relay: OFF**

1. Press the NEXT key until the following screen is displayed.

This screen is displayed when Hot Gas Bypass is installed.

**CGM Hot Gas Bypass Control Relay: OFF**

1. Press the NEXT key until the following screen is displayed.

**CGM Ice Building Control Relay: ON**

1. Press the NEXT key until the following screen is displayed.

This screen is displayed when Leaving Solution Setpoint Source is selected.

**Setpoint Value Measured**

**CGM Ext Leaving Soln STP Input is 44.0 F**

1. Press the NEXT key until the following screen is displayed.

**End Of Sub-Menu (NEXT) To Re-enter STATUS**

2. Pressing the NEXT key will display the beginning of the Submenu.
3. Press the NEXT key again to advance to the following screen.

**Controlling Setpoint Status Submenu**

**Press ENTER to View Data in This Submenu**

1. Press the ENTER key until the following screen is displayed.
2. Press the NEXT key to bypass this menu and advance to "Temperature Input Status Submenu"

**Active Leaving Solution Setpoint From  
EXT LEAVING SOLN STP INPUT is 55.0 F**

1. Press the NEXT key until the following screen is displayed.
- This screen is displayed when Ice Building is enabled.

**Active Ice Build Terminate Setpoint From  
HUMAN INTERFACE STP MENU is 33.0 F**

**Used on Units:** All Brazed Plate Units  
**Possible Values:** On, Off

**Used on Units:** With Hot Gas Bypass option  
**Possible Values:** On, Off

**Used on Units:** With Ice Building Control  
**Possible Values:** On, Off

**Used on Units:** With CGM Ext Leaving Soln Setpoint Source selected  
**Possible Values:** 0 - 99

**Used on Units:** All Units  
**Possible Values:** Human Interface STP Menu, Ext Leaving Soln STP Input, GBAS 0-10 VDC Module, GBAS 0-5 VDC Module, BAS/NETWORK  
Setpoint Range = 0 - 99.9 F

**Used on Units:** With Ice Building Option  
**Possible Values:** Human Interface STP Menu, Ext Leaving Soln STP Input, GBAS 0-10 VDC Module, GBAS 0-5 VDC Module, BAS/NETWORK (Tracer) (TCI only)  
Setpoint Range = 0 - 99.9 F

# System Operating Status

1. Press the NEXT key until the following screen is displayed.

**Active Hot Start Load Limit Setpt From  
HUMAN INTERFACE STP MENU is 78.0 F**

**Used on Units:** All Units

**Possible Values:** Human Interface STP Menu,  
GBAS 0-10 VDC Module,  
GBAS 0-5 VDC Module,  
Setpoint Range = 0 - 99.9 F

1. Press the NEXT key until the following screen is displayed.

**Active Capacity Limit Setpoint From  
HUMAN INTERFACE STP MENU is 63 %**

**Used on Units:** With GBAS 5V or GBAS 10V or TCI or LCI

**Possible Values:** No Source Selected,  
GBAS 0-10 VDC Module,  
GBAS 0-5 VDC Module,  
BAS/NETWORK  
Setpoint Range = 0 - 99.9 F  
Blank

1. Press the NEXT key until the following screen is displayed.

**End of Submenu (NEXT) to Re-enter STATUS**

- Pressing the NEXT key will display the beginning of the Submenu.
- Press the NEXT key again to advance to the following screen.

**Temperature Input Status Submenu  
Press ENTER to View Data in This Submenu**

- Press the ENTER key until the following screen is displayed.
- Press the NEXT key to bypass this menu and advance to "Misc Input Status Submenu"

**Temp Measured By Sensor Connected To  
CGM Entering Soln Temp Input 55 F**

**Used on Units:** All Units

**Possible Values:** -40.0 to 200 F

1. Press the NEXT key until the following screen is displayed.

**Temp Measured By Sensor Connected To  
CGM Leaving Soln Temp Input 50.0 F**

**Used on Units:** All Units

**Possible Values:** -40.0 to 200 F

1. Press the NEXT key until the following screen is displayed.

**Temp Measured By Sensor Connected To  
CGM Outside Air Temp Input 86.0 F**

**Used on Units:** All Units

**Possible Values:** -40.0 to 200 F

1. Press the NEXT key until the following screen is displayed.

**Compressor Module Ckt 1  
Saturated Condenser Temperature 81.0 F**

**Used on Units:** All Units

**Possible Values:** -40.0 to 200 F

1. Press the NEXT key until the following screen is displayed.

**Refrigerant Ckt 1 - Temperature Data  
Suction 75.0 F Sat Liquid 81.0 F**

**Used on Units:** With Superheat/Subcooling installed

**Possible Values:** -40.0 to 200 F

1. Press the NEXT key until the following screen is displayed.  
The following screens are displayed for 40 through 60 Ton units.

**Compressor Module Ckt 2  
Saturated Condenser Temperature 97.0 F**

**Used on Units:** 40 through 60 Ton

**Possible Values:** -40.0 to 200 F

# System Operating Status

## Refrigerant Ckt 2 - Temperature Data

Suction 72.0 F Sat Liquid 97.0 F

1. Press the NEXT key until the following screen is displayed.

## Temp Measured By Sensor Connected To

CGM Zone Temp Input 75.0 F

1. Press the NEXT key until the following screen is displayed.

## Temp Measured By Sensor Connected To

CGM ICS Temp Input 62.0 F

1. Press the NEXT key until the following screen is displayed.

## End of Submenu (NEXT) to Re-enter STATUS

2. Pressing the NEXT key will display the beginning of the Submenu.
3. Press the NEXT key again to advance to the following screen.

## Misc Input Status Submenu

Press ENTER to View Data in This Submenu

1. Press the ENTER key until the following screen is displayed.
2. Press the NEXT key to bypass this menu and advance to "GBAS 0-5VDC Module Status Submenu"

CGM Ice Build Command Input: OFF

1. Press the NEXT key until the following screen is displayed.

CGM Evap Soln Flow Switch Input: FLOW

1. Press the NEXT key until the following screen is displayed.

## Refrigerant Ckt 1 - Pressure Data

Suction 72 PSIG Liquid 265 PSIG

1. Press the NEXT key until the following screen is displayed.

## Refrigerant Ckt 2 - Pressure Data

Suction 65 PSIG Liquid 251 PSIG

1. Press the NEXT key until the following screen is displayed.

## Compressor 1A Phase Currents - Amps

Phase A 86 Phase B 84

1. Press the NEXT key until the following screen is displayed.

## Compressor 1B Phase Currents - Amps

Phase A 81 Phase C 78

**Used on Units:** 40-60 Ton with Superheat/Subcooling Module installed

**Possible Values:** -40.0 to 200 F

**Used on Units:** All Units

**Possible Values:** -40.0 to 200 F

**Used on Units:** With TCI Module Installed

**Possible Values:** -40.0 to 200 F

**Used on Units:** With Ice Building Control Option  
**Possible Values:** Off, Make Ice

**Used on Units:** All Units

**Possible Values:** Flow, No Flow

**Used on Units:** All Units with Superheat/Subcooling

**Possible Values:** Suction = 0.0 to 100.0 PSIG

Liquid = 0.0 to 400.0 PSIG

Comp Off

**Used on Units:** 40 - 60 Ton Units with Superheat/Cooling

**Possible Values:** Suction = 0.0 to 100.0 PSIG

Liquid = 0.0 to 400.0 PSIG

Comp Off

**Used on Units:** With Current Sensing Module

**Possible Values:** 0 to 255

**Used on Units:** With Current Sensing Module

**Possible Values:** 0 to 255

# System Operating Status

1. Press the NEXT key until the following screen is displayed.

**Compressor 2A Phase Currents - Amps**  
Phase B 88 Phase C 90

1. Press the NEXT key until the following screen is displayed.

**Compressor 2B Phase Currents - Amps**  
Phase A 93 Phase C 89

1. Press the NEXT key until the following screen is displayed.

**End of Submenu (NEXT) to Re-enter STATUS**

2. Pressing the NEXT key will display the beginning of the Submenu.
3. Press the NEXT key again to advance to the following screen.

This screen is displayed when GBAS 0-5 VDC Module is installed

**GBAS 0-5VDC Module Status Submenu**  
Press ENTER to View Data in This Submenu

1. Press the ENTER key until the following screen is displayed.
2. Press the NEXT key to bypass this menu and advance to "GBAS 0-10VDC Module Status Submenu"

**GBAS 0-5VDC Analog Input 1 0.00 VDC**  
Assigned: NOT ASSIGNED

3. Press the NEXT key to display Generic BAS Analog Input screens 2, 3, & 4.
4. Press the NEXT key to advance to the following screen.

**GBAS (0-5VDC) Demand Limit Input Status**  
OPEN

1. Press the NEXT key until the following screen is displayed.

**GBAS (0-5VDC) Binary Output 1 OFF**  
Assigned: OUTPUT IS NOT ASSIGNED

2. Press the NEXT key to display Generic BAS Binary Output screens 2, 3, 4 & 5.
3. Press the NEXT key to advance to the following screen.

**End of Submenu (NEXT) to Re-enter STATUS**

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen.

This screen is displayed when GBAS 0-10 VDC Module is installed

**GBAS 0-10VDC Module Status Submenu**  
Press ENTER to View Data in This Submenu

1. Press the ENTER key until the following screen is displayed.
2. Press the NEXT key to bypass this menu and advance to "General Status" Display Screen.

**GBAS 0-10VDC Analog Input 1 0.00 VDC**  
Assigned: NOT ASSIGNED

3. Press the NEXT key to display Generic BAS Analog Input screens 2, 3 & 4.
4. Press the NEXT key to advance to the following screen.

**Used on Units:** With Current Sensing Module on 40-60 Ton  
**Possible Values:** 0 to 255

**Used on Units:** With Current Sensing Module on 40-60 Ton  
**Possible Values:** 0 to 255

**Used on Units:** With GBAS 0-5VDC Module  
**Possible Values:** Input = 0.00 to 5.00 VDC  
Assignment = Not Assigned  
Leaving Solution Setpoint  
Ice Build Terminate Setpoint  
Hot Start Load Limit Setpoint  
Capacity Limit Setpoint

**Used on Units:** With GBAS 0-5VDC Module  
**Possible Values:** Open, Closed

**Used on Units:** With GBAS 0-5VDC Module  
**Possible Values:** Output = On, Off  
Assignment = Output Is Not Assigned  
Indicate any comp is running  
Indicate unit at max capacity  
Indicate selected diag alarms

**Used on Units:** With GBAS 0-10 VDC Module  
**Possible Values:** Output = 0.00 - 10.00 VDC  
Assignment = Output Is Not Assigned  
Leaving Solution Setpoint  
Ice Build Terminate Setpoint  
Hot Start Load Limit Setpoint  
Capacity Limit Setpoint

# System Operating Status

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**GBAS (0-10VDC) Demand Limit Input Status**  
Open

1. Press the NEXT key until the following screen is displayed.

**GBAS (0-10VDC) Binary Output**      **OFF**  
**Assigned:**      **OUTPUT IS NOT ASSIGNED**

1. Press the NEXT key until the following screen is displayed.

**GBAS 0-10VDC Analog Output 1**      **0.0 VDC**  
**Assigned:**      **NOT ASSIGNED**

Assignment = Leaving solution temperature  
Entering solution temperature  
Ckt1 saturated condenser temp  
Ckt2 saturated condenser temp  
Ckt1 suction temperature  
Ckt2 suction temperature  
Ckt1 suction pressure  
Ckt2 suction pressure

2. Press the NEXT key to display Generic BAS Analog Output screens 2, 3 & 4.
3. Press the NEXT key to advance to the following screen.

**End of Submenu (NEXT) to Re-enter STATUS**

4. Pressing the NEXT key will display the beginning of the Submenu.
5. Press the AUTO or STOP key to return to the top level status information.

**Used on Units:** With GBAS 0-10 VDC Module

**Possible Values:** Open, Closed

**Used on Units:** With GBAS 0-10 VDC Module

**Possible Values:** Output = On, Off

Assignment = Output Is Not Assigned

Indicate selected diag alarms

Indicate unit at max capacity

Indicate any comp is running

**Used on Units:** With GBAS 0-10 VDC Module

**Possible Values:** 0.0 to 10.0 VDC

Assignment = Ckt1 liquid line pressure

Ckt2 liquid line pressure

Ckt1 sat liquid temperature

Ckt2 sat liquid temperature

ICS Defined temperature

Outside air temperature

Active Cooling Capacity

# System Programming SETUP

After the unit is installed, the CGM must be programmed with certain setup information (chilled solution setpoints, ON and OFF times, system defaults, setpoint sources, etc...) in order to operate and function properly. The data necessary for unit operation will vary depending on certain factors such as unit size, type, and installed options.

This section of the manual provides step by step instructions for programming this information. Also provided are instructions for checking unit operating status, accessing and clearing diagnostics, and performing service tests.

Some of the displays shown in this manual may not appear on the Human Interface (HI) LCD screen during programming. Only the applicable screens for the specific unit options and operating parameters will be displayed.

## SETUP Menu

The setup menu is used to input initial operating information such as control parameters, functions enable/disable, text display (language), temperature display (C or F), and system tuning parameters. When a setup screen is displayed for 30 minutes without a key being pressed, the LCD screen will revert to the appropriate power-up display. If this happens, press the SETUP key again to return to the setup menu.

1. Press the SETUP key to display the following screen.

**Display Text in** ENGLISH LANGUAGE  
**Display Units in** ENGLISH

2. Press the + or - key until the proper "language" is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key to advance the cursor to the "Units"
5. Press the + or - key until the proper "language" is displayed.
6. Press the ENTER key to confirm this choice.

**Used on Units:** All

**Possible Values:** Text = English, French, Spanish  
Units = SI, English

7. Press the NEXT key until the following screen is displayed.

**Unit control:** LOCAL  
**Unit Address** 49

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "Address" (TCI only)
4. Press the + or - key until the proper value is displayed. (TCI only)
5. Press the ENTER key to confirm this choice. (TCI only)
6. Press the NEXT key until the following screen is displayed.

**Used on Units:** All Units when TCI or LCI installed

**Possible Values:** Control = Local, BAS/NETWORK  
**Address:** 33 to 63 (TCI only)

**General Unit Functions Setup Submenu**  
**Press ENTER to Review or Adjust**

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the "Ice Building Control Functions Submenu".

**Reduce Multi-Unit Startup Power Demand.**  
**After Power-Up, Delay Unit Start** 0 Sec

2. Press the + or - key until the proper value is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key until the following screen is displayed.

**Used on Units:** All Units

**Possible Values:** 0 to 255 sec



# System Programming SETUP

**Demand Limit Definition: NONE**  
**Reduce cooling capacity by this amount**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Compressor Lead/Lag Function: DISABLED**  
**Stage Comp(s) Up/Down in Fixed Sequence**

OR

**Compressor Lead/Lag Function: ENABLED**  
**1st On = Least Starts, 1st Off = Most Runtime**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Hot Gas Bypass Function: DISABLED**  
**Provides Cooling Level Less Than Cool 1**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Hot Gas Bypass Max Run Time 30 Min**  
**Max HGBP Duration Until Shut Off Comp**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Capacity=50% if LST exceeds Hot Strt STP**  
**During Hot Start Time Interval: 60 Min**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Hot Operation Response Option:**  
**50% CAPACITY PER CKT, AUTO RESET DIAG**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Pumpdown Function: DISABLED**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Default Chiller Solution Pump Mode: ON**  
**Pump Always ON Except for Emergency STOP**

OR

**Default Chiller Solution Pump Mode: AUTO**  
**Turn Pump ON As Requested By CGM Module**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.

**Used on Units:** All Units with GBAS5V,  
GBAS10V or TCI

**Possible Values:** None - All Units  
25% - 2 Ckt Only  
50% - All Units  
75% - 2 Ckt Only  
100% - All Units

**Used on Units:** All Units

**Possible Values:** Enabled, Disabled

**Note:** Lead\Lag can not be Enabled if Hot Gas Bypass is Enabled.

**Used on Units:** With Hot Gas Bypass Option installed

**Possible Values:** Enabled, Disabled

**Note:** Hot Gas Bypass can not be Enabled if Lead\Lag is Enabled.

**Used on Units:** With Hot Gas Bypass Option installed

**Possible Values:** 10 to 120 minutes

**Used on Units:** All Units

**Possible Values:** 10 to 120 minutes

**Used on Units:** All Units

**Possible Values:** 50% Capacity per ckt  
(Auto Reset Diag)  
Allow normal operation  
(Info Reset Diag)  
Shut off compressors  
(Manual Reset Diag)

**Used on Units:** All Units

**Possible Values:** Enable, Disable

**Used on Units:** All Units

**Possible Values:** On, Auto

# System Programming SETUP

**Evap Soln Pump Off Delay time      30 Sec**  
**Delay Pump OFF Request By This Amount**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Loop Stabilization Time:              120 Sec**  
**Run Pump To Allow Soln Temp To Stabilize**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Low Ambient Compressor Lockout:    ENABLED**  
**Use Low Ambient Compressor Lockout STP**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Leaving Solution Reset Type:**  
**NONE - NO RESET APPLIED**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

The following two screens will display when either OA, Zone, or ENT Soln Reset is selected.

**Reset Type: Outside Air Temp Reset**  
**Start Temp 70.0 F    End Temp 50.0 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "End Temp"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Reset Type: Outside Air Temp Reset**  
**Maximum Amount of Reset Applied    5.0 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Select Type of Cooling Control Based On**  
**Chiller Application:    PROCESS COOLING**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Used on Units:** All Units  
**Possible Values:** 30 to 600 seconds

**Used on Units:** All Units  
**Possible Values:** 30 to 255 seconds

**Used on Units:** All Units  
**Possible Values:** Enable, Disable

**Used on Units:** All Units  
**Possible Values:** None - No Reset Applied  
Outside Air Temp Reset  
Zone Temp Reset  
Entering Solution Temp Reset

**Used on Units:** All Units with Leaving Solution Reset  
**Possible Values:**  
Reset Type: Outside Air Temp Reset  
Zone Temp Reset  
Entering Soln Temp Reset  
Start Temp OA: 46 - 125 F  
Zone: 67 - 81 F  
ENT Soln Temp Reset: 6 - 80 F  
End Temp OA: 45 - 124 F  
Zone: 66 - 80 F  
ENT Soln Temp Reset: 5 - 79 F  
Max Amount (Zone, OA, ENT Soln Temp Reset): 3 - 16 F

**Used on Units:** All Units  
**Possible Values:** Comfort Cooling, Process Cooling

# System Programming SETUP

## End of Submenu (NEXT) to Re-enter SETUP

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen. The following screens are displayed with Ice Building Control Option.

## Ice Building Control Functions Submenu Press ENTER to Review or Adjust

1. To view the factory preset or to modify the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the "Ice Building Control Functions Submenu".

**Ice Building Function:** DISABLED  
**Ice Building Mode:** ONE TIME

2. Press the + or - key until the proper "Function" is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key to advance the cursor to the "Mode"
5. Press the + or - key until the proper value is displayed.
6. Press the ENTER key to confirm this choice.
7. Press the NEXT key until the following screen is displayed.

**Interval Between Ice Building Cycles.**  
**Ice Rebuild Delay Time** 360 Min

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

## End of Submenu (NEXT) to Re-enter SETUP

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen.

## Head Pressure Ctrl Setup Submenu Press ENTER to Review or Adjust

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the "GBAS 0-5 VDC Module I/O Assignments"

**Saturated Condenser Temp Control Band**  
**Lower Limit 85 F**      **Upper Limit 125 F**

2. Press the + or - key until the proper "LowerLimit" is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key to advance the cursor to the "Upper Limit"
5. Press the + or - key until the proper value is displayed.
6. Press the ENTER key to confirm this choice.
7. Press the NEXT key until the following screen is displayed.

**Used on Units:** Units with Ice Building Control Option  
**Possible Values:** Function = Enabled, Disabled  
Mode = One Time, Continuous

**Used on Units:** Units with Ice Building Control Option  
**Factory Preset:** 360 Min  
**Possible Values:** 30 to 1410 Minutes

**Used on Units:** All Units  
**Possible Values:** Lower Limit - 70 to 90 F  
Upper Limit - 110 to 130 F

# System Programming SETUP

**Saturated Condenser Temp Control Band**  
**Temporary Low Limit Suppression 10 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Saturated Condenser Temperature**  
**Efficiency Check Point 110 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Saturated Condenser Temperature**  
**Low Ambient Control Point 100 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Saturated Condenser Temperature**  
**Low Ambient Control Deadband 4.0 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Saturated Condenser Temperature**  
**OA Temp Suppression Setpoint 40 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**End of Submenu (NEXT) to Re-enter STATUS**

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen.

This screen is displayed when GBAS 0-5 VDC Module is installed

**GBAS 0-5VDC Module I/O Assignment**  
**Press ENTER to Review or Adjust**

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to "GBAS 0-10 VDC Module I/O Assignments"

**GBAS (0-5VDC) Analog Input 1 Assignment**  
**NOT ASSIGNED**

2. Press the + or - key until the proper value is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key to display Generic BAS Analog Input 2 screen.
5. Press the + or - key until the proper value is displayed.
6. Press the ENTER key to confirm each choice.
7. Repeat steps 1 - 4 to display Generic BAS Analog Input screens 2, 3 & 4.
8. Press the NEXT key to advance to the following screen.

**Used on Units:** All Units  
**Possible Values:** 0 to 20 F

**Used on Units:** All Units  
**Possible Values:** 95 to 115 F

**Used on Units:** All Units  
**Possible Values:** 80 to 110 F

**Used on Units:** All Units  
**Possible Values:** 2.0 to 10.0 F

**Used on Units:** All Units  
**Possible Values:** 25 to 66 F, Disabled

**Used on Units:** With GBAS 0-5VDC Module  
**Possible Values:** Leaving Solution Setpoint  
Ice Build Terminate Setpoint  
Hot Start Load Limit Setpoint  
Capacity Limit Setpoint

# System Programming SETUP

## GBAS (0-5VDC) Binary Output 1 Definition OUTPUT IS NOT ASSIGNED

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

The following screens will display if "Indicate selected diagnostics alarms" is assigned to any of the 5 Binary Output Definitions.

## GBAS (0-5VDC) Output 1 Alarm Assignments Press ENTER to Review or Adjust

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key. If no adjustments are required, press the NEXT key to advance to the following screen.

## Assign Diag To GBAS (0-5V) Output #1 ? Any Active Diagnostic (No)

2. Press the + or - key until the proper value is displayed. If "YES" is assigned to "Any Active Diagnostic", pressing the NEXT key will advance to the Binary Output 2 Definition screen. Assigning "NO" to the "Any Active Diagnostic" will advance to the selectable diagnostic screens.
3. Press the ENTER key to confirm each choice.
4. Press the NEXT key to scroll through each Active Diagnostic.

**Used on Units:** With GBAS 0-5VDC Module

**Possible Values:** Not Assigned

Indicate Selected Diag Alarms

Indicate Unit at Max Capacity

Indicate any comp is running

**Used on Units:** With GBAS 0-5VDC Module

**Possible Values:** Yes, No

### Active Diagnostics

CGM ICS Temperature Sensor Fail  
CGM Module Data Storage Error  
CGM OA Temp Sensor Failure  
CGM Zone Temp Sensor Failure  
Ckt 1 Pumpdown Terminated by Time  
Ckt 2 Pumpdown Terminated by Time  
Comp Contactor Fail - Ckt 1  
Comp Contactor Fail - Ckt 2  
Compressor Trip - Ckt 1  
Compressor Trip - Ckt 2  
Comp Protection LPC Open - Ckt 1  
Comp Protection LPC Open - Ckt 2  
Cond Temp Sensor Failure - Ckt 1  
Cond Temp Sensor Failure - Ckt 2  
Current Sensor Module Comm Fail  
Emergency Stop  
Evap Entering Soln Temp Sensor Fail  
Evap Leaving Soln Temp Sensor Fail  
Evap Solution Flow Proving Switch  
Evap Solution Flow Loss  
Extern Leaving Soln STP Input Fail  
GBAS 0-5VDC Module Comm Failure  
GBAS 0-10VDC Module Comm Fail  
Hot Start Load Limit (Auto)  
Hot Start Load Limit (Info)  
Hot Start Load Limit (Man)  
Hot Start Load Limit STP Fail  
IBTS Adjusted To Maintain Min Diff  
Ice Build Terminate Setpoint Fail  
Leaving Solution Setpoint Fail

Liquid Pressure Sensor Fail Ckt 1  
Liquid Pressure Sensor Fail Ckt 2  
Low Ambient Evap Soln Pump Override  
Low Soln Cutout Temp (Man)  
Low Soln Cutout Temp (Auto)  
Low Press Control Open - Ckt 1  
Low Press Control Open - Ckt 2  
LSS Adjusted To Maintain Min Diff  
EST/LST Low Temperature Indication  
MCM Communications Failure  
Sat Liquid Temp Sensor Fail Ckt 1  
Sat Liquid Temp Sensor Fail Ckt 2  
SCM Communications Failure  
Suction Pressure Sensor Fail Ckt 1  
Suction Pressure Sensor Fail Ckt 2  
Suction Temp Sensor Failure - Ckt 1  
Suction Temp Sensor Failure - Ckt 2  
Superheat/Subcool Module Comm Fail  
BAS Module Comm Failure  
BAS/NETWORK Comm Failure  
Unit HI Communications Failure

# System Programming SETUP

1. Press the NEXT key to display Generic BAS Binary Output 2 Definition screen.

## **GBAS (0-5VDC) Binary Output 2 Definition OUTPUT IS NOT ASSIGNED**

2. Press the + or - key until the proper value is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key to display Generic BAS Binary Output 3 screen.
5. Press the + or - key until the proper value is displayed.
6. Press the ENTER key to confirm each choice.
7. Repeat steps 1 - 4 to display Generic BAS Binary Output screens 3, 4 & 5.
8. Press the NEXT key to advance to the following screen.

## **End of Submenu (NEXT) to Re-enter SETUP**

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen.

This screen is displayed when GBAS 0-10 VDC Module is installed

## **GBAS 0-10VDC Module I/O Assignments Press ENTER to Review or Adjust**

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key. If no adjustments are required, press the NEXT key to advance to the "CGM Alarm Output Diagnostic Assignments"

## **GBAS (0-10VDC) Analog Input 1 Assignment NOT ASSIGNED**

2. Press the + or - key until the proper value is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key to display Generic BAS Analog Input 2 screen.
5. Press the + or - key until the proper value is displayed.
6. Press the ENTER key to confirm each choice.
7. Repeat steps 1 - 4 to display Generic BAS Analog Input screens 2, 3 & 4.
8. Press the NEXT key to advance to the following screen.

## **GBAS (0-10VDC) Binary Output Definition OUTPUT IS NOT ASSIGNED**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

The following screen will display if "Indicate selected diag alarms" is assigned.

## **GBAS (0-10VDC) Output Alarm Assignments Press ENTER to Review or Adjust**

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the GBAS Analog Output Assignment screen.

**Used on Units:** With GBAS 0-5VDC Module

**Possible Values:** Output is Not Assigned  
Indicate Selected Diag Alarms  
Indicate Unit at Max Capacity  
Indicate any comp is running

**Used on Units:** With GBAS 0-10VDC Module

**Possible Values:** Not Assigned  
Leaving Solution Setpoint  
Ice Build Terminate Setpoint  
Hot Start Load Limit Setpoint  
Capacity Limit Setpoint

**Used on Units:** With GBAS 0-10VDC Module

**Possible Values:** Output is Not Assigned  
Indicate Selected Diag Alarms  
Indicate Unit at Max Capacity  
Indicate any comp is running

# System Programming SETUP

## Assign Diag To GBAS (0-10V) Output ? Any Active Diagnostic (No)

2. Press the + or - key until the proper value is displayed. If "YES" is assigned to "Any Active Diagnostic", pressing the NEXT key will advance to the "End of Submenu" screen. Assigning "NO" to the "Any Active Diagnostic" will advance to the selectable diagnostic screens. See 0-5 active diagnostics list.
3. Press the ENTER key to confirm each choice.
4. Press the NEXT key to scroll through each Active Diagnostic.

## GBAS (0-10VDC) Analog Output 1 Assignment NOT ASSIGNED

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.

## GBAS (0-10VDC) Analog Output 2 Assignment NOT ASSIGNED

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.
4. Press the NEXT key to display Generic BAS Analog Output 3 screen.
5. Press the + or - key until the proper value is displayed.
6. Press the ENTER key to confirm each choice.
7. Repeat steps 1 - 4 to display Generic BAS Analog Output screens 3 & 4.
8. Press the NEXT key to advance to the following screen.

## End of Submenu (NEXT) to Re-enter SETUP

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen.

## CGM Alarm Output Diagnostic Assignments Press ENTER to Review or Adjust

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the "Device Characteristic Setup Definitions" screen.

## Assign Diagnostic to CGM Alarm Output? Any Active Diagnostic (No)

2. Press the + or - key until the proper value is displayed. If "YES" is assigned to "Any Active Diagnostic", pressing the NEXT key will advance to the "End of Submenu" screen. Assigning "NO" to the "Any Active Diagnostic" will advance to the selectable diagnostic screens. See the active diagnostics list in the GBAS 0-5V section.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key until the following screen is displayed.

## End of Submenu (NEXT) to Re-enter SETUP

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen.

**Used on Units:** With GBAS 0-10VDC Module  
**Possible Values:** Yes, No

**Used on Units:** With GBAS 0-10VDC Module

**Possible Values:** Active Cooling Capacity  
Ckt 1 Liquid Line Pressure

Ckt 2 Liquid Line Pressure  
Ckt 1 Sat Cond Temp  
Ckt 2 Sat Cond Temp  
Ckt 1 Sat Liquid Temp  
Ckt 2 Sat Liquid Temp  
Ckt 1 Suction Pressure  
Ckt 2 Suction Pressure  
Ckt 1 Suction Temperature  
Ckt 2 Suction Temperature  
Entering Solution Temperature  
ICS Defined Temperature  
Leaving Solution Temperature  
Outside Air Temperature

**Used on Units:** All Units  
**Possible Values:** Yes, No

# System Programming SETUP

## Device Characteristic Setup Definitions Press ENTER to Review or Adjust

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the "Control Algorithm Tuning Parameters".

**Actuator Setup      Ckt1 Low Ambient Output**  
**Max Stroke Time                      60 Sec**

2. Press the + or - key until the proper value is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key until the following screen is displayed.

**Actuator Setup      Ckt1 Low Ambient Output**  
**Min Voltage                      2 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Actuator Setup      Ckt1 Low Ambient Output**  
**Max Voltage                      10 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Actuator Setup      Ckt 1 Low Ambient Output**  
**Direct/Reverse Act              DIRECT ACTING**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Actuator Setup      Ckt 2 Low Ambient Output**  
**Max Stroke Time                      60 Sec**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Actuator Setup      Ckt 2 Low Ambient Output**  
**Min Voltage                      2 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Actuator Setup      Ckt 2 Low Ambient Output**  
**Max Voltage                      10 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Actuator Setup      Ckt 2 Low Ambient Output**  
**Direct/Reverse Act              DIRECT ACTING**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Used on Units:** All Units  
**Possible Values:** 1 to 255 Seconds

**Used on Units:** All Units  
**Possible Values:** 0 - 10 VDC

**Used on Units:** All Units  
**Possible Values:** 0 - 10 VDC

**Used on Units:** All Units  
**Possible Values:** Direct Acting/Reverse Acting

**Used on Units:** 40 - 60 Ton Units  
**Possible Values:** 1 to 255 Seconds

**Used on Units:** 40 - 60 Ton Units  
**Possible Values:** 0 - 10 VDC

**Used on Units:** 40 - 60 Ton Units  
**Possible Values:** 0 - 10 VDC

**Used on Units:** 40 - 60 Ton Units  
**Possible Values:** Direct Acting/Reverse Acting



# System Programming SETUP

**Ckt 1 Suction Line Pressure Transducer**  
**0 PSIG= 0.118 VDC      100 PSIG= 4.847 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "100 PSIG"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Ckt 1 Liquid Line Pressure Transducer**  
**0 PSIG= 0.118 VDC      400 PSIG= 4.847 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "400 PSIG"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Ckt 2 Suction Line Pressure Transducer**  
**0 PSIG= 0.118 VDC      100 PSIG= 4.847 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "100 PSIG"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Ckt 2 Liquid Line Pressure Transducer**  
**0 PSIG= 0.118 VDC      400 PSIG= 4.847 VDC**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "400 PSIG"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**End of Submenu (NEXT) to Re-enter STATUS**

1. Pressing the NEXT key will display the beginning of the Submenu.
2. Press the NEXT key again to advance to the following screen.

**Control Algorithm Tuning Parameters**  
**Press ENTER to Review or Adjust**

1. To view the factory preset or to modified the factory presets to meet specific application requirements, press the ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the beginning of the "Setup" menu.

**Comfort Cooling**  
**Design Delta Temperature Setpoint 10.0 F**

2. Press the + or - key until the proper value is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key until the following screen is displayed.

**Used on Units:** With Superheat/Subcooling Option  
**Possible Values:** 0 PSIG - 0.000 to 4.000 VDC  
100 PSIG - 1.000 to 5.000 VDC

**Used on Units:** With Superheat/Subcooling Option  
**Possible Values:** 0 PSIG - 0.000 to 4.000 VDC  
400 PSIG - 1.000 to 5.000 VDC

**Used on Units:** 40-60 Ton With Superheat/Subcooling  
**Possible Values:** 0 PSIG - 0.000 to 4.000 VDC  
100 PSIG - 1.000 to 5.000 VDC

**Used on Units:** 40-60 Ton With Superheat/Subcooling  
**Possible Values:** 0 PSIG - 0.000 to 4.000 VDC  
400 PSIG - 1.000 to 5.000 VDC

**Used on Units:** All Units  
**Possible Values:** 4.0 to 20.0 F

# System Programming SETUP

ENTER key to advance to the following screens. If no adjustments are required, press the NEXT key to advance to the beginning of the "Setup" menu.

**Comfort Cooling**  
**Design Delta Temperature Setpoint 10.0 F**

2. Press the + or - key until the proper value is displayed.
3. Press the ENTER key to confirm this choice.
4. Press the NEXT key until the following screen is displayed.

**Comfort Cooling**  
**Control Response Setpoint 25**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Process Cooling Control Gains**  
**Proportional 25 %/F Reset Time 90s**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "Reset Time"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Process Cooling Control Gains**  
**Proport Bias 0% Max Cy Rate 15.0 cph**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "Max Cy Rate".
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Low Ambient Fan Control Gain**  
**Proportional 2.0 %/F Reset Time 90 Sec**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "Reset Time"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Low Ambient Fan Control Gain**  
**Rate Time 0 Sec**

1. Press the + or - key until the proper value is displayed.

**Used on Units:** All Units  
**Possible Values:** 4.0 to 20.0 F

**Used on Units:** All Units  
**Possible Values:** 1 to 128

**Used on Units:** All Units  
**Possible Values:** Proportional 2.0 to 200.0  
Reset Time 30 to 3600 Sec

**Used on Units:** All Units  
**Possible Values:** Proport Bias 0 to 400%  
Max Cy Rate - 1.5 to 20.0 cph

**Used on Units:** All Units  
**Possible Values:** Proportional 0.2 to 20.0  
Reset Time 5 to 600 Sec

**Used on Units:** All Units  
**Possible Values:** 0 to 50

# System Programming SETPOINTS

## SETPOINTS Menu

The SETPOINTS menu is used to designate default setpoints, low ambient compressor lockout setpoints and select setpoint sources.

These setpoints will be active (in use) for the "Setpoint Source Selection" designated as "DEFAULT" for these inputs.

**HI Leaving Solution Setpoint: 44 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Stop Ice Making When Ent Soln Temp Below  
Hi Ice Build Terminate Setpoint: 27.0 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Comp(s) OFF if Solution Temp Below  
Low Solution Cutout Temp: 35.0 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Heat Output ON When EST or LST Less Than  
Heat Tape Temperature Setpoint: 40.0 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**HI Hot Start Load Limit Setpoint: 71.0 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Request Pump ON When OA Temp Less Than  
Low Ambient Pump Override Temp: 35 F**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Low Ambient Comp Lockout Temp: 40 F  
Comp(s) OFF if OA Temp Below This Value**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Use Leaving Solution Setpoint  
From: HUMAN INTERFACE STP MENU**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.

When a setpoint screen is displayed for 30 minutes without a key being pressed, the LCD screen will revert to the general operating status display. If this happens, press the SETPOINT key again to return to the setpoint menu.

**Used on Units:** All Units

**Possible Values:** Based on Configured Leaving Solution STP Range:

Range 51.0 - 65.0°F

Range 40.0 - 50.0°F

Range 30.0 - 39.0°F

Range 20.0 - 29.0°F

Range 10.0 - 75.0°F (SPECIAL)

**Used on Units:** Units with Ice Building Control Option

**Possible Values:** 20.0 to 31.0 F

**Used on Units:** All Units

**Possible Values:** -10.0 to 60.0 F

Note: Maximum setting may be limited by 'Hi Leaving Solution Setpoint'

**Used on Units:** All Brazed Plate Units

**Possible Values:** 0 to 45.0 F

Note: Maximum setting may be limited by 'Hi Leaving Solution Setpoint'

**Used on Units:** All Units

**Possible Values:** 60.0 to 80.0 F

**Used on Units:** All Units

**Possible Values:** -20.0 to 50.0 F

**Used on Units:** All Units

**Possible Values:** -20.0 to 60.0 F

**Used on Units:** All Units

**Possible Values:** Human Interface STP Menu

GBAS 0-5VDC Module

GBAS 0-10VDC Module

Ext Leaving Soln STP Input

# System Programming SETPOINTS

3. Press the NEXT key until the following screen is displayed.

**Use Ice Building Terminate Setpoint**

**From: HUMAN INTERFACE STP MENU**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Use Hot Start Load Limit Setpoint**

**From: HUMAN INTERFACE STP MENU**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Use Capacity Limit Setpoint**

**From: NO SOURCE SELECTED**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Pressing the NEXT key will return to the 1st SETPOINT screen.
4. Press the AUTO or STOP key to return to the top level status information screen.

**Used on Units:** With Ice Building Control Option

**Possible Values:** Human Interface STP Menu  
GBAS 0-5VDC Module  
GBAS 0-10VDC Module

**Used on Units:** All Units

**Possible Values:** Human Interface STP Menu  
GBAS 0-5VDC Module  
GBAS 0-10VDC Module

**Used on Units:** With GBAS5V or GBAS10V

**Possible Values:** No Source Selected  
GBAS 0-5VDC Module  
GBAS 0-10VDC Module

# System Configuration

## CONFIGURATION Menu

The CGM controlled unit has many operating functions whose settings are preset at the factory. The following configuration programming steps are provided for those cases where the Human Interface module has been replaced after the unit has been in operation and must be reconfigured.

Press the CONFIGURATION key to display the following screens. Check the unit model number and compare it to the data that is displayed in the following screens

<b>Configuration - Model Num Digit</b>	<b>5,6,7</b>
<b>Unit Capacity</b>	<b>50</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

<b>Configuration - Model Num Digit</b>	<b>8</b>
<b>Line Voltage</b>	<b>460 VAC</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

<b>Configuration - Model Num Digit</b>	<b>11</b>
<b>Ice Building Control</b>	<b>INSTALLED</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

<b>Configuration - Model Num Digit</b>	<b>11</b>
<b>Leaving Solution STP Range</b>	<b>40 - 50 F</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

<b>Configuration - Model Num Digit</b>	<b>13+</b>
<b>Hot Gas Bypass Option</b>	<b>INSTALLED</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

<b>Configuration - Model Num Digit</b>	<b>13+</b>
<b>GBAS 0-5VDC Module</b>	<b>INSTALLED</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

<b>Configuration - Model Num Digit</b>	<b>13+</b>
<b>GBAS 0-10VDC Module</b>	<b>INSTALLED</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

<b>Configuration - Model Num Digit</b>	<b>13+</b>
<b>Superheat/Subcool Module</b>	<b>INSTALLED</b>

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.

Refer to the Model number stamped on the unit nameplate located on the control panel door while scrolling through the configurator screens. Certain digits of this alpha/numeric model number provide information that must be entered at the Human Interface (HI) in order for the CGM network to operate properly.

**Used on Units:** All Units  
**Possible Values:** 20, 25, 30, 40, 50, 60

**Used on Units:** All Units  
**Possible Values:** 200 VAC, 230 VAC, 380 VAC, 415 VAC, 460 VAC, 575 VAC, Special Voltage

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

**Used on Units:** All Units  
**Possible Values:** 51-65 F, 40-50 F, 30-39 F, 20-29 F, Special

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

# System Configuration

3. Press the NEXT key until the following screen is displayed.

**Configuration - Model Num Digit** 13+  
**Current Sensing Module** INSTALLED

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Configuration - Model Num Digit** 13+  
**BAS Communications Module** INSTALLED

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Configuration - Model Num Digit** 13+  
**Remote Human Interface** INSTALLED

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

The following displays are not editable.

**Software Revision Number Report:**  
**Cold Generator Module (CGM)** 1.00

1. Press the NEXT key until one of the following screens is displayed.

**Software Revision Number Report:**  
**Single Compressor Module (SCM)** 1.00

OR

**Software Revision Number Report:**  
**Multiple Compressor Module (MCM)** 1.00

1. Press the NEXT key until the following screen is displayed.

**Software Revision Number Report:**  
**GBAS 0-5VDC Module** 1.00

1. Press the NEXT key until the following screen is displayed.

**Software Revision Number Report:**  
**GBAS 0-10VDC Module** 1.00

1. Press the NEXT key until the following screen is displayed.

**Software Revision Number Report:**  
**Superheat/Subcool Module (SSM)** 1.00

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

**Used on Units:** All Units  
**Possible Values:** Installed, Not Installed

**Used on Units:** All Units  
**Possible Values:** 1.0 or Greater

**Used on Units:** 20 to 30 Ton Units  
**Possible Values:** 1.0 or Greater

**Used on Units:** 40 to 60 Ton Units  
**Possible Values:** 1.0 or Greater

**Used on Units:** With GBAS 5VDC Module  
**Possible Values:** 1.0 or Greater

**Used on Units:** With GBAS 10VDC Module  
**Possible Values:** 1.0 or Greater

**Used on Units:** With SSM Module  
**Possible Values:** 1.0 or Greater

# System Configuration

---

1. Press the NEXT key until the following screen is displayed.

**Software Revision Number Report:**  
**Current Sensing Module (CSM) 1.00**

1. Press the NEXT key until the following screen is displayed.

**Software Revision Number Report:**  
**Unit Human Interface (HI) 1.00**

1. Press the NEXT key until the following screen is displayed.

**Software Revision Number Report:**  
**Remote Human Interface (RHI) 1.00**

1. Press the NEXT key until the following screen is displayed.

**Software Revision Number Report:**  
**BAS Communications: Comm3 1.00**

1. Pressing the NEXT key will return to the 1st CONFIGURATION screen.
2. Press the AUTO or STOP key to return to the top level status information screen.

**Used on Units:** With CSM Module  
**Possible Values:** 1.0 or Greater

**Used on Units:** All Units  
**Possible Values:** 1.0 or Greater

**Used on Units:** With Remote Human Interface Module  
**Possible Values:** 1.0 or Greater

**Used on Units:** With TCI or LCI Module  
**Possible Values:** Comm3 (with TCI module)  
Comm5 (with LCI module)  
**Possible Values:** 1.0 or Greater

# System Testing & Troubleshooting

## SERVICE MODE Menu

The SERVICE MODE menu is used to input operating parameters for unit operation during a service test. Depending on the particular test being conducted, the user will cycle through all unit outputs (compressors, fans, pump, etc...) and selectively turn them On or Off for the test. After designating the operating status for each unit component, the operator will designate the "TEST START" delay time.

When a service mode screen is displayed for 30 minutes without a key being pressed, the LCD screen will revert to the general operating status display. If this happens, press the SERVICE MODE key again to return to the service menu.

To operate the system in the TEST MODE, press the SERVICE MODE key to enter into the service mode menu and scroll through all of the system outputs and selectively turn them "On" or "Off".

**CGM Evap Solution Pump Relay: OFF**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Liquid Line Solenoid Valve Ctrl Relays:**  
**Ckt 1 ON Ckt 2 OFF**

1. Press the + or - key until the proper value is displayed.
  2. Press the ENTER key to confirm this choice.
  3. Press the NEXT key to advance the cursor to the "Ckt 2"
- Circuit 2 is used for 40 through 60 Ton units only.**
4. Press the + or - key until the proper value is displayed.
  5. Press the ENTER key to confirm this choice.
  6. Press the NEXT key until the following screen is displayed.

**Low Ambient LPC Bypass Relay(s)**  
**Ckt 1 ON Ckt 2 OFF**

1. Press the + or - key until the proper value is displayed.
  2. Press the ENTER key to confirm this choice.
  3. Press the NEXT key to advance the cursor to the "Ckt 2"
- Circuit 2 is used for 40 through 60 Ton units only.**
4. Press the + or - key until the proper value is displayed.
  5. Press the ENTER key to confirm this choice.
  6. Press the NEXT key until the following screen is displayed.

**CGM Hot Gas Bypass Control Relay: OFF**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

**Compressor Relays**  
**K11 OFF K12 OFF**

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "K11"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.

**Used on Units:** All Units  
**Possible Values:** On, Off

**Used on Units:** All Units  
**Possible Values:** On, Off

**Used on Units:** All Units  
**Possible Values:** On, Off

**Used on Units:** With Hot Gas Bypass Option  
**Possible Values:** On, Off

**Used on Units:** 20 to 30 Ton  
**Possible Values:** On, Off



# System Testing & Troubleshooting

OR

The following screen will display on 40 to 60 Ton units.

## Compressor Relays

K11 OFF K12 OFF K3 OFF K4 OFF

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "K12"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key to advance the cursor to the "K3"
7. Press the + or - key until the proper value is displayed.
8. Press the ENTER key to confirm this choice.
9. Press the NEXT key to advance the cursor to the "K4"
10. Press the + or - key until the proper value is displayed.
11. Press the ENTER key to confirm this choice.
12. Press the NEXT key until the following screen is displayed.

## Condenser Fan Outputs

1A OFF 1B OFF 1C OFF

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "1B"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key until the following screen is displayed.
7. Press the + or - key until the proper value is displayed.
8. Press the ENTER key to confirm this choice.
9. Press the NEXT key to advance the cursor to the "2B"

The following screen will display on 40 to 60 Ton units.

## Condenser Fan Outputs

2A OFF 2B OFF 2C OFF

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key to advance the cursor to the "1B"
4. Press the + or - key until the proper value is displayed.
5. Press the ENTER key to confirm this choice.
6. Press the NEXT key to advance the cursor to the "2A"
7. Press the + or - key until the proper value is displayed.
8. Press the ENTER key to confirm this choice.
9. Press the NEXT key to advance the cursor to the "2B"

## Condenser Fan Speed

Ckt 1 0% Ckt 2 0%

1. Press the + or - key until the proper value is displayed.
  2. Press the ENTER key to confirm this choice.
- Circuit 2 is used for 40 through 60 Ton units only.**
3. Press the NEXT key to advance the cursor to the "Ckt 2"
  4. Press the + or - key until the proper value is displayed.
  5. Press the ENTER key to confirm this choice.
  6. Press the NEXT key until the following screen is displayed.

MCM Heater Tape Relay K13: OFF  
Relay ON: Heat Off, Relay OFF: Heat On

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

CGM Alarm Output: OFF

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.
3. Press the NEXT key until the following screen is displayed.

Used on Units: 40 to 60 Ton

Possible Values: On, Off

Used on Units: All Units

Possible Values: On, Off, Auto

Used on Units: 40 to 60 Ton

Possible Values: On, Off, Auto

Used on Units: All Units

Possible Values: Auto, 0 to 100%

Note: This is the low ambient damper position

Used on Units: All Brazed Plate Units

Possible Values: On, Off

# System Testing & Troubleshooting

3. Press the NEXT key until the following screen is displayed.

**CGM Ice Build Relay Output : OFF**

**Used on Units:** With Ice Building Control Option  
**Possible Values:** On, Off

1. Press the + or - key until the proper value is displayed.  
2. Press the ENTER key to confirm this choice.  
3. Press the NEXT key until the following screen is displayed.

**GBAS 0-5VDC Module Relay Outputs**  
**#1 OFF #2 OFF #3 OFF #4 OFF #5 OFF**

**Used on Units:** With GBAS 5VDC Module Option  
**Possible Values:** On, Off

1. Press the + or - key until the proper value is displayed.  
2. Press the ENTER key to confirm this choice.  
3. Press the NEXT key to advance the cursor to the "#2 Output"  
4. Press the + or - key until the proper value is displayed.  
5. Press the ENTER key to confirm this choice.  
6. Repeat steps 1 - 4 for Outputs 3, 4 & 5.  
7. Press the NEXT key until the following screen is displayed.

**GBAS 0-10VDC Module Relay Output: OFF**

**Used on Units:** With GBAS 10VDC Module Option  
**Possible Values:** On, Off

1. Press the + or - key until the proper value is displayed.  
2. Press the ENTER key to confirm this choice.  
3. Press the NEXT key until the following screen is displayed.

**GBAS 0-10VDC Module Analog Outputs**  
**Out #1 0.2 VDC Out #2 0.4 VDC**

**Used on Units:** With GBAS 10VDC Module Option  
**Possible Values:** 0.0 to 10.0 VDC

1. Press the + or - key until the proper value is displayed.  
2. Press the ENTER key to confirm this choice.  
3. Press the NEXT key to advance the cursor to the "#2 Output"  
4. Press the + or - key until the proper value is displayed.  
5. Press the ENTER key to confirm this choice.  
6. Press the NEXT key until the following screen is displayed.

**GBAS 0-10VDC Module Analog Outputs**  
**Out #3 0.6 VDC Out #4 0.8 VDC**

**Used on Units:** With GBAS 10VDC Module Option  
**Possible Values:** 0.0 to 10.0 VDC

1. Press the + or - key until the proper value is displayed.  
2. Press the ENTER key to confirm this choice.  
3. Press the NEXT key to advance the cursor to the "#4 Output"  
4. Press the + or - key until the proper value is displayed.  
5. Press the ENTER key to confirm this choice.  
6. Press the NEXT key until the following screen is displayed.

**CGM ICS Controlled Relay: OFF**

**Used on Units:** With TCI Module Option (For Future Use)  
**Possible Values:** On, Off

1. Press the + or - key until the proper value is displayed.  
2. Press the ENTER key to confirm this choice.

# System Testing & Troubleshooting

3. Press the NEXT key until the following screen is displayed.

**Start Test in 5 Sec**  
**Press TEST START To Begin, STOP To Halt**

**Used on Units:** All Units  
**Possible Values:** 5 to 255 seconds

1. Press the + or - key until the proper value is displayed.
2. Press the ENTER key to confirm this choice.

The following screen will be displayed after pressing the "TEST START" key if a SERVICE MODE screen has been displayed during the previous 60 minutes.

**Test Start In 5 Sec**  
**Press STOP To Halt**

**Used on Units:** All Units  
**Possible Values:** 120 to 0 Seconds

If a screen has not been displayed during the SERVICE MODE procedure for 60 minutes and the TEST START key is pressed, the following screen will be displayed.

**Press SERVICE MODE**  
**To Review Selections**

**Used on Units:** All Units

When the START TEST timer expires, this screen will be displayed at the unit mounted Human Interface and at the remote mounted Human Interface, if installed.

**Service Test Is Active**  
**Press STOP To Halt**

**Used on Units:** All Units

**Note:** There is no time-out period when the unit is operating in the SERVICE TEST mode. Press the "STOP" or "AUTO" key to discontinue the Service Test. Only the STATUS, CUSTOM, SERVICE MODE, DIAGNOSTICS, and STOP keys are functional once the TEST START key has been pressed.

After pressing the STOP or AUTO key, the following screen is displayed

**Service Mode, STOP SYSTEM Restart**  
**Communicating With Unit. Please Wait**

and then the following screen is displayed:

**Updating Unit Data. Please Wait**  
**TRANE INTELLIPAK**

and then the top level status screen is displayed.

# System Testing & Troubleshooting

## DIAGNOSTICS Menu

The DIAGNOSTICS menu is used to view diagnostics that have resulted from system failures within the unit. There are two lists where diagnostics reside; the Active list, and the Diagnostic Event Log.

The Active list is used for viewing all active diagnostics and for clearing manually resettable diagnostics. This list of diagnostics are displayed after pressing the DIAGNOSTICS key if active diagnostics are present.

Active manual diagnostics can be cleared in batch form at the unit mounted Human Interface. When an Active diagnostic is manually or automatically cleared, it is removed from this buffer. Automatically resetting diagnostics can not be reset by the Human Interface, because the condition which caused the diagnostic has to be corrected for the diagnostic to clear.

The word "MORE" is displayed on all screens if more than one diagnostic exists, except for the last diagnostic. Upon reaching the last diagnostic, the word "MORE" disappears. Pressing the NEXT key at this point causes the display to advance to the first diagnostic in the Diagnostic Event Log.

The Diagnostic Event Log screens are displayed after scrolling through the Active list or after pressing the DIAGNOSTICS key when no active diagnostics are present. It's used to view the past 20 diagnostics. Diagnostics in this

log are stacked in inverse chronological order, with the first diagnostic screen being the most recently reported diagnostic.

When a new diagnostic is displayed, the words "NOT VIEWED" are displayed with it. After viewing the last unviewed diagnostic, the words "NOT VIEWED" change to "VIEWED" for every diagnostic in the log. The diagnostic will remain this way as long as it is in the log. This allows the operator to distinguish between old and new diagnostics in the Event Log.

Pressing the NEXT key after reaching the last diagnostic in the Event Log advances the display to the first diagnostic in the Active list if any exist. If not, the display reverts back to the first Event Log diagnostic. If the Diagnostic Event Log is full (20 events), and another diagnostic occurs, the oldest diagnostic is pushed off the end of the list. If all 20 diagnostics in the list are active when the 21st occurs, then the oldest Active diagnostic is pushed off the end of the list. When an Active diagnostic is automatically or manually cleared in the Active buffer, its status in the Diagnostic Log changes from Active to History. If the operator does not clear an active diagnostic in the Active log, its status will still show as Active in the Diagnostic Log.

When a diagnostic screen is displayed for more than four hours without a key being pressed, the screen will return to the operating status display.

One of the following screens will be the first screen displayed when the DIAGNOSTIC" key is pressed.

**Diagnostic Menu ---- Info**  
**No Active Diagnostics (NEXT) History Log**

OR

**Press CANCEL to Clear All Active Manual**  
**Diagnostics, or Press NEXT to View**

1. If there are active diagnostics, pressing the "CANCEL" key to clear the diagnostics will prompt the following screen.

**Diagnostic Reset Is Password Protected**  
**Please Enter Password:**

1. Press the + (Plus) or - (Minus) keys to enter the password
2. Press the ENTER key to confirm this choice. When the correct password is entered, the following screen will be displayed.

**Used on Units:** All Units

**Possible Values:** + (Plus) and - (Minus)

# System Testing & Troubleshooting

**Resetting Active Manual Diagnostics  
Sending Reset Request**

and then the following screen will be displayed

**Resetting Active Manual Diagnostics  
Updating Unit Data, Please Wait**

and then the following screen will be displayed

**Active Diagnostic ---- Info  
"Please Wait . . . Unit Is In Reset Mode"**

**OR**

3. Pressing the "NEXT" key to view the diagnostics will prompt the following screen if a "MANUAL RESET" failure has occurred.

**Active Diagnostic ---- Manual Reset  
More**

**Used on Units:** All Units

The word MORE will only appear if more than one failure has occurred.

## **Possible Values:**

Comp Contactor Fail - Ckt 1	Evap Leaving Solution Temp Sensor Fail
Comp Contactor Fail - Ckt 2	Evap Entering Solution Temp Sensor Fail
Comp Prot - LPC Open (Ckt 1)	Evap Solution Flow Loss
Comp Prot - LPC Open (Ckt 2)	Hot Start Load Limit (Man)
Compressor Trip - Ckt 1	Low Solution Cutout Temp (Man)
Compressor Trip - Ckt 2	Low Pressure Control Open - Ckt 1
Emergency Stop	Low Pressure Control Open - Ckt 2

**OR**

Pressing the "NEXT" key to view the diagnostics will prompt the following screen if an "AUTO RESET" failure has occurred.

**Used on Units:** All Units

**Active Diagnostic ---- Auto Reset  
More**

The word MORE will only appear if more than one failure has occurred.

## **Possible Values:**

CGM OA Temp Sensor Failure,	IBTS Adjusted to Maintain Min Diff
CGM Zone Temp Sensor Failure,	Ice Build Terminate Setpoint Fail
Cond Temp Sensor Failure - Ckt 1,	Leaving Solution Setpoint Fail
Cond Temp Sensor Failure - Ckt 2,	Low Ambient Evap Solution Pump Override
Current Sensing Module Comm Fail	Low Solution Cutout Temp (Auto)
Evap Solution Flow Proving Switch	LSS Adjusted to Maintain Min Diff
Ext. Leaving Solution STP Input Fail	MCM Communications Failure
GBAS 0-5V Module Comm Failure	SCM Communications Failure
GBAS 0-10V Module Comm Fail	BAS Module Comm Failure
Hot Start Load Limit (Auto)	BAS/NETWORK Comm Failure
Hot Start Load Limit STP Fail	Unit HI Communications Failure

**OR**

Pressing the "NEXT" key to view the diagnostics will prompt the following screen if an "Information Only" failure has occurred.

# System Testing & Troubleshooting

**Active Diagnostic ---- Info**

**More**

**Used on Units:** All Units

The word MORE will only appear if more than one failure has occurred.

If additional active diagnostics are present, pressing the NEXT key will display them.

**Possible Values:**

CGM ICS Temperature Sensor Fail	Sat Liquid Temp Sensor Fail Ckt 1
CGM Module Data Storage Error	Sat Liquid Temp Sensor Fail Ckt 2
EST/LST Low Temperature Indication	Suction Pressure Sensor Fail Ckt 1
Hot Start Load Limit (Info)	Suction Pressure Sensor Fail Ckt 2
Liquid Pressure Sensor Fail Ckt 1	Suction Temp Sensor Fail Ckt 1
Liquid Pressure Sensor Fail Ckt 2	Suction Temp Sensor Fail Ckt 2
Pumpdown Terminated By Time Ckt 1	Superheat/Subcool Module Fail
Pumpdown Terminated By Time Ckt 2	

After viewing all active diagnostics, pressing the NEXT key will display the following screen

**Log 1**

**Used on Units:** All Units

**Possible Values:** Log Number 1-20, Viewed or Not Viewed, Active or History, Manual, Auto, or Info., Any diagnostic listed under the previous screens associated with the type of diagnostic.

Pressing the NEXT key will display each successive log entry.

1. Pressing the "CANCEL" key to clear the diagnostics log will display the following screen.

**Diagnostic Log Is Password Protected  
Please Enter Password:**

**Used on Units:** All Units

**Possible Values:** + (Plus) and - (Minus)

1. Press the + (Plus) or - (Minus) keys to enter the password
2. Press the ENTER key to confirm this choice. When the correct password is entered, the following screen will be displayed.

**Active Diagnostics  
"Please Wait . . . Updating Diagnostic Log"**

**Used on Units:** All Units

**Possible Values:** Manual, Auto, or Info

If the "DIAGNOSTIC LOG" is empty when the "CANCEL" key is pressed, the following screen will be displayed.

**Active Diagnostics ---- Info  
"Diagnostic Buffer Is Already Empty !"**

**Used on Units:** All Units

**Possible Values:** Manual, Auto, or Info

Press the AUTO or STOP key to return to the top level status screen.

## Failure Modes

When any condition results in the unit's inability to perform a normal function, it is said to have entered a failure mode. There are two types of failure modes.

1. An "Analog input out of range" failure mode.

This failure mode occurs when a sensing device such as a temperature sensor begins to transmit information that is outside its allowable range.

2. A "Fault recognition by input logic" failure mode. This failure mode occurs when the UCM receives information that does not "make sense" or does not conform to its predefined logic.

# System Testing & Troubleshooting

## Communications Link Problems

If one of these messages appear on the Human Interface screen, that Human Interface is not communicating with the unit.

**LOCAL HI COMMUNICATIONS LOSS**  
**CHECK COMM LINK WIRING BETWEEN MODULES**

OR

**REMOTE HI COMMUNICATIONS LOSS**  
**CHECK COMM LINK WIRING TO UNIT NUMBER 3**

If one of these messages appear on the Human Interface screen, the link is noisy or there is another Human Interface of the same type on the link.

**Improper Human Interface Configuration**  
**More than one Local HI on link**

OR

**Improper Human Interface Configuration**  
**More than one Remote HI on link**

**Used With:** All Units with Local HI

**Problem:** The Unit Mounted (Local) Human interface has lost communications with the CGM. See "Fail Diagnostic" for additional information.

**Check:** Wiring between Unit Mounted (Local) Human Interface and CGM. Verify crimping and polarity of communications wiring. There should be no loose connections or crimps on wire insulation.

**Used With:** All Units with Remote Human Interface

**Possible Values:** Unit Number 1 through 4

**Problem:** The Remote Human Interface has lost communications with the unit whose number is specified (#3 in this example).

**Check:** Field/unit wiring between Remote Human Interface and the IPCB on the unit number specified. Also, verify wiring between the IPCB and CGM of the unit whose number is specified. Verify crimping and polarity of communications wiring. There should be no loose connections or crimps on wire insulation.

**Used With:** All Units with Local HI

**Problem:** Noisy Communications link or a second Local HI has been installed on the link.

**Check:** Wiring between Unit Mounted (Local) Human Interface and CGM. Verify crimping of communications wiring. There should be no loose connections or crimps on wire insulation. If a Remote HI was installed, verify that a Local HI was not installed by mistake.

**Used With:** All Units with Remote Human Interface

**Problem:** Noisy Communications link or a second Remote HI has been installed on the link.

**Check:** Field/Unit wiring between Remote Human Interface and the IPCB and CGM. Verify crimping of communications wiring. There should be no loose connections or crimps on wire insulation. Verify that no other Remote HI's have been connected to the same communications link/unit.

## Diagnostics

There are four types of diagnostics:

1. (PMR) Partial System Disable, Manual Reset
2. (PAR) Partial System Disable, Auto Reset
3. (INFO) Information Only
4. (HO) History Only

The following Troubleshooting chart lists possible Failure Modes and:

1. The Diagnostic Displayed on the Human Interface's LCD screen and if it is a PMR, PAR, INFO or HO diagnostic.
2. The condition which caused the failure mode to occur or the Reason for Diagnostic.
3. The UCM's Reaction to the failure mode.

# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
CGM ICS Temperature Sensor Fail  Problem: CGM is receiving a signal which is out of range from the CGM ICS Temperature Sensor input.	The unit is reading a signal that is out of range for the CGM ICS Temperature sensor input on the CGM. (Temp < -40 F or Temp > 200 F).	No change in unit operation occurs. This diagnostic is for information only.	(INFO) An automatic reset occurs after the CGM ICS Temperature Sensor returns to its allowable range. In order to prevent rapid cycling of the diagnostic, there is a 10 second delay prior to the
CGM Module Data Storage Error  Problem: There was a data transmission error.  Check: This can be caused by an intermittent power loss. Turn the unit off for 1-2 minutes, then back on again. If diagnostic persists, then the CGM may need to be replaced.	An error occurred while the CGM was writing data to its internal non-volatile memory (EEPROM).	An information only diagnostic will be displayed at the Human Interface.	(INFO) A manual reset may be made at the Human Interface, at Tracer, or by cycling power to the CGM.
CGM OA Temp Sensor Failure  Problem: The Outside Air Temperature sensor input is out of range.  Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If so, check field/unit wiring between Sensor and CGM.	The unit is reading a signal that is out of range for the Outside Air Temperature sensor input on the CGM. (Temp < -40 F or Temp > 200 F).	Unit actions that occur when this diagnostic is active include: a. Low Ambient Compressor Lockout function is disabled b. Low Ambient Pump Override function is activated (ie: Solution Pump ON request is issued). c. LPC Bypass Time is set to Minimum Bypass Time (time used for OA Temp > 65 degF). d. If Leaving Solution Reset type selected is OA Temp Reset, then the Reset type reverts to NONE for the duration of the failure.	(PAR) An automatic reset occurs after the OA Temp input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.
CGM Zone Temp Sensor Failure  Problem: The CGM Zone Temperature sensor input is out of range.  Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If so, check field/unit wiring between Sensor and CGM.	The Leaving Solution Reset type selected is Zone Temp Reset, and the unit is reading a signal that is out of range for this input (Temp < -40 F or Temp > 200 F).	The Reset type reverts to NONE for the duration of the failure.	(PAR) An automatic reset occurs after the designated Zone Temperature signal returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.



# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>Circuit 1 Pumpdown Terminated by Time</p> <p>Problem: Unit went through Pumpdown on Circuit 1 and LPC never tripped. Pumpdown was terminated after 30 seconds.</p> <p>Check: Check circuit 1 pumpdown solenoid valve and low pressure switch to verify proper operation.</p>	<p>Unit remained in pumpdown for 30 seconds without the occurrence of an LPC event. Pumpdown sequence was terminated by a 30 second timer.</p>	<p>No Change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) This diagnostic is reset when a compressor on Circuit 1 is staged on due to a cooling demand.</p>
<p>Circuit 2 Pumpdown Terminated by Time (Circuit #2 40-60 Ton units only)</p> <p>Problem: Unit went through Pumpdown on Circuit 2 and LPC never tripped. Pumpdown was terminated after 30 seconds.</p> <p>Check: Check circuit 2 pumpdown solenoid valve and low pressure switch to verify proper operation.</p>	<p>Unit remained in pumpdown for 30 seconds without the occurrence of an LPC event. Pumpdown sequence was terminated by a 30 second timer.</p>	<p>No Change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) This diagnostic is reset when a compressor on Circuit 2 is staged on due to a cooling demand.</p>
<p>Compressor Contactor Fail - Circuit 1</p> <p>Problem: The Compressor Contactor for Circuit #1 has malfunctioned.</p>	<p>The circuit #1 compressor proving input on the SCM/MCM is detected closed continuously for more than 3 seconds while neither compressor output on Circuit #1 is closed.</p>	<p>A "Lockout Circuit #1" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, Liquid Line Solenoid Relay, and Hot Gas Bypass Relay for Circuit 1 are all de-energized</p>	<p>(PMR) A manual reset is required after the diagnostic is set. It can be reset by the HI or Tracer, or by cycling power to the CGM.</p>
<p>Compressor Contactor Fail - Circuit 2 (Circuit #2 40-60 Ton units only)</p> <p>Problem: The Compressor Contactor for Circuit #2 has malfunctioned.</p>	<p>The Circuit #2 compressor proving input on the MCM is detected closed continuously for more than 3 seconds while neither compressor output on Circuit #2 is closed.</p>	<p>A "Lockout Circuit #2" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, and Liquid Line Solenoid Relay for Circuit 2 are all de-energized</p>	<p>(PMR) A manual reset is required after the diagnostic is set. It can be reset by the HI or Tracer, or by cycling power to the CGM.</p>

# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>Compressor Protection - LPC Open - Circuit 1</p> <p>Problem: State of refrigerant charge for circuit #1 is low.</p>	<p>While the Circuit 1 LPC Bypass Relay was energized, the 7 PSIG LPC switch: a) was open at the time a compressor was requested to start, or b) the switch opened 4 times after a compressor on Circuit 1 was started but prior to accumulating 3 continuous minutes of run time.</p>	<p>A "Lockout Circuit #1" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, and Liquid Line Solenoid Relay for Circuit 1 are all de-energized.</p>	<p>(PMR) A manual reset is required anytime after the Diagnostic is set. The Diagnostic can be reset by the Human Interface or Tracer, or by cycling power to the CGM.</p>
<p>Compressor Protection - LPC Open - Circuit 2 (Circuit #2 40-60 Ton units only)</p> <p>Problem: State of refrigerant charge for circuit #2 is low.</p>	<p>While the Circuit 2 LPC Bypass Relay was energized, the 7 PSIG LPC switch: a) was open at the time a compressor was requested to start, or b) the switch opened 4 times after a compressor on Circuit 2 was started but prior to accumulating 3 continuous minutes of run time.</p>	<p>A "Lockout Circuit #2" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, and Liquid Line Solenoid Relay for Circuit 2 are all de-energized.</p>	<p>(PMR) A manual reset is required anytime after the Diagnostic is set. The Diagnostic can be reset by the Human Interface or Tracer, or by cycling power to the CGM.</p>
<p>Compressor Trip - Circuit 1</p> <p>Problem: The Compressor Circuit #1 has tripped.</p>	<p>The Circuit #1 Compressor proving input is detected open continuously for more than 3 seconds when either or both compressor outputs on Circuit #1 are energized (as described in the Compressor Protection function).</p>	<p>A "Lockout Circuit #1" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, Liquid Line Solenoid Relay, and Hot Gas Bypass Relay for Circuit 1 are all de-energized.</p>	<p>(PMR) A manual reset is required after this diagnostic occurs. The Diagnostic can be reset by the unit mounted Human Interface Module or Tracer, or by cycling power to the CGM.</p>
<p>Compressor Trip - Circuit 2 (Ckt #2 40-60 Ton units only)</p> <p>Problem: The Compressor Circuit #2 has tripped.</p>	<p>The Circuit #2 Compressor proving input is detected open continuously for more than 3 seconds when either or both compressor outputs on Circuit #2 are energized (as described in the Compressor Protection function).</p>	<p>A "Lockout Circuit #2" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, Liquid Line Solenoid Relay for Circuit 2 are all de-energized.</p>	<p>(PMR) A manual reset is required after this diagnostic occurs. The Diagnostic can be reset by the unit mounted Human Interface Module or Tracer, or by cycling power to the CGM.</p>
<p>Cond Temp Sensor Failure - Circuit 1</p> <p>Problem: The Saturated Condenser Temperature Input is out of range for Circuit #1.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If so, check field/wiring between Sensor and MCM/SCM.</p>	<p>The unit is reading a signal that is out of range for the circuit #1 Saturated Condenser Temperature sensor. (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>A "Lockout Circuit # 1" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, Liquid Line Solenoid Relay, and Hot Gas Bypass Relay for Circuit 1 are all de-energized.</p>	<p>(PAR) An automatic reset occurs after the #1 Condenser Temperature input returns to its allowable range within 10 seconds.</p>

# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>Cond Temp Sensor Failure - Circuit 2 (Circuit #2 40-60 Ton units only)</p> <p>Problem: The Saturated Condenser Temperature Input is out of range for Circuit #2.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If so,</p> <p>Current Sensing Module Comm Fail</p> <p>Problem: The CGM has lost communications with the Current Sensing Module (CSM).</p> <p>Check: Check field/unit wiring between CGM and CSM.</p> <p>Emergency Stop</p> <p>Problem: The Emergency Stop input on the CGM is open.</p>	<p>The unit is reading a signal that is out of range for the circuit #2 Saturated Condenser Temperature sensor. (Temp &lt; -40 F or Temp &gt; 200 F).</p> <p>The CGM has lost communications with the CSM.</p> <p>An open circuit has occurred on the Emergency Stop input caused either by a High Duct Temp T-stat trip, or the opening of field-provided contacts, switch, etc...</p> <p>An abnormal temperature reading of the chilled solution exists.</p>	<p>A "Lockout Circuit #2" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, and Liquid Line Solenoid Relay for Circuit 2 are all de-energized.</p> <p>No Change in unit operation occurs. The Current Sensing Module is used for monitoring purposes only, and does not affect unit operation. This diagnostic is for information only.</p> <p>"OFF" or "Close" requests are issued as appropriate to the following functions;  a. Compressor Staging control. (All Compressor Relays, Liquid Line Solenoid Relays, LPC Bypass Relay, and HGBP Relay are deenergized).  b. Evaporator Solution Pump Control. (S</p> <p>No change in the unit operation. This diagnostic is for information only.</p>	<p>(PAP) An automatic reset occurs after the #2 Condenser Temp input returns to its allowable range within 10 seconds.</p> <p>(PAP) An automatic reset occurs after communication has been restored.</p> <p>(PMP) A manual reset is required after the Emergency Stop input recloses. The Diagnostic can be reset by the Human Interface or Tracer or by cycling power to the CGM.</p> <p>(INFO) An automatic reset occurs after the EST and LST have both risen to greater than 3oF above the heat tape temperature setpoint.</p>
<p>EST/LST Low Temperature Indication</p> <p>Problem: Either the entering solution temperature or the leaving solution temperature has fallen below the heat tape temperature setpoint.</p>			

# System Testing & Troubleshooting

<b>DIAGNOSTIC DISPLAYED</b>	<b>REASON FOR DIAGNOSTIC</b>	<b>UCM'S REACTION</b>	<b>RESET REQUIRED</b>
<p>Evaporator Entering Solution Temperature Sensor Fail</p> <p>Problem: The Evaporator Entering Solution Temperature Sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If so, check field/unit wiring between Sensor and CGM.</p>	<p>The unit is reading a signal that is out of range for this input on the CGM. (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>When this diagnostic is active:</p> <p>a. A "Lockout Ckts" request is sent to the compressor staging function. All Compressor Relays, LPC Bypass relays, and Liquid Line Solenoids will be de-energized. Min On times, HGBP, and Pumpdown will be bypassed.</p> <p>b. If Leaving Solution Reset type selected is Entering Solution Reset, then the Reset type reverts to NONE for the duration of the failure.</p> <p>c. Evaporator Solution Pump Control is not affected.</p> <p>d. The Heat Tape relay output will energize.</p>	<p>(PMR) A manual reset is required after this diagnostic occurs. The Diagnostic can be reset by the unit mounted Human Interface Module or Tracer, or by cycling power to the CGM.</p>
<p>Evaporator Leaving Solution Temperature Sensor Fail</p> <p>Problem: The Evaporator Leaving Solution Temperature sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If so, check field/unit wiring between Sensor and CGM.</p>	<p>The unit is reading a signal that is out of range for this input on the CGM (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>When this diagnostic is active:</p> <p>a. A "Lockout Ckts" request is sent to the compressor staging function. All Compressor Relays, LPC Bypass relays, and Liquid Line Solenoids will be de-energized. Min On times, HGBP, and Pumpdown will be bypassed.</p> <p>b. The following functions will be disabled:</p> <ol style="list-style-type: none"> <li>1) Compressor Staging,</li> <li>2) Process/Comfort Cooling,</li> <li>3) Ice Building.</li> </ol> <p>c. Evaporator Solution Pump Control is not affected.</p> <p>d. The Heat Tape relay output will energize.</p>	<p>(PMR) A manual reset is required after this diagnostic occurs. The Diagnostic can be reset by the unit mounted Human Interface Module or Tracer, or by cycling power to the CGM.</p>

# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>Evaporator Solution Flow Loss</p> <p>The switch connected to the flow proving switch input on a unit with a Braze Plate heat exchanger has failed CLOSED;</p> <p><b>or</b></p> <p>during power-up, a unit with a Braze Plate heat exchanger has detected that older versions of control modules are installed.</p>	<p>Units with a Braze Plate heat exchanger require a flow proving switch for freeze protection functionality. This flow proving switch input was detected closed (shorted) at the time the solution pump was commanded ON (Only on units with "Chiller Solution Pump Mode" set to AUTO).</p> <p>Also, units with Braze Plate heat exchanger require newer versions of control boards for proper operation. During power-up, the unit detected at least one replacement module with a Software Version number less than what is required.</p>	<p>A "Lockout all Circuit" request is issued to the compressor staging function. Compressor Relays, LPC Bypass Relays, Liquid Line Solenoid Relays and HGBP relay are all de-energized.</p>	<p>(PMR) A manual reset is required after this diagnostic occurs. The Diagnostic can be reset by the unit mounted Human Interface Module or Tracer, or by cycling power to the CGM.</p> <p>For Service Parts Replacement, please note:</p> <p>(a) For proper operation of units with Braze Plate heat exchangers, please insure the following board is installed:</p> <p>Multiple Compressor Module (MCM)                      - Software Version number greater than or equal to 10.00                      or                      Single Compressor Module (SCM) - Software Version number greater than or equal to 10.00</p>
			<p>(b) To eliminate this diagnostic when it is due to an incompatible Software Version number(s), please install the appropriate board(s) per the following:</p> <p>Cold Generator Module (CGM) - Software Version number greater than or equal to 3.00                      CG Unit Human Interface (HI) - Software Version number greater than or equal to 27.00</p>

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<b>DIAGNOSTIC DISPLAYED</b>	<b>REASON FOR DIAGNOSTIC</b>	<b>UCM'S REACTION</b>	<b>RESET REQUIRED</b>
<p>Evap Solution Flow Proving Switch</p> <p>Problem: Solution Flow Switch is open after the Solution Pump is ON.</p> <p>Check: Verify Solution Pump operation and that the Evaporator Solution Flow Switch is working properly.</p>	<p>The diagnostic can occur at any time after the Evaporator Solution Pump Relay has been requested ON, and the Solution Flow Switch input is detected OPEN (no flow) for 5 continuous minutes.</p>	<p>When the Solution Flow Switch input is detected OPEN (no flow) for 6 continuous seconds, the Unit will de-energize the following relays: Compressor Relays, LPC Bypass Relays, Liquid Line Solenoids, and HGBP Relay.</p>	<p>(PAR) An automatic reset occurs after the Evap Solution Flow Proving Switch has detected Solution flow for 6 continuous seconds.</p>
<p>External Leaving Solution STP Input Fail</p> <p>Problem: CGM is receiving an External Leaving Solution Setpoint (LSS) Input signal which is out of range. Check field/unit wiring between CGM and External Leaving Solution Setpoint potentiometer.</p>	<p>The External Leaving Solution Setpoint (LSS) is designated as the Leaving Solution Setpoint source and it is out of range. Out of range is defined as one of the following:</p> <ul style="list-style-type: none"> <li>a) External LSS &gt; 65 deg F or &lt; 51 deg F for unit with LSS Range 51-65 deg F.</li> <li>b) External LSS &gt; 50 deg F or &lt; 40 deg F for unit with LSS Range 40-50 deg F.</li> <li>c) External LSS &gt; 39 deg F or &lt; 30 deg F for unit with LSS Range 30-39 deg F.</li> <li>d) External LSS &gt; 29 deg F or &lt; 20 deg F for unit with LSS Range 20-29 deg F.</li> <li>e) External LSS &gt; 75 deg F or &lt; 10 deg F for unit with LSS Range SPECIAL.</li> </ul>	<p>While the diagnostic is active, the Leaving Solution Setpoint will revert to using the default (HI) Leaving Solution Setpoint.</p>	<p>(PAR) An automatic reset occurs after the External Leaving Solution Setpoint returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>

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<b>DIAGNOSTIC DISPLAYED</b>	<b>REASON FOR DIAGNOSTIC</b>	<b>UCM'S REACTION</b>	<b>RESET REQUIRED</b>
<p>GBAS 0-5VDC Module Comm Failure</p> <p>Problem: The CGM has lost communications with the GBAS Module.</p> <p>Check: Check field/unit wiring between CGM and GBAS.</p>	<p>The CGM has lost communications with the GBAS Module.</p>	<p>The UCM will initiate the following actions;</p> <ol style="list-style-type: none"> <li>a. If the Demand Limit input was closed prior to communications loss, then the Demand Limit commands issued to the Compressor Staging function will be cancelled.</li> <li>b. If any of the GBAS setpoint control parameters are the HI-selected setpoint sources, then those setpoints will revert to the default HI setpoints.</li> <li>c. Any active GBAS output control parameters will be ignored.</li> <li>d. A failsafe function in the GBAS module will cause all GBAS outputs to be zeroed and de-energized.</li> </ol>	<p>(PAR) An automatic reset occurs after communication has been restored.</p>
<p>GBAS 0-5VDC Module Comm Failure</p> <p>Problem: The CGM has lost communications with the GBAS Module.</p> <p>Check: Check field/unit wiring between CGM and GBAS.</p>	<p>The CGM has lost communications with the GBAS Module.</p>	<p>The UCM will initiate the following actions;</p> <ol style="list-style-type: none"> <li>a. If the Demand Limit input was closed prior to communications loss, then the Demand Limit commands issued to the Compressor Staging function will be cancelled.</li> <li>b. If any of the GBAS setpoint control parameters are the HI-selected setpoint sources, then those setpoints will revert to the default HI setpoints.</li> <li>c. Any active GBAS output control parameters will be ignored.</li> <li>d. A failsafe function in the GBAS module will cause all GBAS outputs to be zeroed and de-energized.</li> </ol>	<p>(PAR) An automatic reset occurs after communication has been restored.</p>

# System Testing & Troubleshooting

<b>DIAGNOSTIC DISPLAYED</b>	<b>REASON FOR DIAGNOSTIC</b>	<b>UCM'S REACTION</b>	<b>RESET REQUIRED</b>
<p>Hot Start Load Limit (Auto)</p> <p>Problem: The Leaving Solution Temperature is too hot.</p>	<p>Hot Operation Response is set to "50% CAPACITY PER CKT, AUTO RESET DIAG". The Leaving Solution Temp exceeded the Hot Start Load Limit Setpoint after the Hot Start Time Interval expired.</p>	<p>While this diagnostic is active, the second compressor on each refrigerant circuit is shut off and/or prevented from staging ON.</p>	<p>(PAR) An automatic reset occurs after the Leaving Solution Temperature decreases 5 deg F or more below the Hot Start Load Limit Setpoint.</p>
<p>Hot Start Load Limit (Info)</p> <p>Problem: The Leaving Solution Temperature is too hot.</p>	<p>Hot Operation Response is set to "ALLOW NORMAL OPERATION, INFO RESET DIAG". The Leaving Solution Temp exceeded the Hot Start Load Limit Setpoint after the Hot Start Time Interval expired.</p>	<p>No change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Leaving Solution Temperature decreases 5 deg F or more below the Hot Start Load Limit Setpoint.</p>
<p>Hot Start Load Limit (Man)</p> <p>Problem: The Leaving Solution Temperature is too hot.</p>	<p>Hot Operation Response is set to "SHUT OFF COMPRESSORS, MANUAL RESET DIAG". The Leaving Solution Temp exceeded the Hot Start Load Limit Setpoint after the Hot Start Time Interval expired.</p>	<p>A "lockout all Ckts" request is issued to the compressor staging function. The Unit will deenergize the following relays: Compressor Relays, LPC Bypass Relays, Liquid Line Solenoids, and HGBP Relay. Comfort/Process Cooling and Ice Building are terminated and prevented from occurring until the diagnostic condition is cleared.</p>	<p>(PMR) A manual reset is required after this diagnostic occurs. The Diagnostic can be reset by the unit mounted Human Interface Module or Tracer, or by cycling power to the CGM.</p>
<p>Hot Start Load Limit Setpoint Fail</p> <p>Problem: The Hot Start Load Limit Setpoint is out of range.</p> <p>Check: If Hot Start Load Limit Setpoint Source is assigned to either GBAS module, but this setpoint has not been assigned to one of that GBAS module's analog inputs, this diagnostic can occur.</p>	<p>The unit is reading a signal that is out of range for the Hot Start Load Limit Setpoint.</p>	<p>The default (HI) Hot Start Load Limit Setpoint will become the active setpoint while this diagnostic is active.</p>	<p>(PAR) An automatic reset occurs after the designated Hot Start Load Limit Setpoint source sends a signal that is within range for 10 continuous seconds, or after a different setpoint source is user-defined.</p>



# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>IBTS Adjusted to Maintain Min Diff</p> <p>Problem: The active Ice Build Terminate Setpoint (IBTS) is closer to the Leaving Solution Cutout Temp Setpoint than the calculated Minimum Differential.</p>	<p>The active Ice Build Terminate Setpoint and the Leaving Solution Cutout Temp Setpoint are too close together for proper unit operation.</p>	<p>The active Ice Build Terminate Setpoint is set to the Leaving Solution Cutout Temp Setpoint plus the larger of 1) calculated Minimum Differential value, or 2) 6.5 deg F.</p>	<p>(PAR) An automatic reset occurs after the difference between the active Ice Build Terminate Setpoint and the Leaving Solution Cutout Temp Setpoint meets the minimum difference requirement.</p>
<p>Ice Build Terminate Setpoint Fail</p> <p>Problem: The Ice Build Terminate Setpoint is out of range.</p> <p>Check: If Ice Build Terminate Setpoint Source is assigned to either GBAS module, but this setpoint has not been assigned to one of that GBAS module's analog inputs, this diagnostic can occur.</p>	<p>The unit is reading a signal that is out of range for the Ice Build Terminate Setpoint.</p>	<p>The default (HI) Ice Build Terminate Setpoint will become the active setpoint while this diagnostic is active.</p>	<p>(PAR) An automatic reset occurs after the designated Ice Build Terminate Setpoint source sends a signal that is within range for 10 continuous seconds, or after a different setpoint source is user-defined.</p>
<p>Leaving Solution Setpoint Fail</p> <p>Problem: The designated Leaving Solution Setpoint is out of range.</p> <p>If either GBAS module is designated as the Leaving Solution Setpoint source, verify that GBAS module has this input assigned to one of its analog inputs.</p>	<p>The designated Leaving Solution Setpoint source is out of range. Out of range is defined as one of the following:</p> <ul style="list-style-type: none"> <li>a) LSS &gt; 65 deg F or &lt; 51 deg F for unit with LSS Range 51-65 deg F.</li> <li>b) LSS &gt; 50 deg F or &lt; 40 deg F for unit with LSS Range 40-50 deg F.</li> <li>c) LSS &gt; 39 deg F or &lt; 30 deg F for unit with LSS Range 30-39 deg F.</li> <li>d) LSS &gt; 29 deg F or &lt; 20 deg F for unit with LSS Range 20-29 deg F.</li> <li>e) LSS &gt; 75 deg F or &lt; 10 deg F for unit with LSS Range SPECIAL.</li> </ul>	<p>While the diagnostic is active, the Leaving Solution Setpoint will revert to using the default (HI) Leaving Solution Setpoint.</p>	<p>(PAR) An automatic reset occurs after the designated Leaving Solution Setpoint returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>
<p>Liquid Pressure Sensor Fail Circuit 1</p> <p>Problem: Circuit 1 Saturated Liquid Line Pressure sensor input is out of range.</p> <p>Check: Check field/unit wiring between Sensor and SSM.</p>	<p>The unit is reading a signal that is out of range for the Circuit 1 Saturated Liquid Line Pressure Sensor input on the SSM. (Pressure &lt; 0 PSIG or Pressure &gt; 400 PSIG).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 1 Saturated Liquid Pressure Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>

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<b>DIAGNOSTIC DISPLAYED</b>	<b>REASON FOR DIAGNOSTIC</b>	<b>UCM'S REACTION</b>	<b>RESET REQUIRED</b>
<p>Liquid Pressure Sensor Fail Circuit 2 (Circuit #2 40-60 Ton units only)</p> <p>Problem: Circuit 2 Saturated Liquid Line Pressure sensor input is out of range.</p> <p>Check: Check field/unit wiring between Sensor and SSM.</p>	<p>The unit is reading a signal that is out of range for the Circuit 2 Saturated Liquid Line Pressure Sensor input on the SSM. (Pressure &lt; 0 PSIG or Pressure &gt; 400 PSIG).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 2 Saturated Liquid Pressure Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>
<p>Low Ambient Evaporator Solution Pump Override</p> <p>Problem: Outside Air Temp too low, request Solution Pump to run to keep Solution moving.</p>	<p>The Outside Air (Ambient) temperature is below the Low Ambient Evap Pump Override Temp Setpoint.</p>	<p>The Evaporator Solution Pump Relay is energized while this condition exists.</p>	<p>(PAR) An automatic reset occurs after the Outside Air Temp increases 5 deg F or more above the Low Ambient Evaporator Pump Override Temp Setpoint.</p>
<p>Low Solution Cutout Temperature (Auto)</p> <p>Problem: The Evaporator Leaving or Entering Solution Temperature is too low.</p>	<p>While no compressors were running, the Evaporator Solution Temperature(s) went below the Low Solution Cutout Temp Setpoint.</p>	<p>While this diagnostic is active, Compressors are prevented from staging on. The Unit will deenergize the following: Compressor Relays, LPC Bypass Relays, Liquid Line Solenoids, and HGBP Relay.</p>	<p>(PAR) An automatic reset occurs after the Evaporator Solution Temperature(s) rises 4 deg F or more above the Low Solution Cutout Temperature Setpoint.</p>
<p>Low Solution Cutout Temperature (Man)</p> <p>Problem: The Evaporator Leaving or Entering Solution Temperature is too low.</p>	<p>While compressors were running, the Evaporator Solution Temperature(s) went below the Low Solution Cutout Temperature Setpoint.</p>	<p>A "Lockout all Circuits" request is issued to the Compressor Staging Function. Compressors are prevented from staging on and the Unit will de-energize the following relays: Compressor Relays, LPC Bypass Relays, Liquid Line Solenoids, and HGBP Relay.</p>	<p>(PMR) A manual reset is required after this diagnostic occurs. The Diagnostic can be reset by the unit mounted Human Interface Module or Tracer, or by cycling power to the CGM.</p>
<p>Low Pressure Control Open - Circuit 1</p> <p>Problem: The refrigerant in Circuit 1 is cold and may cause the Solution in the Chiller barrel to become too cold. Also, there may be a state of charge issue with Circuit 1.</p>	<p>With one or more compressors running, the higher pressure of the two LPC switches on Circuit 1 has opened 6 times with the LPC Bypass relay de-energized, or it was open at the time the LPC Bypass Relay de-energized. On a standard unit this is the 45 PSIG LPC switch, but can be 20 PSIG or lower on units with a lower Leaving Solution Setpoint range.</p>	<p>A "Lockout Circuit # 1" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, Liquid Line Solenoid Relay, and Hot Gas Bypass Relay for Circuit 1 are all de-energized.</p>	<p>(PMR) A manual reset is required anytime after the Diagnostic is set. The Diagnostic can be reset by the Human Interface or Tracer, or by cycling power to the CGM.</p>

# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>Low Pressure Control Open - Circuit 2 (Circuit #2 40-60 Ton units only)</p> <p>Problem: The refrigerant in Circuit 2 is cold and may cause the Solution in the Chiller barrel to become too cold. Also, there may be a state of charge issue with Circuit 2.</p>	<p>With one or more compressors running, the higher pressure of the two LPC switches on Circuit 2 has opened 6 times with the LPC Bypass relay de-energized, or it was open at the time the LPC Bypass Relay de-energized. On a standard unit this is the 45 PSIG LPC switch, but can be 20 PSIG or lower on units with a lower Leaving Solution Setpoint range.</p>	<p>A "Lockout Circuit # 2" request is issued to the Compressor Staging Control function. The Compressor Relays, LPC Bypass Relay, Liquid Line Solenoid Relay, and Hot Gas Bypass Relay for Circuit 2 are all de-energized.</p>	<p>(PMR) A manual reset is required anytime after the Diagnostic is set. The Diagnostic can be reset by the Human Interface or Tracer, or by cycling power to the CGM.</p>
<p>LSS Adjusted to Maintain Minimum Differential</p> <p>Problem: The active Leaving Solution Setpoint (LSS) is closer to the Leaving Solution Cutout Temp Setpoint than the calculated Minimum Differential.</p>	<p>The active Leaving Solution Setpoint and the Leaving Solution Cutout Temperature Setpoint are too close together for proper unit operation.</p>	<p>The active Leaving Solution Setpoint is set to the Leaving Solution Cutout Temperature Setpoint plus the calculated Minimum Differential value.</p>	<p>(PAR) An automatic reset occurs after the difference between the active Leaving Solution Setpoint and the Leaving Solution Cutout Temperature Setpoint meets the minimum difference requirement.</p>
<p>MCM Communications Failure (40-60 Ton units only)</p> <p>Problem: The CGM has lost communications with the MCM.</p> <p>Check: Check field/unit wiring between CGM and MCM.</p>	<p>The CGM has lost communications with the MCM.</p>	<p>A "Lockout" request is sent to the Compressor Staging Control function. The Liquid Line Solenoid Relays and LPC Byp-energized.</p>	<p>(PAR) An automatic reset occurs after communication has been restored.</p>
<p>Sat Liquid Temperature Sensor Fail Circuit 1</p> <p>Problem: Circuit 1 Saturated Liquid Line Temperature sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If not, check field/unit wiring between Sensor and SCM/MCM.</p>	<p>The Superheat/Subcool Module is installed and the unit is reading a signal that is out of range for the Circuit 1 Saturated Liquid Line Temperature Sensor input on the SCM/MCM. (Temp &lt; -55 F or Temp &gt; 209 F).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 1 Saturated Liquid Temperature Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>

# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>Saturated Liquid Temperature Sensor Fail - Circuit 2 (Circuit #2 40-60 Ton units only)</p> <p>Problem: Circuit 2 Saturated Liquid Line Temperature sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If not, check field/unit wiring between Sensor and MCM.</p>	<p>The Superheat/Subcool Module is installed and the unit is reading a signal that is out of range for the Circuit 2 Saturated Liquid Line Temperature Sensor input on the MCM. (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 2 Saturated Liquid Temperature Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>
<p>SCM Communications Failure (20-30 Ton units only)</p> <p>Problem: The CGM has lost communications with the SCM.</p> <p>Check: Check field/unit wiring between CGM and SCM.</p>	<p>The CGM has lost communications with the SCM.</p>	<p>A "Lockout" request is sent to the Compressor Staging Control function. The Liquid Line Solenoid Relays and LPC Bypass Relays are de-energized. A failsafe function in the SCM will cause all SCM outputs to be zeroed and de-energized.</p>	<p>(PAR) An automatic reset occurs after communication has been restored.</p>
<p>Suction Temp Sensor Fail - Circuit 1</p> <p>Problem: Circuit 1 Suction Line Temp sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If not, check field/unit wiring between Sensor and SCM/MCM.</p>	<p>The Superheat/Subcool Module is installed and the unit is reading a signal that is out of range for the Circuit 1 Suction Line Temp Sensor input on the SCM/MCM. (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 1 Suction Line Temp Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>
<p>Suction Temp Sensor Fail - Circuit 2 (Ckt #2 40-60 Ton units only)</p> <p>Problem: Circuit 2 Suction Line Temp sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If not, check field/unit wiring between Sensor and MCM.</p>	<p>The Superheat/Subcool Module is installed and the unit is reading a signal that is out of range for the Circuit 2 Suction Line Temperature Sensor input on the MCM. (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 2 Suction Line Temperature Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>

# System Testing & Troubleshooting

<b>DIAGNOSTIC DISPLAYED</b>	<b>REASON FOR DIAGNOSTIC</b>	<b>UCM'S REACTION</b>	<b>RESET REQUIRED</b>
<p>Suction Temperature Sensor Fail - Circuit 1</p> <p>Problem: Circuit 1 Suction Line Temperature sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If not, check field/unit wiring between Sensor and SCM/MCM.</p>	<p>The Superheat/Subcool Module is installed and the unit is reading a signal that is out of range for the Circuit 1 Suction Line Temperature Sensor input on the SCM/MCM. (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 1 Suction Line Temperature Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>
<p>Suction Temperature Sensor Fail - Circuit 2 (Ckt #2 40-60 Ton units only)</p> <p>Problem: Circuit 2 Suction Line Temperature sensor input is out of range.</p> <p>Check: Sensor resistance between 830 ohms (200 F) and 345.7Kohms (-40 F). If not, check field/unit wiring between Sensor and MCM.</p>	<p>The Superheat/Subcool Module is installed and the unit is reading a signal that is out of range for the Circuit 2 Suction Line Temperature Sensor input on the MCM. (Temp &lt; -40 F or Temp &gt; 200 F).</p>	<p>The Superheat/Subcool calculation is invalid and the values are set to zero. No other change in unit operation occurs. This diagnostic is for information only.</p>	<p>(INFO) An automatic reset occurs after the Circuit 2 Suction Line Temperature Sensor input returns to its allowable range. In order to prevent rapid cycling of the Diagnostic, there is a 10 second delay before the automatic reset.</p>
<p>Superheat/Subcool Module Comm Fail</p> <p>Problem: The CGM has lost communications with the Superheat/Subcool Module (SSM).</p> <p>Check: Check field/unit wiring between CGM and SSM Module.</p>	<p>The CGM has lost communications with the SSM.</p>	<p>No Change in unit operation occurs. The Superheat/Subcool Module is used for monitoring purposes only, and does not affect unit operation. This diagnostic is for information only.</p>	<p>(PAR) An automatic reset occurs after communication has been restored.</p>

# System Testing & Troubleshooting

DIAGNOSTIC DISPLAYED	REASON FOR DIAGNOSTIC	UCM'S REACTION	RESET REQUIRED
<p>BAS Module Communications Failure</p> <p>Problem: The RTM has lost communications with the TCI or LCI.</p> <p>Check: Check field/ unit wiring between RTM and TCI or LCI Module.</p> <p>BAS/NETWORK Comm Failure</p>	<p>CGM has lost communications with the TCI or LCI Module.</p>	<p>All active commands and setpoints provided by the network through the TCI or LCI will be cancelled and/ or ignored. Where the network has been designated as setpoint source, local HI default setpoints will be used.</p>	<p>(PAR) An automatic reset occurs after communication has been restored.</p>
<p>Problem: The TCI or LCI has lost communications with Tracer.</p> <p>Check: Network (Tracer or 3rd party building control panel) is powered up and running properly. If so, check unit wiring between TCI or LCI and network (Tracer or 3rd party building control panel).</p>	<p>The TCI or LCI has lost communications with the network for &gt; 15 minutes.</p>	<p>All active commands and setpoints provided by the network through the TCI or LCI will be cancelled and/ or ignored. Where the network has been designated as setpoint source, local HI default setpoints will be used.</p>	<p>(PAR) An automatic reset occurs after communications with the network and TCI or LCI has been restored.</p>
<p>Unit HI Communications Failure</p> <p>Problem: The CGM has lost communications with the Unit mounted (local) Human Interface (HI).</p> <p>Check: Field/unit wiring between CGM and Local HI.</p>	<p>The CGM has lost communications with the unit-mounted Human Interface.</p>	<p>A failsafe function in the HI will;</p> <ol style="list-style-type: none"> <li>a. disallow any interaction between the HI and the CGM (or any other modules),</li> <li>b. render all HI keystrokes ineffective, and</li> <li>c. cause the following to be displayed on the unit-mounted HI display: LOCAL HI COMMUNICATIONS LOSS CHECK COMM LINK WIRING BETWEEN MODULES</li> </ol> <p>(If the unit has a remote HI option, then on the remote HI module, this diagnostic will be reported and displayed as any other automatic reset diagnostic).</p>	<p>(INFO) An automatic reset occurs after communication has been restored between the CGM and the HI. When the failure screen is cleared, the General display is restored and HI interaction with the CGM is again permitted.</p>

# Module I/O Summary

UNIT MODULE	ANALOG INPUTS	ANALOG OUTPUTS	BINARY INPUTS	BINARY OUTPUTS
Cold Generator Module (CGM)	<ul style="list-style-type: none"> <li>External Leaving Solution Setpoint</li> <li>Evap Entering Solution Temp</li> <li>Evap Leaving Solution Temp</li> <li>ICS Defined Temp</li> <li>Condenser Entering Solution Temp</li> <li>Outdoor Air Temp</li> <li>Condenser Leaving Solution Temp</li> <li>Zone Temperature</li> <li>ICS Temperature</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Emergency Stop</li> <li>External Auto/Stop</li> <li>Ice Building</li> <li>Flow Proving</li> <li>Condenser Pump Proving</li> </ul>	<ul style="list-style-type: none"> <li>Liquid Line Relay (Ckt #1)</li> <li>Liquid Line Relay (Ckt #2)</li> <li>Hot Gas Bypass Relay</li> <li>Alarm Relay</li> <li>Low Ambient Bypass 1 Relay</li> <li>Low Ambient Bypass 2 Relay</li> <li>Solution Pump Relay</li> <li>Ice Making Relay</li> <li>ICS Relay</li> </ul>
Current Sensing Module (CSM)	<ul style="list-style-type: none"> <li>Compressor A, Phase A</li> <li>Compressor A, Phase B</li> <li>Compressor B, Phase A</li> <li>Compressor B, Phase C</li> <li>Compressor C, Phase B</li> <li>Compressor C, Phase C</li> <li>Compressor D, Phase A</li> <li>Compressor D, Phase C</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
Generic Building Automation System 0-5VDC (GBAS 0-5V) Module	<ul style="list-style-type: none"> <li>Four inputs, which can be assigned:</li> <li>Occ Zone Cool Setpoint</li> <li>Unocc Zone Cool Setpoint</li> <li>Occ Zone Heat Setpoint</li> <li>Unocc Zone Heat Setpoint</li> <li>Supply Air Cooling Setpoint</li> <li>Supply Air Heating Setpoint</li> <li>Space Static Pressure Setpoint</li> <li>SA Static Pressure Setpoint</li> <li>Min OA CFM Setpoint</li> <li>Leaving Solution Setpoint</li> <li>Ice Build Terminate Setpoint</li> <li>Hot Start Load Limit Setpoint</li> <li>Maximum Capacity Level Setpoint</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Demand Limit</li> </ul>	<ul style="list-style-type: none"> <li>Five outputs, which can be assigned:</li> <li>Compressors running</li> <li>Running at maximum capacity</li> <li>Selected diagnostics messages</li> </ul>

# Module I/O Summary

UNIT MODULE	ANALOG INPUTS	ANALOG OUTPUTS	BINARY INPUTS	BINARY OUTPUTS
Generic Building Automation System 0-10VDC (GBAS 0-10V) Module	Four inputs, which can be assigned: <ul style="list-style-type: none"> <li>Leaving Solution Setpoint</li> <li>Ice Build Terminate Setpoint</li> <li>Hot Start Load Limit Setpoint</li> <li>Maximum Capacity Level Setpoint</li> </ul>	Four outputs, which can be assigned: <ul style="list-style-type: none"> <li>Leaving Soln Temp</li> <li>Entering Soln Temp</li> <li>Sat. Cond Temp Ckt1</li> <li>Sat. Cond Temp Ckt2</li> <li>Evap Temp Ckt1</li> <li>Evap Temp Ckt2</li> <li>ICS Defined Temp</li> <li>Liquid Pressure Ckt1</li> <li>Suction Pressure Ckt1</li> <li>Liquid Pressure Ckt2</li> <li>Suction Pressure Ckt2</li> <li>Active Cooling Capacity</li> <li>Outdoor Air Temp</li> <li>Saturated Liquid Temp Ckt1</li> <li>Saturated Liquid Temp Ckt2</li> </ul>	<ul style="list-style-type: none"> <li>Demand Limit</li> </ul>	One output, which can be assigned: <ul style="list-style-type: none"> <li>Compressors running</li> <li>Running at maximum capacity</li> <li>Selected diagnostics messages</li> </ul>
Human Interface (HI) Module	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
Interprocessor Communications Bridge (IPCB) Module	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
Multiple Compressor Module (MCM)	<ul style="list-style-type: none"> <li>Evap/Suction Temperature (Ckt #1)</li> <li>Evap/Suction Temperature (Ckt #2)</li> <li>Saturated Condenser Temperature Sensor (Ckt #1)</li> <li>Saturated Condenser Temperature Sensor (Ckt #2)</li> <li>Saturated Liquid Temp (Ckt #1)</li> <li>Saturated Liquid Temp (Ckt #2)</li> </ul>	<ul style="list-style-type: none"> <li>Condenser Fan Speed (Low Ambient Ckt #1)</li> <li>Condenser Fan Speed (Low Ambient Ckt #2)</li> </ul>	<ul style="list-style-type: none"> <li>Compressor Proving (Ckt #1)</li> <li>Compressor Proving (Ckt #2)</li> <li>Low Pressure Cutout(Ckt #1)</li> <li>Low Pressure Cutout (Ckt #2)</li> <li>High Pressure Control (Ckt #1)</li> <li>High Pressure Control (Ckt #2)</li> </ul>	<ul style="list-style-type: none"> <li>Compressor Relay K11</li> <li>Compressor Relay K12</li> <li>Compressor Relay K3</li> <li>Compressor Relay K4</li> <li>Condenser Fan 1A</li> <li>Condenser Fan 1B</li> <li>Condenser Fan 1C</li> <li>Condenser Fan 2A</li> <li>Condenser Fan 2B</li> <li>Condenser Fan 2C</li> <li>Heater Tape</li> </ul>
Single Compressor Module (SCM)	<ul style="list-style-type: none"> <li>Evap/Suction Temperature</li> <li>Saturated Condenser Temperature</li> <li>Saturated Liquid Temperature</li> </ul>	<ul style="list-style-type: none"> <li>Condenser Fan Speed (Low Ambient)</li> </ul>	<ul style="list-style-type: none"> <li>Compressor Proving</li> <li>Low Pressure Cutout</li> <li>High Pressure Control</li> </ul>	<ul style="list-style-type: none"> <li>Compressor Relay K11</li> <li>Compressor Relay K12</li> <li>Condenser Fan A</li> <li>Condenser Fan B</li> </ul>



## Module I/O Summary

UNIT MODULE	ANALOG INPUTS	ANALOG OUTPUTS	BINARY INPUTS	BINARY OUTPUTS
Superheat/Subcool Module (SSM)	<ul style="list-style-type: none"> <li>• Liquid Pressure Ckt #1</li> <li>• Liquid Pressure Ckt #2</li> <li>• Suction Pressure Ckt #1</li> <li>• Suction Pressure Ckt #2</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
Trane Communication Interface (TCI) Module	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
LonTalk Communication Interface (LCI) Module	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>

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