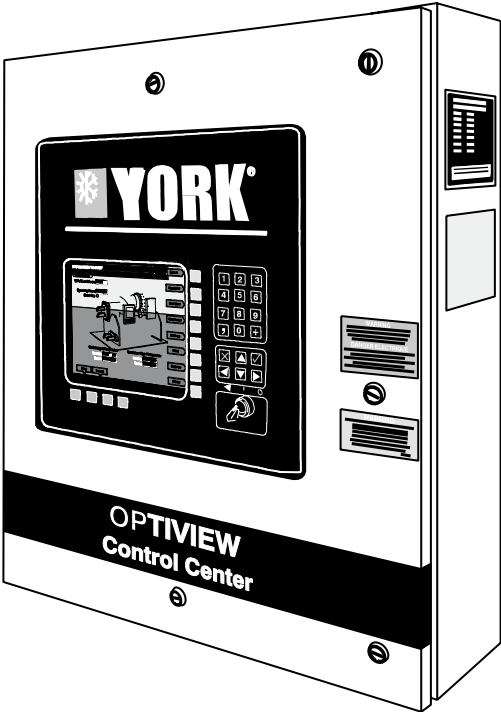


 BY JOHNSON CONTROLS	OPTIVIEW™ CONTROL CENTER NON-YORK CENTRIFUGAL LIQUID CHILLERS	
OPERATION MANUAL	NEW RELEASE	Form 160.10-01 (310)

**OPTIVIEW™ CONTROL CENTER RETROFIT KIT
FOR TRANE LOW PRESSURE
CENTRIFUGAL CHILLERS**



GENERAL SAFETY GUIDELINES

IMPORTANT!

READ BEFORE PROCEEDING!

This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, materials under pressure, rotating components, and both high and low voltage. Any of these has the potential to cause bodily injury or death if proper precautions are not taken. The operating/service personnel has the obligation and responsibility to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in serious damage to the equipment and the property in which the equipment is situated, as well as severe

personal injury or death to themselves and people at the equipment site.

This document is intended for use by owner-authorized operating/service personnel. The individual performing the tasks outlined in this manual must possess independent training that will enable them to perform the assigned tasks properly and safely. Before any work is performed on this equipment, the technician/operator must read and understand the content in this document and any referenced materials. This individual must also be familiar and comply with all applicable governmental standards and regulations pertaining to the task being performed.

SAFETY SYMBOLS

The following symbols are used in this document to alert the reader to specific situations:



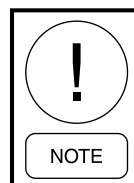
Indicates a possible hazardous situation which will result in death or serious injury if not proper care is not taken.



Identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution if proper care is not taken or instructions and are not followed.



Indicates a potentially hazardous situation which will result in possible injuries or damage to equipment if proper care is not taken.



Highlights additional information useful to the technician in completing the work being performed properly.



External wiring, unless specified as an optional connection in the manufacturer's product line, is not to be connected inside the OptiView cabinet. Devices such as relays, switches, transducers and controls and any external wiring must not be installed inside the micro panel. All wiring must be in accordance with Johnson Controls' published specifications and must be performed only by a qualified electrician. Johnson Controls will NOT be responsible for damage/problems resulting from improper connections to the controls or application of improper control signals. Failure to follow this warning will void the manufacturer's warranty and cause serious damage to property or personal injury.

EMERGENCY SHUTDOWN

In case an emergency of any type should arise while the chiller is running, IMMEDIATELY switch the OptiView compressor switch to the OFF position.

RESPONSIBILITY FOR SAFETY

Every effort has been made in the design and manufacture of this kit to ensure the safety of personnel working on the chiller. However, the individual operating/working on any equipment is ultimately responsible for:

- Personal safety, the safety of other personnel, and the machinery
- Correct utilization of the machinery in accordance with the procedures detailed in the YORK and Trane manuals
- Proper chiller maintenance

ABOUT THIS MANUAL

The contents of this manual include suggested best working practices and procedures related to the service and repair of this kit. These are issued for guidance only; they do not take precedence over the above stated individual responsibility and local safety regulation.

For information related directly to the chiller shells, compressor and other components, refer to the specific manual provided by the manufacturer of the chiller.

PROPER EQUIPMENT HANDLING

Proper Lock-Out / Tag-Out

To ensure safety, notify proper personnel of chiller shutdown and then proceed to switch off the chiller and lock-out / isolate all chiller power supply. Be sure to tag the chiller as “Out of Operation”. Keep the lock-out key on person to avoid accidental chiller restart.

Suitability for Application

The OptiView Retrofit Kit is intended to control and operate competitive centrifugal chillers cooling water or brine solutions and is not suitable for purposes other than those specified in these instructions. Any use of the equipment other than what is intended or operation of the equipment contrary to the relevant procedures may result in injury to the operator, or damage to the equipment. Johnson Controls will NOT be responsible for damage due to misuse.

The chiller must not be operated outside the design parameters specified in any of the manuals included with the OptiView Retrofit Kit and the Trane unit.

Structural Support

Proper structural support of the OptiView Panel must be provided as indicated in these instructions. Failure to provide proper support may result in injury to the operator or damage to the equipment and/or building.

Mechanical Strength

The OptiView Panel is not designed to withstand loads or stresses from adjacent equipment, pipework or structures. No other components may be mounted on or to the OptiView Control Panel. Any extraneous loads may cause failure and may result in injury to the operator, or damage to the equipment.

Pressure Systems

The chiller contains refrigerant vapor and liquid under pressure, which can be a hazardous and cause injury if released. Care must be taken during installation, operation and maintenance of this kit to avoid damage to the pressure system. No attempt should be made to gain access to the component parts of the pressure system other than by suitably trained and qualified personnel.

Electrical

The control center must be grounded. No installation or maintenance work should be attempted on the electrical equipment without first switching the equipment OFF, then isolating and locking out the power supply. Work on live equipment must only be carried out by suitably trained and qualified personnel. Do not attempt to gain access to the inside of the control panel or electrical enclosures during normal operation of the unit.

Refrigerants and Oils

Refrigerants and oils used in the unit are generally non-toxic, non-flammable and non-corrosive, and pose no special safety hazards. However, when an open flame is applied to refrigerant, toxic gases are created. Never subject refrigerant to an open flame. The possibility of refrigerant vapor build up does pose a risk of asphyxiation in confined or enclosed spaces and attention should be given to provide good ventilation.

Use of gloves and safety glasses are required when working with refrigerant and oil.

General Access

There are a number of areas and features which may be a hazard and potentially cause injury when operating the Control Center and chiller unless suitable safety precautions are taken. Access to the Control Center and chiller should be restricted to suitably qualified persons who are familiar with the potential hazards and precautions necessary for safe operation and maintenance of equipment containing high temperatures, pressures and voltages.

CHANGEABILITY OF THIS DOCUMENT

In complying with Johnson Controls' policy for continuous product improvement, the information contained in this document is subject to change without notice. While Johnson Controls makes no commitment to update or provide current information automatically to the manual owner, that information, if applicable, can be obtained by contacting the nearest Johnson Controls Service office.

Operating/service personnel maintains the responsibility of the applicability of these documents to the competitive equipment the kit is installed on. If there is any question regarding the applicability of these documents, the technician should verify whether the equipment has been modified and if current literature is available with the owner of the equipment prior to performing any work on the chiller.

REFERENCE MANUALS LIST

Manual Description	Manual Number
OptiView Control Center Retrofit Kit - Trane Installation Manual	160.10-N1
OptiView Control Center Retrofit Kit - Trane Service Manual	160.10-M1
OptiView Control Center Retrofit Kit - Trane Operation Manual	160.10-O1
Wiring Diagram – Unit with Electromechanical Starter	160.10-PW1
ISN MicroGateway - Installation Manual	450.20-NOM1
CX MicroGateway - Installation Manual	450.24-N11
ModBus MicroGateway - Installation Manual	450.24-N1
N2 MicroGateway - Installation Manual	450.24-N2
ASCII MicroGateway - Installation Manual	450.24-N15
Renewal Parts – OptiView Control Center Retrofit Kit	160.10-RP1
Solid State Starter MOD “B” – Operation/Service Manual	160.00-O2
Variable Speed Drive – Operation Manual	160.00-O1
Variable Speed Drive – Service Manual	160.00-M1

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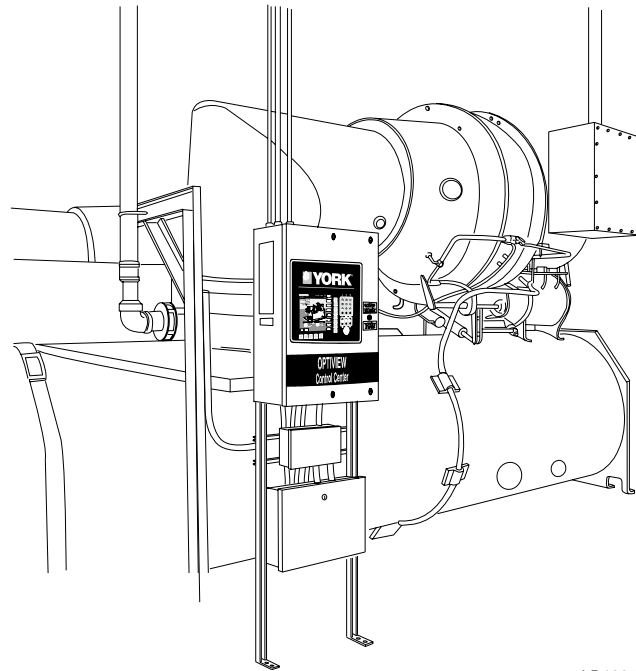
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SECTION 1 - OPTIVIEW RETROFIT KIT CONTROL CENTER INTRODUCTION

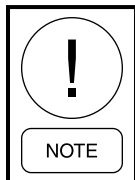


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FIGURE 1 - OPTIVIEW CONTROL CENTER RETROFIT TO TRANE CHILLER

RETROFIT KIT DESCRIPTION

The OptiView Control Center Retrofit Kit for Trane centrifugal chillers is a state of the art microprocessor-based control system that monitors and controls operation of Non-York chillers.



For specific information on principles of chiller operation, refer to the manuals provided by the chiller manufacturer.

The OptiView control center can be configured to work with Trane CVHA, CVHB, CVHE, and CVHF low-pressure chillers that utilize R-11 or R-123 refrigerant. The OptiView is programmed by the operator to suit job specifications. Automatic timed start-ups and shut-downs are also programmable to suit nighttime, weekends, and holidays. The operating status, temperatures, pressures, and other information pertinent to operation of the chiller are automatically monitored and displayed on a graphic display. Other displays can be observed by pressing the keys as labeled on the Control Center.

The OptiView Control Center is compatible with electro-mechanical starters, YORK Solid State Starters, or YORK Variable Speed Drives.

The YORK Mod “B” Solid State Starter, the most recent version, contains a combination Logic/trigger Board that interfaces the Control Center with a serial communications link. The Mod “A” Solid State Starter is not compatible with this kit for Trane model chillers.

The panel comes configured with a full screen LCD Graphic Display mounted in the middle of a keypad interface. The graphic display allows the presentation of several operating parameters at once. In addition, the operator may view a graphical representation of the historical operation of the chiller as well as the present operation. For the novice user, the locations of various chiller parameters are clearly and intuitively marked. Instructions for specific operations are provided on many of the display screens.

The graphic display allows information to be represented in both English units and Metric units, as desired by operating personnel.

The OptiView Control Center continually monitors the system operation and records the cause of any shutdowns (Safety, Cycling or Normal). This information is recorded in memory and is preserved even through a power failure condition. The operator may recall chiller shutdown information for viewing at any time. During operation, the user is continually advised of the operating conditions by various status and warning messages. In addition, the OptiView may be configured to notify the user of certain conditions via alarms. A complete listing of shutdown, status, and warning messages is attached in the “Control Panel Display Messages” section of this book.



Parameters that affect chiller operation characteristics should never be modified by anyone other than a qualified service technician. These parameters are shown in this manual for service technician reference only.

There are certain screens, displayed values, programmable setpoints and manual control shown in this book that are for service technician use only. These screens are only displayed when logged in at “Service” access level or higher. The setpoints and parameters displayed on these screens are explained in detail in *OPTIVIEW CONTROL CENTER RETROFIT KIT - TRANE SERVICE MANUAL (FORM 160.10-M1)*.

Advanced diagnostics and troubleshooting information for service technicians are included in *OPTIVIEW CONTROL CENTER RETROFIT KIT - TRANE SERVICE MANUAL (FORM 160.10-M1)*. Also included in the Service manual are detailed descriptions of chiller features, setup, operations, pre-rotation vane calibration, Smart Freeze, optional hot gas bypass, etc.

OPERATING SOFTWARE

The chiller operating program resides in the OptiView control center Microboard. The OptiView control center is equipped with either of the following Microboards:

- 031-01730-000 – Earlier model microboard. The operating program resides in a replaceable flash mini card. The software version (C.MLM.yy.zz) is printed on label adhered to card. The software version is also viewable on the Diagnostics Screen at the “Service” access level. The program can be upgraded by replacing the card; available from YORK.
- 031-02430-000 – Later model microboard. The operating program resides in non-removable onboard memory. The software version is C.OPT.yy.zz, and is viewable on the Diagnostics screen in “Service” access level. The program can be upgraded by downloading a new program from a program card. Program cards are shirt-pocket-size portable memory storage devices available from YORK.

Software versions (C.MLM.yy.zz or C.OPT.yy.zz) are alpha-numeric codes that represent the application and revision levels as shown below. The revision level increments for each controls software revision.

- C – Commercial chiller
- MLM – Used on Microboard 031-01730-000
- OPT – Used on Microboard 031-02430-000
- yy – Chiller Manufacturer (08 Trane, 09 Carrier, 10 McQuay)
- zz – controls revision level (00, 01, etc)

From this point on, both microboards receive the same software updates at each revision. Software updates should only be performed by a qualified service technician.

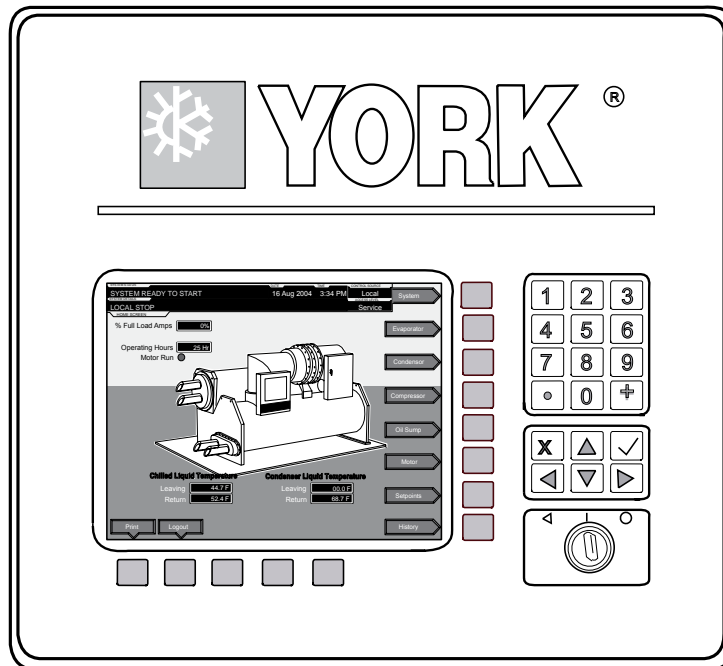
OPTIVIEW REMOTE CAPABILITIES

The OptiView Retrofit Kit expands the capabilities of remote control and communications. A common networking protocol through the Integrated Systems Network (ISN) allows the chillers to function well individually or as a team. This new protocol allows increased remote control of the chiller, as well as 24-hour performance monitoring from a remote site. In addition, compatibility is maintained with the present network of ISN communications. The chiller also maintains the standard digital remote capabilities as well. Both of these remote control capabilities allow for the standard Energy Management System (EMS) interface:

1. Remote Start
2. Remote Stop
3. Remote Leaving Chilled Liquid Temperature Setpoint adjustment (0-10VDC, 2-10VDC, 0-20mA or 4-20mA) or Pulse Width Modulation
4. Remote Current Limit Setpoint adjustment (0-10VDC, 2-10VDC, 0-20mA or 4-20mA) or Pulse Width Modulation (PWM)
5. Remote “Ready to Start” Contacts
6. Safety Shutdown Contacts
7. Cycling Shutdown Contacts

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SECTION 2 - OPTIVIEW OPERATION



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FIGURE 2 - OPTIVIEW CONTROL BOARD

OPTIVIEW CONTROLS OVERVIEW

The OptiView Control Center display is highlighted by a full screen graphics display. This display is nested within a standard keypad, and is surrounded by “soft” keys which are redefined based on the screen currently shown on the display. Eight buttons are located on the right side of the panel and are primarily used for navigation between system screens. There are five buttons at the base of the display. The area to the right of the keypad is used for data entry with a standard numeric keypad provided for entry of system setpoints and limits.



The **Decimal Key** provides accurate entry of setpoint values.



The **Plus/Minus Key** allows for entry of negative values and selection of AM or PM during time entry.



The **Check Key** is the universal ‘Enter’ or ‘Accept’ symbol and confirms changes made to the chiller setpoints.



The **X Key** is the universal ‘Cancel’ symbol and rejects the entry of a setpoint or dismisses an entry form.

The **Cursor Arrow Keys** allow movement on screens which contain a large amount of entry data. In addition, these keys allow the user to scroll through history and event logs:



The **Start/Stop Control Switch** is a three-position switch that controls the operation of the chiller:



When rotated all the way to the right, the switch is in the ‘STOP/RESET’ position. In the middle position, it is in the ‘RUN’ state. When rotated all the way to the left, the switch is in the ‘START’ position.

Start/Stop Control Switch Positions

STOP / RESET (O)

When in this position, the chiller will not run under any condition. For safety reasons, this position is required for many maintenance tasks to be completed (such as vane calibration). In addition, the switch must be placed in this state following a safety shutdown before the chiller is allowed to restart. This guarantees that manual intervention has taken place and the shutdown has been acknowledged.

START (◀)

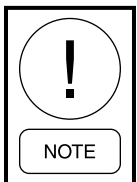
When the switch is placed in the “START” position, the chiller will begin the start sequence. The switch is only in this position momentarily as the operator attempts to locally start the unit. After release, the switch will automatically return to the “RUN” position. The unit will begin the start sequence only if all fault conditions are cleared.

RUN (I)

When the switch is placed this position, the chiller is able to operate. The switch spring-returns to the “RUN” state after being turned to the “START” position. When in this position, the chiller is allowed to function normally and will also allow the chiller to automatically restart following a cycling shutdown. The switch must be in this position to receive a valid remote start signal when operating under a remote control source.

OPTIVIEW DISPLAY PANEL OVERVIEW

The graphical display on each control panel allows a wide variety of information to be presented to the user. Each screen description in this document will begin with a section entitled “**Overview**” which will describe the graphical elements on the screen and give a short summary of the functions available. Each element on the screen will then be categorized into three distinct groups: “**Display Only**”, “**Programmable**”, and “**Navigation**”. Below is a short description of what types of information are included in these groups.



The Programmable values and Navigation commands are also subject to access level restrictions. A minimum access level is noted for any value or command that can be changed.

Display Only

Values in this group are read-only parameters which provide information about the chiller operation. This type of information may be represented by a numerical value, text, or an LED image. If a monitored numerical value is above the normal operating range, the high limit value will be displayed along with the greater-than ‘>’ symbol; if the value is below the normal operating range, the low limit value will be displayed along with the less-than ‘<’ symbol. Numerical values rendered invalid by other conditions, will display X’s to indicate this condition.

Programmable

Values in this group can be changed by the user, provided the user is logged in at the appropriate access level as described below. Each of the programmable values requires a specific access level which will be indicated beside the specified value. All of the programmable controls in the system fall into one of the categories described below:

Access Level

When power is applied to the chiller, the system begins with an access level of “View”. This will allow the user to navigate to most screens and observe the values displayed there. The user will not be allowed to change any values at the “View” level. To change any values, the user must return to the “Home” screen (shown by default when power is applied to the system) and use the “Login” button, located in the series of five buttons below the display. The user may also utilize the “Change Setpoints” key (described below) to login. At this point, the user will be prompted to enter a User ID and the corresponding password.

By default, the User ID is zero (0). In order to gain standard “Operator” level access, the password would be entered as 9 6 7 5, using the numeric keypad and then pressing the ‘✓’ (Enter) key. The “Operator” access level will revert to the “View” level after 10 continuous minutes without a keypress.

If a custom user ID and password have been defined (see “User Screen”), the user may enter that user ID and the corresponding password value at login. If the correct password is entered, the user is authorized with the appropriate access level. If an incorrect password is entered, the user is notified of the failure and prompted again. At this point, the user may retry the password entry or cancel the login attempt.

Change Setpoints

On screens containing setpoints programmable at the “Operator” or higher access level, a key with this label will be visible if the present access level is “View”. This key brings up the access level prompt described previously. This key allows the user to login at a higher Access Level without returning to the Home screen. After login, the user may then modify setpoints on that screen.

Setpoints

The control center uses the setpoint values to control the chiller and other devices connected to the chiller system. Setpoints can be numeric values (such as 45.0° F for the Leaving Chilled Liquid Temperature) or they could Enable or Disable a feature or function.

All setpoints can be programmed following procedure.

1. Press the key assigned to the setpoint to be changed. A dialog box appears displaying the present value, the upper and lower limits of the programmable range, and the default value.
2. If the dialog box begins with the word “ENTER”, use the numeric keys to enter the desired value. Leading zeroes are not necessary. If a decimal point is necessary, press the ‘.’ key (i.e. 45.0).

Pressing the ▲ key, sets the entry value to the default for that setpoint. Pressing the ▼ key, clears the present entry. The ◀ key is a backspace key and causes the entry point to move back one space.

If the dialog box begins with “SELECT”, use the ◀ and ▶ keys to select the desired value.

If the previously defined setpoint is desired, press the ‘X’ (Cancel) key to dismiss the dialog box. Otherwise proceed to step 3.

3. Press the ‘✓’ (Enter) key.

After pressing the “Enter” key, the value is accepted and the dialog box disappears. If the value is out of range, the value is not accepted and the user is prompted to re-enter a value. The chiller will begin to operate based on the new programmed value.

Manual Controls

Some keys are used to perform manual control functions. These may involve manual control of items such as the pre-rotation vanes. Other keys in this category are used to initiate/stop processes such as calibrations or reports.

Free Cursor

On screens containing many setpoints, a specific “soft” key may not be assigned to each setpoint value. A soft key will be assigned to enable the cursor arrow keys below the numeric keypad which are used to “highlight” the desired setpoint field. At this point, the ‘✓’ key is pressed to bring up a dialog prompting the user to enter a new setpoint value. The ‘X’ key cancels cursor mode. (See the “Schedule Screen” for an example.)

Navigation

In order to maximize the amount of values that the panel can display, as well as placing those values in context, multiple screens are utilized to describe the chiller operation. Navigation keys allow movement from one screen to the next. These keys allow the user to either advance or return to the previous screen. Some keys can be used to navigate within the same screen, such as the View Details screen. Page Up and Page Down keys are used to scroll through information that cannot be displayed on a single screen.

Except for the Home screen display, the upper-right “soft” key will always return the user to the Home screen. Navigating with “soft” keys is as simple as pressing the key next to the label containing the name of the desired screen. The system will immediately refresh the display with the graphics for that screen. The following screen map is a layout of all the screens and where each are located in relation to each other.

OptiView Screen Map

Home Screen

System Screen

Evaporator Screen

- Load Rate Screen

Condenser Screen

- Purge Screen

Compressor Screen

- Hot Gas Bypass Screen
- PRV Calibration Screen
- VSD Tuning Screen
- Refrigerant Level Control Screen

Oil Sump Screen

Electro-Mechanical Starter Screen

- Motor Temperature Screen

Mod "B" Solid State Starter Screen

- Motor Temperature Screen

Variable Speed Drive Screen

- VSD Details Screen
- VSD Details Screen
- ACC Screen
- Harmonic Filter Details Screen
- Harmonic Filter Details Screen
- Motor Temperature Screen

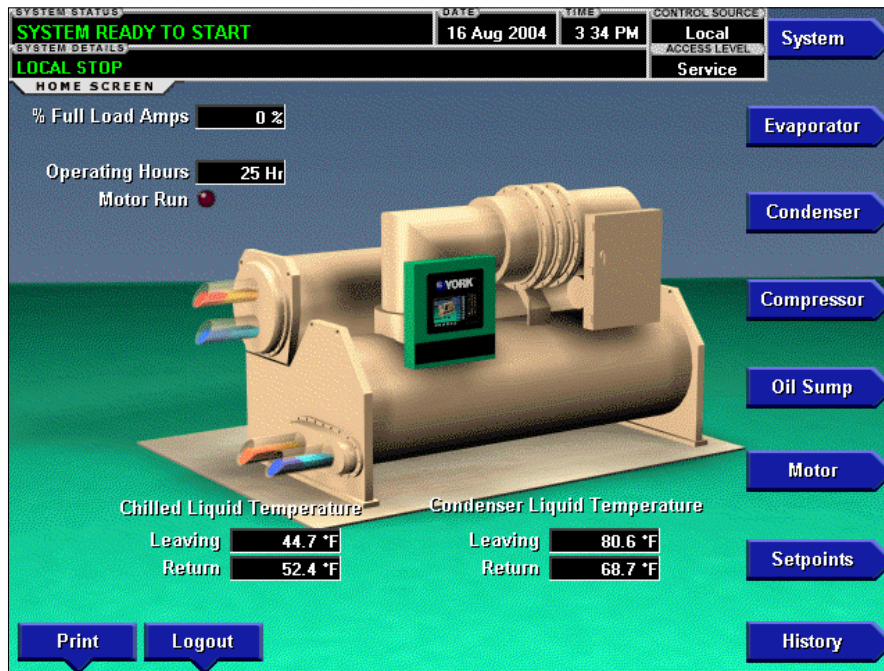
Setpoints Screen

- Setup Screen
 - Schedule Screen
 - User Screen
 - Comms Screen
 - Printer Screen
 - Sales Order Screen
 - Diagnostics Screen
 - Diagnostics - Analog Screen
 - Diagnostics - Digital Screen
 - Diagnostics - VSD Screen
 - Operations Screen

History Screen

- History Details Screen
- Custom View Screen
 - (Custom View) Setup Screen
- Trend Screen
 - Trend Setup Screen
 - Trend Common Slots Screen

HOME SCREEN

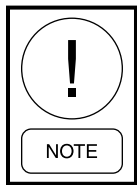


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FIGURE 3 - HOME SCREEN

OVERVIEW

The “Home” screen is the default display screen on the OptiView LCD. The primary values which must be monitored and controlled are shown on this screen. The Home screen display depicts a visual representation of the chiller itself. Animation indicates chilled liquid flow.



Trane CVHB model chillers have a different display chiller graphic for this screen. All functions and setpoints remain the same. Refer to APPENDIX A in this manual for the CVHB graphic associated with this screen.

DISPLAY ONLY

Chilled Liquid Temperature – Leaving

Displays the temperature of the liquid as the liquid leaves the evaporator.

Chilled Liquid Temperature – Return

Displays the temperature of the liquid as the liquid enters the evaporator.

Condenser Liquid Temperature – Leaving

Displays the temperature of the liquid as the liquid leaves the condenser.

Condenser Liquid Temperature – Return

Displays the temperature of the liquid as the liquid enters the condenser.

Motor Run (LED)

LED is lit when the digital output controlling the motor starter contact is on. Signals the motor is running.

Input Power (kW)

Available only if the chiller system is utilizing a Variable Speed Drive or Mod “B” Solid State Starter motor controller. This displays the total input power used by the system.

% Full Load Amps

This displays the percentage of full load amps utilized by the system.

Operating Hours

Displays the cumulative operating hours of the chiller.

PROGRAMMABLE

Login

Access Level Required: VIEW

The OptiView panel restricts certain operations based on password entry by the operator. This key allows the operator to login under a unique user name (as programmed) and access level. Users logged in under higher access levels may perform any actions permitted by lower access levels.

Logout

Access Level Required: OPERATOR

When logged in at any level other than “View”, this key appears on the OptiView display. Pressing this key will return the access level to “View”. After any setpoint changes are made, the operator should press the “Logout” key.

Print

Access Level Required: VIEW

This key provides a printout of the user selected conditions at the time the key is pressed. The “History” page provides further reporting capability (See “History” below). This option will not be present if the chiller is presently configured to log any incoming adaptive capacity control map points (See the Adaptive Capacity Control Details screen).

Message Clear

Access Level Required: SERVICE

When the control center detects certain safety or cycling conditions and the chiller shuts down, the main status display on the display will show a message indicating the cause of the shutdown. Pressing this key while logged in at the appropriate access level clears the message, provided the condition no longer exists.

Warning Reset

Access Level Required: OPERATOR

Use of this key acknowledges a warning condition and resets the message display associated with the condition.

Soft Shutdown

Access Level Required: OPERATOR

This key, available only when the compressor is running, initiates a “Soft Shutdown”. A soft shutdown fully closes the pre-rotation vanes prior to shutting down the compressor, reducing bearing wear by eliminating compressor backspin at shutdown. While the vanes are closing, the System Status line displays “VANES CLOSING BEFORE SHUTDOWN”. When the Vane Motor Switch (VMS) closes, indicating the vanes have fully closed (or 3.5 minutes have elapsed, whichever occurs first), the run signal is removed from the compressor motor starter and a “System Coastdown” is performed.

While the vanes are closing, if a “Local Stop” is initiated by the compressor switch or a fault occurs, the chiller will immediately enter system coastdown.

This chiller will not enter a system coastdown if one of the following faults occur: “Leaving Chilled Liquid Temp – Low Temperature”, “Remote Stop”, “Multi-Unit Cycling – Contacts Open”, “System Cycling – Contacts Open” or “Control Panel – Schedule”

To restart the chiller after an operator-initiated soft shutdown, place the compressor switch in the “Stop/Reset” position (O) and then the “Start” position (◀).

NAVIGATION

System

Advances to an additional chiller system operating level parameter screen.

Evaporator

Advances to a detailed view of all evaporator parameters, including the programmable leaving chilled liquid setpoint.

Condenser

Advances to a detailed view of all condenser parameters such condenser refrigerant temperature.

Compressor

Advances to a detailed view of all the compressor parameters. This includes pre-rotation vane control and calibration.

Oil Sump

Advances to a detailed view of all the oil pump and oil sump parameters such as oil temperature and pressure.

Motor

A detailed view of the motor controller parameters, specific to the controller type presently utilized on the chiller system. This allows programming of the current limit and the pulldown demand limit values. For a VSD system, the adaptive capacity control and harmonic filter information is controlled under this screen.

Setpoints

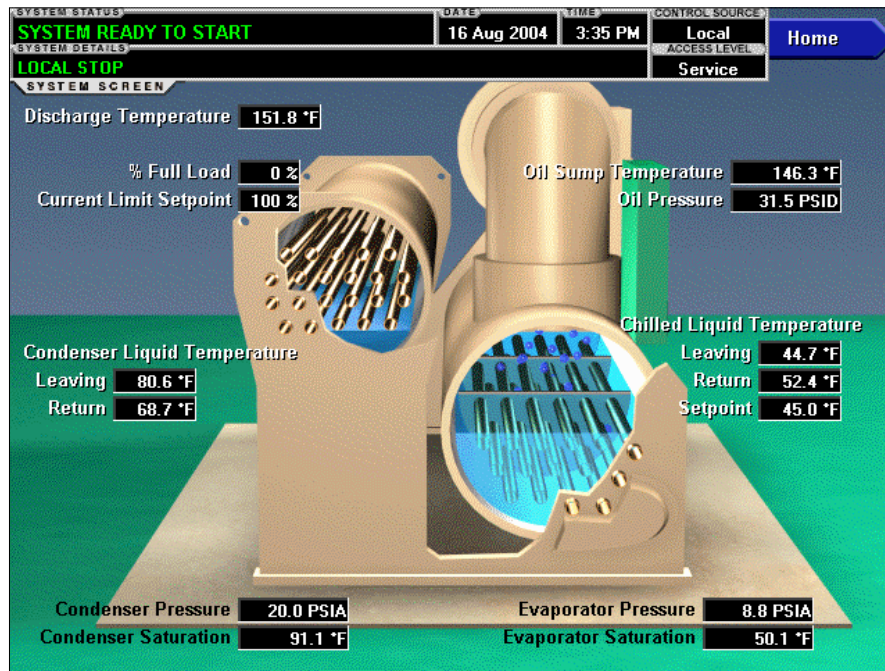
This screen provides a single location to program the most common system setpoints. This screen is also the gateway to many of the general system setup parameters such as: Date/Time, Display Units, Scheduling, Printer Setup, etc.

History

This screen provides access to a “snapshot” of system data at each of the last ten (10) shutdown conditions. This is particularly useful when troubleshooting chiller system problems.

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SYSTEM SCREEN

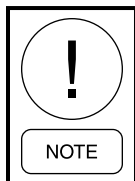


LD09992

FIGURE 4 - SYSTEM SCREEN

OVERVIEW

This screen gives a general overview of common chiller parameters for the evaporator, condenser oil sump and current usage.



Trane CVHB model chillers have a different display chiller graphic for this screen. All functions and setpoints remain the same. Refer to APPENDIX A in this manual for the CVHB graphic associated with this screen.

DISPLAY ONLY

Discharge Temperature

Displays the temperature of the refrigerant (in a gaseous state) at discharge of the compressor before the refrigerant enters the condenser.

Chilled Liquid Temperature – Leaving

This display indicates the temperature of the chilled liquid as the liquid exits the evaporator.

Chilled Liquid Temperature – Return

This display indicates the temperature of the chilled liquid as the liquid enters the evaporator.

Chilled Liquid Temperature – Setpoint

This display indicates the active temperature setpoint to which the chiller is controlling the evaporator liquid. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, a PWM signal in digital remote mode, MicroGateway interface in ISN mode, or a locally programmed value.

Evaporator Pressure

This display indicates the present refrigerant pressure in the evaporator.

Evaporator Saturation Temperature

This display indicates the present saturation temperature in the evaporator, as calculated by the evaporator pressure

Condenser Liquid Temperature – Leaving

This display indicates the temperature of the condenser liquid as the liquid exits the condenser.

Condenser Liquid Temperature – Return

This display indicates the temperature of the condenser liquid as the liquid enters the condenser.

Condenser Pressure

This display indicates the refrigerant pressure in the condenser.

Condenser Saturation Temperature

This display indicates the saturation temperature in the condenser.

Oil Sump Temperature

This displays the temperature of the oil in the sump.

Oil Pressure

This display indicates the pressure differential between the high side oil pressure transducer (output of oil filter) and the low side oil pressure transducer (compressor housing). The displayed value includes offset pressure derived from auto-zeroing during the system prelube. If either of the transducers used to calculate this differential are out of range, the display field will show XX.X.

% Full Load Amps

This displays the percentage of full load amps utilized by the system.

Current Limit

This display indicates the current limit value in use. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN (Integrated Systems Network) mode, or a locally programmed value.

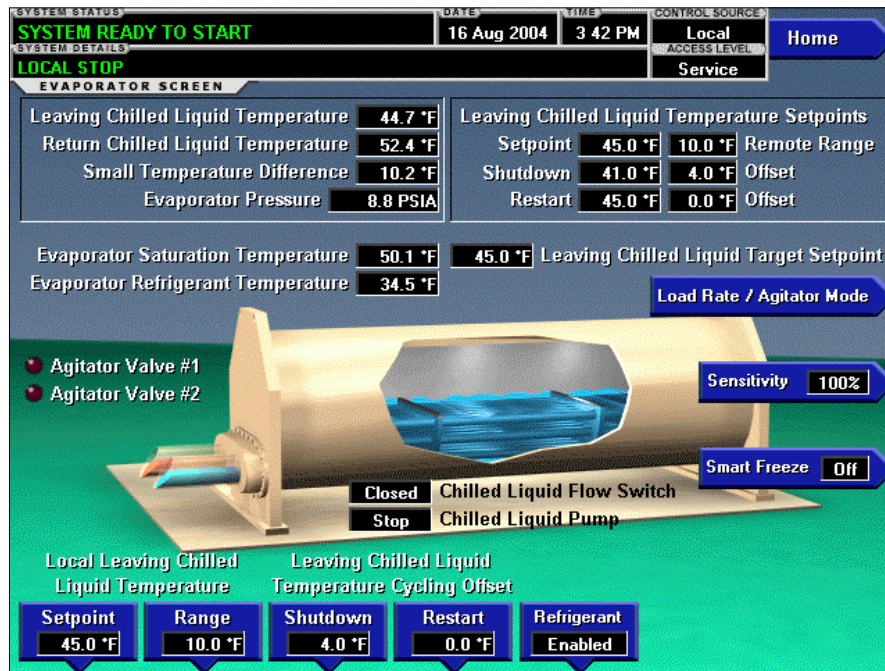
PROGRAMMABLE

None

NAVIGATION**Home*****Access Level Required: VIEW***

Returns the display to the Home screen.

EVAPORATOR SCREEN



LD09993

FIGURE 5 - EVAPORATOR SCREEN

OVERVIEW

This screen displays a cutaway view of the chiller evaporator. All evaporator setpoints are maintained on this screen. Animation of the evaporation process indicates whether the chiller is presently in a “RUN” condition. Animation of the liquid flow indicates chilled liquid is flowing through the evaporator.

DISPLAY ONLY

Chilled Liquid Flow Switch (Open or Closed)

This display indicates whether the liquid flow is present in the evaporator.

Chilled Liquid Pump (RUN or STOP)

This display indicates the command presently sent by the OptiView Control Center to the chilled liquid pump.

Agitator Valve (LEDs)

Not used in this application.

Evaporator Pressure

This display indicates the present refrigerant pressure in the evaporator.

Evaporator Saturation Temperature

This display indicates the present saturation temperature in the evaporator, as calculated from the voltage of the evaporator pressure transducer.

Return Chilled Liquid Temperature

This display indicates the temperature of the chilled liquid entering the evaporator.

Leaving Chilled Liquid Temperature

This display indicates the temperature of the chilled liquid leaving the evaporator.

Evaporator Refrigerant Temperature

This display indicates the temperature of the refrigerant in the evaporator, which is provided by RT7. This sensor is part of the optional refrigerant temperature sensor kit and will only be displayed if this sensor is enabled.

Small Temperature Difference

This display indicates the difference between the leaving chilled liquid temperature and the evaporator refrigerant temperature. The evaporator refrigerant temperature will be represented by the evaporator satu-

ration temperature if the refrigerant temperature sensor is disabled.

Leaving Chilled Liquid Temperature Setpoints – Setpoint

This display indicates the present setpoint to which the chiller is operating, whether controlled locally or remotely.

Leaving Chilled Liquid Temperature Setpoints – Shutdown

This display indicates the leaving chilled liquid temperature at which the chiller will shut down to avoid over-cooling. The default value is 4.0°F below the leaving chilled liquid temperature setpoint.

Leaving Chilled Liquid Temperature Setpoints – Restart

This display indicates the leaving chilled liquid temperature at which the chiller will restart after the chiller has shut down due to over-cooling temperature. The leaving chilled liquid temperature setpoint is the default value for this setting.

PROGRAMMABLE

Local Leaving Chilled Liquid Temperature – Setpoint

Access Level Required: OPERATOR

This value allows the user to define the leaving chilled liquid temperature that is to be maintained by the chiller. The temperature is programmable over the range of 38.0°F to 70.0°F (water) or 10.0°F to 70.0°F (brine). The range is 36.0°F to 70.0°F (water) if Smart Freeze is enabled (see below).

Local Leaving Chilled Liquid Temperature – Range

Access Level Required: OPERATOR

This is the range that a remote device is able to adjust the leaving chilled liquid temperature setpoint above the temperature set locally at the OptiView. The range setpoint is programmable to either 10°F or 20°F, with a default of 20°F. This setpoint value is added to the local leaving chilled liquid temperature (see above) value to create a range limit over which a remote device can adjust the setpoint.

- For example, if the range is programmed for 10°F and the locally programmed value of the chilled

liquid temperature is 45.0°F, then the remote device is able to change and set the leaving chilled liquid temperature setpoint over the range 45.0° - 55.0°F.

A remote device that provides an analog signal (0-20mA, 4-20mA, 0-10VDC or 2-10VDC) in analog remote mode or a PWM signal in digital remote mode defines the setpoint change as an offset value.

- For example, if the setpoint is 45.0°F and the desired setpoint is 50.0°F, then 5.0°F would be the input on the remote device.

A MicroGateway (in ISN Remote mode) can define the setpoint through a serial data stream. In this case, the incoming setpoint is not an offset that is applied to the leaving chilled liquid temperature setpoint value, but is the programmed as the actual setpoint value.

Leaving Chilled Liquid Temperature Cycling Offset – Shutdown

Access Level Required: OPERATOR

This value specifies the number of degrees below the leaving chilled liquid temperature setpoint the chilled liquid can reach before the OptiView performs a “LEAVING CHILLED LIQUID – LOW TEMPERATURE” cycling shutdown. This setpoint is programmable over a range of 1°F to 64°F (dependant on setpoint temperature), to a minimum cutout of 36.0°F (water), 34.0°F (water with Smart Freeze enabled) or 6.0°F (brine). This prevents over-cooling of the chilled liquid.

Anytime the leaving chilled liquid temperature setpoint is increased, the shutdown threshold is 36.0°F (water) or 6.0°F (brine) for the next ten (10) minutes. If Smart Freeze is enabled, the threshold is 34.0°F for the next ten minutes. After ten minutes have elapsed, the shutdown threshold becomes the programmed setpoint value.

Leaving Chilled Liquid Temperature Cycling Offset – Restart

Access Level Required: OPERATOR

This value specifies the number of degrees above the leaving chilled liquid temperature setpoint the chilled liquid is permitted to reach before the chiller will restart after a “LEAVING CHILLED LIQUID – LOW TEMPERATURE” cycling shutdown. The value is programmable over a range of 0°F to 70°F (dependant on setpoint temperature) above the chilled liquid setpoint,

to a maximum restart value of 80°F. The chiller will automatically restart when this temperature is reached. This setpoint can be used to reduce chiller cycling by delaying the chiller restart until the cooling load has increased.

Brine Low Evaporator Cutout

Access Level Required: SERVICE

This value is only available when the chiller is in “Brine” chilled liquid mode. This allows the user to specify the evaporator pressure at which a safety shutdown is initiated. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Sensitivity

Access Level Required: SERVICE

This value allows adjustment for the sensitivity of the pre-rotation vanes response to correct the difference between the leaving chilled liquid temperature setpoint and the actual leaving chilled liquid temperature. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Smart Freeze (Off/On)

Access Level Required: SERVICE

This setting is only available when the chiller is in “Water” chilled liquid mode. This feature allows the user to enable or disable the Smart Freeze operation, which permits the chiller to run closer to the freeze point without shutting down. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Refrigerant (Enabled / Disabled)

Access Level Required: SERVICE

Enables/Disables the display of the refrigerant temperature sensor reading. This sensor should be enabled for Trane applications when the optional refrigerant sensor kit is installed.

Change Setpoints

Access Level Required: VIEW

Allows user to enter login password to change motor settings. This button is only present at the “View” access level.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Load Rate/Agitator Valves

Access Level Required: SERVICE

Advances to a sub-screen which allows programming of load rate. Agitator valves are not used in this application.

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LOAD RATE SCREEN



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FIGURE 6 - LOAD RATE SCREEN

OVERVIEW

This is a sub-screen of the evaporator screen. The load rate setpoint is accessible in this screen. This application does not utilize agitator valves.

DISPLAY ONLY

None

PROGRAMMABLE

Agitator Mode

This application does not utilize agitator valves, this value should be set to “None” (default).

Load Rate

Access Level Required: SERVICE

This value, displayed within the load rate screen tab, is expressed as °F/min. The load rate feature allows for a controlled loading of the chiller by ramping down the Leaving Chilled Liquid Temperature Setpoint (LCLTS) the programmed number of degrees per minute after initial startup.

As an example, if the LCLTS is 45.0°F, the actual Leaving Chilled Liquid Temperature is 58.0°F, and the Load Rate is 3.00 °F/min, the control panel will set the LCLTS to 55.0°F at chiller start and reduce the setpoint three degrees per minute until the LCLTS setpoint of 45.0°F is reached. This reduces the load placed on the chiller, saving energy and reducing chiller component wear.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Evaporator

Access Level Required: VIEW

Returns the display to the Evaporator screen.

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CONDENSER SCREEN



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FIGURE 7 - CONDENSER SCREEN

OVERVIEW

This screen displays a cutaway view of the chiller condenser. All setpoints relating to the condenser side of the chiller are maintained on this screen. Animation indicates condenser liquid flow. This screen also serves as a gateway to the Purge screen, if the chiller is equipped with a YORK TurboGuard II purge unit.

DISPLAY ONLY

Leaving Condenser Liquid Temperature

This display indicates the temperature of the water leaving the condenser.

Return Condenser Liquid Temperature

This display indicates the temperature of the water entering the condenser.

Condenser Pressure

This display indicates the refrigerant pressure in the condenser.

Condenser Saturation Temperature

This display indicates the saturation temperature in the condenser, as calculated from the voltage of the condenser pressure transducer.

Small Temperature Difference

Displays the difference between the condenser refrigerant temperature and the leaving condenser liquid temperature. The condenser refrigerant temperature is represented by the condenser saturation temperature if the condenser refrigerant temperature sensor is not enabled.

Drop Leg Refrigerant Temperature

The drop leg temperature displays the refrigerant temperature provided by RT6. This sensor is part of the optional refrigerant sensor kit.

Sub-Cooling Temperature

This display indicates the difference between the condenser refrigerant temperature and the drop leg refrigerant temperature. Will only be displayed if the drop leg sensor is enabled.

Condenser Refrigerant Temperature

This display indicates the temperature of the refrigerant in the condenser provided by RT17. Will only be displayed if the sensor is enabled. This sensor is part of the optional refrigerant sensor kit.

Condenser Liquid Flow Switch (Open/Closed)

This display will indicate the flow switch is “closed” when condenser liquid flow is present.

Condenser Liquid Pump (Run/Stop)

Indicates the operating status of the condenser liquid pump.

PROGRAMMABLE

High Pressure Warning Threshold

Access Level Required: SERVICE

This value allows the user to define the condenser pressure at which the chiller will initiate a warning. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Drop Leg (Enabled / Disabled)

Access Level Required: SERVICE

The drop leg sensor must be enabled to utilize the refrigerant temperature sensor output on Trane chillers. Should be enabled for Trane applications where the optional refrigerant sensor kit is installed.

Condenser Refrigerant Temperature (Enabled/Disabled)

Access Level Required: SERVICE

This condenser refrigerant temperature must be enabled to utilize the refrigerant temperature sensor output on Trane chillers. Should be enabled for Trane applications that have the optional refrigerant sensor kit installed.

Purge Type

Access Level Required: SERVICE

Allows for selection of type of purge system. If a Trane purge unit is utilized, “Skyguard Remote” must be selected.

NAVIGATION

Home

Access Level Required: VIEW

Returns display to the Home screen.

Refrigerant Level Control

Access Level Required: SERVICE

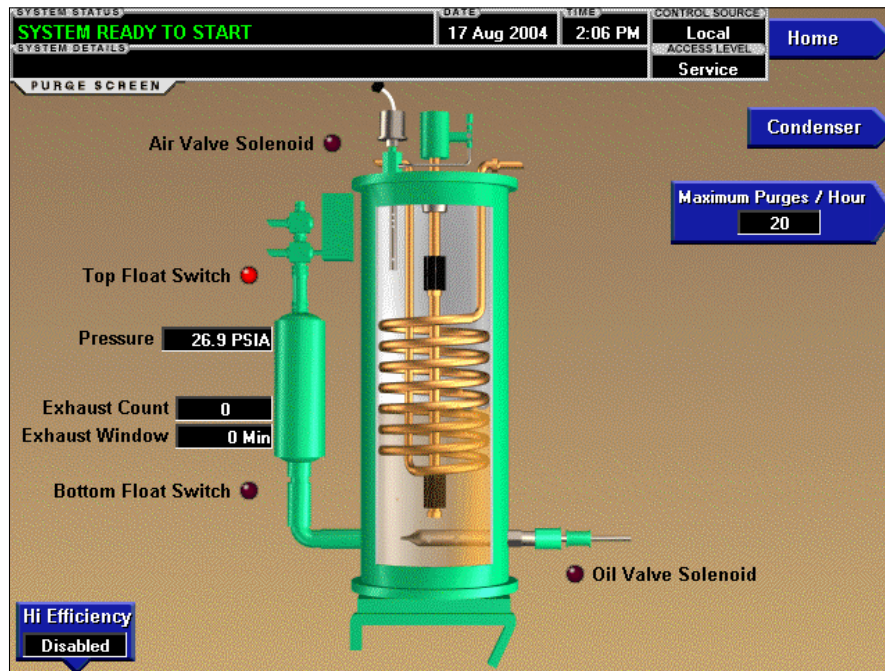
Advances to a sub-screen which allows programming of refrigerant level setpoints, if the chiller is equipped with refrigerant level control. Not supported at the time of this publication.

Purge Control

Access Level Required: VIEW

Advances to a sub-screen which allows programming of the purge system setpoints. Only displayed if the OptiView Control Center is configured for the YORK TurboGuard II Purge System.

PURGE SCREEN



LD10008

FIGURE 8 - PURGE SCREEN

OVERVIEW

This screen displays a cutaway view of the purge tank, if the chiller is equipped with a York TurboGuard II Purge System. LEDs depict the state of the float switches, oil valve solenoid and air valve solenoid and the purge exhaust count is displayed. All setpoints relating to the purge system are maintained on this screen. The purge tank oil level, based on the position of the float switches, is depicted through animation. When both the float switches are closed, the oil level is shown at its lowest (empty) level. When both float switches are open, the level is shown at its highest (full) level. Levels between these extremes are shown at midpoint.

DISPLAY ONLY

Air Valve Solenoid (LED)

Illuminated only when the air valve solenoid is energized (open), venting non-condensibles from the purge tank. For High Efficiency (pump assisted) purge systems, the valve is energized above 90.0 PSIA and de-energizes when the pressure decreases below 80.0 PSIA. For non pump-assisted purge systems, the valve

is energized above 34.7 PSIA and de-energized when the pressure decreases below 9.7 PSIA. Trane chillers which use the TurboGuard II require the high efficiency purge unit.

Top Float Switch (LED)

Illuminated when the Top Float Switch is closed, indicating the purge tank oil level is less than full. The LED is extinguished when the switch is open, indicating the level is at maximum (full).

Bottom Float Switch (LED)

Illuminated when the bottom float switch is closed, indicating the purge tank oil level is at minimum (empty). The LED is not illuminated when switch is open, indicating the oil level is above minimum.

Oil Valve Solenoid (LED)

Illuminated when the oil valve solenoid is energized, filling the purge tank with oil. The LED is not illuminated when the solenoid is de-energized, draining the oil from the purge tank.

Pressure

This display indicates the pressure in the purge tank.

Bypass Time Left

This display is only shown during the first 60 minutes of chiller run. Counts down the 60-minute purge count bypass. When the time is up, Exhaust Count and Exhaust Window are displayed.

Exhaust Count

Exhaust count is only displayed after an initial 60-minute bypass occurs at chiller start-up. Displays the number of purge exhausts that have occurred within the last 0 to 60 minutes, as displayed in the exhaust window. When the purge unit reaches the excess purge threshold or the chiller shuts down, the count display is frozen. The count will be reset when the chiller starts again.

Exhaust Window

Displayed as 0 to 60 minutes. After a 60 minute bypass at chiller start, the exhaust window times from 0 to 60 minutes. During this period, purge exhausts are counted and the exhaust count displayed is that which has occurred in the last number of minutes displayed in the exhaust window. After the exhaust window reaches 60, the purge exhausts that occurred in the oldest minute are discarded from the exhaust count and exhausts from the most recent minute are shifted in, providing a rolling count of purge exhausts that occurred in the last 60 minutes. The count remains at 60 until the chiller is restarted, whereupon the count is reset to 0.

Bypass Time Left

Replaces “Exhaust Window” label during the first 60 minutes of chiller run. Counts down the 60 minute purge count bypass.

PROGRAMMABLE**High Efficiency Purge System (Enabled / Disabled)****Access Level Required: SERVICE**

Selects the appropriate control and purge exhaust thresholds for the purge system installed on the chiller. High efficiency (pump assisted) purge systems exhaust above 90.0 PSIA. Non pump-assisted purge systems exhaust above 34.7 PSIA. Trane chillers equipped with a TurboGuard II must be set to “Enabled”.

Maximum Purges/Hour**Access Level Required: OPERATOR/SERVICE**

Allows the user to define the number of purge air exhausts permitted before a warning for excess purge is displayed. With “Operator” access level, the value can be programmed over a range of 10 to 30 Purges/Hour. The “Service” access level allows this setpoint to be programmed over a range of 1 to 30 Purges/Hour.

Change Setpoint**Access Level Required: VIEW**

Allows user to enter login password to change purge settings. This button is only present at the “View” access level.

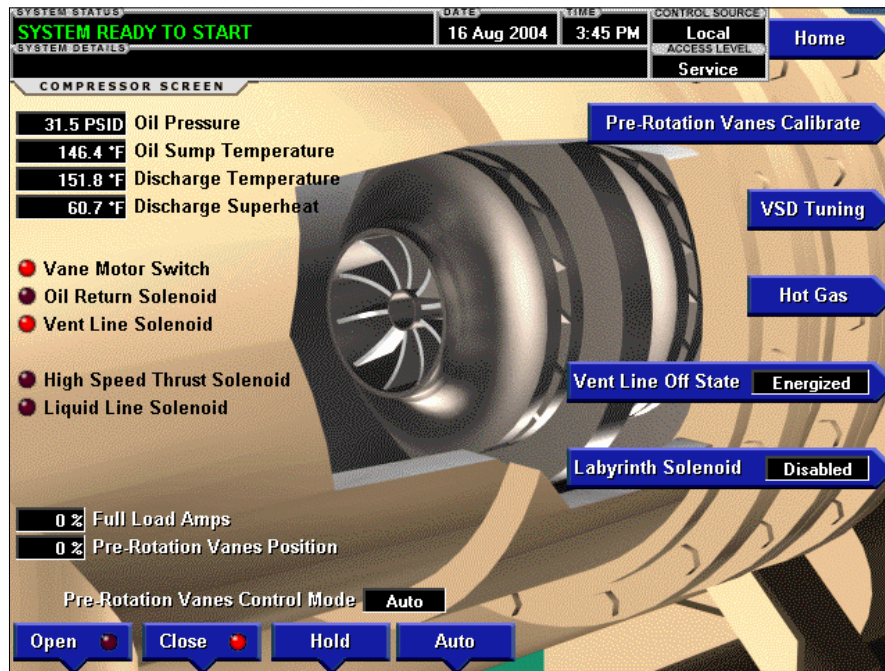
NAVIGATION**Home****Access Level Required: VIEW**

Returns the display to the Home screen.

Condenser**Access Level Required: VIEW**

Returns the display to the Condenser screen.

COMPRESSOR SCREEN

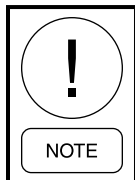


LD09996

FIGURE 9 - COMPRESSOR SCREEN

OVERVIEW

This screen displays a cutaway view of the chiller compressor, revealing the impellers and shows all conditions associated with the compressor. The pre-rotation vanes may be manually controlled from the appropriate access level. Animation of the compressor impeller indicates that the chiller is presently in a **RUN** condition. This screen also serves as a gateway to sub-screens for calibrating the pre-rotation vanes, providing advanced control of the compressor motor Variable Speed Drive and configuring the hot gas bypass, as equipped.



Trane CVHB model chillers have an alternate display chiller graphic for this screen. All functions and setpoints remain the same. Refer to APPENDIX A in this manual for the CVHB graphic associated with this screen.

DISPLAY ONLY

Oil Pressure

Displays the pressure differential between the high side oil pressure transducer (HOP, located between oil filter output and compressor bearing input) and the low

side oil pressure transducer (LOP, located between oil sump and compressor housing). The displayed value includes offset pressure derived from auto-zeroing during the system prelube. The display field will show XX.X when either of the transducers used to calculate oil pressure are out of range.

The offset pressure is the pressure difference between the high oil pressure (HOP) transducer and the low oil pressure (LOP) transducer outputs during a three (3) second period beginning ten (10) seconds into the system prelube. During this time, the transducers should be sensing the same pressure. However, due to accuracy tolerances in transducer design, differences may exist in these pressure readings. To compensate for these differences between transducers and assure differential pressure sensing accuracy, the offset pressure is subtracted algebraically from the oil (differential) pressure value. The offset pressure calculation will not be performed if either transducer is out of range and the offset value will be 0 PSI in this instance.

Oil Sump Temperature

Displays the temperature of the oil in the sump.

Discharge Temperature

Displays the temperature of the refrigerant (in a gaseous state) at discharge of the compressor before the refrigerant enters the condenser.

Discharge Superheat

Displays the discharge superheat. This value is calculated by subtracting the condenser saturation temperature from the compressor discharge temperature.

Vane Motor Switch (LED)

Illuminates when the pre-rotation vanes are completely closed.

Liquid Line Solenoid (LED)

Not used for this application.

High Speed Thrust Solenoid (LED)

Not used for this application.

Labyrinth Solenoid (LED)

Not used for this application.

Oil Return Solenoid (LED)

Not used for this application. May or may not be shown on display, depending on software version.

Vent Line Solenoid (LED)

Illuminates when the vent line solenoid is energized.

Pre-Rotation Vanes Control Mode**Access Level Required: SERVICE**

Indicates whether the vanes are under manual or automatic control.

[Pre-Rotation Vanes] Open (LED)**Access Level Required: SERVICE**

Indicates that the vanes are in the process of opening.

[Pre-Rotation Vanes] Close (LED)**Access Level Required: SERVICE**

Indicates that the vanes are in the process of closing.

Pre-Rotation Vanes Position (Variable Speed Drive and Hot Gas Option only)**Access Level Required: SERVICE**

This value displays the present position of the pre-rotation vanes as a percentage between 0 and 100%.

Full Load Amps**Access Level Required: SERVICE**

Displays the motor current as a percentage of the Full Load Amps (FLA) value.

Phase A, B, C Current (Solid State Starter only)**Access Level Required: SERVICE**

Displays the 3-phase motor current values being read from the Solid State Starter.

PROGRAMMABLE**[Pre-Rotation Vanes] Open (Manual)****Access Level Required: SERVICE**

This key puts the vane control into manual mode and sends an “open” command to the vanes.

[Pre-Rotation Vanes] Close (Manual)**Access Level Required: SERVICE**

This key puts the vane control into manual mode and sends a “close” command to the vanes.

[Pre-Rotation Vanes] Hold (Manual)**Access Level Required: SERVICE**

This key puts the vane control into manual mode and sends a hold command to the vanes to hold the current position.

[Pre-Rotation Vanes] Auto**Access Level Required: SERVICE**

This key returns the vane control to automatic mode.

Vent Line Off State (Energized/De-energized)**Access Level Required: SERVICE**

Allows the Vent Line Solenoid to be programmed in an energized or de-energized state when the chiller is not running. Trane model chillers must be in the energized state.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home Screen.

Pre-Rotation Vane Calibration

Access Level Required: SERVICE

Only available if the chiller is stopped and the system uses a Variable Speed Drive or Hot Gas Bypass control. Advances to the PRV Calibration screen. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

VSD Tuning (Variable Speed Drive only)

Access Level Required: SERVICE

Advances to the VSD tuning screen allowing advanced tuning of the Variable Speed Drive. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Hot Gas

Access Level Required: SERVICE

If the chiller is equipped with a hot gas bypass, this key accesses a sub-screen that allows programming of the hot gas bypass control setpoints and manual control of the hot gas bypass valve. This key is only displayed if hot gas bypass feature has been enabled on the “Operations” screen. This feature is engineered according to each specific application. Service technicians **MUST** consult YORK Service Marketing if this option is installed.

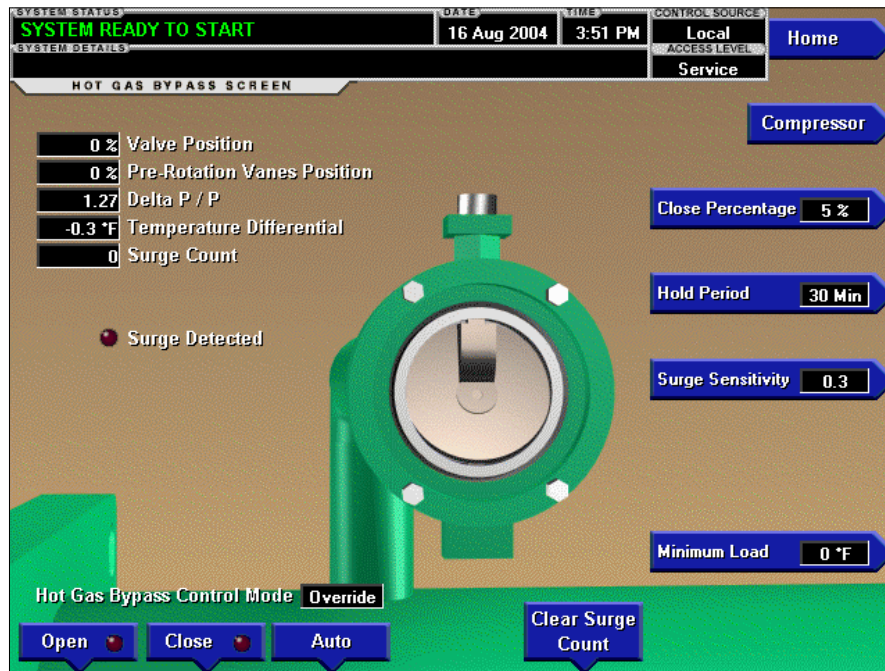
Surge Protection

Access Level Required: SERVICE

This key accesses the Surge Protection screen, which contains setpoints for compressor surge protection. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

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HOT GAS BYPASS SCREEN

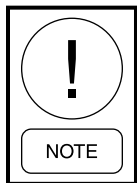


LD09997

FIGURE 10 - HOT GAS BYPASS SCREEN

OVERVIEW

This screen displays a cutaway view of the hot gas bypass valve. All setpoints relating to hot gas bypass control are maintained on this screen. Related hot gas bypass control parameters are also displayed for reference. Through animation, the relative valve position is displayed on the graphic.



This feature must be engineered according to each specific application. If the chiller is equipped with hot gas bypass, YORK Service Marketing MUST be consulted before configuring this screen. The SERVICE access level is required to view this screen.

DISPLAY ONLY

Valve Position

Displays the position of the hot gas valve over the range of 0% (closed) to 100% (fully open). Animation indicates valve position as follows:

- 0% to 19% – fully closed.
- 20% to 39% – 25% open

- 40% to 59% – 50% open
- 60% to 79% – 75% open
- 80% to 100% – 100% open

Pre-rotation Vanes Position

Displays the position of the pre-rotation vanes over the range of 0% (closed) to 100% (fully open). Displayed at XXX until calibration procedure is performed by a service technician.

Delta P/P

Delta P/P is a parameter that represents system pressure differential or “Head”. This value is calculated by subtracting evaporator pressure from condenser pressure and then dividing by the evaporator pressure.

$(\text{condenser pressure} - \text{evaporator pressure}) / \text{evaporator pressure}$

Temperature Differential

The difference between the leaving chilled liquid temperature and the leaving chilled liquid temperature setpoint.

Surge Count

This is the total number of surge events that have been detected over the lifetime of the chiller. These are the surge events detected by the Surge Protection feature. The surge events detected by the compressor VSD adaptive capacity control board are not included in this total.

Surge Detected (LED)

Illuminated for 5 seconds each time a surge is detected by the “Surge Protection” feature. This LED does not illuminate in response to surge events detected by the VSD adaptive capacity control board.

Hot Gas Bypass Control Mode

Indicates whether the hot gas bypass is under automatic, manual or override control. “Override” is displayed during minimum load override conditions or when the compressor motor variable speed drive (as equipped) is running at less than maximum speed.

PROGRAMMABLE

Close Percentage

Access Level Required: SERVICE

This is the amount the hot gas valve will close at 10 minute increments after the programmed hold period has elapsed. This value is adjustable from 5 to 15%, 5% is the default setting. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for additional information.

Hold Period

Access Level Required: SERVICE

The hold period is the amount of time after surges are no longer detected that the hot gas valve will begin to close. This value is adjustable in one minute increments from 30 to 120 minutes. The default setting is 30 minutes. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for additional information.

Surge Sensitivity

Access Level Required: SERVICE

This setting is used to adjust the sensitivity of the control center surge detection. The smaller the value, the more sensitive the control center is to detecting surges. This value is adjustable to tenths (0.1) from 0.3 to 1.3. Three tenths (0.3) is the default setting. Service tech-

nicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for additional information.

Minimum Load

Access Level Required: SERVICE

The minimum load setting is the temperature offset below the leaving chilled liquid temperature at which the hot gas bypass valve will open. The setting is adjustable from 0°F to 4°F, with 0°F as the default setting. Minimum load is disabled when 0°F is entered. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for additional information.

[Hot Gas Bypass Control] Open (Manual)

Access Level Required: SERVICE

This key puts the hot gas bypass control in manual mode and increases the valve position by 5%.

[Hot Gas Bypass Control] Close (Manual)

Access Level Required: SERVICE

This key puts the hot gas bypass control in manual mode and decreases the valve position by 5%.

[Hot Gas Bypass Control] Auto

Access Level Required: SERVICE

Returns the hot gas bypass control to automatic mode.

Clear Surge Count

Access Level Required: SERVICE

This key clears and returns the surge count window to zero.

NAVIGATION

Home

Access Level Required: VIEW

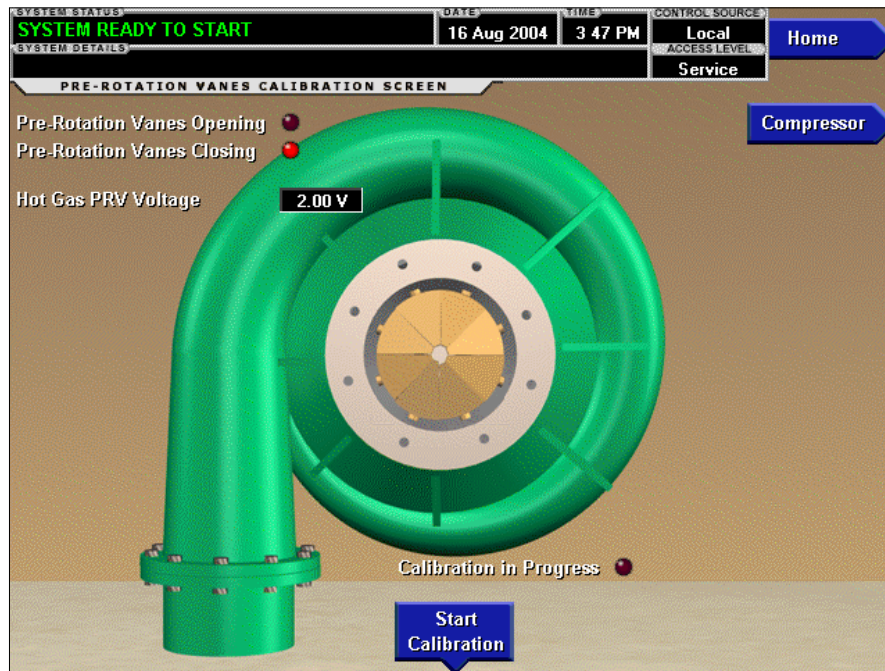
Returns the display to the Home screen

Compressor

Access Level Required: VIEW

Returns the display to the Compressor screen

PRE-ROTATION VANES CALIBRATION SCREEN

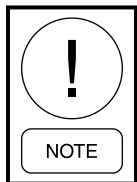


LD09998

FIGURE 11 - PRV CALIBRATION SCREEN

OVERVIEW

This screen displays a cutaway view of the chiller compressor, revealing the pre-rotation vanes and provides the capability of calibrating the pre-rotation vanes for either variable speed drive or hot gas bypass applications.



Requires a login access level of SERVICE to view this screen. Service technicians refer to the OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for additional operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Pre-Rotation Vanes Opening (LED)

Indicates the vanes are opening.

Pre-Rotation Vanes Closing (LED)

Indicates the vanes are closing.

Calibration in Progress (LED)

Indicates the calibration sequence is in progress.

Calibration Messages

These are text messages which step the user through the calibration process and indicate success or failure of the calibration.

Hot Gas PRV Voltage

Displays the pre-rotation vanes position potentiometer feedback voltage when the hot gas bypass feature is enabled.

PROGRAMMABLE

Start Calibration

This option is hidden after calibration has started. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for an explanation of this function.

Cancel Calibration

This option only becomes available after calibration has started. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for an explanation of this function.

NAVIGATION

Home

Access Level Required: VIEW

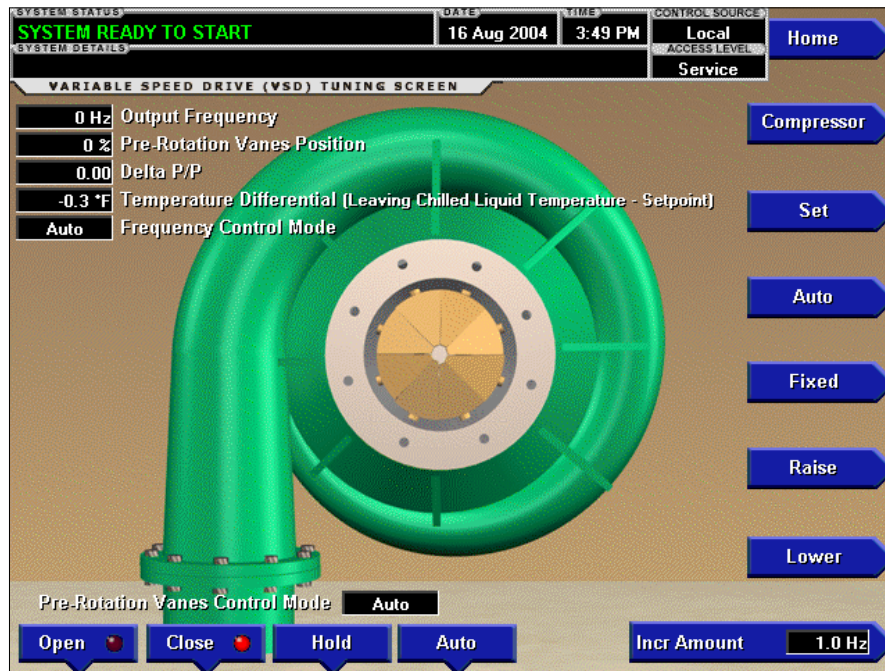
Returns the display to the Home screen.

Compressor

Access Level Required: VIEW

Returns the display to the Compressor screen.

VSD TUNING SCREEN

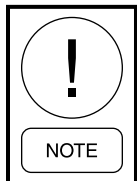


LD09999

FIGURE 12 - VSD TUNING SCREEN

OVERVIEW

For chillers equipped with a variable speed drive (VSD), this screen displays a cutaway view of the chiller compressor, revealing the pre-rotation vanes. This screen provides the capability of manually controlling the pre-rotation vanes and manual control of the frequency command being sent to the VSD. Animation simulates the pre-rotation vane position.



Requires a login access level of SERVICE to view this screen. Service technicians refer to the OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Output Frequency

Displays the output frequency reported by the variable speed drive.

Temperature Differential

Displays the differential between the leaving chilled liquid temperature and the setpoint.

Pre-Rotation Vanes Control Mode

Indicates whether the vanes are under manual or automatic control.

[VSD] Frequency Control Mode (Manual / Auto)

Displays the present state of the command frequency control.

Delta P/P

Delta P/P is a parameter that represents system pressure differential or “Head”. This value is calculated by subtracting evaporator pressure from condenser pressure and then dividing by the evaporator pressure.

$$\left(\text{condenser pressure} - \text{evaporator pressure} \right) / \text{evaporator pressure}$$

[Pre-Rotation Vanes] Open (LED)

Indicates whether the vanes are in the process of opening. Located on the “OPEN” key for manual operation.

[Pre-Rotation Vanes] Close (LED)

Indicates whether the vanes are in the process of closing. Located on the “CLOSE” key for manual operation.

Pre-Rotation Vane Position

This value displays the present position of the pre-rotation vanes as a percentage between 0 and 100%.

[VSD] Command Frequency

Displays the frequency value being sent to the adaptive capacity control.

PROGRAMMABLE**Set**

Allows manual programming of the command frequency value. Manually programming this value will put the VSD frequency control into manual mode.

Auto

Following manual programming of the command frequency, this returns the system to automatic control.

Fixed

This key puts the VSD frequency control into fixed speed mode and constantly sends the maximum frequency to the VSD control.

Incr(ement) Amount

Defines the increment or amount by which the “Increase” and “Decrease” keys will modify the present VSD command frequency.

Raise

This key puts the VSD frequency control into manual mode and increases the present command frequency by the defined increment amount. The value cannot be raised above the maximum allowed frequency.

Lower

This key puts the VSD frequency control into manual mode and decreases the present command frequency by the defined increment amount. The value will not decrease below one (1) Hz.

[Pre-Rotation Vanes] Open (Manual)

This key puts the vane control into manual mode and sends an “open” command to the contacts.

[Pre-Rotation Vanes] Close (Manual)

This key puts the vane control into manual mode and sends a “close” command to the contacts.

[Pre-Rotation Vanes] Hold (Manual)

This key puts the vane control into manual mode and sends a “hold” command to the contacts.

[Pre-Rotation Vanes] Auto

Returns vane control to automatic mode.

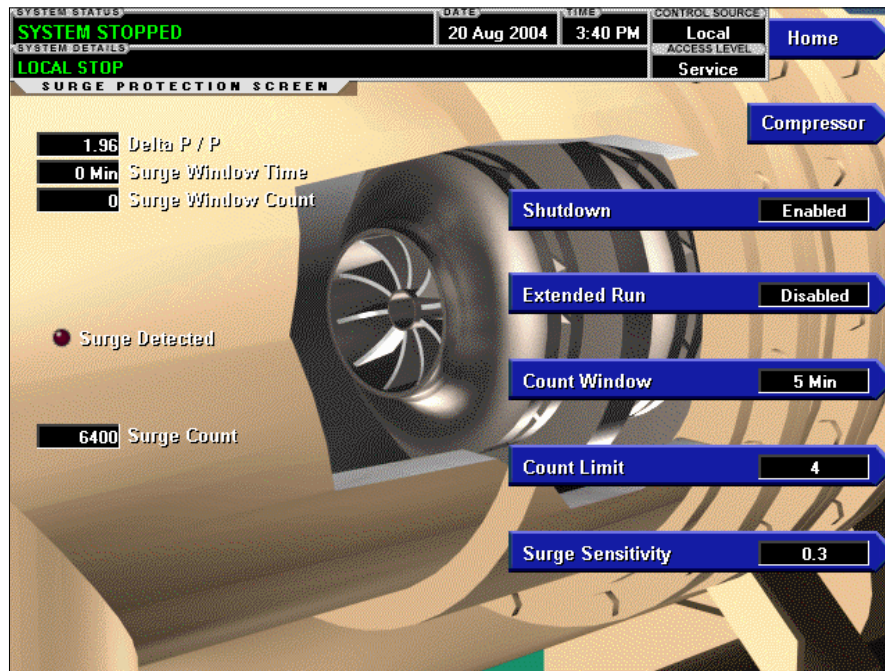
NAVIGATION**Home*****Access Level Required: VIEW***

Returns the display to the Home screen.

Compressor***Access Level Required: VIEW***

Returns the display to the Compressor screen.

SURGE PROTECTION SCREEN



LD10331

FIGURE 13 - SURGE PROTECTION SCREEN

OVERVIEW

This screen displays a cutaway view of the chiller compressor and all parameters relating to the “Surge Protection” feature. All setpoints relating to this feature are maintained at this screen.

DISPLAY ONLY

Delta P/P

Delta P/P is a parameter that represents system pressure differential or “Head”. This value is calculated by subtracting evaporator pressure from condenser pressure and then dividing by the evaporator pressure.

$$\frac{(\text{condenser pressure} - \text{evaporator pressure})}{\text{evaporator pressure}}$$

Surge Window Time

When the chiller is first started and begins to run, this value counts up to the time programmed in the count window setpoint (1 to 5 minutes). When this value reaches the number of minutes programmed in the

count window, the number of surge events in the oldest minute is discarded from the surge window count and the surge events in the most recent minute is added. This provides a rolling count of the total surge events occurring in the count window minutes. This value is reset when the chiller shuts down.

Surge Window Count

Displays the number of surge events that have occurred in the last 1 to 5 minutes, as programmed with the count window setpoint. If the chiller has been running for less than the count window minutes, this is the number of surge events that have occurred within the last number of minutes displayed as the surge window time. The count is cleared when the chiller shuts down.

Surge Detected (LED)

Illuminates for 5 seconds each time a surge is detected by the surge protection feature. This LED does not illuminate in response to surge events detected by the compressor VSD adaptive capacity control (ACC) board.

Total Surge Count

Displays the total number of surge events detected over the lifetime of the unit (up to a maximum of 65535). These are the surge events detected by the surge protection feature. The surge events detected by the compressor VSD adaptive capacity control board (ACC) are not included in this total.

Extended Run Time Remaining

Displays the time remaining in the ten minute “Extended Run” period. During this period, the pre-rotation vanes are driven closed and “WARNING – SURGE PROTECTION – EXCESS SURGE LIMIT” is displayed. Refer to operation under “Count Limit”.

PROGRAMMABLE

Count Window

Access Level Required: OPERATOR

Allows the user to define the period of time (1 to 5 minutes; 3 minutes is default) in which the number of surge events (Surge Window Count) are compared to the maximum allowed (Count Limit). This is used for the purpose of detecting an excess surge situation.

Count Limit

Access Level Required: OPERATOR

Allows the user to define the maximum number of surge events (4 to 20; default is 15) that can occur within a defined period of time (count window) before an excess surge situation is triggered. If the number of surges occurring within window time exceeds the count limit, an excess surge situation is signaled.

When an excess surge situation is detected, the action resulting from the situation depends upon the following:

- If both the shutdown and extended run setpoints are disabled, the chiller will continue to run, displaying the message “WARNING – EXCESS SURGE DETECTED”.
- If the shutdown setpoint is enabled and the extended run setpoint is disabled, the chiller will perform a safety shutdown and display “SURGE PROTECTION – EXCESS SURGE”.
- If the shutdown setpoint is disabled and the extended run setpoint is enabled, the pre-rotation vanes are driven closed for ten (10) minutes and “WARNING – SURGE PROTECTION – EXCESS SURGE LIMIT” is displayed. When the 10 minutes have elapsed, if the surge window count is less than or equal to the count limit, this message and load inhibit are automatically cleared. Alternating with this message is “WARNING – EXCESS SURGE DETECTED” that continues after the 10 minute period has elapsed until manually cleared with the Warning Reset key.
- If both the shutdown and extended run setpoint are Enabled, the ten (10) minute extended run mode is invoked as described previously. However, if the surge window count exceeds the count limit at the completion of the ten (10) minute extended run period, a safety shutdown is performed and “SURGE PROTECTION – EXCESS SURGE” is displayed.

If the chiller is equipped with a VSD and/or hot gas bypass, there are several exceptions related to VSD and/or hot gas bypass equipped chillers for the surge correction/avoidance features to operate. These exceptions are as follows:

- If the hot gas bypass control is enabled, the valve position must be 100% before the shutdown or extended run feature is implemented.
- If the chiller is equipped with a VSD, output frequency must be at full speed (50 Hz/60 Hz) before the shutdown or extended run feature is implemented.
- If equipped with a VSD and hot gas bypass, the VSD output frequency must be at maximum and the hot gas valve must be at 100% before the shutdown or extended run feature is implemented.

Shutdown (Enabled/Disabled)

Access Level Required: OPERATOR

This selectable feature allows the user to select whether the chiller will shutdown or continue to run when an excess surge situation has been detected.

If this setpoint is enabled and the extended run setpoint is disabled, a safety shutdown is performed when the surge window count exceeds the count limit setpoint.

If this setpoint is enabled and the extended run setpoint is enabled, a safety shutdown is performed if the surge window count exceeds the count limit setpoint at the completion of the ten (10) minute extended run period. “SURGE PROTECTION – EXCESS SURGE” is displayed with either shutdown.

If this setpoint is disabled, refer to operation under “Count Limit”.

Extended Run (Enabled/Disabled)

Access Level Required: OPERATOR

Allows the user to select the surge correction/avoidance extended run mode. This will be implemented when an excess surge situation is detected as follows: Anytime the surge window count exceeds the count limit, the pre-rotation vanes are driven closed for the next ten (10) minutes. While this load inhibit is in effect, “WARNING – SURGE PROTECTION – EXCESS SURGE LIMIT” is displayed. When ten (10) minutes have elapsed, the warning message and load inhibit are automatically cleared, provided the surge window count is less than or equal to the count limit. If the shutdown setpoint is enabled and the surge window count exceeds the count limit after the ten minutes elapse, a safety shutdown is performed and “SURGE PROTECTION – EXCESS SURGE” is displayed.

There are several exceptions related to VSD and/or hot gas bypass equipped chillers for extended run to operate. See the exceptions listed under “Shutdown”.

Surge Sensitivity

Access Level Required: SERVICE

Allows the user to define the sensitivity of the surge detection. Selectable over the range of 0.3 to 1.3; default is 0.3. The smaller the number, the greater the sensitivity.

Clear Surge Count

Access Level Required: ADMIN

Allows user to set the “Total Surge Count” display to zero.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen

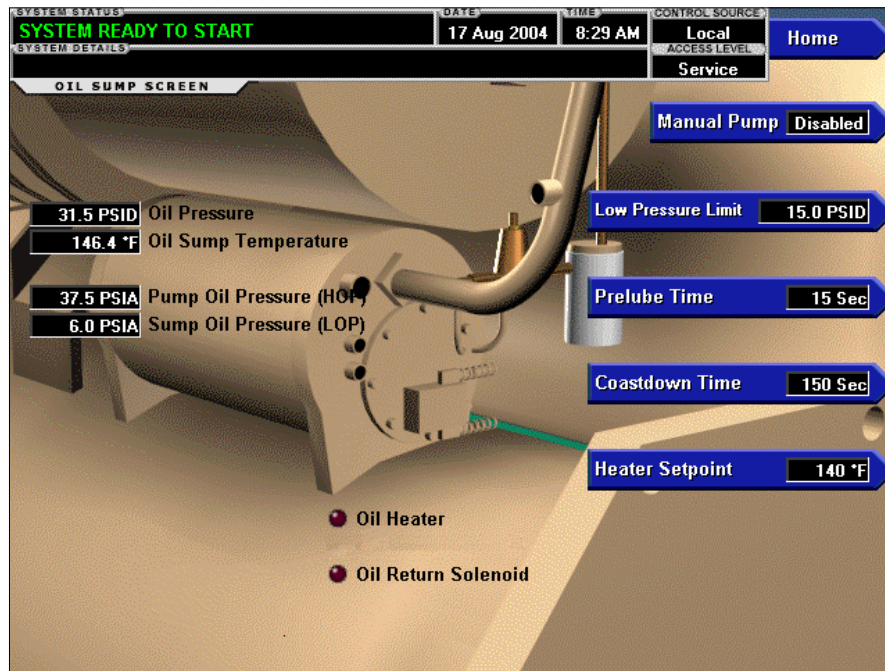
Compressor

Access Level Required: VIEW

Returns the display to the Compressor screen.

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OIL SUMP SCREEN

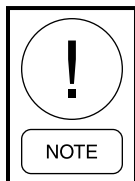


LD09990

FIGURE 14 - OIL SUMP SCREEN

OVERVIEW

This screen displays a close-up of the chiller oil sump and provides the operator with the oil sump operating levels such as oil temperature and pressure.



Trane CVHB model chillers have an alternate display chiller graphic for this screen. All functions and setpoints remain the same. Refer to APPENDIX A in this manual for the CVHB graphic associated with this screen.

DISPLAY ONLY

Oil Sump Temperature

Displays the temperature of the oil in the sump.

Sump Oil Pressure (LOP)

Displays the low side oil pressure measured by the low oil pressure transducer, located between oil sump and compressor housing).

Pump Oil Pressure (HOP)

Displays the high side oil pressure measured by the high oil pressure transducer, located between oil filter output and compressor bearing input.

Oil Return Solenoid (LED)

Not used for this application. May or may not be shown on display, depending on software version.

Oil Heater (LED)

Illuminates when the output controlling oil heater operation is energized.

Oil Pressure

Displays the pressure differential between the pump oil pressure transducer (HOP) and the sump oil pressure transducer (LOP). The displayed value includes offset pressure derived from auto-zeroing during the system pre-lube. If either of the transducers used to calculate this differential are out of range, the display field will show XX.X.

PROGRAMMABLE

Manual Pump (Enabled/Disabled)

Access Level Required: Operator

This key allows the oil pump to be manually activated. The oil pump will run for ten (10) minutes when manual pump is “Enabled”. After ten minutes, the display will revert to “Disabled”. If a longer run time is desired the manual pump must be enabled again when the time has elapsed. Manual oil pump control is only available when the chiller is stopped. The Manual Pump key is not displayed during system prelube, system run and system coastdown.

Low Pressure Limit

Access Level Required: Service

Allows the minimum oil pressure the system is permitted to operate at to be adjusted. This setting can be adjusted from 10.0 PSID to 40.0 PSID, with 25.0 PSID as the default setting.

Prelube Time

Access Level Required: Service

Allows the system prelube time to be adjusted from 15 seconds to 60 seconds. The default setting is 30 seconds.

Coastdown Time

Access Level Required: Service

Allows the system coastdown time to be adjusted from 150 seconds to 600 seconds. The default setting is 150 seconds.

Heater Setpoint

Access Level Required: Service

This key is used to adjust the oil temperature setpoint. The range at which the heater can be set to is from 125°F to 155°F, with 140°F as the default temperature.

Change Setpoint

Access Level Required: VIEW

Allows the login password to be entered to change oil pump settings. This button is only present at the “View” access level.

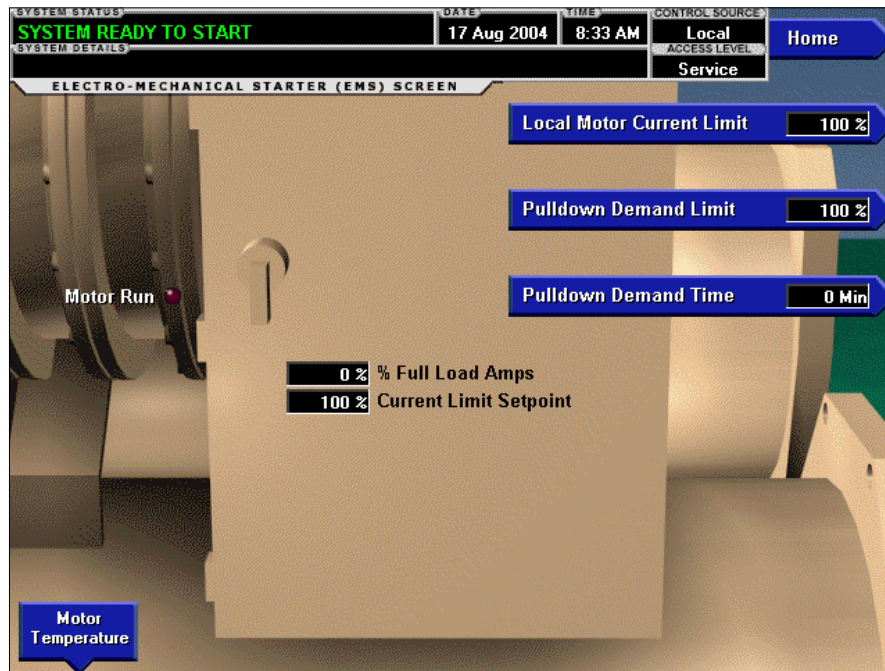
NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

ELECTROMECHANICAL STARTER SCREEN



LD10000

FIGURE 15 - E-M STARTER SCREEN

OVERVIEW

This screen displays all information pertaining to an Electromechanical Starter, which controls the chiller compressor motor.

DISPLAY ONLY

Motor Run (LED)

Illuminates when the digital output from the control center is commanding the compressor motor to “RUN”.

Motor Current % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value. This data is provided by the CM-2 board.

Current Limit Setpoint

Displays the current limit setpoint as programmed by the operator. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN (Integrated Systems Network) mode, or a locally programmed value.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period. This is only displayed if there is time remaining.

PROGRAMMABLE

Local Motor Current Limit

Access Level Required: OPERATOR

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit

Access Level Required: OPERATOR

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is

used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time

Access Level Required: OPERATOR

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

Change Setpoint

Access Level Required: VIEW

Allows user to enter login password to change motor settings. This button is only present at the “View” access level.

NAVIGATION

Home

Access Level Required: VIEW

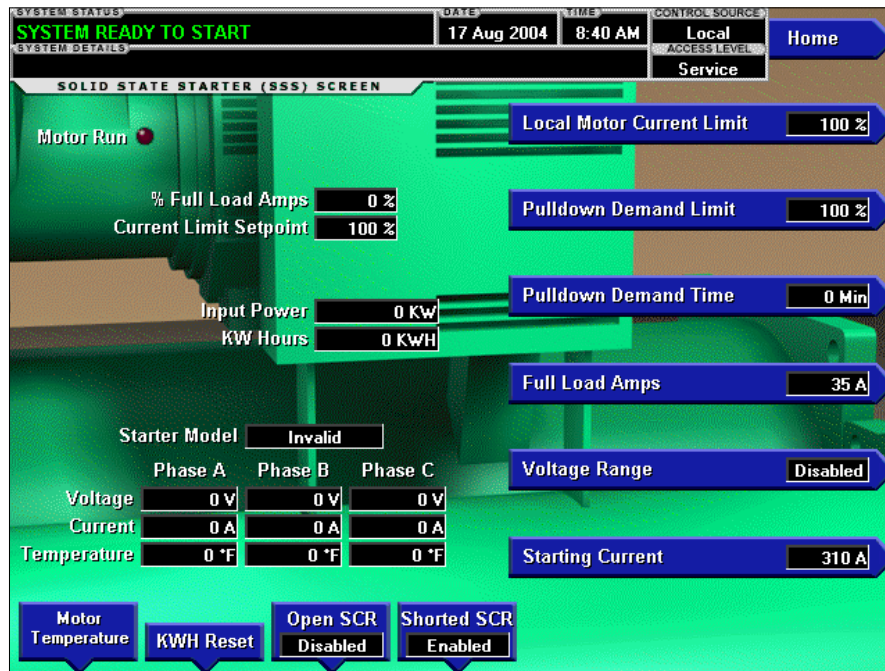
Returns the display to the Home screen.

Motor Temperature

Access Level Required: VIEW

Advances the display to the Motor Temperature screen.

MOD “B” SOLID STATE STARTER SCREEN



LD10001

FIGURE 16 - LCSSS MOD “B” SCREEN

OVERVIEW

If the chiller is equipped with a Mod “B” Solid State Starter, this screen displays all information pertaining to the operation of the starter.

DISPLAY ONLY

Motor Run (LED)

Illuminates when the digital output from the controls is commanding the motor to “RUN”.

(Motor Current) % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value.

Current Limit Setpoint

Displays the current limit setpoint programmed by the operator. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN remote mode or programmed locally at the control center in local mode.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period. This is only displayed if there is time remaining.

Input Power

Displays the kilowatts measured by the solid state starter.

kW Hours

Displays the cumulative amount of kilowatts used over time since the count was last reset.

Starter Model

Displays the Solid State Starter model that is applied to the chiller. Starter models are: 7L, 14L, 26L or 33L.

Voltage – Phase A, B, C

Displays the 3-phase input line voltage measured by the solid state starter.

Current – Phase A, B, C

Displays the 3-phase motor current values measured by the solid state starter.

Temperature – Phase A, B, C

Displays the temperatures of the Silicon Controlled Rectifier (SCR) assemblies.

PROGRAMMABLE

Local Motor Current Limit

Access Level Required: OPERATOR

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit

Access Level Required: OPERATOR

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time

Access Level Required: OPERATOR

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

Full Load Amps

Access Level Required: SERVICE

Defines the maximum amps at which the motor can operate. This value is displayed when logged in at "Operator" or "View" access level. This value is adjustable from 35 Amps to 1050 Amps; 35 Amps is the default value. Service technicians refer to the *Solid State Starter MOD "B" – Operation/Service Manual (Form 160.00-O2)*.

Voltage Range

Access Level Required: SERVICE

This should be set accordingly with the supply voltage connected to the starter, and allows for proper voltage checking. When enabled, this range is used to determine a low line and high line voltage threshold for initiating a shutdown. Service technicians refer to the *Solid State Starter MOD "B" – Operation/Service Manual (Form 160.00-O2)*.

Starting Current

Access Level Required: SERVICE

Defines the maximum allowed motor starting inrush amps. The solid state starter will limit the motor starting current to this value. The starting current can be adjusted from 310 Amps to 3300 Amps; 310 Amps is the default value. Service technicians refer to the *Solid State Starter MOD "B" – Operation/Service Manual (Form 160.00-O2)*.

Open SCR (Enabled/Disabled)

Access Level Required: SERVICE

Allows the user to enable or disable the solid state starter Open SCR safety detection. This must never be disabled unless under advisement of the YORK Factory. Service technicians refer to the *Solid State Starter MOD "B" – Operation/Service Manual (Form 160.00-O2)*.

Shorted SCR (Enabled/Disabled)

Access Level Required: SERVICE

Allows the user to enable or disable the Solid State Starter Shorted SCR safety detection. This setpoint must never be disabled unless under advisement of the York Factory. Service technicians refer to the *Solid State Starter MOD "B" – Operation/Service Manual (Form 160.00-O2)*.

kWH Reset

Access Level Required: SERVICE

Allows the user to reset the cumulative kilowatt-hours to zero (0). Service technicians refer to the *Solid State Starter MOD "B" – Operation/Service Manual (Form 160.00-O2)*.

Change Setpoint

Access Level Required: VIEW

Allows user to enter login password to change motor settings. This button is only present at the "View" access level.

NAVIGATION

Home

Access Level Required: VIEW

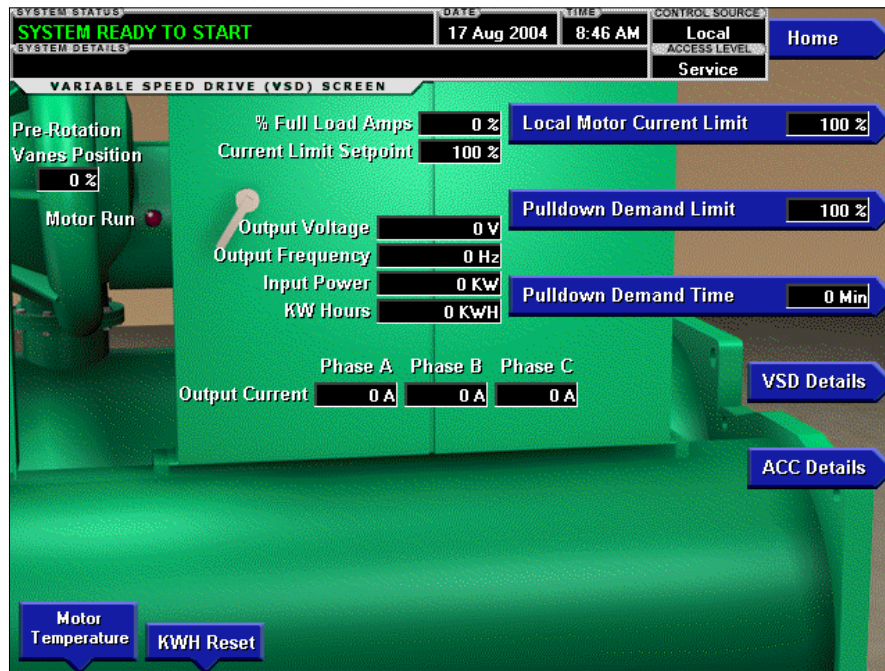
Returns the display to the Home screen.

Motor Temperature

Access Level Required: VIEW

Advances to the Motor Temperature screen.

VARIABLE SPEED DRIVE SCREEN



LD10002

FIGURE 17 - VSD SCREEN

OVERVIEW

This screen displays information pertaining to chillers equipped with a Variable Speed Drive (VSD).

DISPLAY ONLY

Motor Run (LED)

Illuminates when the digital output from the controls is commanding the motor to "RUN".

(Motor Current) % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value.

Current Limit Setpoint

Displays the current limit setpoint programmed by the operator. This value could come from a 0-20mA, 4-20 mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN (Integrated Systems Network) mode, or programmed locally at the control center in local mode.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period. This value is only displayed if there is time remaining.

Output Voltage

Displays the measured output voltage to the chiller motor.

Output Frequency

Displays the present output frequency to the motor.

Output Current – Phase A, B, C

Displays the phase current measured to the motor.

Input Power

Displays the total kilowatts measured by the VSD or harmonic filter, if installed.

KW Hours

Displays the cumulative amount of kilowatts used over time since the count was last reset.

Pre-Rotation Vane Position

Displays the pre-rotation vane position as a value between 0 and 100%.

Supply kVA

Displays the supply kilovolt-amperes (kVA) measured by the filter (harmonic filter installed only).

Total Power Factor

Displays the relationship between the input power and the supply kVA (harmonic filter installed only).

Voltage Total Harmonic Distortion – (L1, L2, L3)

Displays the Total Harmonic Distortion (THD) for each of the voltage lines as calculated by the filter (harmonic filter installed only).

Supply Current Total Demand Distortion – (L1, L2, L3)

Displays the Total Dynamic Distortion (TDD) for each of the supply current lines as calculated by the filter (harmonic filter installed only).

PROGRAMMABLE**Local Motor Current Limit****Access Level Required: OPERATOR**

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit**Access Level Required: OPERATOR**

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time**Access Level Required: OPERATOR**

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts.

The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

kWH Reset**Access Level Required: SERVICE**

Allows the user to reset the cumulative kilowatt-hours to zero (0). Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Filter Inhibit (Harmonic Filter installed only)**Access Level Required: SERVICE**

Allows operator to enable or disable the filter logic from activating, although the system will still communicate with the device. Access to this setting is only available when chiller is stopped.

Change Setpoint**Access Level Required: VIEW**

Allows user to enter login password to change motor settings. This button is only present at the “View” access level.

NAVIGATION**Home****Access Level Required: VIEW**

Returns the display to the Home screen.

VSD Details**Access Level Required: VIEW**

Advances to the sub-screen which provides more information about the VSD.

ACC Details**Access Level Required: SERVICE**

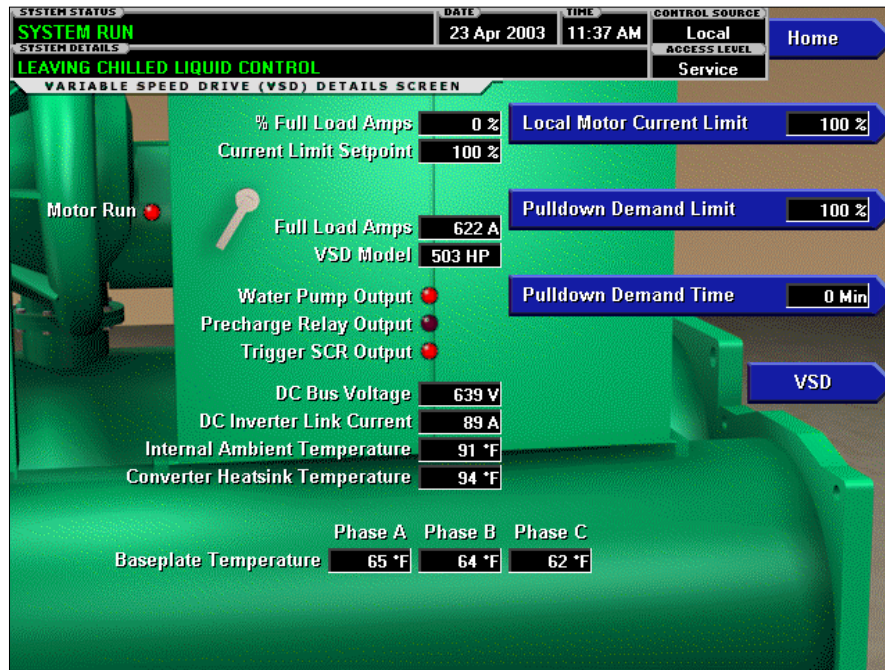
Advances to the sub-screen which provides more information about the Adaptive Capacity Control (ACC).

Filter Details (Harmonic Filter installed only)**Access Level Required: VIEW**

Advances to the sub-screen which provides more information about the harmonic filter.

VARIABLE SPEED DRIVE DETAILS SCREEN 1

STYLE D VSD AND VSD WITH PART NUMBER 371-03789-XXX (503 HP 60 HZ; 410HP 50 HZ)



LD09096

FIGURE 18 - VSD DETAILS SCREEN 1

OVERVIEW

This screen displays more detailed information pertaining to a Variable Speed Drive (VSD) if the chiller is equipped with this style motor control. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Motor Run (LED)

Illuminates when the digital output from the controls is commanding the motor to RUN.

(Motor Current) % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value. For the VSD, this is the data returned by the VSD Logic board.

Current Limit Setpoint

Displays the current limit setpoint programmed by the operator. This value could come from a 0-20mA,

4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN mode, or programmed locally at the control center in local mode.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period. This value is only displayed if there is time remaining.

Water Pump Output (LED)

Illuminates when the relay controlling the water pump output is energized.

Precharge Relay Output (LED)

Illuminates when the relay controlling the precharge output is energized.

Trigger SCR Output (LED)

Illuminates when the relay controlling the trigger SCR output is energized.

DC Bus Voltage

Displays the DC bus voltage as reported by the VSD.

DC Inverter Link Current

Displays the DC Inverter link current reading reported by the VSD.

Internal Ambient Temperature

Displays the ambient temperature inside the VSD cabinet reported by the VSD.

Converter Heatsink Temperature

Displays the heatsink temperature of the converter that is reported by the VSD.

Heatsink Temperature – Phase A, B, C

(Labeled “Baseplate Temperatures” on VSDs with part number 371-03789-xxx (503HP 60Hz; 419HP 50Hz). Displays the heatsink (baseplate) temperature of each of the 3-phase voltage regulators as reported by the VSD.

VSD Model**Access Level Required: SERVICE**

Displays the horsepower configuration of the variable speed drive control, as reported by the VSD to the OptiView panel.

Full Load Amps

Displays the Full Load Amps (FLA) value as reported by the VSD.

PROGRAMMABLE**Local Motor Current Limit****Access Level Required: OPERATOR**

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit**Access Level Required: OPERATOR**

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time**Access Level Required: OPERATOR**

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

Change Setpoint**Access Level Required: VIEW**

Allows user to enter login password to change motor settings. This button is only present at the “View” access level.

NAVIGATION**Home****Access Level Required: VIEW**

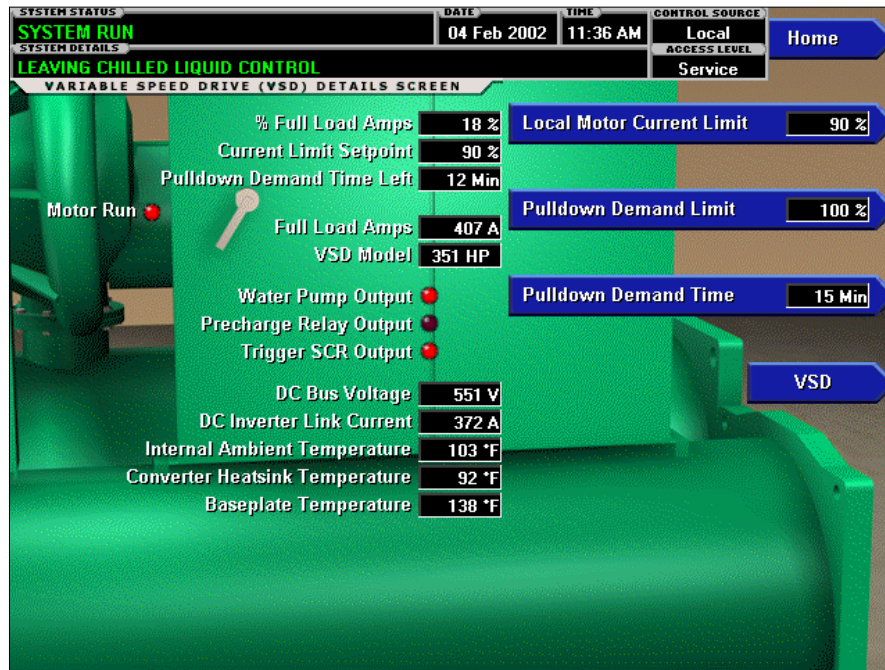
Returns the display to the Home screen.

VSD**Access Level Required: VIEW**

Returns the display to the VSD screen.

VARIABLE SPEED DRIVE DETAILS SCREEN 2

VSD WITH PART NUMBER 371-02767-XXX (60 HZ) OR 371-03700-XXX (50 HZ)



00665VIP

FIGURE 19 - VSD DETAILS SCREEN 2

OVERVIEW

This screen displays more detailed information pertaining to a Variable Speed Drive (VSD). Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Motor Run (LED)

Indicates whether the digital output from the controls is commanding the motor to RUN.

(Motor Current) % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value. For the Variable Speed Drive, this is the data returned by the VSD Logic board.

Current Limit Setpoint

Displays the current limit setpoint programmed by the operator. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote

mode, PWM signal in digital remote mode, or programmed locally at the control center in local mode.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period. This value is only displayed if there is time remaining.

Water Pump Output (LED)

Illuminates when the relay controlling the water pump output is energized.

Precharge Relay Output (LED)

Illuminates when the relay controlling the precharge output is energized.

Trigger SCR Output (LED)

Illuminates when the relay controlling the trigger SCR output is energized.

DC Bus Voltage

Displays the DC Bus voltage that is reported by the VSD.

DC Inverter Link Current

Displays the DC Inverter link current that is reported by the VSD.

Internal Ambient Temperature

Displays the ambient temperature inside the VSD cabinet reported by the VSD.

Converter Heatsink Temperature

Displays the heatsink temperature of the converter as reported by the VSD.

Baseplate Temperature

Displays the baseplate temperature of the 3-phase voltage regulators that is reported by the VSD.

VSD Model**Access Level Required: SERVICE**

Displays the horsepower configuration of the VSD control. The VSD transmits the model number to the OptiView panel.

Full Load Amps

Displays the Full Load Amps (FLA) value reported by the VSD to the OptiView Control Center.

PROGRAMMABLE**Local Motor Current Limit****Access Level Required: OPERATOR**

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit**Access Level Required: OPERATOR**

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time**Access Level Required: OPERATOR**

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

Change Setpoint**Access Level Required: VIEW**

Allows user to enter login password to change motor settings. This button is only present at the “View” access level.

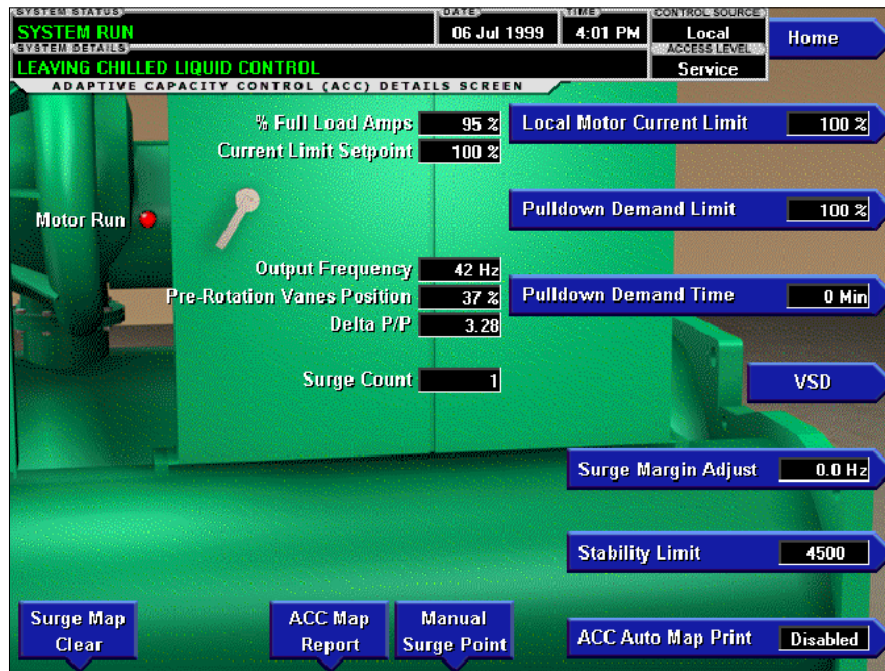
NAVIGATION**Home****Access Level Required: VIEW**

Returns the display to the Home Screen.

VSD**Access Level Required: VIEW**

Returns the display to the VSD Screen.

ADAPTIVE CAPACITY CONTROL DETAILS SCREEN

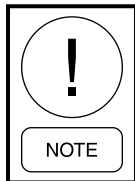


00314VIP

FIGURE 20 - ACC DETAILS SCREEN

OVERVIEW

This screen displays detailed information pertaining to the Adaptive Capacity Control (ACC). This screen is only available if the chiller is equipped with a variable speed drive and the ACC board is installed.



Requires a login access level of SERVICE. Service technicians refer to the OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for additional operation instructions and explanation of programmable setpoints and displayed values.

DISPLAY ONLY

Motor Run (LED)

Illuminates when the digital output from the controls is commanding the motor to RUN.

(Motor Current) % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value, as reported by the VSD Logic board.

Current Limit Setpoint

Displays the current limit setpoint programmed by the operator. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN (Integrated Systems Network) mode, or programmed locally at the control center in local mode.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period. This is only displayed if there is time remaining.

(VSD) Output Frequency

Displays the frequency at which the VSD is operating the motor.

Pre-Rotation Vane Position

Displays the pre-rotation vane position as a value between 0 and 100%.

Surge Count

The total number of surge conditions detected by the ACC board. The surge events detected by the surge protection feature are not included in this total.

Delta P/P

Delta P/P is a parameter that represents system pressure differential or “Head”. This value is calculated by subtracting evaporator pressure from condenser pressure and then dividing by the evaporator pressure.

$(\text{condenser pressure} - \text{evaporator pressure}) / \text{evaporator pressure}$

PROGRAMMABLE

Local Motor Current Limit

Access Level Required: OPERATOR

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit

Access Level Required: OPERATOR

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time

Access Level Required: OPERATOR

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

Stability Limit

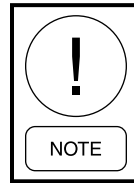
This setpoint controls how sensitive the ACC is to the stability of the leaving chilled liquid temperature by adjusting the pre-rotation vane control algorithm when used in conjunction with an ACC board. This setpoint is a relative value of magnitude and is adjustable from 1000 to 7000. Higher values decrease sensitivity.

Surge Margin Adjust

When the ACC maps a surge point, the ACC will begin to adjust the chiller command frequency and vane controls at a certain “margin” of motor speed above the mapped point. This programmable value allows the service technician to modify the “margin” at which these adjustments will begin to take place to allow more of a cushion between surge points and motor speed.

ACC Auto Map Print (Enabled / Disabled)

The chiller monitors the ACC communications and when a surge point is mapped, a short report of system parameters is printed.



When the ACC auto map print feature is enabled, all other printing capability is disabled.

ACC Map Report

The chiller requests the entire surge map from the ACC. As the map is received, the parameters for each point are printed.

Manual Surge Point

This key will force the ACC to map a surge detection at the present operating conditions. Mapping a point at these conditions will cause the ACC to make adjustments to the command frequency in the future in order to prevent the chiller from operating at the conditions mapped.



Use caution in adding manual surge points to the ACC map. Poor chiller operation will result if a manual surge point is improperly mapped.

Surge Map Clear

This key instructs the ACC to clear all of the surge points presently mapped. This key will require confirmation of the clear by entry of a special password.



Use caution when clearing the surge map. If the surge map is cleared, poor operation will occur until surge points are re-mapped.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

VSD

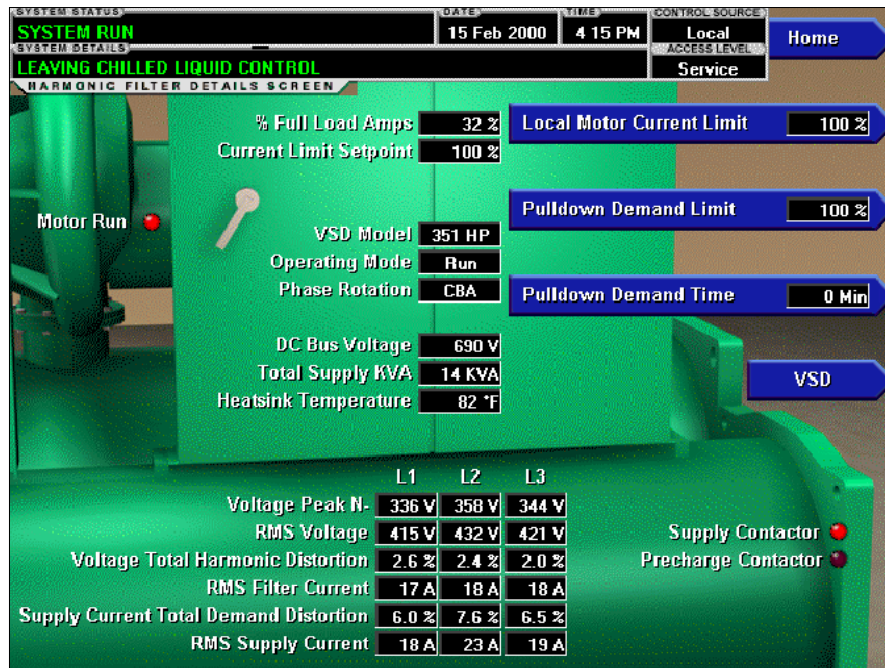
Access Level Required: VIEW

Returns the display to the VSD screen.

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HARMONIC FILTER DETAILS SCREEN 1

STYLE D VSD AND VSD WITH PART NUMBER 371-03789-xxx 503HP (60Hz) OR 419HP (50Hz)



00315VIP

FIGURE 21 - HARMONIC FILTER DETAILS SCREEN 1

OVERVIEW

This screen displays detailed information pertaining to the IEEE-519 Harmonic Filter. This screen is only available on the OptiView panel if the harmonic filter is installed.

DISPLAY ONLY

Motor Run (LED)

Illuminates when the digital output from the controls is commanding the motor to “RUN”.

(Motor Current) % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value. For the variable speed drive this is the data returned by the VSD Logic board.

Current Limit Setpoint

Displays the current limit setpoint programmed by the operator. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN (Integrated Systems

Network) mode, or programmed locally at the control center in local mode.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period. Only displayed if there is time remaining.

Operating Mode (Run / Stop)

This indicates the mode of operation for the chiller.

VSD Model

Access Level Required: SERVICE

Displays the horsepower configuration of the variable speed drive control, as reported by the VSD to the OptiView panel.

DC Bus Voltage

Displays the DC bus voltage as measured by the harmonic filter.

Supply Contactor (LED)

Illuminates when the output to the supply contactor is energized.

Precharge Contactor (LED)

Illuminates when the output to the precharge contactor is energized.

Phase Rotation

Displays the phase rotation detected by the harmonic filter (A, B, C or C, B, A)

Total Supply kVA

Displays the total supply kilovolt-amperes (kVA) measured by the Harmonic Filter.

Heatsink Temperature

(Labeled “Baseplate Temperatures” on VSD with part number 371-03789-xxx (503HP 60Hz; 419HP 50Hz)

Displays the temperature of the harmonic filter heat-sink (baseplate).

Voltage Peak (N-L1, N-L2, N-L3)

Displays the 3-phase peak voltages as measured by the harmonic filter (neutral to line).

RMS Voltage (L1-L2, L2-L3, L3-L1)

Displays the 3-phase RMS voltages across each line.

Voltage Total Harmonic Distortion (L1, L2, L3)

Displays the 3-phase voltage Total Harmonic Distortion (THD) measurements.

RMS Filter Current (L1, L2, L3)

Displays the 3-phase filter current values as measured by the harmonic filter.

Supply Current Total Demand Distortion (L1, L2, L3)

Displays the 3-phase current Total Demand Distortion (TDD) measurements.

RMS Supply Current (L1, L2, L3)

Displays the 3-phase RMS voltages across each line.

PROGRAMMABLE**Local Motor Current Limit****Access Level Required: OPERATOR**

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit**Access Level Required: OPERATOR**

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time**Access Level Required: OPERATOR**

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

NAVIGATION**Home****Access Level Required: VIEW**

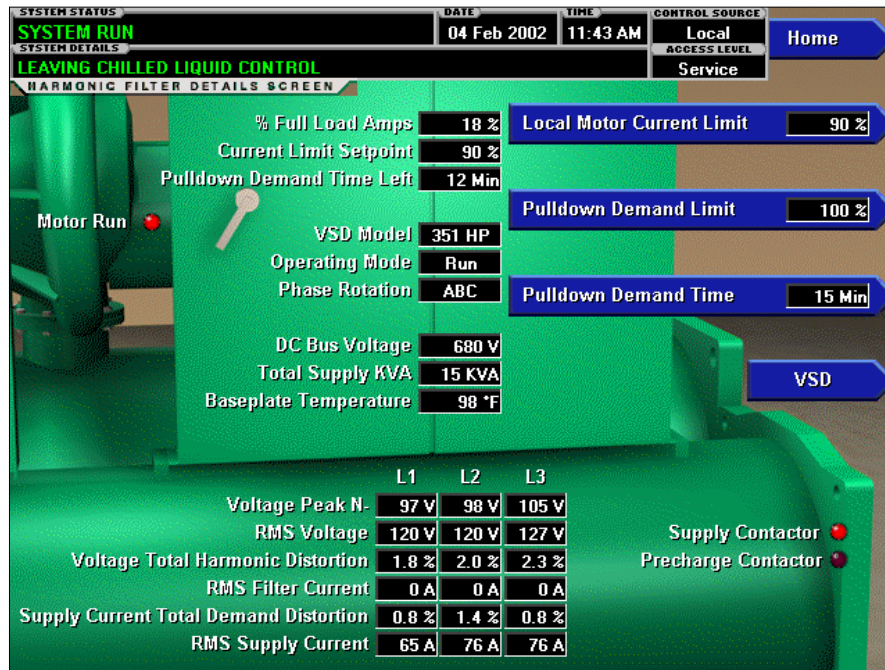
Returns the display to the Home screen.

VSD**Access Level Required: VIEW**

Returns the display to the VSD screen.

HARMONIC FILTER DETAILS SCREEN 2

VSD WITH PART NUMBER 371-02767-XXX (60 HZ) OR 371-03700-XXX (50 HZ)



00664VIP

FIGURE 22 - HARMONIC FILTER DETAILS SCREEN 2

OVERVIEW

This screen displays more detailed information pertaining to the IEEE-519 Harmonic Filter. This screen is only available on the OptiView panel if the harmonic filter is installed.

DISPLAY ONLY

Motor Run (LED)

Indicates whether the digital output from the controls is commanding the motor to “RUN”.

(Motor Current) % Full Load Amps

Displays the motor current as a percentage of the Full Load Amps (FLA) value. For the variable speed drive this is the data returned by the VSD logic board.

Current Limit Setpoint

Displays the current limit setpoint programmed by the operator. This value could come from a 0-20mA, 4-20mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN (Integrated Systems

Network) mode, or programmed locally at the control center in local mode.

Pulldown Demand Time Left (Not Shown)

Displays the time remaining in the programmed pulldown period if the value is nonzero.

Operating Mode (Run / Stop)

This indicates the mode of operation for the chiller harmonic filter.

VSD Model

Access Level Required: SERVICE

Displays the horsepower configuration of the variable speed drive control reported by the VSD to the OptiView control panel.

DC Bus Voltage

Displays the DC bus voltage as measured by the Harmonic Filter.

Supply Contactor (LED)

Illuminates when the output to the supply contactor is energized.

Precharge Contactor (LED)

Illuminates when the output to the precharge contactor is energized.

Phase Rotation

Displays the phase rotation detected by the harmonic filter (A, B, C or C, B, A)

Total Supply kVA

Displays the total supply kilovolt-amperes (kVA) measured by the harmonic filter.

Baseplate Temperature

Displays the temperature of the harmonic filter baseplate.

Voltage Peak (N-L1, N-L2, N-L3)

Displays the 3-phase peak voltages as measured by the harmonic filter (neutral to line).

RMS Voltage (L1-L2, L2-L3, L3-L1)

Displays the 3-phase RMS voltages across each line.

Voltage Total Harmonic Distortion (L1, L2, L3)

Displays the 3-phase voltage Total Harmonic Distortion (THD) measurements.

RMS Filter Current (L1, L2, L3)

Displays the 3-phase filter current values as measured by the harmonic filter.

Supply Current Total Demand Distortion (L1, L2, L3)

Displays the 3-phase current Total Demand Distortion (TDD) measurements.

RMS Supply Current (L1, L2, L3)

Displays the 3-phase RMS voltages across each line.

PROGRAMMABLE**Local Motor Current Limit****Access Level Required: OPERATOR**

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit**Access Level Required: OPERATOR**

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time**Access Level Required: OPERATOR**

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

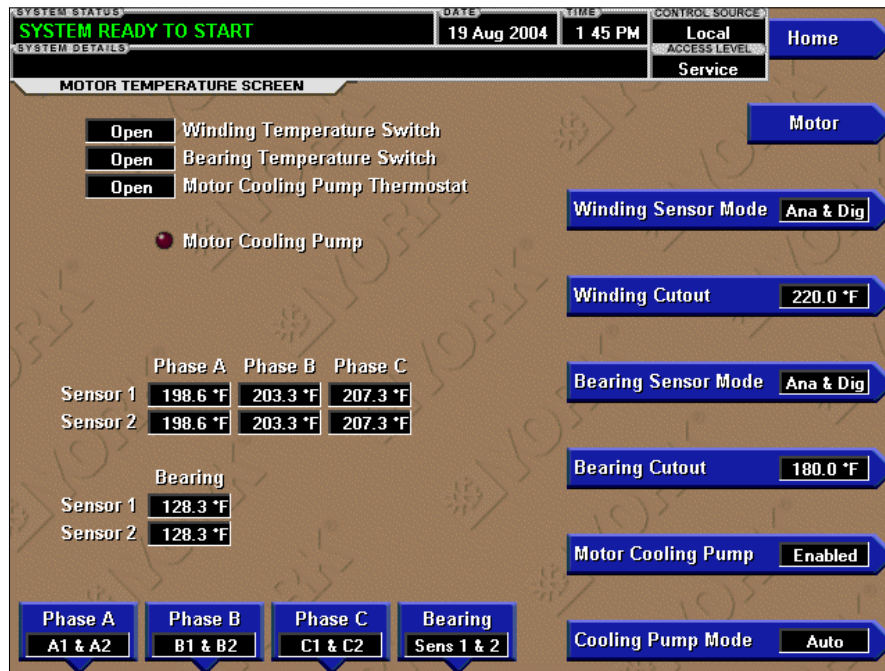
NAVIGATION**Home****Access Level Required: VIEW**

Returns the display to the Home screen.

VSD**Access Level Required: VIEW**

Returns the display to the VSD screen.

MOTOR TEMPERATURE SCREEN



ID10003

FIGURE 23 - MOTOR TEMPERATURE SCREEN

OVERVIEW

This screen allows the operator to view and change settings relating to the chiller motor winding temperature sensors, bearing sensors, and chiller motor cooling pump, as equipped.

For chillers equipped with a motor cooling system, the OptiView panel will energize the motor cooling pump relay for 150 seconds after a high motor winding temperature shutdown. This aids in proper motor cooling.

DISPLAY ONLY

Motor Cooling Pump (LED)

Indicates whether the digital output from the controls is commanding the motor cooling pump to “RUN”. The motor cooling pump feature must be “enabled” for this to be displayed.

Winding Temperature Switch (Open/Closed)

The winding temperature switch indicates if the digital input for the motor winding temperature is open or closed. When the switch is open, the input is indicating the temperature of a motor winding is above the winding cutout setpoint and the display will indicate a fault. When the switch is closed, the input is indicat-

ing the motor winding temperatures are at acceptable levels. This will only be displayed if the digital input is selected.

Bearing Temperature Switch (Open/Closed)

The bearing temperature switch indicates if the digital input for the bearing temperature is open or closed. When the switch is open, the input is indicating that the bearing temperature is above the bearing cutout setpoint and the display will indicate a fault. When the switch is closed, the input is indicating the bearing temperatures are at acceptable levels. This will only be displayed if the digital input is selected.

Motor Cooling Pump Thermostat (Open/Closed)

This indicates the condition of the digital input for the motor cooling pump thermostat. When the display indicates “open”, the cooling pump motor is not running. When the input indicates “closed”, the motor cooling pump is being commanded to “RUN” due to motor temperature. The cooling pump must be enabled for this to be displayed.

(Motor Winding Temperature) Sensor 1**Phase A, B, C**

This readout displays the temperature of the motor windings as calculated from sensor 1 of each winding. This will only be displayed if analog input is enabled for sensor 1 and the current phase sensor (Phase A, B, or C) is switched on.

(Motor Winding Temperature) Sensor 2**Phase A, B, C**

This readout displays the temperature of the motor phase windings as calculated from sensor 2 of each winding. This will only be displayed if analog input is enabled for sensor 2 and the current phase sensor (Phase A, B, or C) is switched on. Trane chillers do not utilize sensor 2.

Bearing Sensor 1 and 2

The temperature for the motor bearings are displayed in this readout. These will only be displayed if the analog input is enabled for each bearing temperature.

Bearing sensors are optional for Trane chillers and may or may not be installed for the OptiView Retrofit Kit. Sensor 1 represents the outboard (motor) bearing temperature and Sensor 2 represents the inboard (compressor) bearing temperature.

PROGRAMMABLE**Winding Sensor Mode****Access Level Required: SERVICE**

This setting allows the type of winding sensor input to be selected (digital, analog, analog and digital). The user may also select NONE if there is no input available.

Winding Cutout**Access Level Required: SERVICE**

This setting adjusts the maximum temperature the chiller motor can operate to until a fault is triggered and the chiller is stopped. This will not be displayed if the winding sensor mode is set at NONE.

Bearing Sensor Mode**Access Level Required: SERVICE**

The type of bearing sensor input is selected from this setting (digital, analog, analog and digital). The user may also select NONE if there is no input available.

Bearing Cutout**Access Level Required: SERVICE**

This setting adjusts the maximum motor bearing temperature the chiller motor can operate until a fault is triggered and the chiller is shutdown. This will not be displayed if the winding sensor mode is set at NONE.

Motor Cooling Pump (Enabled/Disabled)**Access Level Required: SERVICE**

This setting selects whether the motor cooling pump is enabled or disabled, as the chiller is equipped.

Cooling Pump Mode (Auto/Manual)**Access Level Required: SERVICE**

Cooling Pump Mode is displayed only when the motor cooling pump is enabled and allows automatic or manual cooling pump control to be selected. When “Auto” mode is selected, the motor cooling pump will operate whenever the cooling pump thermostat is closed. When “Manual” mode is selected, the cooling pump will operate for a period of ten (10) minutes and then deactivate.

Phase A, B, C (Motor Winding Sensor)**Access Level Required: SERVICE**

These buttons allow the user to select the active temperature sensor inputs for each phase of the motor windings. The active sensors are displayed inside the screen key for each phase.

Bearing (Temperature Sensor)**Access Level Required: SERVICE**

These buttons allow the user to select the active bearing sensor inputs. The active sensor inputs are displayed inside the screen key.

NAVIGATION**Home****Access Level Required: VIEW**

Returns the display to the Home screen.

Motor**Access Level Required: VIEW**

Returns the display to the Motor screen.

SETPOINTS SCREEN

ID10004

FIGURE 24 - SETPOINTS SCREEN

OVERVIEW

This screen provides a convenient location for programming the most common setpoints involved in the chiller control. This screen also serves as a gateway to a sub-screen for defining the setup of general system parameters.

DISPLAY ONLY

Leaving Chilled Liquid Temperature – Setpoint

Displays the present leaving chilled liquid temperature setpoint. This value could come from a 0-20 mA, 4-20 mA, 0-10VDC or 2-10VDC input in analog remote mode, PWM signal in digital remote mode, MicroGateway interface in ISN (Integrated Systems Network) mode, or programmed locally at the control center in local mode.

Leaving Chilled Liquid Temperature – Remote Range

This displays the range the leaving chilled liquid temperature setpoint can be remotely adjusted beyond the temperature set locally at the OptiView.

Leaving Chilled Liquid Temperature Cycling – Shutdown

Displays the leaving chilled liquid temperature at which the chiller will shut down to avoid over-cooling the building. This value is calculated by subtracting the Leaving Chilled Liquid Temperature Cycling Offset Shutdown from the Leaving Chilled Liquid Temperature Setpoint. If this value is programmed below the absolute minimum allowed shutdown temperature, the minimum allowed shutdown value is displayed.

Leaving Chilled Liquid Temperature Cycling – Shutdown Offset

Displays the programmed number of degrees below the leaving chilled liquid temperature setpoint the chilled liquid is permitted to reach until the OptiView Control Center will perform a cycling shutdown to avoid overcooling.

Leaving Chilled Liquid Temperature Cycling – Restart

Displays the leaving chilled liquid temperature at which the chiller will restart after being shut down

due to over-cooling. This value is calculated by adding the Leaving Chilled Liquid Temperature Cycling Offset Restart to the Leaving Chilled Liquid Temperature Setpoint.

Leaving Chilled Liquid Temperature Cycling – Restart Offset

Displays the programmed number of degrees the chilled liquid is permitted to reach above the leaving chilled liquid temperature setpoint before the chiller will restart.

Current Limit Setpoint

Displays the active current limit setpoint, as a percentage of full load amps. In local mode, this is the locally programmed current limit setpoint. In ISN remote mode, this is the setpoint received from the MicroGateway interface. In analog remote mode, this is the setpoint received via 0-10VDC, 2-10VDC, 0-20mA or 4-20mA input. In digital remote mode, this is a Pulse Width Modulation (PWM) signal input.

PROGRAMMABLE

Local Leaving Chilled Liquid Temperature – Setpoint

Access Level Required: OPERATOR

This value allows the user to define the leaving chilled liquid temperature that is to be maintained by the chiller. The temperature is programmable over the range of 38.0°F to 70.0°F (water) or 10.0°F to 70.0°F (brine). The range is 36.0°F to 70.0°F (water) if Smart Freeze is enabled.

Local Leaving Chilled Liquid Temperature – Range

Access Level Required: OPERATOR

This is the range that a remote device is able to adjust the leaving chilled liquid temperature setpoint above the temperature set locally at the OptiView. The range setpoint is programmable to either 10.0°F or 20.0°F, with a default of 20.0°F. This setpoint value is added to the local leaving chilled liquid temperature (see above) value to create a range limit over which a remote device can adjust the setpoint.

- For example, if the range is programmed for 10°F and the locally programmed value of the chilled liquid temperature is 45°F, then the remote device is able to change and set the leaving chilled liquid temperature setpoint over the range 45.0° - 55.0°F.

A remote device that provides an analog signal (0-20mA, 4-20mA, 0-10VDC or 2-10VDC) in analog remote mode or a PWM signal in digital remote mode defines the setpoint change as an offset value.

- For example, if the setpoint is 45.0°F and the desired setpoint is 50.0°F, then 5.0°F would be the input on the remote device.

A MicroGateway (in ISN Remote mode) can define the setpoint through a serial data stream. In this case, the incoming setpoint is not an offset that is applied to the leaving chilled liquid temperature setpoint value, but is the actual setpoint value.

Leaving Chilled Liquid Temperature Cycling Offset – Restart

Access Level Required: OPERATOR

This value specifies the number of degrees above the leaving chilled liquid temperature setpoint the liquid is permitted to reach before the chiller will restart after a “LEAVING CHILLED LIQUID – LOW TEMPERATURE” cycling shutdown. The value is programmable over a range of 0.0°F to 70.0°F (dependant on setpoint temperature) above the chilled liquid setpoint, to a maximum restart value of 80.0°F. The chiller will automatically restart when this temperature is reached. This setpoint can be used to reduce chiller cycling by delaying the chiller restart until the cooling load has increased.

Leaving Chilled Liquid Temperature Cycling Offset – Shutdown

Access Level Required: OPERATOR

This value specifies the number of degrees below the leaving chilled liquid temperature setpoint the chilled liquid can reach before the OptiView performs a “LEAVING CHILLED LIQUID – LOW TEMPERATURE” cycling shutdown. This setpoint is programmable over a range of 1.0°F to 64.0°F (dependant on setpoint temperature), to a minimum cutout of 36.0°F (water), 34.0°F (water with Smart Freeze enabled) or 6.0°F (brine). This prevents over-cooling of the chilled liquid.

Anytime the leaving chilled liquid temperature setpoint is increased, the shutdown threshold is 36.0°F (water) or 6.0°F (brine) for the next ten (10) minutes. If Smart Freeze is enabled, the threshold is 34.0°F for the next ten minutes. After ten minutes have elapsed, the shutdown threshold becomes the programmed setpoint value.

Remote Analog Input Range

Access Level Required: OPERATOR

This setpoint defines the remote signal range applied for remote reset of the leaving chilled liquid temperature setpoint and current limit setpoint in analog remote mode. If the remote signal is 0-10VDC or 0-20mA, this setpoint must be programmed for 0-10VDC. If the remote signal is 2-10VDC or 4-20mA, this setpoint must be programmed for 2-10VDC.

Local Motor Current Limit

Access Level Required: OPERATOR

Allows the maximum allowed motor current (as a percentage of FLA) to be adjusted. When the motor current reaches this value, the pre-rotation vanes will not open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce current to this setpoint. This value is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Limit

Access Level Required: OPERATOR

This setpoint limits the motor current (programmed as a percentage of FLA) during the specified pulldown demand time. This value will override the motor current limit value during this time period. This function is used to provide energy savings following chiller start-up and is adjustable from 30 to 100%, with 100% as the default setting.

Pulldown Demand Time

Access Level Required: OPERATOR

This setpoint programs the period of time the pulldown demand limit will be in effect after the chiller starts. The pulldown demand time is adjustable from 0 to 255 minutes, with 0 minutes as the default.

Print

Access Level Required: VIEW

This function will generate a “Setpoints” print report.

Change Setpoint

Access Level Required: VIEW

Allows user to enter login password to change motor settings. This button is only present at the “View” access level.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Setup

Access Level Required: VIEW

Advances to the Setup sub-screen, allowing setup of general system parameters.

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SETUP SCREEN



ID10005

FIGURE 25 - SETUP SCREEN

OVERVIEW

This screen is the top level of the general configuration parameters. This screen also serves as a gateway to more sub-screens for defining general system parameters. Time and date, along with specifications as to how the time will be displayed (12 or 24 hour format), can be set at this screen.

Certain microboard program jumper and program switch positions are displayed on this screen. For OptiView Control Centers equipped with the 031-02430-000 microboard, settings such as anti-recycle and power failure restart are programmed here. These settings take the place of switches and jumpers on the microboard.

The configuration of the program jumpers and switches (or settings) should be set by a qualified service technician as per the required chiller operation. Refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

DISPLAY ONLY

Chilled Liquid Pump Operation

Displays “Standard” or “Enhanced”

Motor Type

Displays the compressor motor type used; “Fixed Speed” or “Variable Speed”.

Refrigerant Selection

Displays the refrigerant type in use, “R11” or “R123”.

Anti-Recycle

Displays “Disabled” or “Enabled” for the anti-recycle feature.

Power Failure Restart

Displays “Manual” or “Automatic” restart after a power failure occurs.

Liquid Type

Displays the type of chilled liquid, “Water” or “Brine”.

Oil Pump Type

Displays “Constant Run” or “Auxiliary”. Trane chiller applications typically utilize constant run pumps.

Oil Heater Control

Displays “Local” or “Remote”. Trane applications utilize “local” oil heater control.

PROGRAMMABLE

Set Date

Access Level Required: OPERATOR

Allows the user to specify the present date. This value is critical to logging system shutdowns accurately as well as utilizing the scheduling capabilities. When prompted to enter a date value, the user must enter the day, month, and four-digit year (using leading zeroes as necessary). If within range, the value will be accepted. If out of range, the user is prompted for the information again. At this point the user may retry the date entry, or cancel the programming attempt.

Set Time

Access Level Required: OPERATOR

Allows the current local time to be adjusted. Correct time is critical in order to log system shutdowns accurately and for utilizing the scheduling capabilities. Time is entered in hours and minutes, using leading zeroes as necessary. If the chiller is set to 24-hour mode, the time must be entered in the 24-hour format. When the time format is set to 12-hour, AM or PM must also be selected when entering time.

Clock (Enabled / Disabled)

Access Level Required: OPERATOR

Allows the real-time clock to be enabled or disabled. The clock will be disabled during manufacturing and must be enabled at system commissioning. In addition, when preparing for prolonged chiller shutdown the clock should once again be disabled in order to conserve battery power.

12/24 Hr

Access Level Required: OPERATOR

Allows the time display format to be changed. The selected format will be displayed in the button tab. This setpoint will affect the display of the time on the chiller panel and on all reports generated. 12-Hour time format will include the AM and PM modifiers and show the range of time between 1:00 and 12:59, while the 24-Hour time format will show the range of time between 0:00 and 23:59.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Schedule

Access Level Required: VIEW

Advances to the sub-screen allowing configuration of the chiller operation schedule.

User

Access Level Required: VIEW

Advances to the sub-screen allowing configuration of user preferences.

Comms

Access Level Required: VIEW

Advances to the sub-screen allowing configuration of system communications.

Printer

Access Level Required: VIEW

Advances to the sub-screen allowing configuration and control of printer functions.

Sales Order

Access Level Required: VIEW

Advances to the sub-screen displaying the original Sales Order information for the chiller system.

Operations

Access Level Required: VIEW

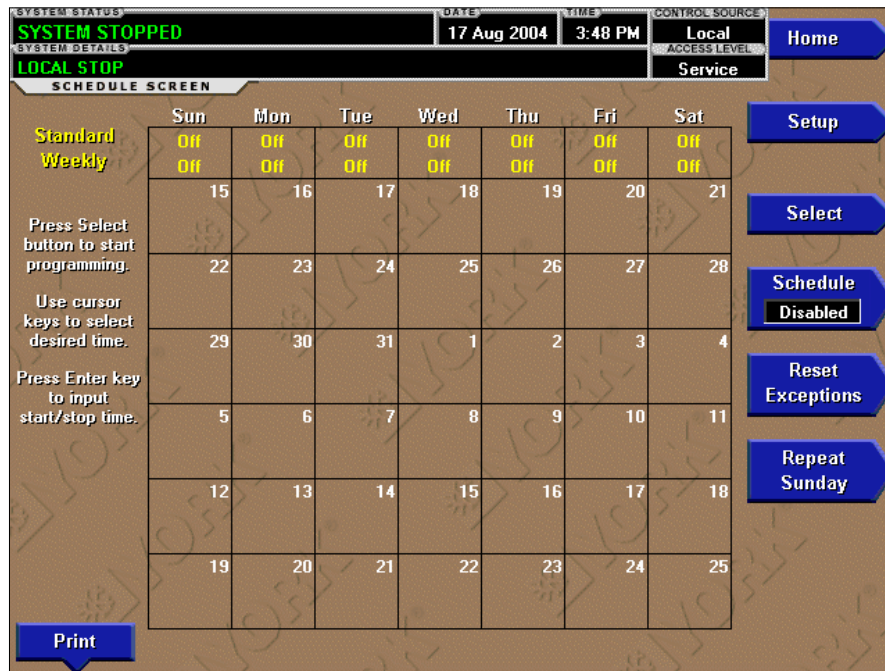
Advances to the sub-screen displaying operating parameters of the chiller system.

Diagnostics

Access Level Required: SERVICE

Advances to the diagnostic sub-screen, which allows viewing of OptiView software versions. Also allows for analog and digital input/output diagnostic capability while operating. Refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

SCHEDULE SCREEN



ID10011

FIGURE 26 - SCHEDULE SCREEN

OVERVIEW

The schedule screen allows the operator to program a chiller operating schedule. The “Standard” weekly schedule is a set of chiller start and stop times based on a Sunday to Saturday week. The schedule also allows for “Exception” day start and stop times for any specific day of the week. Exception days may be programmed up to six weeks in advance.

As each week passes, the operating schedule for that week is updated, using the standard weekly schedule and adding the exception days for that week. The exception week schedule will shift, leaving a blank exception week in the last (sixth) slot.

In order for the Start/Stop combination to be utilized, each “start time” must have a corresponding “stop time” that occurs later in the day. The programmed schedule for a given day can be cancelled by setting both the start time and stop time to 12:00AM. If the start time is the same as the stop time (with any time other than 12:00AM), the chiller is OFF for that day. If the chiller is required to operate continuously through several days, the stop time of Day 1 can be set to 11:59 PM and the start time of Day 2 can be set to 12:00 AM.

The chiller will continue to operate until the stop of Day 2 or as programmed.

The schedule screen contains more programmable values than a normal display screen. As a result, each programmable value is not linked to a specific key. Instead, the “Select” key is used to enable the cursor arrows which are used to highlight the day and the start or stop time the user wishes to modify. At this point, the user may press the ‘✓’ (Enter) key to program the Start/ Stop times for that day.

DISPLAY ONLY

None

PROGRAMMABLE

Standard Week Start/Stop Times

Access Level Required: OPERATOR

For each day of the week, the user may program times for the chiller to start and stop. The times programmed in the “Standard” week will be used as the default start and stop time for every day of the week.

Exception Start/Stop Times

Access Level Required: OPERATOR

Exceptions allow the user may specify a non-standard start and stop time for any day of the week, up to six weeks in advance. As each week goes by, a new weekly schedule will automatically be created using the exception day(s) in combination with the standard week schedule.

Schedule (Enabled / Disabled)

Access Level Required: OPERATOR

Allows the user to enable or disable the schedule feature, which controls scheduled starting and stopping of the chiller. When the schedule is disabled, the chiller must be manually started and stopped.

Repeat Sunday Schedule

Access Level Required: OPERATOR

Duplicates the schedule defined for Sunday to the remainder of the standard, non-exception days for the present week.

Reset All Exception Days

Access Level Required: OPERATOR

Deletes all programming for exception days within the six week schedule.

Select

Access Level Required: OPERATOR

Places a selection box around a start time for a given day. Use ◀, ▶, ▲ or ▼ cursor arrows to move the box and highlight the desired day or start/stop selection.

Print

Access Level Required: VIEW

This function generates a “Schedule” print report.

NAVIGATION

Home

Access Level Required: VIEW

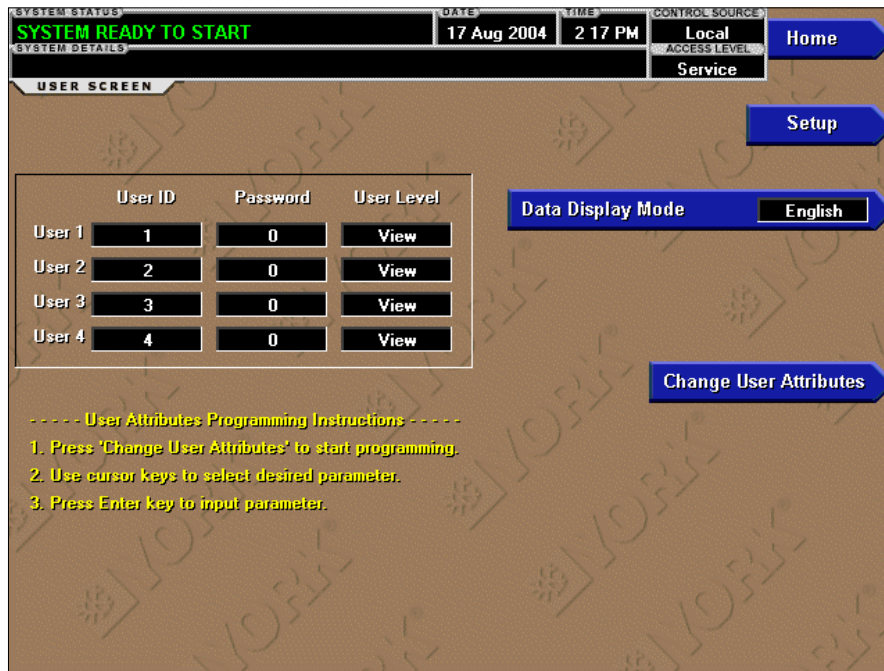
Returns the display to the Home screen.

Setup

Access Level Required: VIEW

Returns the display to the Setup screen.

USER SCREEN



ID10006

FIGURE 27 - USER SCREEN

OVERVIEW

This screen allows the building administrator to assign up to four (4) custom user ID's and passwords to personnel authorized to maintain the chiller. The unit of measurement (data display mode) is also selectable from this screen.

Each custom user value is not linked to a specific key. Instead, the "Change User Attributes" button is pressed, which enables the cursor arrows. The cursor arrow keys are used to highlight the custom user parameter to be modified. At this point, the '✓' (Enter) key is pressed and the value is entered.

DISPLAY ONLY

None

PROGRAMMABLE

Data Display Mode

Access Level Required: OPERATOR

Define the unit measurement system (English or Metric) utilized and displayed by the OptiView panel.

User ID (4)

Access Level Required: SERVICE

This allows up to four (4) custom User ID values to be specified. Each user ID also requires a corresponding password and user level. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*

(User) Password (4)

Access Level Required: SERVICE

This allows a password value for each User ID to be assigned. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

User Level (4)

Access Level Required: SERVICE

This allows the user to specify an access level for each User ID. Service technicians refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

NAVIGATION

Home

Access Level Required: VIEW

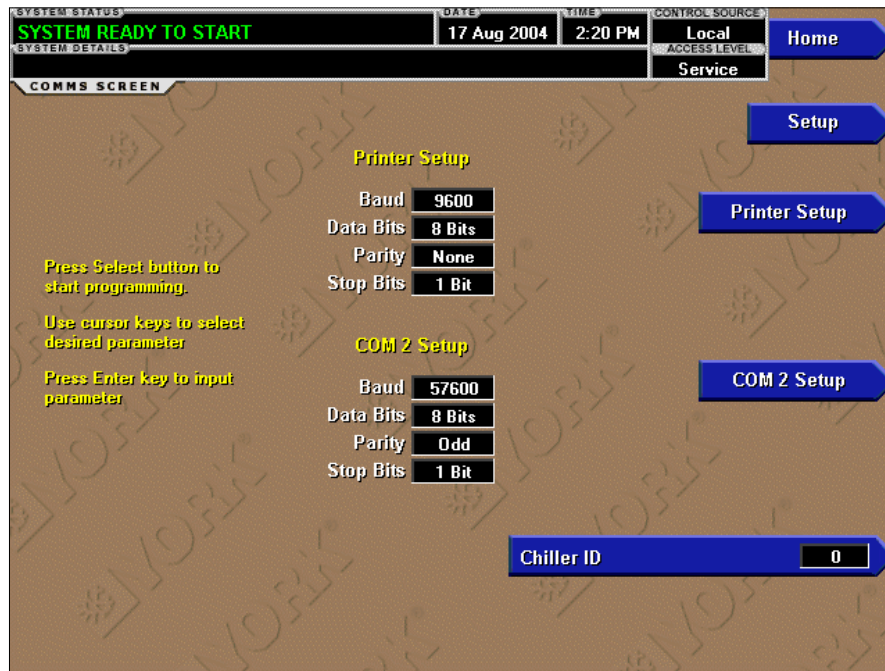
Returns the display to the Home screen.

Setup

Access Level Required: VIEW

Returns the display to the Setup screen.

COMMS SCREEN



ID10007

FIGURE 28 - COMMS SCREEN

OVERVIEW

This screen allows definition of the necessary communications parameters for COM1 (printer communications) and COM2 (Electromechanical starter IDC communications) serial data ports. Refer to “Printer Screen” on the following page and *SECTION 4 - PRINTERS* in this manual for details of the printer connections and setup. Refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for COM2 IDC connections and setup data.

DISPLAY ONLY

None

PROGRAMMABLE

Chiller ID

Access Level Required: OPERATOR

Defines the numeric chiller ID when used within an ISN network of chillers. This ID number is printed at the top of reports obtained with a local printer.

Printer Setup and COM 2 Setup

Access Level Required: OPERATOR

Pressing either key places a green selection box around the first changeable parameter. Use the ▲ and ▼ arrow cursor keys to place the selection box around the desired parameter to be changed. When the selection box is highlighting desired parameter, press the ‘✓’ (Enter) key. A dialog box is displayed, permitting data entry.

Printer Baud Rate

Defines the baud rate the panel will use to communicate with the printer.

Printer Data Bit(s)

Defines the number of data bits the panel will use to communicate with the printer.

Printer Parity Bits

Defines odd or even parity bits for panel-printer communication.

Printer Stop Bit(s)

Defines the number of stop bits the panel will use to communicate with the printer.

COM 2 Baud Rate

Defines the baud rate the panel will use to communicate through the COM2 port.

COM 2 Data Bit(s)

Defines the number of data bits which the panel will use to communicate through the COM2 port.

COM 2 Parity Bits

Defines odd or even parity bits for COM2 communication.

COM 2 Stop Bit(s)

Defines the number of stop bits which the panel will use to communicate through the COM2 port.

NAVIGATION**Home*****Access Level Required: VIEW***

Returns the display to the Home screen.

Setup***Access Level Required: VIEW***

Returns the display to the Setup screen.

PRINTER SCREEN



ID10009

FIGURE 29 - PRINTER SCREEN

OVERVIEW

This screen allows the setup of printer type, print report, and print logging. Refer to “COMMS Screen” on the previous page for communication setup and *SECTION 4 - PRINTERS* in this manual for details of the printer connections and acceptable printer types.

DISPLAY ONLY

Time Remaining Until Next Print

Displays the time until the next print log will occur, if the function is enabled.

PROGRAMMABLE

Log Start Time

Access Level Required: OPERATOR

This setting allows the start time of scheduled print logs to be programmed

Output Interval

Access Level Required: OPERATOR

This setting defines the amount of time between each scheduled automatic print log.

Automatic Printer Logging (Enabled / Disabled)

Access Level Required: OPERATOR

Allows the operator to “Disable” or “Enable” the printing of status reports. When enabled, the reports will begin at the programmed start time and recur at the interval defined by the operator.

Printer Type

Access Level Required: SERVICE

Defines the printer model connected to the chiller system.

ACC Auto Map Print (Enabled / Disabled)

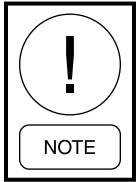
Access Level Required: SERVICE

This feature is only available if the chiller system utilizes a Variable Speed Drive (VSD) motor controller. The chiller monitors the ACC communications and when a surge point is mapped, a short report of system parameters is printed.

ACC Map Report

Access Level Required: SERVICE

This feature is only available if the chiller system utilizes a Variable Speed Drive (VSD) motor controller. The chiller requests the entire surge map from the ACC. As the map is received, the parameters for each point are printed.



When the ACC auto map print feature is enabled, all other printing capability is disabled.

Print Report

Access Level Required: OPERATOR

Selects the report type to print when the “Print Report” key is pressed. This parameter can be selected from the following:

- Status report (present system parameters)
- Setpoints report (present value of the system setpoints)
- Schedule report (present value of the system schedule times)
- Sales Order Data report (information provided on the Sales Order screen).

A print report is generated upon completion of selection.

Print All Histories

Access Level Required: OPERATOR

This function prints a report of the system data at the time of all stored shutdowns.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Setup

Access Level Required: VIEW

Returns the display to the Setup screen.

SALES ORDER SCREEN

SYSTEM STATUS SYSTEM READY TO START **DATE** 17 Aug 2004 **TIME** 2:27 PM **CONTROL SOURCE** Local

SYSTEM DETAILS ACCESS LEVEL Service

SALES ORDER SCREEN

Order Information

Commissioning Date 00 000 0000

Job Name

Job Location

Model Number

York Order Number

Panel Serial Number

Chiller Serial Number

Nameplate Information

Motor Code

Volts

Phases

Frequency (Hz)

LRA

Full Load Amps

Inrush Amps

Design Load

	Evaporator	Condenser
Passes		
Design Working Pressure		
Fouling Factor		
Pressure Drop		
Nozzle Arrangement In		
Nozzle Arrangement Out		
Leaving Temperature		
Return Temperature		
GPM		
Tubes		

System Information

Refrigerant

Tons

Gear Code

Liquid Type

Brine Percent

VSD/SSS/EM

Kilowatts Input

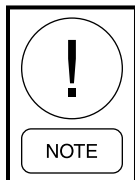
Buttons: Home, Setup, Set Order Info, Print

ID10010

FIGURE 30 - SALES ORDER SCREEN

OVERVIEW

This screen shows sales order and chiller specifications. This data is entered by the service technician at the time of chiller commissioning. These values should never be changed or entered by anyone other than a qualified service technician.



Use the TestOp access level to enter all sales order information. Do not press the set order info key upon completion of sales order data entry.

DISPLAY ONLY

Order Information

Details such as commission date, job name and location, chiller model and serial number, and YORK order number are specified in this area.

Nameplate Information

Any factory designated information about the chiller motor configuration such as the motor code, volts and phase is specified in this area.

Design Load

Any factory defined description of the condenser and evaporator configuration such as load rating and pressure for which the chiller was originally rated and sold at time of shipment is displayed here.

System Information

Any factory description of the chiller design details such as tonnage, refrigerant type, motor starter model, and condenser liquid type is listed here.

PROGRAMMABLE

Set Order Info

Access Level Required: SERVICE

This key allows the order/chiller information to be programmed. Use the keypad arrow cursor keys to move the correct box and press the '✓' (Enter) to display the dialog box used to program information.

Print

Access Level Required: VIEW

This key prints a sales order data report.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Setup

Access Level Required: VIEW

Returns the display to the Setup screen.

DIAGNOSTICS SCREEN

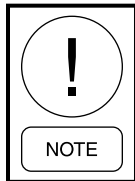


ID10014

FIGURE 31 - DIAGNOSTICS SCREEN

OVERVIEW

The Diagnostics screen identifies software version information. This screen also serves as a gateway to view analog and digital input/output screens.



Requires a login access level of SERVICE to view. Service technicians refer to OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for further explanation of displayed values.

DISPLAY ONLY

Controls

Displays version of flash software installed/loaded into the microboard.

BIOS (Basic Input/Output Software)

Displays the version of the BIOS EPROM installed in the microboard.

Kernal

Displays the operating system core components installed/loaded into the microboard.

GUI (Graphical User Interface)

Displays the graphical user interface software installed/loaded into the microboard.

SIO (Serial Input Output)

Displays the serial input/output software installed/loaded into the microboard.

GPIC

Displays the EPROM installed in the MicroGateway, as equipped.

PROGRAMMABLE

None

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Setup***Access Level Required: VIEW***

Returns the display to the Setup screen.

Analog I/O***Access Level Required: SERVICE***

Advances to a sub-screen which details voltage levels and counts for internal and external analog inputs.

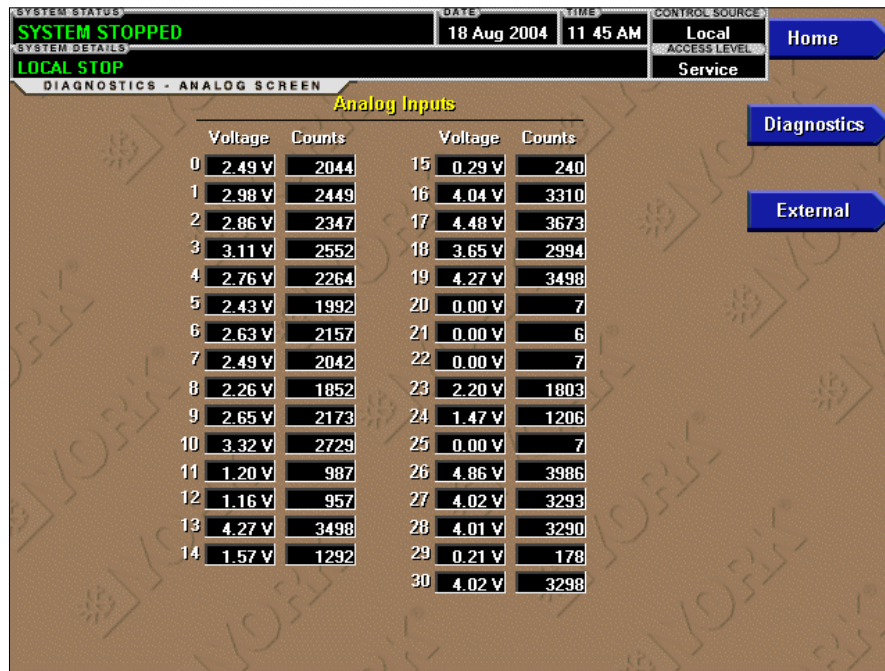
Digital I/O***Access Level Required: SERVICE***

Advances to a sub-screen which indicates activity for digital inputs and outputs.

VSD Comms***Access Level Required: SERVICE***

This key is only available if the chiller is equipped with a VSD. This advances to a sub-screen which details VSD and ACC error statistics.

DIAGNOSTICS - ANALOG SCREEN

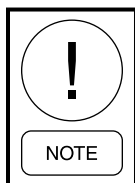


ID10022

FIGURE 32 - ANALOG DIAGNOSTIC SCREEN

OVERVIEW

This screen displays voltage and counts for the analog inputs and outputs connected to the OptiView Control Center. This screen is useful for service technicians checking voltage of analog inputs and outputs.



Requires a login access level of SERVICE to view. Service technicians refer to OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for further explanation of displayed values.

DISPLAY ONLY

Voltage and counts for internal and external analog inputs are displayed.

PROGRAMMABLE

None

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Diagnostics

Access Level Required: VIEW

Returns the display to the Diagnostics screen.

External

Access Level Required: SERVICE

This key toggles the analog screen from the internal input/output view to the external (analog I/O board) input view.

Internal

Access Level Required: SERVICE

This key toggles the analog screen from the external input/output view to the internal input view.

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DIAGNOSTICS - DIGITAL SCREEN

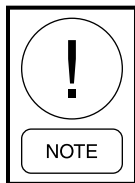


ID10023

FIGURE 33 - DIGITAL DIAGNOSTIC SCREEN

OVERVIEW

This screen displays the activity for each of the digital inputs and outputs that are connected to the OptiView Control Center. The digital screen is useful to service technicians checking operation of digital inputs and outputs as well as program jumper and switch positions.



Requires a login access level of SERVICE to view. Service technicians refer to OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for further explanation of displayed values.

DISPLAY ONLY

This screen displays each of the internal and external digital input/outputs connected to the OptiView Control Center. An LED beside each input/output indicates activity. The tag beside each LED indicates that the input/output is a DIP switch, a jumper (JP), a relay (K), a Terminal (TB#) or the channel for the external digital input/output view.

PROGRAMMABLE

None

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Diagnostics

Access Level Required: VIEW

Returns the display to the Diagnostics screen.

External

Access Level Required: SERVICE

This key toggles the display from internal input/output view to the external I/O board view.

Internal

Access Level Required: SERVICE

This key toggles the display from external input/output channels to internal input/output view.

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DIAGNOSTICS - VSD SCREEN

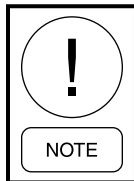


ID10024

FIGURE 34 - VSD DIAGNOSTIC SCREEN

OVERVIEW

This screen displays communication error counts for the OptiView panel, ACC, and VSD. This screen is useful for service technicians checking communication error counts between these components.



Requires a login access level of SERVICE to view. Service technicians refer to OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for further explanation of displayed values.

DISPLAY ONLY

Panel to ACC

This displays the number of communication error counts from the adaptive capacity control (ACC) board to the OptiView panel.

ACC to Panel

This displays the number of communication error counts from the OptiView panel to the ACC board.

ACC to VSD

This displays the number of communication error counts from the ACC board to the VSD.

VSD to ACC

This displays the number of communication error counts from the VSD to the ACC board.

PROGRAMMABLE

Reset Counters

This key allows the service technician to reset the VSD, ACC, and panel error counters.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

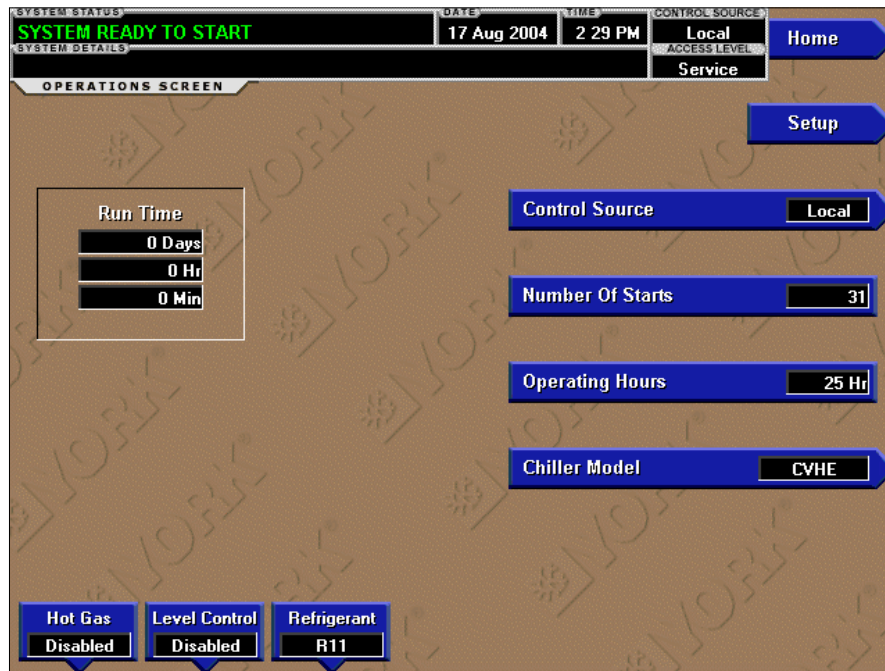
Diagnostics

Access Level Required: VIEW

Returns the display to the Diagnostics screen.

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OPERATIONS SCREEN



ID10012

FIGURE 35 - OPERATIONS SCREEN

OVERVIEW

This screen allows definition of general parameters and options associated with the operation of the chiller.

DISPLAY ONLY

Chiller Run Time

Displays the amount of time the chiller has been running since the last start signal was received. This value is reset to zero when the chiller enters a system coastdown. The value will remain at zero while the chiller is shutdown and during “System Prelube”.

PROGRAMMABLE

Control Source

Access Level Required: OPERATOR

This function selects what source is used to control the chiller. The options for control sources are: local, digital remote, analog remote, modem remote or ISN (Integrated Systems Network) remote.

Number of Starts

Access Level Required: ADMIN

Displays the number of the starts the chiller has initiated. The number of starts may be reprogrammed to any desired value, (generally when this value has been reset due to a microboard replacement), but should not be done so arbitrarily.

Operating Hours

Access Level Required: ADMIN

Displays the total accumulated run time of the chiller. This may be reprogrammed to any desired value (generally when this value has been reset due to a microboard replacement), but should not be done so arbitrarily.

Hot Gas (Enabled/Disabled)

Access level required: SERVICE

If the chiller is equipped with hot gas bypass, this setting enables and disables the hot gas bypass control feature.

Level Control (Enabled/Disabled)***Access level required: SERVICE***

Refrigerant level control is not supported at this time.

Chiller Model***Access level required: SERVICE***

The chiller model key allows the selection of the chiller model. The OptiView operating program controls the chiller per the requirements of the entered model.

NAVIGATION**Home*****Access Level Required: VIEW***

Returns the display to the Home screen.

Setup***Access Level Required: VIEW***

Returns the display to the Setup screen.

HISTORY SCREEN



ID10013

FIGURE 36 - HISTORY SCREEN

OVERVIEW

This screen allows the user to browse through the chiller faults and shutdowns. By using the “Select Fault” and “View Details” keys, a sub-screen containing stored chiller parameters values at the time of the shutdown can be displayed. The “Print History” key can be used to generate a hard-copy report of the parameter values at the time of the shutdown.

DISPLAY ONLY

Last Normal Shutdown

This window displays the date and time and the description of the last normal shutdown. A normal shutdown is defined as:

- Local Stop (panel rocker switch or panel key)
- Remote Stop (digital, analog, modem, or ISN)

Last Fault While Running

This window displays the date and time and the description of the last safety or cycling shutdown while the system was running.

Last Ten Faults

This window displays a chronological listing (most recent first) of the date, time, and description of the last ten safety or cycling shutdowns that occurred while the system is running or stopped.

PROGRAMMABLE

Print History

Access Level Required: VIEW

This generates a report listing the status of the chiller parameters at the time of the selected shutdown.

Print All Histories

Access Level Required: VIEW

This generates a report listing the status of the chiller parameters at the time of each of the stored shutdowns.

Select Fault***Access Level Required: VIEW***

Select Fault allows the user to choose the details or history that is viewed or printed when the “View Details” or “Print History” key is selected.

NAVIGATION**Home*****Access Level Required: VIEW***

Returns the display to the Home screen.

View Details***Access Level Required: VIEW***

Advances to a sub-screen containing the value of select chiller parameters at the time of the associated shutdown.

Trending***Access Level Required: VIEW***

Advances to the Trending sub-screen, allowing the user to view trending data per user-defined chiller parameters.

Custom View***Access Level required: VIEW***

Advances the panel display to the Custom View screen.

HISTORY DETAILS SCREEN

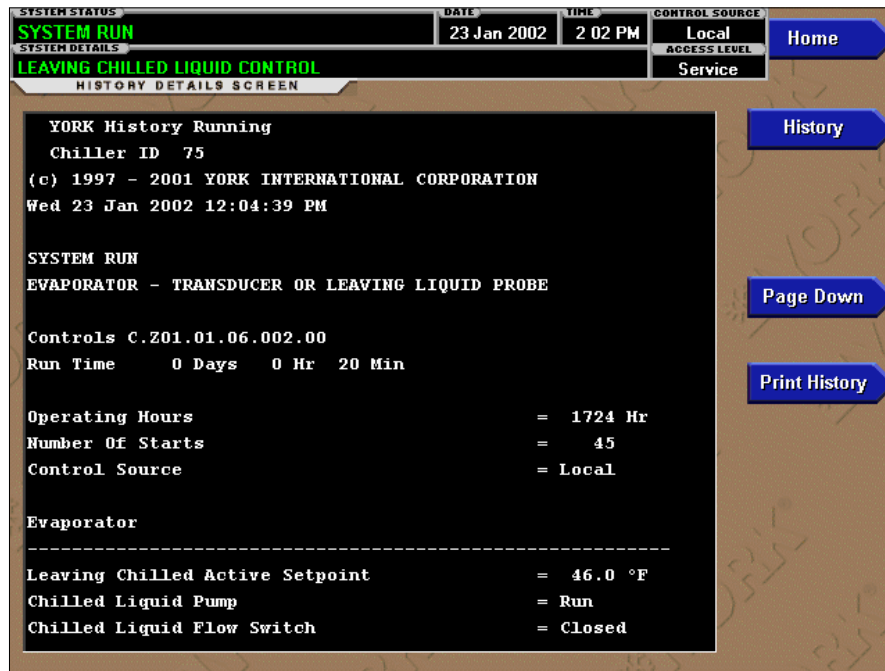


FIGURE 37 - HISTORY DETAILS SCREEN

OVERVIEW

This screen allows the user to view all the system parameters at the time of the shutdown selected on the history screen. Not all screens are shown above; the number of screens required to display all of the data varies with differences in motor starters and options applied.

DISPLAY ONLY

History Printout

This key displays the view of the system parameters as they will be printed.

PROGRAMMABLE

Print History

Access Level Required: VIEW

This generates a report listing the status of the chiller parameters at the time of the selected shutdown.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

History

Access Level Required: VIEW

Returns the display to the History screen.

Page Down

Access Level Required: VIEW

This key is used to scroll down through the displayed history data pages (if applicable).

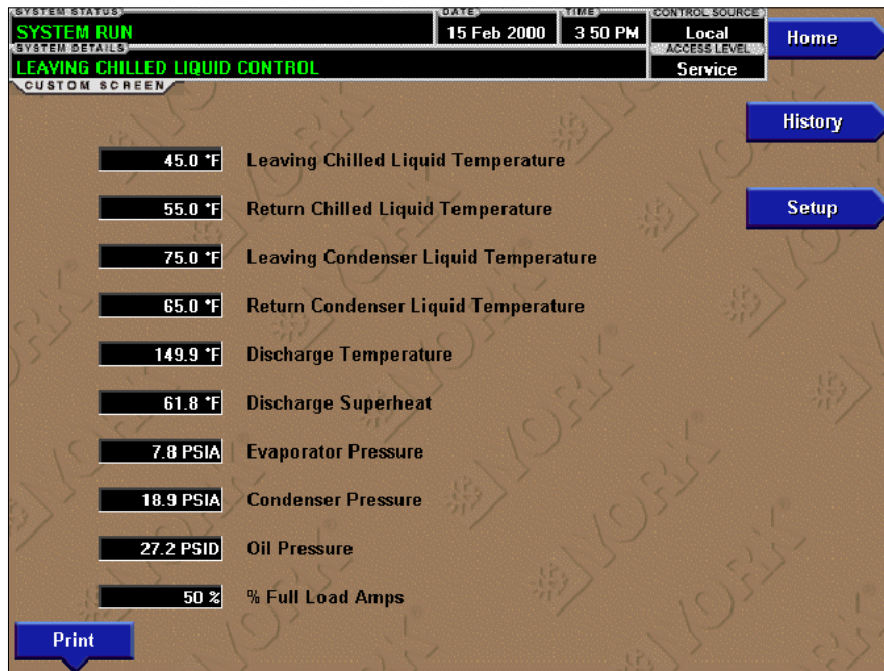
Page Up

Access Level Required: VIEW

This key is used to scroll up through the displayed history data pages (if applicable).

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CUSTOM VIEW SCREEN



00324VIP

FIGURE 38 - CUSTOM VIEW SCREEN

OVERVIEW

This screen displays up to ten (10) user-selected parameters to be displayed simultaneously. These parameters are selected at the custom view “Setup” screen. This feature is useful to display parameters pertinent to a particular problem during service troubleshooting. Once the problem has been resolved, the display can be cleared or the parameters can be left there for monitoring by chiller operating personnel.

DISPLAY ONLY

None

PROGRAMMABLE

Print

Access Level Required: VIEW

This key generates a printed listing of the parameters displayed on this screen.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

History

Access Level Required: VIEW

Returns the display to the History screen.

Setup

Access Level Required: SERVICE

Advances to a sub-screen that allows selection of custom view display parameters.

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(CUSTOM VIEW) SETUP SCREEN

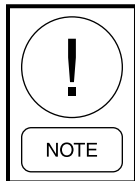


00325VIP

FIGURE 39 - CUSTOM VIEW SETUP SCREEN

OVERVIEW

The setup screen is a sub-screen of the custom view screen. This screen allows the service technician to setup which parameters are displayed on the custom view screen.



Requires a login access level of SERVICE. Service technicians refer to OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1) for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Slot Numbers

Lists the available parameters and corresponding slot numbers that can be displayed. The desired parameters for display are selected from this list.

PROGRAMMABLE

Page Up

Scrolls up through list of available slots and parameters.

Page Down

Scrolls down through list of available slots and parameters.

Select

Pressing the Select key places a green colored selection box around Custom Slot 1. Use the ▲ and ▼ arrow cursor keys to place the selection box around the slot number to be configured.

Custom Slot (1-10)

Use the “Select” key and numeric keypad keys as described above. With the selection box around the slot number to be changed or entered, press the “Enter” (✓) key. A dialog box is displayed permitting data entry. Using the numeric keypad keys, enter the desired slot number and press the “Enter” (✓) key. Setting the slot number to zero deactivates the slot number on the display.

Clear Display

Pressing this key clears all selected parameters from the “Custom View” screen.

NAVIGATION

Home

Access Level Required: VIEW

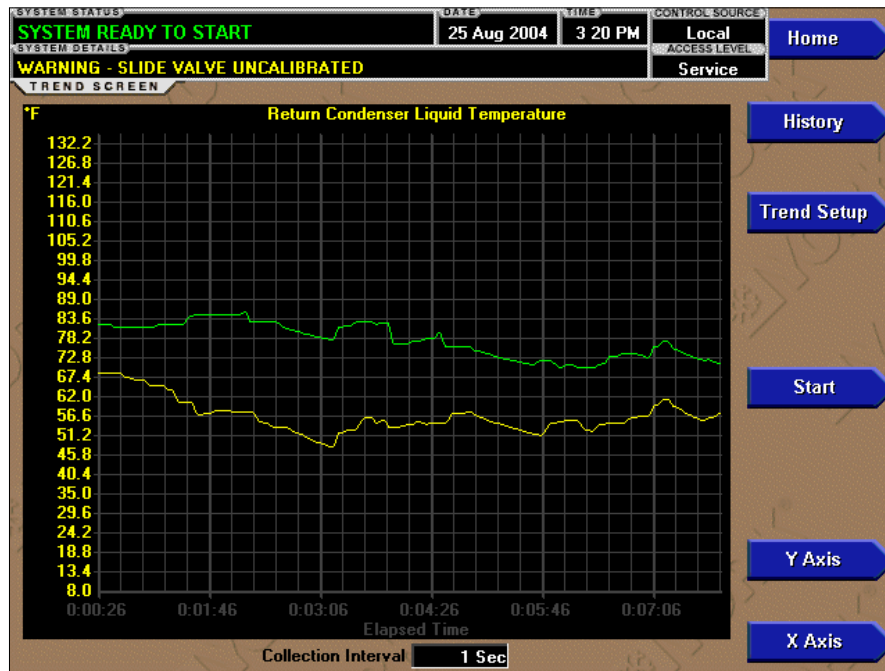
Returns the display to the Home screen.

Custom View

Access Level Required: SERVICE

Returns the display to the Custom View screen.

TREND SCREEN



LD10015

FIGURE 40 - TREND SCREEN

OVERVIEW

The Trend screen allows as many as six operator-selected parameters (Data Points) to be plotted in an X/Y graph format. This is useful for monitoring chiller performance. The X-Axis is scaled per the selected data collection interval and displayed in a time of day or elapsed time format, as selected with the X-axis key. The Y-Axis is scaled for each parameter as per the operator programmed minimum and maximum value. Only one Y-Axis label is displayed at a time. For ease of identification, each plotted parameter and associated Y-Axis labeling is color coordinated.

Analog parameters are scaled in pressure, temperature, volts, amps, hertz or time. Digital parameters are scaled as zero (off) and one (on). The parameters are sampled at the selected data collection interval and plotted using 450 data points across the X-Axis. If the actual value of the sampled parameter is less than the Y-Axis label minimum for that parameter, the value will be plotted at the minimum value. Similarly, if the actual value is greater than the Y-Axis label maximum for that parameter, the value will be plotted at the maximum value.

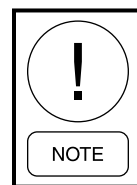
There are two types of charts that can be created: “One Screen” and “Continuous”. When plotting reaches the

end of the X-axis, if “One Screen” is selected, trending stops and data is frozen. If “Continuous” is selected, the oldest data is dropped from the left-hand side of the graph at the next collection interval. Thereafter, the oldest data is dropped from the left hand-side of the graph at each data collection interval.

If a power failure occurs while the trend feature is running, the trending is stopped. Upon restoration of power, the last screen of data that was collected will be displayed on the trending screen. The “Start” key must be pressed to initiate a new trend screen.

DISPLAY ONLY

This screen allows the user to view the graphical trending of the selected parameters and is also a gateway to the trend setup screens.



A red screen with the words “TREND MAX MUST BE > TREND MIN” will appear if the Y-Axis minimum has been programmed to a value that is greater than the Y-Axis maximum for any parameter. If this appears, proceed to the Trend Setup screen to change the values.

PROGRAMMABLE

Start

Access Level Required: OPERATOR

Pressing this key clears and starts a new graph, sets the time of day to the present clock time and begins the trending data collection. This key is only available if trending is stopped.

Stop

Access Level Required: OPERATOR

Pressing this key stops the trending. The trend data is frozen on the display until another graph is started with the “Start” key. The “Stop” key is only available if trending is running.

Y-Axis

Access Level Required: VIEW

This key toggles the Y-Axis labels of the graph. Each key press changes the label to another of the selected parameters. The Y-Axis label that is being displayed is identified at the top of the graph

X-Axis

Access Level Required: VIEW

This key toggles the X-Axis labels of the graph. Each key press alternates the scaling between time of day and elapsed time. The “Time of Day” scaling is in 24-hour format. The “Elapsed Time” scaling is the time elapsed since the “Start” key was pressed, starting the trending.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

History

Access Level Required: VIEW

Returns the display to the History screen.

Trend Setup

Access Level Required: OPERATOR

Advances to a sub-screen for configuring the trending display. This key is only displayed if the trending is stopped.

TREND SETUP SCREEN

SYSTEM STATUS	DATE	TIME	CONTROL SOURCE
SYSTEM READY TO START	25 Aug 2004	3:21 PM	Local
SYSTEM DETAILS			ACCESS LEVEL
WARNING - VANES UNCALIBRATED			Service
TREND SETUP SCREEN			
Data Point 1	Slot	Not Assigned	Trend
Data Point 2	Slot	Leaving Condenser Liquid Temperature	Slot #s
	Minimum	8.0 °F	
	Maximum	132.2 °F	Select
Data Point 3	Slot	Return Condenser Liquid Temperature	
	Minimum	8.0 °F	
	Maximum	132.2 °F	Chart Type
Data Point 4	Slot	Not Assigned	Continuous
Data Point 5	Slot	Not Assigned	Collection Interval
			1 Sec
Data Point 6	Slot	Not Assigned	

Press Select button to start programming. Use cursor keys to select desired parameter Press Enter key to input parameter

LD10020

FIGURE 41 - TREND SETUP SCREEN

OVERVIEW

This screen is used to configure the Trend screen. The parameters to be trended are selected from the Common Slots screen or common slots master list and entered as slot numbers for Data Points 1 through 6. The Y-Axis minimum and maximum values for each parameter are entered as “Data Point Min” and “Data Point Max” for Data Points 1 through 6. The interval at which all the parameters are sampled is selected as the “Collection Interval”.

DISPLAY ONLY

None

PROGRAMMABLE

Chart Type

Access Level Required: OPERATOR

This key toggles the chart type between “Continuous” or “One Screen” view for the Trending screen.

Collection Interval

Access Level Required: OPERATOR

Selects the interval at which the trending parameters are sampled. There are 450 data points displayed across the X-Axis of the graph. Each point represents the value of the parameter at that time. The user selects the time interval between these points. This is called the “Data Collection Interval”, or the interval at which the data for the parameter is sampled. This interval is programmable over the range of 1 second to 3600 seconds (1 hour), in one second increments. The selected interval not only determines the sample interval, but also the full screen time display. The full screen time display is a result of the selected interval in seconds, multiplied by the 450 data points.

- For example: If the data collection interval is programmed for 900 seconds, the parameter would be sampled every 900 seconds, with the last 112.5 hours (4.7 days) of data viewable on the screen. Therefore, the selected interval is a compromise between resolution and full screen time display.

Select the desired data collection interval as follows:

1. Determine the desired time interval (in seconds), between data samples.
2. Calculate the full screen time display as follows:
 - $450 \times \text{Data Collection Interval} = \text{full screen seconds}$
 - $\text{full screen seconds} / 60 = \text{full screen minutes}$
 - $\text{full screen minutes} / 60 = \text{full screen hours}$
 - $\text{full screen hours} / 24 = \text{full screen days}$
3. View the resulting sample interval and full screen display to determine if the data display meets the desired requirements.

Select

Access Level Required: OPERATOR

The Select key is used to enter the slot numbers and the minimum and maximum Y-Axis values of each parameter. Pressing this key places a yellow box around Data Point 1 Slot Number. Use the ▲ and ▼ cursor arrow keys to select the box for the Data Point(s) to be changed. Data Point Slots one through six may be programmed. With the desired value highlighted, press the '✓' (Enter) key. A dialog box is displayed permitting entry of the slot number or data point min and max. Press the '✓' (Enter) once the desired slot number has been entered. Setting the slot number to zero will disable trending for that particular data point. Any or all points can be disabled.

Data Point Minimum (1-6)

Access Level Required: OPERATOR

This is the minimum value displayed for the Y-Axis. Selecting a parameter for a data point sets this to the default value, which is the lowest value allowed for that parameter. This can be changed to a value that provides a more appropriate resolution for the parameter being monitored. This key is not displayed when the slot # for the data point is set to zero (0).

Use the "Select" key as described above to enter the desired value. The value must always be set to a value less than the data point maximum. Otherwise, a red graph is displayed on the Trend screen with the words "TREND MAX MUST BE > TREND MIN". If the parameter selected for this data point is a digital type (on/off), this value must be set to zero (0). Zero indicates the digital input/output is in the "OFF" state.

Data Point Maximum (1-6)

Access Level Required: OPERATOR

This is the maximum value displayed for the Y-Axis. Selecting a parameter for a data point sets this to the default value, which is the highest value allowed for that particular parameter. This can be changed to a value that provides a more appropriate resolution for the parameter being monitored. Data Point Maximum is only displayed if the associated slot number is not zero.

To change this setting, use the "Select" key as described previously and enter the desired value. The value must always be set to a value greater than the data point minimum. Otherwise, a red graph is displayed on the Trend screen with the words "TREND MAX MUST BE > TREND MIN". There are twenty (20) Y-Axis divisions. If a MIN-MAX span is selected that is not evenly divided by 20, the program will automatically select the next higher MAX value that makes the span evenly divided.

- For example: If 0.0 is selected as the MIN and 69.0 is selected as the MAX, the program will insert 70.0 as the MAX value. If the parameter selected for this data point is a digital type (on/off), this value must be set to one (1). One indicates the "ON" state.

NAVIGATION

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Trending

Access Level Required: OPERATOR

Returns the display to the Trending screen.

Slot #s (Numbers)

Access Level Required: OPERATOR

Advances to the Trend Common Slots sub-screen. The desired parameters to be plotted are selected from this screen.

TREND COMMON SLOTS SCREEN

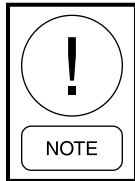


00328VIP

FIGURE 42 - COMMON SLOTS SCREEN

OVERVIEW

This screen displays the slot numbers of the commonly monitored parameters used for trending or custom view and are listed on this screen by chiller component. The slot numbers for the remainder of the available parameters are listed on the “Master Slot Numbers List”.



This screen requires a login access level of OPERATOR or higher to view.

DISPLAY ONLY

Slot Numbers

These are the slot numbers of the most commonly used parameters.

PROGRAMMABLE

Print

Generates a list of the slot numbers for the available parameters.

NAVIGATION

Page Down

Access Level Required: OPERATOR

Scroll down in the displayed data.

Page Up

Access Level Required: OPERATOR

Scroll up in the displayed data.

Home

Access Level Required: VIEW

Returns the display to the Home screen.

Trend Setup

Access Level Required: OPERATOR

Returns the display to the Trend Setup screen.

MASTER SLOT NUMBER LIST (FOR USE WITH THE TREND FEATURE)

Table 1 provides a listing of slot numbers and their descriptions.

TABLE 1 - MASTER SLOT NUMBERS LIST (FOR USE WITH TREND FEATURES)

SLOT#	DESCRIPTION
256	System: Chiller State
257	System: Coastdown Time Remaining
258	System: Prelube Time Remaining
259	System: Are Safety Shutdown Contacts Closed
260	System: Are Cycling Shutdown Contacts Closed
261	System: Are Anticipatory Alarm Contacts Closed
262	System: Operating Hours
264	System: Number of Starts
265	System: Is Stop Switch Closed
266	System: Is Start Switch Closed
267	System: Is Remote Ready to Start
280	External Contact: Is Remote Stop Closed
281	External Contact: Is Remote Start Closed
282	External Contact: Is MultiUnit Cycling Closed
283	External Contact: Is Remote Cycling Closed
284	External Contact: Is Auxiliary Safety Open
285	Jumper: Is Anti-Recycle Enabled
286	Jumper: Coastdown Operation
287	Jumper: Is Diagnostics Enabled
288	Jumper: Liquid Type
289	Jumper: Chilled Liquid Pump Operation
290	Jumper: Motor Type
291	Jumper: Power Failure Restart
292	Jumper: Pre-Run Operation
293	Jumper: Refrigerant Selection
294	Jumper: VSD Motor Supply Line Frequency
295	Jumper: Oil Pump Package
304	Options: Control Mode
305	Options: System Language
306	Options: Chiller ID Number
307	Options: Display Mode
336	Security: Log In Level
337	Security: Log In User ID
512	Sched: Is Schedule Enabled
1280	Pre-Rotation Vanes: Is Motor Switch Closed
1281	Pre-Rotation Vanes: Position
1282	Pre-Rotation Vanes: Are Vanes Opening
1283	Pre-Rotation Vanes: Are Vanes Closing
1284	Pre-Rotation Vanes: Are Vanes Holding
1285	Pre-Rotation Vanes: Control Mode
1296	Discharge: Temperature
1536	Oil: Differential Pressure
1537	Oil: Sump Temperature

SLOT#	DESCRIPTION
1538	Oil Pump: Control Mode
1539	Oil Pump: Is Pump On
1540	Oil Pump: Manual Time Left
1541	Oil Heater: Is Control Enabled
1542	Oil Heater: Is Heater On
1543	Oil Return Solenoid: Is Solenoid On
1792	Leaving Chilled Liquid: Temperature
1793	Leaving Chilled Liquid: Temperature Differential
1794	Leaving Chilled Liquid: Is Flow Switch Closed
1795	Leaving Chilled Liquid: Is Pump On
1796	Leaving Chilled Liquid: Local Temperature Setpoint
1797	Leaving Chilled Liquid: Remote Analog Temperature Setpoint
1798	Leaving Chilled Liquid: Remote ISN Temperature Setpoint
1799	Leaving Chilled Liquid: Remote Modem Temperature Setpoint
1800	Leaving Chilled Liquid: Selected Temperature Setpoint
1801	Leaving Chilled Liquid: Control Sensitivity
1802	Leaving Chilled Liquid: Remote Temperature Range
1803	Leaving Chilled Liquid: Restart Temperature Offset
1804	Leaving Chilled Liquid: Restart Temperature Setpoint
1805	Leaving Chilled Liquid: Shutdown Temperature Offset
1806	Leaving Chilled Liquid: Shutdown Temperature Setpoint
1807	Return Chilled Liquid: Temperature
1808	Evaporator: Pressure
1809	Evaporator: Saturation Temperature
1810	Evaporator: Small Temperature Difference
1811	Evaporator: Is Refrigerant Sensor Present
1812	Evaporator: Refrigerant Temperature
1813	Evaporator: Delta P / P
1814	Evaporator: Brine Low Cutout
1815	Smart Freeze Protection: Is Control Enabled
1816	Liquid Line Solenoid: Is Solenoid Installed
1817	Liquid Line Solenoid: Is Solenoid On
1818	Leaving Chilled Liquid: Remote Digital Temperature Setpoint
2048	Leaving Condenser Liquid: Temperature

SLOT#	DESCRIPTION
2049	Leaving Condenser Liquid: Is Flow Switch Closed
2050	Leaving Condenser Liquid: Is Pump On
2051	Return Condenser Liquid: Temperature
2052	Condenser: Pressure
2053	Condenser: Saturation Temperature
2054	Condenser: Small Temperature Difference
2057	Condenser: Is High Pressure Switch Closed
2058	Condenser: High Pressure Warning Threshold
2059	SubCooling: Temperature
2060	Drop Leg Refrigerant: Is Sensor Present
2061	Drop Leg Refrigerant: Temperature
2062	Vent Line Solenoid: Is Solenoid Installed
2063	Vent Line Solenoid: Is Solenoid On
2304	Motor: Starter Type
2305	Motor: Is Motor Starter On
2306	Motor: Current %FLA
2307	Motor: Is Motor Controller Switch Open
2308	Motor: Current Limit Local Setpoint
2309	Motor: Current Limit Remote Analog Setpoint
2310	Motor: Current Limit Remote ISN Setpoint
2311	Motor: Current Limit Remote Modem Setpoint
2312	Motor: Current Limit Selected Setpoint
2313	Motor: Pulldown Demand Time Remaining
2314	Motor: Pulldown Demand Limit Setpoint
2315	Motor: Pulldown Demand Time Setpoint
2316	Motor: Anti-Recycle Time Remaining
2317	Motor: Current Limit Remote Digital Setpoint
(Mod "B" Solid State Starters)	
2570	LcSss: Input Power
2571	LcSss: Kilowatt Hours
2572	LcSss: Phase A Current
2573	LcSss: Phase B Current
2574	LcSss: Phase C Current
2575	LcSss: Phase A Voltage
2576	LcSss: Phase B Voltage
2577	LcSss: Phase C Voltage
2578	LcSss: Phase A Temperature
2579	LcSss: Phase B Temperature
2580	LcSss: Phase C Temperature
2581	LcSss: Starter Model
2582	LcSss: Full Load Amps
2583	LcSss: Voltage Range
2584	LcSss: Starting Current
2585	LcSss: Is Serial Communications OK
2586	LcSss: Panel to Sss Comm Errors

SLOT#	DESCRIPTION
2587	LcSss: Sss to Panel Comm Errors
2816	VSD: Motor HP
2817	VSD: 100% Full Load Amps
2818	VSD: Input Power
2819	VSD: Kilowatt Hours
2820	VSD: DC Bus Voltage
2821	VSD: DC Inverter Link Current
2822	VSD: Output Frequency
2823	VSD: Output Voltage
2824	VSD: Phase A Current
2825	VSD: Phase B Current
2826	VSD: Phase C Current
2827	VSD: Is Precharge Relay On
2828	VSD: Is Trigger SCR On
2829	VSD: Is Water Pump On
2830	VSD: Control Mode
2831	VSD: Command Frequency
2832	VSD: Manual Frequency Increment
2833	VSD: Internal Ambient Temperature
2834	VSD: Converter Heatsink Temperature
2835	VSD: Phase A Heatsink Temperature
2836	VSD: Phase B Heatsink Temperature
2837	VSD: Phase C Heatsink Temperature
2838	VSD: Is Communications OK
2839	VSD: Panel to ACC Comms Error Count
2840	VSD: ACC to Panel Comms Error Count
2841	VSD: ACC to VSD Comms Error Count
2842	VSD: VSD to ACC Comms Error Count
2843	VSD: VSD to Filter Comms Error Count
2844	VSD: Filter to ACC Comms Error Count
2845	ACC: Delta P/P
2846	ACC: Stability Limit
2847	ACC: Surge Margin
2848	ACC: Manual Surge Command
2849	ACC: Surge Map Count
2850	ACC: Surge Type
2857	ACC: Surge Map Point Count
2858	ACC: Surge Map Delta P/P
2859	ACC: Surge Map Output Frequency
2860	ACC: Surge Map PRV Position
2861	Filter: Is Filter Installed
2862	Filter: Is Operation Inhibited
2863	Filter: Is Filter Running
2864	Filter: Is Precharge Contactor Closed
2865	Filter: Is Supply Contactor Closed

SLOT#	DESCRIPTION
2866	Filter: Phase Rotation
2867	Filter: Motor HP
2868	Filter: Supply kVA
2869	Filter: Total Power Factor
2870	Filter: DC Bus Voltage
2871	Filter: Heatsink Temperature
2872	Filter: L1 - L2 RMS Voltage
2873	Filter: L2 - L3 RMS Voltage
2874	Filter: L3 - L1 RMS Voltage
2875	Filter: L1 - N Peak Voltage
2876	Filter: L2 - N Peak Voltage
2877	Filter: L3 - N Peak Voltage
2878	Filter: L1 Total Harmonic Distortion
2879	Filter: L2 Total Harmonic Distortion
2880	Filter: L3 Total Harmonic Distortion
2881	Filter: L1 RMS Filter Current
2882	Filter: L2 RMS Filter Current
2883	Filter: L3 RMS Filter Current
2884	Filter: L1 RMS Supply Current
2885	Filter: L2 RMS Supply Current
2886	Filter: L3 RMS Supply Current
2887	Filter: L1 Total Demand Distortion
2888	Filter: L2 Total Demand Distortion
2889	Filter: L3 Total Demand Distortion
2890	Filter: Maximum Total Harmonic Distortion
2891	Filter: Maximum Total Demand Distortion
8192	Oil: Pump Pressure
8193	Oil: Sump Pressure
8205	Refrigerant Level: Is Control Enabled
8206	Refrigerant Level: Position
8207	Refrigerant Level: Is Valve Closing
8208	Refrigerant Level: Is Valve Opening
8209	Refrigerant Level: Control Mode
8212	Refrigerant Level: Target Setpoint
8213	Refrigerant Level: Setpoint
8214	Refrigerant Level: Period
8215	Refrigerant Level: Proportional Limit Close
8216	Refrigerant Level: Proportional Limit Open
8217	Refrigerant Level: Rate Limit Close
8218	Refrigerant Level: Rate Limit Open
12288	Purge: Pressure
12289	Purge: Is Air Purge Valve Closed
12290	Purge: Is Oil Purge Valve Closed
12291	Purge: Is Bottom Float Switch Closed
12292	Purge: Is Top Float Switch Closed

SLOT#	DESCRIPTION
12293	Purge: Exhaust Count
12294	Purge: Window Time
12295	Purge: Is High Efficiency Enabled
12296	Purge: Maximum Purges Per Hour
17958	Winding Phase A1 Temperature
17959	Winding Phase A2 Temperature
17960	Winding Phase B1 Temperature
17961	Winding Phase B2 Temperature
17962	Winding Phase C1 Temperature
17963	Winding Phase C2 Temperature
17964	Bearing 1 Temperature
17965	Bearing 2 Temperature

SECTION 3 - OPTIVIEW DISPLAY MESSAGES

INTRODUCTION

The System Status bar of the OptiView display contains a Status line and a Details line. The System Status line contains a message describing the operating state of the chiller. The System Details line displays warning, cycling, safety, start inhibit and other messages, providing further details of the Status Bar messages. The Status Messages listed below are displayed on the Status line. All other messages are displayed on the Details line.

Messages are displayed in different colors to distinguish between the different types of messages. The message type and colors displayed are as follows:

TABLE 2 - STATUS LINE MESSAGES AND COLORS

Message	Color
Normal Operation	Green
Warning	Yellow
Cycling Shutdown	Orange
Safety Shutdown	Red

SYSTEM STATUS MESSAGES

System Ready To Start

The chiller is shut down and ready to start upon receipt of a local or remote start signal.

Cycling Shutdown – Auto Restart

The chiller is shut down on a **CYCLING** shutdown. The cause of the shutdown is still active and is displayed on the Details line of the Status Bar. The chiller will automatically restart when the **CYCLING** condition clears.

Safety Shutdown – Manual Restart

The chiller is shut down on a **SAFETY** shutdown. The cause of the shutdown is still active and is displayed on the Details line of the Status Bar. The chiller can be started after the safety condition clears and the operator moves the compressor switch to the **STOP/RESET (O)** position.

System Prelube

A chiller start has been initiated and the pre-start lubrication is being performed. A **TIME REMAINING** countdown will begin in the system status bar. The prelube duration is configured from the Oil Sump screen. The prelube duration must never be changed by anyone other than a qualified service technician.

System Run

The chiller is running under the condition described in the Details Line of the Status Bar.

System Coastdown

The chiller has shut down and the post-run lubrication is being performed. A **TIME REMAINING** countdown timer will appear in the system status bar. Coastdown duration is determined by the setpoint on the Oil Sump screen. The duration of system Coastdown should never be changed by anyone other than a qualified service technician.

Start Inhibit

The chiller is prevented from starting due to the reason displayed on the Details line of the Status bar.

Vanes Closing Before Shutdown

Displayed while the pre-rotation vanes are closing during a soft shutdown. Soft shutdowns are initiated by the following:

1. Leaving Chilled Liquid – Low temperature
2. Remote Stop
3. Multi-Unit Cycling – Contacts Open
4. System Cycling – Contacts Open
5. Control Panel – Schedule
6. Operator Initiated at Keypad

During soft shutdowns, the vanes are driven fully closed prior to shutting down the compressor. When the vane motor switch closes, indicating the vanes have fully closed (or 3.5 minutes have elapsed, whichever occurs first), the **RUN** signal is removed from the compressor motor starter and a **SYSTEM COASTDOWN** is performed.

While the vanes are closing during any soft shutdown, if a local stop is initiated with the compressor switch or any faults other than those listed above occur, the soft shutdown is terminated. The control center will then perform a **SYSTEM COASTDOWN**.

System Stopped

This message indicates the chiller has been commanded to stop, locally or by remote, the System Coastdown is complete, and the chiller control switch is in the **RUN** position. Once the control switch is moved to the **OFF** position and there is nothing preventing safe operation of the chiller, the message will revert to **SYSTEM READY TO START**.

SYSTEM RUN MESSAGES

LEAVING CHILLED LIQUID CONTROL

The chiller is running and controlling the chilled liquid to the Leaving Chilled Liquid Temperature Setpoint. There are no system conditions inhibiting this operation.

Motor – High Current Limit

The compressor motor current is greater than or equal to the Local or Remote Current Limit Setpoint. When the motor current increases to the INHIBIT OPEN threshold, the pre-rotation vanes are inhibited from opening, preventing any further increase in motor current. If the current continues to rise to the START CLOSE threshold, the vanes begin closing until the current falls to the STOP CLOSE threshold. Auto vane operation is resumed and this message automatically clears when the motor current decreases to the ALLOW OPEN threshold. The thresholds are different for the various motor starter applications. To allow field calibration of the CM-2 current module, pressing the pre-rotation vanes OPEN key in SERVICE access level, starts a 10 minute timer during which the current limit thresholds are elevated. Refer to *Table 3* below:

TABLE 3 - CURRENT LIMIT THRESHOLDS

Vane Control	Motor Current (% FLA)		
	E-M/Solid State Starter	VSD	Service Mode
On rise, inhibit open	100	100	107
On fall, allow open	98	93	106
On rise, start close	104	103	110
On fall, stop close	102	101	109

An example of current limit is as follows: If a chiller with an electromechanical starter FLA is 100 Amps, and the current limit setpoint is 50%, the following will occur:

50 Amps: Inhibit Vane Open

52 Amps: Vanes Begin Closing

51 Amps: Vanes Stop Closing

49 Amps Allow Automatic Vane Control

Current Pulldown Limit

The PULLDOWN DEMAND LIMIT SETPOINT timer is in effect and the compressor motor current is greater than or equal to the pulldown demand current limit setpoint value. The pre-rotation vane operation is being inhibited as described under **MOTOR – HIGH CURRENT LIMIT**.

START INHIBIT MESSAGES

Anti-Recycle XXmin/Sec

The chiller is inhibited from starting because the thirty (30) minute anti-recycle time has not yet elapsed. Time remaining is displayed.

Vane Motor Switch Open

The chiller is inhibited from starting because the pre-rotation vanes are not fully closed.

Motor Current >15% FLA

The OptiView Control Center has detected a compressor motor current that is greater than 15% of the chiller full load amps for ten (10) continuous seconds, while the chiller is stopped. As long as this condition exists, the oil pump is turned on. This message is generally indicative of motor starter, control center start circuits, or motor current feedback circuits failure. After motor current is no longer detected, a SYSTEM COASTDOWN is performed. The chiller can be started after motor current is no longer detected, the system coastdown has completed and the compressor switch is placed in the **STOP/RESET (O)** position.

LCSSS – High Temperature Phase X – Stopped

The chiller is stopped and the liquid cooled solid state starter logic/trigger board has detected that the temperature of the phase A, B, or C (designated as X in this message) Silicon Controlled Rectifier (SCR) module is above 110°F. The starter cooling pump will run and the chiller will be inhibited from starting until the temperature decreases below 109°F.

WARNING MESSAGES

Warning – Real Time Clock Failure

During the initialization process that occurs when power is applied to the control center, test data is writ-

ten to a location in the microboard battery backed memory device (BRAM). This data is then read from the BRAM and compared to the test data. If the read data is not the same as what was written to the device, the control center assumes the BRAM (and Real time Clock operation) is defective and this message is displayed. The BRAM should be replaced by a qualified service technician. This message automatically clears when the BRAM problem has been solved.

Warning – Condenser Or Evaporator XDER Error

The evaporator pressure transducer is indicating a higher pressure than the condenser pressure transducer after the chiller has been running for ten (10) minutes. This is indicative of a condenser or evaporator transducer failure. This message will be displayed until the condition clears and the WARNING RESET key is pressed in OPERATOR (or higher) access mode. This condition is not checked in brine mode.

Warning – Setpoint Override

A blank BRAM battery-backed memory device or a failure of this device was detected during the initialization process that occurs when power is applied to the control center. Because of this failure, any or all of the programmed setpoints may be corrupted. For safety purposes, all setpoints are automatically changed to default values. All setpoints will have to be programmed to their desired values. This message will clear when the WARNING RESET key is pressed (Operator or higher access mode).

Warning – Evaporator – Low Pressure Limit

The evaporator pressure has decreased to the warning threshold. This threshold is fixed in water cooling applications. In brine cooling applications, the threshold is a fixed amount above the programmable safety shutdown threshold. The safety threshold in brine applications is dependent upon the brine solution concentration and is determined by the YORK Factory. While this condition is in effect, the pre-rotation vanes are inhibited from opening further. This message automatically clears and the vanes are permitted to open when the evaporator pressure increases to the reset value.

TABLE 4 - EVAPORATOR PRESSURE THRESHOLDS

Warning Threshold (PSIA)			Reset Threshold (PSIA)	
Refrig.	Water	Brine	Water	Brine
R11	5.5	0.1>Safety Setpoint	5.6	0.3>Safety Setpoint
R123	4.5	0.1>Safety Setpoint	4.7	0.3>Safety Setpoint

3

Warning – Condenser – High Pressure Limit

The condenser pressure has exceeded the high pressure warning setpoint (service programmable), inhibiting the pre-rotation vanes from opening further. This message automatically clears and the vanes are permitted to open when the condenser pressure decreases to 0.1 PSIA below the programmed setpoint.

Warning – Vanes Uncalibrated – Fixed Speed

The compressor motor variable speed drive (VSD) is operating in FIXED SPEED (full speed) mode because the pre-rotation vanes position potentiometer calibration has not been performed.

Warning – Harmonic Filter – Operation Inhibited

The compressor motor VSD harmonic filter has been inhibited. Refer to the *Variable Speed Drive – Service Manual (Form 160.00-M1)*. Harmonic filter operation should not be altered by anyone other than a qualified service technician.

Warning – Harmonic Filter – Data Loss

Communication between the harmonic filter logic board and the VSD logic board or the ACC board cannot be detected. While this condition exists, all filter related parameters are displayed as X's. This message automatically clears when communications are restored.

Warning – Vanes Uncalibrated

The hot gas bypass feature is enabled, but the pre-rotation vanes calibration procedure has not yet been performed.

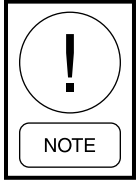
Warning – Harmonic Filter – Input Frequency Range

The power line frequency detected by the VSD harmonic filter is outside the range of 58 to 62 Hz (60 Hz), or 49 to 51 Hz (50 Hz). While this condition exists,

all harmonic filter related parameters are displayed as X's. This message automatically clears when the line frequency is within range.

Warning – Surge Protection – Excess Surge Limit

(Applies only if surge protection EXTENDED RUN feature is enabled)



If the optional hot gas bypass feature is enabled, the valve position must be at 100% before “Extended Run” is implemented. If the chiller is equipped with a VSD, the output frequency must be at full speed (50 Hz/60 Hz) before this control can be implemented.

Displayed during the surge protection ten (10) minute extended run period. This period begins when the SURGE WINDOW COUNT exceeds the COUNT LIMIT. During this period, the pre-rotation vanes are driven closed. When the ten minutes elapse, this message and the pre-rotation vanes load inhibit are automatically cleared. The warning message and load inhibit are also cleared when the chiller is shutdown.

Warning – Purge – High Pressure (Turboguard II Units Only)

With the chiller running, the purge pressure increased above the high pressure limit (95.0 PSIA, high efficiency TGII purge units) continuously for four (4) minutes. This message is displayed until purge pressure decreases below the high pressure limit or the chiller is stopped and the WARNING RESET key is pressed on the Home screen. This warning will not be displayed if the PURGE FLOAT SWITCH ERROR warning is triggered.

Warning – Purge – Canister #1 Full

This message is triggered when the purge canister alarm output increases to 2.20V or above, indicating the canister has reached full capacity. The canister must be replaced following instructions on label inside purge panel door. This message will be displayed until the alarm signal is 0.90 VDC or below and the WARNING RESET key is pressed on the Home screen.

Warning – Purge – Float Switch Error (Turboguard II Units Only)

This message is displayed while the chiller is running and the purge float switches are in invalid states. Typically, this is caused by the bottom float switch being in the closed position and the top float switch in the open position, indicating the oil level is simultaneously below the bottom switch and above the top switch. This message will be displayed until the float switches are indicating valid positions (or the chiller is not running) and the WARNING RESET key is pressed on the Home screen. While this message is displayed, the purge oil solenoid valve is de-energized, draining the purge tank.

Warning – Excess Purge (Turboguard II Units Only)

The purge EXHAUST COUNT has equaled the programmed MAXIMUM PURGES PER HOUR setpoint. Purge operation continues while this message is displayed, but the exhaust count is not incremented. Clearing this message resets the exhaust count and exhaust window. If the chiller is running, the exhaust window will then increment from 0 to 60 minutes and the exhaust count will increment as exhausts occur. This message will be displayed until the WARNING RESET key is pressed on the Home screen.

Warning – External I/O – Serial Communications

This message indicates serial data communications between the microboard and analog I/O board have been interrupted for longer than twenty (20) seconds.

ROUTINE SHUTDOWN MESSAGES

Remote Stop

This message indicates that a STOP command has been received from a remote device. Remote stop commands can be received in digital remote mode via I/O Board TB4-7/8 or in ISN (Integrated Systems Network) remote mode via the MicroGateway serial communications. If the chiller is running when this occurs, the pre-rotation vanes are driven fully closed prior to shutdown.

Local Stop

A local STOP command has been received, indicating the compressor switch in the STOP/RESET (O) position.

Place Compressor Switch In Run Position

The control center is in either digital or ISN (Integrated Systems Network) remote mode. The operator is requested to place the compressor switch in the **RUN** position. The control center will not accept a remote start/stop command unless the switch is in the **RUN** position.

CYCLING SHUTDOWN MESSAGES

Multiunit Cycling – Contacts Open

The multiunit cycling contacts connected to I/O board TB4-9, have opened to initiate a cycling shutdown. The pre-rotation vanes are driven fully closed prior to shutting down the chiller. The chiller will automatically restart when the contacts close.

System Cycling – Contacts Open

The system cycling contacts connected to I/O board TB4-13, have opened to initiate a cycling shutdown. The pre-rotation vanes are driven fully closed prior to shutting down the chiller. The chiller will automatically restart when the contacts close.

Oil – Low Temperature

This message indicates the oil temperature has decreased below 55.0°F. The chiller will automatically restart when the temperature increases above 71.0°F.

Control Panel – Power Failure

A power failure to the OptiView Control Center has occurred. If the power failure occurred while the chiller was running, the control center will automatically restart (auto-restart enabled) when power is restored. However, if the duration of the power failure was less than the applicable SYSTEM COASTDOWN period when power is restored, the remainder of the coastdown will be performed. This message indicates a cycling shutdown when displayed in orange characters and a safety shutdown when displayed in red characters. The control center is configured for chiller auto-restart or manual restart after power failure by a qualified service technician following instructions in the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Leaving Chilled Liquid – Low Temperature

The leaving chilled liquid temperature has reached the programmed shutdown temperature setpoint. The pre-

rotation vanes are driven fully closed prior to shutting down the chiller, if running. The chiller will automatically restart when the liquid temperature increases to the programmed restart temperature setpoint.

Leaving Chilled Liquid – Flow Switch Open

The chilled liquid flow switch has remained open for 2 continuous seconds while the chiller was running or failed to close during the system prelube period. The chiller will automatically restart when the flow switch closes.

Condenser – Flow Switch Open

The condenser water flow switch has remained open for 2 continuous seconds while the chiller was running. This check is bypassed for the first thirty (30) seconds of SYSTEM RUN. The chiller will automatically restart when the flow switch closes.

Motor Controller – Contacts Open

This indicates the CM-2 current module (E-M starter applications) has shutdown the chiller. If a condition that places the starter or motor at risk is detected, the CM-2 module opens the motor controller contacts CM to initiate a shutdown. The CM-2 board LED's will illuminate to identify the specific fault that has occurred. The chiller will automatically restart when the motor controller contacts close. Refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for more information.

Starter – Low Supply Line Voltage

This message indicates that a voltage for a phase is lower than the allowable limit for more than twenty (20) seconds. This fault can occur at chiller startup or after the chiller has been running for one minute. The fault is released when the voltage for the phase increases above the limit starting. Refer to the following *Table 5*.

TABLE 5 - STARTER - LOW SUPPLY LINE VOLTAGE LIMITS

SUPPLY VOLTAGE	LIMIT STARTING	LIMIT RUNNING
200 - 208 Volts	174 V	160 V
220 - 240 Volts	200 V	185 V
380 Volts	331 V	305 V
400 Volts	349 V	320 V
415 Volts	362 V	335 V
440 - 480 Volts	400 V	370 V
550 - 600 Volts	502 V	460 V

Starter – High Supply Line Voltage

This message indicates that a voltage for a phase is greater than the allowable limit for more than twenty (20) seconds. This fault can occur at chiller startup or after the chiller has been running for one minute. The fault is released when the voltage for the phase falls below the limit when starting. Refer to *Table 6*.

TABLE 6 - STARTER - HIGH SUPPLY LINE VOLTAGE LIMITS

SUPPLY VOLTAGE	LIMIT STARTING	LIMIT RUNNING
200 - 208 Volts	226 V	227 V
220 - 240 Volts	261 V	262 V
380 Volts	414 V	415 V
400 Volts	435 V	436 V
415 Volts	453 V	454 V
440 - 480 Volts	523 V	524 V
550 - 600 Volts	654 V	655 V

Motor Controller – Loss Of Current

This message indicates that compressor motor current decreased to 10% Full Load Amps (FLA) for 25 continuous seconds while the chiller was running. This may be caused by the starter de-energizing during run or a defect in the motor current feedback circuitry to the control center. The chiller will automatically restart at the completion of SYSTEM COASTDOWN.

Power Fault

This message indicates the CM-2 current module (Electromechanical starter applications) has shutdown the chiller because a fault condition that places the chiller motor at risk has been detected. This device opens and closes the motor controller CM contacts (located on the CM-2 board and connected between TB6-16 and TB6-53 in the Control Center) in less than three (3) seconds to initiate the shutdown and produce this message. One of three LEDs on the device will illuminate to identify the specific fault that has occurred. Refer to the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)* for CM-2 initiated shutdown details. The chiller will automatically restart when the contacts close.

Control Panel – Schedule

The programmed daily schedule setpoint has shutdown the chiller. Prior to shutdown, the pre-rotation vanes are driven fully closed. The chiller will automatically restart at the next scheduled start time.

MOD B SOLID STATE STARTER CYCLING SHUTDOWN MESSAGES

LCSSS Initialization Failed

When power is restored to the system after a power failure, an initialization process occurs wherein the control center attempts to establish a link with the Liquid Cooled Solid State Starter (LCSSS) through serial communications. If communications are not established within 10 consecutive attempts, a Cycling Shutdown is performed and this message is displayed. The control center attempts to establish communications until successful.

LCSSS – Serial Communications

After communications have been successfully established in the INITIALIZATION process, the OptiView Control Center transmits to the solid state starter on the serial communications link every two (2) seconds. After these communications have been established, if the control center does not receive a reply within ten (10) consecutive attempts, a cycling shutdown is performed and this message is displayed. This same cycling shutdown is performed, along with the same message, if the solid state starter does not receive a response from the control center after ten (10) consecutive attempts to communicate with the control center. The control center will attempt to establish communications until successful.

LCSSS SHUTDOWN – REQUESTING FAULT DATA...

The liquid cooled state starter logic/trigger board has shut down the chiller but the OptiView Control Center has not yet received the cause of the fault from the LCSSS, via the serial communications link. The LCSSS shuts down the chiller by opening the motor controller lcsss stop contacts (K1 relay located on the starter logic/trigger board and connected between TB6-16 and TB6-53 in the control center). The control center microboard then sends a request for the cause of the fault to the logic/trigger board over the serial communications link. Since serial communications are initiated every two (2) seconds, this message is typically displayed for a few seconds and then replaced with one of the following fault messages.

LCSSS – STOP CONTACTS OPEN

Refer to **LCSSS SHUTDOWN – REQUESTING FAULT DATA ...** described previously. If the Control Center's Microboard does not receive the cause

of a starter initiated shutdown with twenty (20) seconds of the shutdown, the microboard assumes the cause is not forthcoming and that message is replaced with this message. The chiller can be started when the motor controller LCSSS stop contacts close. A missing interlock jumper between starter logic/trigger board J1-1 and J1-12 will also produce this message.

LCSSS – POWER FAULT

The liquid cooled solid state starter logic/trigger board has detected that the compressor motor current in one or more phases has decreased to less than 10% of the FLA for a minimum of one (1) line cycle. This check is inhibited during the first four (4) seconds of chiller operation and until the motor current is above 25% of the Job FLA. The chiller will automatically restart upon completion of SYSTEM COASTDOWN.

LCSSS – LOW PHASE (X) TEMPERATURE SENSOR

The liquid cooled solid state starter logic/trigger board has detected that the temperature of the starter phase A, B or C (designated as X above) Silicon Controlled Rectifier (SCR) Module has decreased below 37°F. This would generally be indicative of a disconnected or defective sensor. If all three SCR modules are indicating a temperature of less than 37°F, the SCR module cooling pump turns on. This is accomplished by disconnecting all three sensors. This feature allows service technicians to run the cooling pump while filling the cooling system by disconnecting plugs P2, P3 and P4 in the LCSSS.

LCSSS – RUN SIGNAL

The liquid cooled solid state starter receives two start signals from the OptiView Control Center simultaneously; one via the serial communications link and one via the start relay TB6-24 in the control center. If the signals are not received within 5 seconds of one another, a cycling shutdown is performed and this message is displayed. This is generally indicative of defective wiring.

LCSSS – INVALID CURRENT SCALE SELECTION

There is an invalid compressor motor current scale jumper combination installed in the liquid cooled solid state starter logic/trigger board, J1. Jumper combination determines allowable 100% FLA setpoint range; 7L - 35 to 260A, 14 L- 65 to 510A, 26L - 125 to 850A and

33L-215 to 1050A. The chiller will be permitted to start when the jumpers are configured correctly. Refer to the *Solid State Starter MOD “B” – Operation/Service Manual (Form 160.00-O2)* for valid jumper configurations.

LCSSS – PHASE LOCKED LOOP

The liquid cooled solid state starter logic/trigger board phase locked loop circuit was not able to maintain lock with phase A of the power line. This could be caused by a power line anomaly such as sag or jitter. A power line frequency jitter of up to 3 Hz/second can be tolerated. The chiller will automatically restart when lock has resumed.

LCSSS – LOGIC BOARD PROCESSOR

Communication between the V25 Microprocessor and Digital Signal Processor (DSP) on the liquid cooled solid state starter logic/trigger board has been interrupted. The chiller will automatically restart when communications are restored.

LCSSS – LOGIC BOARD POWER SUPPLY

This message is displayed after a loss of power. Following application of power, this message is displayed and a snapshot of the LCSSS parameters and time of power failure are sent to the control center.

LCSSS – PHASE LOSS

The liquid cooled solid state starter logic/trigger board has detected the line-to-line RMS voltage in any phase has decreased to 30% or below the lowest value of the programmed voltage range. If the programmed voltage range is DISABLED, a value of 60VAC is used as the threshold. The chiller will automatically restart when the line voltage is higher than the shutdown threshold. Service technicians program the voltage range following instructions in the *Solid State Starter MOD “B” – Operation/Service Manual (Form 160.00-O2)*.

LCSSS – LOW SUPPLY LINE VOLTAGE

The liquid cooled solid state starter logic/trigger board has detected that the compressor motor AC power line voltage, in any phase, decreased below the low line voltage threshold continuously for twenty (20) seconds. The chiller will automatically restart when the voltage in all phases reaches the restart level. Refer to *Table 7* for Voltage Thresholds.

TABLE 7 - LCSSS LOW SUPPLY LINE VOLTAGE THRESHOLDS

Supply Voltage Range (Volts)	Shutdown (Volts)	Restart (Volts)
Disabled	None	N/A
200-208	160	174
220-240	185	200
380	305	331
400	320	349
415	335	362
440-480	370	400
550-600	460	502

LCSSS – High Supply Line Voltage

The liquid cooled solid state starter logic/trigger board has detected that the compressor motor AC power line voltage, in any phase, exceeded the high line voltage threshold continuously for twenty (20) seconds. The chiller will automatically restart when the voltage in all phases reaches the restart level. The thresholds are as follows:

TABLE 8 - LCSSS HIGH SUPPLY LINE VOLTAGE THRESHOLDS

Supply Voltage Range (Volts)	Shutdown (Volts)	Restart (Volts)
Disabled	None	N/A
200-208	227	226
220-240	262	261
380	415	414
400	436	435
415	454	453
440-480	524	523
550-600	655	654

VSD CYCLING SHUTDOWN MESSAGES

The following cycling shutdown messages are displayed on compressor motor Variable Speed Drive (VSD) applications only. These messages are generated by events that occur within the VSD. The chiller will automatically restart when the cycling condition clears. Service and troubleshooting information is contained in the *Variable Speed Drive – Service Manual (Form 160.00-M1)*.

VSD Shutdown – Requesting Fault Data

This message indicates the VSD has shutdown the chiller on fault and the OptiView Control Center has not received the cause of the fault from the VSD, via the serial communications link. The VSD shuts down the chiller by opening the motor controller VSD stop contacts (located on the VSD logic board and connected between TB6-16 and TB6-53 in the control center). The control center microboard then sends a request for the cause of the fault to the VSD logic board via the Adaptive Capacity Control board (ACC), over the serial communications link. Since serial communications are initiated every two (2) seconds, this message is typically displayed for a few seconds and then replaced with one of the following fault messages.

VSD – Stop Contacts Open

Refer to **VSD SHUTDOWN – REQUESTING FAULT DATA** message above. When the OptiView microboard does not receive the cause of the fault over the serial link within twenty (20) seconds, the OptiView Control Center assumes the cause is not forthcoming and this message is displayed.

VSD – Logic Board Power Supply

This shutdown is generated by the VSD logic board, indicating that the low voltage power supplies for the logic boards have dropped below their allowable operating limits. The logic board is supplied with power from the 120 to 24 VAC secondary transformer, which is supplied with power from the 480 to 120 VAC control power transformer. This message typically indicates power to the VSD has been lost.

VSD – Single Phase Input Power

This fault is generated by the SCR trigger control and relayed to the VSD logic board to initiate a system shutdown. The SCR trigger control uses circuitry to detect the loss of any one of the three input phases. The trigger will detect the loss of a phase within one half line cycle of the phase loss. This message is also displayed when power to the VSD is removed or if the input power dips to an extremely low level.

VSD – Phase (X) Gate Driver

A second level of current protection exists for each current phase A, B, or C (designated as X above), on the VSD driver boards. The collector-to-emitter saturation voltage of each Insulated Gate Bipolar Transistor (IGBT) is checked continuously while the device is gated on. If the voltage across the IGBT is greater than

a set threshold, the IGBT is gated off and a shutdown pulse is sent to the VSD logic board shutting down the entire VSD system. A gate driver fault can be initiated when the VSD is not running.

VSD Initialization Failed

Upon application of power, all VSD boards go through the INITIALIZATION PROCESS. During this process, memory locations are cleared, program jumper positions are checked and serial communication links are established. There are several causes for unsuccessful initialization as follows:

- The OptiView Control Center and the VSD must be energized at the same time. Pulling the fuse in the OptiView Control Center to remove power from the OptiView will create this fault. Power-up must be accomplished by closing the main disconnect on the VSD cabinet with all fuses in place. A power interruption to the VSD Logic board will also generate this message.
- The Eproms must be of the correct version for each VSD board and they must be installed correctly. The eproms are created as a set, and cannot be interchanged between earlier and later versions.
- Serial data communication must be established. Refer to **VSD – SERIAL COMMUNICATIONS** fault. If communication between the VSD logic board, harmonic filter logic board, ACC board and OptiView Control Center microboard does not take place during initialization, this message will be generated. Proper serial communications can be verified by selecting the VSD DETAILS screen from the MOTOR screen and observing the FLA value. A zero displayed for this and other VSD parameters, indicates a serial communications link problem.
- If the harmonic filter option is included, make sure the filter logic board is not in continuous reset. This condition is evidenced by the filter logic board's LED's alternately blinking. The filter can be eliminated as a cause of initialization failure by disconnecting the filter. Place switch SW1 on the filter logic board in the OFF position and removing the ribbon cable between the filter logic board and the VSD logic boards to check.
- VSD and harmonic filter horsepower ratings do not agree.

VSD – Low DC Bus Voltage

If the DC link drops below 500 VDC (or 414 VDC for 50 Hz applications), the VSD will initiate a system shutdown. A common cause for this shutdown is a severe sag in the incoming power to the drive. Monitor the incoming three-phase AC line and DC link for severe sags with a voltmeter.

VSD – High DC Bus Voltage

The VSD's DC link voltage is continuously monitored and if the level exceeds 745 VDC, a bus over-voltage shutdown is initiated. If this shutdown occurs, the level of the 460 VAC applied to the drive must be checked. The specified voltage range is 414 to 508 VAC. If the incoming voltage is in excess of 508 VAC, steps should be taken to reduce the voltage to within the specified limits.

VSD – High Phase (X) Instantaneous Current

This shutdown is generated by the VSD if the motor current in phase A, B, or C (denoted as X above) exceeds a given limit. The motor current is sensed by the current transformers on the VSD output pole assemblies and the signals are sent to the VSD logic board for processing. Maximum instantaneous permissible currents are:

- 351/292 HP: 771 Amps
- 503/419 HP: 1200 Amps
- 790/658 HP: 1890 Amps

If an overcurrent trip occurs, but the chiller restarts and runs without a problem, the cause may be attributed to a voltage sag on the utility power feeding the VSD that is in excess of the specified voltage range. This is especially true if the chiller was running at or near full load. If there is a sudden dip in line voltage, the current to the motor will increase, since the motor wants to draw constant horsepower. The chiller pre-rotation vanes cannot close quickly enough to correct for this sudden increase in current, and the chiller will trip on an overcurrent fault.

If the chiller will not restart, but keeps tripping on this same fault, an output pole problem is the most likely cause and the VSD would require service.

VSD – DC Bus Voltage Imbalance

The DC link is filtered by many large electrolytic capacitors, rated for 450 VDC. These capacitors are wired in series to achieve 900 VDC capability for the DC link. The voltage must be shared equally from the junction of the center, or series capacitor connection, to the negative bus and the positive bus. This center point should be approximately half of the total DC link voltage. Most actual bus voltage imbalance conditions are caused by a shorted capacitor or a leaky or shorted IGBT transistor in an output phase bank assembly. This usually indicates the VSD requires service.

VSD – Precharge – DC Bus Voltage Imbalance

This message indicates the same fault as the **VSD-DC BUS VOLTAGE IMBALANCE**, except the condition occurred during the chiller prelude period.

VSD – High Internal Ambient Temperature

The internal ambient temperature is monitored by a component mounted on the VSD logic board with a trip threshold set for 140°F. Some potential causes for this shutdown are: internal VSD fan failure, VSD water pump failure or an entering condenser water temperature that exceeds the allowable limit for the job. Additional causes for the shutdown are:

- **Plugged Strainer** – The standard 1.5 Y-strainer contains a woven mesh element with 20 stainless steel wires per inch; adequate for most applications. If condenser water is abnormally contaminated, the strainer may become plugged. Locations with special conditions may consider a dual strainer arrangement with valves to permit cleaning of one strainer with the unit still online.
- **Plugged Heat Exchanger** – In cases where the strainer plugs frequently, the heat-exchanger may eventually plug or become restricted to the point of reduced flow. Back-flush the heat-exchanger by reversing the two rubber hoses which supply condenser water to-from the heat-exchanger. If the rust cannot be back-flushed, the heat-exchanger must be replaced.
- **Low Condenser Flow** – The VSD system requires eight (8) feet of pressure drop across the heat exchanger to maintain adequate liquid flow. If the pressure drop is less than eight feet, the flow problem must be corrected or a booster pump must be added.

VSD – Invalid Current Scale Selection

The position of program jumpers identifies the size of the VSD employed to the logic board. Jumper position allows the VSD to properly scale the output current. If the jumper configuration is incorrect, a chiller shutdown is performed and this message is displayed. Refer to the *Variable Speed Drive – Service Manual (Form 160.00-M1)* for more information.

VSD – Low Phase (X) Inverter Heatsink Temperature

(Style D VSD)

This message indicates a heatsink temperature sensor for Phase A, B, or C (denoted as X above) is showing a temperature less than 37°F and will cause the chiller to shut down. Typically, the problem will be an open thermistor or broken wiring to the thermistor. The normal thermistor resistance is 10K ohms at 77°F.

VSD – Low Converter Heatsink Temperature

If VSD part number is 371-02767-XXX (60 Hz) or 371-03700-XXX (50 Hz), a heatsink temperature sensor indicating a temperature of less than 37°F will cause the chiller to shutdown and display this message. Typically, the problem will be an open thermistor or broken wiring to the thermistor. The normal thermistor resistance is 10K ohms at 77°F.

VSD – Low Phase (X) Inverter Baseplate Temperature

[Applicable to VSD part number 371-03789-xxx (503 HP 60 Hz; 419 HP 50 Hz)]

The chiller has shutdown because the baseplate temperature for the indicated current phase A, B, or C (denoted as X above), has decreased below 37 °F.

VSD – Low Inverter Baseplate Temperature

[Applicable to VSD with part number 371-02767-XXX (60 Hz) or 371-03700-XXX (50 Hz)]

A baseplate temperature sensor indicating a temperature of less than 37°F will cause the chiller to shut down and display this message. Typically, the problem will be an open thermistor or broken wiring to the thermistor. The normal thermistor resistance is 5K ohms at 77°F.

VSD – Logic Board Processor

This shutdown occurs if a communication problem occurs between the two microprocessors on the VSD Logic Board.

VSD – Run Signal

Redundant **RUN** signals are generated by the OptiView Control Center; one via TB6-24 and the second via the serial communications link. Upon receipt of either of the two **RUN** commands by the VSD, a five (5) second timer starts. If both run commands are not received by the VSD logic board within five seconds, a shutdown is performed and this message is displayed. This fault is generally indicative of a wiring problem between the OptiView Control Center and the VSD

VSD – Precharge – Low DC Bus Voltage

During precharge, the DC link must be equal to or greater than 50 VDC (41 VDC for 50 Hz) within one-half (0.5) second and 500 VDC within fifteen (15) seconds after the precharge relay is energized. If this condition is not met, a shutdown is performed and this message is displayed.

VSD – Serial Communications

This fault occurs when communications between the Adaptive Capacity Control (ACC) board and the VSD logic board, or between the control center microboard and the VSD logic board are disrupted. This is typically caused by defective wiring between J11 on the VSD Logic Board and J8 on the ACC Board.

HARMONIC FILTER CYCLING SHUTDOWN MESSAGES

The following cycling shutdown messages are displayed on compressor motor Variable Speed Drive (VSD) applications with the optional harmonic filter only. These messages are generated by events that occur within the VSD harmonic filter. The chiller will automatically restart when the cycling condition clears. Service and troubleshooting information is contained in the *Variable Speed Drive – Service Manual (Form 160.00-M1)*.

Harmonic Filter – Logic Board Or Communications

This message is displayed when communications between the harmonic filter and the VSD logic board are disrupted. The communications must be interrupted for ten (10) continuous communications cycles (20 seconds) before the shutdown will occur.

Harmonic Filter – Phase Locked Loop

This shutdown indicates that a circuit called PHASE LOCKED LOOP on the filter logic board has lost synchronization with the incoming power line. This is usually indicative of an open fuse in one of the filter's incoming power line. Filter power fuses 11FU, 12FU and 13FU should be checked.

Harmonic Filter – High Phase X (A, B, or C) Current

The maximum instantaneous harmonic filter current for each current phase is monitored and compared to a preset limit. If this limit is exceeded, a shutdown is performed and this message for the current phase affected is generated. The filter current is monitored using two DCCT's (DC Current Transformer) and these signals are processed by the filter logic board. The preset limits are as follows:

- 351/292 HP: 356 Amps
- 503/419 HP: 496 Amps
- 790/658 HP: 745 Amps
- 1048/917 HP: 385 AMPS

If the VSD automatically restarts after this shutdown and continues to operate properly with the filter operating, most likely the filter tripped due to a sag or surge in the voltage feeding the VSD. If this message reoccurs, preventing the chiller from starting, the VSD will require service.

Harmonic Filter – High DC Bus Voltage

This shutdown occurs if the voltage level applied to the Harmonic Filter exceeds 860 VAC. The specified voltage range is 414 to 508 VAC. If the incoming voltage is in excess of 508, steps should be taken to reduce the level to within specified limits. The cause of this message is typically high line voltage or a surge on the utility supply.

The harmonic filter has a DC bus as part of the filter power assembly, and this DC link is not connected in any way with the VSD's DC link.

Harmonic Filter – Low DC Bus Voltage

This shutdown occurs when the filter's DC link voltage decreases to a level less than 60 VDC below the filter DC link voltage setpoint. This setpoint is determined by the filter logic board via the sensing of the three phase input line-to-line voltage. The setpoint is set to the peak of the sensed input line-to-line voltage plus 32 volts, not to exceed 760 volts.

The harmonic filter logic board generates a filter DC link voltage by switching the filter IGBT's. This DC level is higher than the level that could be obtained by only rectifying the input line voltage. By generating the DC link voltage, the harmonic filter performs a voltage BOOST function. This is necessary in order to permit current to flow into the power line from the filter when the input line is at peak level. This varies with the input line-to-line voltage. If this shutdown occurs, the likely cause is a severe sag in the input line voltage.

Harmonic Filter – Precharge – Low DC Bus Voltage

During precharge, the filter's DC link must be equal to or greater than 50 VDC (41 VDC for 50 Hz) within 1/10 second after the precharge relay is energized. If this condition is not met, a shutdown is performed and this message is generated.

Harmonic Filter – DC Bus Voltage Imbalance

This shutdown occurs when the shared voltage between the DC link capacitors is not within specifications. The electrolytic capacitors, rated for 450 VDC, are wired in series to achieve a 900 VDC capability for the DC link. The voltage must be shared equally from the junction of the center or series capacitor connection, to the negative bus and to the positive bus. This center point should be approximately half of the total DC link voltage.

Harmonic Filter – Input Current Overload

The three phases of RMS filter current are monitored and if any one of the three phases continuously exceeds a given threshold for seven (7) seconds, a chiller shutdown is performed and this message is displayed. The maximum permissible continuous RMS current ratings for the harmonic filter are as follows:

- 351/292 HP: 128 AMPS
- 503/419 HP: 176 AMPS
- 790/658 HP: 277 AMPS
- 1048/917 HP: 385 AMPS

Harmonic Filter – Logic Board Power Supply

The low voltage power supplies on the filter logic board have decreased below the allowable operating

range. The filter logic board receives power from the VSD logic board via a ribbon cable that connects the two boards.

Harmonic Filter – Run Signal

When a digital run command is received at the filter logic board from the VSD logic board (via the 16 position ribbon cable), a 1/10 second timer is started. If a redundant **RUN** command does not occur on the serial data link from the VSD logic board before the timer expires, a shutdown is performed and this message is generated.

Harmonic Filter – DC Current Transformer X (1 or 2)

During initialization, with no current flowing through each DC Current Transformer (DCCT), the DCCT output voltages are measured and compared with a preset limit via the filter logic board. If the measured values exceed the preset limits, the DCCT's are presumed to be defective and a message indicating which DCCT is affected (1 or 2) and a chiller shutdown will occur.

SAFETY SHUTDOWN MESSAGES

Condenser – High Pressure

The condenser pressure, as sensed by the condenser transducer, has increased above 29.7 PSIA. The chiller can be started after the pressure decreases below 23.7 PSIA and the compressor switch is placed in the **STOP/RESET (O)** position.

Condenser – Pressure Transducer Out of Range

The Condenser Pressure Transducer is indicating a pressure greater than 35.3 PSIA. This is outside the normal operating range of the transducer and generally indicates a defective transducer. The chiller can be started after the transducer indicates a pressure that is within range (at or below 35.3 PSIA) and the compressor switch is placed in the **STOP/RESET (O)** position.

Condenser – High Pressure Contacts Open

This safety fault is set whenever the High Pressure Cutout (HPCO) switch contacts are open. The fault is released when the switch contacts close, and the compressor switch is placed in the **STOP/RESET (O)** position.

Evaporator – Low Pressure

The evaporator pressure has decreased to the safety shutdown threshold. For water cooling applications, the safety shutdown threshold is a fixed value for the respective refrigerant. For brine cooling applications, the safety shutdown threshold varies according to the concentration of the brine solution and is programmed at the YORK Factory. This should not be changed by anyone other than a qualified service technician following instructions in the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*. The chiller can be started after the evaporator pressure increases to the restart threshold and the compressor switch is placed in the **STOP/RESET (O)** position. Refer to *Table 9* for shutdown and restart thresholds:

TABLE 9 - EVAPORATOR PRESSURE THRESHOLDS

Shutdown Threshold (PSIA)			Restart Threshold (PSIA)	
Refrig.	Water	Brine	Water	Brine
R11	< 5.4	0.0 to 12.5 as programmed	> 5.4	> Shutdown threshold
R123	< 4.4	0.0 to 12.5 as programmed	> 4.4	> Shutdown threshold

Evaporator – Low Pressure – Smart Freeze

Smart Freeze protection is activated and has shutdown the chiller because the evaporator temperature has been below the Smart Freeze threshold for greater than the allowable number of seconds. If the refrigerant temperature sensor (RT7) is ENABLED, this parameter is used as the evaporator refrigerant temperature and the freeze threshold is 32.8°F. If RT7 is not enabled, the refrigerant temperature displayed is the evaporator saturation temperature, derived from the evaporator pressure transducer. The freeze threshold is 34.0°F.

The total count is incremented for every second the evaporator refrigerant temperature is below the freeze threshold (but is never decremented below zero). The amount of seconds until the chilled liquid will freeze is based on how far the evaporator refrigerant temperature is below the freeze threshold as follows:

$$\# \text{ seconds to freezing} = (4053.7) / (\text{freeze threshold} - \text{evap. refrigerant temp.})$$

Smart Freeze is activated only if the feature has been enabled by a service technician and the leaving chilled liquid temperature setpoint is less than 38.0°F.

Evaporator – Transducer or Leaving Liquid Probe

The control center has detected a possible defective evaporator pressure transducer or leaving chilled liquid temperature thermistor. The OptiView Control Center converts the evaporator pressure to a saturated temperature value and compares this value to the leaving chilled liquid temperature (difference = chilled liquid temp – evaporator saturated temp). The difference should not be outside the range of –2.5°F to +25.0°F. If the transducer and thermistor are accurate, the evaporator saturated temperature should not be more than 2.5°F warmer, or more than 25.0°F colder than the leaving chilled liquid temperature. In order to initiate a shutdown, the difference must be outside the acceptable range continuously for ten minutes.

Evaporator – Transducer or Temperature Sensor

The control center has detected a possible defective evaporator pressure transducer or refrigerant temperature sensor. The control center converts the evaporator pressure to a saturated temperature value and compares this value to the evaporator refrigerant temperature sensor (RT7, if enabled). If the difference between these temperatures is greater than 3.0°F continuously for one minute, this shutdown is performed. This check is only performed under the following conditions:

- RT7 is enabled.
- Chiller has been running for ten minutes.
- Not in Brine chilled liquid mode.
- Smart Freeze is enabled.
- Evaporator temperature sensor (RT7) or evaporator saturation temperature is indicating a temperature less than 32.0°F).

The chiller can be started after the temperatures are within 3.0°F of one another and the compressor switch is placed in the **STOP/RESET (O)** position.

Discharge – High Temperature

This message indicates the discharge temperature has increased above 220.0°F. The chiller can be re-started after the temperature decreases below 220.0°F and the

compressor switch is placed in the **STOP/RESET (O)** position.

Discharge – Low Temperature

This message indicates the discharge temperature has decreased below 30.0°F. The chiller can be re-started after the temperature increases above 30.0°F and the compressor switch is placed in the **STOP/RESET (O)** position.

Oil – High Temperature

The oil temperature, as sensed by the oil temperature thermistor, is above 180.0°F. The chiller can be started after the temperature decreases below 180.0°F and the compressor switch is placed in the **STOP/RESET (O)** position.

Oil – High Differential Pressure

Indicates the differential oil pressure increased above 60.0 PSID (159.0 PSID, if equipped with an auxiliary oil pump) while the oil pump was running. The differential oil pressure is the difference between the output of the sump oil pressure transducer (system low pressure) and the output of the pump oil pressure transducer (system high pressure). The chiller can be started after the differential oil pressure decreases below 60.0 PSID and the compressor switch is placed in the **STOP/RESET (O)** position.

Oil – Low Differential Pressure

This message indicates the differential oil pressure is below the low pressure cutout setpoint while the chiller was running or dropped to less than 5.0 PSID above the low pressure cutout by the last five (5) seconds of the SYSTEM PRELUBE period. The differential oil pressure is the difference between the output of the sump oil pressure transducer (system low pressure) and the output of the pump oil pressure transducer (system high pressure). The chiller can be started after the compressor switch is placed in the **STOP/RESET (O)** position.

Auxiliary Safety – Contacts Closed

The auxiliary safety shutdown contacts, connected to I/O board TB4-31 have closed, initiating a safety shutdown. This input is connected to the electromechanical low differential oil pressure switch (LOPCO) installed on chillers retrofitted with the OptiView panel. The chiller can be started after the safety contacts open and the compressor switch is placed in the **STOP/RESET (O)** position.

Control Panel – Power Failure

A control panel power failure has occurred. If the power failure duration was less than the duration of the programmed SYSTEM COASTDOWN period, the remainder of the coastdown is performed upon restoration of power. The chiller can be started after the compressor switch is placed in the **STOP/RESET (O)** position. The control center indicates a cycling shutdown when this message is displayed in orange characters; a safety shutdown when displayed in red characters. The control center can be configured for auto-restart or manual restart after power failure by a qualified Service technician following instructions in the *OptiView Control Center Retrofit Kit - Trane Service Manual (Form 160.10-M1)*.

Motor or Starter – Current Imbalance

The three phase compressor motor current imbalance was higher than 30% continuously for 45 seconds. The imbalance is not checked until the chiller has been running for at least 45 seconds and the average of the three phases of motor current is greater than 80% of the programmed 100% chiller Full Load Amps. The average is calculated as: $I_{ave} = (I_a + I_b + I_c) / 3$. The imbalance is calculated as:

$$\frac{(I_a - I_{ave}) + (I_b - I_{ave}) + (I_c - I_{ave})}{2(I_{ave})} \times 100$$

The Mod “B” Solid State Starter detects the imbalance condition and transmits the condition to the OptiView Control Center microboard via serial communications. The Variable Speed Drive returns the 3-phase motor current values to the OptiView Control Center microboard where the unbalance calculation is performed. This safety shutdown is not performed on electromechanical starter applications.

Motor – High Winding Temperature

This message indicates that a motor winding for current phase A, B, or C has exceeded the programmed winding cutout temperature, initiating a chiller shutdown. The chiller can be restarted after the winding temperature has decreased below the winding cutout setpoint.

Motor – High Bearing Temperature

This message indicates that a motor bearing has exceeded the programmed bearing cutout temperature, initiating a chiller shutdown. The chiller can be restarted after the bearing temperature has decreased below the bearing cutout setpoint.

MOD “B” SOLID STATE STARTER SAFETY SHUTDOWN MESSAGES

The following safety shutdown messages are displayed for liquid cooled solid state starter (LCSSS) applications only. These messages are generated by events that occur within the LCSSS. The chiller can be started after the problem has been corrected and a manual reset of the compressor motor switch occurs. Service and troubleshooting information is contained in the *Solid State Starter MOD “B” – Operation/Service Manual (Form 160.00-O2)*.

LCSSS Shutdown – Requesting Fault Data...

The liquid cooled solid state starter logic/trigger board has shut down the chiller but the control center has not yet received the cause of the fault from the LCSSS. The LCSSS shuts down the chiller by opening the motor controller LCSSS stop contacts (K1 relay located on the logic/trigger board and connected between TB6-16 and TB6-53 in the control center). The control center microboard then sends a request for the cause of the fault to the logic/trigger board over the serial communications link. Since serial communications are initiated every two seconds, this message is typically displayed for a few seconds and then replaced with one of the following fault messages.

LCSSS – 105% Motor Current Overload

The highest phase of the compressor motor current is above 105% of the programmed 100% chiller Full Load Amps (FLA) continuously for forty (40) seconds.

LCSSS – High Instantaneous Current

This message indicates the solid state starter logic/trigger board detected that the compressor motor current in any phase exceeded 1.1 (1.414 x RMS value of the programmed Start Current) for a minimum of one second.

LCSSS – High Phase X Heatsink Temperature – Running

The solid state starter logic/trigger board has detected the temperature of current phase A, B or C (designated as X above) Silicon Controlled Rectifier (SCR) modules exceeded 212°F while the chiller was running. The fault can be cleared after all SCR temperatures are lower than 210°F and the compressor switch is placed in the **STOP/RESET (O)** position. However, the chiller cannot be started until all SCR temperatures are lower than 109°F. During the shutdown, the starter cooling pump runs until the temperature is below 109°F.

LCSSS – Phase (X) Shorted SCR

A shorted Silicon Controlled Rectifier (SCR) in phase A, B or C (designated as X in the message) has been detected by the solid state starter logic/trigger board. The voltage across each SCR is monitored to detect the shorted condition. The shorted condition must exist continuously for five (5) seconds in order for the OptiView Control Center to trigger and display the fault. This check is disabled while the chiller is running.

LCSSS – Open SCR

An open Silicon Controlled Rectifier (SCR) has been detected by the solid state starter logic/trigger board. The open condition must exist continuously for five (5) seconds in order for the control center to trigger and display the fault. The chiller can be started after the condition has been corrected. In certain applications, local power line conditions could interfere with the open SCR detection technique. This requires a qualified service technician to disable this check. Refer to the *Solid State Starter MOD “B” – Operation/Service Manual (Form 160.00-O2)*.

LCSSS – Phase Rotation

The solid state starter logic/trigger board has detected the three phase compressor motor power line voltage phase rotation is not correct. The chiller can be started after the phase rotation is correct.

VSD SAFETY SHUTDOWN MESSAGES

The following safety shutdown messages are displayed on compressor motor Variable Speed Drive (VSD) applications only. These messages are generated by events that occur within the VSD. The chiller can be started after the problem has been corrected and a manual reset of the compressor motor switch and VSD logic board reset occurs. Service and troubleshooting information is contained in the *Variable Speed Drive – Service Manual (Form 160.00-M1)*.

VSD Shutdown – Requesting Fault Data

The VSD has shut down the chiller and the control center has not yet received the cause of the fault from the VSD, via the serial communications link. The VSD shuts down the chiller by opening the motor controller VSD STOP CONTACTS (located on the VSD Logic Board and connected between TB6-16 and TB6-53 in the control center). The control center microboard then sends a request for the cause of the fault to the VSD logic board via the adaptive capacity control (ACC) board. Since serial communications are initiated every

two seconds, this message is typically displayed for a few seconds and then replaced with one of the following fault messages.

VSD – 105% Motor Current Overload

This shutdown is generated by the VSD logic board and indicating that a motor overload has occurred. The shutdown is generated when the VSD logic board has detected that at least one of the three output phase currents has exceeded 105% of the chiller Full Load Amps (FLA) value for longer than seven (7) seconds. The chiller FLA value is set by adjustment of the FLA potentiometer on the VSD Logic Board.

VSD – High Converter Heatsink Temperature

(Applicable to VSD with Part Number 371-02767-XXX (60 Hz) and 371-03700-XXX (50 Hz))

This shutdown will occur if the heatsink temperature exceeds 170°F. The chiller can be started after the fault condition clears. If this message is displayed, make sure there is adequate coolant level, check that the coolant pump is operating when the chiller is running, and check the strainer of the heat exchanger primary for clogs and silt.

VSD – High Inverter Baseplate Temperature

(Applicable to VSD with Part Number 371-02767-XXX (60 Hz) and 371-03700-XXX (50 Hz))

This shutdown will occur if the baseplate temperature exceeds 175°F. If this message is displayed, make sure there is adequate coolant level, check that the coolant pump is operating when the chiller is running, and check the strainer of the heat exchanger primary for clogs and silt.

VSD – High Phase (X) Inverter Heatsink Temperature

(Style D VSD)

This shutdown will occur if the heatsink temperature for current phase A, B, or C (denoted by X above) exceeds 158°F on any of the output pole assemblies. This shutdown will seldom occur. In most cases where the coolant temperature has risen abnormally, the VSD will shut down on AMBIENT TEMPERATURE @ 140.0°F before the heatsinks can reach 158°F. If this message is displayed, make sure there is adequate coolant level, ascertain the pump is operating when the chiller is run-

ning, and check the strainer of the heat exchanger primary for clogs and silt.

VSD – High Converter Heatsink Temperature

(Style D VSD)

This shutdown will occur if the heatsink temperature exceeds 158°F on any of the output pole assemblies. This shutdown will seldom occur. In most cases where the coolant temperature has risen abnormally, the VSD will shut down on AMBIENT TEMPERATURE @ 140.0°F before the heatsinks can reach 158°F. If this message is displayed, make sure there is adequate coolant level, check that the coolant pump is operating when the chiller is running, and check the strainer of the heat exchanger primary for clogs and silt.

VSD – High Phase (X) Inverter Baseplate Temperature

(VSD part number 371-03789-xxx (503HP 60 Hz; 419HP 50 Hz))

The chiller has shutdown because the baseplate temperature for current phase A, B, or C (denoted by X above) has exceeded 158°F. If this message is displayed, make sure there is adequate coolant level, check that the coolant pump is operating when the chiller is running, and check the strainer of the heat exchanger primary for clogs and silt.

VSD – Precharge Lockout

If the VSD fails to make precharge, the precharge relay will cut out for ten (10) seconds during which time the VSD fans and coolant pumps will remain energized in order to permit the precharge resistors to cool. Following this ten second cool down period, precharge will again be initiated. If the VSD fails to make precharge after three consecutive tries, the unit will shut down, lockout, and display this message.

HARMONIC FILTER SAFETY SHUTDOWN MESSAGES

The following safety shutdown messages are displayed on compressor motor variable speed drive applications with the optional harmonic filter installed. These messages are generated by events that occur within the VSD harmonic filter. Service and troubleshooting information is contained in the *Variable Speed Drive – Service Manual (Form 160.00-M1)*.

Harmonic Filter – High Heatsink Temperature

(Style D VSD)

The harmonic filter power assembly has one heatsink thermistor on the 503 HP units, and two heatsink thermistors on the 790 HP units. If the temperature on any heatsink exceeds 167°F, the unit will shut down. This message is usually an indication of a low coolant level in the VSD cooling loop. The chiller can be started after the fault condition clears, the OVERTEMP RESET button on the filter logic board is pressed, and the compressor switch is placed in the **STOP/RESET (O)** position.

Harmonic Filter – High Baseplate Temperature

(Applicable to VSD with part number 371-02767-XXX (60 Hz) and 371-03700-XXX (50 Hz))

This shutdown occurs when the baseplate temperature exceeds 174°F. The chiller can be started after the fault condition clears, the OVERTEMP RESET button on the filter logic board is pressed, and the compressor switch is placed in the **STOP/RESET (O)** position.

Harmonic Filter – High Baseplate Temperature

(VSD part number 371-03789-xxx (503HP 60 Hz; 419HP 50 Hz))

The chiller has shutdown because the baseplate temperature has increased above 194°F. The chiller can be started after the fault condition clears, the OVERTEMP RESET button on the filter logic board is pressed and the compressor switch is placed in the **STOP/RESET (O)** position.

Harmonic Filter – High Total Demand Distortion

This shutdown indicates the filter is not operating correctly and the input current to the VSD/Filter is not sinusoidal. This shutdown will occur if the TDD exceeds 25% continuously for 45 seconds. TDD is an acronym for Total Demand Distortion, a term defined by the IEEE Std 519-1992 standard as the “total root-sum-square harmonic current distortion, in percent of the maximum demand load current (15 or 30 min demand)”. In the harmonic filter option supplied by

YORK, the displayed TDD is the total RMS value of all the harmonic current supplied by the main power to the VSD divided by the chiller Full Load Amps, in percent. A standard VSD, less the optional filter typically has an input current TDD level on the order of 28-30%. The chiller can be started after the compressor switch is placed in the **STOP/RESET (O)** position.

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SECTION 4 - PRINTERS



OKIDATA MICROLINE 184



WEIGH-TRONIX



SEIKO DPU-414

FIGURE 43 - PRINTERS

PRINTERS OVERVIEW

A printer can be connected to the OptiView Control Center's Microboard to print the following reports. The screen from which each report can be generated is listed in parenthesis.

- **Status** - Present system parameters (Printer, Home)
- **Setpoints** - Present programmed values of all setpoints (Printer, Setpoints)
- **Schedule** - Present value of programmed daily schedule (Printer, Schedule)
- **Sales Order** - Information on Sales Order Screen (Printer, Sales Order)
- **History** - System parameters at the time of the last normal stop, last fault while running and last 10 faults, whether running or not (Printer, History)
- **Cycling or Safety shutdown initiated Print "Snapshot"** - "Snapshot" of all system parameters at instant of shutdown. Automatically occurs if printer is connected at time of shutdown.
- **ACC Surge Map** - System conditions at instant all surge points were mapped. (compressor motor variable speed drive applications; requires "Service" access level)
- **Trend** - Prints "snapshots" of the existing trend screen data or prints new data collected after the trend print key is pressed.

The operator can set up the OptiView Control Center data logging feature to produce a Status report automatically at a selected start time and interval.

Refer to the following figures for examples of the different print reports.

- Figure 44 - Status
- Figure 45 - Setpoints
- Figure 46 - Schedule
- Figure 47 - Sales Order
- Figure 48 - History
- Figure 50 - Trend
- Figure 51 - Custom Screen
- Figure 52 - Adaptive Capacity Control New Map Point Report
- Figure 53 - Adaptive Capacity Control Existing Map Points Report

PRINTERS

The following printers can be connected to the OptiView Control Center to provide print reports. Printers must be equipped with an RS-232 Serial interface for to communicate properly with the OptiView panel.

Okidata

Model: 184 turbo

- Dimensions: 14 in. wide x 10.5 in. deep
- Paper: 8.5 in. wide
- Type: Dot matrix impact
- Purchase: 800-OKIDATA or www.okidata.com

Weigh-Tronix

Models: 2600, 1220

- Dimensions: 2.3 in. wide x 2.8 in. deep
- Paper: 2.25 in. wide
- Type: Dot matrix impact
- Purchase:
- USA 800-982-6622
- International 707-527-5555
- www.wtxweb.com

Seiko

Model: DPU414-30B (Power supply PW4007-U I required)

- Dimensions: 6.3 in. wide x 6.7 in. deep
- Paper: 4.4 in. wide
- Type: Thermal
- Purchase: www.siiprinters.com

The OptiView control center provides the required formatting control codes for the printers based upon the printer selected. These codes are transmitted through the serial data interface to the printer to provide a proper print format.

Different printers require different formatting control codes. Other printers may provide proper operation when connected to the control center, but the print format may not be correct.

Exercise care and use the following guidelines if an unlisted printer is to be connected to the OptiView panel:

1. The printer must be capable of RS-232 Serial communications.
2. Primary differences between printers involve the formatting control codes required by the printer. These codes are sent from the control center to the printer. For example, Weigh-Tronix printers require a control code to select 40 column width. This same code is interpreted by the Okidata printer as an instruction to print wide characters. In some instances, a printer will ignore a code that cannot be interpreted.
3. The control center requires a busy signal from the printer when the printer receive buffer is full. This causes the control center to suspend data transmission until the printer can accept more data. The busy signal polarity must be logic low when busy for proper printer operation.

PRINTER CONNECTIONS

Connect the listed printers to the control center micro-board as follows. Only one printer can be connected at a time.

TABLE 10 - OKIDATA 182, 182 TURBO, 184 TURBO PRINTER CONNECTIONS

Microboard	Printer	Function
J2-4	pin 3	Tx (data to printer)
J2-2	pin 11	DSR (busy signal from printer)
J2-9	pin 7	Gnd
Cabinet		Shield

TABLE 11 - WEIGH-TRONIX PRINTER CONNECTIONS

Microboard	Printer	Function
J2-4	pin 2	Tx (data to printer)
J2-2	pin 5	DSR (busy signal from printer)
J2-9	pin 7	Gnd
Cabinet		Shield

TABLE 12 - SEIKO PRINTER CONNECTIONS

Microboard	Printer	Function
J2-4	pin 3	Tx (data to printer)
J2-2	pin 8	DSR (busy signal from printer)
J2-9	pin 5	Gnd
Cabinet		Shield

Hardware Required:

Cable

#18 AWG stranded 50 ft. maximum length.

Connectors

Microboard

- None. Strip 1/4" insulation from wire and insert into screw terminal block.

Printers

- Okidata - 25 pin plug DB-25P or equivalent; Shell DB-C2-J9 or equivalent.
- Weigh-Tronix - Same as Okidata. Cable assembly available from Weigh-Tronix.
- Seiko - 9-Pin D-type Subminiature (DB-9 pin male).

PRINTER SETUP

The selected printer must be configured as follows. Refer to manual provided by Printer manufacturer with the respective Printer.

OKIDATA 182, 182 turbo, 184 turbo Printer

CONTROL BOARD Switch settings:

1	on	Unslashed 0
2	off	Unslashed 0
3	off	Unslashed 0
4	off	Form Length 11 in.
5	on	Form Length 11 in.
6	off	Auto Line Feed off
7	on	8 bit data
8	off	Enable front panel

If equipped with a SUPER SPEED serial Board:

1-1	on	Odd or even parity
1-2	on	No parity
1-3	on	8 bit data
1-4	on	Protocol ready/busy
1-5	on	Test select
1-6	on	Print mode
1-7	off	SDD(-) pin 11
1-8	on	SDD(-) pin 11
2-1	on	1200 Baud*
2-2	on	1200 Baud*
2-3	off	1200 Baud*
2-4	off	DSR active
2-5	on	Buffer threshold 32 bytes
2-6	on	Busy signal 200ms
2-7	on	DTR space after power on
2-8	Not Used	

If equipped with HIGH SPEED serial board:

1	off	(-) Low when busy
2	off	1200 Baud*
3	off	1200 Baud*
4	on	1200 Baud*

5	Not	Used
6	off	no parity
7	off	Pin 20 & pin 11 act as busy line

WEIGH-TRONIX Printer

IMP-24 Model 2600

1 off 1200 Baud*

2 on 1200 Baud*

Model 1220 Configure Menu

Baud= 1200

Data Bits = 8

Stop Bits = 1

Hshake = Busy-Line

Cols = 32

Invert = No

Font = 5 x 8

Mag = None

Custom Menu

Auto Seq = No

Zero = 0

Pound sign = #

_(Underscore)

Busy invert = no

Online/offline = yes

Ext Ch Set = no

Print ready = yes

Set Clock = Not Used

Reset Seq = Not Used

SEIKO

Dip Switch Settings

1-1	off	Input-Serial
1-2	on	Printing speed high
1-3	on	Auto loading - on
1-4	off	Auto LF - off
1-5	on	Setting Command - Enable
1-6	off	Printing density - 100%

1-7	on	Printing density - 100%
1-8	on	Printing, density - 100%
2-1	on	Printing Columns - 40
2-2	on	User Font Back-up - on
2-3	on	Character Select - normal
2-4	off	Zero - slash
2-5	on	International character set - American
2-6	on	International character set - American
2-7	on	International character set - American
2-8	off	International character set - American
3-1	on	Data length - 8 bits
3-2	on	Parity Setting - no
3-3	on	Parity condition - odd
3-4	on	Busy control - H/W busy
3-5	on	Baud rate select - 1200*
3-6	off	Baud rate select - 1200*
3-7	on	Baud rate select - 1200*
3-8	off	Baud rate select - 1200*

* Settings shown for 1200 Baud. Other Baud rates can be selected. Refer to printer manufacturer's manual supplied with printer.

CONTROL CENTER SETUP

Chiller ID

Access Level Required: OPERATOR

An "Identification Number" can be assigned to the chiller at the COMMS (optional). This number will appear at the top of each report.

Printer Type

Access Level Required: OPERATOR

Using the Printer screen, the actual printer type connected to the control center must be entered. Selection determines the control codes that are sent to the printer. These codes determine such things as lines per inch, character width and general formatting. Available selections are: Okidata, Weigh-Tronix, Seiko and Epson.

Printer Setup

Access Level Required: OPERATOR

Using the COMMS Screen, the control center must be configured to transmit data in the same format as the Printer is configured to receive the data. The following values must be entered.

- Baud Rate - Set as desired. Value selected must agree with the installed printer's configuration.
- Data Bits - 8
- Parity - None
- Stop Bits - 1

Automatic Data Logging

Access Level Required: OPERATOR

If automatic data logging is desired, a Status report can be automatically printed at a specified interval beginning at a specified time, using the Printer screen. The interval is programmable over the range of 1 minute to 1440 minutes in one minute increments. The first print will occur at the programmed start time and occur at the programmed output interval thereafter. The time remaining until the next print is displayed on the Printer screen.

- Automatic Printer Logging - Enables and disables automatic data logging
- Log Start Time - Enter the time the first print is desired.
- Output Interval - Enter the desired interval between prints.

YORK UPDATE	
CHILLER ID 0	
(c) 1997 - 2004 YORK INTERNATIONAL CORPORATION	
Mon 22 Nov 2004 8:50:45 AM	
SYSTEM RUN	
LEAVING CHILLED LIQUID CONTROL	
[All warnings presently active will be listed here]	
Controls	C.MLM.08.01
Run Time	0 Days 2 Hr 59 Min
Operating Hours	= 25 Hr
Number Of Starts	= 6
Control Source	= Local
Evaporator	

Leaving Chilled Active Setpoint	= 45.0 °F
Chilled Liquid Pump	= Run
Chilled Liquid Flow Switch	= Closed
Leaving Chilled Liquid Temperature	= 45.0 °F
Return Chilled Liquid Temperature	= 55.0 °F
Evaporator Pressure	= 75.0 Psig
Evaporator Saturation Temperature	= 44.4 °F
Evaporator Refrigerant Temperature	= 44.5 °F
Small Temperature Difference	= 0.5 °F
Condenser	

Condenser Liquid Pump	= Run
Condenser Liquid Flow Switch	= Closed
Leaving Condenser Liquid Temperature	= 95.0 °F
Return Condenser Liquid Temperature	= 85.0 °F
Condenser Pressure	= 200.0 Psig
Condenser Saturation Temperature	= 101.4 °F
Small Temperature Difference	= 6.4 °F
Drop Leg Refrigerant Temperature	= 83.0 °F
[If Drop Leg Sensor enabled]	
Sub Cooling Temperature	= 18.4 °F
[If Drop Leg Sensor enabled]	
Compressor	

Discharge Temperature	= 120.0 °F
Vent Line Solenoid	= On
Oil Sump	

Auxiliary Oil Pump	= Off
Sump Oil Pressure (LOP)	= 75.8 Psig
Pump Oil Pressure (HOP)	= 124.6 Psig
Oil Pressure	= 47.8 Psid
Oil Sump Temperature	= 150.0 °F
Oil Heater	= Off
[Skip the following section if Hot Gas Bypass is not enabled]	
Hot Gas	

Valve Position	= 15 %
Pre-Rotation Vanes Position	= 75 %

FIGURE 44 - SAMPLE PRINTOUT (STATUS)

[Skip the following section if Liquid Level is not enabled]

Refrigerant Level Control

Refrigerant Level Position = 35 %

Purge Control

Pressure = 30.1 PSIA
 Exhaust Count = 0
 Exhaust Window = 0 Min

[Skip the following section if Motor Type is not EM]

Electro-Mechanical Starter

Motor Run = On
 % Full Load Amps = 94 %

[Skip the following section if Motor Type is not Mod B SSS]

Liquid-Cooled Solid State Starter

Starter Model = 26L
 Motor Run = On
 % Full Load Amps = 95 %
 kW Hours = 20723 kWh
 Input Power = 8225 kW
 Phase A Voltage = 422 V
 Phase B Voltage = 449 V
 Phase C Voltage = 449 V
 Phase A Current = 253 A
 Phase B Current = 257 A
 Phase C Current = 262 A
 Phase A Temperature = 109 °F
 Phase B Temperature = 109 °F
 Phase C Temperature = 110 °F

[Skip the following section if Motor Type is not VSD]

Variable Speed Drive

Motor Run = On
 % Full Load Amps = 94 %
 Pre-Rotation Vanes Position = 75 %
 Full Load Amps = 402 A
 Precharge Relay Output = Off
 Trigger SCR Output = On
 Water Pump Output = On
 kW Hours = 14528 kWh
 Input Power = 150 kW
 Output Frequency = 60 Hz
 Output Voltage = 800 V
 DC Bus Voltage = 600 V
 DC Inverter Link Current = 300 A
 Phase A Output Current = 195 A
 Phase B Output Current = 198 A
 Phase C Output Current = 193 A
 Internal Ambient Temperature = 88 °F
 Converter Heatsink Temperature = 102 °F
 Phase A Heatsink Temperature [If TMIII VSD] = 93 °F
 Phase B Heatsink Temperature [If TMIII VSD] = 99 °F
 Phase C Heatsink Temperature [If TMIII VSD] = 97 °F
 Baseplate Temperature [If VyperDrive VSD] = 106 °F

[Skip the following section if Motor Type is not VSD or Filter is not present]

Harmonic Filter Data

Precharge Contactor = Off
 Supply Contactor = On
 Operating Mode = Running
 Phase Rotation = ABC
 Total Supply kVA = 148 kVA
 Total Power Factor = 0.97
 DC Bus Voltage = 608 V
 Heatsink Temperature [If TMIII VSD] = 102 °F
 Baseplate Temperature [If VyperDrive VSD] = 102 °F
 Voltage Peak N-L1 = 200 V
 Voltage Peak N-L2 = 200 V
 Voltage Peak N-L3 = 200 V
 L1-L2 RMS Voltage = 215 V
 L2-L3 RMS Voltage = 215 V
 L3-L1 RMS Voltage = 215 V
 L1 RMS Filter Current = 150 A
 L2 RMS Filter Current = 150 A
 L3 RMS Filter Current = 150 A
 L1 RMS Supply Current = 152 A
 L2 RMS Supply Current = 152 A
 L3 RMS Supply Current = 152 A
 L1 Voltage Total Harmonic Distortion = 1.5 %
 L2 Voltage Total Harmonic Distortion = 1.2 %
 L3 Voltage Total Harmonic Distortion = 1.1 %
 L1 Supply Current Total Demand Distortion = 2.6 %
 L2 Supply Current Total Demand Distortion = 2.3 %
 L3 Supply Current Total Demand Distortion = 2.8 %

FIGURE 44 - SAMPLE PRINTOUT (STATUS) (CONT'D)

Motor Winding Temperature

A1 = 193.3 °F
 B1 = 192.5 °F
 B2 = 193.1 °F

Bearing Temperature

Sensor 1 = 128.3 °F
 Sensor 2 = 129.5 °F

FIGURE 44 - SAMPLE PRINTOUT (STATUS) (CONT'D)

FIGURE 44 - SAMPLE PRINTOUT (STATUS) (CONT'D)

```

YORK SCHEDULE
CHILLER ID 3
© 1997 - 2004 YORK INTERNATIONAL CORPORATION
MON 29 MAR 2004 1 27 PM

SCHEDULE = OFF

STANDARD SCHEDULE
-----
SUN  START = OFF      STOP = OFF
MON  START = 8:00 AM  STOP = 5:00 PM
TUE  START = 8:00 AM  STOP = 5:00 PM
WED  START = 8:00 AM  STOP = 5:00 PM
THU  START = 8:00 AM  STOP = 5:00 PM
FRI  START = 8:00 AM  STOP = 5:00 PM
SAT  START = OFF      STOP = OFF

EXCEPTION DAYS
-----
02 APR 1999  START = OFF      STOP = OFF
13 APR 1999  START = 8:00 AM  STOP = 10:00 PM
    
```

FIGURE 45 - SAMPLE PRINTOUT (SCHEDULE)

```

YORK SALES ORDER
CHILLER ID 3
© 1997 - 1999 YORK INTERNATIONAL CORPORATION
MON 29 MAR 1999 1 28 PM

ORDER INFORMATION
-----
COMMISSIONING DATE = 01 JAN 1999
JOB NAME =
JOB LOCATION =
MODEL NUMBER =
YORK ORDER NUMBER =
PANEL SERIAL NUMBER =
CHILLER SERIAL NUMBER =

DESIGN LOAD - CONDENSER =
-----
PASSES =
DESIGN WORKING PRESSURE =
FOULING FACTOR =
PRESSURE DROP =
NOZZLE ARRANGEMENT IN =
NOZZLE ARRANGEMENT OUT =
LEAVING TEMPERATURE =
RETURN TEMPERATURE =
GPM =
TUBES =

DESIGN LOAD - EVAPORATOR
-----
PASSES =
DESIGN WORKING PRESSURE =
FOULING FACTOR =
PRESSURE DROP =
NOZZLE ARRANGEMENT IN =
NOZZLE ARRANGEMENT OUT =
LEAVING TEMPERATURE =
RETURN TEMPERATURE =
GPM =
TUBES =
    
```

FIGURE 46 - SAMPLE PRINTOUT (SALES ORDER)

4

NAMEPLATE INFORMATION	

MOTOR CODE	=
POWER (VOLTS)	=
PHASES	=
FREQUENCY (HZ)	=
LOOKED ROTOR AMPS	=
FULL LOAD AMPS	=
INRUSH AMPS	=
SYSTEM INFORMATION	

REFRIGERANT	=
TONS	=
GEAR CODE	=
LIQUID TYPE	=
BRINE PERCENT	=
KILOWATTS INPUT	=
VSD / SSS / EM	=

**FIGURE 46 -SAMPLE PRINTOUT (SALES ORDER)
(CONT'D)**

YORK HISTORY 1	
CHILLER ID 0	
(c) 1997 - 2004 YORK INTERNATIONAL CORPORATION	
Mon 22 Nov 2004 9:23:12 AM	
SYSTEM READY TO START	
LCSSS - LOGIC BOARD POWER SUPPLY	
[Any warnings active at shutdown will be listed here]	
Controls	C.MLM.08.01
Run Time	0 Days 2 Hr 59 Min
Operating Hours	= 25 Hr
Number Of Starts	= 6
Control Source	= Local
Evaporator	

Leaving Chilled Active Setpoint	= 45.0 °F
Chilled Liquid Pump	= Stop
Chilled Liquid Flow Switch	= Open
Leaving Chilled Liquid Temperature	= 45.0 °F
Return Chilled Liquid Temperature	= 55.0 °F
Evaporator Pressure	= 75.0 Psig
Evaporator Saturation Temperature	= 44.4 °F
Evaporator Refrigerant Temperature	= 44.5 °F
[If Refrigerant Sensor enabled]	
Small Temperature Difference	= 0.5 °F
Condenser	

Condenser Liquid Pump	= Stop
Condenser Liquid Flow Switch	= Open
Leaving Condenser Liquid Temperature	= 95.0 °F
Return Condenser Liquid Temperature	= 85.0 °F
Condenser Pressure	= 200.0 Psig
Condenser Saturation Temperature	= 101.4 °F
Small Temperature Difference	= 6.4 °F
Drop Leg Refrigerant Temperature	= 83.0 °F
[If Drop Leg Sensor enabled]	
Sub Cooling Temperature	= 18.4 °F
[If Drop Leg Sensor enabled]	
Compressor	

Discharge Temperature	= 120.0 °F
Vent Line Solenoid	= Off
Oil Sump	

Oil Pump Run Output	= Off
Sump Oil Pressure (LOP)	= 75.8 Psig
Pump Oil Pressure (HOP)	= 76.6 Psig
Oil Pressure	= 0.0 Psid
Oil Sump Temperature	= 150.0 °F
[Skip the following section if Hot Gas Bypass is not enabled]	
Hot Gas	

Valve Position	= 0 %
Pre-Rotation Vanes Position	= 0 %

FIGURE 47 - SAMPLE PRINTOUT (HISTORY)

Refrigerant Level Control	

Refrigerant Level Position	= 35 %
Purge Control	

Total Purge Count	= 127
Purge Window Time	= 1 Min
Purge Window Count	= 0
[Not displayed if Motor Type is not EM]	
Electro-Mechanical Starter	

Motor Run	= Off
% Full Load Amps	= 0 %
[Not displayed if Motor Type is other than Mod B SSS]	
Liquid-Cooled Solid State Starter	

Starter Model	= 26L
Motor Run	= Off
% Full Load Amps	= 0 %
kW Hours	= 20723 kWh
Input Power	= 0 kW
Phase A Voltage	= 422 V
Phase B Voltage	= 449 V
Phase C Voltage	= 449 V
Phase A Current	= 0 A
Phase B Current	= 0 A
Phase C Current	= 0 A
Phase A Temperature	= 109 °F
Phase B Temperature	= 109 °F
Phase C Temperature	= 110 °F
[Not displayed if Motor Type is other than VSD]	
Variable Speed Drive	

Motor Run	= Off
% Full Load Amps	= 0 %
Pre-Rotation Vanes Position	= 0 %
Full Load Amps	= 402 A
Precharge Relay Output	= Off
Trigger SCR Output	= Off
Water Pump Output	= Off
kW Hours	= 14528 kWh
Input Power	= 0 kW
Output Frequency	= 0 Hz
Output Voltage	= 0 V
DC Bus Voltage	= 600 V
DC Inverter Link Current	= 0 A
Phase A Output Current	= 0 A
Phase B Output Current	= 0 A
Phase C Output Current	= 0 A
Internal Ambient Temperature	= 88 °F
Converter Heatsink Temperature	= 102 °F
Phase A Heatsink Temperature [If TMIII VSD]	= 93 °F
Phase B Heatsink Temperature [If TMIII VSD]	= 99 °F
Phase C Heatsink Temperature [If TMIII VSD]	= 97 °F
Baseplate Temperature [If VyperDrive VSD]	= 106 °F

**FIGURE 47 - SAMPLE PRINTOUT (HISTORY)
(CONT'D)**

[Not displayed if Motor Type is not VSD, or Filter is not present]	
Harmonic Filter Data	

Precharge Contactor	= Off
Supply Contactor	= Off
Operating Mode	= Stopped
Phase Rotation	= ABC
Total Supply kVA	= 0 kVA
Total Power Factor	= 0.00
DC Bus Voltage	= 608 V
Heatsink Temperature [If TMIII VSD]	= 102 °F
Baseplate Temperature [If VyperDrive VSD]	= 102 °F
Voltage Peak N-L1	= 200 V
Voltage Peak N-L2	= 200 V
Voltage Peak N-L3	= 200 V
L1-L2 RMS Voltage	= 215 V
L2-L3 RMS Voltage	= 215 V
L3-L1 RMS Voltage	= 215 V
L1 RMS Filter Current	= 0 A
L2 RMS Filter Current	= 0 A
L3 RMS Filter Current	= 0 A
L1 RMS Supply Current	= 0 A
L2 RMS Supply Current	= 0 A
L3 RMS Supply Current	= 0 A
L1 Voltage Total Harmonic Distortion	= 1.5 %
L2 Voltage Total Harmonic Distortion	= 1.2 %
L3 Voltage Total Harmonic Distortion	= 1.1 %
L1 Supply Current Total Demand Distortion	= 0.0 %
L2 Supply Current Total Demand Distortion	= 0.0 %
L3 Supply Current Total Demand Distortion	= 0.0 %
Motor Winding Temperature	

A1	= 193.3 °F
B1	= 192.5 °F
B2	= 193.1 °F
Bearing Temperature	

Sensor 1	= 128.3 °F
Sensor 2	= 129.5 °F

**FIGURE 47 - SAMPLE PRINTOUT (HISTORY)
(CONT'D)**

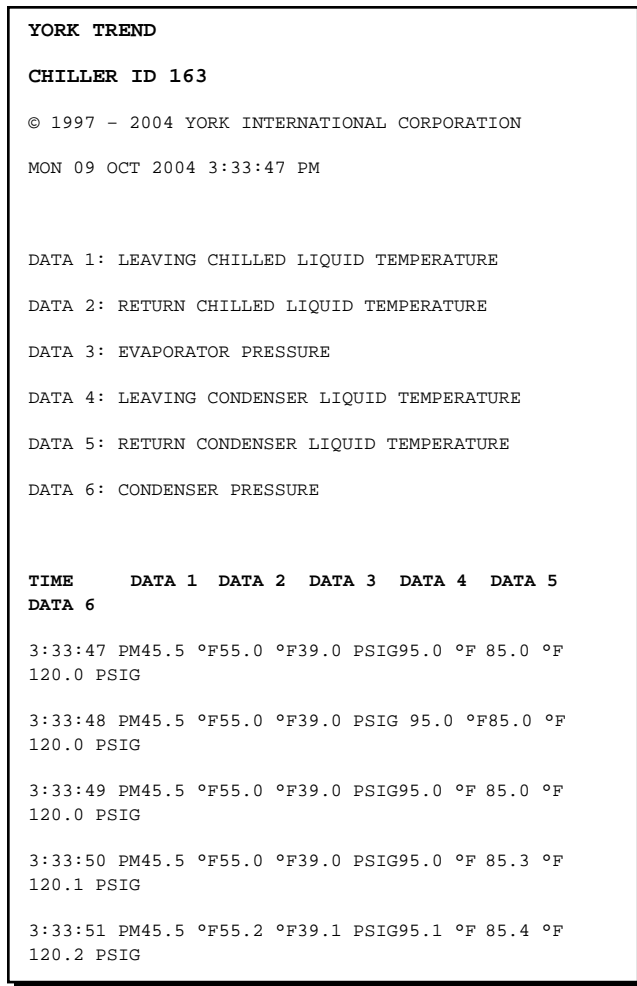


FIGURE 48 - SAMPLE PRINTOUT (TREND DATA NEW OR EXISTING POINTS)

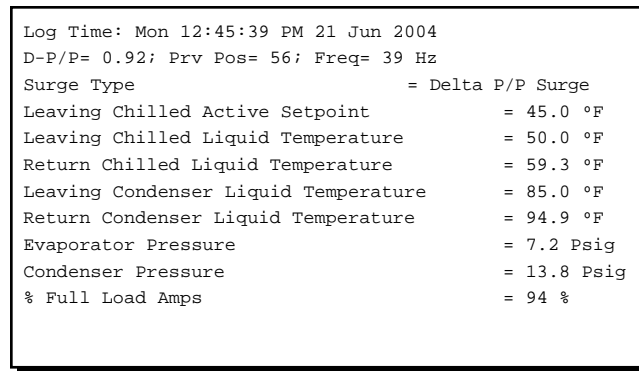


FIGURE 50 - SAMPLE PRINTOUT (ADAPTIVE CAPACITY CONTROL NEW MAP POINT REPORT)

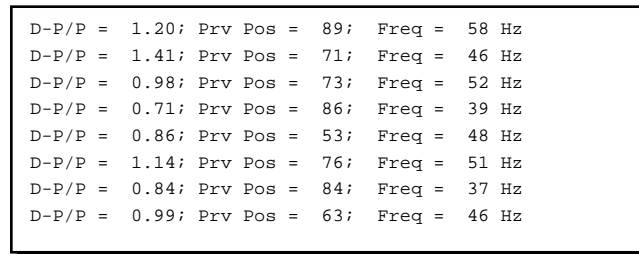


FIGURE 51 - SAMPLE PRINTOUT (ADAPTIVE CAPACITY CONTROL EXISTING MAP POINTS REPORT)

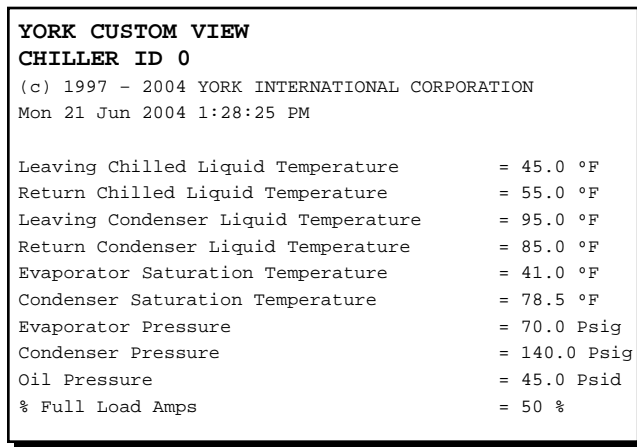


FIGURE 49 - SAMPLE PRINTOUT (CUSTOM SCREEN REPORT)

```

YORK SETPOINTS
CHILLER ID 0
(c) 1997 - 2004 YORK INTERNATIONAL CORPORATION
Mon 22 Nov 2004 8:48:27 AM

Software Versions
-----
Controls                = C.MLM.08.01
BIOS                    = C.MLM.00.03
Kernel                  = 0.18
GUI                     = 0.33
SIO                     = 0.22
GPIC                    = 0.04
Ext I/O                 = 0110112091996
VSD [Not displayed if Motor Type is not VSD] = C.VSD.00.00
SSS [Not displayed if Motor Type is not Mod B SSS] = C.SSS.01.01

System Information
-----
System Language        = English
Data Display Mode     = English
Control Source        = Local
Remote Analog Input Range = 0-10 Volts
Clock                  = Enabled

Jumper Settings
-----
Oil Pump Type          = Standard
Coastdown              = Standard
Chilled Liquid Pump Operation = Standard
Refrigerant Selection = R123
Anti-Recycle          = Enabled
Power Failure Restart = Auto
Liquid Type           = Water
Motor Type             = Fixed Speed

Printer Setup
-----
Automatic Printer Logging = Disabled
Log Start Time           = 12:00 am
Output Interval          = 60 Min
Printer Type             = Okidata
Baud                     = 9600 Baud
Data Bits                = 8 Bits
Parity                   = None
Stop Bits                = 1 Bit

COM 2 Setup
-----
Baud                     = 19200 Baud
Data Bits                = 8 Bits
Parity                   = Odd
Stop Bits                = 1 Bit

Evaporator
-----
Leaving Chilled Local Setpoint = 45.0 °F
Leaving Chilled ISN Setpoint   = 45.0 °F
Leaving Chilled Modem Setpoint = 45.0 °F
Leaving Chilled Analog Setpoint = 45.0 °F
Leaving Chilled Digital Setpoint = 45.0 °F
Remote Range                = 10.0 °F
Sensitivity                  = 100%
    
```

```

Restart Offset          = 0.0 °F
Restart Setpoint        = 45.0 °F
Shutdown Offset         = 4.0 °F
Shutdown Setpoint       = 41.0 °F
Brine Low Evaporator Cutout = 12.5 Psig
Smart Freeze            = Off
Refrigerant             = Enabled

Condenser
-----
High Pressure Warning Threshold = 28.8 Psig
Drop Leg                  = Enabled

Oil Sump
-----
Manual Pump              = Disabled
Low Pressure Limit       = 15.0 PSID
Prelube Time             = 30 Sec
Coastdown Time           = 150 Sec

Purge Control
-----
High Efficiency          = Off
Maximum Purge / Hour     = 20

[Following section not displayed if Hot Gas Bypass is not enabled]
Hot Gas
-----
Hot Gas                  = Enabled
Hold Period              = 30 Min
Close Percentage         = 5 %

[Following section not displayed if Level Control is not enabled]
Refrigerant Level Control
-----
Level Control            = On
Setpoint                 = 50 %
Period                   = 3.5 Sec
Proportion Limit Open   = 15 %
Proportion Limit Close  = 45 %
Rate Limit Open         = 10 %
Rate Limit Close        = 10 %

[Not displayed if Motor Type is not EM]
Electro-Mechanical Starter
-----
Local Motor Current Limit = 100 %
Remote ISN Current Limit  = 100 %
Remote Analog Current Limit = 100 %
Remote Digital Current Limit = 100 %
Remote Modem Current Limit = 100 %
Pulldown Demand Limit    = 100 %
Pulldown Demand Time     = 0 Min
    
```

4

**FIGURE 52 - SAMPLE PRINTOUT (SETPOINTS)
(CONT'D)**

FIGURE 52 - SAMPLE PRINTOUT (SETPOINTS)

[Not if Motor Type is not Mod B SSS]	
Liquid-Cooled Solid State Starter	

Local Motor Current Limit	= 100 %
Remote ISN Current Limit	= 100 %
Remote Analog Current Limit	= 100 %
Remote Digital Current Limit	= 100 %
Remote Modem Current Limit	= 100 %
Pulldown Demand Limit	= 100 %
Pulldown Demand Time	= 0 Min
Starter Model	= 26L
Voltage Range	= 440 - 480
Full Load Amps	= 275 A
Starting Current	= 1150 A
Open SCR	= Enabled
Shorted SCR	= Disabled
<i>[Skip the following section if Motor Type is not VSD]</i>	
Variable Speed Drive	

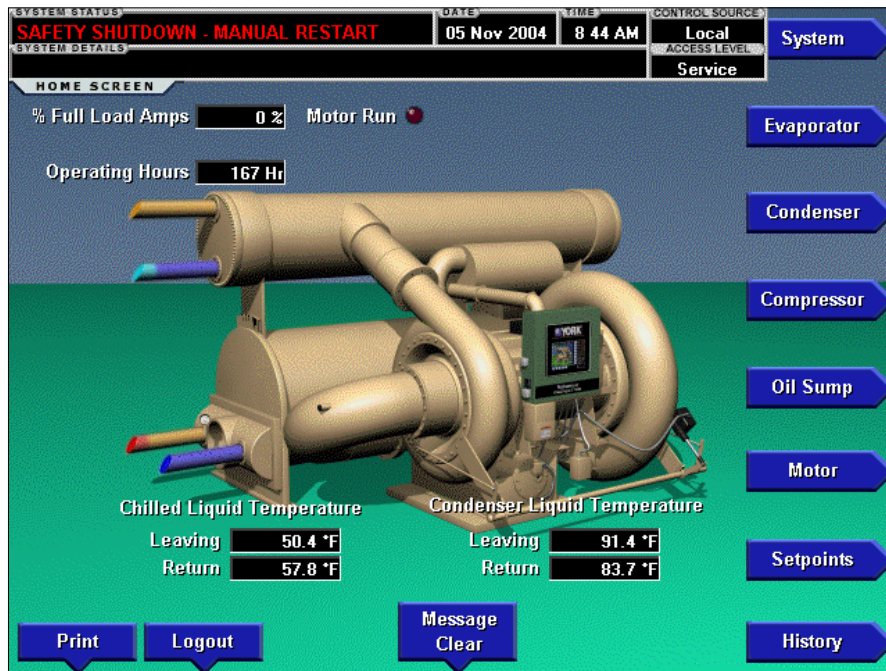
Local Motor Current Limit	= 100 %
Remote ISN Current Limit	= 100 %
Remote Analog Current Limit	= 100 %
Remote Digital Current Limit	= 100 %
Remote Modem Current Limit	= 100 %
Pulldown Demand Limit	= 100 %
Pulldown Demand Time	= 0 Min
Motor HP	= 351 HP
Power Line Frequency	= 60 Hz
<i>[Skip the following section if Motor Type is not VSD]</i>	
Harmonic Filter Data	

Filter Operation	= Enabled
Motor HP	= 351 HP
<i>[Skip the following section if Motor Type is not VSD]</i>	
Adaptive Capacity Control	

Surge Margin Adjust	= 0 Hz
Stability Limit	= 4500

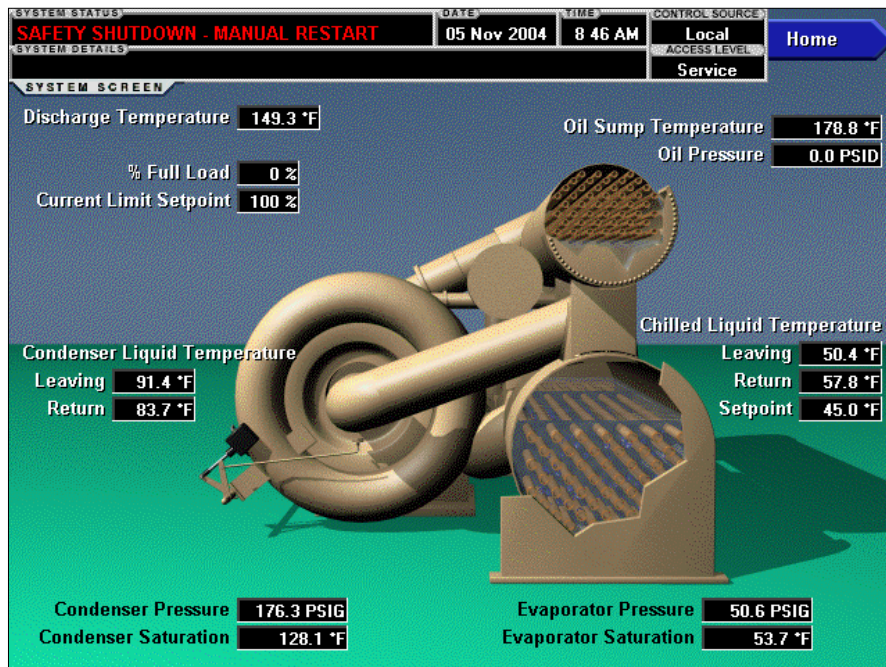
FIGURE 52 - SAMPLE PRINTOUT (SETPOINTS)
(CONT'D)

APPENDIX A - CVHB SCREENS



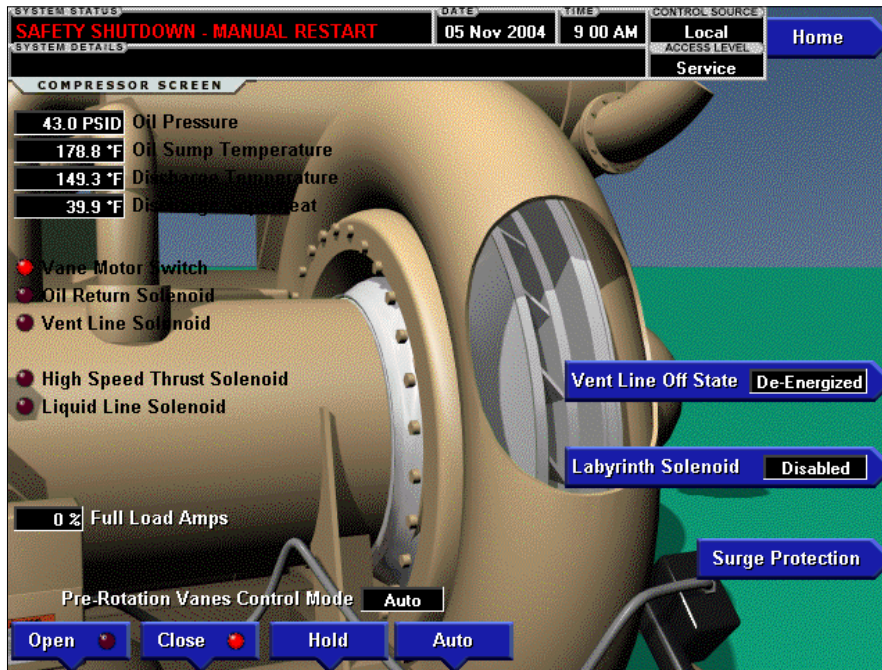
ID10291

FIGURE 53 - CVHB HOME SCREEN



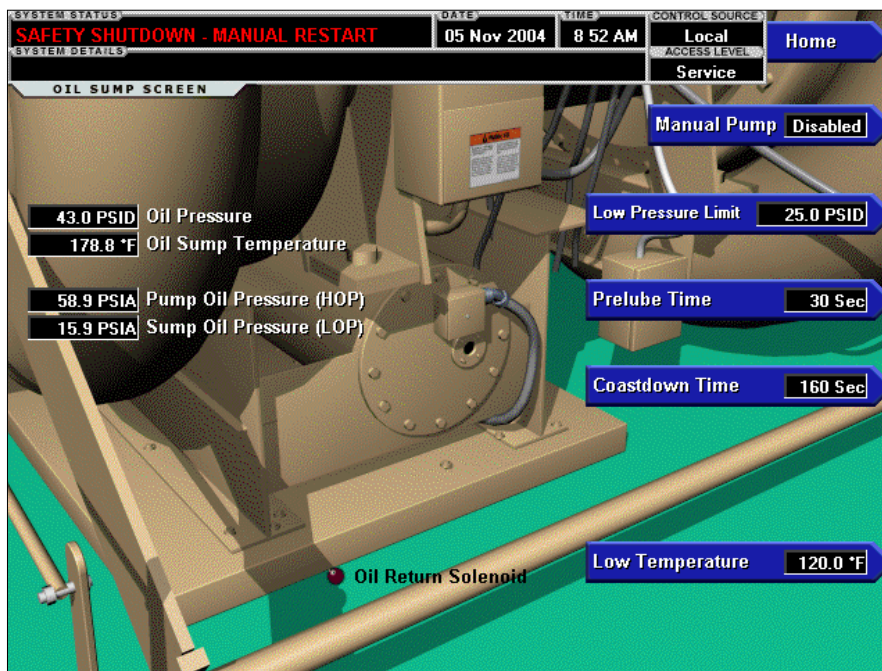
ID10292

FIGURE 54 - CVHB SYSTEM SCREEN



ID10290

FIGURE 55 - CVHB COMPRESSOR SCREEN



ID10293

FIGURE 56 - CVHB OIL SUMP SCREEN

APPENDIX B - PROGRAMMABLE SETPOINT VALUES

TABLE 13 - PROGRAMMABLE SETPOINT VALUES

Evaporator Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Leaving Chilled Liquid Temperature - Setpoint	Operator	38.0 °F - Water 36.0 °F - Sm Frz 10.0 °F - Brine	70.0 °F	45.0 °F
Local Leaving Chilled Liquid Temperature - Range	Operator	10.0 °F	20.0 °F	10.0 °F
LChLT Cycling Offset - Shutdown	Operator	1.0°F	Varies with LChLT setpoint and chilled liquid type.	4.0 °F or highest allowed value, whichever is lower.
LChLT Cycling Offset - Restart	Operator	0.0 °F	Varies with LChLT setpoint and chilled liquid type.	0.0 °F
Brine Low Evaporator Cutout	Service	0.0 PSIA	12.5 PSIA	12.5 PSIA
Sensitivity	Service	10 %	200 %	100 %
Smart Freeze	Service	Off	On	Off
Refrigerant (Sensor)	Service	Disabled	Enabled	Disabled

Load Rate Screen (Evaporator Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Load Rate	Service	0.38 °F / Min, 0.75°F / Min, 1.13 °F / Min, 1.50 °F / Min, 2.25 °F / Min, 3.00°F / Min, 5.25°F / Min, 10.50 °F / Min		0.38 °F / Min

Condenser Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
High Pressure Warning Threshold	Service	14.0 PSIA	28.8 PSIA	28.8 PSIA
Drop Leg (Sensor)	Service	Disabled	Enabled	Disabled
Refrigerant (Sensor)	Service	Disabled	Enabled	Disabled
Purge Type	Service	TurboGuard, SkyGuard Local, SkyGuard Remote		SkyGuard Remote

Purge Screen (Condenser Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
High Efficiency Purge System	Service	Disabled	Enabled	Disabled
Maximum Purges / Hour	Operator	10	30	20
Maximum Purges / Hour	Service	1	30	20

TABLE 13 - PROGRAMMABLE SETPOINT VALUES (CONT'D)

Compressor Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Vent Line Off State	Service	De-Energized	Energized	De-Energized

Hot Gas Bypass Screen (Compressor Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Close Percentage	Service	5 %	15 %	5 %
Hold Period	Service	30 Min	120 Min	30 Min
Surge Sensitivity	Service	0.1	1.3	0.3
Minimum Load	Service	0 °F	4 °F	0° F

VSD Calibration Screen (Compressor Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Increment Amount	Service	0.1 Hz	10.0 Hz	1 Hz

Surge Protection Screen (Compressor Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Shutdown	Service	Disabled	Enabled	Enabled
Extended Run	Service	Disabled	Enabled	Disabled
Count Window	Service	1 Min	5 Min	3 Min
Count Limit	Service	4	20	15
Surge Sensitivity	Service	0.3	1.3	0.3

Oil Sump Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Manual Pump	Operator	Disabled	Enabled	Disabled
Low Pressure Limit	Service	10 PSID	40 PSID	25 PSID
Prelube Time	Service	15 Seconds	60 Seconds	30 Seconds
Coastdown Time	Service	150 Seconds	600 Seconds	150 Seconds
Heater Setpoint	Service	125 °F	155 °F	140 °F

Electromechanical Starter Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Motor Current Limit	Operator	30 %	100 %	100 %
Pulldown Demand Limit	Operator	30 %	100 %	100 %
Pulldown Demand Time	Operator	0 Min	255 Min	0 Min

TABLE 13 - PROGRAMMABLE SETPOINT VALUES (CONT'D)

(MOD "B") Solid State Starter Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Motor Current Limit	Operator	30 %	100 %	100 %
Pulldown Demand Limit	Operator	30 %	100 %	100 %
Pulldown Demand Time	Operator	0 Min	255 Min	0 Min
Full Load Amps	Service	35 Amps	1050 Amps	35 Amps
Voltage Range	Service	Disabled, 200-208, 220-240, 380, 400, 415, 440-480, 550 – 600		Disabled
Starting Current	Service	310 Amps	3300 Amps	310 Amps
Open SCR	Service	Disabled	Enabled	Disabled
Shorted SCR	Service	Disabled	Enabled	Enabled

Variable Speed Drive Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Motor Current Limit	Operator	30 %	100 %	100 %
Pulldown Demand Limit	Operator	30 %	100 %	100 %
Pulldown Demand Time	Operator	0 Min	255 Min	0 Min
Filter Inhibit	Service	Disabled	Enabled	Disabled

Variable Speed Drive Details Screen (Variable Speed Drive Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Motor Current Limit	Operator	30 %	100 %	100 %
Pulldown Demand Limit	Operator	30 %	100 %	100 %
Pulldown Demand Time	Operator	0 Min	255 Min	0 Min

Adaptive Capacity Control Details Screen (Variable Speed Drive Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Motor Current Limit	Service	30 %	100 %	100 %
Pulldown Demand Limit	Service	30 %	100 %	100 %
Pulldown Demand Time	Service	0 Min	255 Min	0 Min
Stability Limit	Service	1000	7000	4500
Surge Margin Adjust	Service	0.0 Hz	25.0 Hz	0.0 Hz
ACC Auto Map Print	Service	Disabled	Enabled	Disabled

Harmonic Filter (Variable Speed Drive Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Motor Current Limit	Operator	30 %	100 %	100 %
Pulldown Demand Limit	Operator	30 %	100 %	100 %
Pulldown Demand Time	Operator	0 Min	255 Min	0 Min

TABLE 13 - PROGRAMMABLE SETPOINT VALUES (CONT'D)

Harmonic Filter Details Screen (Harmonic Filter Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Motor Current Limit	Operator	30 %	100 %	100 %
Pulldown Demand Limit	Operator	30 %	100 %	100 %
Pulldown Demand Time	Operator	0 Min	255 Min	0 Min

Motor Temperature Screen (Motor Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Winding Sensor Mode	Service	None, Analog, Digital, Analog & Digital		None
Winding Cutout	Service	150 °F	265 °F	300 °F
Bearing Sensor Mode	Service	None, Analog, Digital, Analog & Digital		None
Bearing Cutout	Service	100 °F	180 °F	180 °F
Motor Cooling Pump	Service	Disabled	Enabled	Disabled
Motor Cooling Pump Mode	Service	Automatic	Manual	Automatic
Phase A (Active Sensor)	Service	None, A1, A2, A1 & A2		None
Phase B (Active Sensor)	Service	None, B1, B2, B1 & B2		None
Phase C (Active Sensor)	Service	None, C1, C2, C1 & C2		None
Bearing (Active Sensor)	Service	None, Sensor 1, Sensor 2, Sensor 1 & 2		None

Setpoints Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Local Leaving Chilled Liquid Temperature - Setpoint	Operator	38.0 °F - Water 36.0 °F - Sm Frz 10.0 °F - Brine	70.0 °F	45.0 °F
Local Leaving Chilled Liquid Temperature - Range	Operator	10.0 °F	20.0 °F	20.0 °F
LChLT Cycling Offset - Shutdown	Operator	1.0°F	64.0 °F	4.0 °F or highest allowed value, whichever is lower.
LChLT Cycling Offset - Restart	Operator	0.0 °F	70.0 °F	0.0 °F
Remote Analog Input Range	Operator	0 - 10 VDC	2 - 10 VDC	0 - 10 VDC
Motor Current Limit	Operator	30 %	100 %	100 %
Pulldown Demand Limit	Operator	30 %	100 %	100 %
Pulldown Demand Time	Operator	0 Min	255 Min	0 Min

TABLE 13 - PROGRAMMABLE SETPOINT VALUES (CONT'D)

Setup Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Set Date	Operator	16/01/1963	01/01/4000	01/01/1999
Set Time	Operator	12:00 AM or 00:00	11:59 PM or 23:59	12:00 AM or 00:00
Clock	Operator	Disable	Enable	Enable
12/24 Hr (Clock Mode)	Operator	12 Hr Mode	24 Hr Mode	12 Hr Mode

Schedule Screen (Setup Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Schedule	Operator	Disabled	Enabled	Disabled
Schedule Data: Sunday through Saturday, Start Time and Stop Time, Standard Week and six Exception Weeks	Operator	12:00 AM or 00:00	11:59 PM or 23:59	12:00 AM or 00:00
Repeat Sunday	Operator	No	Yes	No
Repeat Exceptions	Operator	No	Yes	No

User Screen (Setup Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Data Display Mode	Operator	English or Metric		English
User ID (ID 1 through 4)	Service	1	9999	1
User Password (ID 1 through 4)	Service	0	9999	0
User Level (ID 1 through 4)	Service	0 - View, 1 - Operator, 2 - Service		0

Comms Screen (Setup Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Chiller ID	Operator	0	255	0
Baud Rate (Printer Setup and COM 2)	Operator	1200, 2400, 4800, 9600, 19200, 38400, 57600		19200
Data Bits (Printer Setup and COM 2)	Operator	5 Bits, 6 Bits, 7 Bits, 8 Bits		8 Blts
Parity (Printer Setup)	Operator	None, Odd, Even		None
Parity (COM 2)	Operator	None, Odd, Even		Odd
Stop Bits (Printer Setup and COM 2)	Operator	1 Bit	2 Bits	1 Bit

TABLE 13 - PROGRAMMABLE SETPOINT VALUES (CONT'D)

Printer Screen (Setup Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Log Start Time	Operator	12:00 AM or 00:00	11:59 PM or 23:59	12:00 AM or 00:00
Output Interval	Operator	1 Min	1440 Min	60 Min
Automatic Printer Logging	Operator	Disabled	Enabled	Disabled
ACC Auto Map Print	Operator	Disabled	Enabled	Disabled
Printer Type	Operator	Okidata, WeighTronix, Epson, Seiko		Okidata
Print Report	View	Status, Setpoint, Schedule, Sales Order, Slot List, Custom Screen Data		Status

Operations Screen (Setup Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Control Source	Operator	Local, ISN, Analog, Digital, Modem		Local
Number Of Starts	Admin	0	99999	0
Operating Hours	Admin	0 Hours	876600 Hours	0 Hours
Hot Gas (Bypass)	Service	Disabled	Enabled	Disabled
(Refrigerant) Level Control	Service	Disabled	Enabled	Disabled
Chiller Model	Service	CVHA, CHVB, CVHE, CVHF		CVHA
Refrigerant	Service	R11	R123	R11

History Screen				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Select Fault	View	Normal, Running, Fault #		Normal

Custom View Setup Screen (Custom View Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Custom Slot (1 through 10)	Operator	0	65535	0

Trend Setup Screen (Trend Subscreen)				
Setpoint	Access Level	Minimum Value	Maximum Value	Default
Chart Type	Operator	Continuous	One Screen	Continuous
Collection Interval	Operator	1 Second	3600 Seconds	60 Seconds
Data Point Slot # (1 through 6)	Operator	0	65535	0
Data Point Min (1 through 6)	Operator	Varies with each slot number programmed		
Data Point Max (1 through 6)	Operator	Varies with each slot number programmed		

APPENDIX C - ANALOG INPUT RANGES (LOW PRESSURE CHILLERS)

The following table indicates the valid display range for each of the analog sensor input parameters for low pressure chillers. In the event that the input sensor is reading a value outside of these ranges, the less than (<) or greater than (>) symbols will be displayed beside the minimum or maximum value, respectively.

TABLE 14 - ANALOG INPUT RANGES (LOW PRESSURE CHILLERS)

Analog Input	English Range			Metric Range		
	Low	High	Units	Low	High	Units
Leaving Chilled Liquid Temperature (RT1)	0.0	82.0	°F	-17.7	27.7	°C
Return Chilled Liquid Temperature (RT9)	0.0	94.1	°F	-17.7	34.5	°C
Leaving Condenser Liquid Temperature (RT4)	8.0	133.5	°F	-13.3	56.3	°C
Return Condenser Liquid Temperature (RT5)	8.0	133.5	°F	-13.3	56.3	°C
Evaporator Refrigerant Temperature (RT7)	0.0	126.1	°F	-17.7	52.3	°C
Discharge Temperature (RT2)	19.0	226.3	°F	-7.2	107.9	°C
Oil Temperature (RT3)	19.0	226.3	°F	-7.2	107.9	°C
Condenser Pressure (CPT)	2.5	35.3	PSIA	17.2	243.4	KPAA
Condenser Temperature (R11)* (RT17)	-1.4	124.2	°F	-18.5	51.2	°C
Condenser Temperature (R123)* (RT17)	7.2	130.1	°F	-13.7	54.5	°C
Evaporator Pressure (EPT)	0.0	12.5	PSIA	6.9	86.2	KPAA
Evaporator Temperature (R11)* (RT7)	-31.2	66.8	°F	-35.7	19.3	°C
Evaporator Temperature (R123)* (RT7)	-22.4	74.2	°F	-30.2	23.4	°C
Oil Sump Pressure (LOP)	2.9	20.9	PSIA	20.0	144.1	KPAA
Oil Pump Pressure (HOP)	14.3	78.2	PSIA	98.6	539.2	KPAA
Purge Pressure (PPT)	0.0	100.0	PSIA	6.9	689.5	KPAA
Drop Leg Refrigerant Temperature (RT6)	0.0	121.8	°F	-17.7	49.8	°C
Bearing Temperature (RT15, RT16)	30.0	250.0	°F	-1.1	121.1	°C
Refrigerant Level (Future)	0.0	100.0	%	0.0	100.0	%

*Calculated values when represented as a saturation temperature. They will display XXX if the pressure used for the calculation is out of range.

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SI METRIC CONVERSION

The following factors can be used to convert from English to the most common SI Metric values.

TABLE 15 - ANALOG INPUT RANGES (LOW PRESSURE CHILLERS)

Measurement	Multiply English Unit	By Factor	To Obtain Metric Unit
Capacity	Tons Refrigerant Effect (ton)	3.516	Kilowatts (kW)
Power	Horsepower	0.7457	Kilowatts (kW)
Flow Rate	Gallons / Minute (gpm)	0.0631	Liters / Second (l/s)
Length	Feet (ft)	304.8	Meters (m)
	Inches (in)	25.4	Millimeters (mm)
Weight	Pounds (lbs)	0.4538	Kilograms (kg)
Velocity	Feet / Second (fps)	0.3048	Meters / Second (m/s)
Pressure Drop	Feet of Water (ft)	2.989	Kilopascals (kPa)
	Pounds / Square Inch (psi)	6.895	Kilopascals (kPa)

TEMPERATURE

To convert degrees Fahrenheit (°F) to degrees Celsius (°C), subtract 32° and multiply by 5/9 or 0.5556.

$$\text{Ex: } (45.0^{\circ}\text{F} - 32^{\circ}) \cdot 0.5556 = 27.2^{\circ}\text{C}$$

To convert a temperature range (i.e., a range of 10°F) from Fahrenheit to Celsius, multiply by 5/9 or 0.5556.

$$\text{Ex: } 10.0^{\circ}\text{F range} \cdot 0.5556 = 5.6^{\circ}\text{C range}$$



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