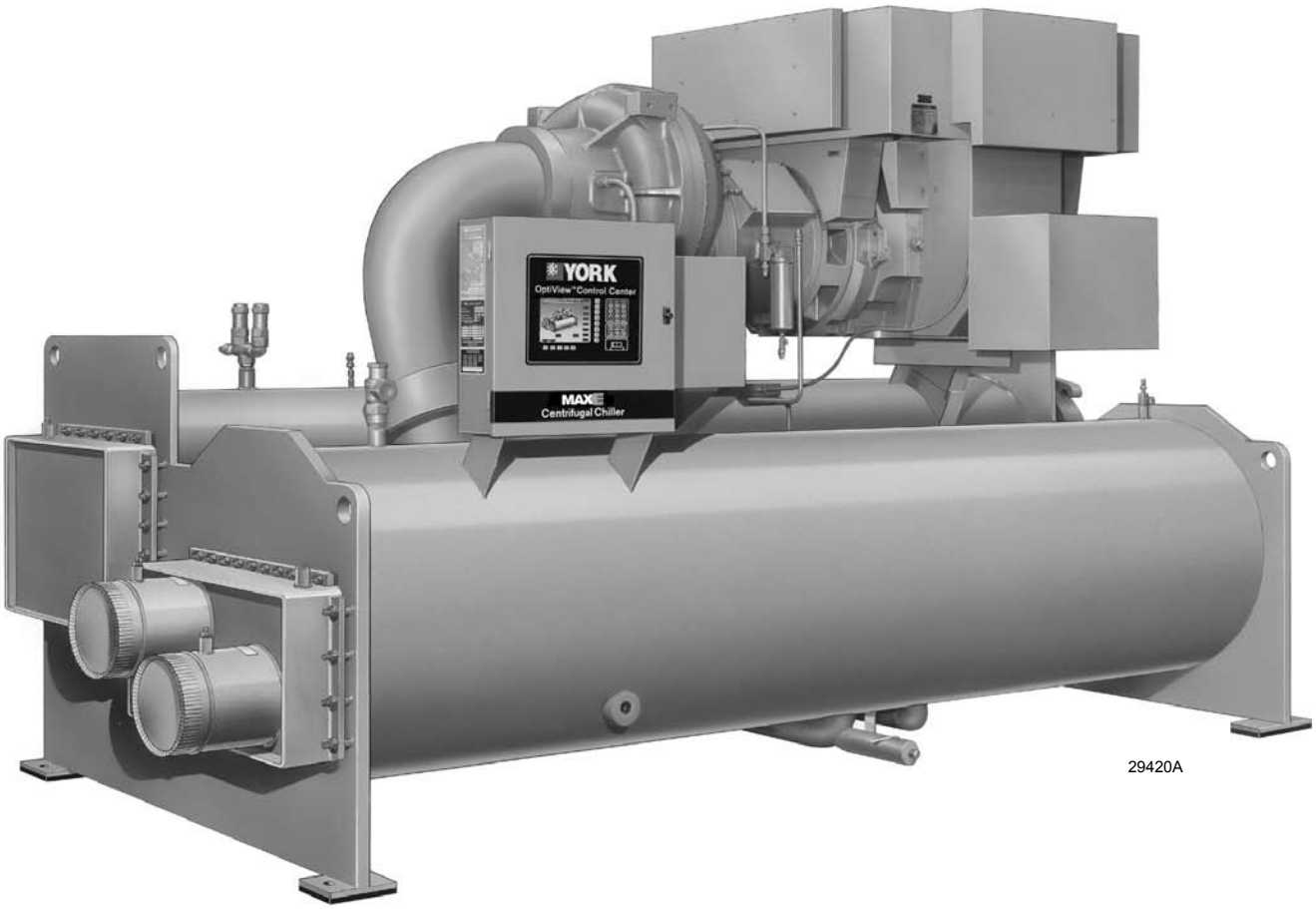
YORK BY JOHNSON CONTROLS	OPTIVIEW™ CONTROL CENTER MAXE™ CENTRIFUGAL LIQUID CHILLERS	
OPERATION MANUAL	Supersedes: 160.54-O1 (1208)	Form 160.54-O1 (809)

MODEL YK (THROUGH STYLE G)
R-134a COOLING ONLY

WITH OPTIVIEW™ CONTROL CENTER FOR ELECTRO-MECHANICAL STARTER, SOLID STATE STARTER & VARIABLE SPEED DRIVE



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IMPORTANT!
READ BEFORE PROCEEDING!
GENERAL SAFETY GUIDELINES

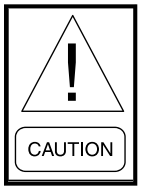
This equipment is a relatively complicated apparatus. During installation, operation, maintenance or service, individuals may be exposed to certain components or conditions including, but not limited to: refrigerants, oils, materials under pressure, rotating components, and both high and low voltage. Each of these items has the potential, if misused or handled improperly, to cause bodily injury or death. It is the obligation and responsibility of operating/service personnel 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 it is situated, as well as severe personal injury or death to themselves and people at the site.

This document is intended for use by owner-authorized operating/service personnel. It is expected that this individual possesses independent training that will enable them to perform their assigned tasks properly and safely. It is essential that, prior to performing any task on this equipment, this individual shall have read and understood this document and any referenced materials. This individual shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question.

SAFETY SYMBOLS

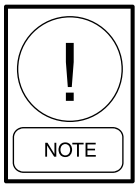
The following symbols are used in this document to alert the reader to areas of potential hazard:

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



CAUTION identifies a hazard which could lead to damage to the machine, damage to other equipment and/or environmental pollution. Usually an instruction will be given, together with a brief explanation.

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



NOTE is used to highlight additional information which may be helpful to you.

External wiring, unless specified as an optional connection in the manufacturer's product line, is NOT to be connected inside the micro panel cabinet. Devices such as relays, switches, transducers and controls may NOT be installed inside the micro panel. NO external wiring is allowed to be run through the micro panel. All wiring must be in accordance with YORK's published specifications and must be performed ONLY by qualified YORK/Johnson Controls personnel. Johnson Controls will not be responsible for damages/problems resulting from improper connections to the controls or application of improper control signals. Failure to follow this will void the manufacturer's warranty and cause serious damage to property or injury to persons.

REFERENCE INSTRUCTIONS

DESCRIPTION	FORM NO.
SOLID STATE STARTER (MOD “A”) – OPERATION & MAINTENANCE	160.46-OM3.1
SOLID STATE STARTER (MOD “B”) – OPERATION & MAINTENANCE	160.00-O2
MEDIUM VOLTAGE SOLID STATE STARTER – OPERATION	160.00-O5
MEDIUM VOLTAGE SOLID STATE STARTER – SERVICE	160.00-M5
VARIABLE SPEED DRIVE – OPERATION	160.00-O1
VARIABLE SPEED DRIVE – SERVICE INSTRUCTIONS	160.00-M4
MEDIUM VOLTAGE VARIABLE SPEED DRIVE – OPERATION	160.00-O6
MEDIUM VOLTAGE VARIABLE SPEED DRIVE – SERVICE	160.00-M6
VARIABLE SPEED OIL PUMP DRIVE	160.52-M2
INSTALLATION	160.54-N1
OPTIVIEW CONTROL CENTER - SERVICE INSTRUCTIONS	160-54-M1
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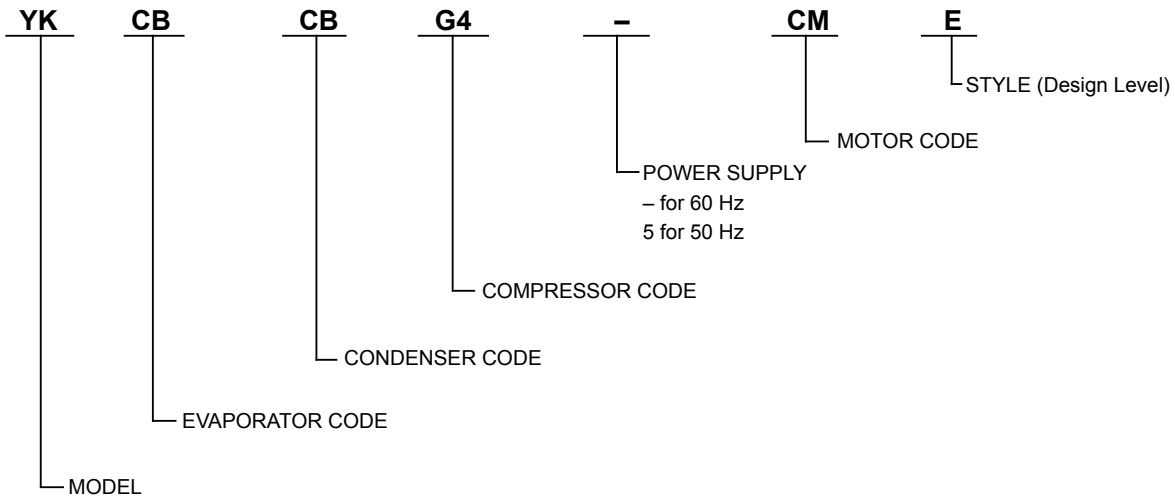
NOMENCLATURE



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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.

It is the responsibility of operating/service personnel as to the applicability of these documents to the equipment in question. If there is any question in the mind of operating/service personnel as to the applicability of these documents, then, prior to working on the equipment, they should verify with the owner whether the equipment has been modified and if current literature is available.

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SECTION 1
DESCRIPTION OF SYSTEM AND FUNDAMENTALS OF OPERATION

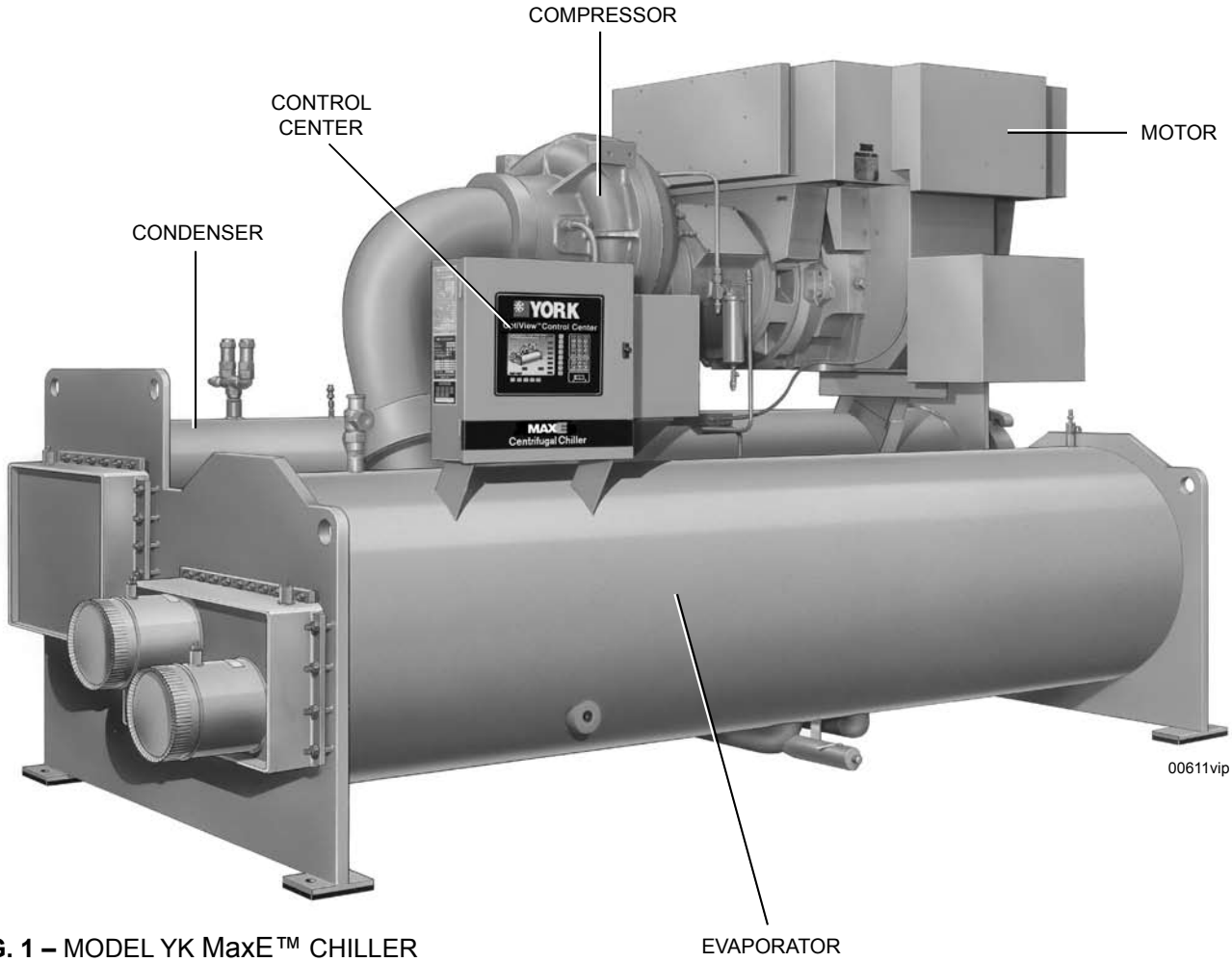


FIG. 1 – MODEL YK MaxE™ CHILLER

SYSTEM OPERATION DESCRIPTION (SEE FIG. 2)

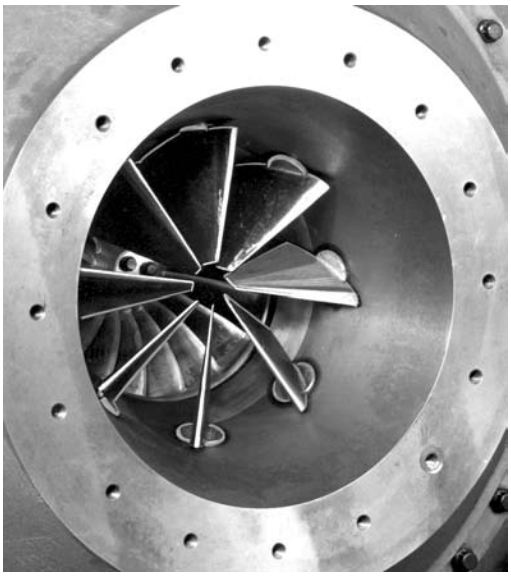
The YORK Model YK MaxE™ Chiller is commonly applied to large air conditioning systems, but may be used on other applications. The chiller consists of an open motor mounted to a compressor (with integral speed increasing gears), condenser, evaporator and variable flow control.

The chiller is controlled by a modern state of the art Microcomputer Control Center that monitors its operation. The Control Center is programmed by the operator to suit job specifications. Automatic timed start-ups and shutdowns 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 displayed and read on a graphic display. Other displays can be observed by pressing the keys as labeled on the Control Center. The chiller with the OptiView Control Center is applied with an electro-mechanical starter, YORK Solid State Starter (optional), or Variable Speed Drive (optional).

When the compressor motor is driven by a YORK Solid State Starter, one of three different Starters could be applied. Later production chillers are equipped with either the Style B Liquid Cooled Solid State Starter (LCSSS) or the Medium Voltage Solid State Starter (MVSSS). Earlier vintage chillers are equipped with the Mod "A" Solid State Starter. This starter contains a Trigger Board that interfaces to a Logic Board that is installed inside of the Control Center.

When the compressor motor is driven by a YORK Variable Speed Drive, there could be a Variable Speed Drive (VSD) or a Medium Voltage Variable Speed Drive (MV VSD) applied.

In operation, a liquid (water or brine to be chilled) flows through the cooler, where boiling refrigerant absorbs heat from the liquid. The chilled liquid is then piped to fan coil units or other air conditioning terminal units, where it flows through finned coils, absorbing heat from the air. The warmed liquid is then returned to the chiller to complete the chilled liquid circuit.



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DETAIL A – COMPRESSOR PREROTATION VANES

The refrigerant vapor, which is produced by the boiling action in the cooler, flows to the compressor where the rotating impeller increases its pressure and temperature and discharges it into the condenser. Water flowing through the condenser tubes absorbs heat from the refrigerant vapor, causing it to condense. The condenser water is supplied to the chiller from an external source, usually a cooling tower. The condensed refrigerant drains from the condenser into the liquid return line, where the variable orifice meters the flow of liquid refrigerant to the cooler to complete the refrigerant circuit.

The major components of a chiller are selected to handle the refrigerant, which would be evaporated at full load design conditions. However, most systems will be called upon to deliver full load capacity for only a relatively small part of the time the unit is in operation.

CAPACITY CONTROL

The major components of a chiller are selected for full load capacities, therefore capacity must be controlled to maintain a constant chilled liquid temperature leaving the cooler. Prerotation vanes (PRV), located at the entrance to the compressor impeller, compensate for variation in load (See Detail A).

The position of these vanes is automatically controlled through a lever arm attached to an electric motor located outside the compressor housing. The automatic adjustment of the vane position in effect provides the performance of many different compressors to match various load conditions from full load with vanes wide open to minimum load with vanes completely closed.

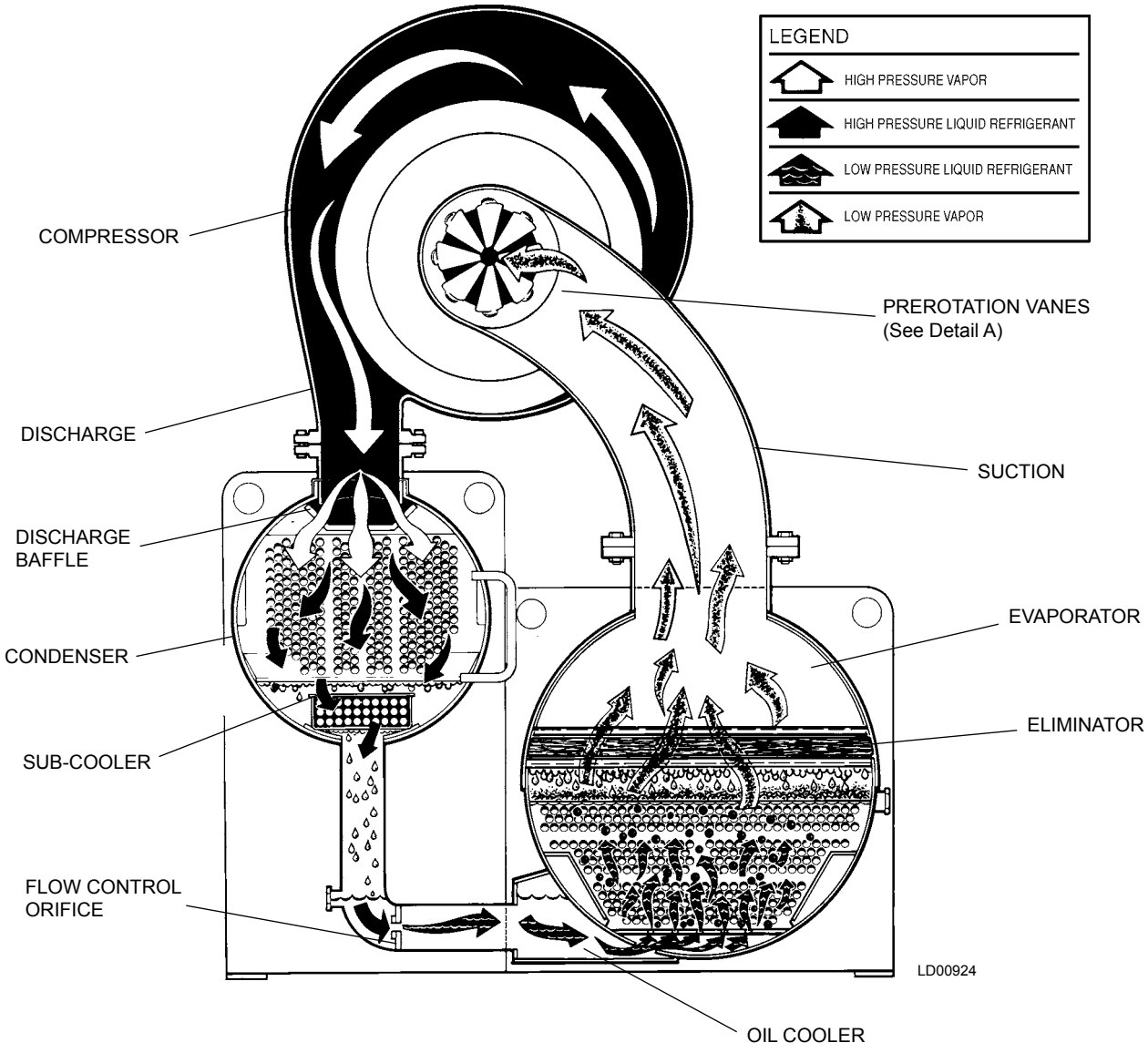

FIG. 2 – REFRIGERANT FLOW-THRU CHILLER

SECTION 2
OPTIVIEW CONTROL CENTER
INTRODUCTION

The YORK OptiView Control Center is a microprocessor based control system for R-22 or R134a centrifugal chillers. It controls the leaving chilled liquid temperature via pre-rotation vane controls and has the ability to limit motor current via control of the pre-rotation vanes. It is compatible with YORK Solid State Starter (optional), Variable Speed Drive (optional), and Electro-Mechanical starter applications.

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 screens.

The graphic display also allows information to be represented in both English (temperatures in °F and pressures in PSIG) and Metric (temperatures in °C and pressures in kPa) mode. The advantages are most apparent, however, in the ability to display many languages.

The 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 user may recall it for viewing at any time. During operation, the user is continually advised of the operating conditions by various status and warning messages. In addition, it 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 **Display Messages** section of this book.

There are certain screens, displayed values, programmable Setpoints and manual control shown in this book that are for Service Technician use only. They 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 YORK Service Manual 160.54-M1. **These parameters affect chiller operation and should NEVER be modified by anyone other than a qualified Service Technician. They are shown in this book for reference only.**

Advanced Diagnostics and troubleshooting information for Service Technicians are included in YORK Service Manual 160.54-M1. Also included in the Service manual are detailed descriptions of chiller features, such as the Refrigerant Level Control, Variable Speed Drive Oil Pump, Hot Gas Bypass, High Speed Thrust Bearing Proximity Probe, Remote Setpoints, Smart Freeze Protection, and Standby Lubrication.

The control center expands the capabilities of remote control and communications. By providing a common networking protocol through the ISN, YORK Chillers not only work well individually, but also as a team. This new protocol allows increased remote control of the chiller, as well as 24-hour performance monitoring via 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
5. Remote “Ready to Start” Contacts
6. Safety Shutdown Contacts
7. Cycling Shutdown Contacts

The chiller operating program resides in the Optiview control center Microboard. The control center could be equipped with either of the following Microboards:

- 031-01730-000 – shipped in new production chillers until January 2004. The program resides in a replaceable Flash Memory Card. The software version (C.MLM.01.xx.yzz) is printed on label adhered to card. Program can be upgraded by replacing the card.
- 031-02430-000 – shipped in new production chillers between January 2004 and June 2006. The program resides in non-removable onboard memory. The software version is C.OPT.01.xx.yzz, 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.
- 031-02430-001 – Shipped in new production chillers after June 2006. This is an upgraded version of the 031-02430-000 microboard. The upgrade is necessary to operate with the Medium Voltage Solid State Starter, Medium Voltage Variable Speed Drive and those Variable Speed Drives and Style B Solid State Starters that serially communicate with the microboard using Modbus Protocol. Variable Speed Drive Modbus applications require Software version C.OPT.01.16.307 (or later). Style B Solid State Starter Modbus applications require Software version C.OPT.01.18.307 (or later).

  The upgrade includes a larger BRAM (U38) and an additional RS-485 port on COM2 serial port for Modbus communications. When used in larger BRAM configuration, requires software version C.OPT.01.15.xxx (or later). This board is backward compatible with YK chillers presently using the 031-01730-000 or 031-02430-000 microboard.

Earlier vintage chillers could be equipped with a later Microboard due to service replacement.

Software versions (C.MLM.01.xx.yzz or C.OPT.01.xx.yzz) are alpha-numeric codes that represent the application, language package and revision levels per below. Each time the controls portion or language section is revised, the respective revision level increments.

- C – Commercial chiller
- MLM – Used on Microboard 031-01730-000
- OPT - Used on Microboard 031-02430-000
- 01 – YK chiller
- xx - controls revision level (00, 01, etc)
- y – language package (0=English only, 1=NEMA, 2=CE, 3=NEMA/CE)
- zz – language package revision level (00, 01, etc)

Throughout this book, reference is made to functions and features that are only available in certain Flash Memory Card revision levels (C.MLM.01.xx.xxx). To cross reference C.MLM software to C.OPT software, refer to the controls revision level. Software version C.OPT.01.08A.300 is of the same controls revision level as C.MLM.01.08.105A/.206A. From this starting point, both receive the same updates at each revision. Software upgrades should only be performed by a Service Technician.

OPTIVIEW CONTROL CENTER

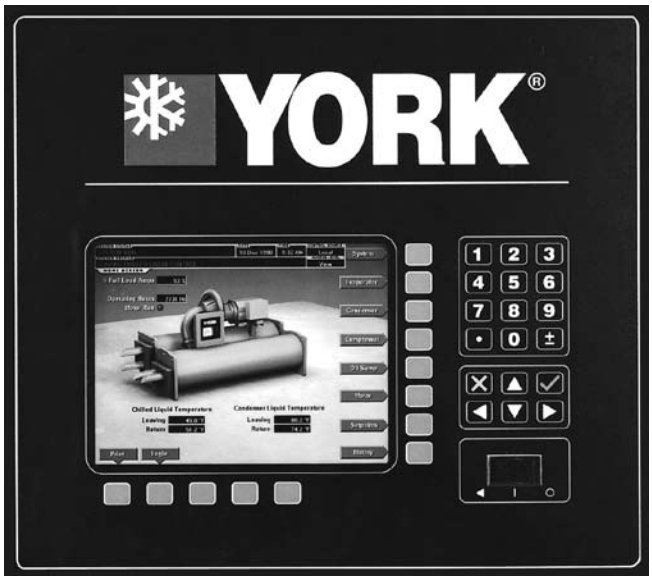

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FIG. 3

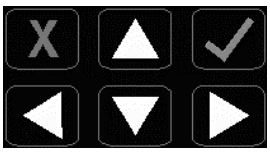
The OptiView™ Control Center display is highlighted by a full screen graphics display. This display is nested within a standard keypad, and is surrounded by "soft" keys which are redefined based on the currently displayed screen. Eight buttons are available on the right side of the panel, and are primarily used for navigation between the system screens. At the base of the display are 5 additional buttons. 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.

A +/- key has also been provided to allow entry of negative values and AM/PM selection during time entry.

In order to accept changes made to the chiller setpoints, the *Check* key is provided as a universal 'Enter' key or 'Accept'' symbol.

In order to reject entry of a setpoint or dismiss an entry form, the *'X'* key is provided as a universal 'Cancel' symbol.



Cursor Arrow keys are provided to allow movement on screens which contain a large amount of entry data. In addition, these keys can be used to scroll through history and event logs.

The Start/Stop control is operated via a three-position rocker switch. When toggled all the way to the right, it is considered in the **STOP/RESET** position. When in the middle position, this is considered the **RUN** state. When toggled to the left-most position, it is considered in the **START** state. Each state is described in detail below:

- **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 proximity probe and 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 (◄)**
  The switch can only remain in this position when being acted upon by a manual force. Once the user has released the switch, it automatically reverts to the RUN position. Generally, this state only occurs momentarily as the operator attempts to locally start the unit. Once this position has been sensed, if all fault conditions are cleared, the unit will enter the system prelube (start sequence).
- **RUN (■)**
  When in this position, the chiller is able to operate. The switch spring-returns to this state after it has been toggled to the **START** position. When in this state, 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 state to receive a valid remote start signal when operating under a remote control source.

INTERFACE CONVENTIONS

OVERVIEW

The new 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 as described below. For each of these elements, an indication is given to show the minimum access level required to program the value or navigate to the sub-screen.

DISPLAY ONLY

Values in this group are read-only parameters of information about the chiller operation. This type of information may be represented by a numerical value, a text string, or an LED image. For numerical values, if the monitored parameter is above the normal operating range, the high limit value will be displayed along with the '>' symbol; if it is below the normal operating range, the low limit value will be displayed along with the '<' symbol. In some cases, the value may be rendered invalid by other conditions and the display will use X's to indicate this.

PROGRAMMABLE

Values in this group are available for change by the user. In order to program any setpoints on the system, the user must first be logged in with the appropriate access level. 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
In order to program any setpoints on the system, the user must first login with an appropriate 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. However, the user will not be allowed to change any values. 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 or utilize the **CHANGE SETPOINTS** key described below. 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. **OPERATOR** access reverts 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.

If the correct password is received, 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** 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 above. It 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 fall into several categories. They could be numeric values (such as 45.0°F for the Leaving Chilled Liquid Temperature), or they could Enable or Disable a feature or function.

Regardless of which setpoint is being programmed, the following procedure applies:

1. Press the desired setpoint key. 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.
3. Press the ‘✓’ (Enter) key.

   If the value is within range, it is accepted and the dialog box disappears. The chiller will begin to operate based on the new programmed value. If out of range, the value will not be accepted and the user is prompted to try again.

Manual Controls

Some keys are used to perform manual control functions. These may involve manual control of items such as the pre-rotation vanes, variable orifice or oil pump speed. Other keys in this category are used to initiate/terminate 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 [page 83] for an example.)

NAVIGATION

In order to maximize the amount of values which the panel can display to the user, and in order to place those values in context, multiple screens have been designed to describe the chiller operation. In order to move from one screen to the next, navigation keys have been defined. These keys allow the user to either move “forward” to a sub-screen of the present screen, or move “backward” to the previous 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. Following is a layout of all the screens and how they are connected.

- Home Screen (page 16)
  - System Screen (page 19)
  - Evaporator (page 21)
  - Condenser (page 24)
    - Level Control (page 24-31)
    - Heat Recovery (page 26)
    - Head Pressure Control (page 30)
  - Compressor (page 42)
    - Proximity Probe Calibration (Style E and earlier chillers with G, H, or J compressors and Style F and later chillers with J or H3 Compressors)(page 36)
    - Hot Gas Bypass (page 46)
    - Surge Protection Screen (page 48)
    - Variable Geometry Diffuser (page 52)
    - Vane Calibration (page 56)
    - VSD Tuning (page 58)
  - Oil Sump (page 60)
  - Motor (page 60)
    - EM Starter Version (page 64)
    - Mod “A” Solid State Starter (page 66)
    - Mod “B” Solid State Starter (page 68)
    - Medium Voltage Solid State Starter (page 70)
    - VSD (page 72)
      - VSD Details (page 76 78)
      - ACC Details (page 80, 82, 84)
        - Surge Map (page 86, 88)
      - Harmonic Filter Details (page 92, 94)
    - Motor Lubrication (page 96)
  - Setpoints (page 98)
    - Setup (page 100)
      - Schedule (page 106)
      - User (page 108)
      - Comms (page 110)
      - Printer (page 112)
      - Sales Order (page 114)
      - Operations (page 116)
      - Diagnostics *(Refer to YORK Service Manual 160.54-M1)*
    - Quick Start (page 104)
  - History (page 120)
    - History Details (page 120)
    - Security Log Screen (page 121)
      - Security Log Details Screen (page 122)
    - Custom View (page 123)
      - Custom Setup (page 124)
    - Trend (page 126)
      - Trend Setup (page 128)
      - Advanced Trend Setup (page 130)
        - Common Slots (page 132)

LANGUAGES

The Screens can be displayed in various languages. Language selection is done on the USER Screen. The desired language is selected from those available. Not all languages are available. English is the default language.

If a language other than English is being displayed, an English-only speaking person should navigate to the USER Screen using the preceding Navigation chart and select English per the USER Screen instructions in this book.

ANALOG INPUT RANGES

The following table indicates the valid display range for each of the analog input values. In the event that the input sensor is reading a value outside of these ranges, the < or > symbols will be displayed beside the minimum or maximum value, respectively.

ANALOG INPUT	ENGLISH RANGE			METRIC RANGE		
	LOW	HIGH	UNITS	LOW	HIGH	UNITS
Leaving Chilled Liquid Temperature	0.0	82.0	°F	-17.7	27.7	°C
Return Chilled Liquid Temperature	0.0	94.1	°F	-17.7	34.5	°C
Leaving Condenser Liquid Temperature	8.0	133.5	°F	-13.3	56.3	°C
Return Condenser Liquid Temperature	8.0	133.5	°F	-13.3	56.3	°C
Evaporator Refrigerant Temperature (Optional)	0.0	126.1	°F	-17.7	52.3	°C
Discharge Temperature	31.8	226.3	°F	-0.1	107.9	°C
Oil Temperature	31.8	226.3	°F	-0.1	107.9	°C
Condenser Pressure (R22 and R134a)	***0.0	315.0	PSIG	0.0	2172.4	KPAG
Condenser Temperature (R22)*	-122.1	130.9	°F	-85.6	54.9	°C
Condenser Temperature (R134a)*	-98.7	160.1	°F	-72.6	71.7	°C
Evaporator Pressure (R22 – water)	49.4	128.8	PSIG	340.6	888.2	KPAG
Evaporator Pressure (R22 – brine)	25.0	100.0	PSIG	172.4	689.6	KPAG
Evaporator Pressure (R134a)	5.5	77.4	PSIG	37.9	533.7	KPAG
Evaporator Temperature (R22 – water)*	13.0	67.0	°F	-10.5	19.4	°C
Evaporator Temperature (R22 – brine)*	-18.0	51.4	°F	-27.7	10.7	°C
Evaporator Temperature (R134a)*	-44.9	64.7	°F	-42.7	18.1	°C
Oil Sump Pressure (R22)	23.2	271.8	PSIG	160.0	1874.4	KPAG
Oil Sump Pressure (R134a)	0.0	315.0	PSIG	0.0	2172.4	KPAG
Oil Pump Pressure (R22 and R134a)	0.0	315.0	PSIG	0.0	2172.4	KPAG
High Speed Thrust Bearing Proximity Position (Style E and earlier chillers with G, H, or J compressors and Style F and later chillers with J or H3 compressors)	8.0	99.0	Mils	-7.1	148.8	°C
High Speed Thrust Bearing Drain Temperature**	19.1	300.0	°F	-7.1	148.8	°C
Refrigerant Level	0.0	100.0	%	0.0	100.0	%
Drop Leg Refrigerant Temperature	0.0	121.7	°F	-17.7	49.8	°C

*Saturation temperatures are calculated values. They will display XXX if the pressure used for the calculation is out of range.

**Not applicable to chillers equipped with Flash Memory Card version C.MLM.01.03 and later.

***7.5 PSIG Flash Memory Card Version C.MLM.01.04 and later.

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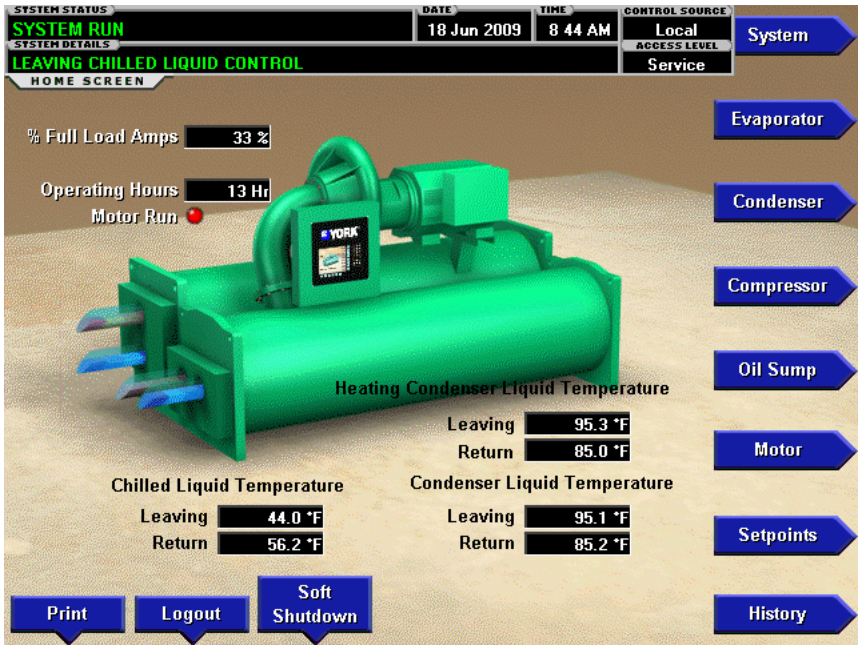

FIG. 4 LD14331

OVERVIEW

When the chiller system is powered on, the above default display appears. 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.

DISPLAY ONLY

Chilled Liquid Temperature - Leaving
Displays the temperature of the liquid as it leaves the evaporator.

Chilled Liquid Temperature - Return
Displays the temperature of the liquid as it enters the evaporator.

Condenser Liquid Temperature - Leaving
Displays the temperature of the liquid as it leaves the condenser.

Condenser Liquid Temperature - Return
Displays the temperature of the liquid as it enters the condenser.

Motor Run (LED)
Is **ON** when the digital output controlling the Motor Starter contact is on.

Input Power (kW)
Available only if the chiller system is utilizing a Variable Speed drive (VSD), Medium Voltage Variable Speed Drive (MV VSD), Mod "B" Solid state Starter or Medium Voltage 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.

Heating Condenser Liquid Temperature - Leaving
(Software version C.OPT.01.21.307 and later)
Displays the temperature of the liquid as it leaves the heating condenser tube bundle. Only appears when the Heat Recovery is enabled.

Heating Condenser Liquid Temperature – Return
(Software version C.OPT.01.21.307 and later)
Displays the temperature of the liquid as it enters the heating condenser tube bundle. Only appears when the Heat Recovery is enabled.

PROGRAMMABLE

Login
Access Level Required: VIEW
The OptiView Panel restricts certain operations based on password entry by the operator. Three different access levels are provided as follows: **VIEW:** The panel defaults to the lowest access level which is termed **VIEW**. In this mode, the chiller operating values and setpoints can be observed, but no changes can be made. **OPERATOR:** The second access level is termed **OPERATOR** and will allow the customer to change all of the setpoints required to operate the chiller system. The **OPERATOR** access level reverts to the **VIEW** level after 10 continuous minutes without a keypress. **SERVICE:** In the event that advanced diagnostics are necessary, a **SERVICE** access level has been provided. Only qualified service personnel utilize this access level. This level provides advanced control over many of the chiller functions and allows calibration of many of the chiller controls. The access levels are listed above in hierarchical order beginning with the lowest level and proceeding to the highest level. Users logged in under higher access levels may perform any actions permitted by lower access levels.

The **OPERATOR** access level is accompanied by a 10-minute timeout. After ten (10) successive minutes without a keypress, the panel will revert to the **VIEW** access level. This prevents unauthorized changes to the chiller if a user was logged in at a higher access level and failed to logout. Proper procedure requires that after making necessary setpoint adjustments the user return to the Home Screen and logout.

Logout
Access Level Required: OPERATOR
This key is displayed when a user is logged in at any level other than **VIEW**. Pressing it will return the access level to **VIEW**.

Print
Access Level Required: VIEW
Use this key to generate a hard-copy report of the present system status. This provides a snapshot of the primary operating conditions at the time the key is pressed. The History page provides enhanced 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 certain safety or cycling conditions have been detected and the chiller has been shutdown, the main status display of the chiller will continue to display a message indicating the cause of the shutdown. Using this key, the message can be cleared once the condition has been removed.

Warning Reset
Access Level Required: OPERATOR
Use of this key acknowledges a warning condition and resets the message display associated with it.

Soft Shutdown
(Flash Memory Card version C.MLM.01.06.xxx and later)
Access Level Required: Operator
This key, available only when the compressor is running, is used to initiate a Soft Shutdown. A Soft Shutdown fully closes the Pre-rotation Vanes prior to shutting down the compressor. This reduces bearing wear by eliminating compressor backspin at shutdown. Pressing this key causes the Vanes to be driven to the fully closed position. While the vanes are closing, "Vanes Closing Before Shutdown" is displayed on the System Status line. 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 with the Compressor Switch or any fault other than "Leaving Chilled Liquid Temp – Low Temperature", "Remote Stop", "Multi-Unit Cycling – Contacts Open", System Cycling – Contacts Open" or "Control Panel – Schedule" occur, it will immediately enter "System Coastdown". To restart the chiller after an operator initiated Soft shutdown, the Compressor Switch must be placed in the Stop/Reset position (O) and then the Start position (3).

NAVIGATION

System
Used to provide additional system information.

Evaporator
A detailed view of all evaporator parameters, including the programmable Leaving Chilled Liquid Setpoints.

Condenser
A detailed view of all condenser parameters, including control of the liquid level functions.

Compressor
A detailed view of all the compressor parameters. This includes pre-rotation vane control, Hot Gas Bypass Control, Proximity Probe calibration, and PRV calibration.

Oil Sump
A detailed view of all the oil pump and oil sump parameters. This includes the Variable Speed Oil Pump when installed. It also controls the Seal Lubrication functionality.

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. It 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 10 shutdown conditions.

SYSTEM SCREEN

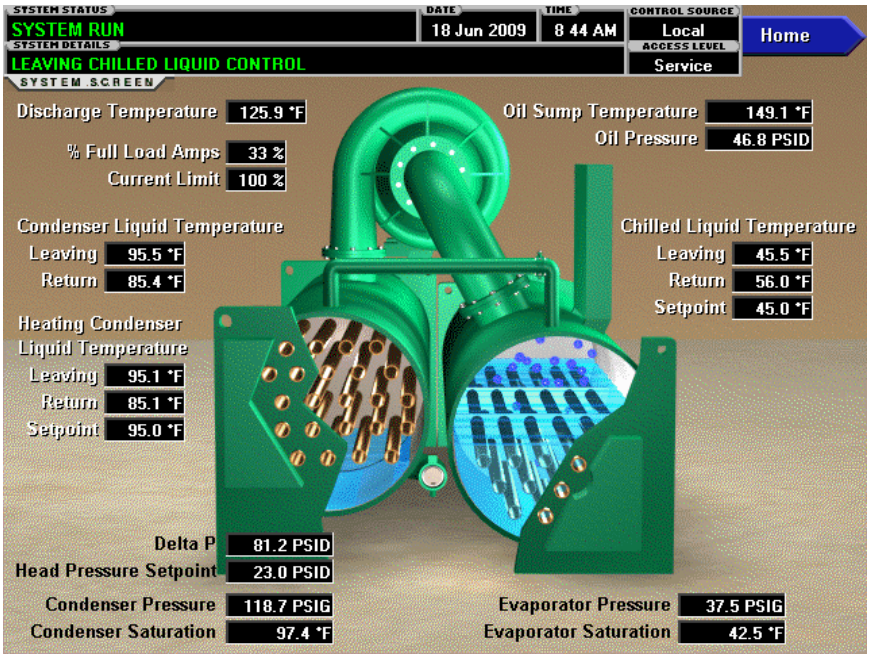

FIG. 5 LD14332

OVERVIEW

This screen gives a general overview of common chiller parameters for both shells.

DISPLAY ONLY

Discharge Temperature
Displays the temperature of the refrigerant in its gaseous state at discharge of the compressor as it travels to the condenser.

Chilled Liquid Temperature - Leaving
Displays the temperature of the liquid as it leaves the evaporator.

Chilled Liquid Temperature - Return
Displays the temperature of the liquid as it enters the evaporator.

Chilled Liquid Temperature - Setpoint
Displays 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, PWM signal in Digital Remote mode, MicroGateway interface in ISN mode, or a locally programmed value.

Evaporator Pressure
Displays the present refrigerant pressure in the evaporator.

Evaporator Saturation Temperature
Displays the present saturation temperature in the evaporator.

Condenser Liquid Temperature - Leaving
Displays the temperature of the liquid as it leaves the condenser.

Condenser Liquid Temperature - Return
Displays the temperature of the liquid as it enters the condenser.

Heating Condenser Liquid Temperature - Leaving
(Software version C.OPT.01.21.307 and later)
Displays the temperature of the liquid as it leaves the heating condenser tube bundle. Only appears when the Heat Recovery is enabled.

Heating Condenser Liquid Temperature – Return
(Software version C.OPT.01.21.307 and later)
Displays the temperature of the liquid as it enters the heating condenser tube bundle. Only appears when the Heat Recovery is enabled.

Heating Condenser Liquid Temperature – Active Hot Water Setpoint
(Software version C.OPT.01.21.307 and later)
Displays the Hot Water Setpoint to which the Leaving Heating Condenser Liquid Temperature is being controlled. Only appears when Heat Recovery is enabled and Hot water Control is enabled.

Delta P
(Software version C.OPT.01.21.307 and later)
Displays the pressure difference between the condenser and evaporator (condenser minus evaporator). This is also called the Head Pressure. Only appears when Head Pressure Control is enabled.

Head Pressure Setpoint
(Software version C.OPT.01.21.307 and later)
Displays the active Head Pressure Setpoint to which the head pressure is being controlled. Only appears when Head Pressure Control is enabled.

Condenser Pressure
Displays the refrigerant pressure in the condenser.

Condenser Saturation Temperature
Displays the saturation temperature in the condenser.

Oil Sump Temperature
Displays the temperature of the oil in the sump.

Oil Pressure
Displays 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 is 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
Displays 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 mode, or a locally programmed value.

PROGRAMMABLE

None

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

EVAPORATOR SCREEN

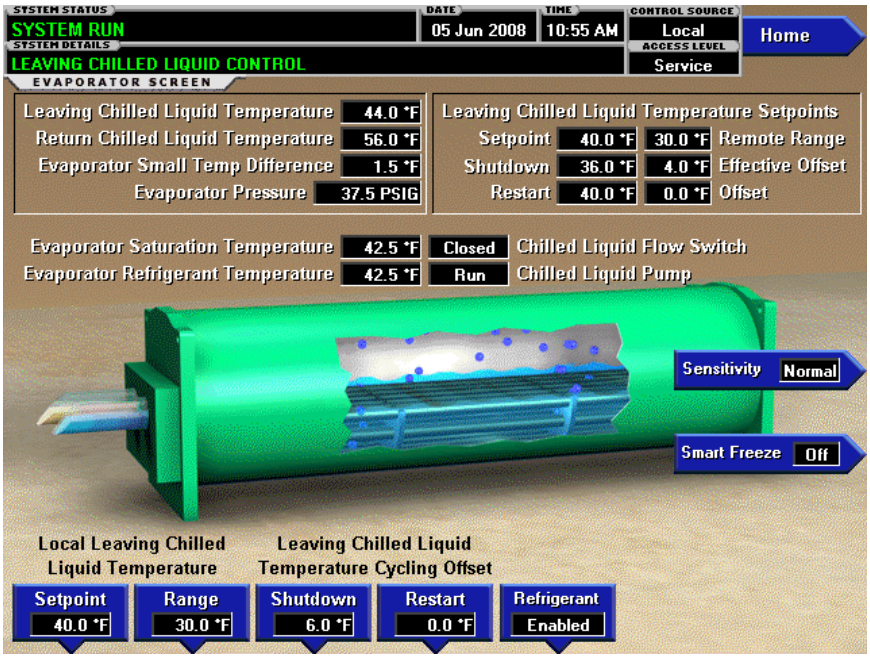

FIG. 6 LD13825

OVERVIEW

This screen displays a cutaway view of the chiller evaporator. All setpoints relating to the evaporator side of the chiller 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 flow.

DISPLAY ONLY

Chilled Liquid Flow Switch (Open / Closed)
Displays whether the liquid flow is present in the evaporator.

Chilled Liquid Pump
Displays the command presently sent by the control center to the Chilled Liquid Pump (**RUN** or **STOP**).

Evaporator Pressure
Displays the present refrigerant pressure in the evaporator.

Evaporator Saturation Temperature
Displays the present saturation temperature in the evaporator.

Return Chilled Liquid Temperature
Displays the temperature of the liquid as it enters the evaporator.

Leaving Chilled Liquid Temperature
Displays the temperature of the liquid as it leaves the evaporator.

Evaporator Refrigerant Temperature
Displays the temperature of the refrigerant in the evaporator, if the sensor is present.

Small Temperature Difference
Displays the difference between the Leaving Chilled Liquid temperature and the Evaporator Refrigerant temperature. The Evaporator Refrigerant temperature will be represented by the Refrigerant Temperature sensor input if the sensor is present, otherwise it will be represented by the Evaporator Saturation temperature.

Leaving Chilled Liquid Temperature Setpoints – Setpoint
Displays the present setpoint to which the chiller is operating, whether controlled locally or remotely.

Leaving Chilled Liquid Temperature Setpoints - Shutdown
Displays the Leaving Chilled Liquid Temperature at which the chiller will shutdown on “Leaving Chilled Liquid – Low Temperature”. This temperature is entered as an offset with the “Leaving Chilled Liquid Temperature Cycling Offset – Shutdown” setpoint below. Although the offset setpoint is changed manually, the offset being used can change automatically to prevent the leaving chilled liquid temperature from going below the minimum allowed value: 36ºF (water), 34ºF (water with smart freeze enabled) or 6ºF (brine). The offset

being used is displayed as "Effective Offset". With software versions earlier than C.OPT.01.18.307, the value is displayed as "Offset" and reflects the programmed value only, not the offset being used. Refer to setpoint description below.

Leaving Chilled Liquid Temperature Setpoints – Restart
Displays the Leaving Chilled Liquid Temperature at which the chiller will restart after it has shutdown on "Leaving Chilled Liquid – Low Temperature" cycling shutdown. This temperature is set as an offset using the "Leaving Chilled Liquid Temperature Cycling Offset – Restart" setpoint, displayed as "Offset" adjacent to this value.

PROGRAMMABLE

Local Leaving Chilled Liquid Temperature - Range *Access Level Required:* OPERATOR
This is the range over which an analog (0-20mA, 4-20mA, 0-10VDC or 2-10VDC) in Analog Remote Mode or a digital signal (PWM) in Digital remote mode can reset the Leaving Chilled Liquid Temperature setpoint above the operator programmed **Base** Setpoint (see below). Programmable as 10, 20, 30 or 40ºF (software version C.OPT.01.18.307 (or later); 10ºF or 20ºF with earlier software versions). It is added to the **Base** value to create a range over which the remote device can reset the setpoint. For example, if this setpoint is programmed for 10°F and the operator programmed value is 45°F, then the remote device can set the Leaving Chilled Liquid Temperature setpoint over the range 45.0° - 55.0°F.

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. It is programmable over the range of 38.0°F to 70.0°F (water) or 10.0°F to 70.0°F (brine). If Smart Freeze (see below) is enabled, the range is 36.0°F to 70.0°F (water). A remote device can provide an analog signal (0-20mA, 4-20mA, 0-10VDC or 2-10VDC) in Analog Remote mode, or PWM signal in Digital Remote mode that changes the setpoint by creating an offset above the operator programmed **Base** Leaving Chilled Liquid Temperature setpoint. This offset may be defined as 10 to 20ºF above the **Base** setpoint (see the Remote Leaving Chilled Liquid Temperature Setpoint Range description above). Additionally, 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 locally programmed **Base** setpoint value, but rather is the setpoint value itself.

Leaving Chilled Liquid Temperature Cycling Offset - Shutdown
Access Level Required: OPERATOR
This value allows the user to specify the Leaving Chilled Liquid Temperature at which the chiller will shut down on a **LEAVING CHILLED LIQUID – LOW TEMPERATURE** cycling shutdown. This is done by defining an offset below the Leaving Chilled Liquid Temperature setpoint. It is programmable over a range of 1°F to 64°F below the setpoint, to a minimum cutout of 36°F (water), 34°F (water with Smart Freeze enabled) or 6°F (brine). 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 (see below) is enabled, the threshold is 34.0°F for the next 10 minutes. After ten (10) minutes have elapsed, the shutdown threshold becomes the programmed setpoint value.

With software version C.OPT.01.18.307 (or later), the offset being used is displayed as "Effective Offset" in the upper right area of the display. Usually, the Offset used is the same as the value programmed for the SHUTDOWN setpoint. However, the Offset being used will automatically change based on the values programmed for the LEAVING CHILLED LIQUID TEMPERATURE setpoint and the SHUTDOWN setpoint, to prevent the leaving chilled liquid temperature from going below the minimum allowed value: 36ºF (water), 34ºF (water with smart freeze enabled) or 6ºF (brine). For example, if the leaving Chilled Liquid Temperature setpoint is set to 45ºF (water) and the SHUTDOWN setpoint is set to 4ºF, the Effective Offset is displayed as 4ºF. If the leaving setpoint is lowered to 38ºF, the Effective Offset will change to 2ºF. If the leaving chilled setpoint is raised back to 45ºF, the Effective Offset will revert back to the SHUTDOWN setpoint. With software versions prior to C.OPT.01.18.307, the value is displayed as "Offset" and reflects the programmed value only, not the offset being used.

Leaving Chilled Liquid Temperature Cycling Offset - Restart
Access Level Required: OPERATOR

This value allows the user to specify the Leaving Chilled Liquid Temperature at which the chiller will restart after a shutdown on a **LEAVING CHILLED LIQUID – LOW TEMPERATURE** cycling shutdown. This is done by defining an offset above the Leaving Chilled Liquid Temperature setpoint. It is programmable over a range of 0°F to 70°F above the 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 in Brine mode. It allows the user to specify the Evaporator Pressure at which a safety shutdown is initiated. Service Technicians refer to YORK Service Manual 160.54-M1.

Sensitivity
Access Level Required: SERVICE

This value allows the user to adjust the sensitivity of the Leaving Chilled Liquid Temperature control. Service Technicians refer to YORK Service Manual 160.54-M1.

Smart Freeze (Off / On)
Access Level Required: SERVICE

This value is only available if the chiller is not in Brine mode. It allows the user to enable the Smart Freeze Point Operation which allows the chiller to run closer to the freeze point without shutting down. Service Technicians refer to YORK Service Manual 160.54-M1.

Refrigerant (Enabled / Disabled)
Access Level Required: SERVICE

When an Evaporator Refrigerant Sensor has been installed it must be enabled via this toggle before the system will utilize the new, enhanced resolution input. Service Technicians refer to YORK Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

CONDENSER SCREEN

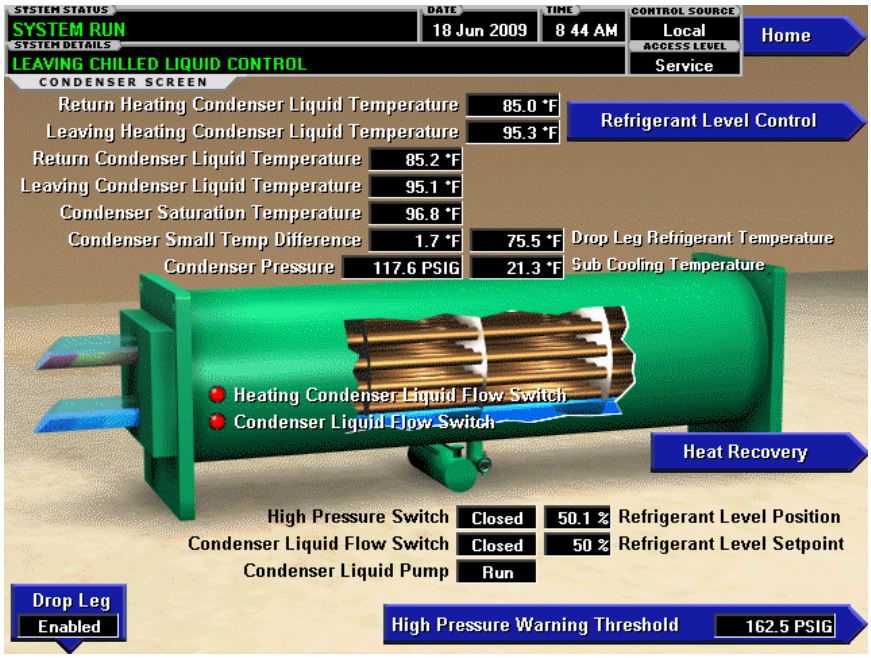

FIG. 7 LD14333

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. With software version C.OPT.01.21.307 and later, when Heat Recovery is enabled, the condenser flow animation will show flow when either the Condenser Liquid Flow Switch or the Heating Condenser Liquid Flow Switch says flow is present. When heat recovery is disabled, the condenser flow animation is based on the standard Condenser Flow Switch. This screen also serves as a gateway to controlling the Refrigerant Level, Heat Recovery and Head Pressure Control.

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DISPLAY ONLY

Leaving Condenser Liquid Temperature
Displays the water temperature as it leaves the condenser.

Return Condenser Liquid Temperature
Displays the water temperature as it enters the condenser.

Condenser Saturation Temperature
Displays the saturation temperature in the condenser.

Small Temperature Difference
Displays the difference between the Condenser Refrigerant temperature and the Leaving Condenser Liquid temperature. The Condenser Refrigerant temperature will be represented by the Condenser Saturation temperature.

Condenser Pressure
Displays the refrigerant pressure in the condenser.

Heating Condenser Liquid Temperature - Leaving
(Software version C.OPT.01.21.307 and later)
Displays the temperature of the liquid as it leaves the heating condenser tube bundle. Only appears when the Heat Recovery is enabled.

Heating Condenser Liquid Temperature – Return
(Software version C.OPT.01.21.307 and later)
Displays the temperature of the liquid as it enters the heating condenser tube bundle. Only appears when the Heat Recovery is enabled.

Heating Condenser Liquid Flow Switch (LED)
(Software version C.OPT.01.21.307 and later)
Displays the status of the flow switch in the heating condenser tube bundle. Illuminates when liquid flow is present. Otherwise, it is extinguished. Only appears when the Heat Recovery is enabled.

Condenser Liquid Flow Switch (LED)
(Software version C.OPT.01.21.307 and later)
Displays the status of the flow switch in the standard condenser tube bundle. Illuminates when liquid flow is present. Otherwise, it is extinguished. Only appears when the Heat Recovery is enabled.

Drop Leg Refrigerant Temperature
Displays the temperature of the refrigerant in the drop leg between the condenser and evaporator shells, if the sensor is present.

Sub-Cooling Temperature
Displays the difference between the Condenser Refrigerant temperature and the Drop Leg Refrigerant temperature. The Condenser Refrigerant temperature will be represented by the Condenser Saturation temperature. If the Drop Leg sensor is not present, this temperature is not displayed.

High Pressure Switch (Open / Closed)
Displays the present position of the high pressure switch. This will indicate whether a High Pressure fault is present.

Condenser Liquid Flow Switch
Indicates whether flow is present in the condenser.

Condenser Liquid Pump (Run / Stop)
Indicates whether Condenser liquid pump is operating.

Refrigerant Level Position
Displays the present position of the refrigerant level if this function is enabled.

Refrigerant Level Setpoint
Displays the setpoint to which the refrigerant level is being controlled.

Ramp Up Time Remaining
Displays the time remaining in the period in which the Refrigerant Level setpoint is being ramped to a Refrigerant Level target setpoint. This is only displayed if the Refrigerant Ramp is enabled and the value is nonzero. Service Technicians refer to YORK Service Manual 160.54-M1.

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.

D**rop Leg (Enabled / Disabled)**
Access Level Required: SERVICE
When a Drop Leg Refrigerant Sensor has been installed it must be enabled via this toggle before the system will utilize the new, enhanced resolution input. Service Technicians refer to YORK Service Manual 160.54-M1.

FAULT ACKNOWLEDGE

(Software version C.MLM.01.11.xxx (and later) or C.OPT.01.11.xxx (and later))
Access Level Required: SERVICE
This allows clearing of the High Condenser Pressure Fault While Shutdown ("Condenser- High Pressure Stopped"). Service Technicians refer to Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Refrigerant Level Control
Access Level Required: SERVICE
Moves to the sub-screen allowing programming of the refrigerant liquid level control setpoints.

Heat Recovery
(Software version C.OPT.01.21.307 and later)
Access Level Required: SERVICE
Moves to a sub screen allowing programming and viewing of the Heat Recovery setpoints and parameters. Only appears when the Heat Recovery is enabled.

Head Pressure Control
(Software version C.OPT.01.21.307 and later)
Access Level Required: SERVICE
Moves to a sub screen allowing programming and viewing of the Head Pressure Control setpoints and parameters. Only appears when Head Pressure Control is enabled and Heat Recovery is disabled.

HEAT RECOVERY SCREEN
(Software Version C.OPT.01.21.307)

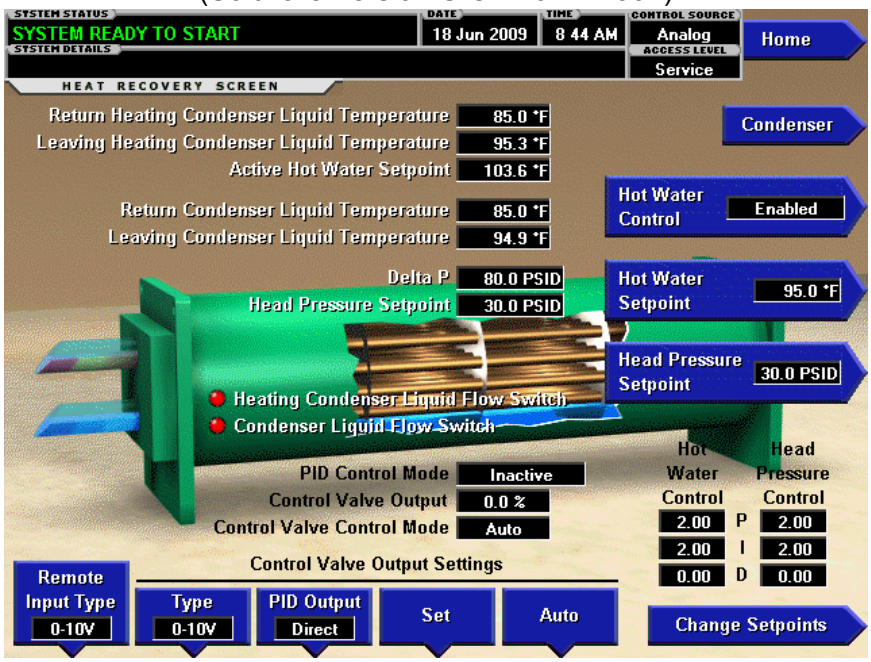

FIG. 7A LD14334

OVERVIEW

This screen displays all parameters related to the Heat Recovery feature. It also allows for setting of the setpoints applicable to this feature.

The Heat Recovery feature is an optional feature and if so equipped, it must be enabled on the SETUP Screen. Once enabled, this screen is accessible from the CONDENSER Screen. If the Head Pressure Control feature is also enabled, there is no separate Head Pressure Control Screen. Rather, the Head Pressure Control parameters and setpoints appear on this screen. The screen above is shown with Heat Recovery, Hot Water Control and Head Pressure Control enabled in ANALOG Control Source.

When Heat recovery is enabled, the condenser flow animation will show flow when either the Condenser Liquid Flow Switch or the Heating Condenser Liquid Flow Switch says flow is present. When heat recovery is disabled, the condenser flow animation is based on the standard Condenser Flow Switch. This screen also serves as a gateway to controlling the Refrigerant Level, Heat Recovery and Head Pressure Control.

A complete explanation of the Heat Recovery feature is contained in Service Manual 160.54-M1.

Note! – Requires Login access level of SERVICE.

DISPLAY ONLY

Return Heating Condenser Liquid Temperature
Displays the temperature of the liquid as it enters the heating condenser tube bundle.

Leaving Heating Condenser Liquid Temperature
Displays the temperature of the liquid as it leaves the heating condenser tube bundle.

Active Hot Water Setpoint
Displays the Hot Water Setpoint to which the Leaving Heating Condenser Liquid Temperature is being controlled. Only appears when Hot water Control is enabled.

Return Condenser Liquid Temperature
Displays the temperature of the liquid as it enters the standard condenser tube bundle.

Leaving Condenser Liquid Temperature
Displays the temperature of the liquid as it leaves the standard condenser tube bundle.

Delta P
Displays the pressure difference between the condenser and evaporator (condenser minus evaporator). This is also called the Head Pressure. Only appears when Head Pressure Control is enabled.

Head Pressure Setpoint
Displays the active Head Pressure Setpoint to which the head pressure is being controlled. Only appears when Head Pressure Control is enabled.

Heating Condenser Liquid Flow Switch (LED)
Displays the status of the flow switch in the heating condenser tube bundle. Illuminates when liquid flow is present. Otherwise, it is extinguished.

Condenser Liquid Flow Switch (LED)
Displays the status of the flow switch in the standard condenser tube bundle. Illuminates when liquid flow is present. Otherwise, it is extinguished.

PID Control Mode
Only appears when Hot Water Control is enabled. Displays the function the Control Valve is controlling. If the chiller is equipped with both Heat Recovery and Head Pressure Control and both are enabled, there is not a control valve for each feature. Rather, there is one common valve that is either performing Hot Water Control for Heat Recovery or it is performing Head Pressure Control. It will not be performing control for both features at the same time. Normally, it will be performing Hot Water Control unless certain operating conditions cause it to switch over to Head Pressure Control. When performing Hot Water Control, "Hot Water" is displayed. When performing Head Pressure Control, "Head Pressure" is displayed. There are also conditions under which it is not controlling either one, in which case "Inactive" is displayed. Which feature will be controlling the valve at any given time and when it is inactive is determined by operating conditions as shown in the flow chart in Heat Recovery Section 24 in Service Manual 160.54-M1.

Control Valve Output
Displays the position command being sent to the control valve. If Hot water control is enabled and there is flow in the Heating Condenser, the valve is performing Heat Recovery Control. Otherwise, if Head Pressure Control is enabled, it is performing Head Pressure Control. Displayed over the range of 0.0% to 100%. The actual value of the output signal for a given error depends on whether the PID OUTPUT setpoint is set to DIRECT or REVERSE. If set to DIRECT, the 0.0% output will be at minimum; the 100% output will be at maximum. If set to REVERSE, the 0.0% output will be at maximum; the 100% output will be at minimum. Only appears when Hot Water Control is enabled or Head Pressure Control is enabled.

Control Valve Control Mode
Displays whether the Control valve is in automatic or manual control. Only appears when Hot Water Control is enabled or Head Pressure Control is enabled.

PROGRAMMABLE

Hot Water Control
(Enabled or Disabled; default Disabled) Allows the Service Technician to enable and disable the Hot Water Control for the Heat Recovery feature. When enabled, Control Valve will control the Return Condenser Liquid Temperature to achieve the Hot Water Setpoint (see below).

Hot Water Setpoint
(65.0 to 125ºF; default 95ºF) Sets the temperature to which the Control Valve will control the Leaving Heating Condenser Liquid Temperature. Only appears when Hot Water Control is enabled (see above).

Head Pressure Setpoint
(15.0 to 60 PSID; default 23.0 PSID)Sets the pressure differential to which the Control Valve will control the Head Pressure. When both Hot Water Control and Head Pressure Control are enabled, the Control Valve will normally be performing Heat Recovery (controlling to the Hot Water Setpoint). However, it will switch over to Head Pressure Control when certain operating conditions are met as shown in the flow chart in Heat Recovery Section 24 in Service Manual 160.54-M1. Only appears when Head Pressure Control is enabled.

Remote Input Type
(0-10V or 4-20mA; default 0-10v)When operating in ANALOG Control Source, the LTC I/O Board accepts a Remote Hot Water Setpoint offset in the form of either a 0-10Vdc or 4-20mA input to the LTC I/O Board input (TB9-3/4). This setpoint configures the LTC I/O Board input to accept the input signal type applied. Only appears when the Hot Water Control is set enabled and the CONTROL SOURCE setpoint (Operations Screen) is set to ANALOG.

Control Valve Output Settings - Type
(0-10v or 4-20mA; default 0-10v) Sets the output signal to the Control Valve to be in the form of either 0-10Vdc or 4-20mA. Only appears when Hot Water Control is enabled or Head Pressure Control is enabled.

Control Valve Output Settings - PID Output
(Direct or Reverse) Allows the output signal to the Control Valve to be set to DIRECT or REVERSE acting. When set to DIRECT, the voltage or current signal to the Control Valve is at minimum for a 0% command and at maximum for a 100% command. When set to REVERSE, the voltage or current signal to the Control Valve is at maximum for a 0% command and at minimum for a 100% command. Only appears when Hot Water Control is enabled or Head Pressure Control is enabled.

Control Valve Output Settings - Set
(0.0% to 100%; default 0.0%) Allows the Control Valve to be manually set to a pre-determined position between 0.0% and 100%. Only appears when Hot Water Control is enabled or Head Pressure Control is enabled.

Control Valve Output Settings - Auto
Places the Control Valve in automatic control. Only appears when Hot Water Control is enabled or Head Pressure Control is enabled.

Change Setpoints
Use to enter the Hot water Control and Head Pressure Control PID variables below. Pressing this key places a green box around the first changeable setpoint. Use the up/dn, left/right arrows to place the selection box aroud thwe desired setpoint. Wityht the setpoint selected, press the ENTER (checkmark) key. A dialog box appears with the range of settings. Using the numeric keys, enter desired value. Then, press the ENTER (checkmark) key.

Hot Water Control - P
Sets the Proportional Gain of the Hot water Control (0.00 to 5.00; default 2.00). Use the Change Setpoints key as described above to select/enter this setpoint. Only appears when Hot Water Control is enabled.

Hot Water Control - I
Sets the Integral Gain of the Hot Water Control (0.00 to 5.00; default 2.00). Use the Change Setpoints key as described above to select/enter this setpoint. Only appears when Hot Water Control is enabled.

Hot Water Control - D
Sets the Derivative Gain of the Hot Water Control (0.00 to 5.00; default 0.00). Use the Change Setpoints key as described above to select/enter this setpoint. Only appears when Hot Water Control is enabled.

Head Pressure Control - P
Sets the Proportional Gain of the Head Pressure Control (0.00 to 5.00; default 2.00). Use the Change Setpoints key as described above to select/enter this setpoint. Only appears when Head Pressure Control is enabled.

Head Pressure Control – I
Sets the Integral Gain of the Head Pressure Control (0.00 to 5.00; default 2.00). Use the Change Setpoints key as described above to select/enter this setpoint. Only appears when Head Pressure Control is enabled.

Head Pressure Control – D
Sets the Derivative Gain of the Head Pressure Control (0.00 to 5.00; default 0.00). Use the Change Setpoints key as described above to select/enter this setpoint. Only appears when Head Pressure Control is enabled.

NAVIGATION

Home
Causes an instant return to the Home Screen

Condenser
Returns to the Condenser Screen

HEAD PRESSURE CONTROL SCREEN

(Software Version C.OPT.01.21.307)

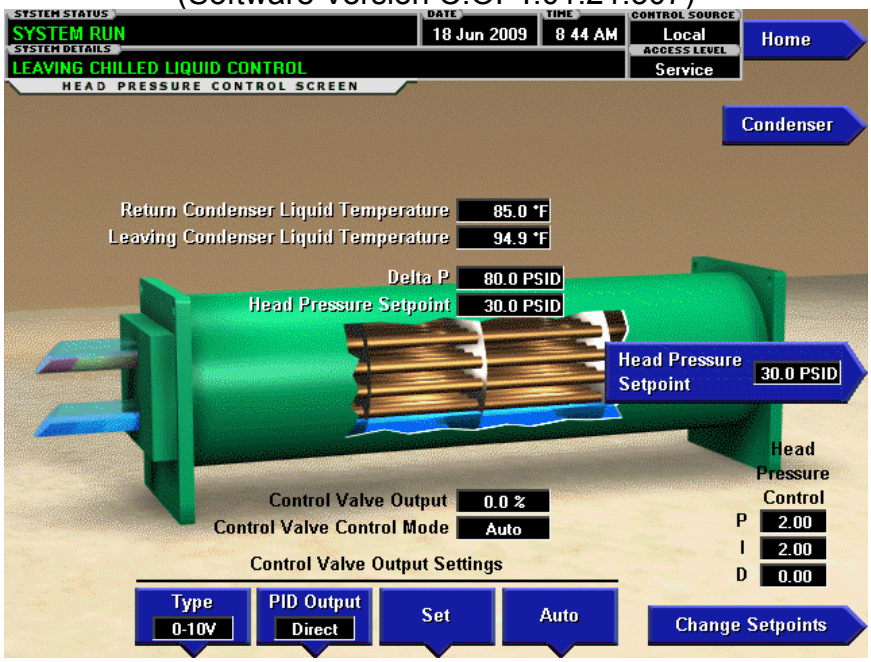

FIG. 7B

LD14335

OVERVIEW

This screen displays all parameters related to the Head Pressure Control feature. It also allows for setting of the setpoints applicable to this feature.

If equipped with this optional feature, it must be enabled on the SETUP Screen. Once enabled, this screen is accessible from the CONDENSER Screen.

The Condenser water flow animation will show flow when the Condenser Liquid Flow Switch senses flow is present.

A complete explanation of the Head Pressure Control feature is contained in Service Manual 160.54-M1.

Note! – Requires login access level of SERVICE

DISPLAY ONLY

Return Condenser Liquid Temperature

Displays the temperature of the liquid as it enters the standard condenser tube bundle.

Leaving Condenser Liquid Temperature

Displays the temperature of the liquid as it leaves the standard condenser tube bundle.

Delta P

Displays the pressure difference between the condenser and evaporator (condenser minus evaporator). This is also called the Head Pressure.

Head Pressure Setpoint

Displays the active Head Pressure Setpoint to which the head pressure is being controlled.

Control Valve Output

Displays the position command being sent to the control valve. Displayed over the range of 0.0% to 100%. The actual value of the output signal for a given error depends on whether the PID OUTPUT setpoint is set to DIRECT or REVERSE. If set to DIRECT, the 0.0% output will be at minimum; the 100% output will be at maximum. If set to REVERSE, the 0.0% output will be at maximum; the 100% output will be at minimum.

Control Valve Control Mode

Displays whether the Control valve is in automatic or manual control.

PROGRAMMABLE

Head Pressure Setpoint
(15.0 to 60 PSID; default 23.0 PSID)Sets the pressure differential to which the Control Valve will control the Head Pressure.

Control Valve Output Settings - Type
(0-10v or 4-20mA; default 0-10v) Sets the output signal to the Control Valve to be in the form of either 0-10Vdc or 4-20mA.

Control Valve Output Settings - PID Output
(Direct or Reverse) Allows the output signal to the Control Valve to be set to DIRECT or REVERSE acting. When set to DIRECT, the voltage or current signal to the Control Valve is at minimum for a 0% command and at maximum for a 100% command. When set to REVERSE, the voltage or current signal to the Control Valve is at maximum for a 0% command and at minimum for a 100% command.

Control Valve Output Settings - Set
(0.0% to 100%; default 0.0%) Allows the Control Valve to be manually set to a pre-determined position between 0.0% and 100%.

Control Valve Output Settings - Auto
Places the Control Valve in automatic control.

Change Setpoints
Use to enter the Head Pressure Control PID variables below. Pressing this key places a green box around the first changeable setpoint. Use the up/dn, left/right arrows to place the selection box aroud thwe desired setpoint. Wityht the setpoint selected, press the ENTER (checkmark) key. A dialog box appears with the range of settings. Using the numeric keys, enter desired value. Then, press the ENTER (checkmark) key.

Head Pressure Control - P
Sets the Proportional Gain of the Head Pressure Control (0.00 to 5.00; default 2.00). Use the Change Setpoints key as described above to select/enter this setpoint.

Head Pressure Control – I
Sets the Integral Gain of the Head Pressure Control (0.00 to 5.00; default 2.00). Use the Change Setpoints key as described above to select/enter this setpoint.

Head Pressure Control – D
Sets the Derivative Gain of the Head Pressure Control (0.00 to 5.00; default 0.00). Use the Change Setpoints key as described above to select/enter this setpoint.

NAVIGATION

Home
Causes an instant return to the Home Screen

Condenser
Returns to the Condenser Screen

REFRIGERANT LEVEL CONTROL SCREEN

(Flash memory Card versions C.MLM.01.06.xxx and earlier)

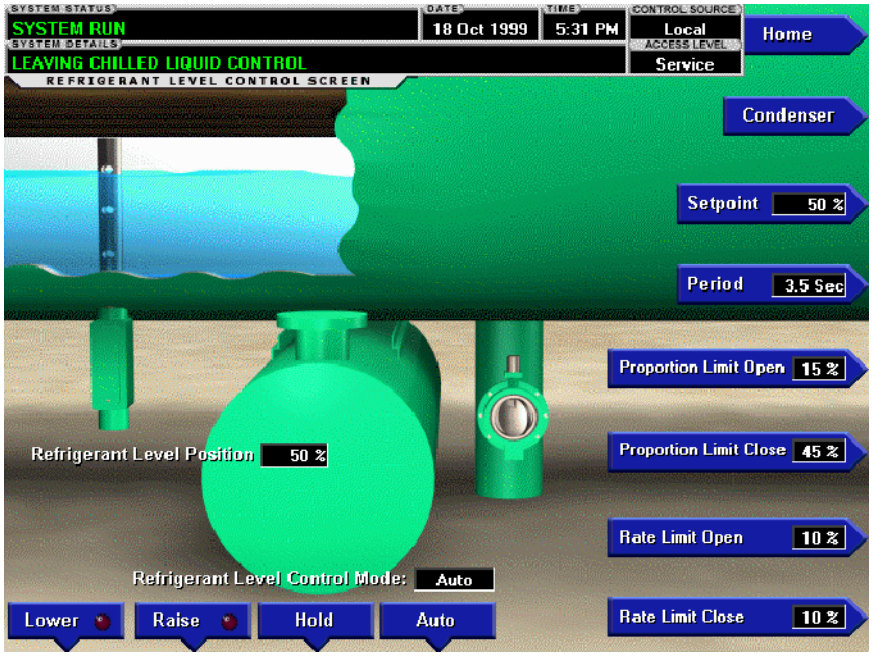

FIG. 8

00303VIP

OVERVIEW

This screen displays a cutaway view of the chiller condenser, along with the liquid refrigerant level sensor and the flow control valve. All setpoints relating to the liquid level control are maintained on this screen. Through animation, the variable orifice position is displayed. In addition, the refrigerant flow control valve (variable orifice) can be manually operated.

NOTE

Requires a login access level of SERVICE. Service Technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Refrigerant Level Position
Displays the present position of the liquid level. The refrigerant level is animated in the cutaway view of the condenser. When the actual level is 0% to 15%, the level is shown about 50% full. When the actual level is 16% to 31%, the level is shown about 60% full. When the actual level is 32% to 47%, the level is shown about 70% full. When the actual level is 48% to 63%, the level is shown about 80% full. When the actual level is 64% to 79%, the level is shown as about 90% full. Actual levels above 79%, shown as 100% full.

Refrigerant Level Control Mode
Indicates whether the liquid level control is under manual or automatic control.

Raise (LED)
Is ON when the digital output controlling the Level Raise contact is on.

Lower (LED)
Is ON when the digital output controlling the Level Lower contact is on.

PROGRAMMABLE

[Refrigerant Level] Setpoint
Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Period
Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Proportional Limit Open
Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Proportional Limit Close
Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Rate Limit Open
Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Rate Limit Close
Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Raise (Manual)
This key puts the level control into manual mode and sends a **RAISE** command to the variable orifice.

[Refrigerant Level Control] Lower (Manual)
This key puts the level control into manual mode and sends a **LOWER** command to the variable orifice.

[Refrigerant Level Control] Hold (Manual)
This key puts the level control into manual mode and sends a **HOLD** command to the variable orifice.

[Refrigerant Level Control] Auto
Returns the Level Control to automatic mode.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Condenser
Access Level Required: VIEW
Return to the Condenser Screen.

REFRIGERANT LEVEL CONTROL SCREEN

(Software Version C.MLM.01.07.xxx to C.MLM.01.10D.xxx or C.OPT.01.10D (and earlier))

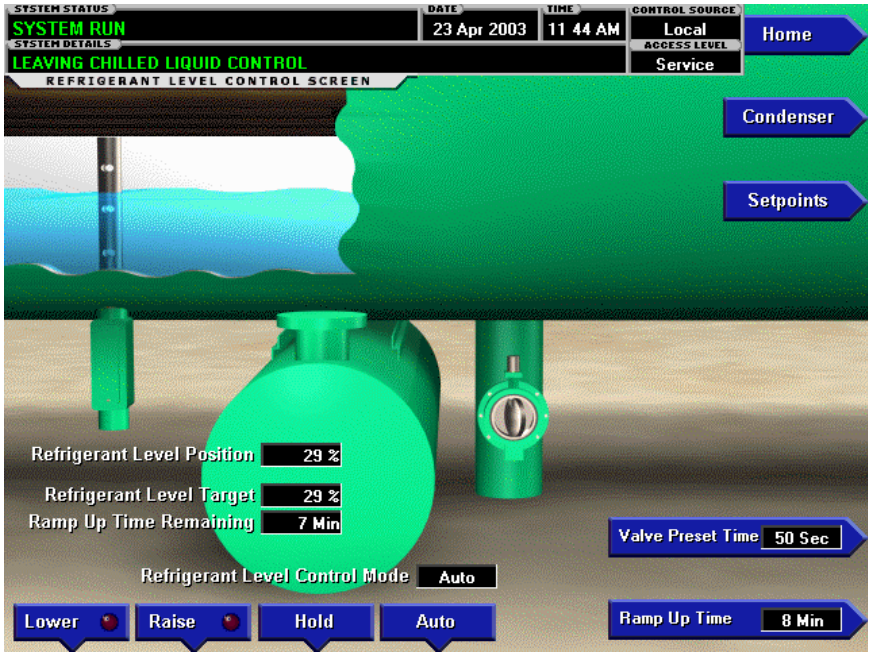

FIG. 8A LD09099

OVERVIEW

This screen displays a cutaway view of the chiller condenser, along with the liquid refrigerant level sensor and variable orifice. Some setpoints relating to the liquid level control are maintained on this screen, while others are contained on a subscreen. Through animation, the variable orifice position is displayed. In addition, the refrigerant flow control valve (variable orifice) can be manually operated.

NOTE

Requires a login access level of SERVICE. Service Technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Refrigerant Level Position

Displays the present position of the liquid level. The refrigerant level is animated in the cutaway view of the condenser. When the actual level is 0% to 15%, the level is shown about 50% full. When the actual level is 16% to 31%, the level is shown about 60% full. When the actual level is 32% to 47%, the level is shown about 70% full. When the actual level is 48% to 63%, the level is shown about 80% full. When the actual level is 64% to 79%, the level is shown as about 90% full. Actual levels above 79%, shown as 100% full.

Refrigerant Level Control Mode

Indicates whether the liquid level control is under manual or automatic control.

Raise (LED)

Is ON when the output controlling the Level Raise contact is on.

Lower (LED)

Is ON when the output controlling the Level Lower contact is on.

PROGRAMMABLE

Valve Preset Time

Service Technicians refer to YORK Service Manual 160.54-M1.

Ramp-up Time

Service Technicians refer to YORK Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Condenser
Access Level Required: VIEW
Return to the Condenser Screen.

Setpoints
Access Level Required: Service
Moves to a sub-screen allowing programming of the Refrigerant Level Control Setpoints.

REFRIGERANT LEVEL CONTROL SETPOINTS SCREEN

(Software Version C.MLM.01.07.xxx to C.MLM.01.10D.xxx or C.OPT.01.10D (and earlier))

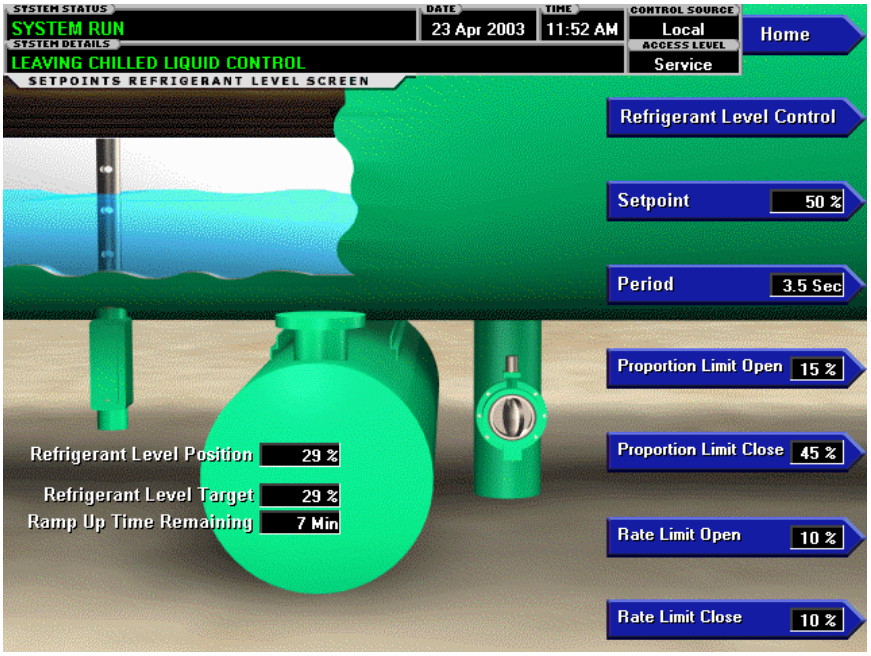

FIG. 8B LD09097

OVERVIEW

This Screen displays a cutaway view of the chiller condenser, along with the liquid refrigerant level sensor and variable orifice. Liquid Level Control setpoints are maintained on this screen. Through animation, the variable orifice position is displayed.

NOTE

Requires a login access level of SERVICE. Service technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Refrigerant Level Position

Displays the present position of the liquid level. The refrigerant level is animated in the cutaway view of the condenser. When the actual level is 0% to 15%, the level is shown about 50% full. When the actual level is 16% to 31%, the level is shown about 60% full. When the actual level 32% to 47%, the level is shown about 70% full. When the actual level is 48% to 63%, the level is shown about 80% full. When the actual level is 64% to 79%, the level is shown as about 90% full. Actual levels above 79% are shown as 100% full.

PROGRAMMABLE

[Refrigerant Level] Setpoint

Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Period

Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control]
Proportional Limit Open

Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control]
Proportional Limit Close

Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Rate Limit Open

Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Rate Limit Close
Service Technicians refer to YORK Service Manual 160.54-M1.

[Refrigerant Level Control] Raise (Manual)
This key puts the control into manual mode and sends a raise command to the variable orifice.

[Refrigerant Level Control] Lower (Manual)
This key puts the control into manual mode and sends a lower command to the variable orifice.

[Refrigerant Level Control] Hold (Manual)
This key puts the control into manual mode and sends a hold command to the variable orifice

[Refrigerant Level Control] Auto
Returns the Level Control to automatic mode.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Refrigerant Level Control
Access Level Required: SERVICE
Return to the Refrigerant Level Control Screen.

REFRIGERANT LEVEL CONTROL SCREEN

(Software Versions C.MLM.01.14.XXX and later or C.OPT.01.14.306 and later)

FIG. 8C

LD10703

OVERVIEW

This screen displays a cutaway view of the chiller condenser, along with the liquid refrigerant level sensor and variable orifice. Setpoints relating to the liquid level control are maintained on this screen. Through animation, the variable orifice position is displayed. Also, the refrigerant flow control valve (variable orifice) can be manually operated.

A Variable Orifice is used to control the condenser refrigerant level to the Refrigerant Level Setpoint. The control thresholds are applied in two different zones, as determined by the error relationship between the actual refrigerant level and the Level Setpoint. Zone 1 parameters are used when the error is less than or equal to 9%. Zone 2 parameters are used when the error is greater than 9%. When transitioning from Zone 2 to Zone 1, the error must be less than or equal to 9% for 60 seconds before the Zone 1 parameters are used. If the error is greater than 9%, the Zone 2 parameters are immediately implemented.

NOTE

Requires login access level of SERVICE. Service technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanations of all programmable Setpoints, Zone parameters and displayed values.

DISPLAY ONLY

Refrigerant Level Position

Displays the present level of the liquid level control. The refrigerant level is animated in the cutaway view of the condenser. When the actual level is 0% to 15%, the level is shown about 50% full. When the actual level is 16% to 31%, the level is shown about 60% full. When the actual level is 32% to 47%, the level is shown about 70% full. When the actual level is 48% to 63%, the level is shown about 80% full. When the actual level is 64% to 79%, the level is shown as about 90% full. Actual levels above 79% shown as 100% full.

Refrigerant Level Control Mode
Indicates whether the liquid level control is under manual or automatic control.

Raise (LED)
ON when the digital output controlling the raise output is ON. Otherwise, it is OFF.

Lower (LED)
ON when the digital output controlling the Lower output is ON. Otherwise, it is OFF.

Zone Control State
Displays the zone control state ("Zone 1", "Zone 2", or "Zone 2 to Zone 1") currently in effect for the Refrigerant Level control. "Zone Control Off" is displayed when the chiller is shutdown.

Zone Time Remaining
Displays the time remaining in the 60 second countdown timer when transitioning from Zone 2 to Zone 1. When transitioning from Zone 2 parameter set to Zone 1 parameter set, the Zone 1 error requirement must be met for 60 continuous seconds before Zone 1 parameters are used.

Refrigerant Level Target
After the chiller has been running for 3 minutes, if the refrigerant level is less than the Level Setpoint, a linearly increasing ramp (Refrigerant Level target) is applied to the Level Setpoint. This ramp allows the level to go from the present level to the programmed Level Setpoint over a period of time programmed as the Ramp Up Time.

Ramp Up Time Remaining
Displays the time remaining in the Ramp Up time countdown timer while a Refrigerant Level target ramp is in effect.

PROGRAMMABLE

Setpoint
Specifies the desired refrigerant level to be maintained in the condenser.

Valve Preset Time
Specifies the duration of pre-positioning (close) pulse during the System Pre-lube when starting the chiller.

Ramp Up Time
Specifies the duration of the ramp up time applied to the Refrigerant Level Target when starting the chiller while the actual refrigerant level is less than the level setpoint after a 3 minute bypass at start.

Period (Zone 1)
Specifies the control period used during Zone 1 operation.

Rate (Zone 1)
Specifies the rate limit threshold used during Zone 1 operation.

Period (Zone 2)
Specifies the control period used in Zone 2 operation.

Rate (Zone 2)
Specifies the rate limit threshold used during Zone 2 operation.

[Refrigerant Level Control] Lower (Manual)
This key puts the Level Control into manual mode and sends a lower (open) command to the variable orifice.

[Refrigerant Level Control] Raise (Manual)
This key puts the Level Control into manual mode and sends a raise (close) command to the variable orifice.

[Refrigerant Level Control] Hold (Manual)
This key puts the Level Control into manual mode and sends a hold command to the variable orifice.

[Refrigerant Level Control] Auto
Returns the Level Control to automatic mode.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen

Condenser
Access Level Required: VIEW
Returns to the Condenser Screen

COMPRESSOR SCREEN
(ALL "P" COMPRESSORS AND STYLE F AND LATER CHILLERS WITH G, Q OR H5-8 COMPRESSORS)

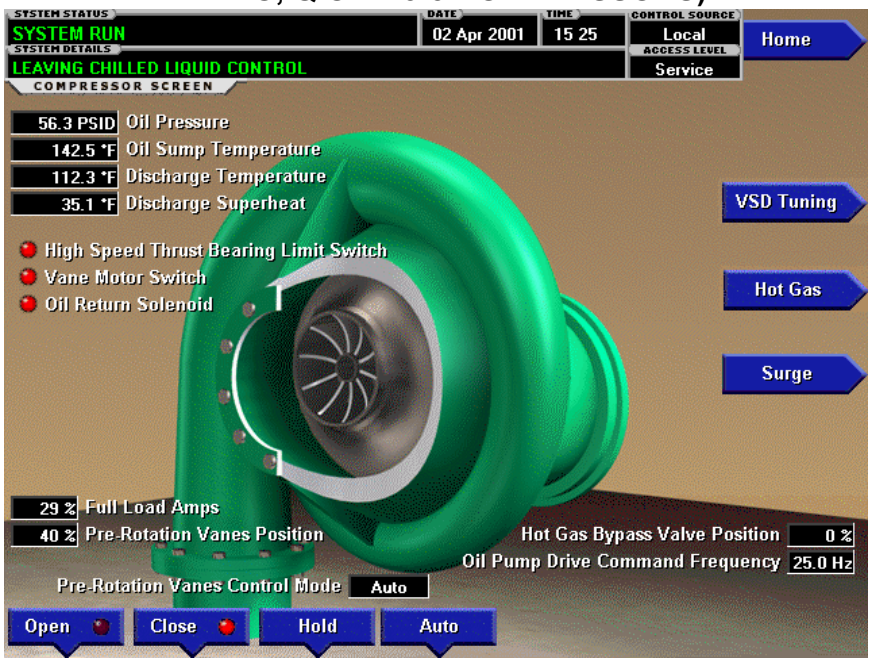

FIG. 9 00549VIP

OVERVIEW

This screen displays a cutaway view of the chiller compressor, revealing the impeller, and shows all conditions associated with the compressor. In addition, with the proper Access Level, the pre-rotation vanes may be manually controlled. Animation of the compressor impeller indicates whether the chiller is presently in a **RUN** condition. This screen also serves as a gateway to subscreens for calibrating the pre-rotation vanes, calibrating the proximity probe, configuring the Hot Gas Bypass, or providing advanced control of the compressor motor Variable Speed Drive.

DISPLAY ONLY

Oil Pressure
Displays the pressure differential between the high side oil pressure transducer (compressor bearing input) and the low side oil pressure transducer (oil sump). The displayed value includes offset pressure derived from auto-zeroing during the system prelube. If either of the transducers used to calculate this differential is out of range, the display field will show XX.X.

The offset pressure is the pressure differential 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 will be sensing the same pressure and their outputs should indicate the same pressure. However, due to accuracy tolerances in transducer design, differences can exist. Therefore to compensate for differences between transducers and assure differential pressure sensing accuracy, the offset pressure is subtracted algebraically from the differential pressure. The offset pressure calculation will not be performed if either transducer is out of range. The offset value will be taken as 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 its gaseous state at discharge of the compressor as it travels to the condenser.

Discharge Superheat
Displays the Discharge superheat, calculated as (Discharge Temperature – Condenser Saturation temperature).

High Speed Thrust Bearing Limit Switch (LED)
Displays the present position of the High Speed Thrust bearing Limit Switch. Extinguished when closed. This is the normal position.

Vane Motor Switch (LED)
Illuminates when the vanes are completely closed.

Oil Return Solenoid (LED)
Illuminates when the 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 whether the vanes are in the process of opening.

[Pre-Rotation Vanes] Close (LED)
Access Level Required: SERVICE
Indicates whether 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.

Oil Pump Drive Command Frequency
(Variable Speed Oil Pump only)
The value displays the present frequency at which the oil pump is being commanded to run.

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.

[Pre-Rotation Vanes] Auto
Access Level Required: SERVICE
This key returns the vane control to automatic mode.

Fault Acknowledge
This option allows clearing of the High Speed Thrust Bearing Limit Switch safety shutdown. Service technicians refer to YORK Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return 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. Moves to the sub-screen allowing calibration of the Pre-rotation vanes. Service Technicians refer to YORK Service Manual 160.54-M1.

VSD TUNING (Variable Speed Drive only)
Access Level Required: SERVICE
Moves to the sub-screen allowing advanced tuning of the Variable Speed Drive. Service Technicians refer to YORK Service Manual 160.54-M1.

Hot Gas
Access Level Required: SERVICE
Moves to a sub-screen that allows programming of the Hot Gas Bypass control setpoints and manual control of the Hot Gas Bypass valve. Only displayed if Hot Gas Bypass feature has been enabled on the OPERATIONS Screen. Service technicians refer to YORK Service Manual 160.54-M1.

Surge
Access Level Required: VIEW
Moves to the sub-screen that allows viewing and programming of the Surge Protection feature. Service Technicians refer to Service Manual 160.54-M1.

COMPRESSOR SCREEN
(STYLE E AND EARLIER CHILLERS WITH G, H, OR J COMPRESSORS AND STYLE G CHILLERS WITH K COMPRESSORS)

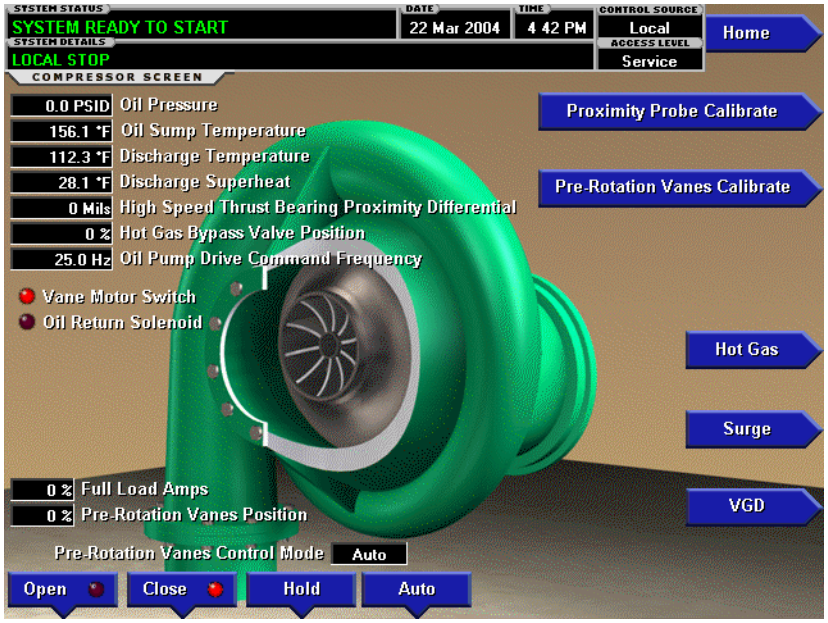

FIG. 9A LD09574

OVERVIEW

This screen displays a cutaway view of the chiller compressor, revealing the impeller, and shows all conditions associated with the compressor. In addition, with the proper Access Level, the pre-rotation vanes may be manually controlled. Animation of the compressor impeller indicates whether the chiller is presently in a **RUN** condition. This screen also serves as a gateway to sub-screens for calibrating the pre-rotation vanes, calibrating the proximity probe, configuring the Hot Gas Bypass, or providing advanced control of the compressor motor Variable Speed Drive.

DISPLAY ONLY

Oil Pressure
Displays the pressure differential between the high side oil pressure transducer (compressor bearing input) and the low side oil pressure transducer (oil sump). The displayed value includes offset pressure derived from auto-zeroing during the system prelube. If either of the transducers used to calculate this differential is out of range, the display field will show XX.X.

The offset pressure is the pressure differential 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 will be sensing the same pressure and their outputs should indicate the same pressure. However, due to accuracy tolerances in transducer design, differences can exist. Therefore to compensate for differences between transducers and assure differential pressure sensing accuracy, the offset pressure is subtracted algebraically from the differential pressure. The offset pressure calculation will not be performed if either transducer is out of range. The offset value will be taken as 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 its gaseous state at discharge of the compressor as it travels to the condenser.

Discharge Superheat
(Flash memory card version C.MLM.01.02 or later)
Displays the Discharge superheat, calculated as (Discharge Temperature – Condenser Saturation temperature).

High Speed Thrust Bearing
Oil Drain Temperature
Displays the temperature of the oil in the high-speed thrust bearing drain line. Not applicable to chillers equipped with Flash Memory Card version C.MLM.01.03 and higher.

High Speed Thrust Bearing
Proximity Differential
Displays the distance between the high-speed thrust collar and the tip of the proximity probe. This measurement takes into account the reference position established at the time of compressor manufacture.

High Speed Thrust Solenoid
(LED - Style E-R22 Only)
Indicates whether the solenoid is presently energized.

Vane Motor Switch (LED)
Indicates whether the vanes are completely closed.

Oil Return Solenoid (LED)
Indicates whether the solenoid is presently energized.

Vent Line Solenoid (LED - Style E-R22)
Indicates whether the solenoid is presently energized.

Liquid Line Solenoid (LED - Style E-R22 and E-R134a J-Compressors)
Indicates whether the solenoid is presently 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 whether the vanes are in the process of opening.

[Pre-Rotation Vanes] Close (LED)
Access Level Required: SERVICE
Indicates whether 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.

Oil Pump Drive Command Frequency
(Variable Speed Oil Pump only)
The value displays the present frequency at which the oil pump is being commanded to run.

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.

[Pre-Rotation Vanes] Auto
Access Level Required: SERVICE
This key returns the vane control to automatic mode.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Proximity Probe Calibration
Access Level Required: SERVICE
Only available if the chiller is stopped. Moves to the sub-screen allowing calibration of the High Speed Thrust Bearing Proximity Probe sensor. Service Technicians refer to YORK Service Manual 160.54-M1.

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. Moves to the sub-screen allowing calibration of the Pre-rotation vanes. Service Technicians refer to YORK Service Manual 160.54-M1.

VSD Tuning (Variable Speed Drive only)
Access Level Required: SERVICE
Moves to the sub-screen allowing advanced tuning of the Variable Speed Drive. Service Technicians refer to YORK Service Manual 160.54-M1.

Hot Gas
Access Level Required: SERVICE
Moves to a sub-screen that allows programming of the Hot Gas Bypass control setpoints and manual control of the Hot Gas Bypass valve. Only displayed if Hot Gas Bypass feature has been enabled on the OPERATIONS Screen. Service technicians refer to YORK Service Manual 160.54-M1.

Surge (Flash memory Card version C.MLM.01.05.xxx and later)
Access Level Required: VIEW
Moves to the sub-screen that allows viewing and programming of the Surge Protection feature. Service Technicians refer to Service Manual 160.54-M1.

VGD
(Software version C.MLM.01.10.xxx (and later) or C.OPT.01.10.302 (and later))
Access Level Required: VIEW
Only displayed if VGD feature enabled on Operations Screen. Moves to the sub-screen that allows viewing and programming of the Variable Geometry Diffuser (VGD) feature. Service technicians refer to Service manual 160.54-M1.

PROXIMITY PROBE CALIBRATION SCREEN
(STYLE E AND EARLIER CHILLERS WITH G, H, OR J COMPRESSORS AND STYLE F AND LATER CHILLERS WITH J OR H3 COMPRESSORS)

FIG. 10

00305VIP

OVERVIEW

This screen displays a cutaway view of the chiller compressor, revealing the proximity probe sensor and provides the capability of calibrating the proximity probe sensor.

NOTE

Requires a login access level of SERVICE. Service Technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

High Speed Thrust Bearing Proximity Position
Displays the distance between the high-speed thrust collar and the proximity probe that is used to measure the position.

High Speed Thrust Bearing Proximity Reference Position
Displays the presently defined offset reference position. This value is defined at the conclusion of a calibration sequence.

Oil Pressure
Displays the pressure differential between the high side oil pressure transducer (compressor bearing input) and the low side oil pressure transducer (oil sump). The displayed value includes offset pressure derived from auto-zeroing during the system prelube. If either of the transducers used to calculate this differential is out of range, the display field will show XX.X.

Calibration in Progress (LED)
Indicates that the calibration sequence is in progress.

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

PROGRAMMABLE

Enter Reference
Service Technicians refer to YORK Service Manual 160.54-M1 for an explanation of this setpoint.

Start Calibration
This option is hidden after calibration has started. Service Technicians refer to YORK Service Manual 160.54-M1 for an explanation of this setpoint.

Cancel Calibration
This option only becomes available after calibration has started. Service Technicians refer to YORK Service Manual 160.54-M1 for an explanation of this setpoint.

Accept Calibration
This option only becomes available after the calibration sequence is complete. Service Technicians refer to YORK Service Manual 160.54-M1 for an explanation of this setpoint.

Fault Acknowledge
This option is only displayed if a fault is present. Allows clearing of High Speed Thrust Bearing related shutdowns. Service Technicians refer to YORK Service Manual 160.54-M1 for a more detailed explanation.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Compressor
Access Level Required: VIEW
Return to the Compressor Screen.

HOT GAS BYPASS SCREEN

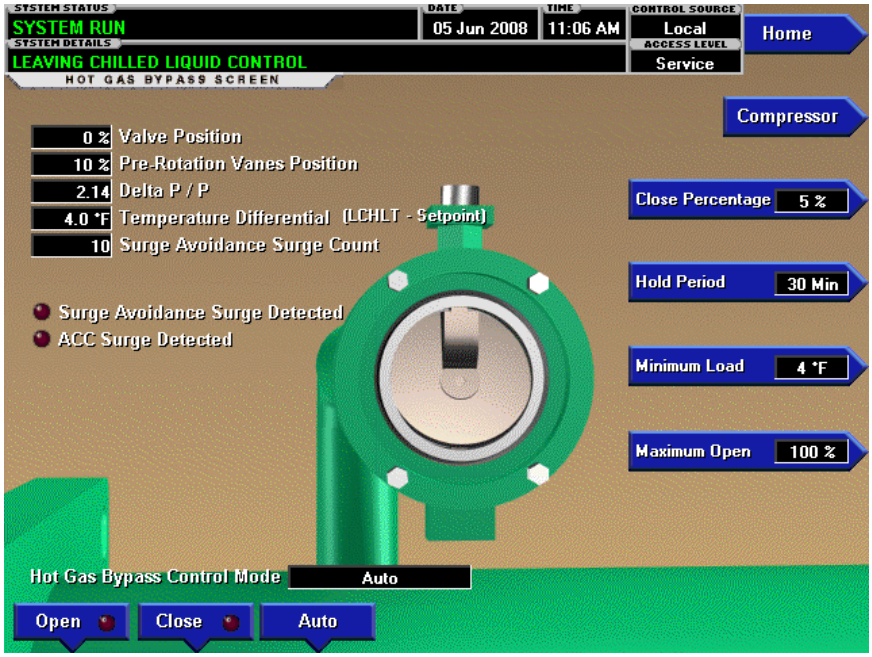

FIG. 11 LD13826

OVERVIEW

This screen displays a cutaway view of the Hot gas Bypass Valve. The setpoints relating to the Hot Gas Bypass Control are maintained on this screen. Related Hot Gas control parameters are displayed for reference. The Hot Gas Valve can be manually controlled from this screen. Through animation, the relative valve position is displayed. The parameters displayed on this screen vary according to the software version and the selection made for the Motor Communications Protocol Setpoint when equipped with Variable Speed Drive (VSD) or Medium Voltage Variable Speed Drive (MV VSD).

Shown above as it appears in software version C.OPT.01.19.307 and later. Earlier version variations noted below.

DISPLAY ONLY

Valve Position
Displays the present position of the Hot Gas valve as a value between 0% (closed) to 100% (full open). By animation, the valve is shown in its relative position. The valve position is animated. When the actual position is 0% to 19%, the valve is shown fully closed. When actual position is 20% to 39%, the valve is shown 25% open. When the actual position is 40% to 59%, the valve is shown 50% open. when actual is 60% to 79%, the valve is shown as 75% open. Positions greater than 79% are shown as full open.

Pre-rotation Vanes Position
Displays the present pre-rotation vanes position as a value between 0% (closed) and 100% (full open)

Delta P/P
Displays the chiller head pressure calculated as (condenser pressure – evaporator pressure/evaporator pressure)

Temperature Differential (LCHLT – Setpoint)
Displays the difference between the leaving chilled liquid temperature and the leaving chilled liquid temperature setpoint

Surge Avoidance Surge Count
(Displayed as “Total surge Count” in software version C.OPT.01.15.307 and earlier)
This is the total number of surges accumulated by the Surge Protection feature. If equipped with a VSD or MV VSD, it is only the surges detected while the drive is running at maximum frequency.

Surge Avoidance Surge Detected (LED)
Illuminates momentarily when a surge is detected by the Surge Protection feature. If equipped with a VSD or MV VSD these are only the surges detected while the drive is running at maximum frequency.

If equipped with software version C.OPT.01.18.307 or earlier, this is displayed as "Surge Detected". It illuminates momentarily when a surge is detected by the Surge Protection feature. If equipped with a VSD, it illuminates whenever a surge is detected, regardless of the VSD operating speed.

ACC Surge Detected (LED)
[Software version C.OPT.01.19.307 and later only. Only displayed if equipped with a VSD (in MODBUS protocol configuration only) or MV VSD]
Illuminates momentarily when a surge is detected by the ACC function in the Microboard, while the drive is running at less than maximum frequency.

Hot Gas Bypass Control Mode
Indicates whether the Hot Gas Bypass is under automatic, manual or override control. When in manual control, it is controlled from this screen. When in override control, "Minimum Load", "VSD Override" or "VGD override" is displayed as appropriate. Refer to Service manual 160.54-M1 section 20 for details of these messages. Software versions C.OPT.01.18.307 and earlier display "Override" for any of these conditions.

PROGRAMMABLE

Close Percentage
(5 to 15%)
This is the incremental amount that the Hot Gas valve will be closed at 10 minute intervals after the HOLD period has elapsed. Service Technicians refer to Service manual 160.54-M1.

Hold Period
(30 to 120 minutes)
This is the period of time after no more surges are detected that the Hot Gas valve closing will begin. Service Technicians refer to Service manual 160.54-M1.

Minimum Load
(0 to 4ºF)
This sets the offset below the Leaving Chilled Liquid Temperature Setpoint at which the Hot Gas valve will be opened to the position allowed by the MAXIMUM OPEN setpoint. Service Technicians refer to Service manual 160.54-M1.

Maximum Open
(25 to 100%)
The maximum allowed position for the Hot Gas valve during a Minimum load override condition. Service Technicians refer to Service manual 160.54-M1.

[Hot Gas Bypass Control] Open (manual)
Puts the Hot Gas Bypass valve in manual control mode. Each time this key is pressed, the valve position is increased by 5%.

[Hot Gas Bypass Control] Close (manual)
Puts the Hot Gas Bypass valve in manual control mode. Each this key is pressed, the valve position is decreased by 5%.

[Hot Gas Bypass Control] Auto
Returns the Hot Gas Bypass Control to automatic mode.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen

Compressor
Access Level Required: VIEW
Causes an instant return to the Compressor Screen

SURGE PROTECTION SCREEN

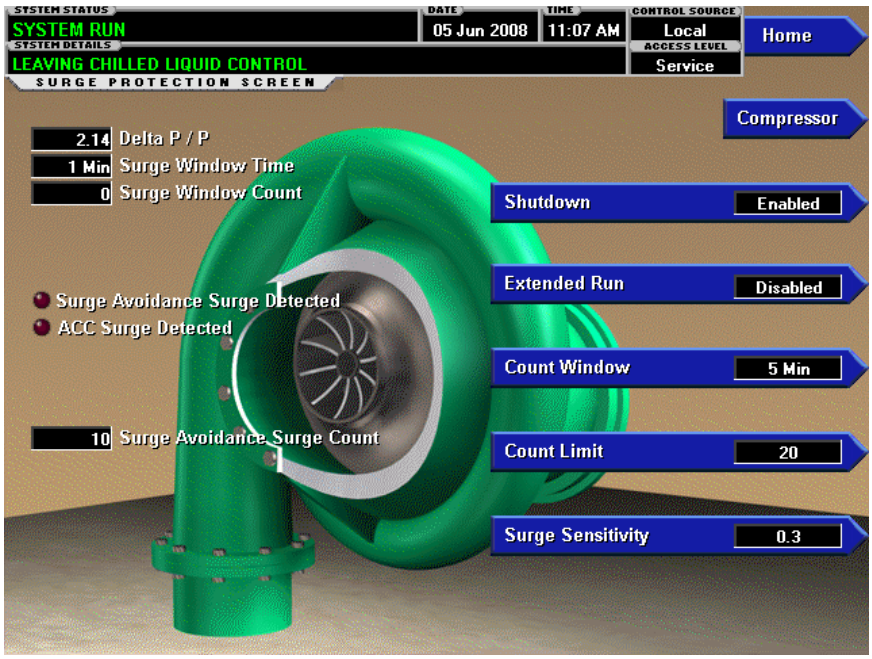

FIG. 12 LD13827

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 screen are maintained on this screen.

The Surge Protection feature detects surge events and provides a running count of the surges detected over the lifetime of the chiller. It allows the user to define how many surges are excessive and how the control will react to an excess surge condition. When excess surging is detected, it can be configured to shutdown the chiller, or initiate a surge avoidance mode while allowing it to continue to run or simply display a warning message. The sensitivity of this surge detection is set by the Sensitivity Setpoint on this screen. The surges detected by this feature are also used for the Hot Gas Bypass feature (refer to Hot Gas Bypass Section).

The detection and counting of surges in this feature is completely independent of the surge detection/counting performed by the Variable Speed Drive (VSD) Adaptive Capacity Control (ACC) surge detection. The ACC surge detection creates a surge map used to control the speed of the drive. If equipped with an ACC Board (new production chillers prior to March 2007), the ACC surge detection is performed there. If not equipped with an ACC Board, (new production chillers after March 2007), the ACC surge detection is performed in the Microboard(refer to 160.54-M1Section 12). With all Medium Voltage Variable Speed Drives (MV VSD), the ACC surge detection is performed in the Microboard.

Screen shown above as it appears in software version C.OPT.01.19.307 (and later). The parameters displayed on this screen vary according to the software version and the motor starter type as noted below.

DISPLAY ONLY

Delta P/P
A parameter that represents the system differential or "Head pressure". It is calculated as (condenser pressure – evaporator pressure) / evaporator pressure.

Surge Window Time
When the chiller enters run mode, this value counts up to the time programmed as the COUNT WINDOW setpoint. When it reaches the COUNT WINDOW minutes, the number of surge events in the oldest minute is discarded and the number of surge events in the most recent minute is added, thus providing a rolling count of the total surge events that have occurred in the last 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, it 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 Avoidance Surge Detected (LED)
Illuminates momentarily when a surge is detected by the Surge Protection feature. If equipped with a VSD or MV VSD these are only the surges detected while the drive is running at maximum frequency.

If equipped with software version C.OPT.01.18.307 or earlier, this is displayed as "Surge Detected". It illuminates momentarily when a surge is detected by the Surge Protection feature. If equipped with a VSD, it illuminates whenever a surge is detected, regardless of the VSD operating speed.

ACC Surge Detected (LED)
[Software version C.OPT.01.19.307 and later only. Only displayed if equipped with a VSD (in MODBUS protocol configuration only) or MV VSD] Illuminates momentarily when a surge is detected by the ACC function in the Microboard, while the drive is running at less than maximum frequency.

Surge Avoidance Surge Count
(Displayed as "Total surge Count" in software version C.OPT.01.15.307 and earlier)
This is the total number of surges accumulated by the Surge Protection feature. If equipped with a VSD or MV VSD, it is only the surges detected while the drive is running at maximum frequency.

Extended Run Time Remaining
Displays the time remaining in the 10-minute "EXTENDED RUN" period. During this period, the Prerotation vanes are driven closed and "Warning – Surge Protection – Excess Surge Limit" is displayed. Refer to operation under "Count Limit" below.

PROGRAMMABLE

Shutdown (Enabled/Disabled)
Access Level Required: OPERATOR
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 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" below.

With Software version C.MLM.01.09.xxx (and later) or C.OPT.01.09.301 (and later):

- If equipped with a compressor Variable Speed Drive (VSD), the VSD output frequency must be at maximum before the SHUTDOWN feature is implemented or surge warning messages are displayed.
- If equipped with a VSD and Hot Gas Bypass (Enabled), the VSD output frequency must be at maximum AND the Hot Gas Valve must be at 100% before the SHUTDOWN feature is implemented or surge warning messages are displayed.

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 10 minutes. While this load inhibit is in effect, "Warning – Surge Protection – Excess Surge Limit' is displayed. When 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 at the completion of this period, a safety shutdown is performed and "Surge Protection – Excess Surge" is displayed.

If the Hot Gas Bypass control is Enabled, the Hot gas Bypass Valve position must be 100% before the Extended Run mode is implemented. If the chiller is equipped with a compressor motor Variable Speed Drive, output frequency must be at full speed (50 Hz/60 Hz) before the Extended Run mode is implemented. If the chiller is equipped with both Hot Gas Bypass and compressor motor Variable Speed Drive, both of the conditions must be met before Extended Run is implemented.

Count Window
Access Level Required: OPERATOR
Allows the user to define the period of time (1 to 5 minutes; default 5;default 3 with Software version C.MLM.01.09.xxx (and later) or C.OPT.01.09.301 (and later)) in which the number of surge events (SURGE WINDOW COUNT) are compared to the maximum allowed (COUNT LIMIT), 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 4 ;default 15 with Software version C.MLM.01.09.xxx (and later) or C.OPT.01.09.301 (and later)) that can occur within a defined period of time before an Excess Surge situation is detected. If the SURGE WINDOW COUNT exceeds the COUNT LIMIT, an Excess Surge situation has occurred.

When an Excess Surge situation is detected, the action 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". See Hot Gas Bypass and Variable Speed Drive exceptions above.
- 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". See Hot Gas Bypass and Variable Speed Drive exceptions above.
- If the SHUTDOWN setpoint is Disabled and the EXTENDED RUN setpoint is Enabled, the Pre-rotation Vanes are driven closed for 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. See Hot Gas Bypass and Variable Speed Drive exception above.
- If both the SHUTDOWN and EXTENDED RUN setpoint are Enabled, the 10 minute Extended RUN mode is invoked as described above. However, if the SURGE WINDOW COUNT exceeds the COUNT LIMIT at the completion of the 10 minute extended run period, a safety shutdown is performed and "Surge Protection – Excess Surge" is displayed. See Hot Gas Bypass and Variable Speed Drive exceptions above.

Surge Sensitivity
Access Level Required: SERVICE
Allows the user to define the surge detection sensitivity of the Surge Protection feature. The Surge Sensitivity Setpoint on the ACC Details Screen sets the sensitivity of the ACC surge detection feature that is employed for ACC Surge detection when configured in MODBUS serial communications protocol. Selectable over the range of 0.3 to 1.3; default 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 to zero.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen

Compressor
Access Level Required: VIEW
Causes an instant return to the Compressor Screen.

VARIABLE GEOMETRY DIFFUSER SCREEN

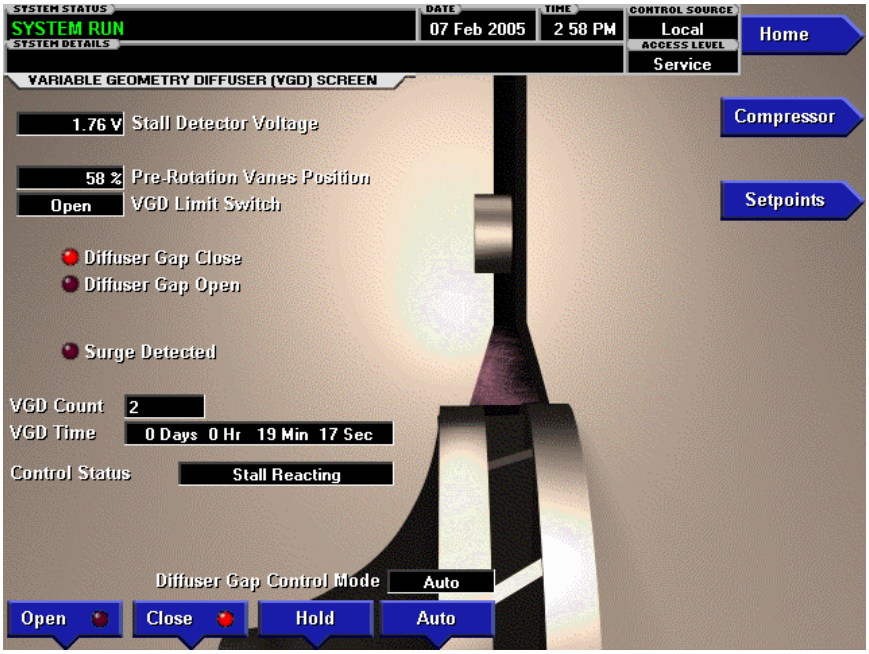

FIG. 12A LD10704

OVERVIEW

(This feature applies to Software version C.MLM.01.10.xxx (and later) or C.OPT.01.10.302 (and later))

This screen displays information pertinent to the VGD operation. Also, the VGD can be manually controlled from this screen.

DISPLAY ONLY

Stall Detector Voltage
Displays the Stall Detector output voltage (x.xxVdc), as received by the Microboard.

Pre-rotation Vanes Position
Displays the position of the Pre-rotation vanes over the range of 0% (fully closed) to 100% (fully open). Displayed as XXX until calibration procedure is performed by Service Technician.

VGD Limit Switch
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
Displays the status of the VGD Limit Switch. Displayed as "Closed" when the switch is closed. This would be when the VGD is in the fully closed position. Otherwise, displayed as "Open"

Diffuser Gap Close (LED)
Illuminates when a close signal is being applied to the VGD.

Diffuser Gap Open (LED)
Illuminates when an open signal is being applied to the VGD.

Surge Detected (LED)
Illuminates for 5 seconds each time a surge is detected.

VGD Count
Displays the number of times the Stall Detector Board output voltage goes above the High Limit setpoint. The count can be cleared with in ADMIN access level using the VGD Cycle Count key on the VGD Setpoints Screen.

VGD Time (__Days __Hrs __Min __Sec)
Displays the accumulated time the Stall Detector Board output voltage is greater than the High Limit Setpoint while the chiller is running.

Control Status
Displays the current state of the VGD control. The states are: Stall Waiting, Stall Reacting, Probing, Surge Reacting, Surge Waiting, Hot Gas Override.

Time Remaining
While the VGD is in the Stall Waiting State, displays the time remaining in the "Probe Wait Time" interval (value programmed as the Probe Wait Time Setpoint).

Diffuser Gap Control Mode
Indicates whether the VGD is under manual or automatic control.

PROGRAMMABLE

[VGD] Open (Manual)
This key puts the VGD in manual mode and sends an open command to the VGD.

[VGD] Close (Manual)
This key puts the VGD in manual mode and sends a close command to the VGD.

[VGD] Hold (Manual)
This key puts the VGD in manual mode and sends a hold command to the VGD.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Compressor
Access Level Required: VIEW
Causes an instant return to the compressor Screen.

VGD Setpoints
Access Level Required: SERVICE
Move to the subscreen that allows programming of the Variable Geometry Diffuser setpoints.

VARIABLE GEOMETRY DIFFUSER SETPOINTS SCREEN

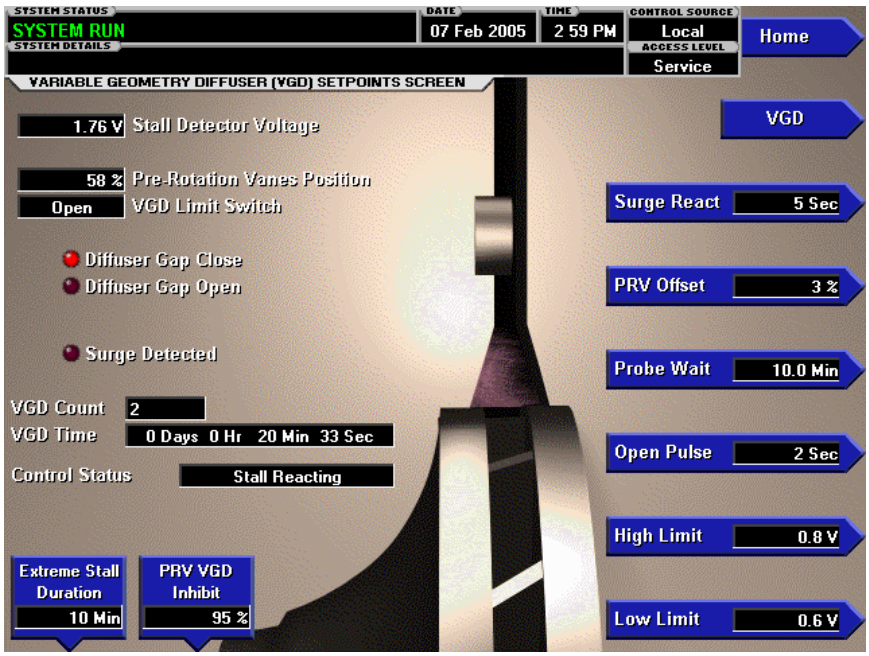

FIG. 12B

LD10705

OVERVIEW

(This feature applies to Software version C.MLM.01.10.xxx (and later) or C.OPT.01.10.302 (and later))

The Variable Geometry Diffuser setpoints are maintained on this screen. All setpoints require a login access level of Service. Service Technicians refer to YORK Service Manual 160.54-M1 for operation and explanation of all setpoints and displayed values.

DISPLAY ONLY

Stall Detector Voltage
Displays the Stall Detector output voltage, as received by the Microboard.

Pre-rotation Vanes Position
Displays the position of the Pre-rotation vanes over the range of 0% (fully closed) to 100% (fully open). Displayed as XXX until calibration procedure is performed by Service Technician.

VGD Limit Switch
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
Displays the status of the VGD Limit Switch. Displayed as "Closed" when the switch is closed. This would be when the VGD is in the fully closed position. Otherwise, displayed as "Open"

Diffuser Gap Close (LED)
Illuminates when a close signal is being applied to the VGD.

Diffuser Gap Open (LED)
Illuminates when an open signal is being applied to the VGD.

Surge Detected (LED)
Illuminates for 5 seconds each time a surge is detected.

VGD Count
Displays the number of times the Stall Detector Board output voltage goes above the High Limit setpoint. The count can be reset with an ADMIN access level using the VGD Cycle Count key on the VGD Setpoints Screen.

VGD Time (__Days __Hrs __Min __Sec)
Displays the accumulated time the Stall Detector Board output voltage is greater than the High Limit Setpoint while the chiller is running.

Control Status
Displays the current state of the VGD control. The states are: Stall Waiting, Stall Reacting, Probing, Surge Reacting, Surge Waiting, Hot Gas Override.

Time Remaining
While the VGD is in the Stall Waiting State, displays the time remaining in the "Probe Wait Time" interval (value programmed as the Probe Wait Time Setpoint).

PROGRAMMABLE

Surge React
(1-30 seconds; default 5) - Specifies the length of the close pulse applied to the VGD in response to a surge.

PRV Offset
(0-5%; default 3) – If the VGD control is in the Stall Waiting state and the Pre-rotation vanes position changes by more than this value, the Probing state will be entered. If the PRV Offset is set to 0%, the Stall Waiting state is performed based only on the "Probe Wait Time" setpoint interval.

Probe Wait
(0.5-15 minutes; default 10) – Specifies how long the VGD control remains in the Stall Waiting or Surge Waiting states before entering the Probing state.

Open Pulse
(1-9 seconds; default 2) – Specifies the length of the open pulse applied to the VGD during 10 second periods while in the Probing state.

High Limit
(0.5-1.2Vdc; default 0.8) – Specifies the Stall Detector Board output voltage that represents an acceptable amount of stall noise.

The minimum difference between the High Limit setpoint and the Low Limit setpoint is 0.1 vdc. If a Low Limit setpoint is entered which is less than 0.1vdc below the High Limit setpoint, the High Limit setpoint is adjusted so that it is 0.1vdc above the newly entered Low Limit value.

Low Limit
(0.4-0.8vdc; default 0.6) – in the Stall Reacting State, the VGD is driven closed until the Stall Detector Board output voltage decreases to this level.

The minimum difference between the High Limit setpoint and the Low Limit setpoint is 0.1 vdc. If a Low Limit setpoint is entered which is less than 0.1vdc below the High Limit setpoint, the High Limit setpoint is adjusted so that it is 0.1vdc above the newly entered Low Limit value.

VGD Count
Access Level required: ADMIN
Allows the user to clear the VGD Cycle Count.

Extreme Stall Duration
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
(10 to 20 minutes; default 10) – Specifies the maximum allowed time an extreme stall condition can exist before the VGD operation is disabled and driven to the full open position to protect it from damage.

NAVIGATION

Home
Access Level Required: Service
Causes an instant return to the Home Screen

VGD Screen
Access Level Required: Service
Causes an instant return to the Variable Geometry Diffuser Screen

PRE-ROTATION VANES CALIBRATION SCREEN

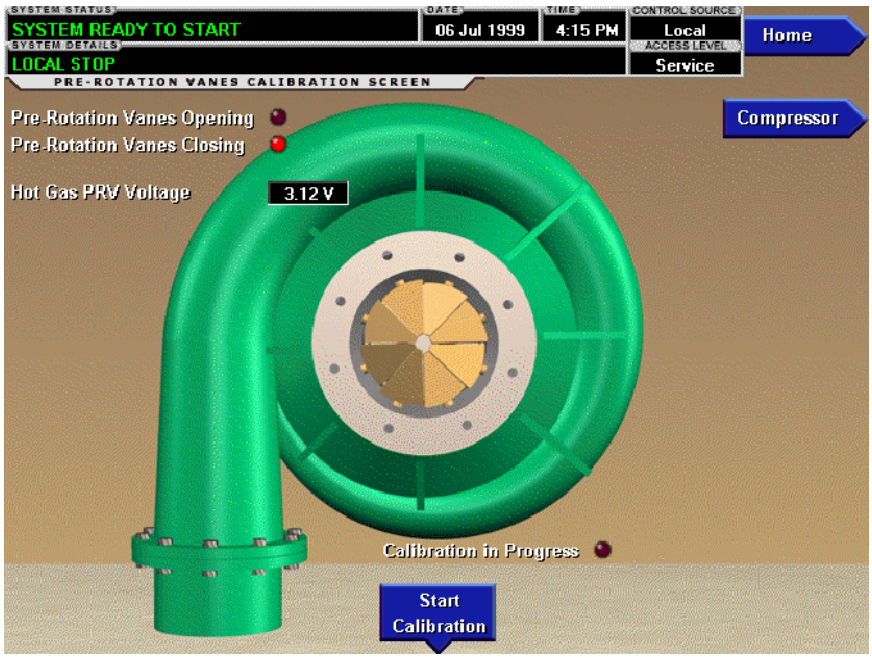

FIG. 13

00307VIP

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.

NOTE

Requires a login access level of SERVICE. Service Technicians refer to YORK Service Manual 160.54-M1 for 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 its success or failure.

Hot Gas PRV Voltage
(Flash Memory Card version C.MLM.01.01 or later)
Displays the Pre-Rotation Vanes position potentiometer feedback voltage when the Hot Gas feature is Enabled.

PROGRAMMABLE

Start Calibration
This option is hidden after calibration has started. Service Technicians refer to YORK Service Manual 160.54-M1 for an explanation of this setpoint.

Cancel Calibration
This option only becomes available after calibration has started. Service Technicians refer to YORK Service Manual 160.54-M1 for an explanation of this setpoint.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Compressor
Access Level Required: VIEW
Return to the Compressor Screen.

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VSD TUNING SCREEN

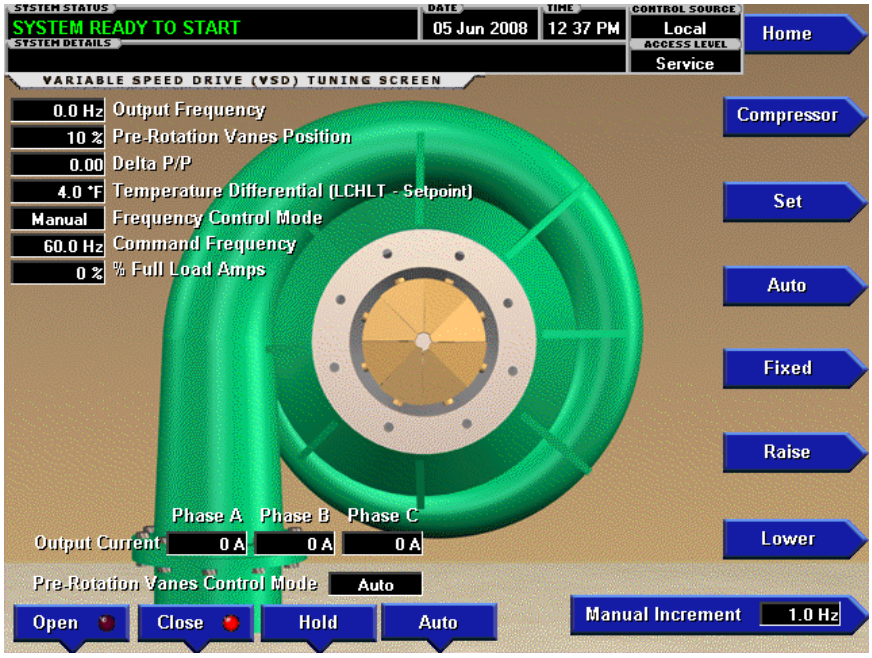


FIG. 14 LD13828

OVERVIEW

This screen applies to both Variable Speed Drives (VSD) and Medium Voltage Variable Speed Drives (MV VSD). It displays a cutaway view of the chiller compressor, revealing the pre-rotation vanes. Animation of the pre-rotation vanes indicates their position. In addition, this screen allows manual control of the vanes and manual control of the Command Frequency being sent to drive.

Shown above as it appears in software version C.OPT.01.19.307 and later. Earlier version variations noted below.

NOTE

Requires Login access level of SERVICE. Service technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Output Frequency
Displays the frequency at which the drive is operating the motor. This value is returned from the drive.

Pre-rotation Vanes Position
Displays the present pre-rotation vane position as a value between 0% (closed) and 100% (full open).

Delta P/P
Displays the chiller head pressure calculated as (condenser pressure - evaporator pressure/evaporator pressure).

Temperature Differential (LCHLT – Setpoint)
Displays the difference between the leaving chilled liquid temperature and the leaving chilled liquid temperature setpoint.

Frequency Control Mode
Displays whether the Command Frequency to the drive is derived from manual or automatic frequency control mode.

Command Frequency
(Software version C.OPT.01.19.xxx and later)
When equipped with a VSD (with the Motor Communications Protocol Setpoint set to MODBUS; ACC Board not present) or equipped with a MV VSD, this is the speed command being sent to the Drive Logic Board in either AUTO or MANUAL speed control mode. When equipped with a VSD (with Motor Communications Protocol Setpoint set to YORK; ACC Board present), it is only displayed in manual speed control mode and it is the speed command being sent to the ACC Board in Manual Speed Control mode.

% Full Load Amps
(Software version C.OPT.01.19.xxx and later)
Displays the motor current as a percentage of chiller full load amps.

Output Current – Phase A, B, C
Displays the phase current measured to the motor.

Pre-Rotation Vanes Control Mode
Indicates whether the vanes are under manual or automatic control

[Pre-rotation Vanes] Open (LED)
Illuminates when an open command is being sent to the vanes

[Pre-rotation Vanes] Close (LED)
Illuminates when a close command is being sent to the vanes

PROGAMMABLE

Set
Allows manual programming of the command frequency value. Manually programming this value will put the drive frequency control in manual speed control mode and send the programmed Command Frequency to the drive.

Auto
Puts the drive frequency control in automatic control. The Pre-rotation Vanes calibration must have been successfully performed before this entry will be accepted.

Fixed
Puts the drive frequency control in fixed speed mode, commanding it to run at maximum frequency (50Hz or 60Hz).

Raise
Puts the drive frequency control into manual mode. Each time it is pressed it increases the Command Frequency to the drive by the amount defined by the Manual Increment key. It will not raise the value above the maximum allowed (50Hz or 60Hz).

Lower
Puts the drive frequency control into manual mode. Each time it is pressed it lowers the Command Frequency to the drive by the amount defined by the Manual Increment key. It will not lower the value below the minimum allowed; (30Hz for 60Hz units; 25Hz for 50Hz units).

Manual Increment
(Increment Amount - Software version C.OPT.01.18.xxx and earlier)
Defines the amount by which the manual Raise and Lower commands will change the Command Frequency to the drive in manual speed control mode. With software version C.OPT.01.18.xxx and earlier, this setting also affects the AUTO speed control mode.

[Pre-rotation Vanes] Open
Puts the vane control into manual mode and sends an OPEN command to the vanes.

[Pre-rotation Vanes] Close
Puts the vanes control into manual mode and sends a CLOSE command to the vanes.

[Pre-rotation Vanes] Hold
Puts the vane control into manual control and sends a HOLD command to the vanes.

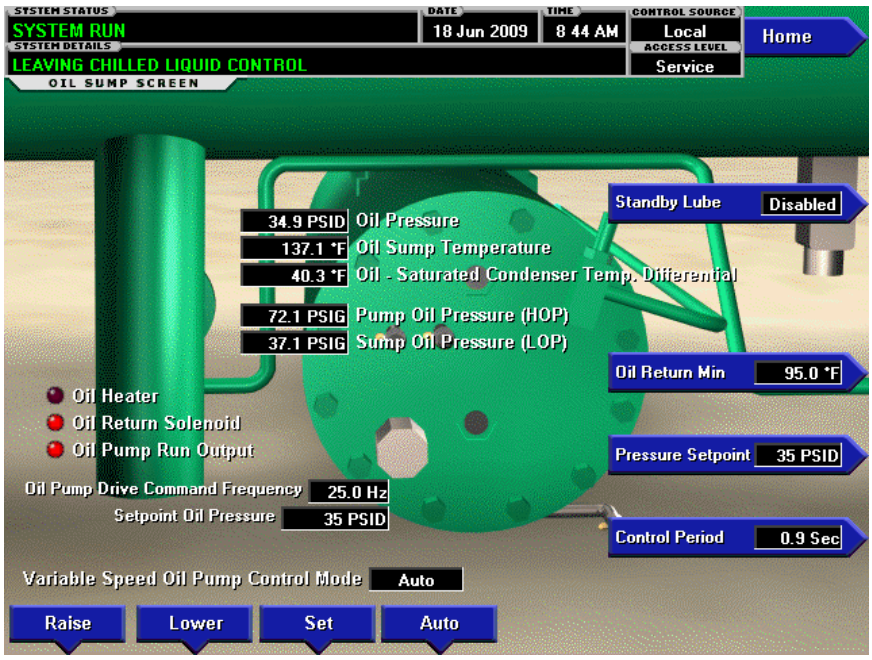
[Pre-rotation Vanes] Auto
Puts the vane control into automatic mode

NAVIGATION

Home
Access level Required: VIEW
Causes an instant return to the Home Screen

Compressor
Access Level Required: VIEW
Return to the Compressor Screen

OIL SUMP SCREEN



LD14336

FIG. 15

OVERVIEW

This screen displays a close-up of the chiller oil sump and provides all the necessary setpoints for maintaining the Variable Speed Oil Pump (VSOP). In addition, this screen allows manual control of the frequency command sent to the VSOP.

DISPLAY ONLY

Oil Pressure
Displays 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. (Refer to explanation of auto-zeroing under the Compressor screen). If either of the transducers used to calculate this differential is out of range, the display field will show XX.X.

Oil Sump Temperature
Displays the temperature of the oil in the sump.

Oil – Saturated Condenser Temperature Differential
(Software version C.OPT.01.21.307 and later)
(Variable Speed Oil Pump Only)
Displays the difference between the Oil Sump Temperature and the Saturated Condenser Temperature. This parameter is useful when analyzing oil heater operation since it is used in the control of the oil heater.

Sump Oil Pressure (LOP)
Displays the low side Oil Pressure measured at the sump.

Pump Oil Pressure (HOP)
Displays the high side Oil Pressure measured at the compressor bearing input.

Oil Pump Run Output (LED)
Indicates whether the Oil Pump is being commanded to operate.

Oil Return Solenoid (LED)
Indicates whether the solenoid is energized.

Oil Heater (LED – Variable Speed Oil Pump Only)
Indicates whether the oil heater output is energized.

Oil Seal Lubrication Time Remaining
Access Level Required: SERVICE
If a seal lubrication is in progress, this will display the amount of time remaining in the lubrication process. Service Technicians refer to YORK Service Manual 160.54-M1.

Next Oil Seal Lubrication
Access Level Required: SERVICE
This display will show the time remaining until the next seal lubrication when this function is enabled. Service Technicians refer to YORK Service Manual 160.54-M1.

Target / Setpoint Oil Pressure (Variable Speed Oil Pump Only)
The Variable Speed Oil Pump (VSOP), if installed, operates to control to a defined Oil Pressure value. During prelube, and for the first 15 seconds after prelube, this setpoint value is 45.0 PSID. During this time, this field will display the target value. After 15 seconds, this value will display the user-programmed setpoint Oil Pressure.

Pulldown Time Remaining (Variable Speed Oil Pump Only)
Displays the time remaining until the user-programmed Oil Pressure setpoint is used.

Variable Speed Oil Pump Control Mode (Variable Speed Oil Pump Only)
Indicates whether the variable speed oil pump speed is under manual or automatic control.

Oil Pump Drive Command Frequency (Variable Speed Oil Pump Only)
Displays the actual Speed Command being sent to the VSOP. This value could be the result of automatic control based on the Oil Pressure setpoint, or the result of a manual speed command.

Manual Oil Pump Operation Time Left
Displays the time remaining in the 10-minute manual oil pump operation described below.

PROGRAMMABLE

Standby Lube (Enabled / Disabled)
Access Level Required: SERVICE
Allows the user to enable or disable the standby lube operation. When enabled, this function causes the Oil Pump to operate for a period of two (2) minutes at 24-hour intervals from when the oil pump was last run for at least 2 minutes. Service Technicians refer to YORK Service Manual 160.54-M1.

OIL RETURN MIN
(Software version C.OPT.01.21.307 and later; P,Q,H9 compressors only)
Access Level Required: SERVICE
To avoid an "Oil – Low Temperature Differential" cycling condition from preventing a chiller start after running at low load conditions for extended periods, the Oil Return Solenoid (1SOL) is cycled closed when the oil temperature gets too low on the P, Q and H9 compressor chillers, while the chiller is running. The OIL RETURN MIN Setpoint key appears on the Oil Sump Screen when the CHILLER STYLE/COMPRESSOR TYPE Setpoint (on the Operations Screen) is set to P, Q or H9 compressor in Service access level. This setpoint is programmable over the range of 80.0ºF to 110.0ºF (default 95.0ºF) and controls the oil return Solenoid as follows:

- When the compressor is running and the Oil Sump Temperature < Oil Return Min Setpoint, close (de-energize) the Oil Return Solenoid by de-energizing K12 relay
- When the compressor is running and Oil Sump Temperature > Oil Return Min + 7°F, open (energize) the Oil Return Solenoid by energizing K12 relay.
- During coastdown, the solenoid operation is not changed from standard logic, it remains closed. During startup the operation is not changed from standard logic, it remains closed for 1 minute after System Run.

In previous software versions, the Oil Return Solenoid (1SOL) is opened 1 minute into System Run and remains open until System Coastdown

Pressure Setpoint (Variable Speed Oil Pump Only)
Access Level Required: SERVICE
The Variable Speed Oil Pump (VSOP) operates to control to a defined Oil Pressure value. This key allows the user to define the setpoint for the VSOP control. Service Technicians refer to YORK Service Manual 160.54-M1.

Control Period (Variable Speed Oil Pump Only)
Access Level Required: SERVICE
By default, the automatic VSOP control algorithm operates every 300ms. This key allows the user to specify the control period in multiples of 300ms. Service Technicians refer to YORK Service Manual 160.54-M1.

Variable Speed Oil Pump Speed Control:

Set
Access Level Required: SERVICE
This key allows the user to specify a fixed manual speed at which the VSOP will run.

Raise
Access Level Required: SERVICE
This key puts the VSOP control into Manual Mode and increments the present Speed Command by 0.5 Hz.

Lower
Access Level Required: SERVICE
This key puts the VSOP control into Manual Mode and decrements the present Speed Command by 0.5 Hz.

Auto
Access Level Required: SERVICE
This key returns the VSOP to Automatic Mode where control is based on the Oil Pressure setpoint.

Manual Pump
Access Level Required: OPERATOR
This key puts the Oil Pump control in Manual Mode and forces it to RUN. The Oil Pump is limited to running for a maximum of ten (10) minutes. If a longer running time is desired, this key must be pressed again. Manual Oil Pump control is disabled (and the button hidden) during system prelube, system run, proximity probe calibration, seal lubrication, and system coastdown.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

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ELECTRO-MECHANICAL STARTER SCREEN

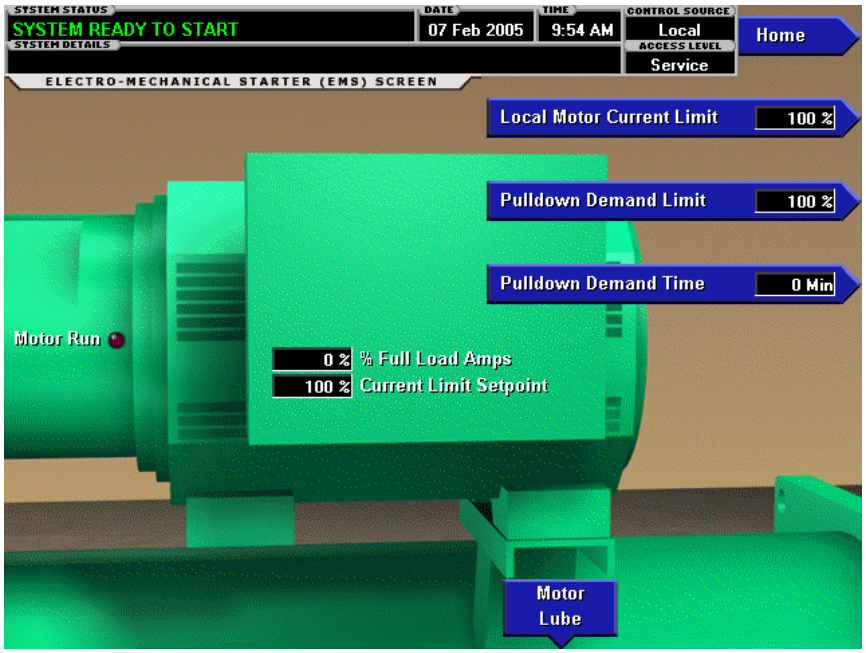


FIG. 16 LD10706

OVERVIEW

This screen displays all information pertaining to an Electro-Mechanical Starter.

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 Electro-Mechanical Starter this is the data returned by the CM-2 board.

Current Limit Setpoint
Displays 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Motor Lube
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
Access Level required: VIEW
Moves to the subscreen allowing operator acknowledgement of the compressor motor Lubrication and viewing of the compressor motor lubrication parameters.

MOD "A" SOLID STATE STARTER SCREEN

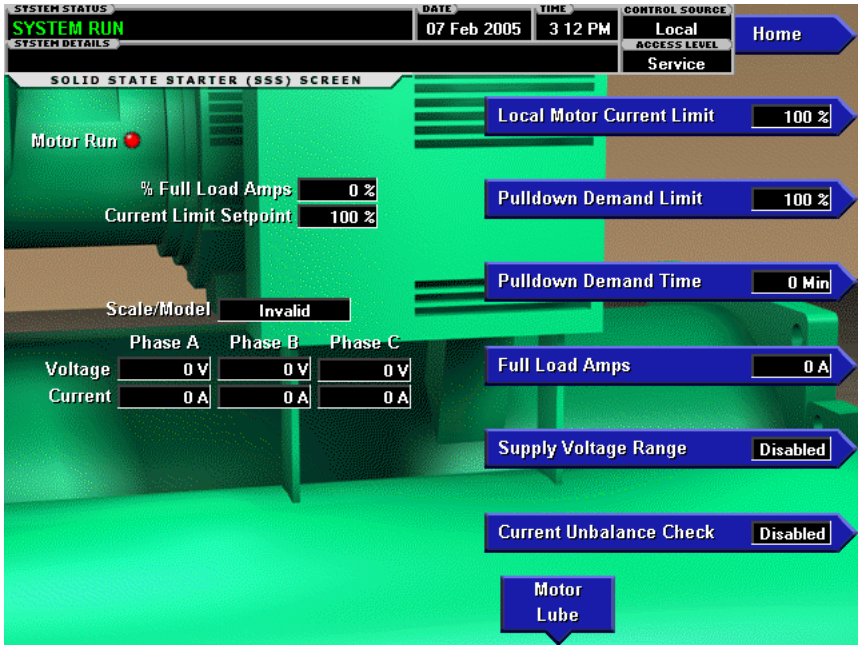


FIG. 17 LD10707

OVERVIEW

This screen displays all information pertaining to the Mod "A" Solid State Starter.

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 Solid State Starter this is the data returned by the Starter Logic board.

Current Limit Setpoint
Displays the current limit value in use. 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

Scale/Model
Display information about the Liquid Cooled-Solid State Starter Rating and the maximum allowed Full Load Amps.

Voltage - Phase A, B, C
Display the 3-phase input line voltage values being read from the Solid State Starter.

Current - Phase A, B, C
Display the 3-phase motor current values being read from the Solid State Starter.

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

Full Load Amps
Access Level Required: SERVICE
Define the maximum amps at which the motor can operate. This value is viewable when logged in under the Operator or View access level. Service Technicians refer to YORK Service Manual 160.54-M1.

Supply Voltage Range
Access Level Required: SERVICE
Allows the user to select a specific voltage range for voltage checking. When not disabled, this line voltage range is used to determine a low line and high line voltage threshold for initiating a shutdown. Service Technicians refer to YORK Service Manual 160.54-M1.

Current Unbalance Check (Enabled / Disabled)
Access Level Required: SERVICE
Allows the user to control whether the logic checks for current unbalance and initiates a shutdown as a result. Service Technicians refer to YORK Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Motor Lube
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
Access Level required: VIEW
Moves to the subscreen allowing operator acknowledgement of the compressor motor Lubrication and viewing of the compressor motor lubrication parameters.

MOD "B" SOLID STATE STARTER SCREEN

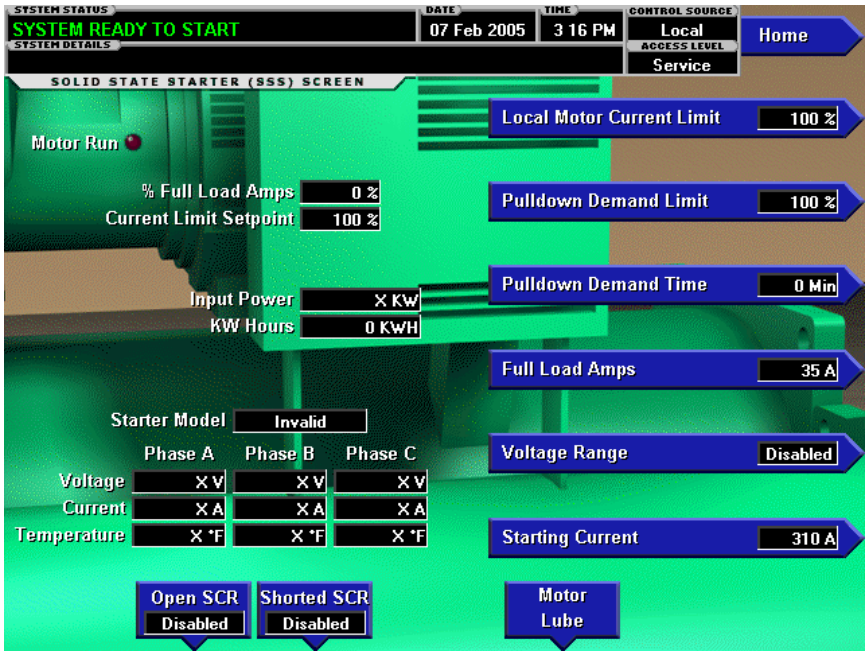


FIG. 18 LD10708

OVERVIEW

This screen displays all information pertaining to the Mod "B" Solid State Starter.

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.

Current Limit Setpoint
Displays the current limit 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 remote Mode or a locally programmed value in Local Mode.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period.

Input Power
Displays the Kilowatts measured by the Solid State Starter.

kW Hours
Displays the cumulative amount of kilowatts used over time.

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 assemblies.

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as percentage of FLA). When the motor current reaches this value, the Pre-rotation Vanes will not be permitted to open further. If the motor rises above this value, the Pre-rotation Vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

Full Load Amps
Access Level Required: SERVICE
Defines the maximum amps at which the motor can operate. This value is viewable when logged in at Operator or View access level. Service technicians refer to YORK Service Manual 160.54-M1.

Voltage Range
Access Level Required: SERVICE
Allows the user to select specific line voltage range for voltage checking. When not disabled, this line voltage range is used to determine a low line and high line voltage threshold for initiating a shutdown. Service Technicians refer to YORK Service Manual 160.54-M1.

Starting Current
Access Level Required: SERVICE
Defines the maximum allowed motor starting amps. The Solid State Starter will limit the motor starting current to this value. Service technicians refer to YORK Service manual 160.54-M1.

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 YORK Service Manual 160.54-M1.

Shorted SCR (Enabled/Disabled)
(Flash Memory Card version C.MLM.01.04b or later)
Access Level required: SERVICE
Allows the user to enable or disable the Solid State Starter Shorted SCR safety detection. This must never be disabled unless under advisement of the York Factory. Service Technicians refer to YORK Service Manual 160.54-M1.

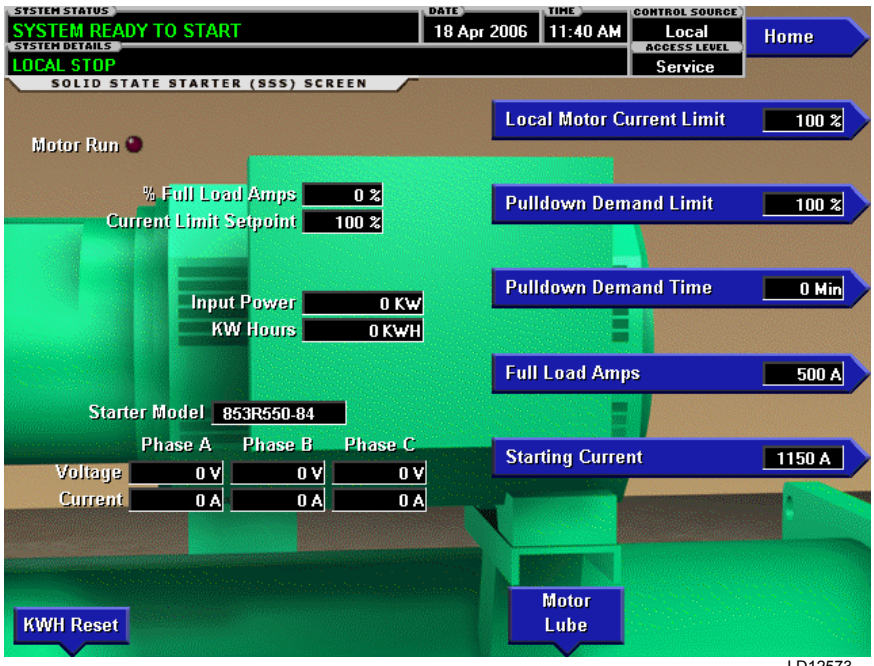
kWH Reset
Access Level Required: ADMIN
Allows the user to reset the cumulative Kilowatt Hours. Service technicians refer to YORK Service Manual 160.54-M1.

NAVIGATION

HOME
Access Level Required: VIEW
Causes an instant return to the HOME Screen.

Motor Lube
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
Access Level required: VIEW
Moves to the subscreen allowing operator acknowledgement of the compressor motor Lubrication and viewing of the compressor motor lubrication parameters.

MEDIUM VOLTAGE SOLID STATE STARTER SCREEN



LD12573

FIG. 18A

OVERVIEW

This screen displays all information pertinent to the Medium Voltage Solid State Starter (MVSSS). Software version C.OPT.01.15.307 (or later) is required for MVSSS applications.

DISPLAY ONLY

Motor Run (LED)

Indicates when the Optiview Control Center is commanding the motor to run.

Motor Current % Full Load Amps

Displays the motor current as a percentage of Job Full Load Amps setpoint.

Current Limit Setpoint

Displays the Current Limit 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 Remote mode or a locally programmed value in Local mode.

Pulldown Time Left

Displays the time remaining in the programmed pulldown period.

Input Power

Displays the kilowatts measured by and transmitted from the starter.

KW Hours

Displays the cumulative kilowatt hours. The microboard calculates this value from the Input Power transmitted from the starter. When the number exceeds 999999 KWH, the value will rollover to zero.

Voltage – Phase A, B, C

Displays the 3-phase input line voltage as measured by and transmitted from the starter.

Current – Phase A, B, C

Displays the 3-phase motor current as measured by and transmitted from the starter.

Starter Model

Displays the starter model number as transmitted from the starter.

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the Pre-rotation Vanes will not be permitted to open further. If the motor current rises above this value, the Pre-rotation vanes close to reduce the current to this value.

Pulldown Demand Limit

Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown time. This value will override the Motor Current Limit setpoint during this time period. The Pre-rotation Vanes are used to limit the motor current to this value.

Pulldown Demand Time

Access Level Required: OPERATOR
Allows the user to set the period of time for which the pulldown demand limit will be in effect.

Full Load Amps

Access Level Required: SERVICE
Defines the maximum amps at which the motor can operate. This value is viewable when logged in at at Operator or View access level. Service Technicians refer to YORK Service Manual 160.54-M1.

Starting Current

Access Level Required: SERVICE
Defines the maximum allowed motor starting amps. The starter will limit the starting current to this value. Service Technicians refer to YORK Service Manual 160.54-M1.

KWH Reset

Access Level Required: SERVICE
Allows the user to reset the cumulative Kilowatt Hours. Service Technicians refer to YORK Service Manual 160.54-M1.

NAVIGATION

Home

Access Level Required: VIEW
Causes an instant return to the Home Screen

Motor Lube

Access Level Required: VIEW
Moves to a subscreen allowing operator acknowledgement of the compressor motor lubrication and viewing of the compressor motor lubrication parameters.

VARIABLE SPEED DRIVE SCREEN

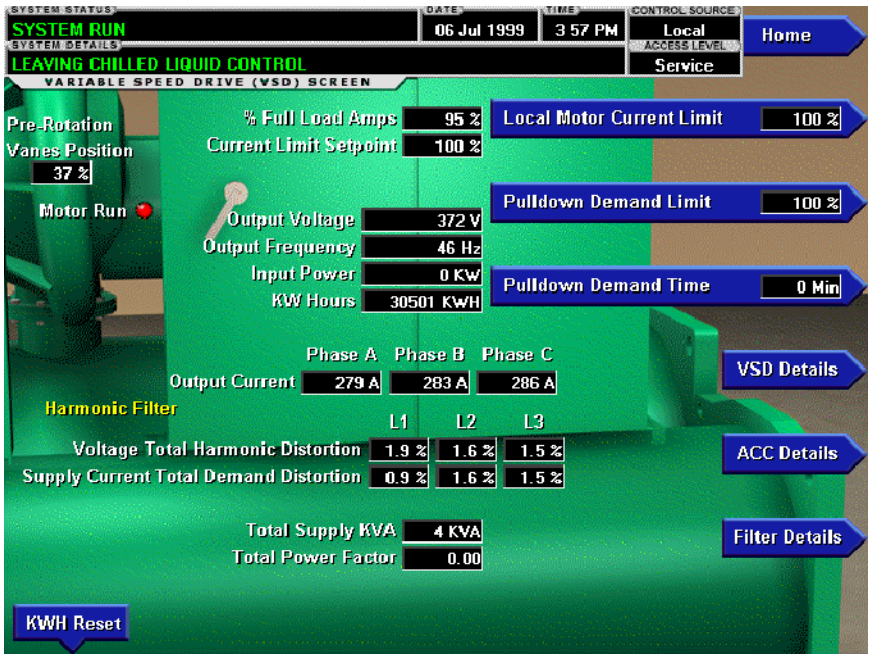


FIG. 19

00312VIP

OVERVIEW

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

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.

Current Limit Setpoint
Displays the current limit value in use. 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

Output Voltage
Displays the output voltage measured to the 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 as the VSD motor controller operates.

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

Harmonic Filter Data (Harmonic Filter installed only)

Supply kVA
Displays the supply kva measured by the filter.

Total Power Factor
Displays the relationship between the Input Power and the Supply kVA.

Voltage Total Harmonic Distortion - (L1, L2, L3)
Displays the Total Harmonic Distortion (THD) for each of the voltage lines as calculated by the filter.

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.

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

kWH Reset
Access Level Required: ADMIN
Allows the user to reset the cumulative Kilowatt Hours to zero (0). Service Technicians refer to YORK Service Manual 160.54-M1.

Filter Inhibit (Harmonic Filter installed only)
Access Level Required: SERVICE
Disable the filter logic from activating, although the system will still communicate with the device. Only available when chiller is stopped.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD Details
Access Level Required: VIEW
Moves to the sub-screen which provides more information about the Variable Speed Drive.

ACC Details
Access Level Required: SERVICE
Moves to the sub-screen which provides more information about the Adaptive Capacity Control.

Filter Details (Harmonic Filter installed only)
Access Level Required: VIEW
Moves to the sub-screen which provides more information about the Harmonic Filter.

Motor Lube
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
Access Level required: VIEW
Moves to the subscreen allowing operator acknowledgement of the compressor motor Lubrication and viewing of the compressor motor lubrication parameters.

MEDIUM VOLTAGE VARIABLE SPEED DRIVE SCREEN

(Software Version C.OPT.01.16.xxx and later)

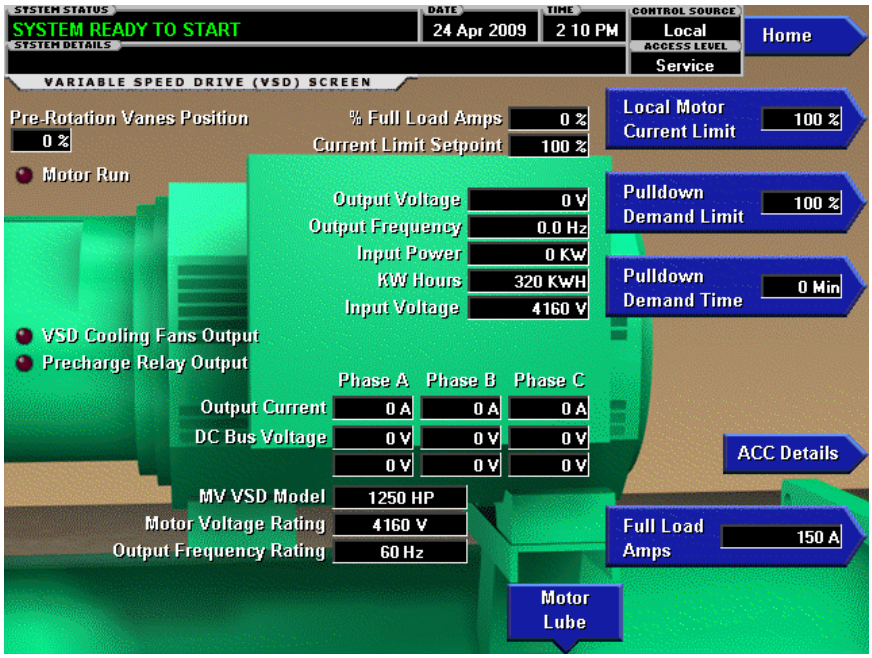


FIG. 19A LD14337

OVERVIEW

This screen displays information pertaining to a Medium Voltage Variable Speed Drive (MV VSD). Screen shown above is as it appears in software version C.OPT.01.20.307 (and later). For details of MV VSD operation and setpoints, refer to Service Manual 160.00-M6.

DISPLAY ONLY

Motor Run (LED)
Indicates whether the digital output from the controls is commanding the chiller to run.

Motor Current % Full Load Amps
Displays the motor current as a percentage of the full load amps (FLA).

Current Limit Setpoint
Displays 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 mode or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is not zero.

Output Voltage
Displays the output voltage to the motor. Value is provided by the MV VSD.

Output Frequency
Displays the present output frequency to the motor. Value is provided by the MV VSD.

Input Power
Displays the total Kilowatts measured by the MV VSD. Value is provided by the MV VSD.

KW Hours
Displays the cumulative amount of Kilowatts used over time as the VSD motor operates. Value is calculated by the Optiview Control Center from the Input Power value provided from the MV VSD.

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

Output Current
Displays the average of the 3-phase output current to the motor. Value is provided by the MV VSD.

Input Voltage
Displays the average of the 3-phase input voltage to the MV VSD. Value is provided by the MV VSD.

VSD Cooling Fans Output (LED)
Illuminates when the VSD cooling fans are being commanded to run.

Precharge Relay Output (LED)
Illuminates when the pre-charge relay is commanded to energize.

Output Current (Phase A, B, C)
Displays the three phases of output current to the motor.

DC Bus Voltage (Phase A, B, C)
Displays the three phases of DC Bus voltage

MV VSD Model
Displays the model number as received from the MV VSD. The Model Number is displayed as a number representing the horsepower rating (ie; 1500HP). With software version C.OPT.01.20.307 (and later), it is derived from the Motor Rated Voltage (Modbus Address 40012) and the Programmed Drive Current (Modbus Address 40013) values received from the MV VSD according to the following table. If this results in a model that is not defined in the lookup table, the model number is displayed as "INVALID" and the chiller will not be allowed to run while this is displayed

Motor Rated Voltage (V)				
		2300 V	3300 V	4160 V
Model in HP	500	107 A	78 A	62 A
	600	129 A	93 A	74 A
	700	157 A	110 A	87 A
	800	172 A	124 A	99 A
	900	202 A	141 A	112 A
	1000	224 A	156 A	125 A
	1250	280 A	195 A	155 A
	1500	336 A	235 A	186 A
	1750	392 A	274 A	217 A
	2000	438 A	312 A	248 A
	2250	494 A	345 A	274 A
	2500	561 A	391 A	310 A
Max. Job/Rated 100% FLA (A) (Programmed Drive Current)				

Motor Voltage Rating
Displays the voltage rating of the MV VSD as received from the MV VSD . With software version C.OPT.01.20.307 (and later), this is the motor voltage rating (Modbus Address 40012) as received from the MV VSD. Displayed as 1300V, 3300V or 4160V. If an invalid value is received, "INVALID" is displayed and the chiller will not be allowed to run.

Output Frequency Rating
(software version C.OPT.01.20.307 and later)
This is the rated output frequency (Modbus Address 40033), as received from the MV VSD. This value is the maximum drive frequency (Hz) when the MV VSD receives a 100% speed command from the Optiview Control Center. If the value received is not 50Hz or 60Hz, "INVALID" is displayed. If this is the case, then the "Motor Voltage Rating" (above) determines the maximum frequency as follows:

Motor Voltage Rating	Output Frequency Rating
2300 or 4160V	60Hz
3300V	50Hz

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

Full Load Amps
Access Level Required: SERVICE
Defines the maximum amps at which the motor can operate this value is viewable when logged in at VIEW or OPERATOR level. Service Technicians refer to YORK Service manual 160.54-M1. With software version C.OPT.01.20.307 (and later), the maximum programmable value of this setpoint is equal to PROGRAMMED DRIVE CURRENT (Modbus Address 40013) value received from the MV VSD. In previous software versions, it was derived from a lookup table based on the MOTOR RATED VOLTAGE and MV VSD Model.

KWH Reset
Access Level Required: SERVICE
Allows the user to reset the cumulative Kilowatt Hours to zero. Service Technicians refer to YORK Service manual 160.54-M1.

NAVIGATION

Home
Access level Required: VIEW
Causes an instant return to the Home Screen.

ACC Details
Access Level required: SERVICE
Moves to a subscreen which provides more information about the Adaptive Capacity Control.

Motor Lube
Moves to a subscreen allowing operator acknowledgement of the compressor motor lubrication and viewing of the compressor motor lubrication parameters.

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VARIABLE SPEED DRIVE (VSD) DETAILS SCREEN

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

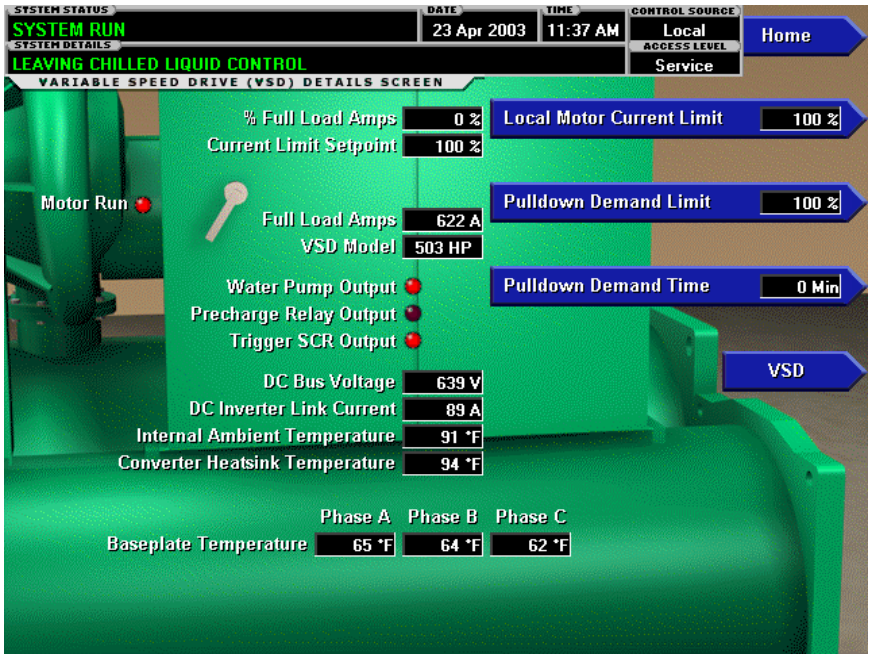

FIG. 20 LD09096

OVERVIEW

This screen displays more detailed information pertaining to a Variable Speed Drive (VSD). Flash memory Card version C.MLM.01.08.xxx and later is required for VSD part number 371-03789-xxx (503HP 60Hz; 419HP 50Hz). Service Technicians refer to YORK Service Manual 160.54-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 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

Water Pump Output (LED)
Indicates whether the relay controlling the water pump output is energized.

Precharge Relay Output (LED)
Indicates whether the relay controlling the precharge output is energized.

Trigger SCR Output (LED)
Indicates whether 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 as reported by the VSD.

Internal Ambient Temperature
Displays the ambient temperature inside the VSD cabinet as reported by the VSD.

Converter Heatsink Temperature
Displays the heatsink temperature of the converter as reported by the VSD.

Heatsink Temperature - Phase A, B, C
(Labeled "Baseplate Temperatures" on VSD 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.

100% Full Load Amps
Displays the full load amps value as reported by the VSD.

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD
Access Level Required: VIEW
Returns to the VSD Screen.

VARIABLE SPEED DRIVE (VSD) DETAILS SCREEN

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

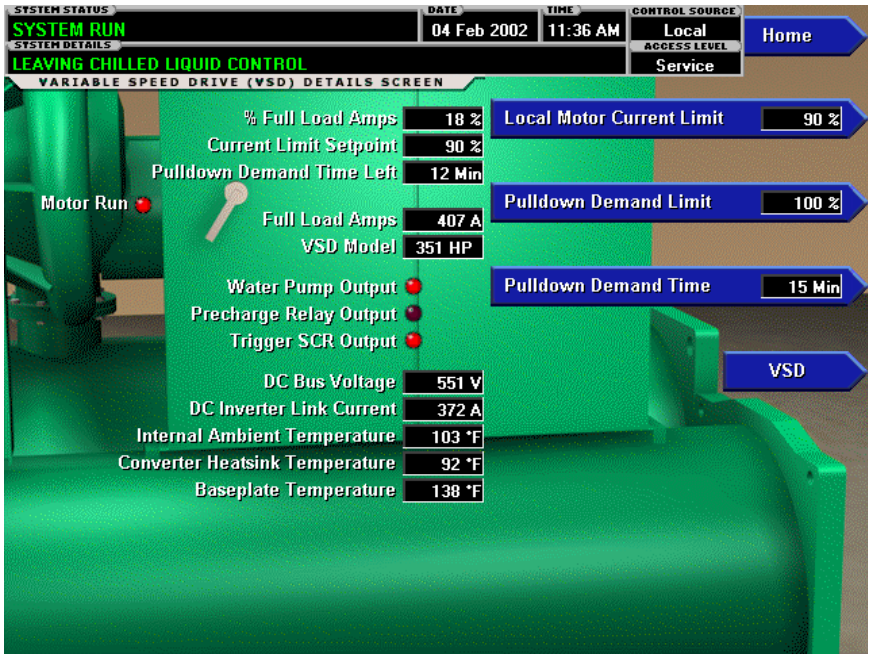

FIG. 21 00665VIP

OVERVIEW

This screen displays more detailed information pertaining to a Variable Speed Drive (VSD). Service Technicians refer to YORK Service Manual 160.54-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 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

Water Pump Output (LED)
Indicates whether the relay controlling the water pump output is energized.

Precharge Relay Output (LED)
Indicates whether the relay controlling the precharge output is energized.

Trigger SCR Output (LED)
Indicates whether 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 as reported by the VSD.

Internal Ambient Temperature
Displays the ambient temperature inside the VSD cabinet as 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 as reported by the VSD.

VSD Model
Access Level Required: SERVICE
Displays the Horsepower configuration of the Variable Speed Drive control.

100% Full Load Amps
Displays the full load amps value as reported by the VSD.

PROGRAMMABLE

Local Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD
Access Level Required: VIEW
Returns to the VSD Screen.

ADAPTIVE CAPACITY CONTROL DETAILS SCREEN

(Software Version C.OPT.01.18.307 and earlier)

(VSD and MV VSD)

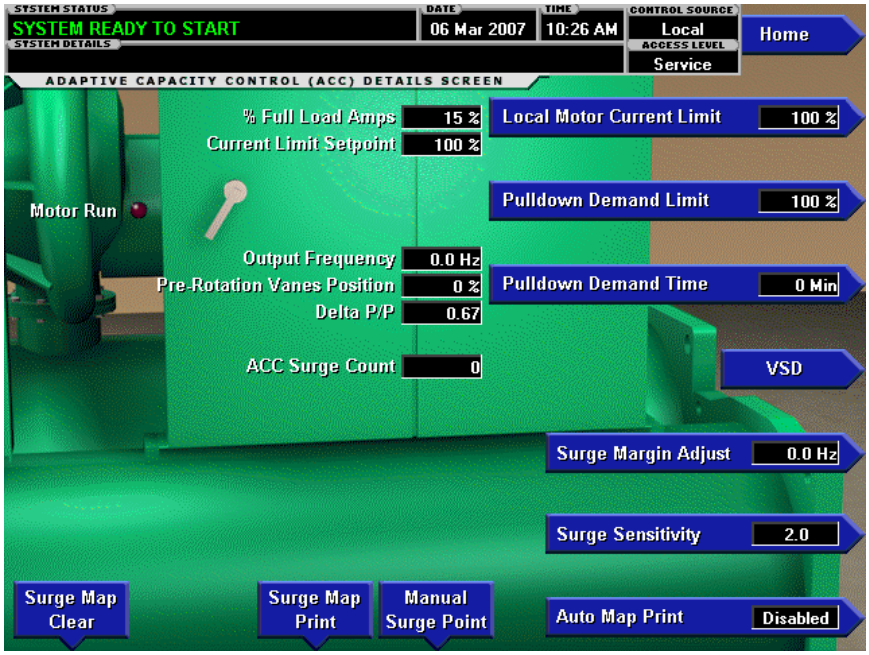

FIG. 22 LD12572

OVERVIEW

This screen displays more detailed information pertaining to a Adaptive Capacity Control (ACC).

NOTE

Requires a login access level of SERVICE. Service Technicians refer to YORK Service Manual 160.54-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.

Current Limit Setpoint
Displays 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

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%.

ACC Surge Count
The total number of surge conditions detected by the Adaptive Capacity Control. The surge events detected by the Surge Protection feature are not included in this total.

Delta P/P
The value calculated by the Condenser and Evaporator pressures as reported by the Adaptive Capacity Control.

PROGRAMMABLE

Local Motor Current Limit
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

Surge Sensitivity
Allows the user to define the surge detection sensitivity of the ACC surge detection. Service Technicians refer to YORK VSD manual 160.00-M4.

Surge Margin Adjust
When the ACC maps a surge point, it will begin to adjust the chiller command frequency and vane controls at a certain "margin" from the mapped point. This programmable value allows the service technician to modify the "margin" at which these adjustments will begin to take place.

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 WITH CAUTION.***

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 this function is active, 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.

Surge Map Clear
This key instructs the ACC to clear all of the surge points presently mapped. This key will require confirmation of its selection by entry of a special password. ***USE WITH CAUTION.***

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD
Access Level Required: VIEW
Returns to the VSD Screen.

ADAPTIVE CAPACITY CONTROL DETAILS SCREEN

YORK Protocol Configuration

(Software version C.OPT.01.19.307 and later)

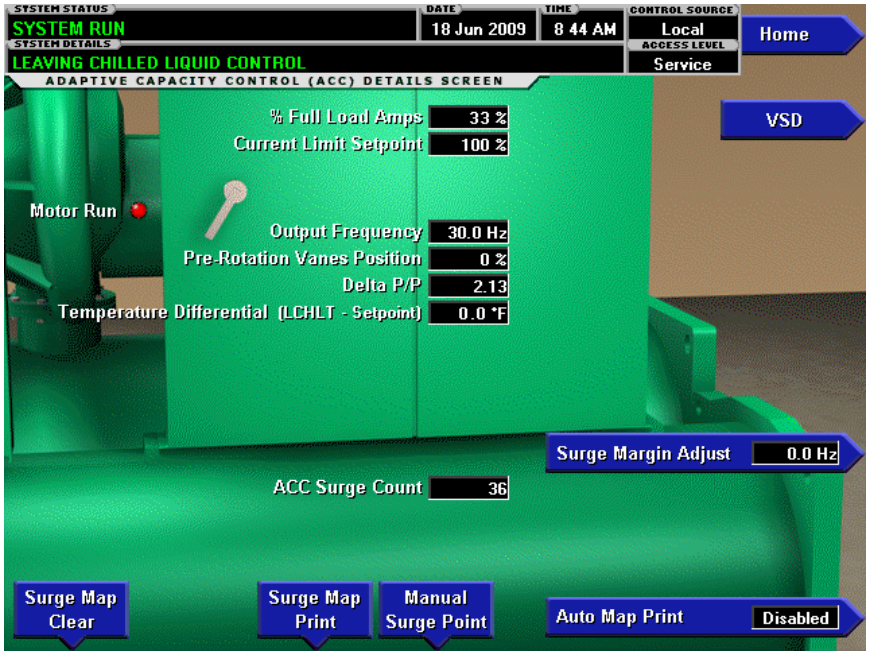

FIG. 22A LD14338

OVERVIEW

This screen displays detailed information pertaining to the Adaptive Capacity Control (ACC). It is shown above with the Optiview-to-VSD serial communications hardware/interface in the "YORK protocol configuration" (Service Technicians refer to Optiview Service Manual 160.54-M1 to determine existing hardware/interface configuration). This configuration was used in new production chillers prior to March 2007. In this configuration, the microboard communicates with the VSD Logic Board via the ACC Board using YORK protocol serial communications. The ACC Board performs the ACC function. The Motor Communications Protocol Setpoint (on the SETUP Screen) is set to YORK in this configuration.

NOTE

Requires Login access level of SERVICE. Service technicians refer to YORK Service Manual 160.54-M1 for setpoint entry instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

% Full Load Amps
Displays the motor current as a percentage of chiller full load amps as calculated by the microboard from current values returned from the drive Logic Board.

Current Limit Setpoint
Displays the current limit setpoint value in use. This value could come from a 0-20mA, 4-20mA, 0-10Vdc or 2-10Vdc input in Analog remote mode, PWM input in Digital remote mode, Microgateway interface in ISN remote mode or locally programmed value in Local mode.

Motor Run (LED)
Illuminated when the control center is commanding the drive to run. Otherwise, it is extinguished.

Output Frequency
Displays the frequency at which the drive is operating the motor. This value is provided by the drive Logic Board.

Pre-rotation Vanes Position
Displays the present pre-rotation vane position as a value between 0% (closed) and 100% (full open). This value is provided by the ACC Board.

Delta P/P
Displays chiller head pressure calculated as (condenser pressure - evaporator pressure/evaporator pressure). This value is calculated by the ACC Board.

Temperature Differential (LCHLT – Setpoint)
Displays the difference between the leaving chilled liquid temperature and the leaving chilled liquid temperature setpoint.

Command Frequency
This is only displayed in manual speed control mode and it is the speed command being sent to the ACC Board in Manual Speed Control mode.

ACC Surge Count
This count is provided by the ACC Board. Increments each time the ACC Board detects a surge, whether running at maximum or less than maximum frequency.

PROGRAMMABLE

Surge Margin Adjust
This value determines how close the frequency reduction will be allowed to get to the surge line. It is sent to the ACC Board. Programmable over the range of 0.0 (default) to 25.0Hz. Service Technicians should refer to YORK VSD Service Manual 160.00-M4 prior to adjusting this setpoint.

Auto Map Print (Enable/Disable)
When enabled, the ACC surge map values from the ACC Board are printed to a connected printer each time a surge point is mapped, as shown in Section 3 of this book.

Manual Surge Point
Allows the Service Technician to manually log the present running operating conditions into the surge map (in the ACC Board) as a valid surge point. When this key is pressed, a dialog box appears requesting a special password to proceed. Service Technicians refer to procedure and password in YORK Optiview Service Manual 160.54-M1 section 23.

Surge Map Print
Allows the Service Technician to print the entire surge map from the ACC Board to a connected printer, as shown in section 3 of this book.

Surge Map Clear
Allows the Service Technician to clear the surge map stored in the ACC Board. When this key is pressed, a dialog box appears requesting a special password to proceed. Service Technicians refer to procedure and password in YORK Optiview Service Manual 160.54-M1 section 23.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD
Access Level Required: VIEW
Returns to the VSD Screen

ADAPTIVE CAPACITY CONTROL DETAILS SCREEN

MODBUS Protocol Configuration

(Software version C.OPT.01.19.307 and later)

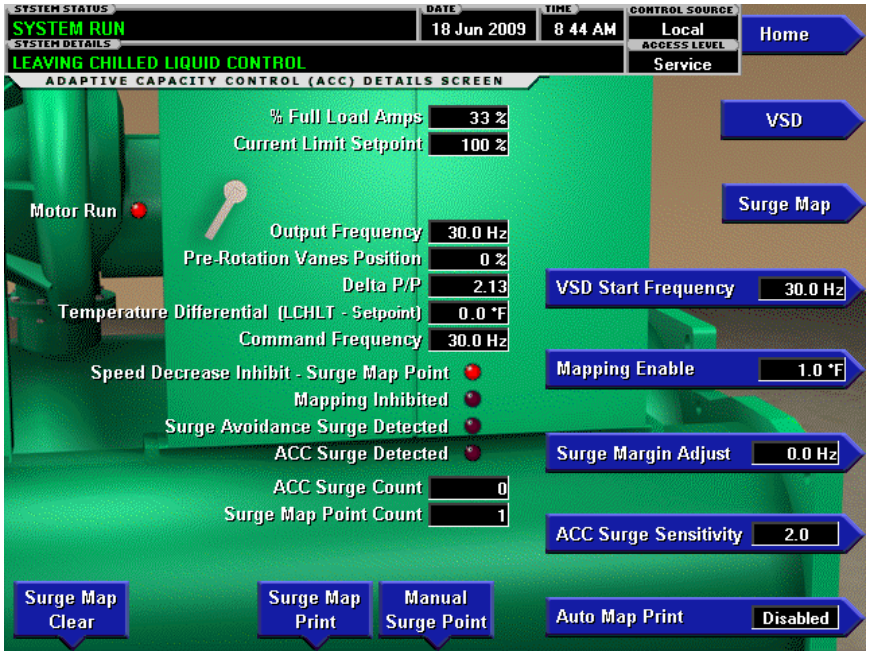

FIG. 22B LD14339

OVERVIEW

This screen displays detailed information pertaining to the Adaptive Capacity Control (ACC). It is shown above with the OptiView-to-VSD serial communications hardware/interface in the "MODBUS protocol configuration" (Service Technicians refer to OptiView Service Manual 160.54-M1 to determine existing hardware/interface configuration). This configuration is used in new production chillers after March 2007. In this configuration, the microboard communicates directly with the VSD Logic Board using MODBUS protocol serial communications. The Microboard performs the ACC function and the ACC Board is not present. The Motor Communications Protocol Setpoint (on the SETUP Screen) is set to MODBUS in this configuration. Due to service parts replacement, earlier production chillers could be in the MODBUS configuration. All Medium Voltage Variable Speed Drives (MV VSD) use MODBUS protocol.

NOTE

Requires Login access level of SERVICE. Service technicians refer to YORK Service Manual 160.54-M1 for setpoint entry instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

% Full Load Amps
Displays the motor current as a percentage of chiller full load amps as calculated by the microboard from current values returned from the drive Logic Board.

Current Limit Setpoint
Displays the current limit setpoint value in use. This value could come from a 0-20mA, 4-20mA, 0-10Vdc or 2-10Vdc input in Analog remote mode, PWM input in Digital remote mode, Microgateway interface in ISN remote mode or locally programmed value in Local mode.

Motor Run (LED)
Illuminated when the control center is commanding the drive to run. Otherwise, it is extinguished.

Output Frequency
Displays the frequency at which the drive is operating the motor. This value is returned from the drive Logic Board.

Pre-rotation Vanes Position
Displays the present pre-rotation vane position as a value between 0% (closed) and 100% (full open).

Delta P/P
Displays chiller head pressure calculated as (condenser pressure - evaporator pressure/evaporator pressure). This value is calculated by the Microboard.

Temperature Differential (LCHLT – Setpoint)
Displays the difference between the leaving chilled liquid temperature and the leaving chilled liquid temperature setpoint.

Command Frequency
This is the speed command being sent to the Drive Logic Board in either AUTO or MANUAL speed control mode.

Speed Decrease Inhibit – Surge Map Point (LED)
Illuminates when the Microboard ACC function is unable to reduce speed due to a mapped surge point. Otherwise, it is extinguished.

Mapping Inhibited (LED)
Illuminates when the Microboard ACC function is not permitted to map points or reduce speed due to unstable Leaving Chilled Liquid Temperature, manual speed control, current limit in effect (chiller FLA only) or during Soft Shutdown (software version C.OPT.01.21.307 and later). Otherwise, it is extinguished.

ACC Surge Detected (LED)
Illuminates momentarily when a surge is detected by the ACC function in the Microboard, while the drive is running at less than maximum frequency.

Surge Avoidance Surge Detected (LED)
Illuminates momentarily when a surge is detected by the Surge Protection feature. This feature only detects surges that occur while the drive is running at maximum frequency.

ACC Surge Count
Increments when a surge is detected while the drive is running at less than maximum frequency.

Surge Map Point Count
Displays the total number of data points contained in the surge map.

PROGRAMMABLE

VSD Start Frequency
(Software version C.OPT.01.21.307 and later)
Sets the starting frequency from which the ramp-up will begin. Programmable over the following range: 60Hz units – 30Hz to 60Hz (default 45Hz), 60Hz units with Quick Restart-30Hz to 45Hz (default 45Hz), 50Hz units – 25Hz to 50Hz (default 37.5 Hz), 50Hz units with Quick Restart – 25Hz to 37.5Hz (default 37.5Hz).

ACC Mapping Enable
(Software version C.OPT.01.21.307 and later)
Sets the Delta T (Leaving Chilled Liquid Temperature - Setpoint) needed to be met to enable surge mapping and speed reduction initially on startup. Programmable over the range of 0.5ºF to 4.0ºF (default 1.0ºF).

Surge Margin Adjust
This value determines how close the frequency reduction will be allowed to get to the surge line. Programmable over the range of 0.0 (default) to 25.0Hz. Service Technicians should refer to YORK VSD Service Manual 160.00-M4 prior to adjusting this setpoint.

Surge Sensitivity
Allows the Service Technician to adjust the sensitivity of the ACC surge detection in the Microboard (surges that occur while the drive is running at less than maximum frequency). Programmable over the range of 1.5 to 2.5 with default of 2.0. Smaller values increase the sensitivity.

Auto Map Print (Enable/Disable)
When enabled, the ACC surge map values are printed to a connected printer each time a surge point is mapped, as shown in Section 3 of this book.

Manual Surge Point
Allows the Service Technician to manually log the present running operating conditions into the surge map as a valid surge point. When this key is pressed, a dialog box appears requesting a special password to proceed. Service Technicians refer to procedure and password in YORK OptiView Service Manual 160.54-M1 section 23.

Surge Map Print
Allows the Service Technician to print the entire surge map to a connected printer, as shown in section 3 of this book.

Surge Map Clear
Allows the Service Technician to clear the surge map. When this key is pressed, a dialog box appears requesting a special password to proceed. Service Technicians refer to procedure and password in YORK OptiView Service Manual 160.54-M1 section 23.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD
Access Level Required: VIEW
Returns to the VSD Screen

Surge Map
Access Level Required: SERVICE
Causes a jump to the sub-screen that displays the surge map.

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SURGE MAP SCREEN - Table View

(Software version C.OPT.01.19.307 and later)

FIG. 22C LD13832

OVERVIEW

The surge map can be shown in either TABLE (default) or LIST view as selected with the Map View key. Shown above is the TABLE view.

In this view, a table is used to graphically represent the surge map in the view window. The X-axis is Delta P/P, the Y-axis is Pre-rotation Vanes position and each drive frequency point in the surge map is represented by an "X". To view the details of any mapped point, position the green box (□) over the desired "X" using the keypad arrow keys (▲▼◄►). The drive Output Frequency, Pre-rotation Vanes Position and Delta P/P of the selected point is displayed at the bottom of the screen under SELECTED. The default position for the green box is in the upper left corner of the view window. Once moved, it will remain at the last position.

The Present Operating conditions are indicated with an "*" (as shown above) and are detailed at the bottom of the screen under PRESENT. If the present condition is the same as a mapped point, the "*" will be replaced by an "O".

This screen is applicable to Variable Speed Drives (VSD) (with the Motor Communications Protocol setpoint set to MODBUS; ACC Board is not present) and Medium Voltage Variable Speed Drives (MV VSD). It is not accessible if equipped with a VSD in YORK Motor Communications Protocol Setpoint configuration (ACC Board is present).

NOTE

Requires Login access level of SERVICE. Service Technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Mapping Inhibited (LED)
Illuminates while the Microboard ACC function is not permitted to map points or reduce speed due to unstable Leaving Chilled Liquid Temperature , manual speed control, current limit in effect (chiller FLA only) or during Soft Shutdown (software version C.OPT.01.21.307 and later). Otherwise, it is extinguished.

ACC Surge Detected (LED)
Illuminates momentarily when a surge is detected by the ACC function in the Microboard, while the drive is running at less than maximum frequency.

Speed Decrease Inhibit – Surge Map Point (LED)
Illuminates when the Microboard ACC function is not permitted to reduce speed due to a mapped surge point. Otherwise, it is extinguished.

Output Frequency
Selected: Displays the drive output frequency of the selected surge point.
Present: Displays the present drive output frequency

Pre-Rotation Vanes Position
Selected: Displays the PRV position of the selected surge point
Present: Displays the present PRV position

Delta P/P
Selected: Displays the Delta P/P of the selected surge point
Present: Displays the present Delta P/P

PROGRAMMABLE

Map View
Allows a Service Technician to change the view from TABLE to LIST.

Manual Surge Point
Allows the Service Technician to manually log the present running conditions into the surge map as a valid surge point. When this key is pressed, a dialog bog appears requesting a special password to proceed. Service Technicians refer to procedure and password in YORK OptiView Service Manual 160.54-M1 section 23.

Remove Surge Point
Allows the Service Technician to remove a mapped surge point. When this key is pressed, a dialog box appears requesting a special password to proceed. The surge point is selected by placing the green box over the desired point. Then the REMOVE SURGE POINT key is pressed to remove it. Service Technicians refer to procedure and password in YORK OptiView Service Manual 160.54-M1 section 23.

NAVIGATION

Home
Access Level Required: SERVICE
Causes an instant return to the Home Screen.

VSD
Access Level Required: SERVICE
Returns to the VSD Screen

ACC Details
Access Level Required: SERVICE
Returns to the ACC Screen

SURGE MAP SCREEN - List View

(Software version C.OPT.01.19.307 and later)

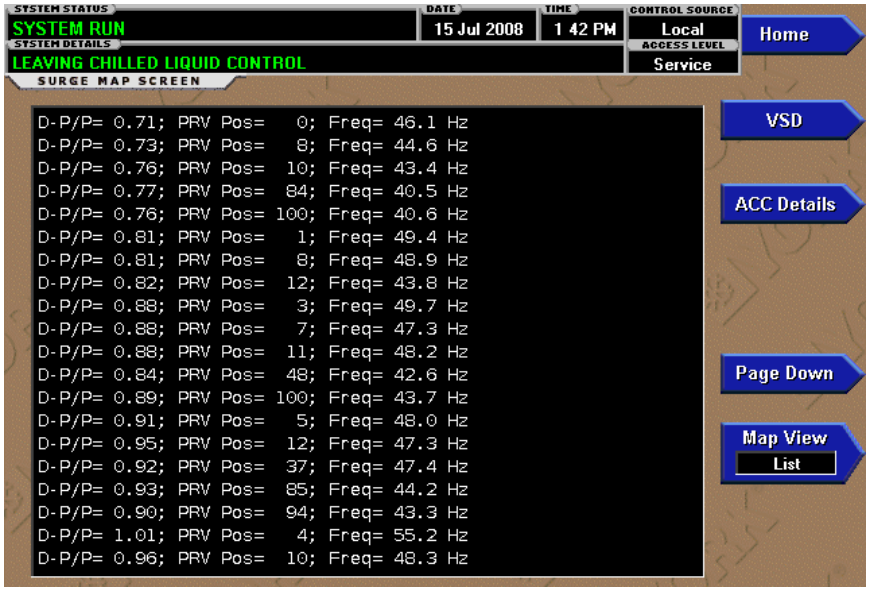

FIG. 22D LD13833

OVERVIEW

The surge map can be shown in either TABLE (default) or LIST view as selected with the Map View key.

Shown above is the LIST view. In this view, the Delta P/P, Pre-rotation vanes position and VSD output frequency of each mapped point are listed. It is the same report that is generated when the surge map is printed to a printer. Therefore, this view cannot be selected while a print is in progress. If the Surge Map key is pressed on the ACC Details Screen while a print is in progress, the Map View is reset to TABLE if it is set to LIST.

The PAGE UP and PAGE DOWN keypad keys are used to scroll to the previous or next list of parameters.

This screen is applicable to Variable Speed Drives (VSD) (with the Motor Communications Protocol setpoint set to MODBUS; ACC Board is not present) and Medium Voltage Variable Speed Drives (MV VSD). It is not accessible if equipped with a VSD in YORK Motor Communications Protocol Setpoint configuration (ACC Board is present).

NOTE

Requires Login access level of SERVICE. Service technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

PROGRAMMABLE

Map View
Allows the Service Technician to change the view from LIST to TABLE.

Page Up
This key scrolls the contents of the view window up to the previous list of parameters. If the window cannot be scrolled up, this key will not be displayed.

Page Down
This key scrolls the contents of the view window to the next list of parameters. If the window cannot be scrolled down, this key is not displayed.

NAVIGATION

Home
Causes an instant return to the Home Screen

VSD
Returns to the VSD Screen

ACC Details
Causes a return to the ACC Details Screen

HARMONIC FILTER DETAILS SCREEN

(Style D VSD and VSD with part number 371-03789-xxx (503HP 60Hz; 419HP 50Hz)

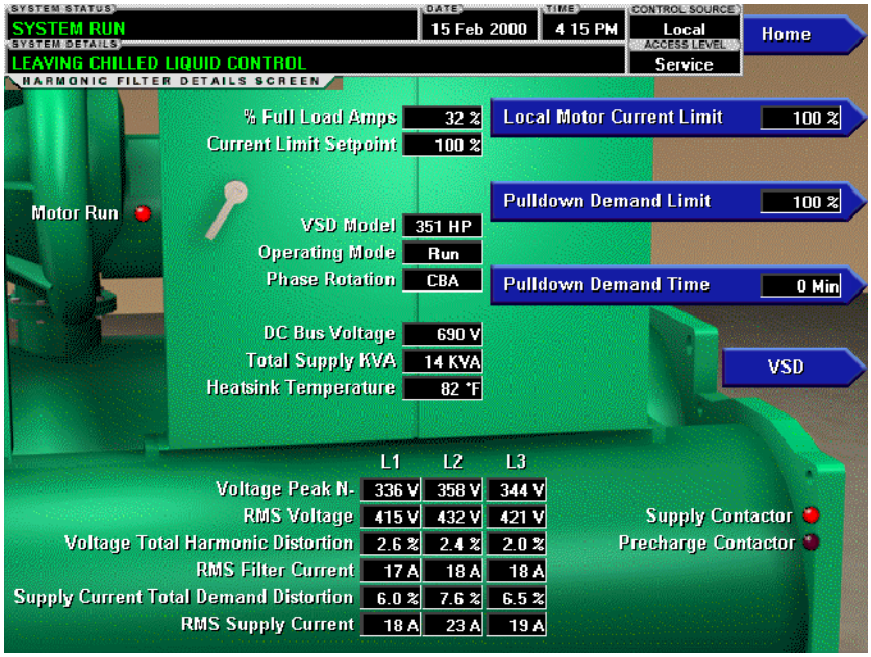

FIG. 23 00315VIP

OVERVIEW

This screen displays more detailed information pertaining to the IEEE-519 Harmonic Filter. Flash memory Card version C.MLM.01.08.xxx and later is required for VSD part number 371-03789-xxx (503 HP 60Hz; 419 HP 50Hz).

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 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

Operating Mode (Run / Stop)
Indicates whether the Harmonic Filter is operating.

VSD Model
Access Level Required: SERVICE
Displays the horsepower for which the attached Harmonic Filter is configured.

DC Bus Voltage
Displays the DC Bus voltage as measured by the Harmonic Filter.

Supply Contactor (LED)
Indicates whether the output to the Supply Contactor is energized.

Precharge Contactor (LED)
Indicates whether 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-Amps 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 Heatsink (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 user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD
Access Level Required: VIEW
Returns to the VSD Screen.

HARMONIC FILTER DETAILS SCREEN

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

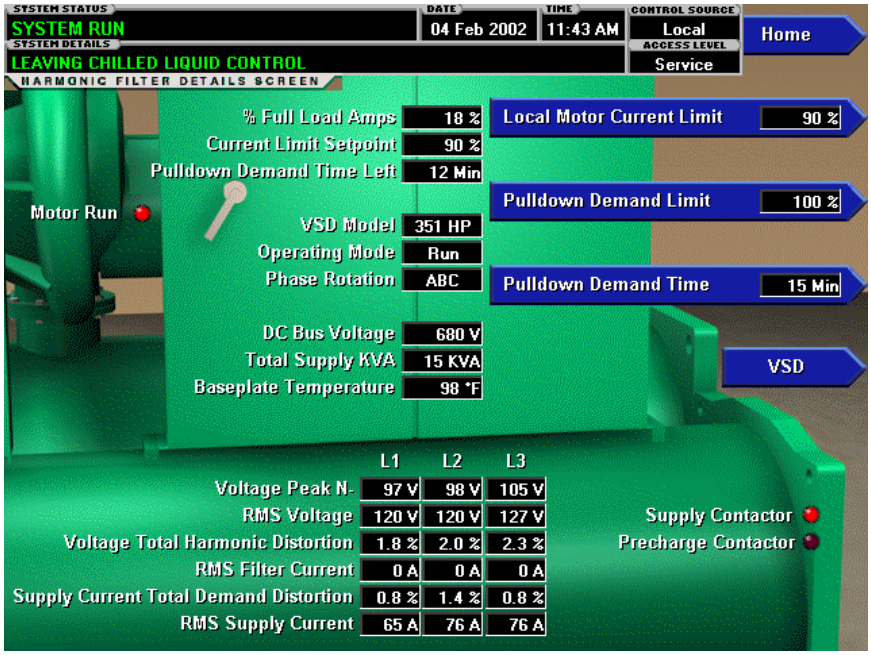

FIG. 24 00664VIP

OVERVIEW

This screen displays more detailed information pertaining to the IEEE-519 Harmonic Filter.

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 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 mode, or a locally programmed value.

Pulldown Demand Time Left
Displays the time remaining in the programmed pulldown period if the value is nonzero.

Operating Mode (Run / Stop)
Indicates whether the Harmonic Filter is operating.

VSD Model
Access Level Required: SERVICE
Displays the horsepower for which the attached Harmonic Filter is configured.

DC Bus Voltage
Displays the DC Bus voltage as measured by the Harmonic Filter.

Supply Contactor (LED)
Indicates whether the output to the Supply Contactor is energized.

Precharge Contactor (LED)
Indicates whether 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-Amps 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 user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of FLA) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

VSD
Access Level Required: VIEW
Returns to the VSD Screen.

MOTOR LUBRICATION SCREEN

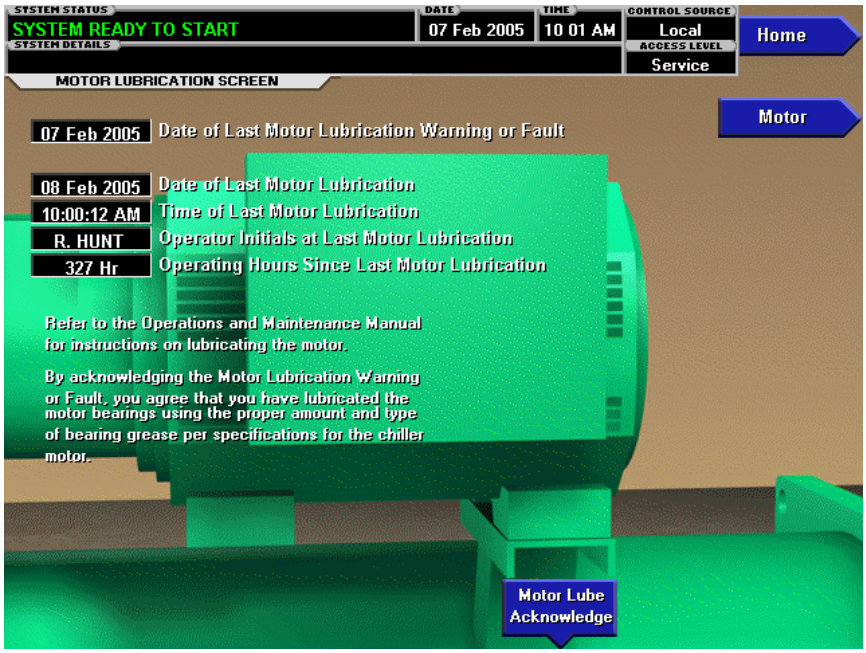

FIG. 25

LD10702

OVERVIEW

(This feature applies to Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later) only)

This feature provides an indication when the compressor motor lubrication is required. The lubrication requirement and notification is based on the "Operating Hours Since Last Motor Lubrication". There are up to three levels of notification, each indicating an increasing level of urgency. "Warning – Motor Bearing Lube Suggested" is displayed when the hours exceed 1000 hours. If there is no response, "Warning – Motor Bearing Lube Required" is displayed when the hours exceed 1200 hours. If there is still no response, a safety shutdown is performed when the hours exceed 1400 hours and "Motor – Lack of Bearing Lubrication" is displayed. Refer to Display Messages section of this book for details of these messages.

To provide a record of when a motor lubrication is performed, the Operator enters his/her initials, name or user ID using the Motor Lube Acknowledge key. The date and time of this entry is automatically logged as the Date of Last Lubrication and Time of Last Lubrication. This also clears any motor lubrication warning or safety that is in effect and resets the Operating Hours Since Last Lubrication to zero.

If equipped with software version C.OPT.01.16.XXX (or later), this lubrication notification and shutdown feature can be enabled or disabled based on the customer's preference using the AUTO LUBE and SHUTDOWN keys.

DISPLAY ONLY

Date of Last Motor Lubrication Warning or Fault
Displays the date of the last motor lubrication warning or safety shutdown.

Date of Last Motor Lubrication
Displays the date of the last motor lubrication. This parameter is automatically recorded when the Operator enters his/her initials, name or user ID using the Motor Lube Acknowledge key.

Time of Last Motor Lubrication
Displays the time of the last motor lubrication. This parameter is automatically recorded when the Operator enters his/her initials, name or user ID using the Motor Lube Acknowledge key.

Operator Initials at Last Motor Lubrication
Displays the initials, name or user ID entered by the Operator when the motor lubrication is performed. Entered as a 3 to 8 character string using the Motor Lube Acknowledge key.

Operating Hours Since Last Motor Lubrication
Displays the run hours (in whole hours) accumulated since the last motor lubrication. The value is reset to zero whenever the Operating Hours (on the Operations Screen) is reset to zero or whenever the Operator enters his/her initials, name or user ID using the Motor Lube Acknowledge key.

PROGRAMMABLE

Motor Lube Acknowledge
Access Level Required: OPERATOR
When the motor lubrication has been performed, the Operator must acknowledge the lubrication has been performed. This is done by entering his/her initials, name or user ID as a 3 to 8 character string. The entry is displayed as the Operator Initials at Last Lubrication. The date and time of this entry is automatically logged as the Date of Last Motor Lubrication and Time of Last Motor Lubrication. This entry also resets the Operating Hours Since Last Lubrication to zero.

This entry also resets the motor lubrication warning messages: "Warning – Motor Bearing Lube Suggested", "Warning – Motor Bearing Lube Required" and safety shutdown "Motor – Lack of Bearing Lubrication".

Enter your initials, name or user ID using the following procedure. The entry must be a minimum of 3 characters and a maximum of 8 characters.

1. At the keypad, log in at OPERATOR access level using Password 9 6 7 5. If resetting the safety shutdown "Motor – Lack of Lubrication", place COMPRESSOR switch in Stop-reset (O) position.
2. Press the Motor Lube Acknowledge key on the Motor Lubrication Screen. A dialog box appears. A red box highlights the first changeable location.
3. Use the ▲▼keys to scroll sequentially through the alphabet to enter letters or numbers. Each time the ▲ is pressed, the next higher sequential alphabet letter or number is displayed. Each time the ▼is pressed, the next lower alphabet letter or number is displayed. When the desired letter or number is displayed, use the ► key to forward space the red box for the next entry. Use the ◄ key to backspace, if necessary. To write over an existing entry or to place a blank space, scroll to the beginning of the alphabet. The selection prior to the letter A is a blank space. Use the ● key to enter a period/decimal point. During the entry process, if it is desired to exit the dialog box and retain the previous entry, press the CANCEL (X) key.
4. When all of the desired characters have been entered, press the ENTER (√) key.

Motor Lube Date
Access level required: ADMIN
Allows modification of the Date of Last Motor Lubrication.

Auto Lube
(Software version C.OPT.01.16.XXX and later)
Access Level Required: SERVICE
This setpoint accommodates those chillers that are equipped with the optional Automatic Motor Lubrication hardware that automatically lubricates the motor at regular intervals. Since chillers equipped with this hardware don't require manual lubrication, the lubrication warnings displayed at 1000, 1200 and 1400 (safety shutdown) operating hours since last lubrication are unnecessary. Therefore, when the automatic lubrication hardware is present, this setpoint must be ENABLED. With this setting, no lubrication warnings or safety shutdown will occur. If DISABLED, as it should be when not equipped with the automatic lubrication hardware, the motor lubrication warnings and safety shutdown will occur at the associated operating hours. Service technicians refer to procedure in Service Manual 160.54-M1.

Shutdown
(Software version C.OPT.01.16.XXX and later)
Access Level Required: SERVICE
If the Auto Lube setpoint above is set to DISABLED, the SHUTDOWN Setpoint is used to enable or disable the safety shutdown that occurs at 1400 operating hours since last lubrication. The safety shutdown can be enabled or disabled per the customer's preference. If enabled, the safety shutdown will occur at the normal 1400 hours. If disabled, a warning will be displayed but the safety shutdown will not occur. Service Technicians refer to procedure in Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen

Motor
Access Level Required: VIEW
Causes an instant return to the Motor Screen

SETPOINTS SCREEN

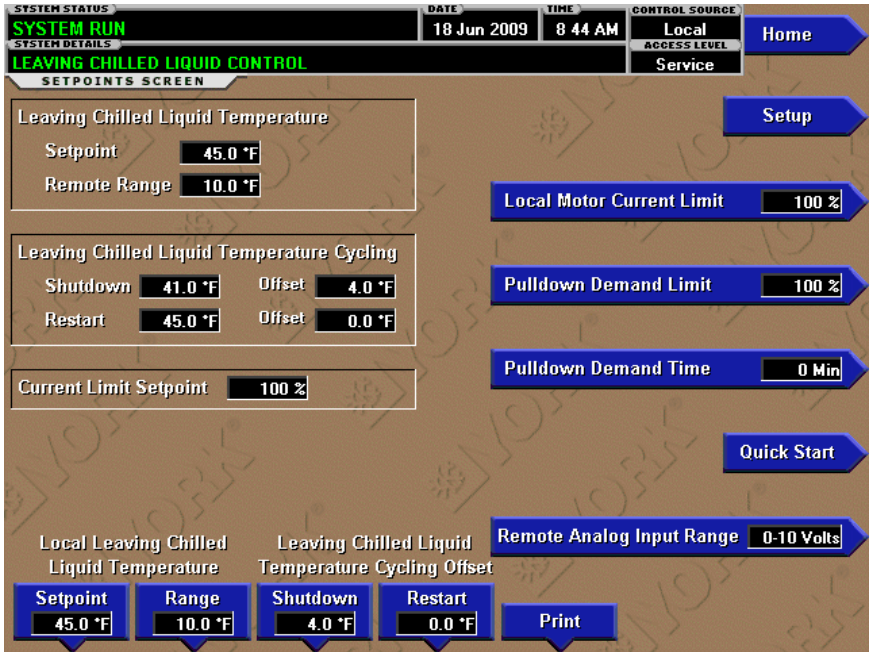

FIG. 26 LD14342

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 setpoint to which the chiller is operating whether controlled remotely or locally. 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 mode, or a locally programmed value.

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 below the absolute minimum allowed shutdown temperature the minimum value is displayed.

Leaving Chilled Liquid Temperature Cycling – Restart
Displays the Leaving Chilled Liquid Temperature at which the chiller will restart after it has shut down due to over-cooling temperature. This value is calculated by adding the Leaving Chilled Liquid Temperature Cycling Offset – Restart to the Leaving Chilled Liquid Temperature – Setpoint.

Current Limit Setpoint
(Flash Memory Card version C.MLM.01.01 or later)
Displays the active Current Limit setpoint. 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 the Pulse width Modulation signal input.

PROGRAMMABLE

Local Leaving Chilled Liquid Temperature - Range *Access Level Required*: OPERATOR
This is the range over which an analog signal (0-20 mA, 4-20 mA, 0-10VDC or 2-10VDC) in Analog Remote Mode or a digital signal (PWM) in Digital remote mode can reset the Leaving Chilled Liquid Temperature setpoint above the operator programmed **Base** Setpoint (see below). Programmable as either 10°F or 20°F, with a default of 20°F, it is added to the *BASE* value to create a range over which the remote device can reset the setpoint. For example, if this setpoint is programmed for 10°F and the operator programmed value is 45°F, then the remote device can set the Leaving Chilled Liquid Temperature setpoint over the range 45.0°F - 55.0°F.

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. It is programmable over the range of 38.0°F to 70.0°F (water) or 10.0°F to 70.0°F (brine). If Smart Freeze is enabled, the range is 36.0°F to 70.0°F (water). A remote device can provide an analog signal (0-20 mA, 4-20 mA, 0-10VDC or 2-10VDC) in Analog Remote mode, or PWM signal in Digital Remote mode that changes the setpoint by creating an offset above the operator programmed *BASE* Leaving Chilled Liquid Temperature setpoint. This offset may be defined up to 10.0°F or 20.0°F above the *BASE* setpoint (see the Remote Leaving Chilled Liquid Temperature Setpoint Range description above). Additionally, 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 locally programmed *BASE* setpoint value, but rather is the setpoint value itself.

Leaving Chilled Liquid Temperature Cycling Offset - Shutdown
Access Level Required: OPERATOR
This value allows the user to specify the Leaving Chilled Liquid Temperature at which the chiller will shut down on a **LEAVING CHILLED LIQUID – LOW TEMPERATURE** cycling shutdown. This is done by defining an offset below the Leaving Chilled Liquid Temperature setpoint. It is programmable over a range of 1°F to 64°F below the setpoint, to a minimum cutout of 36°F (water), 34°F (water with Smart Freeze enabled) or 6°F (brine). It establishes the minimum allowed temperature for the Leaving Chilled Liquid Temperature and prevents overcooling of the building. 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 10 minutes. After ten (10) minutes have elapsed, the shutdown threshold becomes the programmed setpoint value.

Leaving Chilled Liquid Temperature Cycling Offset - Restart
Access Level Required: OPERATOR
This value allows the user to specify the Leaving Chilled Liquid Temperature at which the chiller will restart after a shutdown on a **LEAVING CHILLED LIQUID – LOW TEMPERATURE** cycling shutdown. This is done by defining an offset above the Leaving Chilled Liquid Temperature setpoint. It is programmable over a range of 0°F to 70°F above the 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.

Remote Analog Input Range
(Flash Memory Card version C.MLM.01.01 or later)
Access Level Required: OPERATOR
This setpoint defines, for the Control center, 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.

Motor Current Limit
Access Level Required: OPERATOR
Allows the user to specify the maximum allowed motor current (as a percentage of FLA). When the motor current reaches this value, the pre-rotation vanes will not be permitted to open further. If the motor current rises above this value, the pre-rotation vanes will close to reduce the current to this value.

Pulldown Demand Limit
Access Level Required: OPERATOR
Allows the user to specify the current limit value (as a percentage of Full Load Amps) to which the chiller will be limited during the specified pulldown limit 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.

Pulldown Demand Time
Access Level Required: OPERATOR
Allows the user to set a period of time for which the pulldown demand limit will be in effect after the chiller starts.

Print
Access Level Required: VIEW
Generates **Setpoints** print report.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Setup
Access Level Required: VIEW
Moves to the sub-screen allowing setup of general system parameters.

Quick Start
(Software version C.OPT.01.21.307 and later)
Access Level Required:
ADMIN (to initially enable the feature);
SERVICE (if feature is enabled)
Moves to the sub-screen allowing the Quick Start feature to be enabled/disabled. Once enabled, this screen allows programming and viewing of Quick Start setpoints and parameters.

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SETUP SCREEN

FIG. 27 LD14340

OVERVIEW

This screen is the top level of the general configuration parameters. It allows programming of the time and date, along with specifications as to how the time will be displayed (12 or 24 hour format). In addition, the chiller configuration, as determined by the state of the Microboard Program Jumpers and Program Switches is displayed. A qualified Service Technician, following instructions in YORK Service Manual 160.54-M1, establishes this configuration per the desired operation. This screen also serves as a gateway to more sub-screens for defining general system parameters.

DISPLAY ONLY

031-01730-000 Microboard

Chilled Liquid Pump Operation:
Displays **Standard** or **Enhanced**

Motor Type:
Displays **Fixed Speed** or **Variable Speed**

Refrigerant Selection:
Displays **R-22** or **R134a**

Anti-Recycle:
Displays **Disabled** or **Enabled**

Power Failure Restart:
Displays **Manual** or **Automatic**

Liquid Type:
Displays **Water** or **Brine**

Coastdown:
Displays **Standard** (150 seconds) or **Enhanced** (15 minutes – Steam Turbine applications)

Pre-Run:
Displays **Standard** (50 seconds) or **Extended** (180 seconds)

Oil Pump Package:
Displays **Fixed Speed** or **Variable Speed**

Power Line Frequency (VSD only):
Displays **60 Hz** or **50 Hz**

031-02430-000 & 031-02430-001 Microboard

Refrigerant Selection
Displays R22 or R134a

Liquid Type
Displays Water or Brine

PROGRAMMABLE

Set Date
Access Level Required: OPERATOR
Allows the user to specify the present date. This value is critical to logging system shutdowns accurately and for 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 user to specify the present time. This value is critical to logging system shutdowns accurately and for utilizing the scheduling capabilities. When prompted to enter a time value, the user must enter the hour and minute desired (using leading zeroes as necessary). If the chiller is presently set to 24-hour mode, the time must be entered in the 24-hour format. Otherwise, the user must also select AM or PM for the entered time. If out of range, the user is prompted for the information again. At this point the user may retry the time entry, or cancel the programming attempt.

Clock (Enabled / Disabled)
Access Level Required: OPERATOR
Allows the user to enable or disable the real-time clock in order to conserve battery life. The clock will be disabled during manufacturing and must be enabled at system commissioning. In addition, when preparing for prolonged shutdown the clock should once again be disabled.

12/24 Hr
Access Level Required: OPERATOR
Allows the user to specify the format in which the time will be presented to the user. 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.

031-02430-000 & 031-02430-001 Microboard only

Change Settings
Access Level Required: OPERATOR or higher
Used to enter the following setpoints. Pressing this key places a green selection box around the first changeable setpoint. The access level determines which setpoints can be changed. Use the ▲ and ▼ keys to place the selection box around the desired setpoint. With the setpoint selected, press the ENTER (√) key. A dialog box appears with the range of settings.

Chilled Liquid Pump Operation
Access Level Required: SERVICE
Allows a Service Technician to select chilled liquid pump control contacts (I/O Board TB2-44/45) operation as either Standard or Enhanced. Service Technicians refer to YORK Service Manual 160.54-M1.

Motor Drive Type
Access Level Required: SERVICE
Allows a Service Technician to enter the applied compressor motor type as either electro-mechanical (EM), Solid State Starter (SSS-Mod A), Solid State starter (SSS – Mod B), Variable Speed Drive-60Hz or Variable Speed Drive-50Hz. Service Technicians refer to YORK Service manual 160.54-M1.

Anti-Recycle
Access level Required: SERVICE
Allows a Service Technician to Enable or Disable the anti-recycle timer. Service Technicians refer to YORK Service manual 160.54-M1.

Power Failure Restart
Access Level Required: OPERATOR
Allows the user to select Manual or Automatic restart after power failure.

Coastdown
Access Level Required: SERVICE
Allows a Service Technician to select either Standard (electric motor) or Enhanced (15 minutes–Steam Turbine applications). When Standard is selected, the duration depends on the Software used. With version C.OPT.01.16.XXX (and later), the duration is programmable using the Coastdown Time setpoint below. With earlier software versions, the duration is fixed at 150 seconds. Service Technicians refer to YORK Service manual 160.54-M1.

Pre-Run
Access Level Required: SERVICE
Allows Service Technician to select either Standard (30 seconds) or Extended (180 seconds)

Oil Pump Package
Access level Required: SERVICE
Allows Service Technician to enter the applied oil pump drive type as either Variable Speed or Fixed Speed. Service Technicians refer to YORK Service Manual 160.54-M1.

Motor Communications Protocol
(VSD applications – Software version C.OPT.01.16.307 or later)
(Style B Liquid Cooled Solid State Starter applications – Software version C.OPT.01.18.307 or later)
Access Level Required: SERVICE
Only displayed when MOTOR DRIVE TYPE setpoint above is selected as "VSD-60Hz", "VSD-50Hz" or "SSS-Mod B". Allows the Service Technician to enable the appropriate serial communications port for communications with the Style B Liquid Cooled Solid State Starter (LCSSS) or Variable Speed Drive (VSD). Entered as "York" to enable COM 5 (J15) or "Modbus" to enable COM 2 (J13). Selection required is based on hardware and interface that is present. Service Technicians should refer to York Service Manual 160.54-M1 Section 11 (LCSSS) or Section 12 (VSD) to determine which hardware/interface is present. This setpoint and entry instructions are described in detail in Section 3A and 23 of Service Manual 160.54-M1. The chiller must be stopped with the Start-Run-Stop/Reset switch in the Stop/Reset position to change this setpoint.

Motor Node ID
(VSD applications – Software version C.OPT.01.16.307 or later) (Style B Liquid Cooled Solid State Starter applications – Software version C.OPT.01.18.307 or later)
Access Level Required: SERVICE
Only displayed when "Modbus" is selected for the Motor Communications Protocol setpoint above. Allows the Service Technician to enter the Modbus Address of the VSD Logic Board or Style B LCSSS Logic/Trigger Board. The Motor Node ID setpoint must be set to "1" to match the address assigned to the VSD Logic Board or Style B LCSSS Logic/Trigger Board. This setpoint and entry instructions are described in detail in Section 3A and 23 of Service Manual 160.54-M1. The chiller must be stopped with the Start-Run-Stop/Reset switch in the Stop/Reset position to change this setpoint. VSD applications: Set the Modbus Address of VSD Logic Board 031-02506 to "1" by setting Switch SW3 position 1 to "ON with all other positions "OFF". Style B Solid State Starter applications: Set the Modbus Address of the Logic/Trigger Board 031-02505 to "1" by setting Switch SW1 position 1 to "ON" with all other positions "OFF".

Coastdown Time
(Software version C.OPT.01.16.xxx (or later))
Access Level Required: SERVICE
Only displayed when "Standard" is selected as the COASTDOWN Setpoint above. Allows Service technician to select appropriate coastdown time for compressor motor applied. Larger motors require a longer coastdown time to assure the motor rotation has stopped before the oil pump is turned off at completion of post-lube. Programmable range is determined by the CHILLER STYLE/COMPRESSOR setpoint (Style F/J7 and G/K6-K7, the range is 240 (default) to 900 seconds. All others, the range is 150 (default) to 900 seconds). Service Technicians refer to YORK Service Manual 160.54-M1.

Condenser Temperature Range
(Software version C.OPT.01.19.307 or later)
Access Level Required: ADMIN
Special order R134a chillers are allowed to operate at higher than standard condenser temperatures. The resulting higher operating pressures require higher condenser warning and safety shutdown thresholds than standard applications. These chillers are equipped with a special High Pressure Cutout Switch (HPCO) that can be set to trip at a higher pressure.

This setpoint allows for either standard or higher temperature condenser temperature operation. It is set at the factory and requires an ADMIN password to change it. It is only visible when set to "Extended". It is set to "Extended" for those chillers equipped for high condenser temperature operation. Otherwise, it is set to "Standard". For R134a chillers, the thresholds are as follows:

	Standard	Extended
"Warning – High Pressure Limit" – Maximum allowable value (PSIG):	162.5	193
"Condenser – High Pressure" – Trip/reset threshold (PSIG):	180/120	200/140
"Condenser – High Pressure Stopped" – Trip/reset threshold (PSIG):	160/160	170/170

PRV Position
(Software version C.OPT.01.21.307 and later)
Access Level Required: SERVICE
New production chillers after June 2009 can be equipped with an optional Pre-rotation Vanes Potentiometer, regardless of other options. This setpoint allows the software to be used in all YK chillers, whether equipped with the potentiometer or not. The PRV position will be shown on respective screens when Enabled.

- Enabled – Automatically set to this setting if Hot Gas Bypass or Variable Geometry Diffuser (VGD) is enabled on the OPERATIONS Screen or Motor Drive Type Setpoint is set to VSD or MVVSD. The actual connection point of the potentiometer is determined by the equipment configuration: If equipped with a VSD in YORK protocol configuration, it is connected to the ACC Board; in MODBUS protocol configuration, it is connected to the Microboard J7. If not equipped with VSD, but equipped with Hot Gas Bypass, the connection point is determined by which I/O Board is present: with I/O Board 371-02514-000, it is connected to this board; otherwise, it is connected to the Microboard J7. If not equipped with Hot Gas Bypass but equipped with a VGD, it is connected to the Microboard J7.
- Disabled – Set to this position when not equipped with a PRV potentiometer. If equipped with a VSD, MVVSD or the Hot Gas Bypass or Variable Geometry Diffuser is enabled, this setpoint is automatically enabled and cannot be set to disabled.

Heat Recovery
(Software version C.OPT.01.21.307 and later)
Access Level Required: SERVICE
Allows the Service Technician to enable or disable the Heat Recovery feature. Refer to Service Manual 160.54-M1.

Head Pressure Control
(Software version C.OPT.01.21.307 and later)
Access Level Required: SERVICE
Allows the Service Technician to enable or disable the Head Pressure Control feature. Refer to Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Schedule
Access Level Required: VIEW
Moves to the sub-screen allowing definition of the chiller operation schedule.

Diagnostics
Access Level Required: SERVICE
Moves to the sub-screen allowing limited diagnostic capability while operating. Refer to YORK Service Manual 160.54-M1

Comms
Access Level Required: VIEW
Moves to the sub-screen allowing configuration of system communications.

Printer
Access Level Required: VIEW
Moves to the sub-screen allowing configuration and control of printer functions.

Sales Order
Access Level Required: VIEW
Moves to the sub-screen displaying the Sales Order information for the chiller system.

Operations
Access Level Required: VIEW
Moves to the sub-screen displaying operating parameters of the chiller system.

User
Access Level Required: VIEW
Moves to the sub-screen allowing configuration of user preferences.

QUICK START SCREEN

(Software version C.OPT.01.21.307 and later)

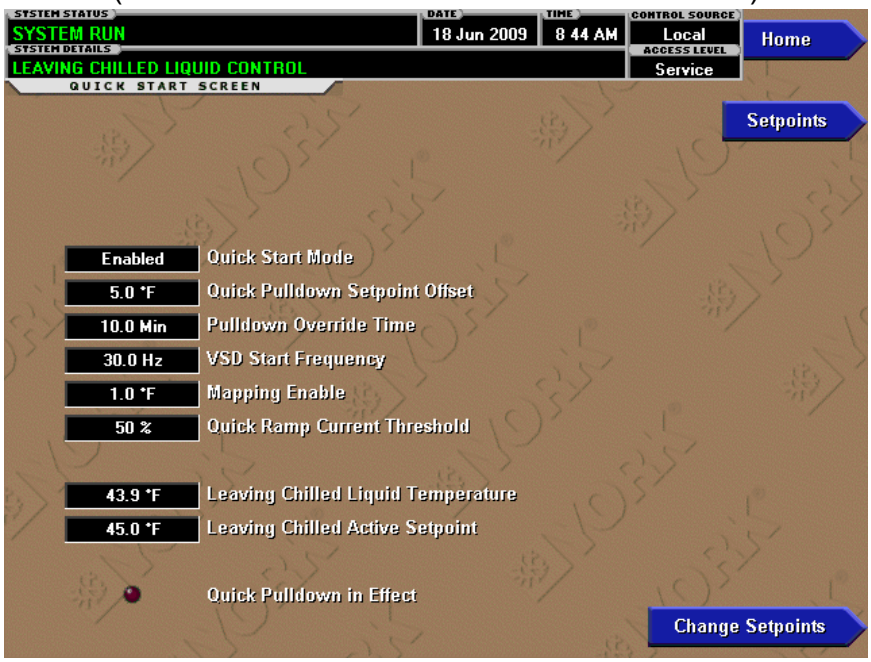

FIG. 27A LD14341

OVERVIEW

The Quick Start feature is useful in data center and process control applications where it is desirable to re-establish cooling as fast as possible after a shutdown or power failure. This feature, when enabled, allows quicker starts and restarts than normal control. It does this by reducing the time cycle for chiller restart and once running, loading the chiller as fast as possible. After the chiller is running and has met a specified setpoint or a specified period of time has elapsed, control returns to normal.

Quick Start feature has two different start modes:

- Quick Restart – When a chiller shutsdown, if certain conditions are met at the completion of Coastdown (and within 30 seconds thereafter), the VSD is started immediately with no Prelube. The vanes are given a constant open pulse and after the VSD achieves its start frequency, the speed ramp rate is faster than with normal control.
- Quick Normal Start – If the conditions for a Quick Restart are not met, the next time the chiller is started, it has a prelube period just like a normal start, however the vanes will begin to open at the beginning of Prelube, instead of waiting until System Run. At the completion of Prelube, the VSD is started and after the VSD achieves its Start Frequency, the speed ramp rate is faster than with normal control.

In order to use this feature, the chiller must be equipped with a Variable Speed Drive in Modbus Protocol Configuration or a Medium Voltage Variable Speed Drive. The low inrush current of a VSD allows more starts per hour and allows the chiller to start with a more open vane position. It must be enabled with an ADMIN password by a qualified service technician using the procedure in Service Manual 160.54-M1. Once enabled, all setpoints and parameters related to this feature are displayed on this screen, when logged in at Service access level.

Service technicians refer to Service manual 160.54-M1 for complete explanation of this feature.

DISPLAY ONLY

Leaving Chilled Liquid Temperature
Displays the temperature of the liquid as it leaves the evaporator.

Leaving Chilled Active Setpoint
Displays the setpoint to which the Leaving Chilled Liquid is being controlled.

Quick Pulldown in Effect (LED)
Illuminates while a Quick Pulldown is in effect. This is in effect from a start initiate until the Quick Pulldown Setpoint Offset has been reached or the Pulldown Override Time has elapsed, whichever occurs first.

PROGRAMMABLE

Change Setpoints
Access Level Required: SERVICE or higher
Used to enter the following setpoints. Pressing this key places a green selection box around the first changeable setpoint. Use the ▲ and ▼ keys to place the selection box around the desired setpoint. With the setpoint selected, press the ENTER (√) key. A dialog box appears with the range of settings.

Quick Start Mode
Access Level Required: ADMIN
(Enabled, Disabled; default Disabled) -This setpoint is used to Enable and Disable the Quick Start feature. It can only be Enabled when the Motor Drive Type Setpoint is set to VSD and the Motor Communications Protocol is set to Modbus. Or, the Motor Drive Type Setpoint is set to MVVSD. The default is DISABLED. Quick Start can only be enabled using an ADMIN password. When logged in at ADMIN access level, a QUICK START key will appear on the SETPOINTS Screen. Pressing this key will navigate to the QUICK START Screen where this setpoint is used to enable/disable the feature.

Quick Start can be Disabled when logged in at Service access level. However, once Disabled, it requires an ADMIN password to enable it again, as explained above. Quick Start Mode will be automatically disabled when any of the following occur: The Motor Drive Type is changed to something other than VSD or MVVSD or the Motor Communications Protocol is changed to YORK.

Quick Pulldown Setpoint Offset
Access Level Required: SERVICE
(0ºF to 10ºF; default 5ºF) - This setpoint sets the Leaving Chilled Liquid Temperature at which the control transitions from Quick Start mode to normal operation. It is entered in the form of an offset above the active Leaving Chilled Liquid Temperature (LCHLT) Setpoint. Once the leaving chilled liquid temperature falls below the Active LCHLT Setpoint + Quick Pulldown Setpoint Offset, PRV (Quick Restart) and speed control (Quick Restart and Quick Normal Start) revert to normal automatic control. Lower values of this offset result in faster pulldown times but can result in overshoot of the LCHLT setpoint. Setting the value to its minimum of 0 results in the fastest pulldown time but nearly always results in setpoint overshoot. Depending upon how close the Low Chilled Liquid Temperature shutdown threshold is to the LCHLT setpoint, this could result in a Low Chilled Liquid Temperature cycling shutdown.

The leaving chilled liquid temperature and setpoint is shown on the Quick Start Screen for reference. This setpoint sets one of the two setpoints that determine when the control transitions from Quick Start mode to normal operation. The other is the Pulldown Override Time below.

Pulldown Override Time
Access Level Required: SERVICE
(0 min to 15 min; default 10 min)- This setpoint is the length of time the PRV is held open (Quick restart) and the ACC speed (Quick Restart and Quick Normal Start) is increased on startup if the Quick Pulldown Setpoint Offset is not reached. This could be due to hitting current limit during the pulldown. If the Quick Pulldown Setpoint Offset is not reached in the Pulldown Override Time, PRV and ACC speed control will revert back to normal automatic control.

VSD Start Frequency
Access Level Required: SERVICE
(60Hz units with quick start enabled = 30Hz to 45Hz; default 45Hz)(50Hz = 25Hz to 37.5Hz; default 37.5Hz) - This setpoint is the same as shown on the ACC Details Screen. It can be programmed on either the ACC Screen or the Quick Start Screen. It sets the VSD start frequency from which the speed will ramp from.

Mapping Enable
Access Level Required: SERVICE
(0.5ºF to 4.0ºF; default 1.0ºF) - This is the same setpoint as shown on the ACC Details Screen. It can be programmed on either the ACC Screen or the Quick Start Screen.It sets the Delta T needed to be met to enable surge mapping and speed reduction initially on startup.

Quick Ramp Current Threshold
Access Level Required: SERVICE
(20% to 80% FLA; default 50%) - This setpoint sets the motor current threshold where the VSD speed command ramp rate changes. At or below this threshold the speed command ramp is 4X of standard control. Over this threshold, the ramp rate is 2X of standard control until it hits the standard current limiting over 80% FLA. Higher current thresholds can result in faster pulldown times. However, setting this value too high can result in slower pulldown times due to hitting the current limit sooner on pulldown.

NAVIGATION

Home
Access Level Required: SERVICE
Causes an instant return to the Home Screen

Setpoints
Access Level Required: SERVICE
Returns to the Setpoints Screen

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SCHEDULE SCREEN

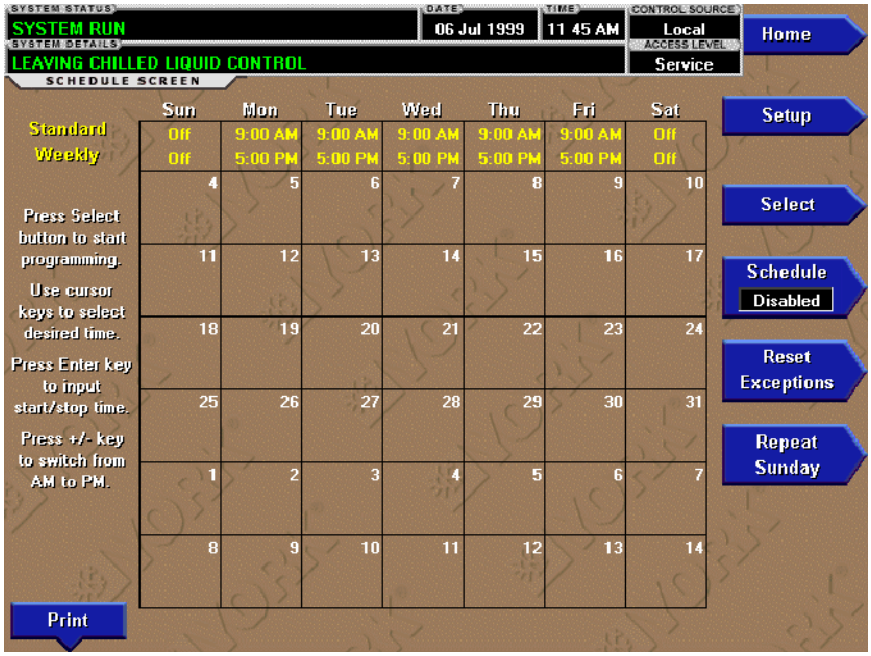

FIG. 28 00331VIP

OVERVIEW

The schedule screen contains more programmable values than a normal display screen. As such, each programmable value is not linked to a specific button. 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 '✓' (**Check**) key to program the Start / Stop times for that day.

In order for the Start / Stop combination to be utilized, each Start time must have a corresponding Stop time which occurs later in the day. The presently 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 equals the Stop time (with any time other than 12:00AM), the chiller is OFF for that day. If the user desires the chiller 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 not stop but continue to operate until the stop of Day 2.

The user has the ability to define a standard set of Start / Stop times which are utilized every week. The user may then specify *exception* Start / Stop combinations for any day of the week up to 6 weeks in advance. At the end of each week the schedule for the next week is created by combining the standard week definition and the next defined exception week. The schedule is then updated as each of the exception weeks "shifts down", leaving a new, blank exception week in the 6th week slot.

DISPLAY ONLY

None

PROGRAMMABLE

Standard Week Start/Stop Times
Access Level Required: OPERATOR
For each day of the week, the user may specify a time for the chiller to start and a time for the chiller to stop. The times specified in this entry week will be used as the default for every week of chiller operation.

Exception Start/Stop Times
Access Level Required: OPERATOR
For each day of the week, the user may specify a time for the chiller to start and a time for the chiller to stop. These Start / Stop combinations may be scheduled up to five (5) weeks in advance and also for the present week. As each week goes by, the new schedule will be created for the present week using the Exception specification in combination with the Standard week definition, as described above.

Schedule (Enabled / Disabled)
Access Level Required: OPERATOR
Allows the user to enable or disable the monitoring function which enforces the scheduled starting and stopping of the chiller.

Repeat Sunday Schedule
Access Level Required: OPERATOR
Duplicates the schedule defined for Sunday for the remainder of the standard weekdays.

Reset All Exception Days
Access Level Required: OPERATOR
Deletes all programming for exception days within the next 6 weeks.

Select
Access Level Required: OPERATOR
Places a selection box around a start time for a given day. Use ◄ , ► , ▲ or ▼ cursor arrows to place the box around the desired start or stop time for a given day.

Print
Access Level Required: VIEW
Generates a **Schedule** print report.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Setup
Access Level Required: VIEW
Return to the previous setup screen.

USER SCREEN

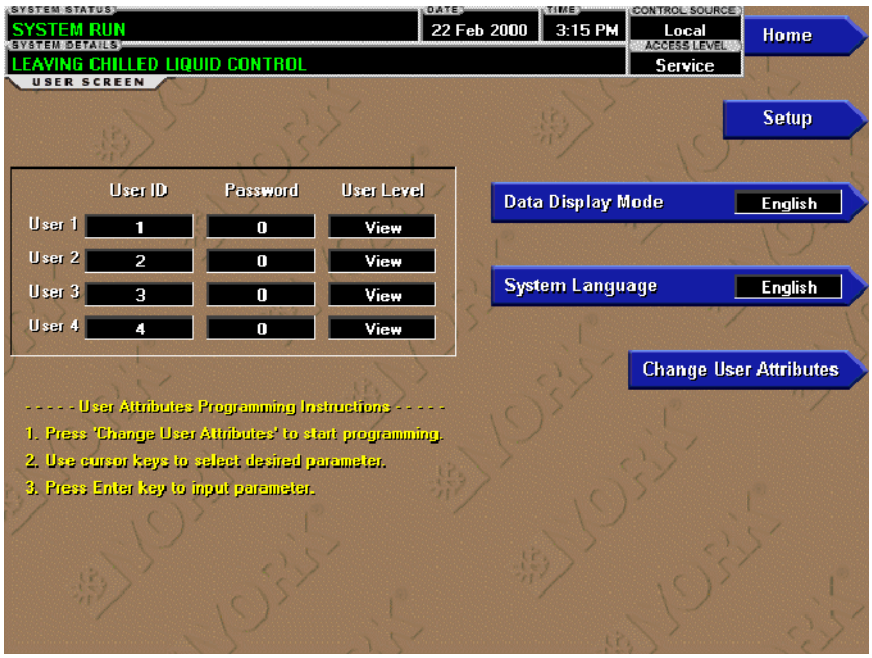

FIG. 29

00317VIP

OVERVIEW

This screen allows definition of custom User ID's and matching passwords. This allows the building administrator to assign custom passwords to those who are authorized to maintain the chiller.

Each Custom User value is not linked to a specific button. Instead, the **Change** button is pressed which enables the cursor arrows which are used to highlight the Custom User parameter the user wishes to modify. At this point the '✓' (**Check**) button is pressed and the value may be entered.

DISPLAY ONLY

None

PROGRAMMABLE

System Language
Access Level Required: OPERATOR
Allows the user to define the language for all Screens. The desired language is selected by scrolling through the list of those available. English is the Default language and is selected by pressing the ▲ key when the dialog box appears during the selection process. The selected language will not be displayed until after the user navigates from the USER Screen to another Screen. The selections are: English, French, German, Hungarian, Italian, Japanese(software version C.OPT.01.20.307 and later), Portuguese, Simplified Chinese, Spanish, and Traditional Chinese.

English / Metric Units
Access Level Required: OPERATOR
Define the unit system (English or Metric) used by the chiller display.

Custom User ID (4)
Access Level Required: SERVICE
This allows the user to specify up to four (4) Custom User ID values. Each user ID will then require a corresponding Password and User Level. A User ID can be defined for various maintenance personnel. Service Technicians refer to YORK Service Manual 160.54-M1.

Custom User Password (4)
Access Level Required: SERVICE
This allows the user to specify up to four (4) Custom Password values. Each Password will then require a corresponding User ID and User Level. Service Technicians refer to YORK Service Manual 160.54-M1.

Custom User Access Level (4)
Access Level Required: SERVICE
This allows the user to specify up to four (4) Custom User Access Levels. Each Access Level will then require a corresponding Password and User ID. Service Technicians refer to YORK Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Setup
Access Level Required: VIEW
Return to the Setup Screen.

COMMS SCREEN

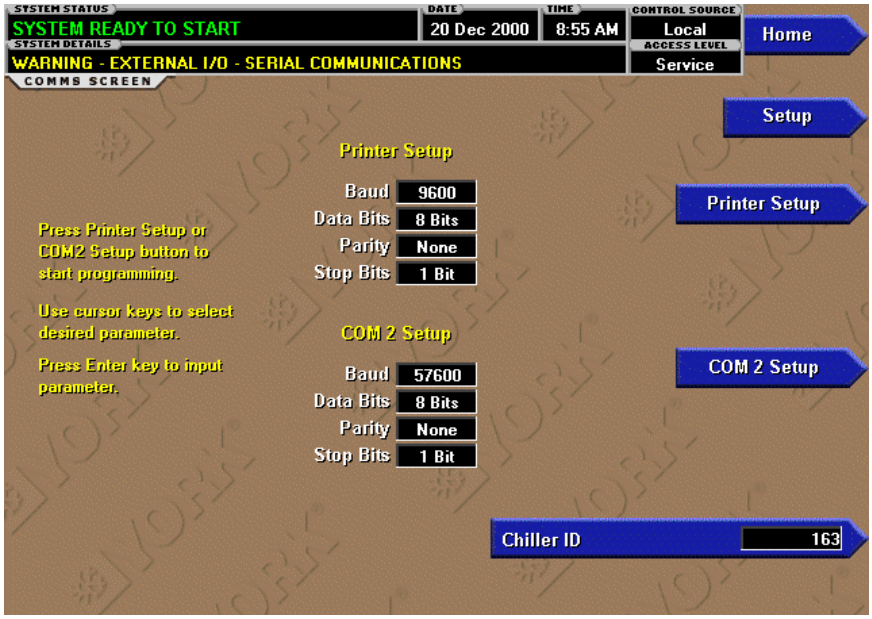

FIG. 30 00470VIP

OVERVIEW

(Screen shown from all applications equipped with Flash Memory Card version C.MLM.01.05.xxx and later. Screen layout from earlier versions slightly different.)

This screen allows definition of the necessary communications parameters. Refer to PRINTER Section of this book for details of the Printer connections and setup. Presently, there are no COM 2 communications features available.

DISPLAY ONLY

None

PROGRAMMABLE

Chiller ID
Access Level Required: OPERATOR
Define the numeric chiller ID when used within an ISN network of chillers. This ID number is also 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 ▼ keys to place the selection box around the desired parameter to be changed. With the selection box around the desired parameter, press the ENTER '✓' key. A dialog box is displayed permitting data entry. In VSD or LCSSS Modbus Protocol configuration, COM2 button is not shown because COM2 serial port is used for this interface.

Printer Baud Rate
Define the baud rate at which the panel shall communicate to the printer.

Printer Data Bit(s)
Define the number of data bits with which the panel shall communicate to the printer.

Printer Parity Bit(s)
Define the number of parity bits with which the panel shall communicate to the printer.

Printer Stop Bit(s)
Define the number of stop bits with which the panel shall communicate to the printer.

COM 2 Baud Rate
Define the baud rate at which the panel shall communicate through the modem port.

COM 2 Data Bit(s)
Define the number of data bits with which the panel shall communicate to the modem port.

COM 2 Parity Bit(s)
Define the number of parity bits with which the panel shall communicate through the modem port.

COM 2 Stop Bit(s)
Define the number of stop bits with which the panel shall communicate through the modem port.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Setup
Access Level Required: VIEW
Return to the Setup Screen.

PRINTER SCREEN

FIG. 31 00319VIP

OVERVIEW

This screen allows definition of the necessary communications parameters for the printer. Refer to PRINTER section of this book for details of the Printer connections and setup.

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
Set the time at which scheduled print logs will begin.

Output Interval
Access Level Required: OPERATOR
Define the interval at which log printing will occur.

Automatic Printer Logging (Enabled / Disabled)
Access Level Required: OPERATOR
Enable the printer to begin printing status reports beginning at the programmed start time and recurring at the interval defined above.

Printer Type
Access Level Required: SERVICE
Define the printer type connected to the chiller system.

ACC Auto Map Print (Enabled / Disabled)
Access Level Required: SERVICE
Only available if the chiller system utilizes a Variable Speed Drive motor controller. The chiller monitors the ACC communications and when a surge point is mapped, a short report of system parameters is printed. *When this function is active, all other printing capability is disabled*.

ACC Map Report
Access Level Required: SERVICE
Only available if the chiller system utilizes a Variable Speed Drive motor controller. The chiller requests the entire surge map from the ACC. As the map is received, the parameters for each point are printed.

Print Report
Access Level Required: OPERATOR
Select the report type to print when the Print Report key is selected. This can vary from Status report (present system parameters), Setpoints report (present value of the system setpoints), Schedule report (present value of the system schedule times), or a 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
Generate a report of the system data at the time of all stored shutdowns.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Setup
Access Level Required: VIEW
Return to the Setup Screen.

SALES ORDER SCREEN

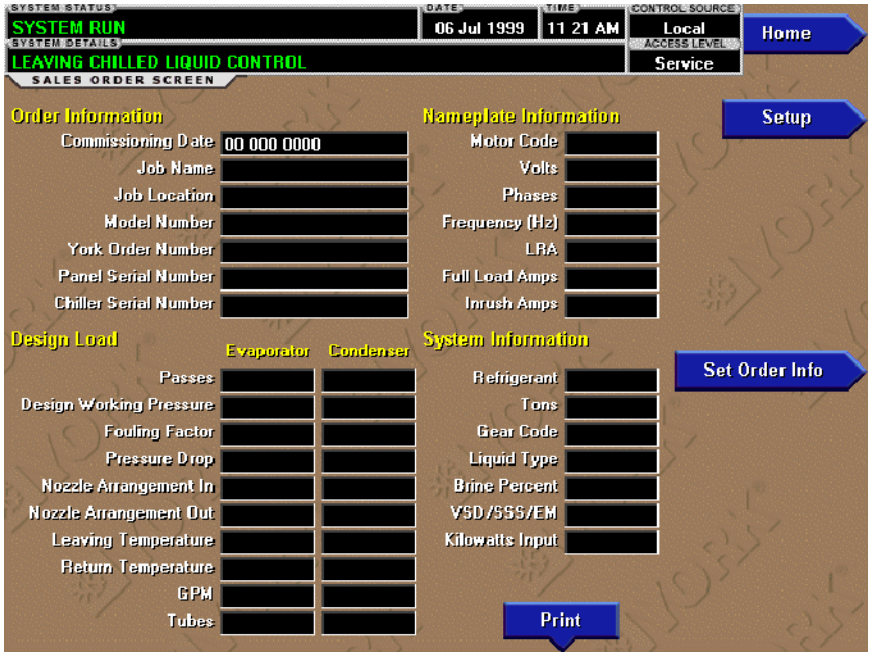

FIG. 32

00320VIP

OVERVIEW

This screen allows definition of the sales order parameters. The Commissioning date is entered by the YORK Service Technician at the time of chiller commissioning. These values should never be changed or entered by anyone other than a qualified Service Technician. Entry instructions are included in the YORK Service Manual 160.54-M1. The remainder of the values are entered at the YORK Factory during the manufacturing of the chiller.

DISPLAY ONLY

Model Number
Factory defined model number of the chiller system.

Panel Serial Number
Factory defined serial number for the micropanel.

Chiller Serial Number
Factory defined serial number for the chiller system.

YORK Order Number
Factory defined order number under which the chiller was sold.

System Information
Factory defined conditions for which the chiller was originally rated and sold.

Condenser and Evaporator Design Load Information
Factory defined description of the condenser and evaporator configuration at time of shipment.

Nameplate Information
Factory defined information about the chiller motor configuration.

PROGRAMMABLE

Commissioning Date
Access Level Required: SERVICE
Define the date at which the chiller was commissioned.

Job Name and Location
Access Level Required: SERVICE
Factory defined job name and location the chiller is destined for.

Print
Access Level Required: VIEW
This generates a listing of the Sales Order data

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Setup
Access Level Required: VIEW
Return to the Setup Screen.

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OPERATIONS SCREEN

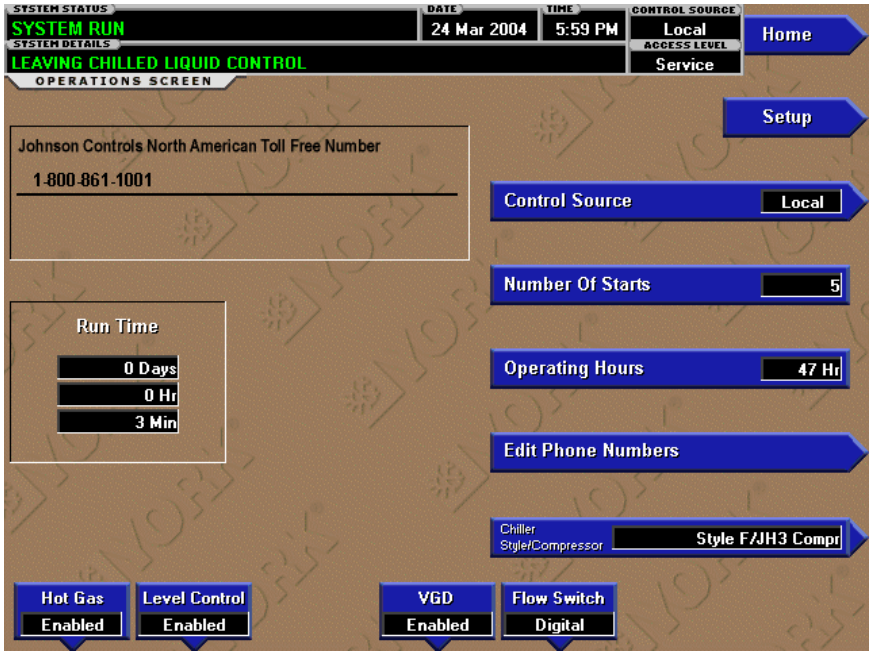


FIG. 33 LD09578a

OVERVIEW

This screen allows definition of general parameters having to do with the operation of the chiller.

DISPLAY ONLY

Chiller Run Time
(Flash memory Card version C.MLM.01.04 or later)

Displays the amount of time the chiller has been running since the last start signal was received. Value is reset to zero when the chiller enters Coastdown. It remains at zero while shutdown and during "System Prelube".

PROGRAMMABLE

Control Source
Access Level Required: OPERATOR

Define whether the control of the chiller will be Local, Digital Remote, Analog Remote, Modem Remote or ISN Remote.

Number of Starts
Access Level Required: ADMIN
Displays the number of the starts the chiller has initiated. This may be reprogrammed to a 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 a desired value (generally when this value has been reset due to a Microboard replacement), but should not be done so arbitrarily.

Hot Gas Control (Enabled/Disabled)
Access level required: SERVICE
Enables and disables the optional Hot gas Bypass Control feature.

Refrigerant Level Control (Enabled / Disabled)
Access Level Required: SERVICE
Enables and Disables the Refrigerant Level Control Feature.

Flow Switch
(Style F and later chillers equipped with Flash Memory Card version C.MLM.01.08.xxx and later)
Access Level Required: SERVICE
Used to enter the applicable Flow Switch type. Style F and later chillers could be equipped with either Paddle-type or Thermal-Type Flow sensors. The actual type installed must be entered to allow the program to read the correct input. Key is only displayed if Style F chiller is selected with the Chiller Style/Compressor Setpoint below. The Service Technicians refer to YORK Service Manual 160.54-M1.

VGD (Enabled/Disabled)
(Software version C.MLM.01.10.xxx (and later) or C.OPT.01.10.302 (and later))
Access Level Required: SERVICE
Enables and disables the Variable Geometry Diffuser feature. If equipped with this feature, it should be enabled. Otherwise, it should be disabled.

Chiller Style/Compressor
(Flash Memory Card version C.MLM.01.07.xxx and later)
Access Level Required: SERVICE
Used to enter the chiller style/compressor combination. Once the applicable chiller style/compressor combination is entered, the program controls the chiller per the requirements of the entered chiller style and compressor. Service Technicians refer to YORK Service Manual 160.54-M1.

Edit Phone Numbers
(Flash Memory Card version C.MLM.01.05.xxx and later)
Access Level Required: SERVICE
Displays up to two service phone numbers. The Regional service phone number is displayed as the first number. Although the label and number can be changed appropriately, the default for this entry is "Johnson Controls North American Toll Free Number 1-800-861-1001". The Local service phone number is displayed as the second number. Although blank by default, the appropriate label and number can be entered by a Service Technician. Service Technicians refer to Service Manual 160.54-M1.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

Setup
Access Level Required: VIEW
Return to the Setup Screen.

HISTORY SCREEN

FIG. 34

00661VIP

OVERVIEW

This screen allows the user to browse through the faults. In order to get a more thorough reporting of the system conditions at the time of the recorded shutdown, move to the sub-screen **HISTORY DETAILS.**

The user may use the **Select Fault** button to select the history to view. At this point the **View Details** button is used to jump to a sub-screen containing stored chiller parameters values at the time of the shutdown. Additionally, the **Print History** button 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 (Panel rocker switch)
- Remote (Digital, Analog 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 and time and the description of the last ten safety or cycling shutdowns that occur 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.

NAVIGATION

Home
Access Level Required: VIEW
Causes an instant return to the Home Screen.

View Details
Access Level Required: VIEW
Causes a move to a sub-screen containing the value of select chiller parameters at the time of the associated shutdown.

Trending
Access Level Required: VIEW
Causes a move to a sub-screen allowing the user to view trending data on selected chiller parameters.

Custom View
(Flash memory Card version C.MLM.01.04 or later)
Access Level required: VIEW
Causes a move to a sub-screen allowing the user to view the Custom Setup Screen.

Security Log
(Flash memory Card version C.MLM.01.06 and later and "P" compressors C.MLM.04.02 and later)
Access Level Required: SERVICE
Causes a move to a sub-screen allowing the user to view a record of the last 75 setpoint changes.

HISTORY DETAILS SCREEN

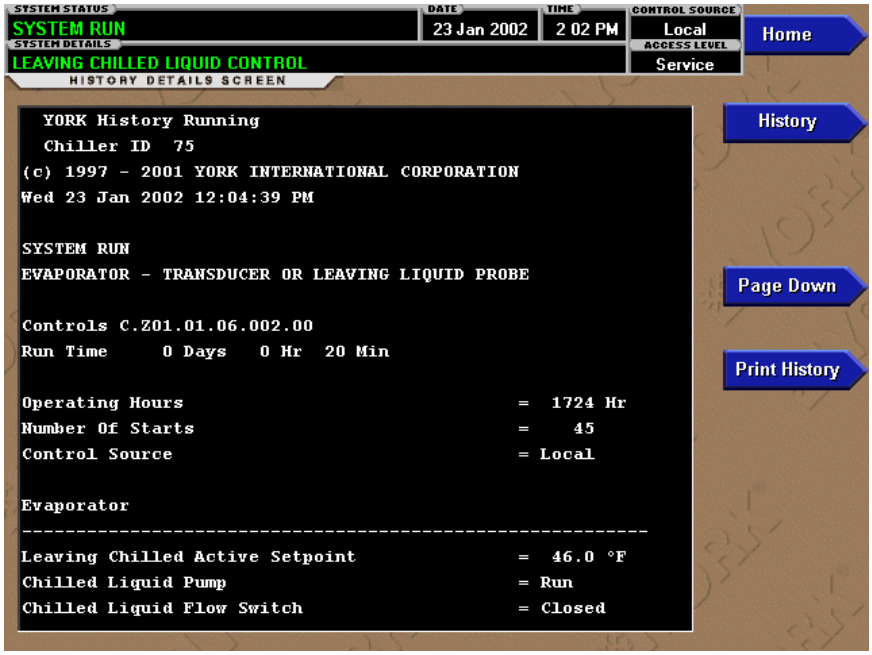


FIG. 35

00660VIP

OVERVIEW

This screen allows the user to see an on-screen printout of all the system parameters at the time of the selected shutdown. Not all screens are shown above. The number of screens required to display all of the data varies according to type of motor starter and options applied.

DISPLAY ONLY

History Printout
This is the on-screen printout of the system parameters.

PROGRAMMABLE

Page Up
Access Level Required: VIEW
Scroll up in the displayed data (if applicable).

Page Down
Access Level Required: VIEW
Scroll down in the displayed data (if applicable).

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
Causes an instant return to the Home Screen.

History
Access Level Required: VIEW
Causes a return to the History Screen.

SECURITY LOG SCREEN

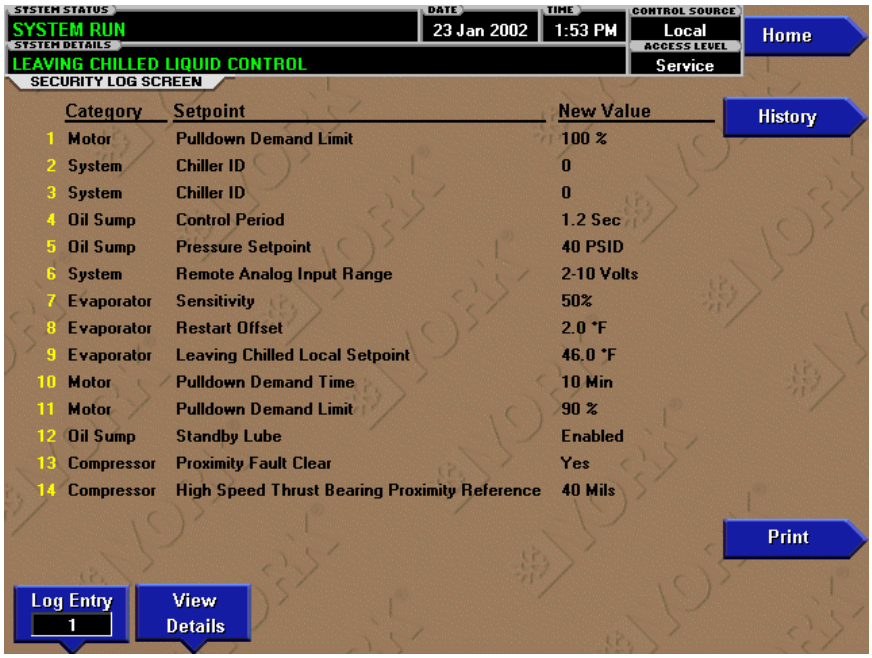
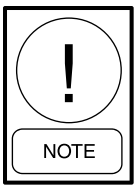


FIG. 36 00662VIP

OVERVIEW

(This screen only available with Flash Memory Card version C.MLM.01.06.xxx and later)
This screen displays a listing of the last 75 setpoint changes. They are listed and numbered in reverse order in which they were changed, with the most recent listed as number 1. Multiple pages are necessary to display all 75 changes. Not all setpoints are logged. Service technicians refer to list in YORK Service Manual 160.54-M1.

The details of any setpoint change can be viewed by navigating to a subscreen that displays the date and time of the change, Access Level and USER ID used to make the change, the old setpoint value and the new setpoint value.



Requires a login access level of SERVICE.

DISPLAY ONLY

Category
Displays the category of the setpoint (motor, evaporator, condenser, etc.)

Setpoint
Displays the setpoint that was changed.

New Value
Displays the value that was entered at the time of the setpoint change.

PROGRAMMABLE

Log Entry
Allows the user to select a particular setpoint change for detail viewing.

Print
Generates a detailed report of all setpoint changes listed in the setpoint change log.

Page Up
Scroll up in the displayed data (if applicable).

Page Down
Scroll down in the displayed data (if applicable).

NAVIGATION

Home
Access level Required: SERVICE
Causes an instant return to the Home Screen.

History
Access Level Required: SERVICE
Causes an instant return to the History Screen.

View Details
Access Level required: SERVICE
Causes a move to a sub-screen containing the details of the setpoint change selected with the Log Entry key.

SECURITY LOG DETAILS SCREEN

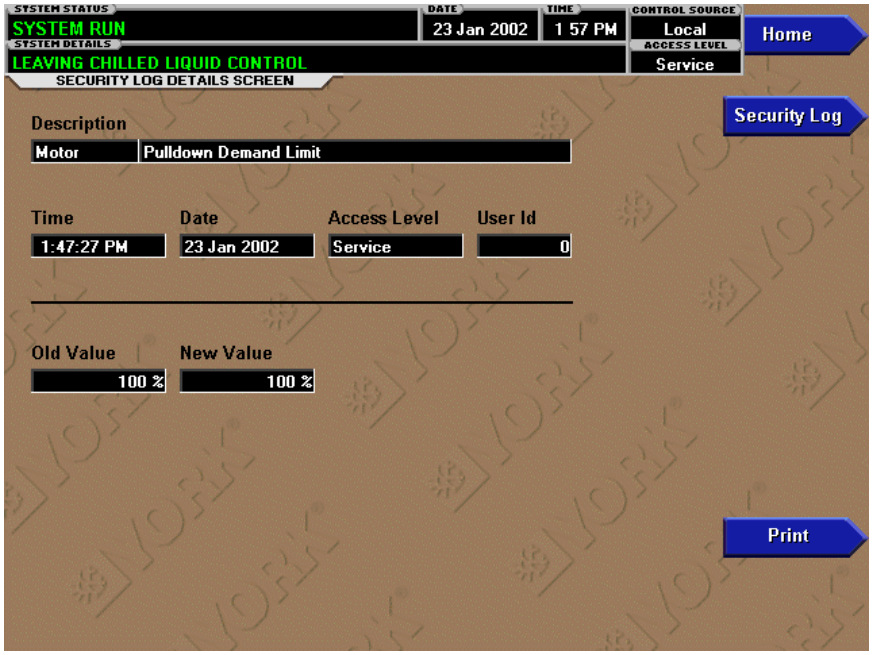


FIG. 37

00663VIP

OVERVIEW

(This screen only available with Flash memory Card version C.MLM.01.06.xxx and later)
This screen allows the user to view the details of a logged setpoint change, selected from the list on the Security Log Screen. The date and time the setpoint was changed, the new and old setpoint value and access level and user ID used to make the change are displayed. The data on this screen can be printed.

NOTE

Requires a login access level of SERVICE.

DISPLAY ONLY

Description
Displays the setpoint/category that was changed.

Time
Displays the time the setpoint was changed.

Date
Displays the date the setpoint was changed.

Access Level
Displays the Login Access Level used to make the setpoint change.

User ID
Displays the login User ID used to make the setpoint change.

Old Value
Displays the previous setpoint value.

New Value
Displays the value entered at the time of the setpoint change.

PROGRAMMABLE

Print
Generates a report of change parameters displayed on this screen.

NAVIGATION

Home
Access Level Required: SERVICE
Causes an instant return to the Home Screen

Security Log
Access Level Required: SERVICE
Causes an instant return to the Security Log Screen.

CUSTOM VIEW SCREEN

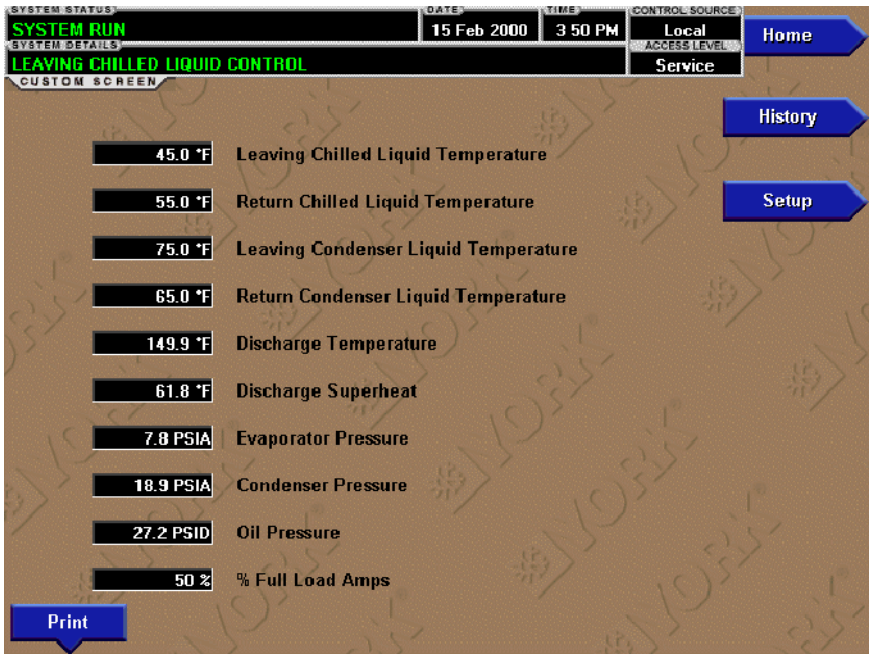


FIG. 38

00324VIP

OVERVIEW

(Flash memory Card version C.MLM.01.04 or later) This screen allows up to 10 Service Technician selected parameters to be displayed. These parameters are selected from a list on the Custom View Setup Screen. This allows the Service Technician to display parameters pertinent to a particular problem during troubleshooting. At completion of the service call, the display can be cleared or the parameters can be left there for monitoring by operations personnel.

DISPLAY ONLY

None

PROGRAMMABLE

Print

Access Level Required: VIEW

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

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

History

Access Level Required: VIEW

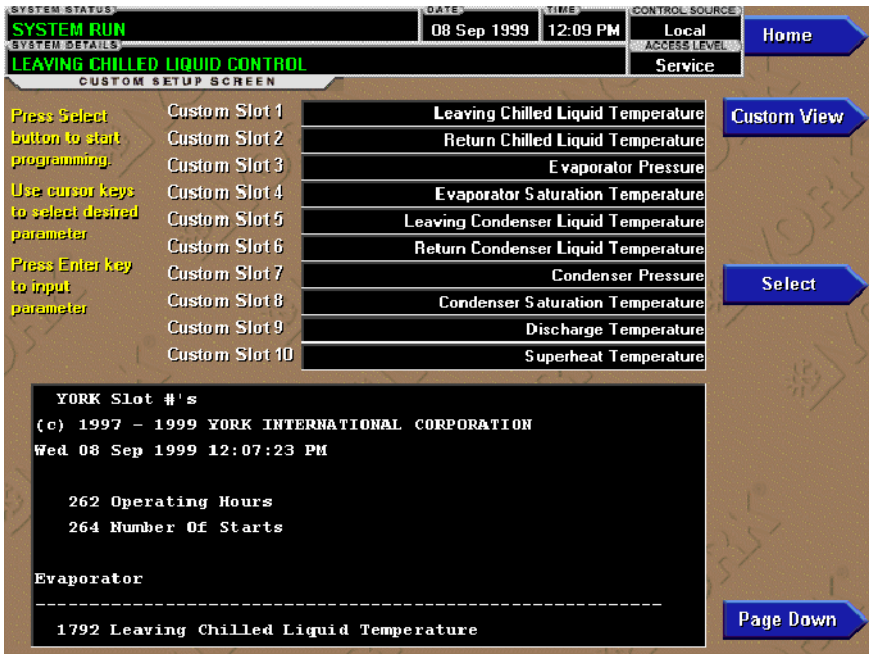
Causes an instant return to the History Screen.

Setup

Access Level Required: OPERATOR

Causes a jump to the sub-screen that allows selection of the parameters to be displayed.

CUSTOM VIEW SETUP



00325VIP

FIG.39

OVERVIEW

(Flash memory Card version C.MLM.01.04 or later**)**
This screen allows the Service technician to select up to 10 parameters for display on the Custom View Screen.

NOTE

Requires a login access level of SERVICE. Service Technicians refer to YORK Service Manual 160.54-M1 for operation instructions and explanation of all programmable setpoints and displayed values.

DISPLAY ONLY

Slot Numbers
Lists the available parameters that can be displayed. The desired parameters for display are selected from this list.

PROGRAMMABLE

Page Up
Scroll up through list of available parameters.

Page Down
Scroll down through list of available parameters.

Select
First use the Page Up and Page Down keys to scroll through the Slot Numbers list and note the number of the parameter(s) to be displayed. Pressing the Select key places a green colored selection box around Custom Slot 1. If it is desired to change an already entered parameter, use the 5 and 6 keys to place the selection box around the slot number to be changed. 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.

Custom Slot (1-10)
Use the Select key and numeric keypad keys as described above and enter the slot number from Slot Numbers list. Setting the Slot number to zero clears the display of this slot number.

NAVIGATION

Home
Access Level Required: VIEW
Causes a return to the Home Screen.

Custom View
Access Level Required: SERVICE
Causes a return to the Custom View Screen.

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TREND SCREEN

FIG. 40 00472VIP

OVERVIEW

As many as six Operator selected parameters (Data Points) can be plotted in an X/Y graph format. 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 toggle key. The Y-Axis is scaled for each parameter per the selected minimum and maximum value for each parameter. Analog parameters are scaled in pressure, temperature, volts, amps, hertz or time. Digital on/off parameters are scaled as zero (off) and one (on). Only one Y-Axis label is displayed at a time. The Y-Axis Toggle Key is used to toggle the Y-Axis labels through the different parameters. The Y-Axis label that is being displayed is identified at the top of the graph. For identification, each plotted parameter and associated Y-Axis labeling is color coordinated.

On compressor applications other than "P" compressors, if equipped with Flash Memory Card version C.MLM.01.04.xxx and earlier, all trended Data Points are displayed simultaneously. On all "P" compressor applications or other compressor applications that are equipped with Flash Memory Card version C.MLM.01.05.xxx and later, the DATA SELECT key is used to display all trended Data Points simultaneously or select a single Data Point for display.

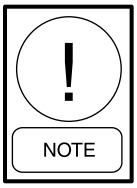
The parameters are sampled at the selected Data Collection Interval and plotted using 450 data points across the X-Axis. If the actual value of the sampled parameter is less than the Y-Axis label minimum for that parameter, the value will be plotted at the minimum value. Similarly, if the actual value is greater than the Y-Axis label maximum for that parameter, the value will be plotted at the maximum value.

There are three types of charts that can be created: ONE SCREEN, CONTINUOUS or TRIGGERED (not applicable to Flash Memory Card version C.MLM.01.04.xxx and earlier). 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 TRIGGERED is selected, data collection can be set to start or stop based upon the selected TRIGGER ACTION (START or STOP). If START is selected, data collection will not begin until the Triggers have been satisfied and any selected TRIGGER DELAY has elapsed. Data collection will stop at the completion of one screen of data as with the ONE SCREEN. If STOP is selected, data collection will not stop until the Triggers have been satisfied and any selected TRIGGER DELAY has elapsed.

If a power failure occurs while the trending 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 graph 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 the graph, starts a new graph, sets the time of day to the present clock time and begins the trending. This key is only available if trending is stopped. If the selected Chart Type is TRIGGERED and TRIGGER ACTION is set to START, data collection will not begin until the Triggers have been satisfied and any selected TRIGGER DELAY has elapsed. Otherwise, data collection will begin immediately.

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.

Print
(Flash Memory Card version C.MLM.01.05.xxx and later)
Access Level Required: VIEW
Allows the data on the trend screen to be printed in tabular format. If set to EXISTING, a snapshot of the data presently on the screen is sent to the printer. If set to NEW, all data collected after pressing this key will be sent to the printer as it is collected. If set to DISABLED, no data is sent to the printer. Refer to PRINTERS section of this book for printout example.

Data Select
(Flash Memory Card version C.MLM.01.05.xxx and later)
Access Level Required: VIEW
Allows the user to display all trended data points simultaneously or select a single trended data point for display, hiding the other data points. Selections are ALL DATA or DATA POINT X (1-6).

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.

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
Causes a return to the Home Screen.

History
(Flash Memory Card version C.MLM.01.04.xxx and later)
Access Level Required: VIEW
Causes a return to the History Screen.

Trend Setup
Access Level Required:
Only displayed if the trending is stopped. Causes a jump to a sub-screen for configuring the trending display.

TREND SETUP SCREEN

FIG. 41 00473VIP

OVERVIEW

This screen is used to configure the trending 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 Data Collection Interval.

DISPLAY ONLY

None

PROGRAMMABLE

Chart Type
Access Level Required: OPERATOR
Selects CONTINUOUS, ONE SCREEN or TRIGGERED (If compressor application is other than "P", applies only to Flash Memory Card version (C.MLM.01.05.xxx and later) type of graph.

Collection Interval
Access Level Required: OPERATOR
Selects the interval at which the parameters are sampled. There are 450 data points displayed across the X-Axis of the graph. Each point represents the instantaneous value of the parameter. The user selects the time interval between these points. This is called the DATA COLLECTION INTERVAL, or the interval at which 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 x Data Collection Interval = full screen seconds
   - full screen seconds / 60 = full screen minutes
   - full screen minutes / 60 = full screen hours
   - full screen hours / 24 = full screen days
3. Decide if the resultant sample interval and full screen display meet the requirements. If not, select a different sample interval.

Select
Access Level Required: OPERATOR
This key is used to enter the slot numbers and the minimum and maximum Y-Axis values of each parameter to be trended. Pressing this key places a yellow box around Data Point 1 Slot Number. Use the ▲ and ▼ navigation keys to place the box around the value of Data Points 1 through 6 to be changed. With the desired value selected, press the ✓ key. A dialog box is displayed permitting data entry.

Data Point Slot # (1-6)
Access Level Required: OPERATOR
Use the SELECT key as described above and enter the slot number from the Common Slots Screen or Master Slot Number List of the desired parameter to be trended. The selected parameter description will be displayed for the Data Point. Setting this slot number to zero will disable trending for that particular Data Point. Any or all points can be disabled.

Data Point Min (1-6)
Access Level Required: OPERATOR
Only displayed if the Associated Slot Number is not Zero. 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. It can be changed to a value that provides a more appropriate resolution for the parameter being monitored. To change, use the SELECT key as described above and enter the desired value. The value must always be set to a value less than the Data Point Max. 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 OFF state.

Data Point Max (1-6)
Access Level Required: OPERATOR
Only displayed if the associated slot number is not zero. 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 parameter. It can be changed to a value that provides a more appropriate resolution for the parameter being monitored. To change, use the **SELECT** key as described above and enter the desired value. The value must always be set to a value greater than the Data Point Min. Otherwise, a red graph is displayed on the Trend Screen with the words "TREND MAX MUST BE > TREND MIN". There are 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 by 20 (If compressor application is other than "P", applies only to Flash memory card version C.MLM.01.02 or later). 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
Causes a return to the Home Screen.

Trending
Causes a return to the Trending Screen.

Slot Numbers
(Flash memory card version C.MLM.01.02 or later)
Causes a jump to a sub-screen that lists the slot numbers of the most commonly monitored parameters. The desired parameters to be plotted are selected from this screen.

Triggers
(Flash Memory Card version C.MLM.01.05.xxx and later)
Causes a jump to the Advanced Trend Setup Screen, where the start/stop Triggers can be setup. Only displayed if TRIGGERED has been selected as Chart Type.

ADVANCED TREND SETUP SCREEN

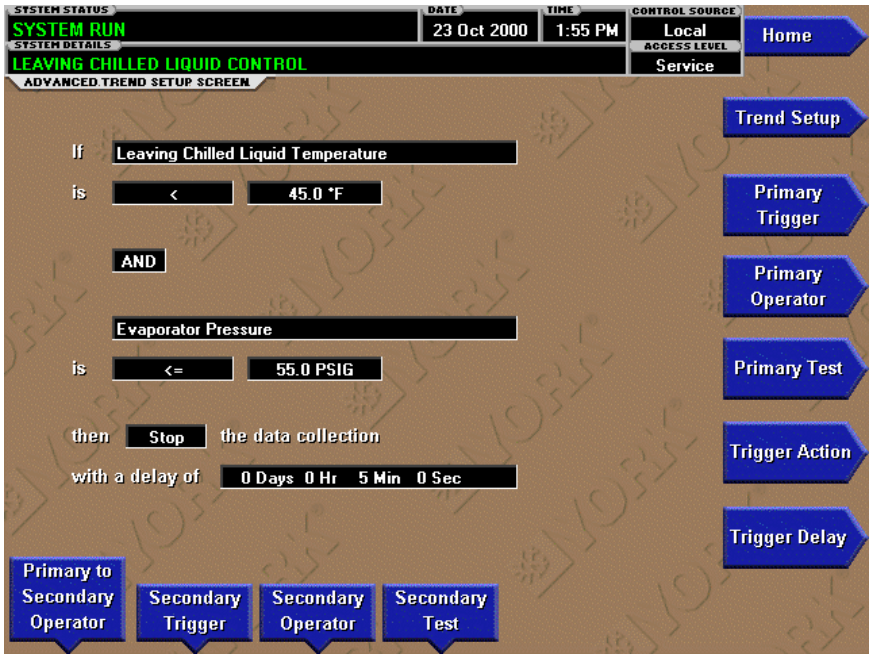


FIG. 42 00474VIP

OVERVIEW

(Flash Memory Card version C.MLM.01.05.xxx and later)

The desired data collection start/stop triggers are setup on this screen. The trend data collection can be set to start or stop based upon the status of up to two selected Triggers.

The Triggers can consist of digital events or analog parameters compared to thresholds. The Triggers can be used individually or in combination. The digital and analog parameters are selected from the Common Slots Screen (or Master Slot Numbers List in this book).

The parameter selected as the Primary Trigger is compared to a value selected as the Primary Test, using the Primary Operator as a comparator. If it is evaluated as true, then the data collection is started or stopped (after any selected Trigger delay) per the selected Trigger Action.

A Secondary Trigger can be evaluated with the Primary Trigger to start/stop data collection. The Primary to Secondary Operator is used to define the Trigger combinations required to be true to start/stop data collection. The Secondary Trigger is setup and evaluated the same as the Primary Trigger.

Entry fields are as follows:

If Primary Trigger
Is Primary Operator Primary Test

Primary to Secondary Operator

Secondary Trigger
Is Secondary Operator Secondary Test

Then Trigger Action the Data Collection
With a delay of Trigger Delay

After the desired Triggers are set, the START key on the TREND Screen must be manually pressed before the triggers will be evaluated. While waiting for the triggers to start or stop data collection, a status message is displayed in the upper right corner of the TREND Screen describing the pending action.

DISPLAY ONLY

None

PROGRAMMABLE

Primary Trigger
Access Level Required: OPERATOR
Selects the first parameter to be evaluated. Selection is made from the Slot Numbers listing on the Trend Common Slots Screen or the Master Slot Numbers List in

this book. Setting this slot number to zero disables the Primary Trigger.

Primary Operator
Access Level Required: OPERATOR
Selects the comparator for the Primary Trigger's relationship to the Primary Test. If the Primary Trigger is an analog value, selections are: <, <=, =, =>, >. If the Primary Trigger is a digital event, selections are: Equal To, Not Equal To.

Primary Test
Access Level Required: OPERATOR
Selects the value or condition that the Primary Trigger is compared to. Selection ranges from the Primary Trigger minimum value to the Primary Trigger maximum value.

Trigger Action
Access Level Required: OPERATOR
Selects whether the trend data collection will Start or Stop when the Trigger comparisons are true. If set to Start, data collection will stop after one screen of data is collected.

Trigger Delay
Access Level Required: OPERATOR
Allows the data collection start or stop to be delayed after the Triggers evaluate as true. The delay is selectable from 1 to 864000 seconds (10 days). Display is in days, hours, minutes and seconds. The delay timer begins when the triggers evaluate as true. If the Trigger Action is set to Start, data collection will begin after the triggers evaluate as true and the delay timer has elapsed. If the Trigger Action is set to Stop, data collection will stop after the Triggers evaluate as true and the delay timer has elapsed.

Primary to Secondary Operator
Access Level Required: OPERATOR
Selects whether the Primary Trigger, Secondary Trigger or both have to be true in order to start or stop data collection. Selections are AND, OR, XOR and None. If NONE is selected, the Secondary Trigger is disabled.

Data collection will start/stop (as selected with Trigger Action) when:

- If AND selected: Both Primary AND Secondary are true
- If OR selected: Either Primary OR Secondary (or both) are true
- If XOR selected: Either Primary OR Secondary (but not both) are true

Secondary Trigger
Access Level Required: OPERATOR
Selects the second parameter to be evaluated. Selection is made from the Slot Numbers listing on the Trend Common Slots Screen or the Master Slot Numbers List in this book. Setting this slot number to zero disables the Secondary Trigger.

Secondary Operator
Access Level Required: OPERATOR
Selects the comparator for the Secondary Trigger's relationship to the Secondary Test. If the Secondary trigger is an Analog value, selections are: <, <=, =, =>, >. If the Secondary Trigger is a digital event, selections are: Equal To, Not Equal To.

Secondary Test
Access Level Required: OPERATOR
Selects the value or condition that the Secondary Trigger is compared to. Selection ranges from the Secondary Trigger minimum to the Secondary Trigger maximum.

NAVIGATION

Home
Causes an instant return to the Home Screen.

Trend Setup
Causes an instant return to the Trend Setup Screen.

COMMON SLOTS SCREEN

FIG. 43 00328VIP

OVERVIEW

This screen displays the slot numbers of the commonly monitored parameters. The slot numbers for the remainder of the available parameters are listed on the Master Slot Numbers List that follows.

From these lists, select up to six parameters to be trended. Return to the Trend Setup Screen and enter the parameters Slot Numbers into Data Points 1 through 6.

NOTE

Requires a login access level of OPERATOR or higher.

DISPLAY ONLY

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

PROGRAMMABLE

Page Down
Access Level Required: OPERATOR
Scroll down in the displayed data.

Page Up
Access Level Required: OPERATOR
Scroll up in the displayed data.

Print
Access Level Required: OPERATOR
Generates a list of the slot numbers of the available parameters.

NAVIGATION

Home
Causes an instant return to the Home Screen.

Trend Setup
Causes a return to the Trend Setup Screen.

MASTER SLOT NUMBERS LIST FOR USE WITH TREND FEATURE

SLOT NO.	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
263	System: Run Time (in seconds)
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
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

SLOT NO.	DESCRIPTION
2048	Leaving Condenser Liquid: Temperature
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
2351	Motor - Operating Hours Since last Lubrication
	(Mod “A” Solid State Starters)
2560	SSS: Phase A Current
2561	SSS: Phase B Current
2562	SSS: Phase C Current
2563	SSS: Phase A Voltage
2564	SSS: Phase B Voltage
2565	SSS: Phase C Voltage
2566	SSS: Scale/Model
2567	SSS: Full Load Amps
2568	SSS: Supply Voltage Range
2569	SSS: Is Current Unbalance Check Enabled
	(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
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

SLOT NO.	DESCRIPTION
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
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

SLOT NO.	DESCRIPTION
2891	Filter: Maximum Total Demand Distortion
8192	Oil: Pump Pressure
8193	Oil: Sump Pressure
8194	Oil Seal Lube: Is Control Enabled
8195	Oil Seal Lube: Time To Next Lube
8196	Oil Seal Lube: Time Left
8197	VSOP: Speed Command
8198	VSOP: Control Mode
8199	VSOP: Manual Command Frequency
8200	VSOP: Is Pulldown In Effect
8201	VSOP: Pulldown Time Remaining
8202	VSOP: Target Setpoint
8203	VSOP: Pressure Setpoint
8204	VSOP: Control Period
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
8210	Refrigerant Level: Is Pulldown In Effect
8211	Refrigerant Level: Pulldown Time Remaining
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
8221	HSTB: Oil Drain Temperature (Before C.MLM.01.03)
8222	HSTB: Is Solenoid Installed
8223	HSTB: Is Solenoid On
8224	HSTB: Proximity Position
8225	HSTB: Proximity Differential
8226	HSTB: Proximity Reference Position
8280	Stall Detector Board output voltage
8281	VGD open
8282	VGD close
8317	Stall DC Pressure Voltage

DISPLAY MESSAGES

The Status Bar of the Display contains a Status Line and, beneath it a Details Line. The Status Line contains a message describing the operating state of the chiller; whether it is stopped, running, starting or shutting down. The Details Line displays Warning, Cycling, Safety, Start Inhibit and other messages that provide 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.

To aid in the meaning of the message, messages are displayed in different colors as follows:

Normal Operation messages	-	Green
Warning messages	-	Yellow
Cycling Shutdown messages	-	Orange
Safety Shutdown messages	-	Red

For messages specific to the Variable Speed Drive, Medium Voltage Variable Speed Drive, Solid State Starter and Medium Voltage Solid State Starter, refer to the applicable Service Manual as follows: VSD 160.00-M4; MV VSD 160.00-M6; Solid State Starter 160.00-O2; MV SSS 160.00-M5.

STATUS MESSAGES

"SYSTEM READY TO START"
The chiller is shut down but will 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 in effect 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 in effect 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. The Prelube duration is either 50 seconds or 180 seconds, as configured with a Microboard Program Switch. The Pre-lube duration must never be changed by anyone other than a qualified Service Technician. The standard Prelube duration is 50 seconds.

"**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. The Coastdown duration varies according to the microboard and setup. On 031-01730-000 microboards, it is 150 seconds for electric motor applications (standard); 15 minutes for Steam Turbine applications (enhanced), as determined by Program Jumper JP36. On 031-02430-000/001 microboards, the duration varies according to the software used. With Software version C.OPT.01.16.XXX (and later), the Coastdown duration is determined by the setting of the COASTDOWN (standard or enhanced) and COASTDOWN TIME setpoints. If the COASTDOWN setpoint is set to enhanced (steam turbine applications), it is 15 minutes. If set to standard (electric motor applications), it is programmable over a range determined by the CHILLER STYLE/COMPRESSOR setpoint (for style F/J7 and G/K6-K7, the range is 240 (default) to 900 seconds. All others, the range is 150 (default) to 900 seconds). With earlier software versions, the duration is fixed at 150 seconds.

"**START INHIBIT**"
The chiller is prevented from being started 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. During Soft Shutdowns, the Vanes are driven fully closed prior to shutting down the compressor. When the Vane Motor End 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. 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 (Flash Memory Card version C.MLM.01.06.xxx and later)

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 and it will immediately perform a "System Coastdown".

RUN MESSAGES

"**LEAVING CHILLED LIQUID CONTROL**"
The chiller is running, controlling the Leaving Chilled Liquid to the Leaving Chilled Liquid Temperature Setpoint. There are no system conditions inhibiting this operation.

"**CURRENT PULLDOWN LIMIT**"
The Pulldown Demand Limit Setpoint timer is in effect and the Compressor Motor current is ≥ the Pulldown Demand Current Limit Setpoint value. The Pre-rotation vane operation is being inhibited as described in "MOTOR – HIGH CURRENT LIMIT" message below.

"**MOTOR – HIGH CURRENT LIMIT**"
The Compressor Motor current is ≥ the Local or Remote Current Limit Setpoint. The Current Limit Setpoint is programmed over a range of 30 to 100% of the Chiller Full Load Amps (FLA). When the motor current increases to the "inhibit open" threshold, the Pre-rotation Vanes are inhibited from further opening. This prevents a further current rise. If the current continues to rise to the "start close" threshold, the Vanes begin closing until the current falls to the "stop close" threshold. Automatic 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 Solid State Starter (Mod "A") Logic Board or 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 below:

Vane Control	Motor Current (%FLA)		
	Electro-Mechanical/ Solid State Starter	VSD	Service Mode
On rise, inhibit open	100	100	107
On fall, allow open	98	98	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 Solid Sate Starter chiller 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

With software versions prior to C.OPT.01.16.xxx, this message is also displayed when the compressor motor Variable Speed Drive has not yet reached full speed after having been commanded to do so in manual speed control mode.

"LOAD CONTROL MODE"
(Software version C.OPT.01.16.xxx and later)
Access Level Required: SERVICE
The compressor motor Variable Speed Drive has not yet reached full speed after having been commanded to do so in manual speed control. While this is displayed, the Pre-rotation Vanes are inhibited from further opening.

START INHIBIT MESSAGES

"**ANTI-RECYCLE XXMin/Sec**"
The chiller is inhibited from starting because the 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"
This start inhibit is instantaneously set whenever the chiller is not running and a motor current of greater than 15% FLA is detected. The Oil Pump is started as soon as this fault is detected. The starting frequency for the Variable Speed Oil Pump is 45.0Hz. The start inhibit is released when the motor current decreases to ≤15% FLA and the COMPRESSOR switch is placed in the STOP-RESET (O) position. A full System Coastdown is performed when this fault is released. With software version C.MLM.01.10D.xxx (and earlier) or C.OPT.01.10D.xxx (and earlier), the motor current must exceed 15% FLA for 10 continuous seconds before the start inhibit is set.

"VSD – FREQUENCY > 0Hz"
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
This start inhibit is set whenever the chiller is shutdown and a compressor motor Variable Speed Drive (VSD) Output Frequency of greater than 0Hz is detected. This fault is released and the chiller can be started after the frequency is at 0Hz and the COMPRESSOR Switch is placed in the STOP-RESET (O) position. The Oil Pump is started (with a starting frequency of 45Hz) as soon as this fault is detected. A System Coastdown is performed whenever this fault is released.

"LCSSS – HIGH TEMPERATURE PHASE X - STOPPED"
(Mod. "B" Solid State Starter only)
The chiller is stopped and the Liquid Cooled Solid State Starter Logic/Trigger Board has detected that the temperature of phase A, B, or C (designated as X in this message) Silicon Controlled Rectifier (SCR) module is > 110°F. The starter cooling pump will run and the chiller will be inhibited from starting until the temperature decreases to <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 written to a location in the BRAM battery backed memory device (IC location U52 on Microboard). This data is then read from the BRAM and compared to the test data. If the read data is not the same as that which was written to the device, it is assumed 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 XDCR ERROR**"
The Evaporator pressure Transducer is indicating a higher pressure than the Condenser pressure Transducer after the chiller has been running for 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 Keypad key is pressed in OPERATOR (or higher) access mode. Condition not checked in Brine mode.

"**WARNING – REFRIGERANT LEVEL OUT OF RANGE**"
(Flash Memory Card version C.MLM.01.05C.xxx and earlier and "P" compressors with C.MLM.04.01B and earlier)
The output of the Condenser Refrigerant Level Sensor is > 5.1VDC. This is indicative of a Level Sensor failure. While this condition exists, the Refrigerant Variable Orifice is driven to the full open position. This message automatically clears when the Refrigerant Level sensor output is within range.

"**WARNING – STANDBY LUBE – LOW OIL PRESSURE**"
A minimum of 15 PSID of oil pressure was not achieved in the first 30 seconds of a Standby Lubrication cycle, or the pressure decreased below this value during the remainder of the cycle. This message will be displayed and no further Standby Lubrications will be performed until the WARNING RESET key is pressed in OPERATOR (or higher) access mode.

"**WARNING – SETPOINT OVERRIDE**"
A blank BRAM battery-backed memory device (IC location U52 on Microboard) or a failure of this device was detected during the initialization process that occurs when power is applied to the Control Center. Due to this failure, any or all of the programmed Setpoints could have been corrupted. Therefore, all Setpoints have been automatically changed to their Default values. All Setpoints will have to be programmed to their desired values. This message will clear when the WARNING RESET key is pressed in OPERATOR (or higher) access mode.

"**WARNING – CONDENSER – HIGH PRESSURE LIMIT**"
The Condenser Pressure exceeds the High Pressure Warning Setpoint threshold, programmed by a Service technician logged in at SERVICE access level. While this condition is in effect, the Pre-rotation Vanes are inhibited from further opening. This message automatically clears and the Vanes are permitted to open when the Condenser pressure decreases to 5 PSIG below the Setpoint.

"**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 determined by the Brine solution and is determined by the YORK Factory. While this condition is in effect, the Pre-rotation Vanes are

inhibited from further opening. This message automatically clears and the Vanes are permitted to open when the Evaporator pressure increases to the reset value.

	Warning Threshold (PSIG)		Reset Threshold (PSIG)	
	Water	Brine	Water	Brine
R22	56.2	+1.9 >Safety Setpoint	57.5	+3.2>Safety Setpoint
R134a	27.0	+2.0 >Safety Setpoint	28.0	+3.0>Safety Setpoint

"**WARNING – VANES UNCALIBRATED – FIXED SPEED**"
The Compressor Motor Variable Speed Drive (VSD) is operating 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 variable Speed Drive (VSD) Harmonic Filter has been inhibited. Refer to VSD Service manual 160.00-M1. Harmonic filter operation should not be altered by anyone other than a qualified Service technician.

"**WARNING – HARMONIC FILTER – DATA LOSS**"
Communications between the Harmonic Filter Logic Board and the Compressor Motor Variable Speed Drive (VSD) Logic Board or the Adaptive Capacity Control Board is not occurring. While this condition exists, all Filter related parameters are displayed as X's. This message automatically clears when communications are restored.

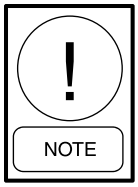
"**WARNING – HARMONIC FILTER – INPUT FREQUENCY RANGE**"
The power line frequency detected by the Compressor motor Variable Speed Drive (VSD) Harmonic Filter is outside the range of 58 to 62 Hz (60 Hz), or 49 to 51 Hz (50 Hz). While this condition exists, all Filter related parameters are displayed as X's. This message automatically clears when the line frequency is within range.

"**WARNING – VANES UNCALIBRATED"**
The Hot Gas Bypass feature is enabled, but the Pre-rotation vanes calibration procedure has not yet been performed.

"WARNING – EXTERNAL I/O – SERIAL COMMUNICATIONS"
Serial communications between the Microboard and the optional Analog I/O Board has been interrupted for at least 20 seconds.

"WARNING – EXCESS SURGE DETECTED"
(Flash Memory Card version C.MLM.01.05.xxx and later)
(Applies only if Surge Protection SHUTDOWN feature is Disabled)
The Surge Window Count has exceeded the Count Limit. Message can be manually cleared after the Surge Window Count is ≤ the Count Limit, or the SHUTDOWN feature is Enabled or the chiller is stopped. To clear message press WARNING RESET key on HOME Screen when logged in at OPERATOR (or higher) access level.

"WARNING – SURGE PROTECTION – EXCESS SURGE LIMIT"
(Flash Memory Card version C.MLM.01.05.xxx and later)
(Applies only if Surge Protection EXTENDED RUN feature is Enabled)
Displayed during the Surge Protection 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 10 minutes have elapsed, this message and the Pre-rotation Vanes load inhibit are automatically cleared. Message and load inhibit are also cleared when the chiller is shutdown.



If the optional Hot Gas Bypass feature is enabled, the valve position must be at 100% before the Extended Run is implemented. If the chiller is chiller is equipped with a compressor motor Variable Speed Drive, the output frequency must be at full speed (50 Hz/60 Hz) before this control can be implemented.

"**WARNING – CONDENSER OR VGD SENSOR FAILURE**"
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
The difference between the Stall Pressure Transducer output and the Condenser Pressure Transducer output has exceeded 0.28 Vdc for 3 continuous minutes while the chiller was running. This feature verifies the operation of the Stall Transducer and the Condenser transducer. Since both transducers are measuring essentially the same pressure, both outputs should be within the specified tolerance. This message must be manually cleared. It will be displayed until the transducer outputs are within the acceptable range of each other and the WARNING RESET key in SERVICE access level.

While this message is displayed, the Variable Geometry Diffuser (VGD) is driven to the full open position and held there until this warning is manually cleared. When cleared, the VGD returns normal operation.

"**WARNING – CONDITIONS OVERRIDE VGD** "
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
An extreme stall condition has been detected while the chiller was running. An extreme stall condition exists when the Stall Detector Voltage (output of the Stall Detector Board) exceeds twice the HIGH LIMIT setpoint for the duration programmed in the EXTREME STALL DURATION Setpoint (10 to 20 minutes). While this message is displayed, the compressor Variable Geometry Diffuser (VGD) is driven to the full open position and held there until the message is manually cleared. This protects the VGD ring from possible damage from an extreme stall condition. This message can be cleared after the Stall Detector Voltage returns to less than two times the HIGH LIMIT Setpoint and the WARNING RESET key is pressed in SERVICE access level.

The Extreme Stall condition is not checked under the following conditions:

- While the VGD is in Manual control mode.
- While the VGD is fully closed (VGD Limit Switch closed).
- While the Pre-rotation vanes position is greater than the PRV VGD INHIBIT Setpoint.

Warning – Motor Bearing Lube Suggested"
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
The Operating Hours Since Last Motor Lubrication has exceeded 1000 hours. This will be displayed until manually cleared by the Operator or the Operating Hours Since Last Motor Lubrication exceed 1200 hours, whereupon it is replaced by the message "Warning – Motor Bearing Lube Required" below. The Operator clears this message by entering his/her initials, name or user ID in Operator Access Level (or higher) using the Motor Lube Acknowledge key on the Motor Lubrication Screen. Refer to the Motor Lubrication Screen for entry instructions. The date and time of this entry is automatically logged as the "Date of Last Motor Lubrication" and "Time of Last Motor Lubrication". It also resets the "Operating Hours Since Last Lubrication" to zero. The date this warning occurs is stored as the "Date of Last Motor Lubrication Warning or Fault". With software version C.OPT.01.16.xxx (and later), this warning message will not be displayed if the AUTO LUBE setpoint on the Motor Lubrication Screen enabled.

"Warning – Motor Bearing Lube Required"
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
The Operating Hours Since Last Motor Lubrication has exceeded 1200 hours. This replaces "Warning – Motor Bearing Lube Suggested" above. This is displayed until manually cleared by the Operator or the Operating Hours Since Last Motor Lubrication exceed 1400 hours, whereupon it is replaced by the message "Motor – Lack of Bearing Lubrication" below. The Operator clears this message by entering his/her initials, name or user ID in Operator Access Level (or higher) using the Motor Lube Acknowledge key on the Motor Lubrication Screen. Refer to the Motor Lubrication Screen for entry instructions. The date and time of this entry is automatically logged as the "Date of Last Motor Lubrication" and "Time of Last Motor Lubrication". It also resets the "Operating Hours Since Last Lubrication" to zero. The date this warning occurs is stored as the "Date of Last Motor Lubrication Warning or Fault". With software version C.OPT.01.16.xxx (and later), this warning message will not be displayed if the AUTO LUBE setpoint on the Motor Lubrication Screen enabled.

ROUTINE SHUTDOWN MESSAGES

"**REMOTE STOP**"
A shutdown 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 shutting down the chiller.

"**LOCAL STOP**"
A local shutdown command has been received by placing the Keypad Start-Run-Stop/Reset Switch in the stop (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. If the chiller is running when this occurs, 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. If the chiller is running when this occurs, 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 DIFFERENTIAL**"
The chiller is prevented from starting because for one of the following reasons. The chiller will automatically restart when the conditions have been satisfied (only checked when shutdown and first 10 seconds of Pre-lube).

The chiller has been shut down for ≤30 minutes and the oil temperature minus the condenser saturation temperature is <30°F.

-OR-

The chiller has been shut down for > 30 minutes and the oil temperature minus the condenser saturation temperature is < 40°F.

-OR-

Following a Power failure, upon restoration of power, the oil temperature minus the condenser saturation temperature is < 40°F.

"**OIL – LOW TEMPERATURE**"
The oil temperature has decreased to < 55°F. The chiller will automatically restart when the temperature increases to > 55.0°F and is greater than the Condenser Saturated temperature by 30 or 40°F, as described above in the OIL – LOW TEMPERATURE DIFFERENTIAL message description.

"**CONTROL PANEL – POWER FAILURE**"
A Control Power failure has occurred. If the power failure occurred while the chiller was running, it will automatically restart when power is restored. However, if the power failure duration was < the duration of the applicable "Coastdown" period (2.5 minutes standard; 15 minutes steam turbine) when power is restored, the remainder of the "Coastdown" will be performed, prior to the chiller starting. This message can indicate a Cycling (auto-restart after power failure) or Safety (manual restart after power failure) shutdown, depending upon Control Center configuration. It indicates a cycling shutdown when displayed in orange characters; Safety shutdown when displayed in red characters. The Control Center is configured for auto-restart or manual restart after power failure by a qualified Service Technician following instructions in YORK Service Manual 160.54-M1.

"**LEAVING CHILLED LIQUID – LOW TEMPERATURE**"
The Leaving Chilled Liquid Temperature has decreased to the programmed Shutdown Temperature Setpoint. If the chiller is running when this occurs, the Pre-rotation Vanes are driven fully closed prior to shutting down the chiller. The chiller will automatically restart when the temperature increases to the programmed Restart Temperature Setpoint.

"**LEAVING CHILLED LIQUID – FLOW SWITCH OPEN**"
The Chilled Liquid Flow Switch has remained open for 5 continuous seconds (2 seconds with software version C.OPT.01.15A.xxx and earlier) while the chiller was running or failed to close during the System Pre-lube period. The chiller will automatically restart when the flow switch closes.

"**CONDENSER – FLOW SWITCH OPEN**"
The Condenser water flow switch has remained open for 30 continuous seconds (2 seconds with software version C.OPT.01.15A.xxx and earlier) while the chiller was running. This check is bypassed for the first 30 seconds of "System Run". The chiller will automatically restart when the flow switch closes.

"**MOTOR CONTROLLER – CONTACTS OPEN**"
The Cm-2 Current module (Electromechanical starter applications) or Solid State Starter Logic Board (Mod "A" Solid State Starter applications) has shutdown the chiller. When detecting a fault condition that places the starter or motor at risk, these devices open the Motor Controller contacts "CM" (located on the respective device and connected between TB6-16 and TB6-53 in the Control Center) to initiate a shutdown. Since there are several different faults that are monitored, LED's on the respective device illuminate to identify the specific fault that has occurred. Refer to YORK

Manual 160.46-OM3.1 for details of Mod "A" Solid State Starter initiated shutdowns and 160.54-M1 for CM-2 initiated shutdowns. The chiller will automatically restart when the Motor Controller contacts close. On some shutdowns, the respective device automatically closes the contacts when the fault condition clears. Other shutdowns require the Operator to perform a Manual Reset at the respective device.

Device	Manual Reset Fault	Automatic Reset Fault
CM-2 Module	Overload	None
Solid State Starter	Overload	Phase Rotation/Loss
	High Temp (>212°F)	High Temp start inhibit (>110°F)
	Fault Current	Trigger Board Out-of-Lock

"**MOTOR CONTROLLER – LOSS OF CURRENT**"
The Compressor Motor current decreased to 10% Full Load Amps (FLA) for 25 continuous seconds while the chiller was running. This could 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**"
The CM-2 Current Module (Electro-Mechanical starter applications) or Solid State Starter Logic Board (Mod "A" Solid State Starter applications) has shutdown the chiller because it detected a fault condition that places the motor at risk. These devices open and close the Motor controller "CM" contacts (located on the respective device and connected between TB6-16 and TB6-53 in the Control Center) in < 3 seconds to initiate the shutdown and produce this message. An LED on the respective device illuminates to identify the specific fault that has occurred. Refer to YORK Manual 160.46-OM3.1 for details of Solid State Starter initiated shutdowns and 160.54-M1 for CM-2 initiated shutdowns. The chiller will automatically restart when the contacts close.

Device	Shutdown
CM-2 Module	Power fault
Solid State Starter	Power Fault
	Half Phase

"**CONTROL PANEL – SCHEDULE**"
The programmed Daily Schedule Setpoint has shutdown the chiller. If this occurs while the chiller is running, the Pre-rotation Vanes are driven fully closed prior to shutting down the chiller. The chiller will automatically restart at the next scheduled start time.

"**STARTER – LOW SUPPLY LINE VOLTAGE**" **(MOD "A" SOLID STATE STARTER)**
The voltage in any phase of the AC Power Line Voltage supplying the Solid State Starter has decreased to the low line voltage threshold for 20 continuous seconds. The chiller will automatically restart when the voltage returns to the restart level. The thresholds are as follows:

Supply Voltage Range (Volts)	Shutdown (Volts)	Restart (Volts)
380	305	331
400	320	349
415	335	362
440-480	370	400
550-600	460	502
Supply Voltage Range disabled	none	N/A

"**STARTER – HIGH SUPPLY LINE VOLTAGE**" **(MOD "A" SOLID STATE STARTER)**
The voltage in any phase of the AC Power Line Voltage supplying the Solid State Starter has increased to the high line voltage threshold for 20 continuous seconds. The chiller will automatically restart when the voltage returns to the restart level. The thresholds are as follows:

Supply Voltage Range (Volts)	Shutdown (Volts)	Restart (Volts)
380	415	414
400	436	435
415	454	453
440-480	524	523
550-600	655	654
Supply Voltage Range disabled	none	N/A

"**PROXIMITY PROBE – LOW SUPPLY VOLTAGE**"
(Style E and earlier chillers with G, H, or J compressors and Style F and later chillers with J or H3 compressors).

This message indicates the +24VDC power supply voltage to the Proximity Probe has decreased to +19.0VDC. This is below the minimum level required for reliable operation. The chiller will automatically restart when the voltage increases to ≥19.7VDC.

"**OIL – VARIABLE SPEED PUMP – DRIVE CONTACTS OPEN**"
The Oil Pump Variable Speed Drive has shut down the chiller by opening its status contacts connected to the I/O Board TB3-70. The Drive initiates a shutdown anytime its internal protection circuits will not permit the Drive to run. The contacts remain open until its internal protection circuits are satisfied it is safe to operate. Some Drive initiated shutdowns require AC power to be cycled to clear the fault. Refer to YORK Form 160.54-M1. The chiller will automatically restart when the contacts close.

MOD "B" SOLID STATE STARTER CYCLING SHUTDOWN MESSAGES

"LCSSS INITIALIZATION FAILED"
When AC Power is restored to the system after a power failure, an initialization process occurs wherein the Control Center attempts to establish communications through the serial communications link with the Liquid Cooled Solid State Starter. 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 Control Center initiates a data transmission to the Liquid Cooled Solid State Starter on the serial communications link every 2 seconds. After these communications have been established, if the Control Center does not receive a reply within 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 Liquid Cooled Solid State Starter does not receive a response from the control center after 10 consecutive attempts to communicate with the Control Center after INITIALIZATION has been successfully completed. The Control Center attempts 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 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 Microboard, in the Control Center 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 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 ...**" above. If the Control Center's Microboard does not receive the cause of a starter initiated shutdown with 20 seconds of the shutdown, it is assumed it 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 <10% of the FLA for a minimum of 1 line cycle. This check is inhibited during the first 4 seconds of SYSTEM RUN and until the motor current is >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 in the message) Silicon Controlled Rectifier (SCR) Module has decreased to <37°F. This would generally be indicative of a disconnected or defective sensor. If all three SCR Modules are indicating a temperature of <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 Control Center simultaneously; one via the serial communications link and one via the start relay TB6-24 in the Control Center. If they 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 Starter Logic/Trigger Board J1. Jumper combination determines allowable "100% FLA" setpoint range; 7L-35 to 260A, 14L-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 YORK Starter service manual 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 - 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 20 seconds. The chiller will automatically restart when the voltage in all phases returns to the restart level. The thresholds are as follows:

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 20 seconds. The chiller will automatically restart when the voltage in all phases returns to the restart level. The thresholds are as follows:

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

"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"

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 ROTATION/LOSS"

(Flash Memory Card version C.MLM.01.03 or earlier**)**

The Liquid Cooled Solid Starter Logic/Trigger Board has detected the three-phase compressor motor power line voltage phase rotation is not correct or the line-to-line voltage in any phase has decreased to <30% of nominal. The chiller will automatically restart when the power line conditions are acceptable.

"LCSSS – PHASE LOSS"

(Flash memory Card version C.MLM.01.04 or later)

The Liquid Cooled Solid State Starter Logic/Trigger Board has detected the line-to-line RMS voltage in any phase has decreased to ≤ 30% of the lowest value of the programed 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 > the shutdown threshold. The voltage range is programmed by a Service technician following instructions in Service Manual 160.54-M1.

COMPRESSOR MOTOR VARIABLE SPEED DRIVE: 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 YORK Manual 160.00-M1.

"**VSD SHUTDOWN – REQUESTING FAULT DATA**"
The VSD has shutdown 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 Microboard in the Control Center then sends a request for the cause of the fault to the VSD Logic Board via the Adaptive Capacity Control Board, over the serial link. Since serial communications are initiated every 2 seconds, this message is typically displayed for a few seconds and then replaced with one of the below listed fault messages.

"**VSD – STOP CONTACTS OPEN**"
Refer to "**VSD Shutdown – Requesting Fault Data**" message above. If the Control Center's Microboard does not receive the cause of the Fault over the Serial Link within 20 seconds, it is assumed it is not forthcoming and that message is replaced with **VSD – STOP CONTACTS OPEN** message.

"**VSD INITIALIZATION FAILED"**
Upon application of power, all boards go through the initialization process. At this time, memory locations are cleared, program jumper positions are checked and serial communications links are established. There are several causes for an unsuccessful initialization as follows:

- The Control Center and the VSD must be energized at the same time. The practice of pulling the fuse in the Control Center to remove power from the Control Center will create a problem. 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 communications must be established. Refer to **VSD – Serial Communications** fault. If communications between the VSD Logic Board, Harmonic Filter Logic Board, ACC Board and Control Center Microboard does not take place during initialization, this message will be generated. The Serial communications can be verified by selecting the **VSD DETAILS** screen from the **MOTOR** screen and observing the Full Load amps 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 by placing 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.
- VSD and Harmonic Filter Horsepower ratings do not agree.

"**VSD – HIGH PHASE A INSTANTANEOUS CURRENT**"
This shutdown is generated by the VSD if the motor current in phase "A" 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 for this product. Thus is especially true if the chiller was running at, or near full load. If there should be a sudden dip in line voltage, the current to the motor will increase, since the motor wants to draw constant horsepower. The chiller Prerotation 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 shutdown, an output pole problem is the most likely cause. The VSD would require service under these conditions.

"**VSD – HIGH PHASE B INSTANTANEOUS CURRENT**"
See "**High Phase A Instantaneous Current**" message above.

"**VSD – HIGH PHASE C INSTANTANEOUS CURRENT**"
See "**High Phase A Instantaneous Current**" message above.

"**VSD – PHASE A GATE DRIVER**"
A second level of current protection exists on the VSD driver boards themselves. The collector-to-emitter saturation voltage of each 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 – PHASE B GATE DRIVER**"
See "Phase A Gate Driver" message above.
"**VSD – PHASE C GATE DRIVER**"
See "Phase A Gate Driver" message above.

"**VSD - SINGLE PHASE INPUT POWER**"
This shutdown 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 every time power to the VSD is removed or if the input power dips to a very low level.

"**VSD – HIGH DC BUS VOLTAGE**"
The VSD's DC link voltage is continuously monitored and if the level exceeds 745VDC, a Bus Over-Voltage shutdown is initiated. If this shutdown occurs, it will be necessary to look at the level of the 460VAC applied to the drive. The specified voltage range is 414 to 508VAC. If the incoming voltage is in excess of 508VAC, steps should be taken to reduce the voltage to within the specified limits.

"**VSD – LOGIC BOARD POWER SUPPLY**"
This shutdown is generated by the VSD logic board and it indicates that the low voltage power supplies for the logic boards have dropped below their allowable operating limits. The power supplies for the logic boards are derived from the secondary of the 120 to 24VAC transformer, which in turn, is derived from the 480 to 120VAC control power transformer. This message usually means the power to the VSD has been removed.

"**VSD – LOW DC BUS VOLTAGE'**
If the DC link drops below 500VDC (or 414VDC for 50 Hz applications), the drive 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 for severe sags and also monitor the DC link with a voltmeter.

"VSD-LOW DC BUS VOLTAGE"
(575V/60Hz applications)
(Software version C.OPT.01.15.xxx (or later))
If the DC Link Voltage falls below 600VDC while running, this shutdown is performed.

"**VSD – DC BUS VOLTAGE IMBALANCE**"
The DC link is filtered by many large electrolytic capacitors, rated for 450VDC. These capacitors are wired in series to achieve 900VDC capability for the DC link. It is important that the voltage 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 ½ 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-DC BUS VOLTAGE IMBALANCE"
(575V/60Hz applications)
(Software version C.OPT.01.15.xxx (or later))
If the Half DC Link Voltage does not remain within ±106VDC of the DC Link Voltage divided by 2 while running, this shutdown is performed.

"**VSD – PRECHARGE – DC BUS VOLTAGE IMBALANCE**"
This message indicates the same as the "VSD-DC Bus Voltage imbalance" message above, except the condition occurred during the Pre-lube period.

"VSD—PRECHARGE-DC BUS VOLTAGE IMBALANCE"
(575V/60Hz applications)
(Software version C.OPT.01.15.xxx (or later))
If the Half DC Link voltage does not remain within ± 106VDC of the DC Link Voltage divided by 2 during the pre-charge interval, this shutdown is performed.

"**VSD – HIGH INTERNAL AMBIENT TEMPERATURE**"
The ambient temperature monitored is actually the temperature detected by a component mounted on the VSD logic board. The high ambient trip threshold is 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. This has been found to work adequately on most applications. Some users may have very dirty condenser water, which can cause the strainer to plug. Locations with special conditions may want to consider a dual strainer arrangement with quarter turn valves, to permit cleaning of one strainer with the unit still on line.
- 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. At this point, we suggest you 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 might have to be replaced.
- Low Condenser Flow – The VSD system requires 8 feet of pressure drop across the heat exchanger to maintain adequate GPM. If the pressure drop is less than 8 feet, it will be necessary to correct the flow problem or add a booster pump as is applied on retrofit chillers.

"**VSD – INVALID CURRENT SCALE SELECTION**"
Since the part number of the VSD Logic Board is the same on all horsepower sizes, the position of Program Jumpers tells the Logic Board the size of the VSD employed. This allows the VSD to properly scale the output current. If the Jumper configuration is invalid, a shutdown is performed and this message is generated. Refer to YORK VSD Service manual 160.00-M1.

"**VSD – LOW PHASE A INVERTER HEATSINK TEMPERATURE**"
(Style D VSD)
A Heatsink temperature sensor indicating a temperature <37°F will cause the chiller to shut down and display this message. In most cases, 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 B INVERTER HEATSINK TEMPERATURE**"
(Style D VSD)
See "Low Phase A Inverter Heatsink Temperature" message above.

"**VSD – LOW PHASE C INVERTER HEATSINK TEMPERATURE**"
(Style D VSD)
See "Low Phase A Inverter Heatsink Temperature" message above.

"**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 <37°F will cause the chiller to shutdown and display this message. In most cases, 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 A INVERTER BASEPLATE TEMPERATURE"
(VSD part number 371-03789-xxx (503 HP 60 Hz; 419 HP 50 Hz) (Flash Memory Card version C.MLM.01.08 and later)
The chiller has shutdown because the Baseplate temperature has decreased to <37 ºF.

"VSD – LOW PHASE B INVERTER BASEPLATE TEMPERATURE"
(VSD part number 371-03789-xxx (503 HP 60 Hz; 419 HP 50 Hz) (Flash Memory Card version C.MLM.01.08 and later)
The chiller has shutdown because the Baseplate temperature has decreased to <37 ºF.

"VSD – LOW PHASE C INVERTER BASEPLATE TEMPERATURE"
(VSD part number 371-03789-xxx (503 HP 60 Hz; 419 HP 50 Hz) (Flash Memory Card version C.MLM.01.08 and later)
The chiller has shutdown because the Baseplate temperature has decreased to <37 ºF.

"**VSD – PRECHARGE – LOW DC BUS VOLTAGE**"
During Pre-charge, the DC link must be equal to or greater than 50VDC (41VDC for 50 Hz) within ½ second and 500VDC within 15 seconds after the Pre-charge relay is energized. If this condition is not met, a shutdown is performed and this message is generated.

VSD-PRECHARGE-LOW DC BUS VOLTAGE"
(575V/60Hz applications)
(Software version C.OPT.01.15.xxx (or later))
If the DC Link voltage does not reach at least 60VDC (within 4 seconds) or at least 600VDC (within 20 seconds) after the precharge command has been received, this shutdown is performed.

"VSD – LOW INVERTER BASEPLATE TEMPERATURE"
(Applicable to VSD with part number 371-02767-XXX (60 Hz) or 371-03700-XXX (50 Hz))
(If compressor other than "P", requires Flash Memory Card version C.MLM.01.05A.xxx and later)
A baseplate temperature sensor indicating a temperature of <37°F will cause the chiller to shut down and display this message. In most cases, 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 is generated if a communications problem occurs between the two microprocessors on the VSD Logic Board.

"**VSD – RUN SIGNAL**"
Redundant RUN signals are generated by the 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 5 second timer shall commence timing. If both run commands are not received by the VSD Logic Board within 5 seconds, a shutdown is performed and this message is displayed. This is generally indicative of a wiring problem between the Control Center and the VSD.

"**VSD – SERIAL COMMUNICATIONS**"
This message is generated 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, is disrupted. This is generally indicative of defective wiring between J11 on the VSD Logic Board and J8 on the ACC Board.

"HARMONIC FILTER – LOGIC BOARD OR COMMUNICATIONS"
This message is generated when communications between the Harmonic filter and the VSD Logic Board, is disrupted. If equipped with Flash Memory Card version C.MLM.01.06.xxx and later, the communications must be interrupted for 10 continuous communications cycles (20 seconds) before the shutdown will occur.

"**HARMONIC FILTER – HIGH DC BUS VOLTAGE**"
The Harmonic filter's DC Link voltage is continuously monitored and if the level exceeds 860VDC, this shutdown is performed. The Harmonic Filter has its own 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. If this shutdown occurs, it will be necessary to look at the level of 460VAC applied to the Harmonic Filter. The specified voltage range is 414 to 508. 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.

"**HARMONIC FILTER – HIGH PHASE A CURRENT**"
The maximum instantaneous harmonic filter current is monitored and compared to a preset limit. If this limit is exceeded, a shutdown is performed and this message is generated. The Filter current is monitored using two DCCT's 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, it is 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 PHASE B CURRENT**"
See "Harmonic Filter – High Phase A Current" message above.

"**HARMONIC FILTER – HIGH PHASE C CURRENT**"
See "Harmonic Filter – High Phase A Current" message above.

"**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 – PRECHARGE – LOW DC BUS VOLTAGE**"
During pre-charge, the filter's DC link must be equal to or greater than 50VDC (41VDC for 50 Hz) within 1/10 second after the pre-charge relay is energized. If this condition is not met, a shutdown is performed and this message is generated.

"VSD-HARMONIC FILTER-PRECHARGE-LOW DC BUS VOLTAGE"
(575V/60Hz applications)
(Software version C.OPT.01.15.xxx (or later))
If the DC Link voltage does not reach at least 60VDC (within 100 millisconds) or at least 630VDC (within 5 seconds) after the filter precharge command has been received, this shutdown is performed.

"**HARMONIC FILTER – LOW DC BUS VOLTAGE**"
The Harmonic Filter generates its own filter DC link voltage by switching its IGBT's. This DC level is actually higher than the level that one could obtain by simply rectifying the input line voltage. Thus, the harmonic filter actually 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 its peak level. This shutdown occurs when the filter's DC link voltage decreases to a level less than 60VDC 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. This setpoint is set to the peak of the sensed input line-to-line voltage plus 32 volts, not to exceed 760 volts and it varies with the input line-to-line voltage. If this shutdown occurs occasionally, the likely cause is a severe sag in the input line voltage.

"**HARMONIC FILTER – DC BUS VOLTAGE IMBALANCE**"
The filter DC link is filtered by large, electrolytic capacitors, rated for 450VDC. These capacitors are wired in series to achieve a 900VDC capability for the DC link. It is important the voltage is 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 ½ of the total DC link voltage.

"VSD-HARMONIC FILTER-DC BUS VOLTAGE IMBALANCE"
(575V/60Hz applications)
(Software version C.OPT.01.15.xxx (or later))
If the Half DC Link Voltage does not remain within ± 63 VDC of the DC Link Voltage divided by 2, this shutdown is performed.

"**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 7 seconds, a chiller shutdown is performed and this message is displayed. The maximum permissible continuous RMS current ratings for the harmonic filter are:

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 their permissible operating range. The filter logic board receives its power from the VSD logic board via the ribbon cable, connecting 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 1**"
During initialization, with no current flowing through the DC Current Transformers (DCCT's), 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 this shutdown is generated.

"**HARMONIC FILTER – DC CURRENT TRANSFORMER 2**"
See "Harmonic Filter – DC Current Transformer 1" message above.

SAFETY SHUTDOWN MESSAGES

"**EVAPORATOR – LOW PRESSURE**"
The evaporator pressure, as sensed by the Evaporator Transducer, 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. The Brine shutdown threshold is programmed at the YORK Factory. It should not be changed by anyone other than a qualified Service Technician following instructions in YORK Service Manual 160.54-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.

	Shutdown (PSIG)	Restart (PSIG)
Water Cooling - R22	54.3	54.4
- R134a	25.0	25.1
Brine Cooling - R22	25.0 to 54.3 as programmed	+0.1 > Shutdown threshold
- R134a	6.0 to 25.0 as programmed	+0.1 > Shutdown threshold

"EVAPORATOR – LOW PRESSURE - SMART FREEZE"
(Flash memory card version C.MLM.01.02 or later**)**
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 Evaporator Refrigerant Temperature sensor RT7 is Enabled, (using procedure in Service Manual 160.54-M1), this parameter is used as the evaporator refrigerant temperature and the freeze threshold is 32.8°F. If RT7 is not enabled, the evaporator refrigerant temperature used is the Evaporator Saturation Temperature, derived from the Evaporator Pressure Transducer and the freeze threshold is 34.0°F.

The total count is incremented once for every second the evaporator refrigerant temperature is below the freeze threshold (but is never decremented below zero). The number of seconds it will take the chilled liquid to freeze is based on how far the evaporator refrigerant temperature is below the freeze threshold as follows:

seconds to freezing = (4053.7) / (freeze threshold – evap. refrigerant temp.)

Smart Freeze is activated only if the feature has been Enabled by a Service technician **(**following instructions in Service Manual 160.54-M1) and the Leaving Chilled Liquid temperature Setpoint is <38.0°F.

"**EVAPORATOR – TRANSDUCER OR LEAVING LIQUID PROBE**"
A possible defective Evaporator pressure Transducer or Leaving Chilled Liquid temperature Thermistor has been detected. The pressure and temperature that these devices are indicating are not in the correct relationship to each other. The 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 > 2.5°F warmer nor > 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 10 minutes. For Steam Turbine drive applications, this check is bypassed for the first 20 minutes of chiller operation. The chiller can be started after the COMPRESSOR switch is placed in the Stop-Reset (O) position.

"**EVAPORATOR – TRANSDUCER OR TEMPERATURE SENSOR**"
A possible defective Evaporator pressure Transducer or Refrigerant Temperature Sensor has been detected. The Control Center converts the evaporator pressure to a Saturated Temperature value and compares this value to the optional Evaporator Refrigerant Temperature Sensor. If the difference between these temperatures is greater than 3.0°F, continuously for 1 minute, this shutdown is performed. This check is only performed under the following conditions:

- Chiller has been running for at least 10 minutes
- Evaporator Refrigerant temperature (RT7) has been enabled by a Service technician using instructions in YORK Service Manual 160.54.M1
- Not in Brine cooling mode (If compressor application other than "P", applies only to Flash memory card version C.MLM.01.02 and later)
- Smart Freeze is enabled (If compressor application other than "P", applies only to Flash Memory Card version C.MLM.01.05.xxx and later)
- Evaporator Temperature Sensor (RT7) or Evaporator Saturation Temperature is indicating a temperature of <32.0°F (If compressor application other than "P", applies only to Flash Memory Card version C.MLM.01.05.xxx and later)

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.

"**CONDENSER – HIGH PRESSURE CONTACTS OPEN**"
The contacts of the electro-mechanical high pressure safety device, located on the condenser shell, have opened because this device has detected a pressure > 180.0 PSIG (R134a – except "P" compressors), >200.0 PSIG (R134a – "P" compressors), >265.0 (R22). The contacts will automatically close when the condenser pressure decreases to <120.0 PSIG (R134a – except "P" compressors), <140.0 PSIG (R134a – "P" compressors), < 205 PSIG (R22). The chiller can be started after the contacts close and the COMPRESSOR switch is placed in the Stop-Reset (O) position.

For special order R134a high condenser temperature chiller applications, a special HP cutout is set to trip/reset at 200/140 PSIG.

"**CONDENSER – HIGH PRESSURE**"
The condenser pressure, as sensed by the Condenser Transducer, has increased to >180.0 PSIG (R134a), >265.0 PSIG (R22). The chiller can be started after the pressure decreases to < 120.0 PSIG (R134a), < 205 PSIG (R22) and the COMPRESSOR switch is placed in the Stop-reset (O) position.

For special order R134a high condenser temperature chiller applications, the CONDENSER TEMPERATURE RANGE setpoint (software version C.OPT.01.19.307 or later) is set to "Extended". The trip/reset threshold is then 200/140 PSIG.

"CONDENSER – HIGH PRESSURE – STOPPED"
(Software versions C.MLM.01.11.xxx and later or C.OPT.01.11.303 and later) The condenser pressure exceeded 160.0PSIG (R134a), 240.0 PSIG (R22) while the chiller was stopped. High temperature condenser water flowing through the condenser while the chiller is shutdown can cause a condenser high pressure condition resulting in loss of refrigerant. This safety fault anticipates this problem by annunciating the condenser high pressure condition. The chiller can be restarted after a Service Technician performs a special reset preset procedure contained in YORK Service Manual 160.54-M1.

For special order R134a high condenser temperature chiller applications, the CONDENSER TEMPERATURE RANGE setpoint (software version C.OPT.01.19.307 or later) is set to "Extended". The trip/reset is then 170/170 PSIG .

"**CONDENSER – PRESSURE TRANSDUCER OUT OF RANGE**"
The Condenser Pressure Transducer is indicating a pressure that is < 6.8 PSIG (R134a), < 24.2 PSIG (R22) or > 300.0 PSIG (R134a or R22). This is outside the normal operating range of the transducer. This is generally indicates a defective transducer. The chiller can be started after the transducer is indicating a pressure that is within range and 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 a general-purpose, user defined safety shutdown input. The chiller can be started after the contacts open and the COMPRESSOR switch is placed in the Stop-Reset (O) position.

"**DISCHARGE – HIGH TEMPERATURE**"
The discharge temperature, as sensed by the Discharge Temperature Thermistor, has increased to > 220.0°F. The chiller can be started after the temperature decreases to < 220.0°F and the COMPRESSOR switch is placed in the Stop-Reset (O) position.

"**DISCHARGE – LOW TEMPERATURE**"
The discharge temperature, as sensed by the Discharge Temperature Thermistor, has decreased to < 30.0°F. The chiller can be started after the temperature increases to > 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, has increased to > 180.0°F. The chiller can be started after the temperature decreases to < 180.0°F and the Compressor switch is placed in the Stop-Reset (O) position.

"**OIL – LOW DIFFERENTIAL PRESSURE**"
The differential oil pressure decreased to < 15.0 PSID while the chiller was running or failed to achieve 25.0 PSID by the last 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.

"**OIL - HIGH DIFFERENTIAL PRESSURE**"
The differential oil Pressure increased to > 90.0 PSID (120.0 PSID with software versions C.MLM.01.08.xxx (and later) or C.OPT.01.08A.xxx (and later)) 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 to < 90.0 PSID and the COMPRESSOR switch is placed in the Stop-reset (O) position.

"**OIL – PUMP PRESSURE TRANSDUCER OUT OF RANGE**"
The Pump Oil Pressure Transducer (system high pressure) is indicating a pressure that is <0.0 PSIG or >315.0 PSIG. This is outside the normal operating range of the transducer. This generally indicates a defective transducer. The chiller can be started after the transducer is indicating a pressure that is within range and the **COMPRESSOR** switch is placed in the Stop-reset (O) position.

"**OIL – SUMP PRESSURE TRANSDUCER OUT OF RANGE**"
The Sump Oil Pressure Transducer (system low pressure) is indicating a pressure that is outside the normal operating range of the transducer as follows: R134a - <0.0 PSIG or >315.0 PSIG, R22 - <23.2 PSIG or >271.8 PSIG. This generally indicates a defective transducer. The chiller can be started after the transducer is indicating a pressure that is within range and the COMPRESSOR switch is placed in the Stop-reset (O) position.

"**OIL - DIFFERENTIAL PRESSURE CALIBRATION**"
The Sump and Pump oil pressure Transducers indicated a differential oil pressure of >15.0 PSID during the oil pressure transducer Auto-Zeroing period that begins 10 seconds into "System Pre-lube" and lasts for 3 seconds. This is indicative of a defective Sump or Pump Transducer, since the oil pump is not running during this period and the actual differential oil pressure is 0 PSID. The transducers are sensing the same pressure during this period and their outputs should be similar. The chiller can be started after the COMPRESSOR switch is placed in the stop-reset (O) position.

"**OIL – VARIABLE SPEED PUMP – SETPOINT NOT ACHIEVED**"
This is only applicable to chillers equipped with the Oil Pump Variable Speed Drive. One of the following conditions have occurred while in "System Prelube", "System Run" or "System Coastdown". The chiller can be started after the **C**OMPRESSOR switch is placed in the Stop-reset (O) position. With software version C.OPT.01.18.307 (or later), this safety shutdown is not performed when the Refrigerant Selection (microboard SW1-1) is set to "R22".

1. The differential oil pressure was < 35.0 PSID; (< 25 PSID for "P" compressors equipped with software version C.01.10A.xxx (and earlier) or C.OPT.01.10A.xxx (and earlier) for 5 continuous seconds during the last 10 seconds of the "System Prelube" period or during the first 15 seconds of "System Run".

-OR-

2. Anytime after the first 30 seconds of "System run", the differential oil pressure was < the Oil Pressure Setpoint with the speed command from the Microboard at 60 Hz for 5 continuous seconds.

"**CONTROL PANEL – POWER FAILURE**"
A Control Power failure has occurred. If the power failure duration was < the duration of the applicable "Coastdown" period (2.5 minutes standard; 15 minutes steam turbine), 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. This message can indicate a Cycling (auto-restart after power failure) or Safety (manual restart after power failure) shutdown, depending upon Control Center configuration. It indicates a Cycling shutdown when displayed in orange characters; Safety shutdown when displayed in red characters. The Control center is configured for auto-restart or manual restart after power failure by a qualified Service technician following instructions in YORK Service Manual 160.54-M1.

"**MOTOR OR STARTER – CURRENT IMBALANCE**"
The three phase compressor motor current imbalance was > 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 > 80% of the programmed 100% chiller Full Load Amps. The average is calculated as: Iave = (Ia+Ib+Ic) / 3. The imbalance is calculated as:

$$\frac{(Ia-Iave) + (Ib-Iave) + (Ic-Iave)}{2(Iave)} \times 100$$

The Style B Solid State Starter and Variable Speed Drive detects the unbalance condition and advise the Optiview Control Center Microboard via serial communications. The Style A Solid State Starter and Variable Speed Drives 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 Electro-mechanical starter applications.

"**THRUST BEARING – PROXIMITY PROBE CLEARANCE**"
(Style E and earlier chillers with G, H or J compressors and Style F and later Chillers with J or H3 Compressors)

The clearance between the compressor high speed thrust collar and the tip of the Proximity Probe has increased ≥ +10 mils or decreased ≥ -25 mils (for 2 continuous seconds) from the Reference Position. The minimum allowed clearance is 23 mils. Therefore, if the Reference position is < 47 mils, the shutdown will occur when the actual clearance is ≤ 22 mils.

If equipped with software version C.MLM.01.10.xxx (and later) or C.OPT.01.10.302 (and later), the operation is as follows: the clearance is only checked during the last 20 seconds of "System Prelube", during "System Run" and during "Coastdown". Therefore, the fault is only detected during those periods. Also, the +10mil threshold must be exceeded for 2 continuous seconds (instantaneous with previous software).

This shutdown must be evaluated by a qualified Service Technician prior to starting the chiller. Starting the chiller without this evaluation could result in severe compressor damage. To prevent the chiller from starting without the proper evaluation, restart is inhibited until the clearance is within acceptable limits and a special reset procedure is performed by the Service Technician. The evaluation and reset procedure are contained in YORK Service Manual 160.54-M1.

"**THRUST BEARING – PROXIMITY PROBE OUT OF RANGE**"
(Style E and earlier chillers with G, H or J compressors and Style F and later Chillers with J or H3 Compressors)

The clearance between the compressor high speed thrust collar and the tip of the Proximity Probe has decreased to < 17 mils.

If equipped with software version C.MLM.01.10.xxx (and later) or C.OPT.01.10.302 (and later), the operation is as follows: the clearance is only checked during the last 20 seconds of "System Prelube", during "System Run" and during "Coastdown". Therefore, the fault is only detected during those periods.

This shutdown must be evaluated by a qualified Service Technician prior to starting the chiller. Starting the chiller without this evaluation could result in severe compressor damage. To prevent the chiller from starting without the proper evaluation, restart is inhibited until the clearance is within +10 to -25 mils of the Reference Position and a special reset procedure is performed by the Service Technician. The evaluation and reset procedure are contained in YORK Service Manual 160.54-M1.

"**THRUST BEARING – HIGH OIL TEMPERATURE**"
(Not applicable to Flash Memory Card version C.MLM.01.03 and later)

The temperature of the oil in the High Speed Drain Line, as sensed by the Proximity Probe, has increased to ≥ 250.0°F.

This shutdown must be evaluated by a qualified Service Technician prior to starting the chiller. Starting the chiller without this evaluation could result in severe compressor damage. To prevent the chiller from starting without the proper evaluation, restart is inhibited until the temperature decreases to < 180.0°F and a special reset procedure is performed by the Service technician. The evaluation and reset procedure are contained in YORK Service Manual 160.54-M1.

"**THRUST BEARING – OIL TEMPERATURE SENSOR**"
(Not Flash Memory Card version C.MLM.01.03 and later)

The temperature of the oil in the High Speed Drain Line, as sensed by the Proximity Probe, has decreased to < 50.0°F during "System Run" or the last 10 seconds of "System Prelube".

This shutdown must be evaluated by a qualified Service Technician prior to starting the chiller. Starting the chiller without this evaluation could result in severe compressor damage. To prevent the chiller from starting without the proper evaluation, restart is inhibited until the temperature increases to >50.0°F and a special reset procedure is performed by the Service Technician. The evaluation and reset procedure are contained in YORK Service Manual 160.54-M1.

"THRUST BEARING - LIMIT SWITCH OPEN"
(All "P and Q" compressors and Style F Chillers with G or H5-8 Compressors)

The High Speed Thrust Bearing Limit Switch contacts, connected to TB3-81, have opened. This occurs when the Bearing position decreases to < the allowed position.

This shutdown must be evaluated by a qualified Service Technician prior to starting the chiller. Starting the chiller without this evaluation could result in severe compressor damage. To prevent the chiller from starting without the proper evaluation, restart is inhibited until the switch contacts have closed and a special reset procedure is performed by the Service Technician. The evaluation and reset procedure are contained in YORK Service Manual 160.54-M1.

"**WATCHDOG – SOFTWARE REBOOT**"
The Microboard's software Watchdog initiated a Microprocessor reset because it detected that a portion of the chiller operating Program was not being executed. The result of this reset is a Safety shutdown and re-initialization of the Program. This is generally indicative of a severe electrical power disturbance or impending Microboard Failure. The chiller can be started after the COMPRESSOR switch is placed in the Stop-Reset (O) position.

"SURGE PROTECTION – EXCESS SURGE"
(Flash Memory Card version C.MLM.01.05.xxx and later)
(Applies only if Surge Protection SHUTDOWN feature is Enabled)

The Surge Window Count surge events exceeded the Count Limit setpoint. If the Surge Protection Extended Run feature is Disabled, the chiller shuts down as soon as the count exceeds the limit. If the Extended Run feature is Enabled, this shutdown occurs only if the count exceeds the limit at completion of the 10 minute Extended Run period. The chiller can be started after the COMPRESSOR Switch is placed in the Stop-Reset (O) position.

MOTOR – LACK OF BEARING LUBRICATION"
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
The Operating Hours Since Last Motor Lubrication has exceeded 1400 hours. This message replaces "Warning Motor Bearing Lube Required" above. This safety shutdown remains in effect until the Operator places the COMPRESSOR Switch in the Stop-reset (O) position and enters his/her initials, name or user ID in Operator Access Level (or higher) using the Motor Lube Acknowledge key on the Motor Lubrication Screen. Refer to the Motor Lubrication Screen for entry instructions. The date and time of this entry is automatically logged as the "Date of Last Motor Lubrication" and "Time of Last Motor Lubrication". It also resets the "Operating Hours Since Last Lubrication" to zero. The date this warning occurs is stored as the "Date of Last Motor Lubrication Warning or Fault". With software version C.OPT.01.16.xxx (and later), this message will only be displayed if the AUTO LUBE setpoint is disabled. With this setting, if the SHUTDOWN setpoint is enabled, this safety shutdown will occur. If SHUTDOWN is disabled, this warning message will be displayed but the safety shutdown will not be performed.

MOD "B" SOLID STATE STARTER SAFETY SHUTDOWN MESSAGES

"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, via the serial communications link. 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 Microboard, in the Control Center, 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 2 seconds, this message is typically displayed for a few seconds and then replaced with one of the following fault messages.

"LCSSS – HIGH INSTANTANEOUS CURRENT"
The Liquid Cooled 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 1 second. The chiller can be started after the **COMPRESSOR** switch is placed in the Stop-Reset (O) position.

"LCSSS – HIGH PHASE (X) HEATSINK TEMPERATURE – RUNNING"
The Liquid Cooled Solid State Starter Logic/Trigger Board has detected the temperature of phase A, B or C (designed as X in the message) Silicon Controlled Rectifier (SCR) Modules has exceeded 212°F while the chiller was running. The safety can be reset after all SCR temperatures are < 210°F and the COMPRESSOR switch is placed in the Stop-Reset position (O). However, the chiller cannot be started until all SCR temperatures are < 109°F. During the shutdown, the starter cooling pump runs until the temperature is < 109°F.

"LCSSS – 105% MOTOR CURRENT OVERLOAD"
The highest phase of the compressor motor current increased to > 105% of the programmed 100% chiller Full Load Amps continuously for 40 seconds. The chiller can be started after the COMPRESSOR switch is placed in the Stop-Reset (O) position.

"LCSSS – PHASE (X) SHORTED SCR"
(Flash memory Card version C.MLM.01.04 or later)
A shorted Silicon Controlled Rectifier (SCR) in phase A, B or C (designated as X in the message) has been detected by the Liquid Cooled Solid State Starter Logic/Trigger Board. The voltage across each SCR in monitored to detect the shorted condition. The shorted condition must exist continuously for 5 seconds in order to annunciate the fault. This check is disabled while the chiller is running. The chiller can be started after the condition has been corrected and the COMPRESSOR switch is placed in the Stop-Reset (O) position.

"LCSSS – OPEN SCR"
An open Silicon Controlled Rectifier (SCR) has been detected by the Liquid Cooled Solid State Starter Logic/Trigger Board. The open condition must exist continuously for 5 seconds in order to annunciate the fault. The chiller can be started after the condition has been corrected and the COMPRESSOR switch is placed in the Stop-Reset (O) position. This check is disabled when the chiller is shut down. 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 YORK Service Manual 160.54-M1.

"LCSSS – PHASE (X) OPEN SCR"
(Software versions C.MLM.01.11.xxx and later or C.OPT.01.11.303 and later) An open SCR in phase A, B or C (designated as X in message) has been detected. This safety shutdown has the same criteria as "LCSSS – OPEN SCR" above. However, when the Solid State Starter Logic/Trigger Board is equipped with Eprom version C.SSS.01.03 (and later) and the Optiview Control Center is equipped with above software, the phase in which the open SCR occurred is identified.

"LCSSS – PHASE ROTATION"
(Flash memory Card version C.MLM.01.04 or later)
The Liquid Cooled 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 and the COMPRESSOR Switch is placed in the Stop-Reset (O) position.

COMPRESSOR MOTOR VARIABLE SPEED DRIVE: 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 manual resets are performed as detailed below. Service and troubleshooting information is contained in YORK Manual 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 Microboard in the Control Center then sends a request for the cause of the fault to the VSD Logic Board via the Adaptive Capacity Control Board, over the serial link. Since serial communications are initiated every 2 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 it indicates that a motor overload has occurred. The shutdown is generated when the VSD Logic Board has detected that at least 1 of the 3 output phase currents has exceeded 105% of the chiller Full Load Amps (FLA) value for > 7 seconds. The chiller FLA value is set by adjustment of the FLA potentiometer on the VSD Logic Board. The chiller can be started after the RESET push-button on the VSD Logic Board is pressed and the COMPRESSOR switch is placed in the Stop-reset position (O).

"**VSD – HIGH PHASE A INVERTER 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, ascertain the pump is operating when the chiller is running, and check the strainer in the primary of the heat exchanger for clogs and silt. The chiller can be started after the fault condition clears, the RESET button on the VSD Logic Board is pressed and the COMPRESSOR switch is placed in the Stop-reset position (O).

"**VSD – HIGH PHASE B INVERTER HEATSINK TEMPERATURE**"
(Style D VSD)
See Phase A message above.

"**VSD – HIGH PHASE C INVERTER HEATSINK TEMPERATURE**"
(Style D VSD)
See Phase A message above.

"**VSD – HIGH CONVERTER HEATSINK TEMPERATURE**"
(Style D VSD)
See Phase A message above.

"VSD – HIGH CONVERTER HEATSINK TEMPERATURE"
(Applicable to VSD with Part Number 371-02767-XXX (60 Hz) and 371-03700-XXX (50 Hz))
(If compressor other than "P", requires Flash Memory Card version C.MLM.01.05A.xxx and later)
This shutdown will occur if the heatsink temperature exceeds 170°F. The chiller can be started after the fault condition clears and the COMPRESSOR Switch is placed in the Stop-reset (O) position.

"VSD - HIGH INVERTER BASEPLATE TEMPERATURE"
(Applicable to VSD with Part Number 371-02767-XXX (60 Hz) and 371-03700-XXX (50 Hz))
(If compressor other than "P", requires Flash Memory Card version C.MLM.01.05A.xxx and later)
This shutdown will occur if the baseplate temperature exceeds 175°F. The chiller can be started after the fault condition clears, the RESET button on the VSD Logic Board is pressed and the COMPRESSOR Switch is placed in the Stop-reset position (O).

"VSD – HIGH PHASE A INVERTER BASEPLATE TEMPERATURE"
(VSD part number 371-03789-xxx (503HP 60 Hz; 419HP 50 Hz) (Flash Memory Card version C.MLM.01.08.xxx and later)

The chiller has shutdown because the Baseplate temperature has increased to >158ºF. The chiller can be started after the fault condition clears, the RESET button on the VSD Logic Board and the COMPRESSOR switch is placed in the stop-reset position (O).

"VSD – HIGH PHASE B INVERTER BASEPLATE TEMPERATURE"
(VSD part number 371-03789-xxx (503HP 60 Hz; 419HP 50 Hz) (Flash Memory Card version C.MLM.01.08.xxx and later)
The chiller has shutdown because the Baseplate temperature has increased to >158ºF. The chiller can be started after the fault condition clears, the RESET button on the VSD Logic Board and the COMPRESSOR switch is placed in the stop-reset position (O).

"VSD – HIGH PHASE C INVERTER BASEPLATE TEMPERATURE"
(VSD part number 371-03789-xxx (503HP 60 Hz; 419HP 50 Hz) (Flash Memory Card version C.MLM.01.08.xxx and later)
The chiller has shutdown because the Baseplate temperature has increased to >158ºF. The chiller can be started after the fault condition clears, the RESET button on the VSD Logic Board and the COMPRESSOR switch is placed in the stop-reset position (O).

"**VSD – PRECHARGE LOCKOUT**"
If the VSD fails to make Pre-charge, the Pre-charge relay shall drop out for 10 seconds during which time the VSD's fans and water pumps shall remain energized in order to permit the Pre-charge resistors to cool. Following this 10-second cool down period, Pre-charge shall again be initiated. The VSD shall attempt to make Pre-charge 3 consecutive times. If the VSD fails to make Pre-charge on 3 consecutive tries, the unit will shut down, lockout and display this message. The chiller can be started after the COMPRESSOR switch is placed in the Stop-reset (O) position.

"**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))

(If compressor other than "P", requires Flash Memory Card version C.MLM.01.05A.xxx and later) This shutdown occurs when the Baseplate temperature exceeds 174°F (79°C). 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 position (O).

"HARMONIC FILTER – HIGH BASEPLATE TEMPERATURE"
(VSD part number 371-03789-xxx (503HP 60 Hz; 419HP 50 Hz) (Flash Memory Card version C.MLM.01.08.xxx and later)
The chiller has shutdown because the Baseplate temperature has increased to >194ºF. 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 position (O).

"VSD-HARMONIC FILTER-HIGH BASEPLATE TEMPERATURE" (575V/60Hz applications)
(Software version C.OPT.01.15.xxx (or later))
If the Baseplate temperature rises above the following limits, this shutdown is performed:
424HP – 70.0 deg F, 174.2 deg C
608HP – 88.0 deg F, 190.4 deg C

"**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 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 position (O).

VSD – LOW FREQUENCY DETECTED"
(Software version C.MLM.01.14.xxx (and later) or C.OPT.01.14.306 (and later))
After a 20 second bypass after entering "System Run", if the VSD frequency decreases to below 1 Hz less than the minimum allowed frequency for 25 continuous seconds, this shutdown is initiated. With software version C.OPT.01.19.307 (and earlier), this fault occurs when the VSD frequency falls below 1 Hz less than the minimum allowed frequency after having reached the minimum frequency. The minimum allowed frequency for the VSD is 25Hz for 50Hz units; 30Hz for 60Hz units. The COMPRESSOR Switch is placed in the STOP-RESET position.

SECTION 3
PRINTERS

23887A

OKIDATA MICROLINE 184

23889A

WEIGH-TRONIX

00085VIP

SEIKO DPU-414

FIG. 44 – PRINTERS

PRINTERS

A printer can be connected to the 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 of all system parameters at instant of shutdown. Automatically occurs if printer is connected at time of shutdown.
- **Adaptive Capacity Control (ACC) surge Map** - System conditions at instant all surge points were mapped. (Compressor Motor Variable Speed Drive applications; requires **SERVICE** access level) (Printer, ACC)
- **Trend** (Flash Memory card version C.MLM.01.05.xxx and later) - Prints a snapshot of the existing trend screen data or prints new data collected after the trend print key is pressed.

The printer can be permanently connected to the Control Center or connected as required to produce a report. If permanently connected, a **DATA LOGGING** feature can produce a Status report automatically, beginning at an Operator selected start time and occurring at an Operator selected interval thereafter.

The following figures are examples of the different print reports. Solid State Starter application print reports shown. Electro-Mechanical starter and Variable Speed Drive reports are similar but print parameters applicable to those devices.

- Figure 45 - Status
- Figure 46 - Setpoints
- Figure 47 - Schedule
- Figure 48 - Sales Order
- Figure 49 - History
- Figure 50 - Security Log (Flash Memory Card version C.MLM.01.06.xxx and later and "P" compressors C.MLM.04.02.xxx and later)
- Figure 51 - Trend (Flash Memory Card version C.MLM.01.05.xxx and later)
- Figure 52 - Custom Screen (If compressor other than "P", applies only to Flash Memory Card C.MLM.01.04 and later)
- Figure 53 - Adaptive Capacity Control New Map point Report
- Figure 54 - Adaptive Capacity Control Existing Map points Report

PRINTERS

The following Printers can be used. **Printers must be equipped with an RS-232 Serial interface**.

- **Okidata** –
  Models: 182,182 turbo, 184 turbo
  Dimensions: 14 in. wide x 10.5 in. deep
  Paper: 8.5 in. wide
  Type: Dot matrix impact
  Purchase: 800-OKIDATA

- **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

- **Seiko –**
  Printer: DPU414-30B
  Dimensions: 6.3 in. wide x 6.7 in. deep
  Paper: 4.4 in. wide
  Type: Thermal
  Power Supply: PW4007I (required)
  Battery Pak (Ni-Mh): BP4005
  Thermal paper: SS112-025A
  Purchase: Jaco Electronics (formally Reptron acquired by Jaco)
  13710 Reptron Blvd
  Tampa, Florida 33626
  Phone: 800-800-5441
  Fax: 813-891-4056
  www.jacoelectronics.com

Purchase Contact: Katy Buelow
kbuelow@jacoelect.com

The Control Center provides the required formatting control codes for the printers above when the printer is selected on the PRINTER Screen in the instructions below. These codes are transmitted through the serial interface to the printer to provide a proper print format. Different printers require different formatting control codes. Other printers might provide proper operation when connected to the Control Center. However, the print format may not be correct or as desired. Proceed with caution and use the following guidelines if an unlisted printer is selected:

1. All 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 it cannot interpret.
3. The Control Center requires a busy signal from the printer when the printer receive buffer is full. This causes the Control Center to momentarily terminate data transmission until the printer can accept more data. The busy signal polarity must be asserted low when busy.

PRINTER CONNECTIONS

Connect the printers to the Control Center Microboard as follows. Only one printer can be connected at a time.

• OKIDATA 182, 182 turbo, 184 turbo

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

• WEIGH-TRONIX

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

• SEIKO

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 respective Printer.

- **OKIDATA 182, 182 turbo, 184 turbo Printer**

  CONTROL BOARD Switch settings:

  SW1 - 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:

SW1-1 - 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:

SW1 - 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

SW1 - 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

DipSW1-1 = 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%

DipSW 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

DipSW 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

Using the COMMS Screen, assign an Identification number to the chiller. This number will appear at the top of each report.

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 be the same as Printer configuration above.
- Data Bits - 8
- Parity - None
- Stop Bits - 1

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 and Seiko.

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 1 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.

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```
YORK UPDATE
CHILLER ID 0
(c) 1997 - 2001 YORK INTERNATIONAL CORPORATION
Mon 22 Nov 1999 8:50:45 AM

SYSTEM RUN
LEAVING CHILLED LIQUID CONTROL
  [List all warnings presently active]
Controls C.MLM.01.06.102
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
  [If Refrigerant Sensor enabled]
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
Liquid Line Solenoid                     =  On
  [If Mod C Chiller]
Vent Line Solenoid                       =  On
  [If Mod D Chiller or higher]

Oil Sump
-------------------------------------------------------------------------
Oil Pump Run Output                      =  On
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
  [If Mod D Chiller or higher]
Oil Return Solenoid                      =  Off
  [If Mod D Chiller or higher]

  [Skip the following section if Hot Gas Bypass is not
  enabled]
Hot Gas
-------------------------------------------------------------------------
Valve Position                           =  15 %
Pre-Rotation Vanes Position              =  75 %

Surge
-------------------------------------------------------------------------
Total Surge Count                        =  127
Surge Window Time                        =  1 Min
Surge Window Count                       =  0

  [Skip the following section if Variable Speed Oil Pump
  is not installed]
Variable Speed Oil Pump
-------------------------------------------------------------------------
Oil Pump Drive Command Frequency         =  25.0 Hz
Pulldown Time Remaining                  =  9.0 Min
  [If Pulldown in effect]

  [Skip the following section if Liquid Level is not
                                          enabled]
Refrigerant Level Control
-------------------------------------------------------------------------
Refrigerant Level Position               =  35 %
Ramp Up Time Remaining                   =  15 Sec

  [If Ramp Up in effect]
Proximity Probe
-------------------------------------------------------------------------
High Speed Thrust Bearing Proximity Differen =  2 Mils
High Speed Thrust Solenoid               =  On
[If Mod C Chiller]

  [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 A SSS]
Liquid-Cooled Solid State Starter
-------------------------------------------------------------------------
Motor Run                                =  On
% Full Load Amps                         =  94 %
Phase A Voltage                          =  447 V
Phase B Voltage                          =  409 V
Phase C Voltage                          =  442 V
Phase A Current                          =  193 A
Phase B Current                          =  204 A
Phase C Current                          =  190 A

  [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
```

FIG. 45 – SAMPLE PRINTOUT (STATUS)

```
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 %
```


FIG. 45 – (CONT'D) SAMPLE PRINTOUT (STATUS)

YORK SETPOINTS
CHILLER ID 0
(c) 1997 - 2001 YORK INTERNATIONAL CORPORATION
Mon 22 Nov 1999 8:48:27 AM

Software Versions

Controls	=	C.MLM.01.04
BIOS	=	C.MLM.00.00
Kernel	=	0.18
GUI	=	0.28
SIO	=	0.23
GPIC	=	0.04
Ext I/O	=	
0110112091996		
[Skip if External I/O board is not activated]		
VSD [Skip if Motor Type is not VSD]	=	C.VSD.00.00
SSS [Skip 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

Pre-Run	=	Standard
Coastdown	=	Standard
Chilled Liquid Pump Operation	=	Standard
Refrigerant Selection	=	R22
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	=	Normal
Restart Offset	=	0.0 ~F
Restart Setpoint	=	45.0 ~F
Shutdown Offset	=	4.0 ~F
Shutdown Setpoint	=	41.0 ~F
Brine Low Evaporator Cutout	=	54.3 Psig
Smart Freeze	=	Off
Refrigerant	=	Enabled

Condenser

High Pressure Warning Threshold	=	246.3 Psig
Drop Leg	=	Enabled

Oil Sump

Oil Pump Package	=	Variable Speed
Standby Lube	=	On

[Skip the following section if Variable Speed Oil Pump is not installed]
Variable Speed Oil Pump

Pressure Setpoint	=	35 Psid
Control Period	=	0.9 Sec

Proximity Probe

High Speed Thrust Bearing Proximity Referenc = 41 Mils

[Skip the following section if Liquid Level 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 %

[Skip the following section if Hot Gas Bypass is not enabled]
Hot Gas

Hot Gas	=	Enabled
Hold Period	=	30 Min
Close Percentage	=	5 %
Minimum Load	=	1 ~F
Maximum Open	=	80 %

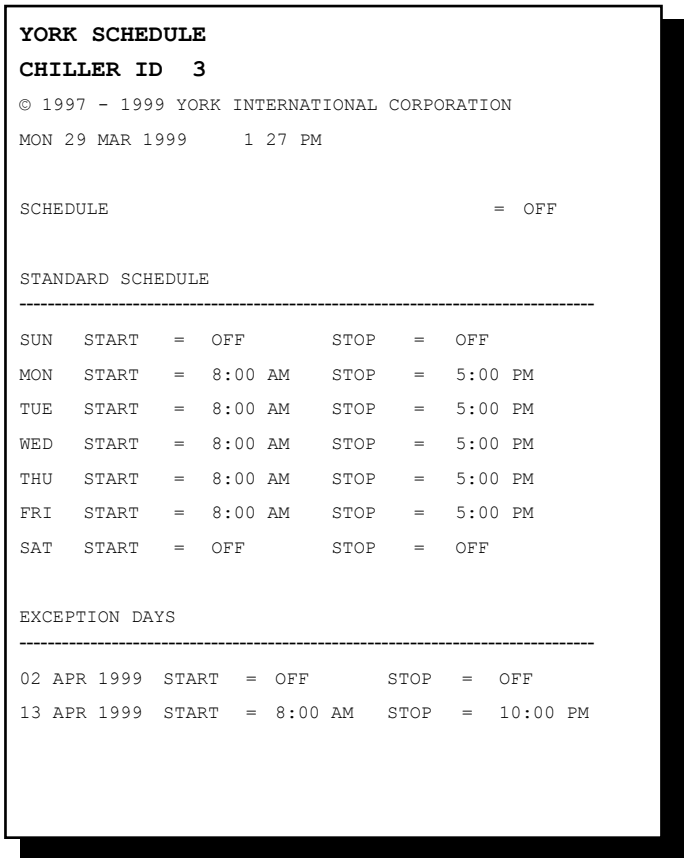
Surge

Surge Sensitivity	=	0.3
Shutdown	=	Enabled
Extended Run	=	Disabled
Count Limit	=	15
Count Window	=	5 Min

FIG. 46– SAMPLE PRINTOUT (SETPOINTS)

```
  [Skip the following section 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

  [Skip the following section if Motor Type is not Mod A
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
Scale/Model                                =  600 V, 281 A
Supply Voltage Range                       =  Disabled
Full Load Amps                             =  150 A
Current Imbalance Check                    =  Disabled

  [Skip the following section 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

  [Skip the following section if Motor Type is not VSD]
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

  [Skip the following section if Motor Type is not VSD]
Harmonic Filter Data
-------------------------------------------------------------------------
Filter Operation                           =  Enabled
Motor HP                                   =  351 HP

  [Skip the following section if Motor Type is not VSD]
Adaptive Capacity Control
-------------------------------------------------------------------------
Surge Margin Adjust                        =  0 Hz
Stability Limit                            =  4500
```

FIG. 46 – (CONT'D) SAMPLE PRINTOUT (SETPOINTS)



YORK SCHEDULE
CHILLER ID 3
© 1997 - 1999 YORK INTERNATIONAL CORPORATION
MON 29 MAR 1999 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

FIG. 47 – SAMPLE PRINTOUT (SCHEDULE)

YORK SALES ORDER
CHILLER ID 3

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	=

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	=

FIG. 48 – SAMPLE PRINTOUT (SALES ORDER)

```
YORK HISTORY 1
CHILLER ID 0
(c) 1997 - 2001 YORK INTERNATIONAL CORPORATION
Mon 22 Nov 1999 9:23:12 AM

SYSTEM READY TO START
LCSSS - LOGIC BOARD POWER SUPPLY
  [List any warnings that were active at the time of
shutdown]

Controls C.MLM.01.06.102
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
Liquid Line Solenoid                     =  Off
  [If Mod C Chiller]
Vent Line Solenoid                       =  Off
  [If Mod D Chiller or higher]

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
Oil Heater                               =  Off
  [If Mod D Chiller or higher]
Oil Return Solenoid                      =  Off
  [If Mod D Chiller or higher]

  [Skip the following section if Hot Gas Bypass is not
enabled]
Hot Gas
-------------------------------------------------------------------------
Valve Position                           =  0 %
Pre-Rotation Vanes Position              =  0 %

Surge
-------------------------------------------------------------------------
Total Surge Count                        =  127
Surge Window Time                        =  1 Min
Surge Window Count                       =  0

  [Skip the following section if Variable Speed Oil Pump
  is not installed]
Variable Speed Oil Pump
-------------------------------------------------------------------------
Oil Pump Drive Command Frequency         =  25.0 Hz
Pulldown Time Remaining                  =  9.0 Min
  [If Pulldown in effect]

  [Skip the following section if Liquid Level is not
enabled]
Refrigerant Level Control
-------------------------------------------------------------------------
Refrigerant Level Position               =  35 %
Ramp Up Time Remaining                   =  15 Sec
  [If Ramp Up in effect]

Proximity Probe
-------------------------------------------------------------------------
High Speed Thrust Bearing Proximity Differen =  2 Mils
High Speed Thrust Solenoid               =  Off
  [If Mod C Chiller]

  [Skip the following section if Motor Type is not EM]
Electro-Mechanical Starter
-------------------------------------------------------------------------
Motor Run                                =  Off
% Full Load Amps                         =  0 %

  [Skip the following section if Motor Type is not Mod A
SSS]
Liquid-Cooled Solid State Starter
-------------------------------------------------------------------------
Motor Run                                =  Off
% Full Load Amps                         =  0 %
Phase A Voltage                          =  447 V
Phase B Voltage                          =  409 V
Phase C Voltage                          =  442 V
Phase A Current                          =  0 A
Phase B Current                          =  0 A
Phase C Current                          =  0 A

  [Skip the following section if Motor Type is not Mod B
SSS]
Liquid-Cooled Solid State Starter
-------------------------------------------------------------------------
Starter Model                            =  26L
Motor Run                                =  Off
% Full Load Amps                         =  0 %
 kW Hours                                =  20723  kWH
```

FIG. 49 – SAMPLE PRINTOUT (HISTORY)

```
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

  [Skip the following section if Motor Type is not 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
  [Skip the following section 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 %
```


FIG. 49 – (CONT'D) SAMPLE PRINTOUT (HISTORY)

```
YORK SETPOINT CHANGE LOG
CHILLER ID 0
(c) 1997 - 2001 YORK INTERNATIONAL CORPORATION
Fri 05 Oct 2001 4:48:04 PM

Log Entry 1 Evaporator - Leaving Chilled Local Setpoint
-------------------------------------------------------------------------
Date                                    =  05 Oct 2001
Time                                    =  4:23:49 PM

Access Level                            =  Service
User Id                                 =  4268
Old Value                               =  46.5 ~F
New Value                               =  48.0 ~F

Log Entry 2 Condenser - High Pressure Warning Threshold
-------------------------------------------------------------------------
Date                                    =  05 Oct 2001
Time                                    =  1:36:12 PM
Access Level                            =  Service
User Id                                 =  4268
Old Value                               =  162.5 Psig
New Value                               =  225.0 Psig

Log Entry 3 Condenser - Drop Leg
-------------------------------------------------------------------------
Date                                    =  05 Oct 2001
Time                                    =  1:36:02 PM
Access Level                            =  Service
User Id                                 =  4268
Old Value                               =  Disabled
New Value                               =  Enabled

Log Entry 4 Evaporator - Refrigerant
-------------------------------------------------------------------------
Date                                    =  05 Oct 2001
Time                                    =  1:35:48 PM
Access Level                            =  Service
User Id                                 =  4268
Old Value                               =  Disabled
New Value                               =  Enabled
```

FIG. 50 – SAMPLE PRINTOUT (SECURITY LOG REPORT)

```
YORK TREND
CHILLER ID 163
© 1997 - 2000 YORK INTERNATIONAL CORPORATION
MON 09 OCT 2000 3:33:47 PM

DATA 1: LEAVING CHILLED LIQUID TEMPERATURE
DATA 2: RETURN CHILLED LIQUID TEMPERATURE
DATA 3: EVAPORATOR PRESSURE
DATA 4: LEAVING CONDENSER LIQUID TEMPERATURE
DATA 5: RETURN CONDENSER LIQUID TEMPERATURE
DATA 6: CONDENSER PRESSURE

  TIME    DATA 1  DATA 2  DATA 3  DATA 4  DATA 5  DATA 6
3:33:47 PM 45.5 °F  55.0 °F 39.0 PSIG 95.0 °F  85.0 °F 120.0 PSIG
3:33:48 PM 45.5 °F  55.0 °F 39.0 PSIG 95.0 °F  85.0 °F 120.0 PSIG
3:33:49 PM 45.5 °F  55.0 °F 39.0 PSIG 95.0 °F  85.0 °F 120.0 PSIG
3:33:50 PM 45.5 °F  55.0 °F 39.0 PSIG 95.0 °F  85.3 °F 120.1 PSIG
3:33:51 PM 45.5 °F  55.2 °F 39.1 PSIG 95.1 °F  85.4 °F 120.2 PSIG
```

FIG. 51 – SAMPLE PRINTOUT (TREND DATA NEW OR EXISTING POINTS)

```
YORK CUSTOM VIEW
CHILLER ID 0
(c) 1997 - 2001 YORK INTERNATIONAL CORPORATION
Mon 21 Jun 1999 1:28:25 PM

Leaving Chilled Liquid Temperature         = 45.0 ~F
Return Chilled Liquid Temperature = 55.0 ~F
Leaving Condenser Liquid Temperature       = 95.0 ~F
Return Condenser Liquid Temperature        = 85.0 ~F
Evaporator Saturation Temperature = 41.0 ~F
Condenser Saturation Temperature           = 78.5 ~F
Evaporator Pressure                        = 70.0 Psig
Condenser Pressure                         = 140.0 Psig
Oil Pressure                               = 45.0 Psid
% Full Load Amps                           = 50 %
```

FIG. 52 – SAMPLE PRINTOUT (CUSTOM SCREEN REPORT)

```
Log Time: Mon 12:45:39 PM 21 Jun 1999
D-P/P= 0.92; Prv Pos= 56; Freq= 39 Hz
Surge Type                                = Delta P/P Surg
Leaving Chilled Active Setpoint           = 45.0 ~F
Leaving Chilled Liquid Temperature        = 50.0 ~F
Return Chilled Liquid Temperature = 59.3 ~F
Leaving Condenser Liquid Temperature      = 85.0 ~F
Return Condenser Liquid Temperature       = 94.9 ~F
Evaporator Pressure                       = 7.2 Psig
Condenser Pressure                        = 13.8 Psig
% Full Load Amps                          = 94 %
```

FIG. 53– SAMPLE PRINTOUT (ADAPTIVE CAPACITY CONTROL NEW MAP POINT REPORT)

```
D-P/P =  1.20; Prv Pos =  89;  Freq =  58 Hz
D-P/P =  1.41; Prv Pos =  71;  Freq =  46 Hz
D-P/P =  0.98; Prv Pos =  73;  Freq =  52 Hz
D-P/P =  0.71; Prv Pos =  86;  Freq =  39 Hz
D-P/P =  0.86; Prv Pos =  53;  Freq =  48 Hz
D-P/P =  1.14; Prv Pos =  76;  Freq =  51 Hz
D-P/P =  0.84; Prv Pos =  84;  Freq =  37 Hz
D-P/P =  0.99; Prv Pos =  63;  Freq =  46 Hz
```

FIG. 54 – SAMPLE PRINTOUT (ADAPTIVE CAPACITY CONTROL EXISTING MAP POINTS REPORT)

SI METRIC CONVERSION

The following factors can be used to convert from English to the most common SI Metric values.

MEASUREMENT	MULTIPLY THIS *ENGLISH* VALUE	BY	TO OBTAIN THIS *METRIC* VALUE
CAPACITY	TONS REFRIGERANT EFFECT (ton)	3.516	KILOWATTS (kW)
POWER	KILOWATTS (kW)	NO CHANGE	KILOWATTS (kW)
	HORSEPOWER (hp)	0.7457	KILOWATTS (kW)
FLOW RATE	GALLONS / MINUTE (gpm)	0.0631	LITERS / SECOND (L/s)
LENGTH	FEET (ft)	304.8	MILLIMETERS (mm)
	INCHES (in)	25.4	MILLIMETERS (mm)
WEIGHT	POUNDS (lb)	0.4536	KILOGRAMS (kg)
VELOCITY	FEET / SECOND (fps)	0.3048	METERS / SECOND (m/s)
PRESSURE DROP	FEET OF WATER (ft)	2.989	KILOPASCALS (k Pa)
	POUNDS / SQ. INCH (psi)	6.895	KILOPASCALS (k Pa)

TEMPERATURE:

To convert degrees Fahrenheit (°F) to degrees Celsius (°C) subtract 32° and multiply by 5/9 or 0.5556.

To convert a temperature range (i.e., 10°F or 12°F chilled water range) from Fahrenheit to Celsius, multiply by 5/9 or 0.5556.

NOTES

BY JOHNSON CONTROLS

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Tele. 800-861-1001
www.york.com

Form 160.54-O1 (809)
Supersedes: 160.54-O1 (1208)