



STEAM TURBINE CENTRIFUGAL LIQUID CHILLERS

OPERATIONS MANUAL

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MODEL YST STEAM TURBINE DRIVE CENTRIFUGAL LIQUID CHILLER WITH OPTIVIEW™ CONTROL CENTER DESIGN LEVEL F AND G



LD12189

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IMPORTANT!

READ BEFORE PROCEEDING!

GENERAL SAFETY GUIDELINES

This equipment is a relatively complicated apparatus. During rigging, installation, operation, maintenance, or service, individuals may be exposed to certain components or conditions including, but not limited to: heavy objects, refrigerants, 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 rigging, installation, and 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 rigging, installation, and operating/service personnel. It is expected that these individuals possess 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 the on-product labels, this document and any referenced materials. This individual shall also be familiar with and comply with all applicable industry and 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 specific situations:



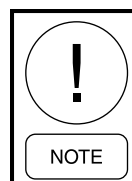
Indicates a possible hazardous situation which will result in death or serious injury if proper care is not taken.



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



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



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



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

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. Johnson Controls makes no commitment to update or provide current information automatically to the manual or product owner. Updated manuals, if applicable, can be obtained by contacting the nearest Johnson Controls Service office or accessing the Johnson Controls QuickLIT website at <http://cgproducts.johnsoncontrols.com>.

It is the responsibility of rigging, lifting, and operating/service personnel to verify the applicability of these documents to the equipment. If there is any question

regarding the applicability of these documents, rigging, lifting, and operating/service personnel should verify whether the equipment has been modified and if current literature is available from the owner of the equipment prior to performing any work on the chiller.

CHANGE BARS

Revisions made to this document are indicated with a line along the left or right hand column in the area the revision was made. These revisions are to technical information and any other changes in spelling, grammar or formatting are not included.

ASSOCIATED LITERATURE

MANUAL DESCRIPTION	FORM NUMBER
Installation - Units Manufactured Before 12/06	160.67-N1
Installation - Units Manufactured. After 12/06	160.67-N2
Unit Operation & Maintenance	160.67-O2
Wiring Diagram - Model YST	160.67-PW6
Renewal Parts - Control And Instrumentation - Model YST	160.67-RP2

NOMENCLATURE

The model number denotes the following characteristics of the unit.

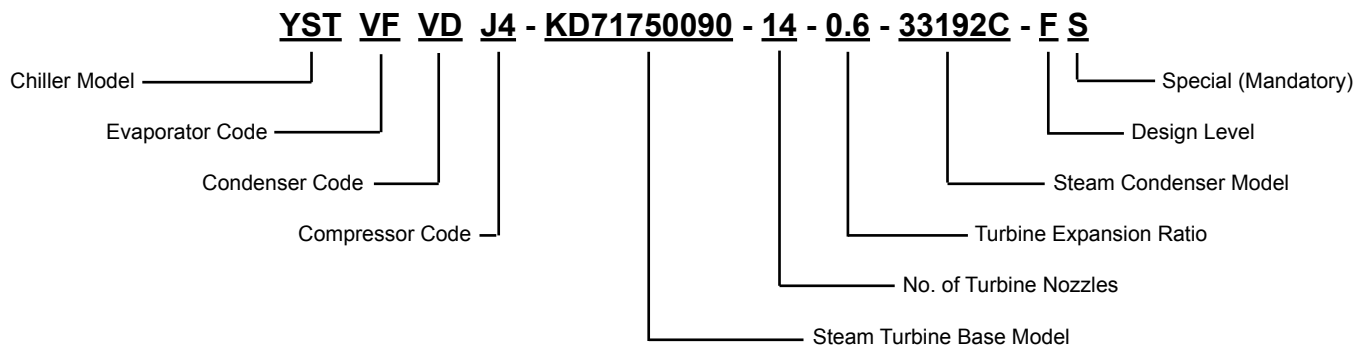


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SECTION 1- DESCRIPTION OF SYSTEM AND FUNDAMENTALS OF OPERATION

1

GENERAL SYSTEM DESCRIPTION

The YORK Model YST Chiller is commonly applied to large air conditioning systems, but may be used on other applications. The Chiller is completely factory-packaged including; the evaporator, refrigerant condenser, compressor, steam turbine, lubrication systems, power panel, control center, and all interconnecting unit piping and wiring. The steam condenser package is shipped separately and suitable for direct mounting onto the chiller or mounting along side the chiller.

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.

The chiller control panel provides control of entire system, including turbine and steam condenser operation and monitoring.

The control panel includes a color liquid crystal display (LCD) surrounded by “soft” keys which are redefined based on the screen displayed at that time, mounted in the middle of a keypad interface and installed in a locked enclosure. The screen details all operations and parameters, using a graphical representation of the chiller and its major components. Panel text is in English only. Data can be displayed in either English or Metric units.

REFRIGERATION SYSTEM OPERATION

(See Figure 3 on page 11)

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.

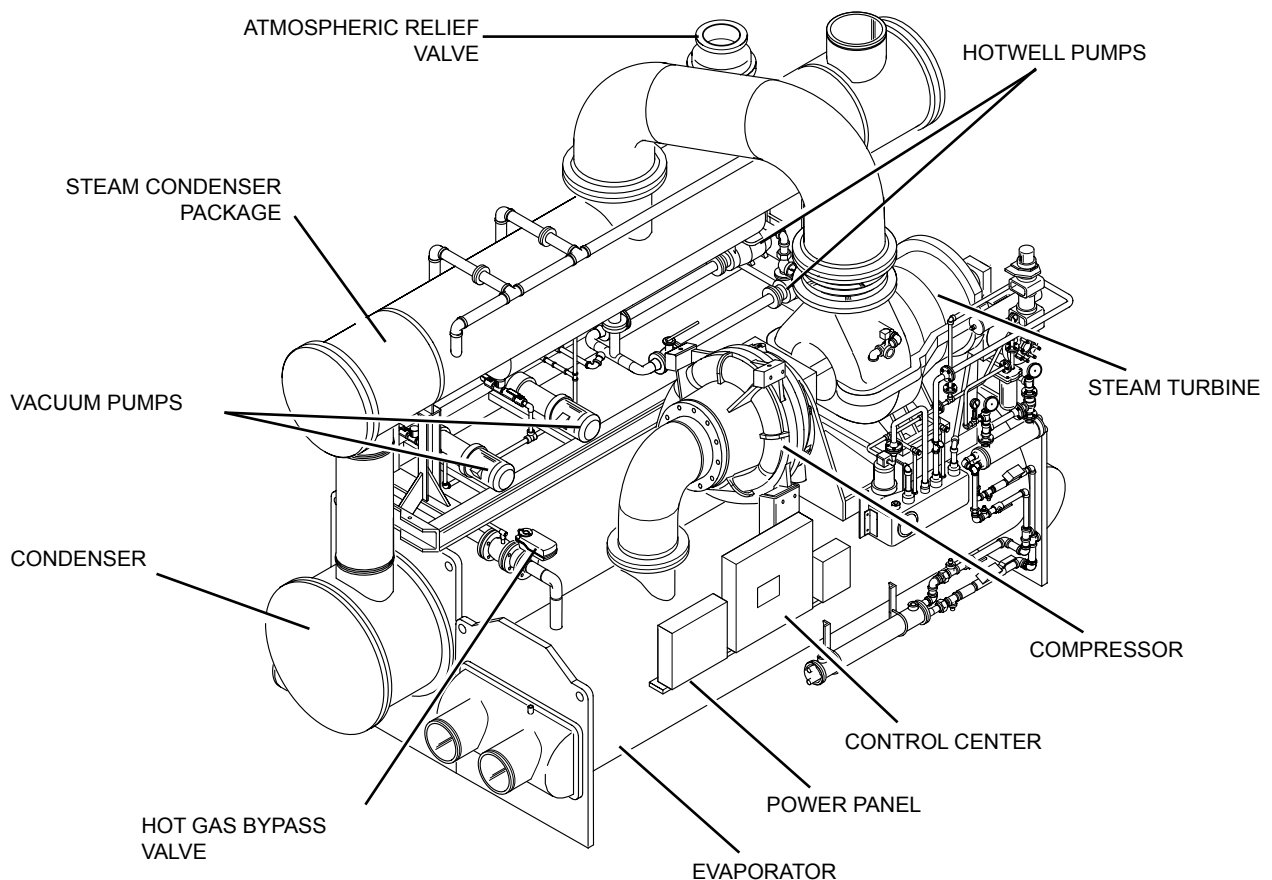
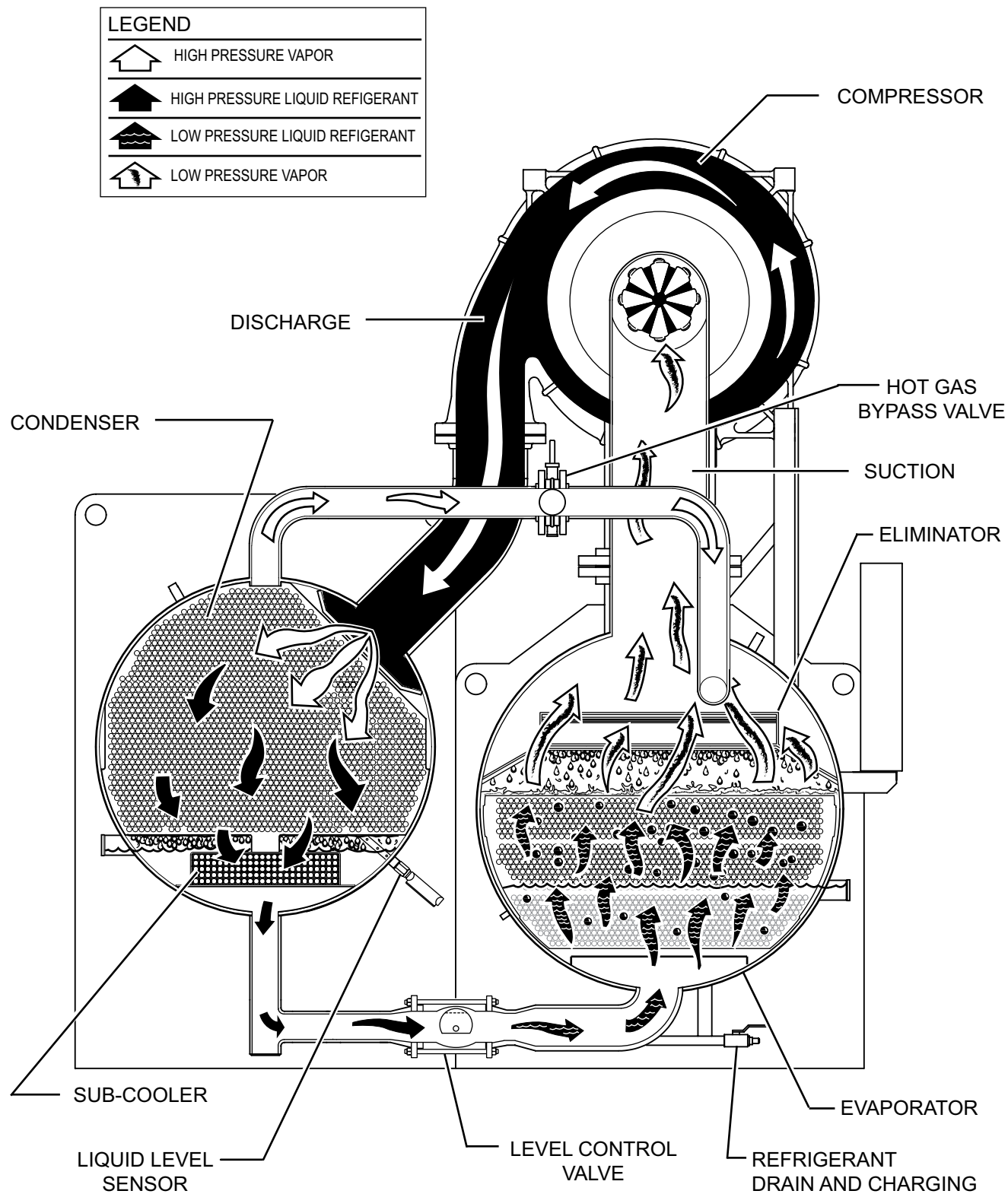


FIGURE 1 - MODEL YST CHILLER

REFRIGERANT FLOW DIAGRAM**FIGURE 2 - REFRIGERANT FLOW-THRU**

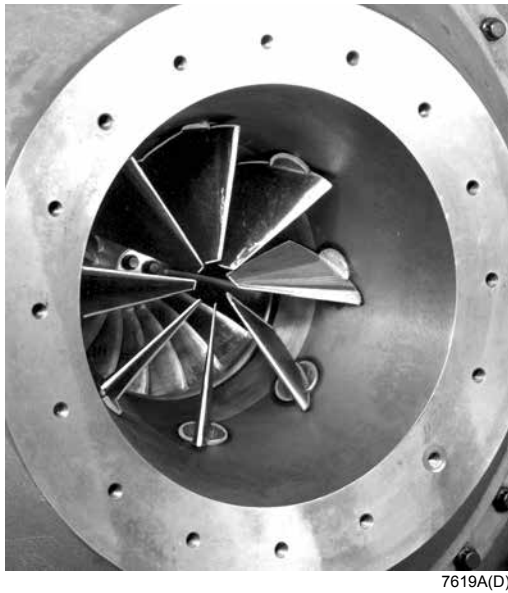


FIGURE 3 - DETAIL A – COMPRESSOR PRE-ROTATION VANES

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 subcooler level control valve meters the flow of liquid refrigerant to the cooler to complete the refrigerant circuit.

The Subcooler liquid level is continuously monitored to provide optimum subcooler, refrigerant condenser and evaporator performance. The level control valve automatically adjusts to all Real-World operating conditions, providing the most efficient and reliable operation of refrigerant flow control.

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 CONTROLS

During part load operation at off design conditions, the chiller capacity is reduced to maintain a constant leaving chilled liquid temperature by first decreasing the speed, closing the compressor pre-rotation vanes (PRV) (See *Figure 3 on page 11*), then opening the Hot Gas Bypass valve.

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.

This provides capacity reduction from 100% to 10% of design for normal air conditioning applications. The speed is controlled by a pneumatically actuated governor valve which throttles the inlet steam flow to the turbine to maintain the speed dictated by the capacity control logic. If the tower water temperatures must be held above 75°F for other chillers, the capacity control logic automatically limits the amount of speed reduction and PRV closure to maintain stable operation. The hot gas by-pass valve is then modulated to admit condenser gas into the evaporator and reduce the cooling effect as required. This will maintain a constant leaving chilled liquid temperature with loads down to 10% of design.

STEAM AND CONDENSATE FLOW

(See *Figure 4* on page 13)

The primary function of a steam turbine is to convert thermal energy into the mechanical energy required to rotate the compressor. When the trip valve is opened and the speed setpoint is increased to open the governor valve, the high pressure and temperature steam enters the steam ring of the turbine. From the steam ring, the steam passes through some permanently open nozzles and through the number of hand valves opened depending on the load requirements. As steam passes through stationary nozzles, steam pressure decreases while steam velocity increases. Mechanical energy is produced when high velocity steam strikes the turbine blades and causes the turbine rotor to move. As the steam passes through the stages of the rotor assembly producing mechanical energy, the thermal energy of the steam is reduced. The pressure and temperature of the supply steam determines how much thermal energy is available to produce mechanical energy and therefore have a significant effect on the ability of the chiller to produce the design refrigeration capacity.

The turbine exhaust must also be held at the proper vacuum by the steam condenser in order for the turbine to produce the required mechanical energy for a given load. The turbine exhaust steam enters the steam condenser through the steam inlet connection on the top of the condenser and is distributed longitudinally over the tubes. When the steam contacts the relatively cool tubes, it condenses. This condensing effect is a rapid change in state from a gas to a liquid, which results in a great reduction in specific volume. It is this reduction in volume that creates the vacuum in the steam

condenser. The steam condenser tubes are kept cool by the circulation of liquid from the refrigerant condenser outlet, which removes the heat given up by the condensing steam. Any air that enters the steam condenser via leakage in piping, around shaft seals, valves, etc., is removed by vacuum venting equipment such as a liquid ring vacuum pump, steam ejectors, or a combination of both.

The condensate is circulated by the hotwell pump through the recirculation and overboard valves. These valves are controlled by the chiller control panel to maintain the condensate level in the hotwell at the bottom of the steam condenser shell below the tubes. During the slow roll warm-up of the turbine, the condensate level will drop causing the overboard valve to close and the recirculation valve to open and return most of the condensate to the hotwell. As the turbine is ramped up to rated speed, more steam is condensed and the level increases causing the recirculation valve to close and the overboard valve to open thus returning more condensate to the boiler.

STEAM AND CONDENSATE FLOW DIAGRAM

1

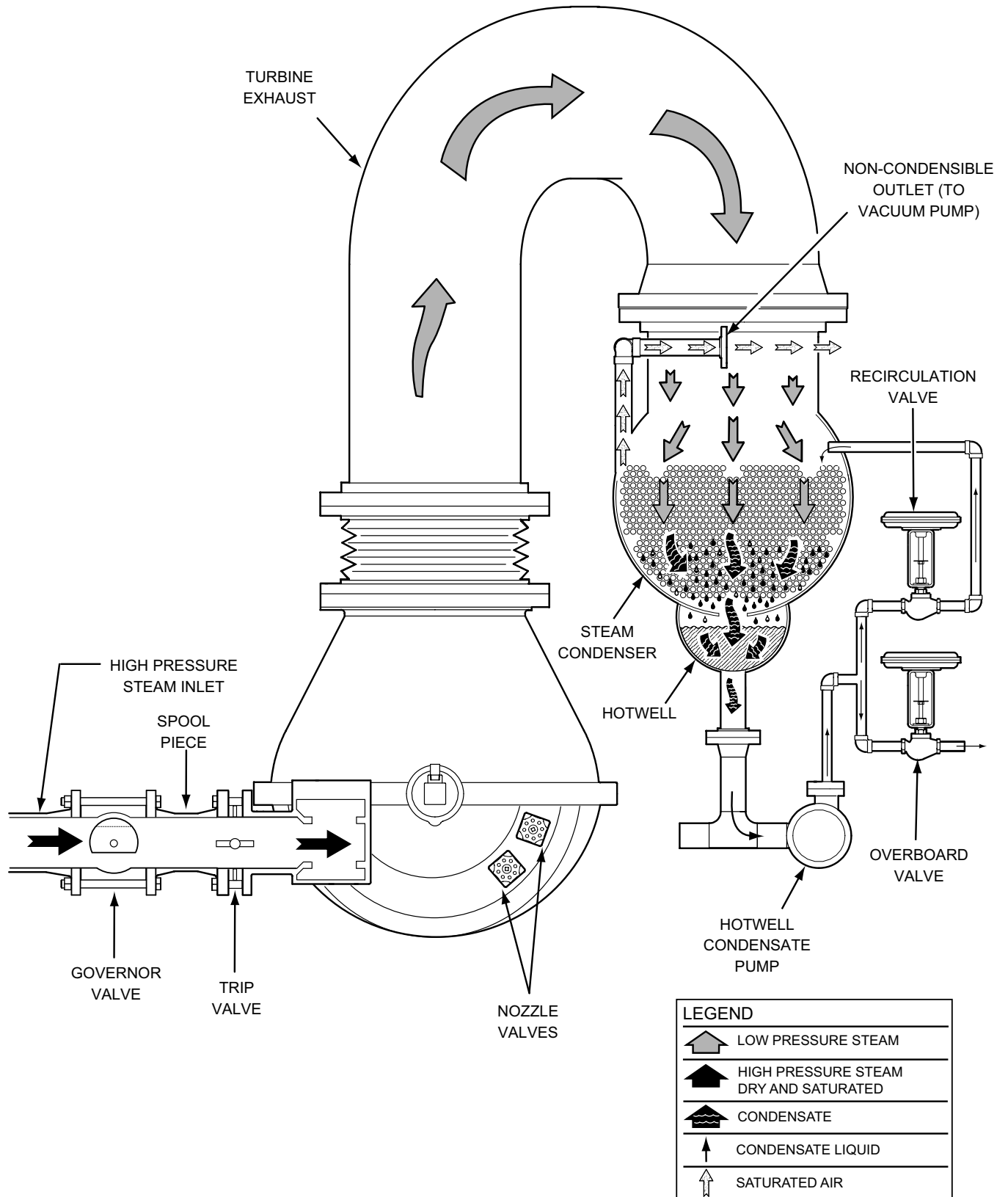


FIGURE 4 - STEAM AND CONDENSATE FLOW

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SECTION 2 - OPTIVIEW CONTROL CENTER INTRODUCTION

The YORK OptiView Control Center is furnished as standard on each chiller and provides the ultimate in efficiency, automation, monitoring, data recording, and chiller protection. The Control Center is a factory-mounted, wired and tested microprocessor based control system for R134a or R22 centrifugal chillers. The panel is configured with a diagonal color Liquid Crystal Display (LCD) surrounded by "soft" keys, which are redefined with one keystroke based on the screen displayed at that time. This makes chiller operation quicker and easier with a single button revealing a wide array of information on a large, full-color illustration of the appropriate component.

The LCD display allows graphic animated display of the chiller, chiller sub-systems and system parameters; this allows the presentation of several operating parameters at once. The operator may view a graphical representation of the historical operation of the chiller as well as the present operation. A Status Bar is displayed at all times on all screens. It contains the System - Status Line and Details Line, the Control Source, Access Level, and Time and Date.

During turbine slow roll, start up, operation and coastdown, the system will indicate vital information available at any time. The locations of various chiller parameters are clearly marked and 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.

Security access is provided to prevent unauthorized changes and setpoints. This is accomplished with three different levels of access and passwords for each level. There are screens, displayed values, programmable setpoints and manual controls shown that are for Service Technician use only. They are only displayed when logged in at SERVICE access level or higher. 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.

The control center is also fused to provide individual overcurrent protected 115 VAC power for the remote

mounted liquid pump motor starter control circuits (supplied by others) and controls installed on the chiller. Numbered terminal strips for wiring such as Remote Start/Stop, Chilled Liquid Pump Start, Condenser Liquid Pump Start, and Local or Remote Cycling devices are provided. The panel also provides field interlocks that indicate the chiller status. These contacts include a Remote Mode Ready-to-Start, a Cycling Shutdown, a Safety Shutdown and a chiller Run contact. System pressures are monitored with transmitters (4-20 mA) and transducers (0-5 VDC). System temperatures are monitored using thermistors and RTD's.

Setpoints can be changed from a remote location via 0-10VDC and 4-20mA, contact closures or through serial communications. The adjustable remote reset range [up to 20°F (11.1°C)] provides flexible, efficient use of remote signal depending on reset needs. Serial data interface to the Building Automation System (BAS) is through the optional Microgateway Card, which can be mounted inside the control Center. Interfaces using other industry standard protocols such as MODBUS RTU, Johnson N2, BACnet MS/TP, LON-MARK and ASCII are available.

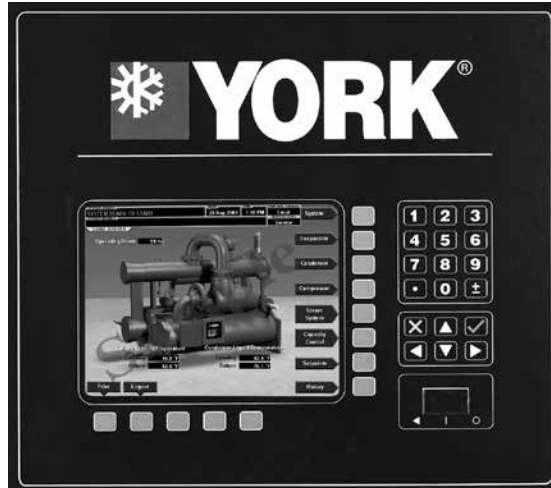
The operating program is stored in non-volatile memory to eliminate chiller failure due to AC power failure/battery discharge. Programmed setpoints are retained in lithium battery-backed RTC memory.

Smart Freeze Point Protection will run the chiller at 36°F (2.2°C) leaving chilled liquid temperature eliminating system trips on Low Liquid Temperature. The program and sensors will monitor the chiller liquid and evaporator refrigerant liquid temperatures to prevent freeze up. Every programmable point has a pop-up screen with the allowable ranges, so that the chiller can not be programmed to operate outside of its design limits.

The capacity control logic provides stable operation at maximum efficiency at off design conditions by modulating the turbine speed, compressor pre-rotation vanes and hot gas by-pass valve.

Advanced Diagnostics and troubleshooting information for qualified, trained Service Technicians are included in YORK Service Manual 160.67-M3. Refer to this manual where screen access level required = service.

OPTIVIEW CONTROL CENTER



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FIGURE 5 - OPTIVIEW CONTROL CENTER

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 allow movement on screens which contain a large amount of entry data. These keys can also 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. LED images are "ON" (illuminated) to indicate that the device is energized or the operation is currently active. 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 al-

lowed 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), they could Enable or Disable a feature or function, or they could select a mode of operation depending on the equipment supplied.

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, the available modes of operation, 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

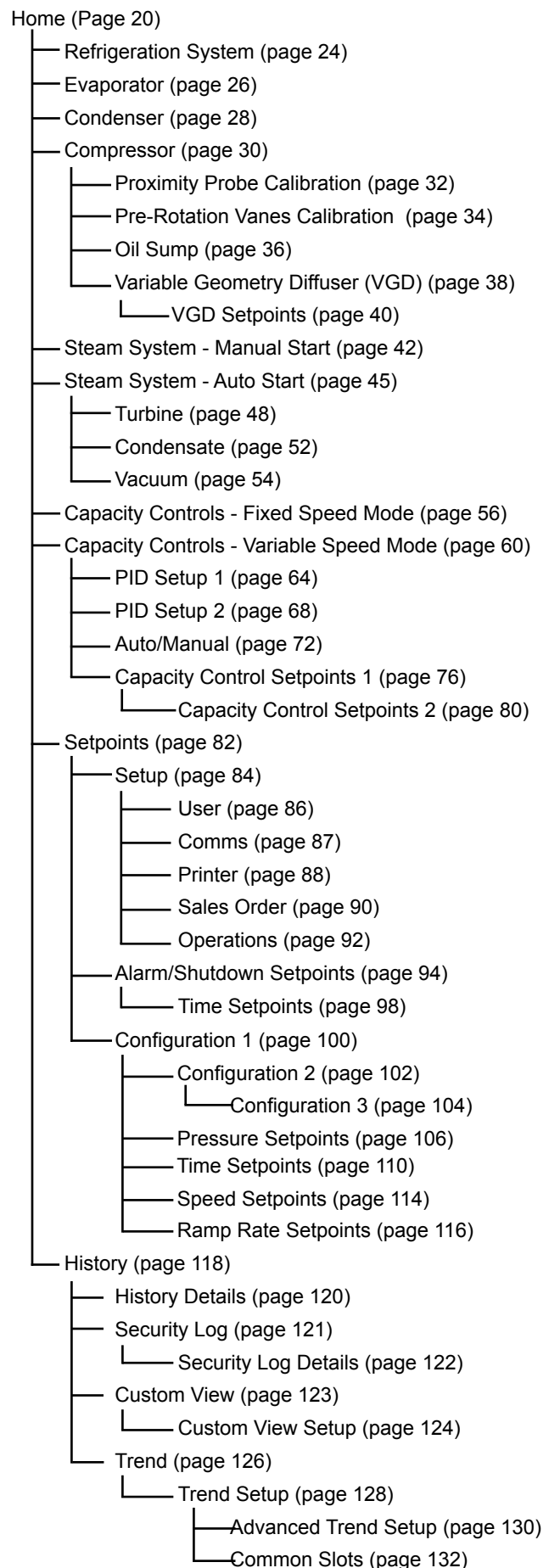
Some keys are used to perform manual control functions. These may involve manual control of items such as the pre-rotation vanes, subcooler level control valve, hot gas bypass valve or oil pump speed. Other keys in this category are used to initiate/terminate processes such as calibrations or reports.

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 Configuration Screen 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.



ANALOG INPUT RANGES - YORK MICROBOARD

The following tables indicate 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 mini-

mum or maximum value, respectively. Inputs shown as optional must be enabled on the appropriate screen in order to be displayed.

2

YORK MICROBOARD 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	8.0	99.0	Mils	203	2515	Micrometers
Subcooler Refrigerant Level	0.0	100.0	%	0.0	100.0	%
Drop Leg Refrigerant Temperature (optional)	0.0	121.7	°F	-17.7	9.8	°C

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

English/Metric Display Units Configuration – The Control Panel can present data on the Graphic Display in English or Metric Units. In Operator Access Level, from the HOME screen, press the “Setpoints” key to go to the SETPOINTS screen. Next, press the “Setup”

key to go to the SETUP screen. Press the “User” key to go the USER SETUP screen. Press the “English/Metric Units” key to select the desired units. The data field will toggle between English and Metric with each press of the “◀ or ▶” key.

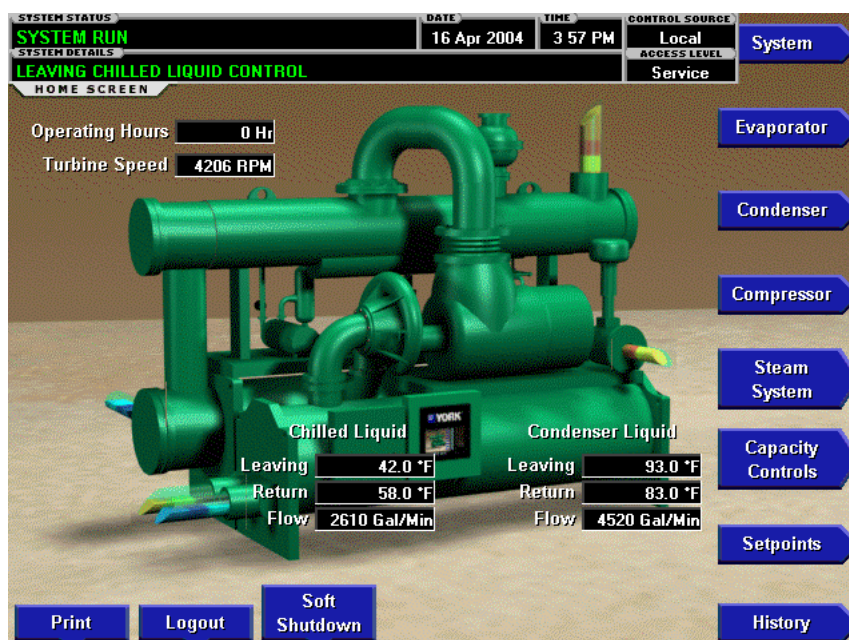
ANALOG INPUT RANGES - FRICK I/O BOARD

FRICK I/O BOARD ANALOG INPUT	ENGLISH RANGE			METRIC RANGE		
	LOW	HIGH	UNITS	LOW	HIGH	UNITS
Turbine Shaft End Horizontal Vibration (Optional)	0.0	5.0	Mils	0.0	127.0	Micrometers
Turbine Shaft End Vertical Vibration (Optional)	0.0	5.0	Mils	0.0	127.0	Micrometers
Turbine Supply Oil Temperature.	32.0	302.0	°F	0.0	150.0	°C
Turbine Shaft End Brg Temperature (Optional)	32.0	302.0	°F	32.0	150.0	°C
Turbine Governor End Horizontal Vibration (Optional)	0.0	5.0	Mils	0.0	127.0	Micrometers
Turbine Governor End Vertical Vibration (Optional)	0.0	5.0	Mils	0.0	127.0	Micrometers
Turbine Gov. End Brg Temperature (Optional)	32.0	302.0	°F	32.0	150.0	°C
Turbine Inlet Steam Temperature	32.0	842.0	°F	32.0	450.0	°C
Compressor Horizontal Vibration (Optional)	0.0	2.0	In/Sec	0.0	50.8	MM/Sec
Turbine Supply Oil Pressure	0.0	30.0	PSIG	0.0	206.8	kPaG
Turbine Inlet Steam Pressure	0.0	300.0	PSIG	0.0	2068.5	kPaG
Compressor Vertical Vibration (Optional)	0.0	2.0	In/Sec	0.0	50.8	MM/Sec
Chilled Water Flow (Optional)	0.0	#6000	GPM	0.0	#378.5	L/Sec
PRV Position Feedback Potentiometer	0.0	100.0	%	0.0	100.0	%
Condenser Water Flow (Optional)	0.0	#8000	GPM	0.0	#504.7	L/Sec
Steam Flow (Optional)	0.0	#22000	LB/HR	0.0	#9979.2	Kg/Hr
Turbine First Stage Steam Pressure	0.0	**100.0	PSIG	0.0	**689.5	kPaG
Turbine Exhaust Steam Pressure	0.0	45.0	PSIA	0.0	310.3	kPaA
Turbine Speed Sensor #1	0.0	5000.0	RPM	0.0	5000.0	RPM
Turbine Speed Sensor #2	0.0	5000.0	RPM	0.0	5000.0	RPM
Hotwell Condensate Level	0.0	100.0	%	0.0	100.0	%
Surface Condenser Outlet Temperature	30	150.0	°F	-1.11	65.6	°C

#Value shown is example only. Full scale range is programmable on Configuration Screen 2.

**For NON-Condensing Turbines, The high end of the range of the first stage steam pressure is 150 PSIG/ 1034.2 KPaG

HOME SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 6 - HOME SCREEN

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. The chilled and condenser liquid flow lines are animated whenever adequate flow has been established to close the respective flow switch. The turbine steam inlet flow line is animated at speeds above 500 RPM.

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 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.

Operating Hours

Displays the cumulative operating hours of the chiller.

Turbine Speed

The turbine speed is sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft. The pickup signals are converted to 4-20 mA signals by frequency-to-analog converters in the Turbine Box and connected to the Analog I/O Board in the Control Center. This data field displays the highest of the two speed input signals.

Steam Flow

Displays the rate of steam flowing through the turbine. This text and data field only appears if FSE1-Steam Flow Sensor Enable is set for Enabled on Configuration Screen 2.

Chilled Liquid Flow

Displays the rate of chilled liquid flowing through the evaporator. This text and data field only appears if FSE1-Evaporator Flow Sensor Enable is set for Enabled on Configuration Screen 2.

Condenser Liquid Flow

Displays the rate of cooling liquid flowing through the condenser. This text and data field only appears if FSE3-Condenser Flow Sensor Enable is set for Enabled on Configuration Screen 2.

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.)

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. Safety Shutdown Messages cannot be cleared until 35 seconds after the drive train has coasted to a stop as detected by the turbine rotating (speed switch) digital input.

Warning Reset

Access Level Required: OPERATOR

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

Soft Shutdown

Access Level Required: OPERATOR

This key, available only when the chiller is running, is used to initiate a controlled shutdown. This will decrease the sudden loss of steam load when the chiller trips, possibly preventing boiler relief valves from lifting.

When the MSSP4-Turbine Start Mode is set for Auto, when the Soft Shutdown is initiated, the Main Steam Inlet Valve control output is first decreased (ramped down at RRSP7 %/second) until it is equal to or less than the current output to the Governor Valve. From this point as the chiller unloads and until it is shutdown, the Main Steam Inlet Valve output will equal the Governor Valve output. When the two valve signals are tracking, the present LCLT Controller SP (Local/Remote setpoint, whichever is selected) is ramped up to a value equal to the return chiller liquid temp +5 °F and the chiller capacity controls begin unloading the chiller. At the same time, a Soft Shutdown timer (TDSP9-Soft Shutdown Rampdown Timer, adjustable 2-20 minutes on the Time Setpoints Screen) is enabled.

When the MSSP4-Turbine Start Mode is set for Manual, when the Soft Shutdown is initiated, the unloading proceeds immediately.

When the Speed Control Mode on Capacity Control Setpoints Screen 1 is set for Variable, the unloading begins with speed reduction to the calculated anti-surge minimum speed. When the speed has decreased to the calculated anti-surge minimum speed, the PRV

will close to the calculated anti-surge minimum vane position. While the vanes are closing and the head is decreasing, the speed will continue to ramp down to the lower calculated anti-surge minimum speed. When the PRV position feedback signal is equal to the calculated anti-surge minimum vane position, the hot gas valve will begin opening. While the hot gas valve is opening and the head is decreasing, the speed will continue to ramp down to the lower calculated anti-surge minimum speed and the vanes will continue to close to the lower calculated anti-surge minimum.

When the MSSP7-Speed Control Mode on Capacity Control Setpoints Screen 1 is set for Fixed, the unloading sequence begins with the vanes and proceeds to the hot gas valve as described above.

The chiller will be shutdown when the hot gas valve signal has increased to 95% (if HGV is Enabled) or the Soft Shutdown logic has been unloading the chiller longer than the TDSP9-Soft Shutdown Rampdown Timeout minutes entered on the Time Setpoints Screen (if HGV is Disabled).

While the chiller is unloading, if a LOCAL STOP is initiated with the Start/Stop control switch or any faults other than LEAVING CHILLED LIQUID-LOW TEMPERATURE, REMOTE STOP, or SYSTEM CYCLING – CONTACTS OPEN occur, the chiller will shutdown immediately and SYSTEM COASTDOWN is displayed.

To restart the chiller after an operator initiated Soft Shutdown, the Start/Stop control switch must be placed in the Stop/Reset position (O) and then the Start position (◀).

NAVIGATION

System

Used to provide additional refrigeration 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 position, Hot Gas Bypass Valve position (Control Output Signal), Proximity Probe calibration, and PRV calibration.

Steam System

Access Level Required: VIEW

A detailed view of all steam parameters and status of turbine and steam control devices. It is also the gateway to the screens showing details of the turbine lubrication system, steam condenser hotwell level control system, condensate pump and vacuum pump controls.

Capacity Controls

Access Level Required: VIEW

A detailed view of the capacity control system including various override and anti-surge control setpoints and parameters. It is also the gateway to screens for entering the tuning parameters of the various PID controllers and other setpoints pertinent to the operation of the capacity controls. The Auto/Manual Screen is also accessible from this screen.

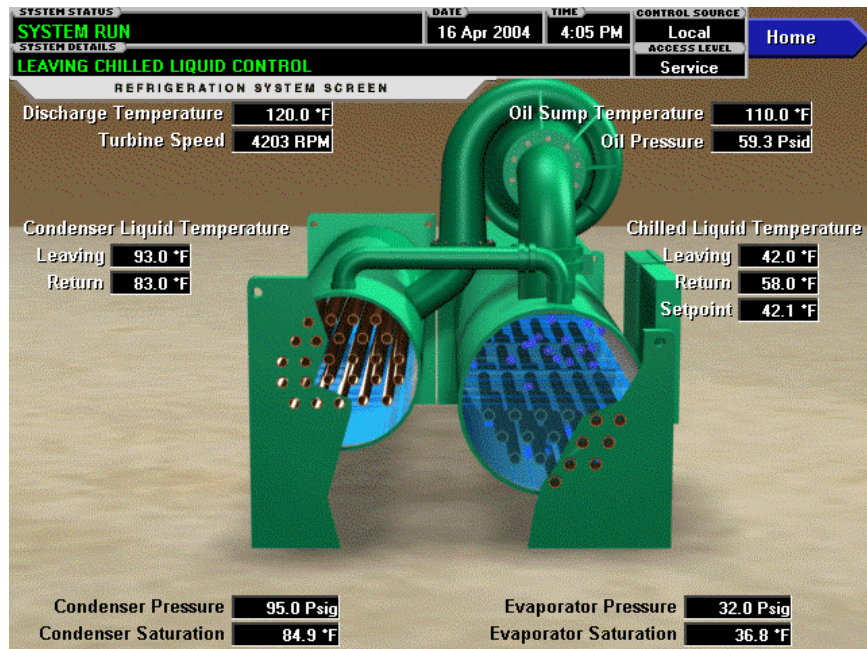
Setpoints

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, Printer Setup, etc. System alarm shutdown setpoints and configuration screens are also accessed from this screen.

History

This screen provides access to a snapshot of system data at each of the last 10 shutdown conditions.

REFRIGERATION SYSTEM SCREEN



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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 7 - REFRIGERATION SYSTEM SCREEN

OVERVIEW

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

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.

Turbine Speed

The turbine speed is sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft. This data field displays the highest of the two speed input signals.

PROGRAMMABLE

None

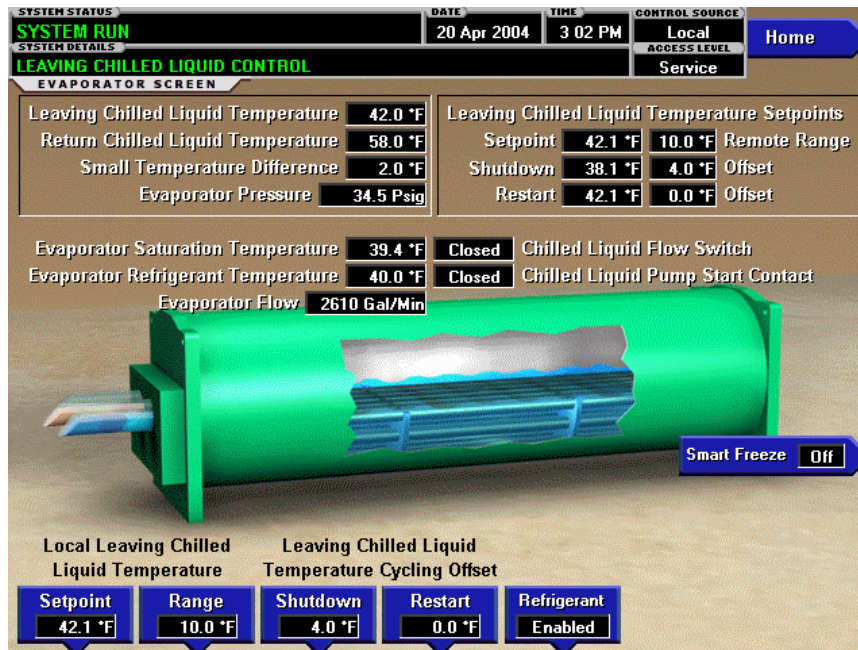
NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

EVAPORATOR SCREEN



00301VIP

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 8 - EVAPORATOR SCREEN

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 lines indicate chilled liquid flow.

DISPLAY ONLY

Chilled Liquid Flow Switch (Open/Closed)

Displays whether the liquid flow is present in the evaporator.

Chilled Liquid Pump Start Contact (Open/Closed)

Displays the status of the contact on the I/O board used to control the Chilled Liquid Pump Motor Starter.

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.

Chilled Liquid Flow

Displays the rate of chilled liquid flowing through the evaporator. This text and data field only appears if FSE1- Evaporator Flow Sensor Enable is set for Enabled on Configuration Screen 2.

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 shut down to avoid over-cooling the building. By default this value is 4°F below the Leaving Chilled Setpoint.

Leaving Chilled Liquid Temperature Setpoints – Restart

Displays the Leaving Chilled Liquid Temperature at which the chiller will restart after it has shut down due to over-cooling temperature. By default, the chiller will restart at the Leaving Chilled Liquid Temperature Setpoint.

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 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° - 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 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 allowable temperature for the Leaving Chilled Liquid Temperature and prevents over-cooling 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 (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.

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.

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.

Refrigerant (Enabled / Disabled)

Access Level Required: SERVICE

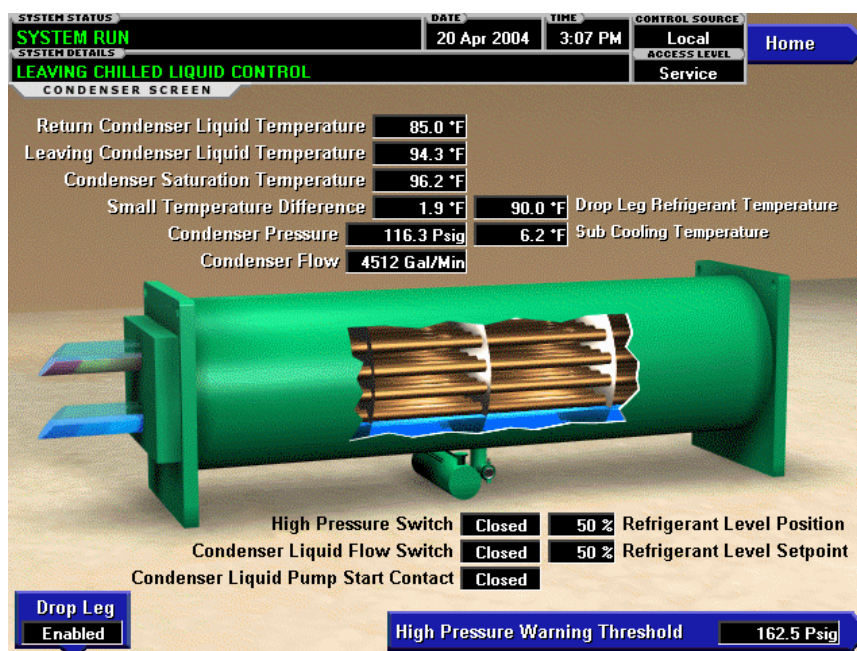
When an Evaporator Refrigerant Sensor has been installed it must be enabled via this toggle before the system will utilize the new, enhanced resolution input.

NAVIGATION**Home**

Access Level Required: VIEW

Causes an instant return to the Home Screen.

CONDENSER SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 9 - CONDENSER SCREEN

OVERVIEW

This screen displays a cutaway view of the chiller condenser. All setpoints relating to the condenser side of the chiller are maintained on this screen. Animation of the liquid flow lines indicate condenser liquid flow.

DISPLAY ONLY

Leaving Condenser Liquid Temperature

Displays the liquid temperature as it leaves the condenser.

Return Condenser Liquid Temperature

Displays the liquid temperature as it enters the condenser.

Condenser Pressure

Displays the refrigerant pressure in the condenser.

Condenser Liquid Flow

Displays the rate of cooling liquid flowing through the condenser. This text and data field only appears if FSE3-Condenser Flow Sensor Enable is set for Enabled on Configuration Screen 2.

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.

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 (Open / Closed)

Displays the status of the contact on the I/O board used to control the Condenser Liquid Pump Motor Starter.

Refrigerant Level Position

Displays the present position of the subcooler refrigerant level if this function is enabled.

Refrigerant Level Setpoint

Displays the setpoint to which the subcooler refrigerant level is being controlled.

Pull Down Time Remaining

Displays the time remaining in the period in which the Subcooler Refrigerant Level Controller is inactive after startup with the level control valve output signal held at 100% to keep the valve fully open. This is only displayed after the ramp up to rated speed has been completed, the TDSP17-Turbine Stabilization Delay shown on the Time Setpoints Screen has elapsed, and the pull down time remaining value is not zero.

Subcooler Control Zone

Displays the current operation of the Enhanced Zone Level Control. Service Technicians refer to YORK Service Manual 160.67-M3 for additional information on the operation of this control.

Subcooler Zone Time Remaining

This is only displayed when the chiller is running after the stabilization and pull-down delays when the zone control is active and transitioning from Zone 2 to Zone 1 control. It displays the seconds remaining in the time delay established by the Subcooler Zone Transition Time setpoint on the Capacity Controls Setpoints Screen 2.

Level Control Output

Displays the present control signal being sent to the analog output controlling the Subcooler Level Control Valve. As the refrigerant level in the subcooler rises above the setpoint, this output increases to open the valve.

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.

Drop Leg (Enabled / Disabled)

Access Level Required: SERVICE

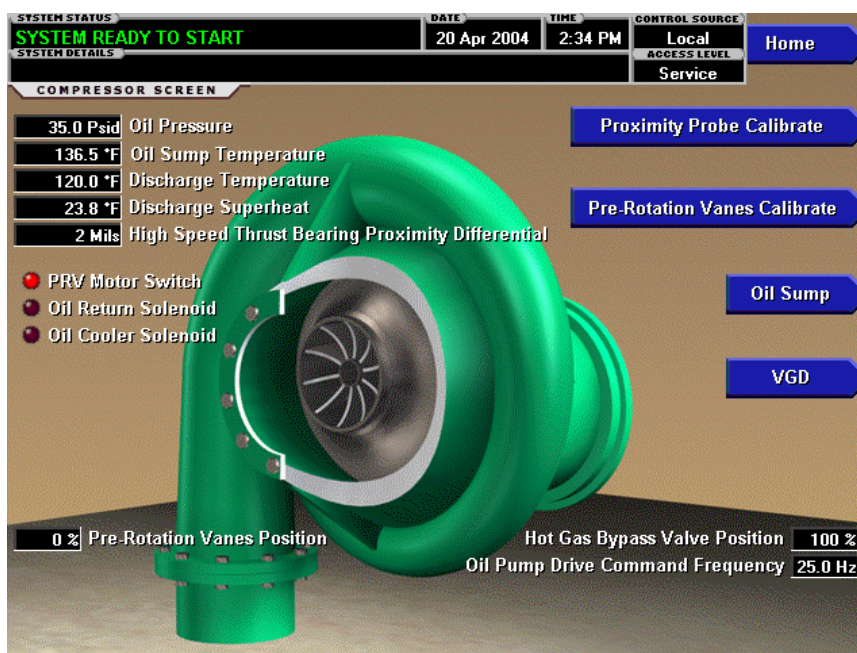
When a Drop Leg Refrigerant Sensor has been installed it must be enabled via this toggle before the system will utilize the new, enhanced resolution input.

NAVIGATION**Home**

Access Level Required: VIEW

Causes an instant return to the Home Screen.

COMPRESSOR SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 10 - COMPRESSOR SCREEN

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 that the compressor drive shaft is rotating as sensed by the Turbine Rotating (Speed Switch) digital input. This screen also serves as a gateway to sub-screens for calibrating the pre-rotation vanes, calibrating the proximity probe, Variable Geometry Diffuser (VGD) and viewing the oil sump parameters.

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 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. This is only displayed when the "Compressor Thrust Probe" is set for "Position" on the Operations Screen.

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. The liquid injection solenoid (if supplied) is also energized when this LED is on.

Vent Line Solenoid (LED - Style E-R22)

Indicates whether the solenoid is presently energized.

Pre-Rotation Vanes Position

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

Hot Gas Bypass Valve Position

This value displays the present position control signal sent to the analog output controlling the hot gas bypass valve.

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.

Oil Cooling Valve (LED)

Illuminates when the digital output controlling the solenoid valve or electric actuator in the compressor oil cooler liquid inlet line is energized to allow cooling liquid into the cooler.

Horizontal Vibration

Displays the movement of the Compressor Casing. It is measured by an Accelerometer installed at approximately 45° from the vertical center on the right side of the Rotor Support when facing the shaft end of the

Compressor. The Accelerometer signal is converted to a 4-20 mA signal by a Transmitter in the Turbine Box and connected to the Frick Analog I/O Board in the Control Center. This text and data field only appear if MSSP18-Compressor Vibration Sensors is set for Enabled on Configuration Screen 1.

Vertical Vibration

Displays the movement of the Compressor Casing. It is measured by an Accelerometer installed at approximately 45° from the vertical center on the left side of the Rotor Support when facing the shaft end of the Compressor. The Accelerometer signal is converted to a 4-20 mA signal by a Transmitter in the Turbine Box and connected to the Frick Analog I/O Board in the Control Center. This text and data field only appear if MSSP18-Compressor Vibration Sensors is set for Enabled on Configuration Screen 1.

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. This is only displayed when the "Compressor Thrust Probe" is set for "Switch" on the Operations Screen.

PROGRAMMABLE**Fault Acknowledge**

Access Level Required: SERVICE

This key allows clearing of the High Speed Thrust Bearing Limit Switch safety shutdown.

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. This key is only displayed when the "Compressor Thrust Probe" is set for "Position" on the Operations Screen.

Pre-Rotation Vane Calibration

Access Level Required: SERVICE

Only available if the chiller is stopped. Moves to the sub-screen allowing calibration of the Pre-rotation vanes.

Oil Sump

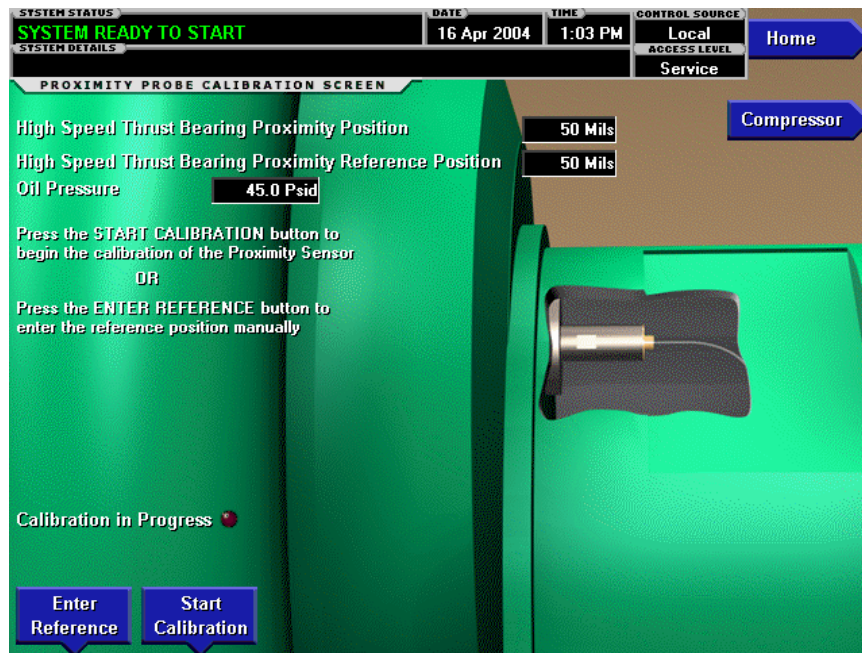
A detailed view of all the oil pump and oil sump parameters. This includes the Variable Speed Oil Pump when installed. It also controls the Seal Lubrication functionality.

VGD

Access Level Required: VIEW

A detailed view of the information pertinent to the Variable Geometry Diffuser (VGD) operation. It is also the gateway to the Variable Geometry Diffuser (VGD) Setpoints Screen. This key is only displayed if the VGD was enabled on the Operations Screen.

PROXIMITY PROBE CALIBRATION SCREEN

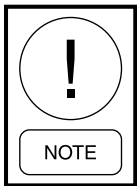


NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 11 - PROXIMITY PROBE CALIBRATION SCREEN

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. It is only displayed when the "Compressor Thrust Probe" is set for "Position" on the Operations Screen.



Requires a login access 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

Start Calibration

This option is hidden after calibration has started.

Cancel Calibration

This option only becomes available after calibration has started.

Accept Calibration

This option only becomes available after the calibration sequence is complete.

Fault Acknowledge

This option is only displayed if a fault is present. Allows clearing of High Speed Thrust Bearing related shutdowns.

NAVIGATION

Home

Access Level Required: VIEW

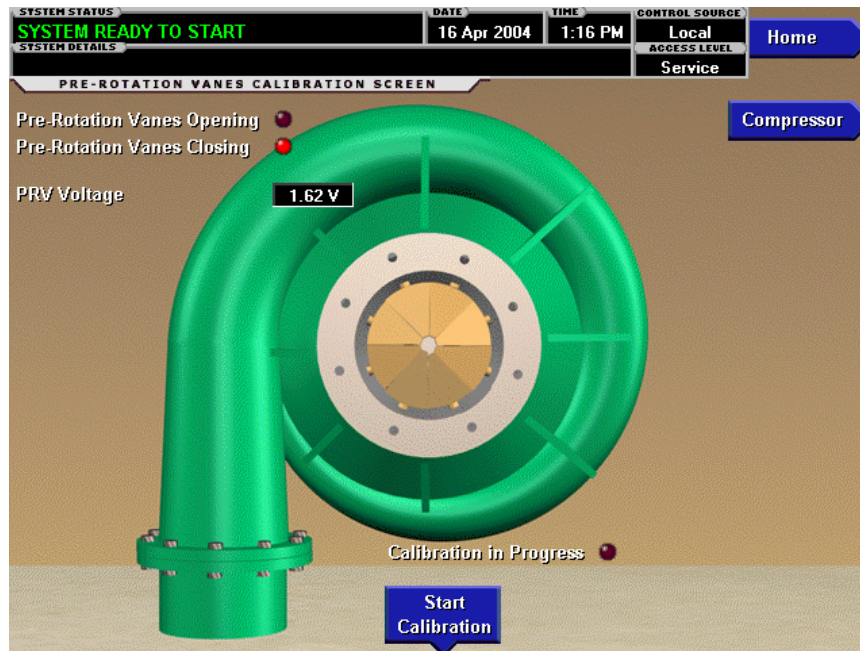
Causes an instant return to the Home Screen.

Compressor

Access Level Required: VIEW

Return to the Compressor Screen.

PRE-ROTATION VANES CALIBRATION SCREEN

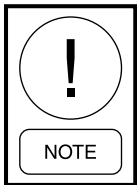


NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 12 - PRE-ROTATION VANES CALIBRATION SCREEN

OVERVIEW

This screen displays a cutaway view of the chiller compressor, revealing the pre-rotation vanes and provides the capability of calibrating the pre-rotation vanes for either Variable Speed Drive or Hot Gas Bypass applications.



*Requires a login access level of **SERVICE**. Service Technicians refer to **YORK Service Manual 160.67-M3** 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.

PRV Voltage

Displays the Pre-Rotation Vanes position potentiometer feedback voltage.

PROGRAMMABLE

Start Calibration

This option is hidden after calibration has started. Service Technicians refer to YORK Service Manual 160.67-M3 for an explanation of this setpoint.

Cancel Calibration

This option only becomes available after calibration has started. Service Technicians refer to YORK Service Manual 160.67-M3 for an explanation of this setpoint.

NAVIGATION

Home

Access Level Required: VIEW

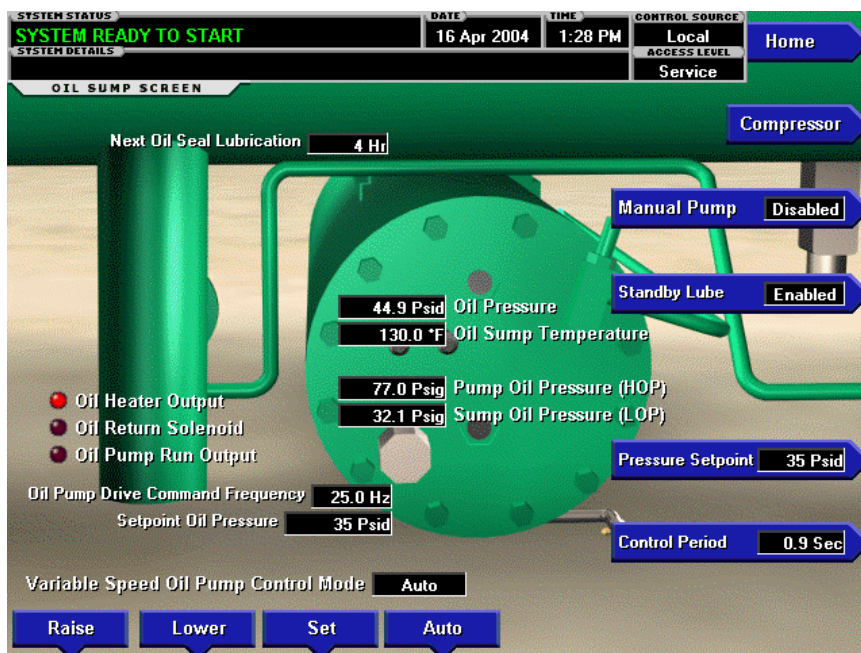
Causes an instant return to the Home Screen.

Compressor

Access Level Required: VIEW

Return to the Compressor Screen.

OIL SUMP SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 13 - OIL SUMP SCREEN

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 Sump Temperature

Displays the temperature of the oil in the sump.

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 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 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 Output (LED)

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.

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.

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.

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.

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.

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 (Disabled/Enabled)

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 key 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.

VARIABLE GEOMETRY DIFFUSER (VGD) SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 14 - VARIABLE GEOMETRY DIFFUSER (VGD) SCREEN

OVERVIEW

This screen is only available if the VGD was enabled on the Operations Screen. It displays all information pertinent to the operation of the VGD. 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.

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.

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

Appears when the VGD control is enabled after the transition to the “System Run” mode. Displays the current state of the VGD control. The states are: Stall Waiting, Stall Reacting, Probing, Sensor Override.

Limit Switch

Displays the status of the CCW limit switch in the VGD actuator. The status will change from Open to Closed when the VGD reaches its fully closed position.

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)**

Access Level Required: SERVICE

This key puts the VGD in manual mode and sends an open command to the VGD.

[VGD] Close (Manual)

Access Level Required: SERVICE

This key puts the VGD in manual mode and sends a close command to the VGD.

[VGD] HOLD (MANUAL)

Access Level Required: SERVICE

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

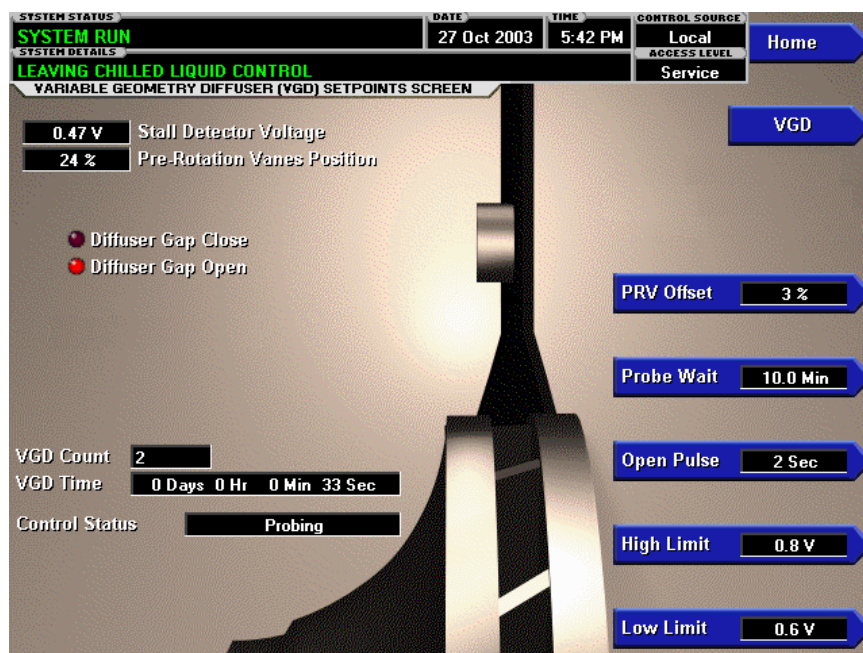
Causes an instant return to the compressor Screen.

VGD Setpoints

Access Level Required: SERVICE

Moves to the subscreen that allows programming of the Variable Geometry Diffuser setpoints.

VARIABLE GEOMETRY DIFFUSER SETPOINTS SCREEN



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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 15 - VARIABLE GEOMETRY DIFFUSER (VGD) SETPOINTS SCREEN

OVERVIEW

This screen is only available if the VGD was enabled on the Operations Screen. The Variable Geometry Diffuser setpoints are maintained on this screen. All setpoints require a login access level of Service.

DISPLAY ONLY

Stall Detector Voltage

Displays the Stall Detector output voltage (x.xxV), 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.

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.

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

Appears when the VGD control is enabled after the transition to the “System Run” mode. Displays the current state of the VGD control. The states are: Stall Waiting, Stall Reacting, Probing, and Sensor Override.

Limit Switch

Displays the status of the CCW limit switch in the VGD actuator. The status will change from Open to Closed when the VGD reaches its fully closed position.

Condenser Pressure Voltage

Displays the DC voltage from the condenser pressure transducer.

Stall DC Pressure Voltage

Displays the DC voltage from the stall pressure transducer.

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**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.

Extreme Stall Duration

(1-20 Min, default 10) – If the Stall Detector Voltage exceeds twice the High Limit for this duration, the VGD control is disabled, the VGD is opened, and WARNING – CONDITIONS OVERRIDE VGD is displayed.

PRV VGD Inhibit

(40-100%, default 95) – If the Pre-Rotation Vanes Position is above this value, the VGD control is disabled and the VGD is pulsed open according to the Open Pulse setpoint.

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.

NAVIGATION**Home**

Access Level Required: SERVICE

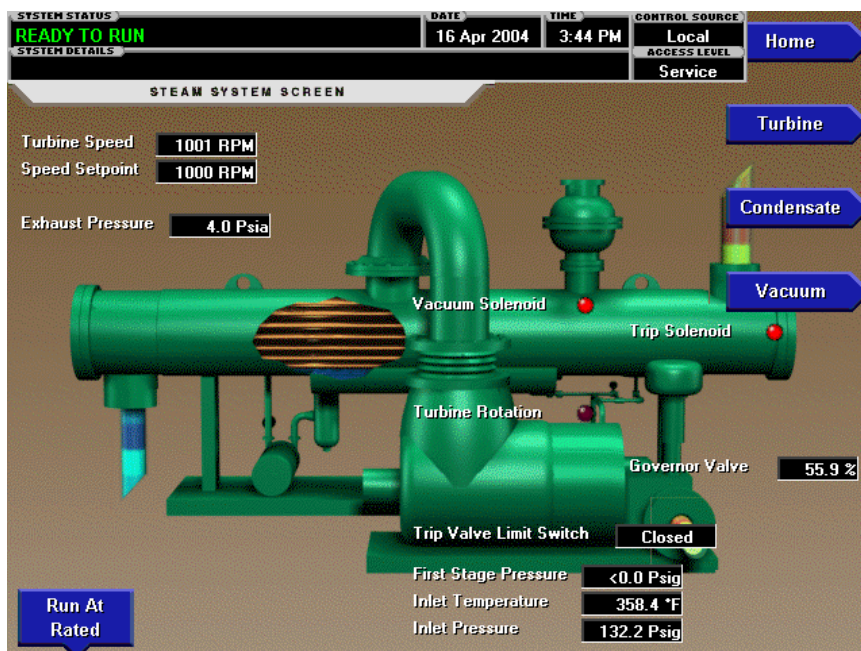
Causes an instant return to the Home Screen.

VGD Screen

Access Level Required: SERVICE

Causes an instant return to the Variable Geometry Diffuser Screen.

STEAM SYSTEM SCREEN - MANUAL START



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 16 - STEAM SYSTEM SCREEN - MANUAL START

OVERVIEW

This screen displays information pertaining to the turbine and steam condenser and shows all steam parameters and the status of turbine and steam control devices. The cooling liquid flow lines are animated whenever adequate flow has been established to close the refrigerant condenser liquid flow switch contacts. The turbine steam inlet flow line is animated at speeds above 500 RPM. See *Figure 17 on page 46* for a typical screen that would appear if a MSSP4-Turbine Start Mode is set for AUTO.

DISPLAY ONLY

Turbine Speed

The turbine speed is sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft. The pickup signals are converted to 4-20 mA signals by frequency-to-analog converters in the Turbine Box and connected to the Frick Analog I/O Board in the Control Center. This data field displays the highest of the two speed input signals.

Speed Setpoint

Displays the current speed setpoint that is dictated by the startup logic during the slow roll warm-up and ramp up to rated speed. After the chiller has attained minimum rated speed, the capacity control logic determines this setpoint.

Steam Flow

Displays the rate of steam flowing through the turbine. This text and data field only appears if FSE1-Steam Flow Sensor Enable is set for Enabled on Configuration Screen 2.

Exhaust Pressure

Displays the steam pressure measured at the exhaust of the turbine.

First Stage Pressure

Displays the steam pressure measured in the first stage of the turbine. This text and data field only appears if MSSP15-Turbine First Stage Pressure Sensor is set for Enabled on Configuration Screen 1.

Inlet Pressure

Displays the steam pressure measured at the inlet of the turbine.

Inlet Temperature

Displays the steam temperature measured at the inlet of the turbine .

Leaving Steam Condenser Liquid Temperature

Displays the colling liquid temperature measured at the outlet of Steam Condenser.

Governor Valve

Displays the present control signal being sent to the analog output controlling the pneumatically actuated turbine governor valve. This valve modulates the steam inlet flow to the turbine to control the speed at the value shown in the Speed Setpoint display. A 100% value represents a command for the valve to open fully.

Vacuum Solenoid (LED)

Illuminates when the vacuum breaker solenoid valve is energized to open the turbine exhaust to atmospheric pressure.

Trip Solenoid (LED)

Illuminates when the Turbine Trip Valve air dump solenoid valve is energized to open the turbine trip valve.

Turbine Rotation (LED)

Illuminates when the turbine shaft begins to rotate as sensed by the Turbine Rotating (Speed Switch) digital input.

Trip Valve Limit Switch (Open/Closed)

Displays the status of the limit switch sensing the closed position of the pneumatically actuated turbine trip valve. The status will change from Open to Closed after the Trip Solenoid LED illuminates indicating that limit switch contacts are closed and the valve is open.

Nozzle #1 Solenoid (LED)

Illuminates when the Turbine Nozzle Valve #1 Air Dump Solenoid Valve is energized to open that turbine nozzle valve. This object only appears if MSSP16-Turbine Nozzle Solenoids is set for Enabled or MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1. See *Figure 17 on page 46*.

Nozzle #2 Solenoid (LED)

Illuminates when the Turbine Nozzle Valve #2 Air Dump Solenoid Valve is energized to open that turbine nozzle valve. This object only appears if MSSP16-Turbine Nozzle Solenoids is set for Enabled or MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1. See *Figure 17 on page 46*.

Steam Ring Drain Solenoid (LED)

Illuminates when the digital output controlling the Turbine Steam Ring Drain Solenoid Valve is energized to open the drain line and allow any water that may have condensed inside the turbine to drain out.

PROGRAMMABLE**Begin Slow Roll**

Access Level Required: OPERATOR

This key is used to initiate the turbine slow roll warm-up sequence only if the MSSP4-Turbine Start Mode is set for Manual on the Configuration Screen 1. It appears only after the chiller start has been initiated, the pre-lube has been completed, and the turbine trip valve limit switch input has closed. Pressing this key causes the speed setpoint to increase to the SSP1-Slow Roll Speed setpoint shown on the Speed Setpoints Screen at the RRSP3-Slow Roll Ramp Rate shown on the Ramp Rate Setpoints Screen. This causes the output signal to the governor valve transducer to increase to open the governor valve. After the key has been pressed, this object disappears.

Run At Rated

Access Level Required: OPERATOR

This key is used to initiate the ramp up to rated speed only if MSSP4-Turbine Start Mode is set for Manual on the Configuration Screen 1. It appears only after the turbine slow roll warm-up has been completed and the turbine exhaust pressure is less than the programmed value. Pressing this key causes the Chilled Liquid Pump Start contacts (terminals 44-45 on the relay output board) to close to start the chilled liquid pump. After the TDSP5-Chilled Liquid Flow Switch Check Delay shown on the Time Setpoints Screen, if the chilled liquid flow switch is closed, the speed setpoint rapidly increases to the SSP3-Fixed Speed setpoint shown on the Speed Setpoints Screen at the RRSP4-Minimum Rated Speed Ramp Rate shown on the Ramp Rate Setpoints Screen. This causes the output signal to the governor valve transducer to increase to open the governor valve. After the key has been pressed, this object disappears.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Turbine

Access Level Required: VIEW

A detailed view of all the turbine lube system parameters and other status displays pertinent to the operation and protection of the turbine.

Condensate

Access Level Required: VIEW

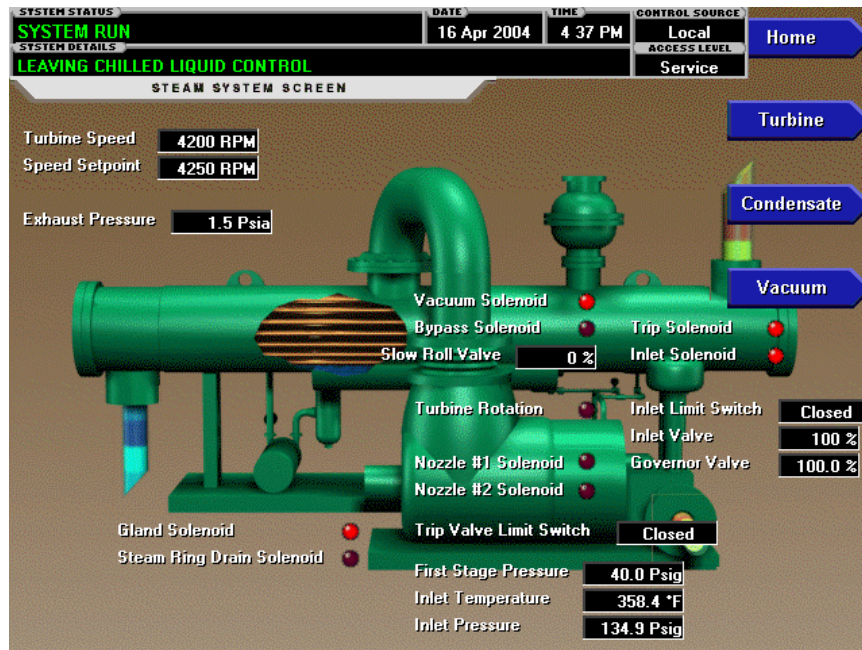
A detailed view of steam condenser hotwell condensate parameters and other status displays pertinent to the operation of the hotwell pumps and level control system.

Vacuum

Access Level Required: VIEW

A detailed view of the steam condenser with status displays pertinent to the operation of the steam condenser vacuum pumps.

STEAM SYSTEM SCREEN - AUTO START



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 17 - STEAM SYSTEM SCREEN - AUTO START

OVERVIEW

This screen displays information pertaining to the turbine and steam condenser and shows all steam parameters and the status of turbine and steam control devices. The cooling liquid flow lines are animated whenever adequate flow has been established to close the refrigerant condenser liquid flow switch contacts. The turbine steam inlet flow line is animated at speeds above 500 RPM.

DISPLAY ONLY

Turbine Speed

The turbine speed is sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft. The pickup signals are converted to 4-20 mA signals by frequency-to-analog converters in the Turbine Box and connected to the Analog I/O Board in the Control Center. This data field displays the highest of the two speed input signals.

Speed Setpoint

Displays the current speed setpoint that is dictated by the startup logic during the slow roll warm-up and ramp up to rated speed. After the chiller has attained minimum rated speed, the capacity control logic determines this setpoint.

Steam Flow

Displays the rate of steam flowing through the turbine. This text and data field only appears if FSE1-Steam Flow Sensor Enable is set for Enabled on Configuration Screen 2.

Exhaust Pressure

Displays the steam pressure measured at the exhaust of the turbine.

First Stage Pressure

Displays the steam pressure measured in the first stage of the turbine. This text and data field only appears if MSSP15-Turbine First Stage Pressure Sensor is set for Enabled on Configuration Screen 1.

Inlet Pressure

Displays the steam pressure measured at the inlet of the turbine.

Inlet Temperature

Displays the steam temperature measured at the inlet of the turbine.

Leaving Steam Condenser Liquid Temperature

Displays the cooling liquid temperature measured at the outlet of steam condenser

Governor Valve

Displays the present control signal being sent to the analog output controlling the pneumatically actuated turbine governor valve. This valve modulates the steam inlet flow to the turbine to control the speed at the value shown in the Speed Setpoint display. A 100% value represents a command for the valve to open fully.

Vacuum Solenoid (LED)

Illuminates when the vacuum breaker solenoid valve is energized to open the turbine exhaust to atmospheric pressure.

Trip Solenoid (LED)

Illuminates when the Turbine Trip Valve air dump solenoid valve is energized to open the turbine trip valve.

Turbine Rotation (LED)

Illuminates when the turbine shaft begins to rotate as sensed by the Turbine Rotating (Speed Switch) digital input.

Trip Valve Limit Switch (Open/Closed)

Displays the status of the limit switch sensing the closed position of the pneumatically actuated turbine trip valve. The status will change from Open to Closed after the Trip Solenoid LED illuminates indicating that limit switch contacts are closed and the valve is open.

Nozzle #1 Solenoid (LED)

Illuminates when the Turbine Nozzle Valve #1 Air Dump Solenoid Valve is energized to open that turbine nozzle valve. This object only appears if MSSP16-Turbine Nozzle Solenoids is set for Enabled or MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1.

Nozzle #2 Solenoid (LED)

Illuminates when the Turbine Nozzle Valve #2 Air Dump Solenoid Valve is energized to open that turbine nozzle valve. This object only appears if MSSP16-Turbine Nozzle Solenoids is set for Enabled or MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1.

Bypass Solenoid (LED)

Illuminates when the Steam Inlet Slow Roll Bypass Air Dump Solenoid Valve is energized to allow the valve to be opened for slow roll warm-up when the Slow Roll Valve display is greater than 0%. This object only appears if MSSP4-Turbine Start Mode is set for Auto and MSSP19- Governor Valve Location is set for Turbine on Configuration Screen 1.

Slow Roll Valve

Displays the present control signal being set to the analog output controlling the Steam Inlet Slow Roll Bypass Valve. A 100% value represents a command for the valve to open fully. This object only appears if MSSP4-Turbine Start Mode is set for Auto and MSSP19- Governor Valve Location is set for Turbine on Configuration Screen 1.

Inlet Solenoid (LED)

Illuminates when the Main Steam Inlet Block Valve Air Dump Solenoid Valve is energized to allow the valve to be opened for ramp up to rated speed. This object only appears if MSSP4-Turbine Start Mode is set for Auto and MSSP19- Governor Valve Location is set for Turbine on Configuration Screen 1.

Inlet Valve

Displays the present control signal being set to the analog output controlling the Main Steam Inlet Block Valve. A 100% value represents a command for the valve to open fully. This object only appears if MSSP4-Turbine Start Mode is set for Auto and MSSP19- Governor Valve Location is set for Turbine on Configuration Screen 1.

Inlet Limit Switch (Open/Closed)

Displays the status of the Main Steam Inlet Valve Closed Limit Switch. The status will change from Closed to Open when the Inlet Valve display is greater than 0% and indicates that the valve has moved off of the fully closed position and is admitting steam to the turbine for ramp up to rated speed. This object only appears if MSSP4-Turbine Start Mode is set for Auto and MSSP19- Governor Valve Location is set for Turbine on Configuration Screen 1.

Steam Ring Drain Solenoid (LED)

Illuminates when the digital output controlling the Turbine Steam Ring Drain Solenoid Valve is energized to open the drain line and allow any water that may have condensed inside the Turbine to drain out.

Leaving Steam Condenser Liquid Temperature

Display purposes only. This is the outlet temperature of the surface condenser. NOTE: This feature was added in 2007, and may NOT be applicable to units manufactured prior to 2007.

NAVIGATION**Home**

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Turbine

Access Level Required: VIEW

A detailed view of all the turbine lube system parameters and other status displays pertinent to the operation and protection of the turbine.

Condensate

Access Level Required: VIEW

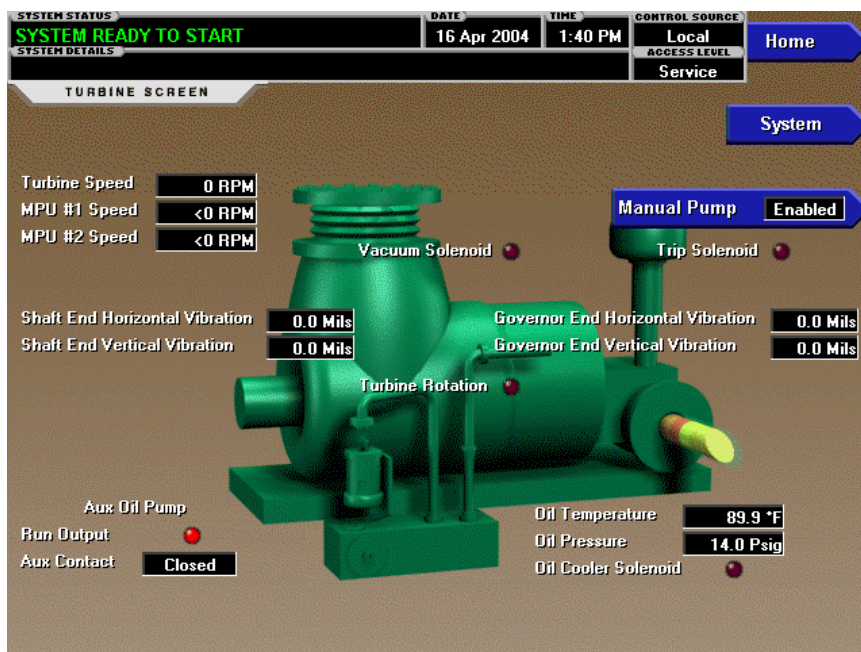
A detailed view of steam condenser hotwell condensate parameters and other status displays pertinent to the operation of the hotwell pumps and level control system.

Vacuum

Access Level Required: VIEW

A detailed view of the steam condenser with status displays pertinent to the operation of the steam condenser vacuum pumps.

TURBINE SCREEN



LD09264

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 18 - TURBINE SCREEN

OVERVIEW

This screen displays information for the turbine lube system and shows all measured oil and bearing parameters and status displays pertinent to the operation and protection of the turbine. In addition, this screen also allows manual control of the turbine auxiliary oil pump. The turbine steam inlet flow line is animated at speeds above 500 RPM.

Turbine Speed

The turbine speed is sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft. The pickup signals are converted to 4-20 mA signals by frequency-to-analog converters in the Turbine Box and connected to the Analog I/O Board in the Control Center. This data field displays the highest of the two speed input signals.

MPU #1 Speed

Access Level Required: SERVICE

Displays the speed input signal from the designated magnetic pickup.

MPU #2 Speed

Access Level Required: SERVICE

Displays the speed input signal from the designated magnetic pickup.

Shaft Bearing Temperature

Displays the surface temperature of the shaft end journal bearing. This text and data field only appears if MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on Configuration screen 1.

DISPLAY ONLY

Governor Bearing Temperature

Displays the surface temperature of the governor end journal bearing. This text and data field only appears if MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on Configuration screen 1.

Shaft Horizontal Vibration

Displays the movement of the turbine shaft on the shaft end of the turbine. It is measured by a proximity probe installed at approximately 45 degrees from the vertical center on the right side when facing the governor end of the turbine. The probe signal is converted to a 4-20 mA signal by a transmitter in the Turbine Box and connected to the Analog I/O Board in the Control Center. This text and data field only appears if MSSP13-Turbine Shaft Vibration Sensors is set for Enabled or the MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1.

Shaft Vertical Vibration

Displays the movement of the turbine shaft on the shaft end of the turbine. It is measured by a proximity probe installed at approximately 45 degrees from the vertical center on the left side when facing the governor end of the turbine. The probe signal is converted to a 4-20 mA signal by a transmitter in the Turbine Box and connected to the Analog I/O Board in the Control Center. This text and data field only appears if MSSP13-Turbine Shaft Vibration Sensors is set for Enabled or the MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1.

Governor Horizontal Vibration

Displays the movement of the turbine shaft on the governor end of the turbine. It is measured by a proximity probe installed at approximately 45 degrees from the vertical center on the right side when facing the governor end of the turbine. The probe signal is converted to a 4-20 mA signal by a transmitter in the Turbine Box and connected to the Analog I/O Board in the Control Center. This text and data field only appears if MSSP13-Turbine Shaft Vibration Sensors is set for Enabled or the MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1.

Governor Vertical Vibration

Displays the movement of the turbine shaft on the governor end of the turbine. It is measured by a proximity probe installed at approximately 45 degrees from the vertical center on the left side when facing the governor end of the turbine. The probe signal is converted to a 4-20 mA signal by a transmitter in the Turbine Box and connected to the Analog I/O Board in the Control Center. This text and data field only appears if MSSP13-Turbine Shaft Vibration Sensors is set for Enabled or the MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1.

Oil Temperature

Displays the temperature of the supply oil leaving the oil cooler down stream of the temperature control valve. This text and data field only appears if the MSSP6-Turbine Lubrication Type is set for Pump on Configuration Screen 1.

Oil Pressure

Displays the pressure of the supply oil leaving the oil cooler down stream of the temperature control valve. This text and data field only appears if the MSSP6-Turbine Lubrication Type is set for Pump on Configuration Screen 1.

Oil Cooling Valve (LED)

Illuminates when the digital output controlling the solenoid valve or electric actuator in the turbine oil cooler liquid inlet line is energized to allow cooling liquid into the cooler. If the MSSP6-Turbine Lubrication Type is set for Ring on Configuration Screen 1, this is the valve controlling the cooling liquid inlet to the bearing oil reservoirs on the turbine.

Aux Oil Pump Run Output (LED)

Illuminates when the turbine auxiliary oil pump contactor is energized to start the oil pump. This object only appears if the MSSP6-Turbine Lubrication Type is set for Pump on Configuration Screen 1.

Aux Contact (Open/Closed)

Displays the status of the auxiliary contact on the turbine auxiliary oil pump contactor. The status will change from Open to Closed after the Run Output LED illuminates indicating that the contactor has pulled in. This object only appears if the MSSP6-Turbine Lubrication Type is set for Pump on Configuration Screen 1.

Vacuum Solenoid (LED)

Illuminates when the vacuum breaker solenoid valve is energized (normally open) to isolate the turbine exhaust from atmospheric pressure.

Trip Solenoid (LED)

Illuminates when the Turbine Trip Valve air dump solenoid valve is energized to open the turbine trip valve.

PROGRAMMABLE

Manual Pump (Disabled/Enabled)

Access Level Required: OPERATOR

This key puts the auxiliary oil pump control in the Manual Mode and forces it to RUN. The oil pump is limited to running ten (10) minutes. If a longer running time is desired, this key must be pressed again. Manual Pump control is disabled (and the key hidden) during system prelube, system run, and system coastdown. This object only appears if the MSSP6-Turbine Lubrication Type is set for Pump on Configuration Screen 1.

NAVIGATION

Home

Access Level Required: VIEW

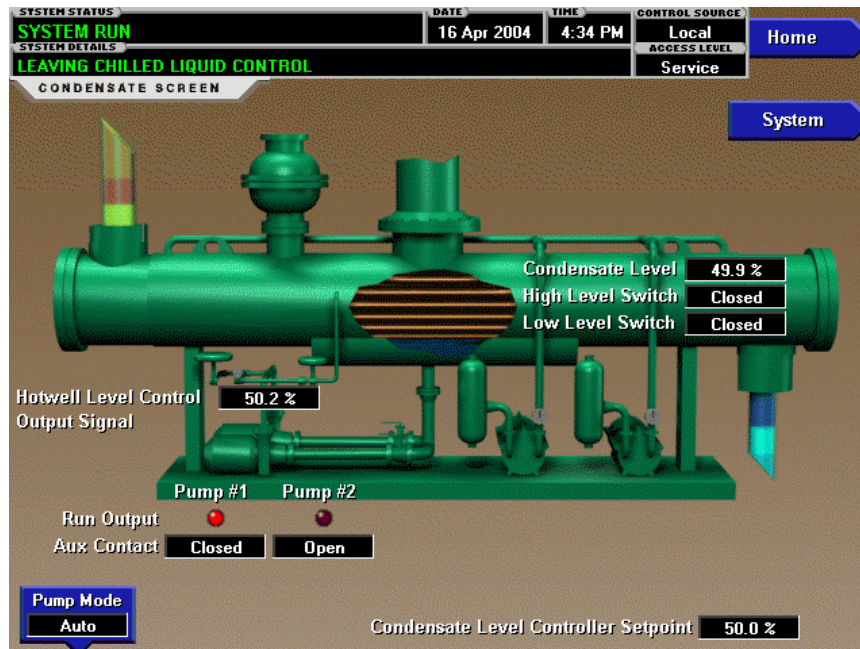
Causes an instant return to the Home Screen.

System

Access Level Required: VIEW

Causes an instant return to the Steam System Screen.

CONDENSATE SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 19 - CONDENSATE SCREEN

OVERVIEW

This screen displays information pertaining to the steam condenser hotwell condensate and other status displays pertinent to the operation of the hotwell pumps and level control system. The cooling liquid flow lines are animated whenever adequate flow has been established to close the refrigerant condenser liquid flow switch contacts.

Condensate Level Setpoint

Displays the present Hotwell Level Setpoint (HLSP1) entered on the PID Setup Screen 1.

Condensate Level

Displays the level of condensate in the steam condenser hot well.

High Level Switch (Open/Closed)

Displays the status of the Hotwell Condensate High Level Switch digital input. The status will be Closed when the condensate level in the hotwell is in the normal operating range and will change to Open when the level in the hotwell has increased to 5.5 inches or more above the normal operating level.

Low Level Switch (Open/Closed)

Displays the status of the Hotwell Condensate Low Level Switch digital input. The status will be Closed when the condensate level in the hotwell is in the normal operating range and will change to Open when the level in the hotwell has decreased to 5.5 inches or more below the normal operating level.

Hotwell Level Control

Displays the present control signal being sent to the analog output controlling the electric to pneumatic level control valve transducer. This transducer provides a 3-15 PSIG output signal to the condensate recirculation and overboard valves. As the level in the hot well increases, the transducer pneumatic output signal to the valves decreases to open the overboard valve and close the recirculation valve.

Pump #1 Run Output (LED)

Illuminates when the Hotwell Pump #1 contactor is energized to start the pump.

Pump #1 Aux Contact (Open/Closed)

Displays the status of the auxiliary contact on the Hotwell Pump #1 contactor. The status will change from Open to Closed after the Run Output LED illuminates indicating that the contactor has pulled in.

Pump #2 Run Output (LED)

Illuminates when the Hotwell Pump #2 contactor is energized to start the pump. This object only appears if MSSP10-Hotwell Pump Mode is set for Dual on Configuration Screen 1.

Pump #2 Aux Contact (Open/Closed)

Displays the status of the auxiliary contact on the Hotwell Pump #2 contactor. The status will change from Open to Closed after the Run Output LED illuminates indicating that the contactor has pulled in. This object only appears if MSSP10-Hotwell Pump Mode is set for Dual on Configuration Screen 1.

PROGRAMMABLE

Pump Mode (Auto/Manual 1/ Manual 2)

Access Level Required: SERVICE

This key puts the selected hotwell pump in the Manual Mode and forces it to RUN. The selected pump will only start if the other pump is not running. If MSSP10-Hotwell Pump Mode is set for Single on Configuration Screen 1, the hotwell pump will be started if Manual1 or Manual 2 is selected.

NAVIGATION

Home

Access Level Required: VIEW

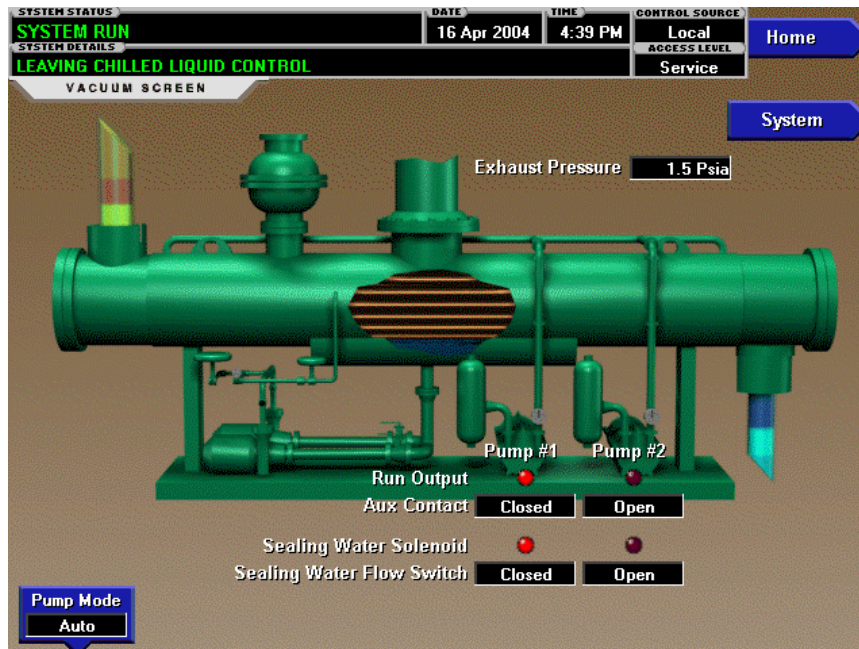
Causes an instant return to the Home Screen.

System

Access Level Required: VIEW

Causes an instant return to the Steam System Screen.

VACUUM SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 20 - VACUUM SCREEN

OVERVIEW

This screen displays information pertinent to the operation of the steam condenser vacuum pumps. The cooling liquid flow lines are animated whenever adequate flow has been established to close the refrigerant condenser liquid flow switch contacts.

DISPLAY ONLY

Exhaust Pressure

Displays the pressure in the turbine exhaust line as measured by a transmitter installed on the turbine.

Pump #1 Sealing Water Solenoid (LED)

Illuminates when Vacuum Pump #1 Sealing Water Solenoid Valve is energized to allow sealing water into the pump housing.

Pump #1 Sealing Water Flow Switch (Open/Closed)

Displays the status of the Vacuum Pump #1 Sealing Water Flow Switch digital input. The status will change from Open to Closed after the Pump #1 Sealing Water Solenoid LED is illuminated and adequate flow has been established to close the flow switch contacts.

Pump #1 Run Output (LED)

Illuminates when the Vacuum Pump #1 contactor is energized to start the pump. This will occur after the Vacuum Pump #1 Sealing Water Flow Switch status changes to closed.

Pump #1 Aux Contact (Open/Closed)

Displays the status of the auxiliary contact on the Vacuum Pump #1 contactor. The status will change from Open to Closed after the Run Output LED illuminates indicating that the contactor has pulled in.

Pump #2 Sealing Water Solenoid (LED)

Illuminates when Vacuum Pump #2 Sealing Water Solenoid Valve is energized to allow sealing water into the pump housing. This object only appears if the MSSP11-Vacuum Pump Mode is set for Dual on Configuration Screen 1.

Pump #2 Sealing Water Flow Switch (Open/Closed)

Displays the status of the Vacuum Pump #2 Sealing Water Flow Switch digital input. The status will change from Open to Closed after the Pump #2 Sealing Water Solenoid LED is illuminated and adequate flow has been established to close the flow switch contacts. This object only appears if MSSP11-Vacuum Pump Mode is set for Dual on Configuration Screen 1.

Pump #2 Run Output (LED)

Illuminates when the Vacuum Pump #2 contactor is energized to start the pump. This will occur after the Vacuum Pump #2 Sealing Water Flow Switch status changes to closed. This object only appears if MSSP11-Vacuum Pump Mode is set for Dual on Configuration Screen 1.

Pump #2 Aux Contact (Open/Closed)

Displays the status of the auxiliary contact on the Vacuum Pump #2 contactor. The status will change from Open to Closed after the Run Output LED illuminates indicating that the contactor has pulled in. This object only appears if MSSP11-Vacuum Pump Mode is set for Dual on Configuration Screen 1.

PROGRAMMABLE

Pump Mode (Auto/Manual 1/ Manual 2)

Access Level Required: SERVICE

This key initiates a Manual start sequence for the selected vacuum pump by manually energizing the associated vacuum pump sealing water solenoid valve. The selected vacuum pump will start after the associated sealing water flow switch status changes to closed. The manual starting of the selected pump will only be initiated if the other pump is not running. If MSSP11-Vacuum Pump Mode is set for Single on Configuration Screen 1, the vacuum pump start sequence will be initiated if Manual 1 or Manual 2 is selected.

NAVIGATION

Home

Access Level Required: VIEW

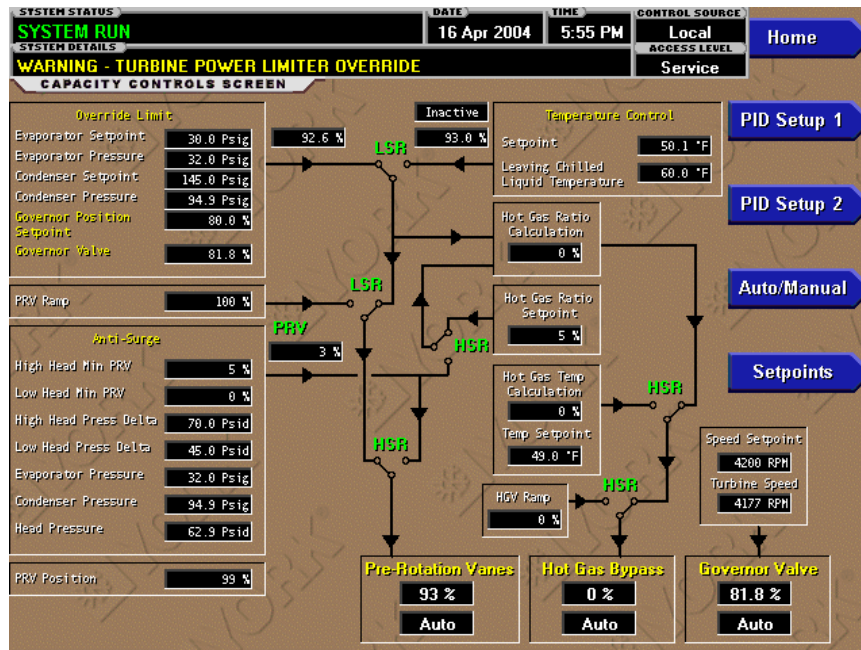
Causes an instant return to the Home Screen.

System

Access Level Required: VIEW

Causes an instant return to the Steam System Screen.

CAPACITY CONTROLS SCREEN-FIXED SPEED MODE



LD09261

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 21 - CAPACITY CONTROLS SCREEN-FIXED SPEED MODE

OVERVIEW

This screen appears when MSSP7-Speed Control Mode on Capacity Control Setpoints Screen 1 is set for Fixed. The fixed speed mode would likely only be used in plants where the condensing water is always at a high temperature so that speed reduction would not be possible due to the high system pressure differential. This screen is a detailed view of the capacity control system including various override and anti-surge control setpoints and parameters. It is also the gateway to screens for entering the tuning parameters of the various PID controllers and other setpoints pertinent to the operation of the capacity controls. The Auto/Manual Screen is also accessible from this screen.

DISPLAY ONLY

Graphics and Animation

The arrows on the interconnecting lines indicate the logical direction of signal flow between the controlling devices. An HSR (High Select Relay) will select the higher of the two signals entering it and pass it on to the next device. An LSR (Low Select Relay) will select the lower of the two signals entering it and pass it on to the next device. The line within the relay will toggle to show which input is currently being selected.

Override Limit Box

This box displays parameters pertinent to the override limiting controls that take control of the capacity control devices during off design operation in order to prevent unsafe operation and prevent the chiller from shutting down.

Override Limit - Evaporator Pressure Setpoint

Displays the present setpoint of the Evaporator Pressure PID controller that is entered on PID Setup Screen 1. If the evaporator pressure falls below this value, the output of this block will decrease below 100%. The text color changes to Red if this controller is active.

Override Limit - Evaporator Pressure

Displays the present refrigerant pressure in the evaporator.

Override Limit - Condenser Pressure Setpoint

Displays the present setpoint of the Condenser Pressure PID controller that is entered on PID Setup Screen 1. If the condenser pressure rises above this value, the output of this block will decrease below 100%. The text color changes to Red if this controller is active.

Override Limit - Condenser Pressure

Displays the present refrigerant pressure in the condenser.

Override Limit - Horsepower Limit Setpoint

This is displayed if MSSP8-Power Limiting Mode on Capacity Control Setpoints Screen 1 is set for Horsepower. It displays the present setpoint of the Horsepower Limit PID controller. If the calculated horsepower rises above this value, the output of this block will decrease below 100%. The text color changes to Red if this controller is active.

Override Limit - Horsepower

Displays the calculated horsepower output of the turbine.

Override Limit - Governor Position Setpoint

This is displayed if MSSP8-Power Limiting Mode on Capacity Control Setpoints Screen 1 is set for Position. It displays the present setpoint of the Gov Valve Position Limit PID controller that is entered on PID Setup Screen 2. This mode is only used when the Turbine First Stage Steam Pressure Transmitter is not present. In this case, the only available means to prevent the turbine from producing too much power is to monitor the Governor Valve output at normal full load conditions and then enter this percent as the setpoint for the position-limiting controller. If the output signal controlling the Governor Valve I/P Transducer rises above this value, the output of this block will decrease below 100%. The text color changes to Red if this controller is active.

Override Limit - Governor Valve

Displays the present output signal controlling the Governor Valve I/P Transducer.

Anti-Surge Box

This box displays parameters pertinent to the anti-surge controls that limit the amount of vane closure based on the head pressure differential (condenser minus evaporator pressure). The output data field displays the present calculated minimum vane control signal.

Anti-Surge - High Head Min PRV

Displays the present High Head Min PRV setpoint that is entered on the Auto/Manual Screen. This is the minimum PRV control signal allowed when the head is equal to the High Head Pressure Delta setpoint.

Anti-Surge - Low Head Min PRV

Displays the present Low Head Min PRV setpoint that is entered on the Auto/Manual Screen. This is the minimum PRV control signal allowed when the head is equal to the Low Head Pressure Delta setpoint.

Anti-Surge - High Head Press Delta

Displays the present High Head Pressure Delta setpoint that is entered on the Auto/Manual Screen. This is the maximum head that the chiller will likely see in normal operation. The output data field will show the High Head Min PRV value when the Head Pressure is at this value.

Anti-Surge - Low Head Press Delta

Displays the present Low Head Pressure Delta setpoint that is entered on the Auto/Manual Screen. This is the minimum head that the chiller will likely see in normal operation while running at or above the minimum rated speed. The output data field will show the Low Head Min PRV value when the Head Pressure is at this value.

Anti-Surge - Head Pressure

Displays the present result of the condenser refrigerant pressure minus the evaporator refrigerant pressure.

Temperature Control Box

This box displays parameters pertinent to the Leaving Chilled Liquid Controller used to maintain the liquid temperature at the setpoint shown. The output displayed will decrease to unload the chiller if the Leaving Chilled Liquid Temperature is below the Setpoint. The response time of the controller is determined by the tuning entered on the PID Setup Screen 1. The data field above the output display shows the Inactive or Active status of the controller. The controller is Inactive (yellow text) during shutdown and ramp up to rated speed with its output signal equal to the present PRV Ramp signal. It becomes Active (green text) when the vane ramp signal is at 97% or the leaving chilled liquid temperature decreases to within 2 °F of the present setpoint. It is also Inactive if any override controller is active, in which case its' output is equal to the override block output. It becomes Active after the override controller is no longer controlling and the TDSP10-Temp Control Override Transfer Delay shown on the Capacity Control Setpoints Screen 1 has elapsed.

Temperature Control - Setpoint

Displays the present Leaving Chilled Liquid Temperature Setpoint used to control the chiller. This may be the Local Setpoint entered on the Setpoints Screen or the Remote Setpoint if being controlled by a remote signal.

Temperature Control - Leaving Chilled Liquid Temperature

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

PRV Ramp

Displays the present signal leaving the PRV Ramp logic. It is based on the RRSP8-PRV Ramp Rate shown on the Capacity Control Setpoints Screen 1. On start-up, when the ramp up to rated speed has commenced, this output is set at the PRVM- PRV Minimum Open Position shown on Capacity Control setpoints Screen 2. It is used to provide a controlled loading rate after the chiller has been ramped up to the minimum rated speed.

HGV Ramp

Displays the present signal leaving the HGV Ramp logic. It is based on the RRSP9-Hot Gas Valve Ramp Rate shown on the Capacity Control Setpoints Screen 1. It is used to provide a controlled loading rate after the chiller has been ramped up to the minimum rated speed.

Hot Gas Ratio Calculation

Displays the present signal leaving the Hot Gas Ratio Calculation. The Hot Gas Ratio calculation controls the hot gas bypass valve at a scaled ratio to the percentage of available capacity control signal below the Minimum Vane Position Calculation output, thus providing a 0-100% control signal for the hot gas bypass valve. The capacity control signal from the Leaving Chilled Liquid Controller/Override Limit decreases to close the vanes to the calculated anti-surge minimum value. Therefore, if the vane signal is stopped at 20% and the capacity control signal continues to decrease, the output of this calculation will increase from 0-100% as the control signal decreases from 20-0% to fully open the Hot Gas Bypass Valve if required.

Hot Gas Ratio Setpoint

Displays the HGVRAT-Hot Gas Valve Ratio Bypass setpoint shown on Capacity Control Setpoints Screen 1. This output is used to establish a minimum vane position above the calculated anti-surge value to provide greater stability at very low system pressure differentials when the minimum vane position calculation would normally be 0%. Therefore, the vanes are prevented from closing below this value, and the Hot Gas Ratio Calculation uses this minimum signal as the starting point for controlling the Hot Gas Bypass Valve.

Hot Gas Temp Calculation

Displays the present output signal from the Hot Gas Valve Temperature Controller. In some cases, it may be desirable to allow the vanes to go completely closed which would leave no signal for the Hot Gas Ratio calculation to control the hot gas valve. The Hot Gas Temp Calculation is a separate PID controller which controls at the Temp Setpoint which is equal to the present Leaving Chilled Liquid Temperature Setpoint minus the TSP3-Hot Gas Valve Temp Controller SP Diff shown on Capacity Control Setpoints Screen 1. The output displayed will increase to open the Hot Gas Bypass Valve and unload the chiller if the Leaving Chilled Liquid Temperature is below the Temp Setpoint. The response time of the controller is determined by the HGV control mode tuning entered on the PID Setup Screen 1 for the Temperature Control.

Speed Setpoint

Displays the present setpoint of the Speed Control PID controller. This setpoint is automatically controlled by the chiller sequencing logic during startup and shutdown. The Governor Valve output displayed will increase to open the pneumatically actuated governor valve on the turbine if the Turbine Speed is below this setpoint. The Slow Roll, Min Rated, and Rated tuning values entered on the PID Setup Screen 2 determine the response time of the Speed Control PID controller.

Turbine Speed

Displays the highest of the two speed input signals sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft.

Governor Valve

Displays the present control signal being sent to the analog output used to control the I/P transducer on the pneumatically actuated governor valve. The data field below the output display shows the Auto/Manual status of the Speed Setpoint as presently selected on the Auto/Manual Screen.

Hot Gas Bypass

Displays the present control signal being sent to the analog output used to control Hot Gas Bypass Valve actuator. The data field below the output display shows the Auto/Manual status of the Hot Gas Bypass as presently selected on the Auto/Manual Screen.

Pre-Rotation Vanes

Displays the present control signal being sent to the PRV positioning logic used to control the Open/Close digital outputs connected to the PRV actuator. The data field below the output display shows the Auto/Manual status of the Pre-Rotation Vanes as presently selected on the Auto/Manual Screen.

PROGRAMMABLE

None

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

PID Setup 1

Access Level Required: VIEW

Moves to a sub-screen that allows programming of the tuning parameters for the Leaving Chilled Liquid Temperature, Evaporator Pressure, Condenser Pressure, Hotwell Level, and Subcooler Level PID controllers.

PID Setup 2

Access Level Required: VIEW

Moves to a sub-screen that allows programming of the tuning parameters for the Governor (Slow Roll), Governor (Min Rated), Governor (Rated), Governor Valve Position Limit, Horsepower Limit PID controllers.

Auto/Manual

Access Level Required: SERVICE

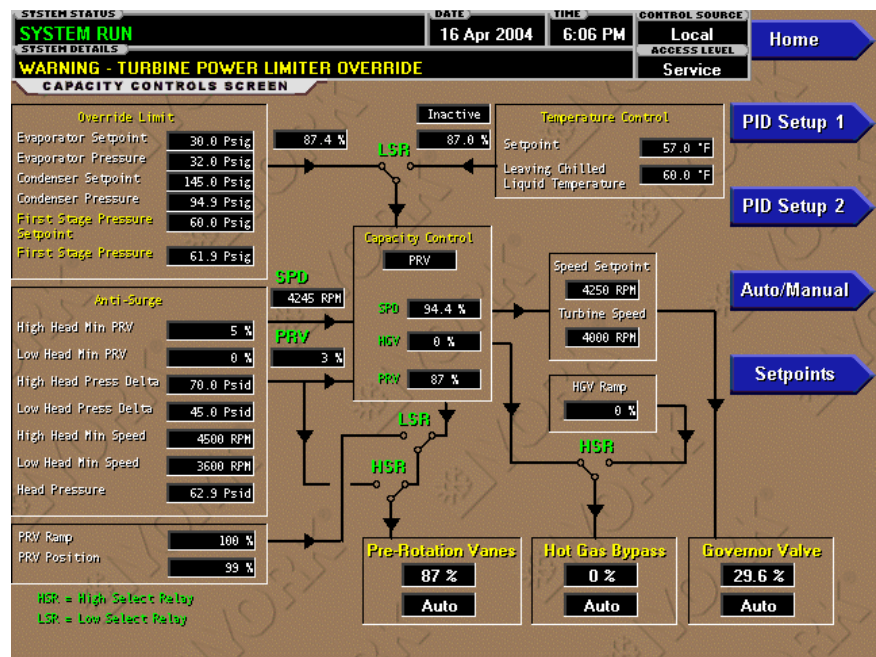
Moves to a sub-screen that allows the operator to manually control any of the capacity control devices. The programmable Anti-Surge limits are also accessible from this screen.

Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various parameters pertinent to the operation of the capacity controls. It is also the gateway to Capacity Control Setpoints Screen 2.

CAPACITY CONTROLS SCREEN-VARIABLE SPEED MODE



LD09262

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 22 - CAPACITY CONTROLS SCREEN-VARIABLE SPEED MODE

OVERVIEW

This screen appears when MSSP7-Speed Control Mode on Capacity Control Setpoints Screen 1 is set to Variable. The Variable speed mode is the default mode and is used to provide the greatest efficiency of operation in plants where the condensing water is cooled to as low as 55 °F. This allows the turbine speed to be reduced to the minimum rated speed and the compressor pre-rotation vanes to be closed completely prior to opening the hot gas valve. This screen is a detailed view of the capacity control system logic including various override and anti-surge control setpoints and parameters. It is also the gateway to screens for entering the tuning parameters of the various PID controllers and other setpoints pertinent to the operation of the capacity controls. The Auto/Manual Screen is also accessible from this screen.

DISPLAY ONLY

Graphics and Animation

The arrows on the interconnecting lines indicate the logical direction of signal flow between the controlling devices. An HSR (High Select Relay) will select the higher of the two signals entering it and pass it on to the next device. An LSR (Low Select Relay) will select the lower of the two signals entering it and pass it on to

the next device. The line within the relay will toggle to show which input is currently being selected.

Override Limit Box

This box displays parameters pertinent to the override limiting controls that take control of the capacity control devices during off-design operation in order to prevent unsafe operation and prevent the chiller from shutting down.

Override Limit - Evaporator Pressure Setpoint

Displays the present setpoint of the Evaporator Pressure PID controller that is entered on PID Setup Screen 1. If the evaporator pressure falls below this value, the output of this block will decrease below 100%. The text color changes to Yellow if this controller is active.

Override Limit - Evaporator Pressure

Displays the present refrigerant pressure in the evaporator.

Override Limit - Condenser Pressure Setpoint

Displays the present setpoint of the Condenser Pressure PID controller that is entered on PID Setup Screen 1. If the condenser pressure rises above this value, the output of this block will decrease below 100%. The text color changes to Yellow if this controller is active.

Override Limit - Condenser Pressure

Displays the present refrigerant pressure in the condenser.

Override Limit - Horsepower Limit Setpoint

This is displayed if MSSP8-Power Limiting Mode on Capacity Control Setpoints Screen 1 is set for Horsepower. It displays the present setpoint of the Horsepower Limit PID controller. If the calculated horsepower rises above this value, the output of this block will decrease below 100%. The text color changes to Red if this controller is active.

Override Limit - Horsepower

Displays the calculated horsepower output of the turbine.

Override Limit - Governor Position Setpoint

This is displayed if MSSP8-Power Limiting Mode on Capacity Control Setpoints Screen 1 is set for Position. It displays the present setpoint of the Gov Valve Position Limit PID controller that is entered on PID Setup Screen 2. This mode is only used when the Turbine First Stage Team Pressure Transmitter is not present. In this case, the only available means to prevent the turbine from producing too much power is to monitor the Governor Valve output at normal full load conditions and then enter this percent as the setpoint for the position-limiting controller. If the output signal controlling the Governor Valve I/P Transducer rises above this value, the output of this block will decrease below 100%. The text color changes to Yellow if this controller is active.

Override Limit - Governor Valve

Displays the present output signal controlling the Governor Valve I/P Transducer.

Anti-Surge Box

This box displays parameters pertinent to the anti-surge controls that limit the amount of speed reduction and vane closure based on the head pressure differential (condenser minus evaporator pressure). The output data fields display the present calculated minimum speed and vane control signals.

Anti-Surge - High Head Min PRV

Displays the present High Head Min PRV setpoint that is entered on the Auto/Manual Screen. This is the minimum PRV control signal allowed when the head is equal to the High Head Pressure Delta setpoint.

Anti-Surge - Low Head Min PRV

Displays the present Low Head Min PRV setpoint that is entered on the Auto/Manual Screen. This is the minimum PRV control signal allowed when the head is equal to the Low Head Pressure Delta setpoint.

Anti-Surge - High Head Press Delta

Displays the present High Head Pressure Delta setpoint that is entered on the Auto/Manual Screen. This is the maximum head that the chiller will likely see in normal operation. The output data field will show the High Head Min PRV value when the Head Pressure is at this value.

Anti-Surge - Low Head Press Delta

Displays the present Low Head Pressure Delta setpoint that is entered on the Auto/Manual Screen. This is the minimum head that the chiller will likely see in normal operation while running at or above the minimum rated speed. The output data field will show the Low Head Min PRV value when the Head Pressure is at this value.

Anti-Surge - High Head Min Speed

Displays the present High Head Min Speed setpoint that is entered on the Auto/Manual Screen. This is the minimum speed setpoint allowed when the head is equal to the High Head Pressure Delta setpoint.

Anti-Surge - Low Head Min Speed

Displays the present Low Head Min Speed setpoint that is entered on the Auto/Manual Screen. This is the minimum speed setpoint allowed when the head is equal to the Low Head Pressure Delta setpoint.

Anti-Surge - Head Pressure

Displays the present result of the condenser refrigerant pressure minus the evaporator refrigerant pressure.

Temperature Control Box

This box displays parameters pertinent to the Leaving Chilled Liquid Controller used to maintain the liquid temperature at the setpoint shown. The output displayed will decrease to unload the chiller if the Leaving Chilled Liquid Temperature is below the Setpoint. The response time of the controller is determined by the tuning entered on the PID Setup Screen 1. The data field above the output display shows the Inactive or Active status of the controller. The controller is Inactive (yellow text) during shutdown and ramp up to rated speed with its output signal equal to the present PRV Ramp signal. It becomes Active (green text) when the

vane ramp signal is at 97% or the leaving chilled liquid temperature decreases to within 2 °F of the present setpoint. It is also Inactive if any override controller is active, in which case its' output is equal to the override block output. It becomes Active after the override controller is no longer controlling and the TDSP10-Temp Control Override Transfer Delay shown on the Capacity Control Setpoints Screen 1 has elapsed.

Temperature Control - Setpoint

Displays the present Leaving Chilled Liquid Temperature Setpoint used to control the chiller. This may be the Local Setpoint entered on the Setpoints Screen or the Remote Setpoint if being controlled by a remote signal.

Temperature Control - Leaving Chilled Liquid Temperature

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

PRV Ramp

Displays the present signal leaving the PRV Ramp logic. It is based on the RRSP8-PRV Ramp Rate shown on the Capacity Control Setpoints Screen 1. On startup, when the ramp up to rated speed commences, this output is set at the PRVM- PRV Minimum Open Position shown on Capacity Control setpoints Screen 2. It is used to provide a controlled loading rate after the chiller has been ramped up to the minimum rated speed.

PRV Position

Displays the present position of the compressor pre-rotation vanes as sensed by the potentiometer on the vane operating shaft. This display will lag behind the Pre-Rotation Vanes control signal display but will eventually be within 1% of the Pre-Rotation Vanes control signal display after the vane actuator has finished moving.

HGV Ramp

Displays the present signal leaving the HGV Ramp logic. It is based on the RRSP9-Hot Gas Valve Ramp Rate shown on the Capacity Control Setpoints Screen 1. It is used to provide a controlled loading rate after the chiller has been ramped up to the minimum rated speed.

Capacity Control Box

This box displays parameters pertinent to the Capacity Control Ratchet Mode Selector. This selector determines which device should be used for capacity control and ensures that the chiller is always operating as efficiently as possible. The data field below the Capacity Control text displays Hot Gas, PRV, or Speed, depending on which device is presently being controlled.

Capacity Control – SPD

Displays the present Capacity Ratchet Mode Selector output signal for controlling the speed. The output represents the % equivalent of the speed based on 0-4500 RPM being equal to 0-100%. When in the Hot Gas mode, this value will be equal to the calculated anti-surge minimum speed output. On startup, after the chiller is running at or above the minimum rated speed, the turbine stabilization delay has elapsed, and the Hot Gas Bypass Valve is closing, as the system head increases causing the calculated anti-surge minimum speed output to increase, this output will increase to maintain system stability. When the mode changes to Speed after the PRV output is at 100%, this output will increase as required to maintain the leaving chilled liquid temperature at setpoint.

Capacity Control – PRV

Displays the present Capacity Ratchet Mode Selector output signal for controlling the compressor pre-rotation vanes. When in the Hot Gas mode, this value will be equal to the calculated anti-surge minimum PRV output. On startup, when the ramp up to rated speed has commenced, the PRV Ramp output and the Pre-Rotation Vanes signal are set to the PRVM- PRV Minimum Open Position shown on Capacity Control Setpoints Screen 2. When the mode changes to PRV after the HGV output is at 0%, the PRV Ramp output begins increasing from the PRVM% to open the vanes. As the system head increases, if the calculated anti-surge minimum PRV output increases above the ramp output signal, the HSR will select the high anti-surge signal to maintain system stability. If the Leaving Chilled Liquid Temperature Controller becomes Active and begins to control this output, the LSR will select the lower of this signal and the PRV Ramp output in order to maintain the leaving chilled liquid temperature at setpoint.

Capacity Control – HGV

Displays the present Capacity Ratchet Mode Selector output signal for controlling the Hot Gas Bypass Valve. On startup after the chiller is running at or above the minimum rated speed and the turbine stabilization delay has elapsed, when the selector is displaying Hot Gas, this output will be equal to the HGV Ramp output. As the system is pulled down to design conditions, if the Leaving Chilled Liquid temperature Controller becomes Active and begins to control this output, the HSR will select the higher of this signal and the HGV Ramp output in order to maintain the leaving chilled liquid temperature at setpoint.

Speed Setpoint

Displays the present setpoint of the Governor (Speed Control) PID Controller. This setpoint is automatically controlled by the chiller sequencing logic during startup and shutdown and by the capacity controls logic while SYSTEM RUN is displayed. The Governor Valve output displayed will increase to open the pneumatically actuated governor valve on the turbine if the Turbine Speed is below this setpoint. The Slow Roll, Min Rated, and Rated tuning values entered on the PID Setup Screen 2 determine the response time of the Speed Control PID Controller.

Turbine Speed

Displays the highest of the two speed input signals sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft.

Governor Valve

Displays the present control signal being sent to the analog output used to control the I/P transducer on the pneumatically actuated governor valve. The data field below the output display shows the Auto/Manual status of the Speed Setpoint as presently selected on the Auto/Manual Screen.

Hot Gas Bypass

Displays the present control signal being sent to the analog output used to control Hot Gas Bypass Valve actuator. The data field below the output display shows the Auto/Manual status of the Hot Gas Bypass as presently selected on the Auto/Manual Screen.

Pre-Rotation Vanes

Displays the present control signal being sent to the PRV positioning logic used to control the Open/Close digital outputs connected to the PRV actuator. The data field below the output display shows the Auto/Manual status of the Pre-Rotation Vanes as presently selected on the Auto/Manual Screen.

PROGRAMMABLE

None

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

PID Setup 1

Access Level Required: VIEW

Moves to a subscreen that allows programming of the tuning parameters for the Leaving Chilled Liquid Temperature, Evaporator Pressure, Condenser Pressure, Hotwell Level, and Subcooler Level PID controllers.

PID Setup 2

Access Level Required: VIEW

Moves to a sub-screen that allows programming of the tuning parameters for the Governor (Slow Roll), Governor (Min Rated), Governor (Rated), Governor Valve Position Limit, Horsepower Limit PID controllers.

Auto/Manual

Access Level Required: SERVICE

Moves to a sub-screen that allows the operator to manually control any of the capacity control devices. The programmable Anti-Surge limits are also accessible from this screen.

Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various parameters pertinent to the operation of the capacity controls. It is also the gateway to Capacity Control Setpoints Screen 2.

PID SETUP SCREEN 1

SYSTEM STATUS
SYSTEM RUN
SYSTEM DETAILS
LEAVING CHILLED LIQUID CONTROL

DATE: 16 Apr 2004 TIME: 4:53 PM CONTROL SOURCE: Local
ACCESS LEVEL: Service

PID SETUP SCREEN 1

Temperature Control
PV: 42.0 °F
CV: 0.0 %
Active
SP: 42.1 °F
P: 1.00
I: 5.00
D: 0.00
RR: 0.2 °F/Sec

Evaporator Pressure
PV: 32.0 Psig
CV: 100.0 %
Inactive
SP: 30.0 Psig
P: 1.00
I: 5.00
D: 0.00

Condenser Pressure
PV: 95.0 Psig
CV: 100.0 %
Inactive
SP: 145.0 Psig
P: 1.00
I: 5.00
D: 0.00

Hotwell Level
PV: 50.0 %
CV: 50.0 %
Auto
SP: 50.0 %
P: 1.00
I: 5.00
D: 0.00
O: 50.0 %

Subcooler Level
PV: 50 %
CV: 60 %
Auto
SP: 50 %
P: 1.00
I: 5.00
D: 0.00
RR: 0.1 %/Sec

Capacity Controls
PV = Process Variable
CV = Control Variable
SP = Setpoint
P = Proportional
I = Integral
D = Derivative
O = Offset
RR = Ramp Rate

Home
Capacity Controls
Select Control
PRV
Select PID
Temperature
Change Settings

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 23 - PID SETUP SCREEN 1

OVERVIEW

This screen displays the present tuning parameters used by the Leaving Chilled Liquid Temperature, Evaporator Pressure, Condenser Pressure, Hotwell Level, and Subcooler Level PID controllers. Each of the controller boxes displays the input process variable (PV) that is being controlled as well as the controller output signal (CV) that repositions the controlled device to maintain the process variable at setpoint (SP). The response time of each controller is determined by the Proportional (P), Integral (I), and Derivative (D) tuning setpoints entered. In some cases, different tuning parameters must be entered to match the process response time depending on the controlled device. The black text to the right of the data fields changes to SPD, PRV, or HGV depending on the mode selected with the **Select Control** key. In some cases, a setpoint ramp rate (RR) is also available. All setpoints require a login access level of Service or higher. Service Technicians refer to YORK Service Manual 160.67-M3 for operation and a detailed explanation of the tuning parameters.

To view the results of a setpoint change, the applicable Screen name is also referenced.

PROGRAMMABLE / DISPLAY ONLY

Temperature Control

Screen: Capacity Controls

SP (TCSP) Range: 36.0-70.0 °F

SP (TCSP) Default: 42.0 °F

RR (RRSP1) Range: 0.1-2.0 °F/Sec

RR (RRSP1) Default: 0.1 °F/Sec

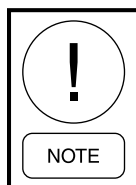
PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00

SPD PID Defaults - P: 1.00 I: 2.00 D: 0.00

PRV PID Defaults - P: 2.00 I: 4.00 D: 0.00

HGV PID Defaults - P: 2.00 I: 3.00 D: 0.00

This box displays parameters pertinent to the Leaving Chilled Liquid Controller used to maintain the liquid temperature (PV) at the setpoint (SP). The setpoint of this controller is changed locally on the Setpoints Screen or remotely via one of the available remote setpoint options. The output (CV) displayed will decrease to unload the chiller if the Leaving Chilled Liquid Temperature is below the Setpoint. The setpoint ramp rate (RR) determines the rate at which the setpoint ramps to a new value. The black text to the right of the data fields changes to SPD, PRV, or HGV depending on the mode selected with the Select Control key. The green Active text changes to yellow Inactive text to display if the controller is presently controlling the chiller capacity.



When the Select Control key is set for HGV, the tuning parameters entered are also used by the HGV Temperature Controller.

Evaporator Pressure

Screen: Capacity Controls

SP (PSP1) Range:
Water: 25.0-35.0 PSIG SP (PSP1) Default: 30.0 PSIG
Brine: 6.0-35.0 PSIG

PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00

SPD PID Defaults - P: 2.00 I: 0.95 D: 0.00

PRV PID Defaults - P: 2.00 I: 2.00 D: 0.00

HGV PID Defaults - P: 2.00 I: 2.00 D: 0.00

This box displays parameters pertinent to the Evaporator Pressure Controller used to maintain the refrigerant pressure in the evaporator (**PV**) at the setpoint (**SP**) during off design operation. The output (**CV**) displayed will decrease to unload the chiller if the evaporator refrigerant pressure falls below the setpoint. The black text to the right of the data fields changes to **SPD**, **PRV**, or **HGV** depending on the mode selected with the **Select Control** key. The green **Inactive** text changes to yellow **Active** text to display if the controller is presently controlling the chiller capacity.

Condenser Pressure

Screen: Capacity Controls

SP (PSP2) Range: 130.0-180.0 SP (PSP2) Default: 145.0 PSIG

PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00

SPD PID Defaults - P: 1.00 I: 0.95 D: 0.00

PRV PID Defaults - P: 2.00 I: 2.00 D: 0.00

HGV PID Defaults - P: 2.00 I: 2.00 D: 0.00

This box displays parameters pertinent to the Condenser Pressure Controller used to maintain the refrigerant pressure in the condenser (**PV**) at the setpoint (**SP**) during off design operation. The output (**CV**) displayed will decrease to unload the chiller if the condenser refrigerant pressure increases above the setpoint. In some cases, different tuning parameters must be entered to match the process response time depending on the controlled device. The black text to the right of the data fields changes to **SPD**, **PRV**, or **HGV** depending on the mode selected with the **Select Control** key. The green **Inactive** text changes to yellow **Active** text to display if the controller is presently controlling the chiller capacity.

Hotwell Level

Screen: Condensate

SP (HLSP1) Range: 30.0-70.0% SP (HLSP1) Default: 50.0%

PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00 O: 40.0-60.0%

PID Tuning Defaults - P: 2.79 I: 1.25 D: 0.00 O: 50.0%

This box displays parameters pertinent to the Hotwell Level Controller used to maintain the condensate level (**PV**) in the steam condenser within the proportional band of 40-60%. With the default tuning parameters shown above, the output (**CV**) will be 50% at the setpoint and will decrease from 50-0% as the level (**PV**) increases from 50-60% to open the Overboard Valve and close the Recirculation Valve. The green text **Auto** changes to yellow **Manual** text to show the status of the controller output as presently selected on the Auto/Manual Screen.

Subcooler Level

Screen: Condensate

SP (LSP) Range: 20.0 - 80.0% SP (LSP1) Default: 50.0%

RR (RRSP10) Range: 0.1-4.0 %/Sec RR (RRSP10) Default: 0.1%/Sec

PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00

Z1 PID Tuning Defaults - P: 0.10 I: 2.50 D: 0.00

Z2 PID Tuning Defaults - P: 0.10 I: 2.50 D: 0.00

This box displays parameters pertinent to the Subcooler Level Controller used to maintain the refrigerant liquid level (**PV**) in the subcooler at the setpoint (**SP**). The output (**CV**) displayed will increase to open the Subcooler Level Control Valve if the level increases above the setpoint. On startup, after the TDSP6-Time Delay/Subcooler Level Pulldown has elapsed, the level setpoint is set from 0% to the present level and then ramped up to the programmed setpoint at the programmed setpoint ramp rate (**RR**) displayed. The output (**CV**) will begin to decrease from 100% to close the valve and begin backing liquid up in the subcooler until the setpoint is achieved. The output (**CV**) will never be allowed to decrease below the LCVM-Subcooler Level Valve Minimum Position shown on Capacity Control Setpoints Screen 1. The green **Auto** text changes to yellow **Manual** text to show the status of the controller output as presently selected on the Auto/Manual Screen. The black text to the right of the data fields changes to **Z1** or **Z2** depending on the zone selected with the **Select Zone** key.

PROGRAMMABLE

Select Zone (Z1/Z2)

Access Level Required: VIEW

This key selects the present tuning parameters for display and programming (if access level is SERVICE) for the Subcooler Level controller.

Select Control (SPD/PRV/ HGV)

Access Level Required: VIEW

In some cases, different tuning parameters must be entered to match the process response time depending on the controlled device. This key selects the present tuning parameters for display and programming (if access level is SERVICE) for the Temperature, Evaporator Pressure, and Condenser Pressure controllers.

Select Control (Temperature/Evaporator/ Condenser/Hotwell/ Subcooler)

Access Level Required: VIEW

This key selects the desired controller for which tuning parameters will be programmed (if access level is SERVICE).

Change Settings

Access Level Required: SERVICE

This key enables the field selection cursor in the presently selected controller. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Capacity Controls

Access Level Required: VIEW

Causes an instant return to the Capacity Controls Screen.

PID SETUP SCREEN 2

SYSTEM STATUS
SYSTEM RUN
SYSTEM DETAILS
LEAVING CHILLED LIQUID CONTROL
PID SETUP SCREEN 2

DATE
16 Apr 2004

TIME
5:03 PM

CONTROL SOURCE
Local
ACCESS LEVEL
Service

Home

Capacity Controls

Gov Governor (Slow Roll)

PV 4245 RPM
CV 60.0 %
Auto
SP 4250 RPM
P 1.00
I 5.00
D 0.00
RR 50 RPM

Gov Governor (Min Rated)

PV 4245 RPM
CV 60.0 %
Auto
SP 4250 RPM
P 1.00
I 5.00
D 0.00
RR 100 RPM

Gov Governor (Rated)

PV 4245 RPM
CV 60.0 %
Auto
SP 4250 RPM
P 1.00
I 5.00
D 0.00
RR 10 RPM

Gov Valve Position Limit

PV 60.0 %
CV 100.0 %
SP 100.0 %
P 1.00
I 5.00
D 0.00

1st Stage Pressure Limit

PV 40.1 Psig
CV 100.0 %
SP 60.0 Psig
P 1.00
I 5.00
D 0.00

PV = Process Variable
CV = Control Variable
SP = Setpoint
P = Proportional
I = Integral
D = Derivative
RR = Ramp Rate

Select PID
Slow Roll

Change Settings

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 24 - PID SETUP SCREEN 2

OVERVIEW

This screen displays the present tuning parameters used by the Governor (Speed Control) Logic. Because of variations in chiller load, inlet steam and exhaust steam pressures during various stages of startup and operation, three different sets of tuning parameters (Slow Roll/Min Rated/Rated) may be required in order to provide stable speed control. The tuning parameters are automatically loaded into the Governor (Speed Control) PID Logic at the transition to the next speed control range to provide the proper control. Also shown are the tuning parameters used by the Gov Valve Position Limit and Horsepower Limit PID logic. Each of the controller boxes displays the input process variable (**PV**) that is being controlled as well as the controller output signal (**CV**) that repositions the controlled device to maintain the process variable at setpoint (**SP**). The response time of each controller is determined by the Proportional (**P**), Integral (**I**), and Derivative (**D**) tuning setpoints entered. In some cases, a setpoint ramp rate (**RR**) is also available. All setpoints require a login access level of Service or higher. Service Technicians refer to YORK Service Manual 160.67-M3 for operation and a detailed explanation of the tuning parameters.

Governor (Slow Roll)

Screen: Capacity Controls

SP (SSP1) Range: 750-1200 RPM SP (SSP1) Default: 1000 RPM
RR (RRSP3) Range: 25-100 RPM/Sec RR (RRSP3) Default: 50 RPM/Sec
PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00
PID Tuning Defaults - P: 1.68 I: 1.46 D: 0.00

This box displays parameters pertinent to the Governor (Speed Control) PID Logic during the slow roll warm-up of the turbine to maintain the speed (**PV**) at the setpoint (**SP**). The output (**CV**) displayed will decrease to close the governor valve if the speed increases above the setpoint. The setpoint is automatically ramped from 0 to the SSP1- Slow Roll Speed shown on the Speed Setpoints Screen at the ramp rate (**RR**) shown as long as the Speed Setpoint is in the Auto mode. The green **Auto** text changes to yellow **Manual** text to show the status of the Speed Setpoint as presently selected on the Auto/Manual Screen.

PROGRAMMABLE/DISPLAY ONLY**Governor (Min Rated)**

Screen: Capacity Controls

SP (SSP2) Range: 3200-3600 RPM	SP (SSP2) Default: 3200 RPM
RR (RRSP4) Range: 100-200 RPM/Sec	RR (RRSP4) Default: 200 RPM/Sec
PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00	
PID Tuning Defaults - P: 0.75 I: 2.00 D: 0.00	

This box displays parameters pertinent to the Governor (Speed Control) PID Logic during the ramp up to rated speed to maintain the speed (PV) at the setpoint (SP). The output (CV) displayed will decrease to close the governor valve if the speed increases above the setpoint. The setpoint is automatically ramped from the SSP1- Slow Roll Speed to the SSP3 – Fixed Speed shown on the Speed Setpoints Screen at the ramp rate (RR) shown as long as the Speed Setpoint is in the Auto mode. The green Auto text changes to yellow Manual text to show the status of the Speed Setpoint as presently selected on the Auto/Manual Screen.

Governor (Rated)

Screen: Capacity Controls

SP Range: 3200-4700 RPM	SP Default: 4500 RPM
RR (RRSP4) Range: 1-200 RPM/Sec	RR (RRSP4) Default: 10 RPM/Sec
PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00	
PID Tuning Defaults - P: 1.20 I: 1.21 D: 0.00	

This box displays parameters pertinent to the Governor (Speed Control) PID Logic during normal operation at the minimum rated speed or above to maintain the speed (PV) at the setpoint (SP). The output (CV) displayed will decrease to close the governor valve if the speed increases above the setpoint. The setpoint is automatically ramped to the setpoint dictated by the capacity/anti-surge controls after the turbine stabilization period at the ramp rate (RR) shown as long as the Speed Setpoint is in the Auto mode and will never be allowed drop below SSP2-Minimum Rated Speed nor rise above SSP9-Maximum Rated Speed shown on the Speed Setpoints Screen. The green text shows the Auto or Manual status of the Speed Setpoint as presently selected on the Auto/Manual Screen.

Gov Valve Position Limit

Screen: Capacity Controls

SP (GSP1) Range: 20.0-100.0 %	SP (GSP1) Default: 100.0 %
PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00	
PID Tuning Defaults - P: 1.00 I: 1.50 D: 0.00	

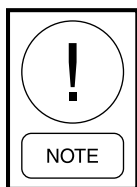
This box displays parameters pertinent to the Governor Valve Position Limit power limiting override controller which is active only when MSSP8-Power Limiting Mode on Capacity Control Setpoints Screen 1 is set for Position. The output (CV) displayed will decrease to reduce the speed setpoint, close the vanes, and open the hot gas valve if required to maintain the governor valve output signal (PV) at the setpoint (SP). The setpoint is usually determined by observing the Governor Valve output signal at normal full load conditions and then entering this percent as the setpoint of this controller. The green Inactive text changes to yellow Active to display if the controller is presently controlling the chiller capacity.

Horsepower Limit

Screen: Capacity Controls

SP (HLSP) Range: Variable	SP Default: 840
PID Tuning Ranges - P: 0.00-5.00 I: 0.00-5.00 D: 0.00-5.00	
PID Tuning Defaults - P: 1.00 I: 1.50 D: 0.00	

This box displays parameters pertinent to the Horsepower Limit override controller which is active only when MSSP8-Power Limiting Mode on Capacity Control Setpoints Screen 1 is set for Horepower. The output (CV) displayed will decrease to reduce the speed setpoint, close the vanes, and open the hot gas valve if required to maintain the turbine horsepower (PV) at the setpoint (SP). The horsepower setpoint is initially set to the maximum allowable based on the compressor model entered on the Setup Screen. It is factory adjusted to the lower of the compressor maximum or 115% of the turbine design horsepower and can only be changed in the TEST OP or ADMIN ACCESS level. The turbine horsepower (PV) is automatically calculated by the program based on the inlet, first stage, and exhaust steam conditions. The green text changes to Inactive or Active to display if the controller is presently controlling the chiller capacity.



When control source is set for ISN (operations screen), a HP setpoint must be maintained by the ISN system or HP setpoint will revert to minimum setting.

PROGRAMMABLE

Select PID (Slow Roll/Min Rated/Rated/Position Limit/Horsepower Limit)

Access Level Required: VIEW

This key selects the desired controller for which tuning parameters will be programmed (if access level is SERVICE).

Change Settings

Access Level Required: SERVICE

This key enables the field selection cursor in the presently selected controller. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Home

Access Level Required: VIEW

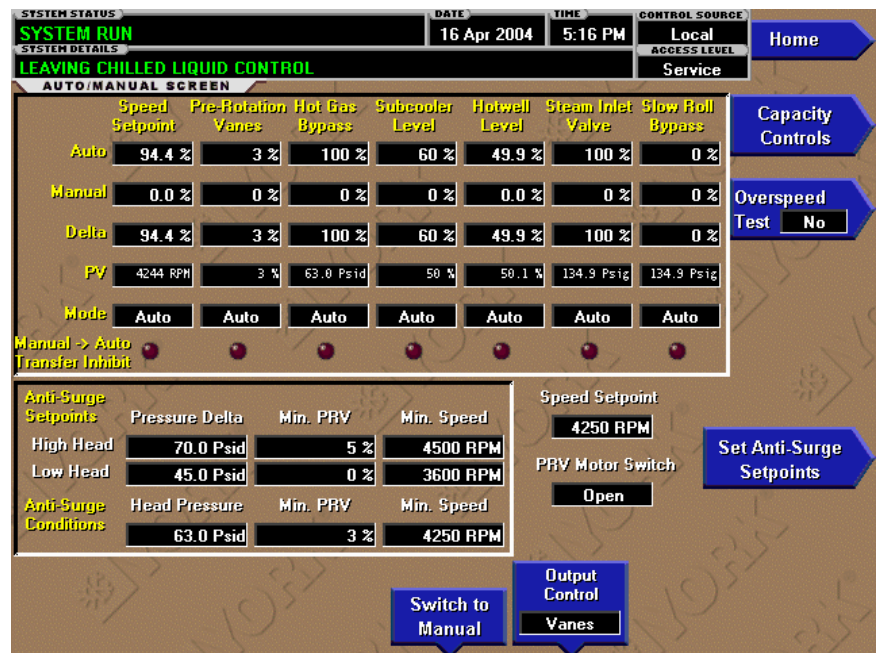
Causes an instant return to the Home Screen.

Capacity Controls

Access Level Required: VIEW

Causes an instant return to the Capacity Controls Screen.

AUTO/MANUAL SCREEN



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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 25 - AUTO/MANUAL SCREEN

OVERVIEW

This screen is only accessible in the Service or higher access level and allows the operator to manually control any of the capacity control devices. Each device has data fields beneath the device name that display various process variables and control signals affected by manually controlling the output signal to the device.

The programmable Anti-Surge limits are entered on this screen. To view the results of a setpoint change, the applicable Screen name is referenced. Service Technicians refer to YORK Service Manual 160.67-M3 for additional information.

This screen would normally only be used by a qualified YORK Service Technician to determine at initial commissioning or subsequent site visits to test the final control devices and determine final tuning parameters. It is also used to perform the Turbine Mechanical Overspeed Test.

DISPLAY ONLY

Auto

Displays the present automatic control signal entering the Auto/Manual control logic. This signal will vary independently of the Manual signal when the device is placed in the Manual mode for all devices except the Speed Setpoint which will track its' Manual signal.

Manual

Displays the present manually controlled signal being sent to the device. When the device is switched to Manual, the manual control signal is set to equal the present automatic signal to provide a bump-less transfer. The Increase/Decrease/Set keys that appear are then used to manipulate the manual control signal.

Delta

Displays the present differential between the Auto and Manual signals.

Mode (Auto/Manual)

Displays the present controlled status of the device.

Manual -> Auto Transfer Inhibit (LED)

Illuminates when the differential between the Auto and Manual signals is greater than 5% indicating that a transfer from the Manual mode to the automatic mode is not allowed.

Speed Setpoint

Displays the present speed setpoint being sent to the Speed Control PID Logic residing in the Frick analog I/O board firmware. The Auto and Manual data fields represent the % equivalent of the speed based on 0-4500 RPM being equal to 0-100%. The PV data field displays the highest of the two speed input signals sensed by two magnetic pickups that monitor a toothed gear installed on the turbine shaft.

Pre-Rotation Vanes

Displays the present control signal being sent to the PRV position control logic controlling the Open/Close digital outputs connected to the PRV actuator. The PV data field displays the present position of the compressor pre-rotation vanes as sensed by the potentiometer on the vane operating shaft. This display will lag behind the Pre-Rotation Vanes control signal display but will eventually be within 1% of the Pre-Rotation Vanes control signal display after the vane actuator has finished moving.

Hot Gas Bypass

Displays the present control signal being sent to the analog output used to control Hot Gas Bypass Valve actuator.

Subcooler Level

Displays the present control signal being sent to the analog output used to control Subcooler Level Control Valve actuator. The PV data field displays the present refrigerant liquid level in the subcooler.

Hotwell Level

Displays the present control signal being sent to the analog output used to control Hotwell Level Control I/P Transducer. The **PV** data field displays the present condensate level in the steam condenser.

Steam Inlet Valve

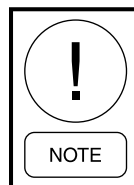
Displays the present control signal being set to the analog output controlling the Main Steam Inlet Block Valve. A 100% value represents a command for the valve to open fully. This object only appears if MSSP4-Turbine Start Mode is set for Auto and MSSP19 - Governor Valve Location is set to Turbine on Configuration Screen 1. The PV data field displays the steam pressure measured at the inlet of the turbine between the trip valve and the governor valve.

Slow Roll Valve

Displays the present control signal being set to the analog output controlling the Steam Inlet Slow Roll Bypass Valve. A 100% value represents a command for the valve to open fully. This object only appears if MSSP4-Turbine Start Mode is set for Auto and MSSP19 - Governor Valve Location is set to Turbine on Configuration Screen 1. The PV data field displays the steam pressure measured at the inlet of the turbine between the trip valve and the governor valve.

PRV Motor Switch (Open/Closed)

Displays the status of the limit switch in the PRV actuator. The status will be Closed when the actuator has moved to its fully counter clockwise position indicating that the vanes are completely closed.



When the PRV control signal is set to 0% in the Manual mode, the vanes switch may not be activated. Place the control signal back to the auto mode to activate this switch.

Anti-Surge Conditions - Head Pressure

Displays the present result of the condenser refrigerant pressure minus the evaporator refrigerant pressure.

Anti-Surge Conditions – Min. PRV

Displays the present calculated minimum vane control signal.

Anti-Surge Conditions – Min. Speed

Displays the present calculated minimum speed setpoint.

PROGRAMMABLE**Anti-Surge Setpoints - High Head Press Delta (PD1)**

Range: 20-120 PSID Screen: Capacity Controls
Default: 75 PSID

This is the maximum head that the chiller will likely see in normal operation. The Anti-Surge Conditions data fields will show the calculated High Head Min Speed (MS%) and PRV (MV%) values when the present Head Pressure (PD) is at this value.

Anti-Surge Setpoints - High Head Min PRV (MVP1)

Screen: Capacity Controls
Range: 5-50 % Default: 20 %

This is the minimum PRV control signal allowed when the head is equal to the High Head Pressure Delta setpoint PD1.

Anti-Surge Setpoints - High Head Min Speed (MSP1)

Screen: Capacity Controls
Range: 3200-4700 RPM Default: 4500 RPM

This is the minimum speed allowed when the head is equal to the High Head Pressure Delta setpoint PD1. It is only utilized when MSSP7-Speed Control Mode is set for Variable.

Anti-Surge Setpoints - Low Head Press Delta (PD2)

Screen: Capacity Controls
Range: 30-80 PSID Default: 40 PSID

This is the minimum head that the chiller will likely see in normal operation while running at or above the minimum rated speed. The Anti-Surge Conditions data fields will show the calculated Low Head Min Speed (MS%) and PRV (MV%) values when the present Head Pressure (PD) is at this value.

Anti-Surge Setpoints - Low Head Min PRV (MVP2)

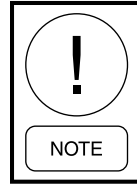
Range: 0-50 % Screen: Capacity Controls
Default: 15 %

This is the minimum PRV control signal allowed when the head is equal to the Low Head Pressure Delta setpoint (PD2).

Anti-Surge Setpoints - Low Head Min Speed (MSP2)

Range: 3200-4500 RPM Screen: Capacity Controls
Default: 3600 RPM

This is the minimum speed allowed when the head is equal to the Low Head Pressure Delta setpoint (PD2).



Even if the Low Head Min Speed is set lower than the SSP2-Minimum Rated Speed Setpoint on the Speed Setpoints Screen, the speed setpoint will never be allowed to go below the minimum rated speed.

Set Anti-Surge Setpoints Key

Access Level Required: SERVICE

This key enables the field selection cursor in the Anti-Surge Setpoints box. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

Output Control Key (Speed/Vanes/Hot Gas/ Subcool/Hotwell/Stm Inlet/Stm Bypass)

Access Level Required: SERVICE

This key is used to select the output signal to be manually controlled. The Stm Inlet/Stm Bypass selections only appear if MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1.

Switch to Manual Key

Access Level Required: SERVICE

This key places the selected output signal in Manual and displays the Increase/Decrease/Set keys that are required to manipulate the manual control signal. It will not function while the messages START SEQUENCE INITIATED or SYSTEM COASTDOWN are displayed. When pressed, the key text changes to Green text Switch to Auto. If the control signal is manually changed more than 5% from the Auto signal, the text changes to Red.

Increase Key

Access Level Required: SERVICE

This key increases the Manual control signal 1% each time it is pressed.

Decrease Key

Access Level Required: SERVICE

This key decreases the Manual control signal 1% each time it is pressed.

Set Key

Access Level Required: SERVICE

This key displays a pop-up window which allows the operator to enter a value from 0-100%. When the “✓” key is pressed, the pop-up window disappears and the manual signal ramps to the value entered at 2%/second.

Overspeed Test Key (No/Yes)

Access Level Required: SERVICE



Only a qualified YORK or turbine manufacturer Service Technician should perform this test.

When the operator pushes this key, the message **WARNING - MECHANICAL OVERSPEED TEST IN PROGRESS** is displayed and the key data field changes to Yes. During the test, the software overspeed shutdown at the SSP8-Overspeed Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen is disabled to allow the operator to manually increase the Speed Setpoint at a fixed 1%/sec rate up to the SSP4-Overspeed Test Limit shown on the Speed Setpoints Screen. The mechanical trip mechanism on the turbine should trip before SSP4-Overspeed Test Limit speed is reached and the message **TURBINE MECHANICAL TRIP** displayed. If the turbine does not trip and the speed exceeds the SSP4-Overspeed Test Limit setpoint for 2 seconds, the chiller will be tripped and **MECHANICAL OVERSPEED TEST FAILURE** will be displayed.

If the key is pushed prior to the mechanical trip and the speed is below the SSP8-Overspeed Shutdown setpoint, the status bar changes back to the normal operating message, the software overspeed shutdown is reactivated. When the speed setpoint is put in the Auto mode, the speed is ramped down to the present rated speed setpoint.

If the button is pushed prior to the mechanical trip and the speed is above the SSP8-Overspeed Shutdown setpoint, the turbine will be tripped immediately and the message **TURBINE OVERSPEED TRIP** will be displayed.

If the turbine mechanical trip functions properly and the chiller is tripped, the overspeed test logic is inactivated and the key data field changes to No after no rotation has been detected for 35 seconds.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Capacity Controls

Access Level Required: VIEW

Causes an instant return to the Capacity Controls Screen.

CAPACITY CONTROL SETPOINTS SCREEN 1

SYSTEM STATUS	DATE	TIME	CONTROL SOURCE
SYSTEM READY TO START	16 Apr 2004	12 58 PM	Local
SYSTEM DETAILS			ACCESS LEVEL
			Service

CAPACITY CONTROLS SETPOINTS SCREEN 1	
HGVRAT - Hot Gas Valve Ratio Bypass	5 %
LCVM - Subcooler Level Valve Minimum Position	25 %
MSSP1 - Capacity Ratchet Mode HGV Reselection	3 %
MSSP2 - Capacity Ratchet Mode PRV Reselection	3 %
MSSP3 - Capacity Ratchet Mode SPD Reselection	3 %
MSSP7 - Speed Control Mode	Variable
MSSP8 - Power Limiting Mode	None
RRSP2 - Hot Gas Valve Ramp Rate	0.6 %/Sec
RRSP8 - PRV Ramp Rate	0.5 %/Sec
TDSP10 - Temp Control Override Transfer Delay	5 Sec
TDSP14 - AntiSurge Update Delay Time	30 Sec
TSP3 - Hot Gas Valve Temp Controller Diff.	1.1 °F

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 26 - CAPACITY CONTROL SETPOINTS SCREEN 1

OVERVIEW

This screen allows programming of various parameters pertinent to the operation of the capacity controls other than tuning parameters of the PID controllers. To view the results of a setpoint change, the applicable Screen name is referenced. All setpoints require a login access level of Service or higher.

PROGRAMMABLE

HGVRAT – Hot Gas Valve Ratio Bypass

Screen: Capacity Controls

Range: 0-20 %

Default: 5 %

This is only used if MSSP7-Speed Control Mode is set at Fixed. It is used to establish a minimum vane position above the calculated anti-surge value to provide greater stability at very low system pressure differentials when the minimum vane position calculation would normally be 0%. Therefore, if the vane signal is stopped at 5% and the capacity control signal continues to decrease, the output of the Hot Gas Ratio Calculation will increase from 0-100% as the control signal decreases from 5-0% to fully open the Hot Gas Bypass Valve if required.

LCVM – Subcooler Level Valve Minimum Position

Screen: PID Setup Screen 1

Range: 5-100 %

Default: 30 %

This is used to prevent the Subcooler Level Controller output (CV) from closing the level control valve too far while operating in the event of a low refrigerant charge or level sensor malfunction. The output of the level controller PID logic will never be allowed to decrease below this value while the unit is operating.

MSSP1 – Capacity Ratchet Mode HGV Reselection

Range: 0-5 %

Screen: Capacity Controls

Default: 3 %

This is only used if MSSP7-Speed Control Mode is set at Variable and should rarely need adjustment. While the Capacity Ratchet Selector is in the Hot Gas mode, the logic waits until either the capacity control or anti-surge signal has changed the hot gas valve control signal more than this value before it re-evaluates whether the mode control needs to be changed to PRV. However, if the HGV control signal is at 0% when loading, the mode is changed immediately to PRV.

MSSP2 – Capacity Ratchet Mode PRV Reselection

Screen: Capacity Controls

Range: 0-5 %

Default: 3 %

This is only used if MSSP7-Speed Control Mode is set at Variable and should rarely need adjustment. While the Capacity Ratchet Selector is in the PRV mode, the logic waits until either the capacity control or anti-surge signal has changed the PRV control signal more than this value before it re-evaluates whether the mode control needs to be changed to Speed (if loading) or Hot Gas (if unloading). However, if the PRV control signal is at 100% when loading or at MV% when unloading, the mode is changed immediately.

MSSP3 – Capacity Ratchet Mode SPD Reselection

Screen: Capacity Controls

Range: 0-5 %

Default: 3 %

This is only used if MSSP7-Speed Control Mode is set at Variable and should rarely need adjustment. While the Capacity Ratchet Selector is in the Speed mode, the logic waits until either the capacity control or anti-surge signal has changed the Speed Setpoint signal more than this value before it re-evaluates whether the mode control needs to be changed to PRV. However, if the Speed Setpoint signal is at MS% when unloading, the mode is changed immediately to PRV.

MSSP7 – Speed Control Mode

Screen: Capacity Controls

Range: Variable/Fixed

Default: Variable

This determines if the capacity controls will reduce the speed setpoint at part load conditions. For maximum efficiency, the Variable speed mode should be used. The Fixed speed mode would likely only be used in plants where the condensing water is always at a high temperature so that speed reduction would not be possible due to the high system pressure differential.

MSSP8 – Power Limiting Mode

Screen: Capacity Controls

Range: Horsepower/Position/None Default: Horsepower

This override controller is used to unload the chiller to prevent the turbine from producing enough horsepower to overload the compressor bearings. It would usually only be activated during system pulldown or other off design (high load) conditions. The Position mode is only used when the Turbine First Stage Steam Pressure Transmitter is not present. In this case, the only available means to prevent the turbine from producing too much power is to monitor the Governor control signal at normal full load conditions and then enter this percent as the setpoint for the position-limiting controller.

RRSP2 – Hot Gas Valve Ramp Rate

Screen: Capacity Controls

Range: 0.1-10 %/Sec

Default: 5.0 %/Sec

This is used to provide a controlled loading rate after the chiller has been ramped up to the minimum rated speed and the turbine stabilization delay has elapsed. The default value matches the approximate stroke rate of the hot gas valve actuator since the chiller will capacity will only increase as fast as the valve opens. In the variable speed mode, this rate may be increased to initiate a Capacity Ratchet Mode change to PRV before the Hot Gas Valve has actually closed fully. This will allow the vanes to begin opening and pull the system down to design conditions sooner.

RRSP8 – PRV Ramp Rate

Screen: Capacity Controls

Range: 0.1-10 %/Sec

Default: 5.0 %/Sec

This is used to provide a controlled loading rate after the chiller has been ramped up to the minimum rated speed and the turbine stabilization delay has elapsed. The default value matches the approximate stroke rate of the PRV actuator since the chiller capacity will only increase as fast as the vanes open. In the variable speed mode, this rate may be increased to initiate a Capacity Ratchet Mode change to Speed before the vanes have actually opened fully. This will allow the speed to begin increasing and pull the system down to design conditions sooner.

TDSP10 – Temp Control Override Transfer Delay

Screen: Capacity Controls

Range: 0-60 Sec

Default: 5 Sec

This is used to delay the transfer of the capacity controls back to the Leaving Chilled Liquid Temperature Controller after the system conditions have returned to normal and the override controller is no longer controlling.

TDSP14 – Anti-Surge Update Delay Time

Screen: Capacity Controls

Range: 0-60 Sec

Default: 30 Sec

This is only used if MSSP7-Speed Control Mode is set at Variable. While the Capacity Ratchet Mode Selector is in the Hot Gas mode, as the head decreases the speed may be reduced and the vanes closed further so that less hot gas is required to maintain the leaving chilled liquid temperature at setpoint. To maintain maximum efficiency of operation, the lower calculated minimum speed (MS%) and minimum vane position (MV%) are moved into the associated devices every time this time delay has elapsed. This will allow the hot gas valve to move closed and reduce steam consumption. When in the PRV mode and the head decreases, the lower minimum speed (MS%) is moved into the Speed Setpoint every time this time delay has elapsed. This will allow the vanes to open further and reduce steam consumption.

TSP3 – Hot Gas Valve Temp Controller SP Diff

Screen: Capacity Controls

Range: 0-4.0 °F

Default: 1.1 °F

This is only used if MSSP7-Speed Control Mode is set at Fixed. In some cases, it may be desirable to allow the vanes to go completely closed which would leave no signal for the Hot Gas Ratio calculation to control the hot gas valve. This is the value subtracted from the present Leaving Chilled Liquid Temperature Setpoint to determine the setpoint of the HGV Temperature Controller. This output of this controller increases as the Leaving Chilled Liquid Temperature decreases below the setpoint to open the Hot Gas Valve and maintain the leaving chilled liquid temperature at setpoint. The response time of the controller is determined by the tuning entered on the PID Setup Screen 1 for the Temperature Control when the Select Control key is set at HGV.

Change Setpoints*Access Level Required:* SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION**Page Down***Access Level Required:* VIEW

Moves to the Capacity Control Setpoints Screen 2.

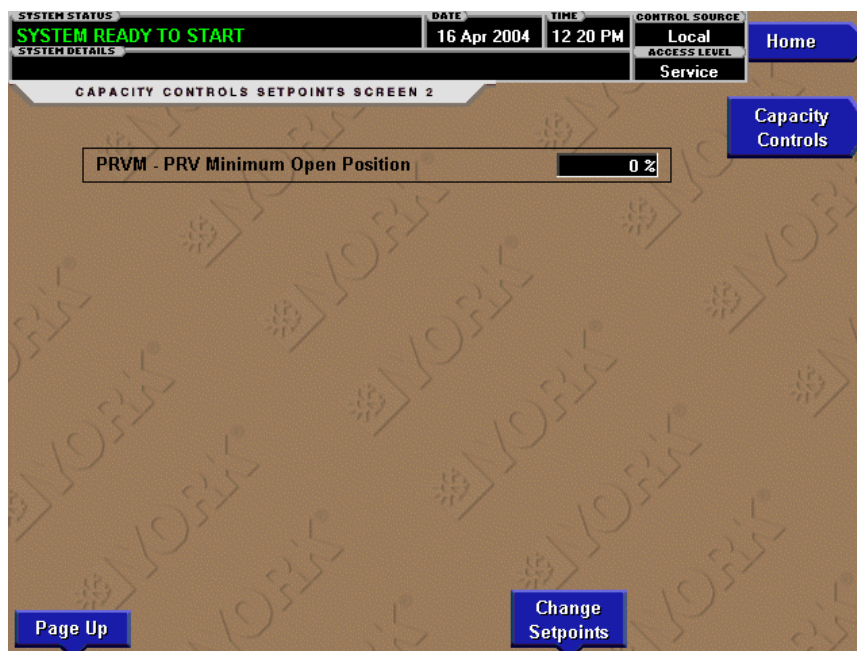
Home*Access Level Required:* VIEW

Causes an instant return to the Home Screen.

Capacity Controls*Access Level Required:* VIEW

Causes an instant return to the Capacity Controls Screen.

CAPACITY CONTROL SETPOINTS SCREEN 2



LD09270

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 27 - CAPACITY CONTROL SETPOINTS SCREEN 2

OVERVIEW

This screen allows programming of various parameters pertinent to the operation of the capacity controls other than tuning parameters of the PID controllers. To view the results of a setpoint change, the applicable Screen name is also referenced. All setpoints require a login access level of Service or higher. Service Technicians refer to YORK Service Manual 160.67-M3 for detailed description of operation.

PROGRAMMABLE

PRVM – PRV Minimum Open Position

Screen: Capacity Controls

Range: 0-100 %

Default: 10 %

This is used to provide a minimum opening of the compressor pre-rotation vanes during startup. On startup, when the ramp up to rated speed has commenced, this PRV Ramp and the PRV control signal is set at this value. While the turbine speed is stabilizing and the hot gas valve is closing, the vanes are opened to this value to provide additional gas flow through the compressor. After the stabilization delay has elapsed, the PRV control signal will begin increasing from this value at the RRSP8-PRV Ramp Rate. If the Leaving Chilled Liquid Temperature Controller becomes Active, it begins controlling at the present PRV control signal. LSR3 will then select the lower of the capacity control signal and

the PRV Ramp output in order to maintain the leaving chilled liquid temperature at setpoint.

Subcooler Zone Transition Time

Screen: Condenser

Range: 1-60 Sec. Default: 5 Sec.

When transitioning from Zone 2 to Zone 1, the error (difference between the measured subcooler level and the Subcooler Level Controller setpoint) must stay below the threshold Subcooler Zone Transition Delta setpoint continuously for this amount of time before the PID parameters are switched.

Subcooler Zone Transition Delta

Screen: Condenser

Range: 1-20% Default: 9%

This subcooler level error (difference between the measured subcooler level and the Subcooler Level Controller setpoint) must be greater than this value to initiate the transition from Zone 1 to Zone 2 control. When transitioning from Zone 2 to Zone 1, the error must stay below this value continuously for longer than the Subcooler Zone Transition Time Setpoint before the PID parameters are switched.

HPCS – Horsepower Calculation Slope

Screen: Capacity Controls
Range: 0-700 Default: 294.8

This is used to calculate the actual horsepower output of the turbine. It is entered at the factory and can only be changed in the TEST OP or ADMIN Access Level.

HPCI - Horsepower Calculation Intercept

Screen: Capacity Controls
Range: -500-500 Default: 301

This is used to calculate the actual horsepower output of the turbine. It is entered at the factory and can only be changed in the TEST OP or ADMIN Access Level.

HPCE - Horsepower Calculation Efficiency

Screen: Capacity Controls
Range: 0.01-1 Default: 0.68

This is used to calculate the actual horsepower output of the turbine. It is entered at the factory and can only be changed in the TEST OP or ADMIN Access Level.

DSP - Design Steam Pressure

Screen: Capacity Controls
Range: 80-400 Default: 125

This is the steam pressure that the turbine must have at the inlet flange in order to provide the design horsepower output. This is used to calculate the actual horsepower output of the turbine. It is entered at the factory and can only be changed in the TEST OP or ADMIN Access Level.

DST – Design Steam Temperature

Screen: Capacity Controls
Range: 324-750 Default: 353

This is the steam temperature that the turbine must have at the inlet flange in order to provide the design horsepower output. This is used to calculate the actual horsepower output of the turbine. It is entered at the factory and can only be changed in the TEST OP or ADMIN Access Level.

Change Setpoints

Access Level Required: SERVICE/TEST OP

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

Page Up

Access Level Required: VIEW

Causes an instant return Capacity Control Setpoints Screen 1.

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Capacity Controls

Access Level Required: VIEW

Causes an instant return to the Capacity Controls Screen.

SETPOINTS SCREEN

SYSTEM STATUS
SYSTEM READY TO START

DATE
16 Apr 2004

TIME
12 03 PM

CONTROL SOURCE
Local
ACCESS LEVEL
Service

SETPOINTS SCREEN

Leaving Chilled Liquid Temperature
Setpoint 42.1 °F
Remote Range 10.0 °F

Leaving Chilled Liquid Temperature Cycling
Shutdown 38.1 °F Offset 4.0 °F
Restart 42.1 °F Offset 0.0 °F

Local Leaving Chilled Liquid Temperature
Setpoint 42.1 °F Range 10.0 °F

Leaving Chilled Liquid Temperature Cycling Offset
Shutdown 4.0 °F Restart 0.0 °F

Remote Analog Input Range 0-10 Volts

Print

LD09260

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 28 - SETPOINTS SCREEN

OVERVIEW

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

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.

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 over-cooling 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

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.

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.

Alarm/Shutdown Setpoints

Access Level Required: VIEW

Moves to the sub-screen displaying the alarm and shutdown setpoints for safety logic associated with the turbine and steam condenser.

Configuration

Access Level Required: VIEW

Moves to the subscreen displaying the setup of parameters associated with the turbine and steam condenser operation, optional equipment and the configuration of optional analog inputs and outputs.

SETUP SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 29 - SETUP SCREEN

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 Switches and the current programmed configuration is displayed. A qualified Service Technician, following instructions in YORK Service Manual 160.67-M3, 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

Refrigerant Selection

Displays the condition of the Program Switch SW1-1 , ON = R134a, OFF = R2

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.

Change Settings*Access Level Required:* SERVICE

This key allows the following chiller parameters to be programmed:

Liquid Type*Access Level Required:* TEST OPERATOR/ADMINISTRATOR

Displays **Water** or **Brine**

Chilled Liquid Pump Operation

Displays **Standard** or **Enhanced**

Power Failure Restart

Displays **Manual** or **Automatic**

Pre-Lube

Displays **Standard** (50 seconds) or **Extended** (180 seconds)

Compressor Oil Pump Package

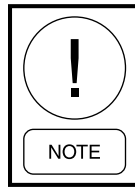
Displays **Fixed Speed** or **Variable Speed**

Compressor Model*Access Level Required:* TEST OP / ADMIN

The Horsepower Limit PID setpoint is initially set to the maximum allowable for the Compressor Model entered here. It is entered at the factory and can only be changed in the TEST OP or ADMIN access level.

Inlet Steam Pressure Range*Access Level Required:* Test OP/Admin

The inlet steam pressures range is entered at the factory and can only be changed in the test OP or Admin access level. Range setting is 0-150PSIG, 0-300 PSIG or 0-500 PSIG.



Panel will be automatically booted for changes to take affect.

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

Causes an instant return to the Home Screen.

Diagnostics*Access Level Required:* SERVICE

Moves to the sub-screen allowing limited diagnostic capability while operating. Refer to YORK Service Manual 160.67-M3

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.

USER SCREEN

SYSTEM STATUS
SYSTEM READY TO START

DATE 16 Apr 2004 **TIME** 11:56 AM **CONTROL SOURCE** Local
ACCESS LEVEL Service

USER SCREEN

	User ID	Password	User Level
User 1	1	0	View
User 2	2	0	View
User 3	3	0	View
User 4	4	0	View

Data Display Mode English

Change User Attributes

----- User Attributes Programming Instructions -----
 1. Press 'Change User Attributes' to start programming.
 2. Use cursor keys to select desired parameter.
 3. Press Enter key to input parameter.

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 30 - USER SCREEN

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

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 corre-

sponding Password and User Level. A User ID can be defined for various maintenance personnel.

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.

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.

NAVIGATION

Home

Access Level Required: VIEW

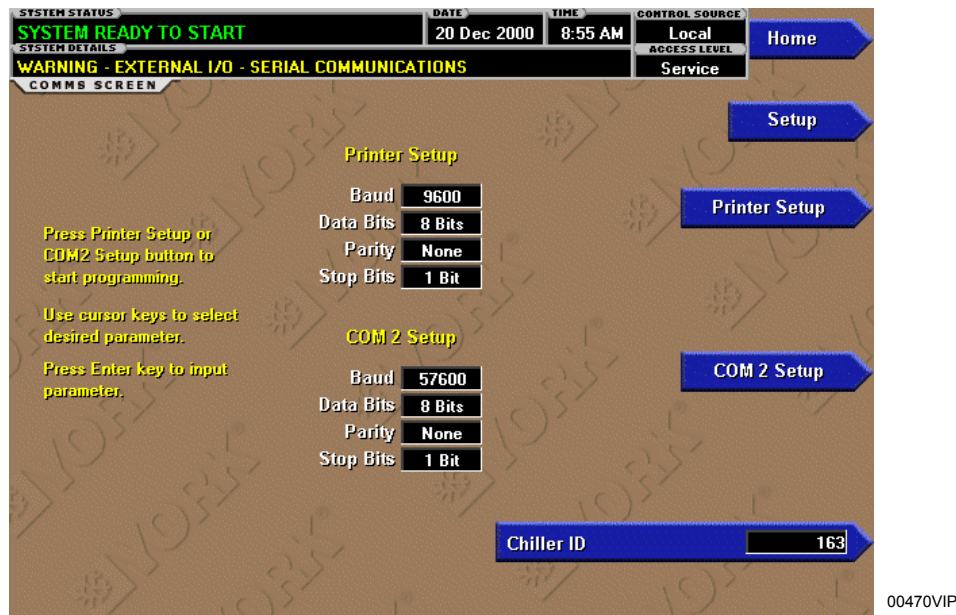
Causes an instant return to the Home Screen.

Setup

Access Level Required: VIEW

Return to the Setup Screen.

COMMS SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 31 - COMMS SCREEN

OVERVIEW

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.

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

SYSTEM STATUS: SYSTEM RUN
SYSTEM DETAILS: 06 Jul 1999 11 19 AM
CONTROL SOURCE: Local
ACCESS LEVEL: Service

LEAVING CHILLED LIQUID CONTROL
PRINTER SCREEN

Home Setup

Automatic Printer Logging Disabled

Log Start Time 12:00 AM

Output Interval 60 Min

Printer Type Okidata

Print Report Print All Histories

00319VIP

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 32 - PRINTER SCREEN

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.

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

SYSTEM STATUS
SYSTEM READY TO START

DATE 16 Apr 2004 **TIME** 11 47 AM **CONTROL SOURCE** Local
ACCESS LEVEL Service

Home

SALES ORDER SCREEN

Order Information

Commissioning Date	28 Jul 2004
Job Name	UConn Co-Gen
Job Location	Storrs, CT
Model Number	YSTWFYDJ4-KD7
York Order Number	03-105495-01
Panel Serial Number	JLR-071
Chiller Serial Number	GANM 285180

Turbine Information

Horsepower	1613
Steam Pressure	125
Steam Temperature	353
# Nozzles	13
Expansion Ratio	1.1
# OL Nozzles	1
Exhaust Pressure	2.8

Design Load

	Evaporator	Condenser	Steam Condenser
Passes	2	2	1
Design Working Pressure	150	150	150
Fouling Factor	.0001	.00025	85
Pressure Drop	18.5	23.8	12.2
Nozzle Arrangement In	B	12	BOTTOM
Nozzle Arrangement Out	C	13	TOP
Leaving Temperature	42.0	94.34	100.16
Return Temperature	54.0	85.0	94.34
GPM	4200	6300	6300
Tubes	182	261	0.049

System Information

Refrigerant	R134a
Tons	2100
Gear Code	PS
Liquid Type	Water
Brine Percent	0
Power(Volts/Ph/Hz)	460/3/60

Print

00320VIP

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 33 - SALES ORDER SCREEN

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 160.67-M3. 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.

Evaporator, Condenser and Steam Condenser Information

Factory defined description of the evaporator, refrigerant condenser, and steam condenser configuration at time of shipment.

Turbine Information

Factory defined information about the turbine design and steam requirements for design load conditions.

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.

OPERATIONS SCREEN

SYSTEM STATUS
SYSTEM READY TO START

DATE 20 Apr 2004 **TIME** 4:23 PM **CONTROL SOURCE** Local

ACCESS LEVEL Service

OPERATIONS SCREEN

York Intl North American Toll Free Number
1-800-861-1001

Danbury Service
203-730-8100

Run Time
0 Days
0 Hr
0 Min

Control Source Local

Number Of Starts 5

Operating Hours 65 Hr

Edit Phone Numbers

Hot Gas Enabled Level Control Enabled Flow Switch Analog

LD09098

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 34 - OPERATIONS SCREEN

OVERVIEW

This screen allows definition of general parameters having to do with the operation of the chiller.

DISPLAY ONLY

Chiller Run Time

Displays the amount of time the chiller has been running at rated speed 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” and ramp up to minimum rated speed.

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 Hot gas Bypass Control feature.

Refrigerant Level Control (Enabled / Disabled)

Access Level Required: SERVICE

Enables and Disables the Subcooler Refrigerant Level Control Feature.

Flow Switch

Access Level Required: SERVICE

Used to enter the applicable Flow Switch type. Style F and later chillers could be equipped with Differential Pressure Type (Digital), Paddle-type (Digital) or Thermal-Type (Analog) Flow sensors. The actual type installed must be entered to allow the program to read the correct input.

VGD (Enabled/Disabled)

Access level required: SERVICE

Enables and Disables the Variable Geometry Diffuser control feature.

Edit Phone Numbers

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 “York Int’l 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.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setup

Access Level Required: VIEW

Return to the Setup Screen.

ALARM/SHUTDOWN SETPOINTS SCREEN



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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 35 - ALARM/SHUTDOWN SETPOINTS SCREEN

OVERVIEW

This screen allows programming of the actuation points for various Alarm and Shutdown conditions primarily associated with the protection of the turbine and steam condenser. If an Alarm Setpoint is exceeded, a Warning Message will be displayed. If a Shutdown Setpoint is exceeded, the chiller will be shutdown immediately and a Safety Shutdown Message will be displayed. In either case the Audible Alarm on the Power Panel is sounded and the Anticipatory Alarm/Safety Shutdown contacts on the YORK I/O Board are closed. In order to better understand how these setpoints are used in the logic, references are made to the applicable page number of YORK YST Logic Diagram 160.67-M3 where the setpoint has visibility. To view the graphics associated with the setpoint, the applicable Screen name is also referenced. All setpoints require a login access level of Service or higher.

PROGRAMMABLE

HLSP2 – Hotwell High Level Shutdown

Screen: Condensate
Range: 80-100 % Default: 90 %

An immediate shutdown is initiated if the Hotwell Level Transmitter input signal remains continuously above this setpoint for the TDSP13-Hotwell High Level Timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen.

PSP7 - Turbine Exhaust Steam High Pressure Shutdown

Screen: Steam System
Range: 2.5-7.5 PSIA Default: 3.5 PSIA

An immediate shutdown is initiated if the input signal from the Turbine Exhaust Steam Pressure Transmitter remains continuously above this setpoint for the TDSP7-Turbine Exhaust High Pressure Timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen. This check is bypassed until the chiller is in the "System Run" mode.

PSP8 - Turbine Supply Oil Low Pressure Shutdown

Screen: Turbine
Range: 6.0-10.0 PSIG Default: 6.0 PSIG

This is only used when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. An immediate shutdown is initiated if the input signal from the Turbine Supply Oil Pressure Transmitter is below this setpoint. This check is bypassed for the first 45 seconds of the prelube after the message “START SEQUENCE INITIATED” is displayed.

PSP16 - Turbine Inlet Steam High Pressure Alarm

Screen: Steam System
Range: 100.0-500.0 PSIG Default: 500.0 PSIG

An alarm is generated if the input signal from the Turbine Inlet Steam Pressure Transmitter is above this setpoint.

SSP8 – Overspeed Shutdown

Screen: Auto/Manual
Range: 3600-4900 RPM Default: 4900 RPM

An immediate shutdown is initiated if the higher of the two speed analog input signals from the frequency-to-analog converters in the Turbine Box is above this setpoint.

TSP4 - Turbine Shaft End Bearing High Temperature Alarm

Screen: Turbine
Range: 180.0-220.0 °F Default: 210.0 °F

This is only used when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. An alarm is generated if the input signal from the Turbine Shaft End Bearing RTD Temperature Transmitter is above this setpoint. The final setpoint should be 5-10 °F higher than the normal operating temperature of the bearing.

TSP5 - Turbine Shaft End Bearing High Temperature Shutdown

Screen: Turbine
Range: 180.0-220.0 °F Default: 220.0 °F

This is only used when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. An immediate shutdown is initiated if the input signal from the Turbine Shaft End Bearing RTD Temperature Transmitter is above this setpoint. **The final setpoint should be 5-10 °F higher than the normal operating temperature of the bearing.**

TSP6 - Turbine Governor End Bearing High Temperature Alarm

Screen: Turbine
Range: 180.0-220.0 °F Default: 210.0 °F

This is only used when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. An alarm is generated if the input signal from the Turbine Governor End Bearing RTD Temperature Transmitter is above this setpoint. The final setpoint should be 5-10 °F higher than the normal operating temperature of the bearing.

TSP7 - Turbine Governor End Bearing High Temperature Shutdown

Screen: Turbine
Range: 180.0-220.0 °F Default: 220.0 °F

This is only used when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. An immediate shutdown is initiated if the input signal from the Turbine Governor End Bearing RTD Temperature Transmitter is above this setpoint. **The final setpoint should be 5-10 °F higher than the normal operating temperature of the bearing.**

TSP8 - Turbine Supply Oil High Temperature Alarm

Screen: Turbine
Range: 110.0-135.0 °F Default: 130.0 °F

This is only used when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. An alarm is generated if the input signal from the Turbine Supply Oil RTD Temperature Transmitter is above this setpoint.

TSP8 - Turbine Supply Oil High Temperature Shutdown

Screen: Turbine
Range: 110.0-135.0 °F Default: 135.0 °F

This is only used when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. An immediate shutdown is initiated if the input signal from the Turbine Supply Oil RTD Temperature Transmitter is above this setpoint.

TVSP1 - Turbine Vibration Alarm

Screen: Turbine

Range: 1.0-3.0 Mills

Default: 1.8 Mills

This is only used when the turbine is supplied with proximity probes and MSSP13-Turbine Shaft Vibration Sensors is set for Enabled on Configuration Screen 1. An alarm is generated if the input signal from any of the four turbine vibration transmitters is above this setpoint.

TVSP2 - Turbine Vibration Shutdown

Screen: Turbine

Range: 1.0-3.0 Mills

Default: 3.0 Mills

This is only used when the turbine is supplied with proximity probes and MSSP13-Turbine Shaft Vibration Sensors is set for Enabled on Configuration Screen 1. An immediate shutdown is initiated if the input signal from any of the four turbine vibration transmitters is above this setpoint.

CVSP1- Compressor Vibration Alarm

Screen: Compressor

Range: 0.00-2.00 in/sec

Default: 0.30 in/sec

This is only used when the Compressor is supplied with Accelerometers and MSSP18-Compressor Vibration Sensors is set for Enabled on Configuration Screen 1. An alarm is generated if the input signal from either of the two Compressor Vibration Transmitters is above this setpoint.

CVSP2- Compressor Vibration Shutdown

Screen: Compressor

Range: 0.00-2.00 in/sec

Default: 0.50 in/sec

This is only used when the Compressor is supplied with Accelerometers and MSSP18-Compressor Vibration Sensors is set for Enabled on Configuration Screen 1. Shutdown is initiated if the input signal from either of the two Compressor Vibration Transmitters is above this setpoint for a continuous period, TDSP-18 Compressor Vibration Trip Timeout, which is programmable on the Time Delay Alarm/Shutdown Setpoints Screen.

Set Alarms*Access Level Required: SERVICE*

This key enables the field selection cursor. The operator may then toggle between the programmable Alarm data fields using the Cursor Arrow keys.

Set Shutdowns*Access Level Required: SERVICE*

This key enables the field selection cursor. The operator may then toggle between the programmable Shutdown data fields using the Cursor Arrow keys.

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

Causes an instant return to the Home Screen.

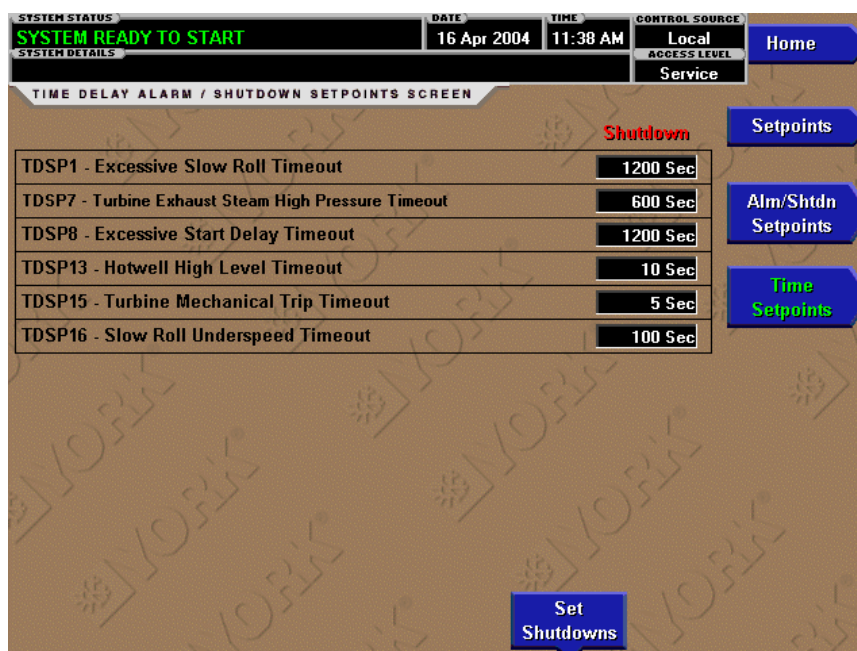
Setpoints*Access Level Required: VIEW*

Causes an instant return to the Setpoints Screen.

Time Setpoints*Access Level Required: VIEW*

Moves to a sub-screen allowing the programming of time delays associated with alarm and shutdown logic.

TIME DELAY ALARM/SHUTDOWN SETPOINTS SCREEN



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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 36 - TIME DELAY ALARM/SHUTDOWN SETPOINTS SCREEN

OVERVIEW

This screen allows programming of the time delays for various Alarm and Shutdown conditions primarily associated with the protection of the turbine and steam condenser. To view the graphics associated with the setpoint, the applicable Screen name is also referenced. All setpoints require a login access level of Service or higher.

PROGRAMMABLE

TDSP1 – Excessive Slow Roll Timeout

Screen: Steam System

Range: 0-2700 Sec

Default: 1200 Sec

An immediate shutdown is initiated if the turbine has been slow rolling longer than the calculated slow roll warm-up time plus this delay.

TDSP7 - Turbine Exhaust High Pressure Timeout

Screen: Steam System

Range: 0-1800 Sec

Default: 600 Sec

An immediate shutdown is initiated if the input signal from the Turbine Exhaust Steam Pressure Transmitter remains continuously above the PSP7-Turbine Exhaust Steam High Pressure Shutdown setpoint shown on the

Alarm/Shutdown Setpoints Screen for this delay after the chiller is in the "System Run" mode.

TDSP8 – Excessive Start Delay Timeout

Screen: Steam System

Range: 0-2700 Sec

Default: 1200 Sec

An immediate shutdown is initiated if the system prelube has been completed but the operator has failed to press the Begin Slow Roll key on the Steam System Screen to initiate the slow roll warm-up within this delay.

TDSP13 – Hotwell High Level Timeout

Screen: Condensate

Range: 0-60 Sec

Default: 10 Sec

An immediate shutdown is initiated if the Hotwell Level Transmitter input signal remains continuously above the HLSP2 – Hotwell High Level Shutdown shown on the Alarm/Shutdown Setpoints Screen or the steam condenser hotwell high-level switch input to the York I/O board has been continuously open for this delay.

TDSP15 – Turbine Mechanical Trip Timeout

Screen: Turbine

Range: 5-2400 Sec

Default: 10 Sec

An immediate shutdown is initiated if the Turbine Trip Valve Air Dump Solenoid is energized and the Turbine Trip Valve Limit Switch contact is open after this delay.

TDSP16 – Slow Roll Underspeed Timeout

Screen: Steam System

Range: 5-200 Sec

Default: 100 Sec

An immediate shutdown is initiated if the Turbine Rotating (Speed Switch) contact is closed but the SSP1-Slow Roll Setpoint speed shown on the Speed Setpoints Screen has not been achieved within this delay.

TDSP18 – Compressor Vibration Trip Timeout

Screen: Compressor

Range: 2-300 Sec

Default: 5 Sec

A shutdown is initiated if either of the two Compressor Vibration Transmitter input signals remain continuously above the CVSP2-Compressor Vibration Shutdown shown on the Alarm / Shutdown Setpoints Screen for this delay.

Set Shutdowns

Access Level Required: SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setpoints

Access Level Required: VIEW

Causes an instant return to the Setpoints Screen.

Alarm / Shutdown Setpoints

Access Level Required: VIEW

Causes an instant return Alarm / Shutdown Setpoints Screen.

CONFIGURATION SCREEN 1

SYSTEM STATUS	DATE	TIME	CONTROL SOURCE
SYSTEM READY TO START	15 Apr 2004	6:01 PM	Local
SYSTEM DETAILS			ACCESS LEVEL
			Service

CONFIGURATION SCREEN 1	
MSSP4 - Turbine Start Mode	Manual
MSSP6 - Turbine Lubrication Type	Pump
MSSP10 - Hotwell Pump Mode	Dual
MSSP11 - Vacuum Pump Mode	Dual
MSSP13 - Turbine Shaft Vibration Sensors	Disabled
MSSP14 - Turbine Bearing Temperature Sensors	Disabled
MSSP15 - Turbine First Stage Pressure Sensor	Enabled
MSSP16 - Turbine Nozzle Solenoids	Disabled
MSSP17 - Turbine Stage Count	7

Page Down

Change Setpoints

Setpoints

Configuration Setpoints

Pressure Setpoints

Time Setpoints

Speed Setpoints

Ramp Rate Setpoints

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 37 - CONFIGURATION SCREEN 1

OVERVIEW

This screen allows programming of various parameters pertinent to the operation of the chiller and the optional equipment supplied. It is also the gateway to screens for programming various setpoints pertinent to the operation of the chiller and optional flow transmitter inputs. In order to better understand how these setpoints are used in the logic, references are made to the applicable page number of YORK YST Logic Diagram 160.67-M3 where the setpoint has visibility. To view the results of a setpoint change, the applicable Screen name is also referenced. All setpoints require a login access level of Service or higher.

PROGRAMMABLE

MSSP4 – Turbine Start Mode

Screen: Steam System,Turbine

Range: Auto/Manual

Default: Manual

This must be changed to Auto if the chiller is supplied with optional equipment to control all the steam supply and turbine casing drain valves for completely automatic startup of the chiller.

MSSP6 – Turbine Lubrication Type

Screen: Turbine

Range: Pump/Ring

Default: Pump

This must be set to Pump if the turbine is supplied with a pressurized lube system and auxiliary oil pump and Ring if it is supplied with oil slinger rings for bearing lubrication.

MSSP10 – Hotwell Pump Mode

Screen: Condensate

Range: Dual/Single

Default: Dual

This must be set to Single if the steam condenser is supplied with only one hotwell pump and Dual if supplied with an optional standby hotwell pump.

MSSP11 – Vacuum Pump Mode

Screen: Vacuum

Range: Ejector/Single/Dual

Default: Dual

This must be set to Ejector if the steam condenser is supplied with optional steam ejectors and one vacuum pump, Single if supplied with only one vacuum pump, and Dual if supplied with an optional standby vacuum pump.

MSSP13 – Turbine Shaft Vibration Sensors

Screen: Turbine

Range: Enabled/Diasabled Default: Disabled

This is automatically changed to Enabled if MSSP4-Turbine Start Mode is set for Auto and the turbine must be fitted with two proximity probes on each end. If MSSP4 is set to Manual, this must be set to Enabled if the turbine is fitted with vibration probes.

MSSP14 – Turbine Bearing Temperature Sensors

Screen: Turbine

Range: Enabled/Diasabled Default: Disabled

If the turbine is not fitted with bearing temperature sensors, this must be set to Disabled.

MSSP15 – Turbine First Stage Pressure Sensor

Screen: Steam System

Range: Enabled/Diasabled Default: Disabled

If the turbine is not fitted with a first stage pressure transmitter, this must be set to Disabled.

MSSP16 – Turbine Nozzle Solenoids

Screen: Steam System

Range: Enabled/Diasabled Default: Disabled

This is automatically changed to Enabled if MSSP4-Turbine Start Mode is set for Auto and the turbine must be fitted with pneumatically actuated nozzle valves. If MSSP4 is set to Manual, this must be set to Enabled if the turbine is fitted with pneumatically actuated nozzle valves.

MSSP17 – Turbine Stage Count

Screen: Turbine

Range: 6-10 Default: 7

This is set to the number of stages in the turbine and is used in the calculation for the preset of the slow roll warm-up timer. A countdown timer displaying the time remaining in the slow roll cycle appears with the message “**SLOW ROLLING**” in the System Status display.

MSSP18 – Compressor Vibration Sensors

Screen: Compressor

Range: Enabled / Disabled Default: Disabled

If the Compressor is not fitted with Accelerometers, this must be set to Disabled.

MSSP19 – Governor Valve Location

Screen: Steam System

Range: Turbine/External Default: External

If the Governor Valve is NOT installed on the Turbine, this must be set to External.

Change Setpoints*Access Level Required:* SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION**Page Down***Access Level Required:* VIEW

Moves to the Configuration Screen 2.

Home*Access Level Required:* VIEW

Causes an instant return to the Home Screen.

Setpoints*Access Level Required:* VIEW

Causes an instant return to the Setpoints Screen.

Pressure Setpoints*Access Level Required:* VIEW

Moves to a sub-screen that allows programming of various pressure thresholds pertaining to the operation of the chiller.

Time Setpoints*Access Level Required:* VIEW

Moves to a sub-screen that allows programming of various time delays pertaining to the operation of the chiller.

Speed Setpoints*Access Level Required:* VIEW

Moves to a sub-screen that allows programming of various speed thresholds pertaining to the operation of the chiller.

Ramp Rate Setpoints*Access Level Required:* VIEW

Moves to a sub-screen that allows programming of various speed setpoint and valve control signal ramp rates pertaining to the operation of the chiller.

CONFIGURATION SCREEN 2

SYSTEM STATUS		DATE	TIME	CONTROL SOURCE
SYSTEM READY TO START		16 Apr 2004	11:33 AM	Local
SYSTEM DETAILS		ACCESS LEVEL		
		Service		

CONFIGURATION SCREEN 2	
FSE1 - Steam Flow Sensor Enable	Disabled
FSE2 - Evaporator Flow Sensor Enable	Disabled
FSE3 - Condenser Flow Sensor Enable	Disabled
FSP1 - Steam Flow Sensor Range	24000 Lb/Hr
FSP2 - Evaporator Flow Sensor Range	6000 Gal/Min
FSP3 - Condenser Flow Sensor Range	8000 Gal/Min
FSP4 - Steam Flow Transmitter Signal Type	Linear
FSP5 - Evaporator Flow Transmitter Signal Type	Linear
FSP6 - Condenser Flow Transmitter Signal Type	Linear

Page Up Page Down Change Setpoints

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 38 - CONFIGURATION SCREEN 2

OVERVIEW

This screen is used to configure the analog inputs dedicated for the customer supplied steam and water flow transmitters. These inputs must be configured to match the full- scale range and the linearity of the transmitter output signal in order for the data fields to display the correct values. The transmitters must be connected to the Control Center per the Field Control Modifications Wiring Diagram YORK Form 160.67-PW2.

PROGRAMMABLE

FSE1 – Steam Flow Sensor Enable

Screen: Steam System
Range: Enabled/Diasabled Default: Disabled

This must be set to Enabled to display the rate of steam flowing through the turbine.

FSE2 – Evaporator Flow Sensor Enable

Screen: Evaporator
Range: Enabled/Diasabled Default: Disabled

This must be set to Enabled to display the rate of chilled liquid flowing through the evaporator.

FSE3 – Condenser Flow Sensor Enable

Screen: Condenser
Range: Enabled/Diasabled Default: Disabled

This must be set to Enabled to display the rate of cooling liquid flowing through the condenser.

FSP1 – Steam Flow Sensor Range

Screen: Steam System
Range: 0-30,000 Lb/Hr Default: 24,000 Lb/Hr

This is the calibrated upper range limit of the steam flow transmitter output signal.

FSP2 – Evaporator Flow Sensor Range

Screen: Evaporator
Range: 0-10,000 Gal/Min Default: 6000 Gal/Min

This is the calibrated upper range limit of the chilled liquid flow transmitter output signal.

FSP3 – Condenser Flow Sensor Range

Screen: Condenser
Range: 0-10,000 Gal/Min Default: 8000 Gal/Min

This is the calibrated upper range limit of the condens-er liquid flow transmitter output signal.

FSP1 – Steam Flow Transmitter Signal Type

Screen: Steam System
Range: Linear/Square Root Default: Linear

If the Steam Flow Transmitter produces an output which is linear with the differential pressure drop across a flow sensing element, this must be set to Square Root. The logic will then extract the square root of the input signal to provide a display that is linear with the steam flow.

FSP2 – Evaporator Flow Transmitter Signal Type

Screen: Evaporator

Range: Linear/Square Root

Default: Linear

If the Evaporator Flow Transmitter produces an output which is linear with the differential pressure drop across a flow sensing element, this must be set to Square Root. The logic will then extract the square root of the input signal to provide a display that is linear with the chilled liquid flow.

FSP2 – Condenser Flow Transmitter Signal Type

Screen: Condenser

Range: Linear/Square Root

Default: Linear

If the Condenser Flow Transmitter produces an output which is linear with the differential pressure drop across a flow sensing element, this must be set to Square Root. The logic will then extract the square root of the input signal to provide a display that is linear with the cooling liquid flow.

Change Setpoints

Access Level Required: SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Page Up

Access Level Required: VIEW

Causes an instant return to Configuration Screen 1.

Page Down

Access Level Required: VIEW

Moves to the Configuration Screen 3.

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setpoints

Access Level Required: VIEW

Causes an instant return to the Setpoints Screen.

Pressure Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various pressure thresholds pertaining to the operation of the chiller.

Time Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various time delays pertaining to the operation of the chiller.

Speed Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed thresholds pertaining to the operation of the chiller.

Ramp Rate Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed setpoint and valve control signal ramp rates pertaining to the operation of the chiller

CONFIGURATION SCREEN 3

SYSTEM STATUS: **SYSTEM READY TO START**

DATE: 15 Apr 2004 TIME: 6 05 PM CONTROL SOURCE: Local

SYSTEM DETAILS: ACCESS LEVEL: Service

CONFIGURATION SCREEN 3

CAO - Configurable Analog Output	Governor Position
CDOA - Configurable Digital Output	Compressor Oil Pump
CDOB - Configurable Digital Output	Compressor Oil Pump
CDOC - Configurable Digital Output	Compressor Oil Pump

Navigation buttons: Home, Setpoints, Configuration Setpoints, Pressure Setpoints, Time Setpoints, Speed Setpoints, Ramp Rate Setpoints, Page Up, Change Setpoints.

LD09279

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 39 - CONFIGURATION SCREEN 3

OVERVIEW

This screen is used to configure one spare analog output and three spare digital outputs to duplicate specific existing I/O points. These spares may be used for remote signaling or to replace an existing point in the event of a hardware failure.

PROGRAMMABLE

CAO – Configurable Analog Output

Screen: N/A

Range: Governor Position/Hotwell Level/HGV Position/Turbine Speed/Steam Inlet Position

Default: Governor Position

This setpoint determines which existing analog output control logic drives the 4-20 mA output signal from the Frick Analog I/O Board analog output Channel #2. For example, with the default setpoint, this output will be 4 mA at 0% and 20 mA at 100% control signal to the turbine governor valve analog output.

CDOA – Configurable Digital Output

Screen: N/A

Range: Compressor Oil Pump/Turbine Oil Pump/Hotwell Pump/Vacuum Pump/Turbine Start Relay

Default: Compressor Oil Pump

This setpoint determines what existing digital output control logic drives the 120 VAC digital output on the Frick Digital I/O Board digital output Channel #22. For example, with the default setpoint, this output is on when the compressor VS oil pump drive is enabled to start the compressor oil pump. If the setpoint is Hotwell or Vacuum Pump, this output is on if either the lead or stand-by pump run output is on.

CDOB – Configurable Digital Output

Screen: N/A

Range: Compressor Oil Pump/Turbine Oil Pump/Hotwell Pump/Vacuum Pump/Turbine Start Relay

Default: Compressor Oil Pump

This setpoint determines what existing digital output control logic drives the 120 VAC digital output on the Frick Digital I/O Board digital output Channel #23. For example, if set for Turbine Oil Pump, this output is on when the turbine auxiliary oil pump run output is on.

CDOC – Configurable Digital Output

Screen: N/A

Range: Compressor Oil Pump/Turbine Oil Pump/Hotwell Pump/Vacuum Pump/Turbine Start Relay

Default: Compressor Oil Pump

This setpoint determines what existing digital output control logic drives the 120 VAC digital output on the Frick Digital I/O Board digital output Channel #24. For example, if set for Turbine Start Relay, this output is on when the main start relay K18 on the York I/O board is on to energize the Turbine Trip Valve Air Dump Solenoid and open the trip valve.

Change Setpoints

Access Level Required: SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Page Up

Access Level Required: VIEW

Causes an instant return to Configuration Screen 2.

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setpoints

Access Level Required: VIEW

Causes an instant return to the Setpoints Screen.

Pressure Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various pressure thresholds pertaining to the operation of the chiller.

Time Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various time delays pertaining to the operation of the chiller.

Speed Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed thresholds pertaining to the operation of the chiller.

Ramp Rate Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed setpoint and valve control signal ramp rates pertaining to the operation of the chiller.

PRESSURE SETPOINTS SCREEN

SYSTEM STATUS	DATE	TIME	CONTROL SOURCE
SYSTEM READY TO START	15 Apr 2004	5 59 PM	Local
SYSTEM DETAILS			ACCESS LEVEL
			Service

PRESSURE SETPOINTS SCREEN	
PSP5 - Vacuum Pump Shutdown	1.5 Psia
PSP6 - Ready To Run Turbine Exhaust Pressure	5.0 Psia
PSP9 - Turbine Auxiliary Oil Pump Off	16.0 Psig
PSP10 - Turbine Auxiliary Oil Pump On	8.0 Psig
PSP12 - Open Ejector Steam Inlet	5.0 Psia
PSP13 - Turbine Nozzle Solenoid #1 Activate	45.0 Psig
PSP14 - Turbine Nozzle Solenoid #2 Activate	50.0 Psig
PSP15 - Turbine Nozzle Solenoid Deadband	5.0 Psig

Setpoints

Configuration Setpoints

Pressure Setpoints

Time Setpoints

Speed Setpoints

Ramp Rate Setpoints

Change Setpoints

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 40 - PRESSURE SETPOINTS SCREEN

OVERVIEW

This screen allows programming of various pressure thresholds pertinent to the operation of the chiller and the optional equipment supplied. It is also a gateway to screens for programming time delays, speeds, and ramp rates pertinent to the operation of the chiller. In order to better understand how these setpoints are used in the logic, references are made to the applicable page number of YORK YST Logic Diagram 160.67-M3 where the setpoint has visibility. To view the results of a setpoint change, the applicable Screen name is also referenced. All setpoints require a login access level of Service or higher.

PROGRAMMABLE

PSP5 – Vacuum Pump Shutdown

Screen: Vacuum

Range: 0-10.0 PSIA

Default: 9.0 PSIA

This determines when the vacuum pump is stopped during slow roll. During the slow roll, an extremely low exhaust pressure may cause speed instability; therefore this is usually set at 9 PSIA. When the chiller is supplied with a steam condenser that uses a single vacuum pump and steam ejectors to maintain the required turbine exhaust pressure and MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Ejector, this determines when the vacuum pump is

stopped during slow roll and normal operation. After the vacuum pump has pulled the exhaust pressure down below the PSP12-Open Ejector Steam Inlet pressure and the ejectors are operating, the turbine exhaust pressure will decrease rapidly. The vacuum pump is stopped when the turbine exhaust pressure has decreased to this setpoint.

PSP6 – Ready To Run

Screen: Steam System

Range: 0-15.0 PSIA

Default: 12.0 PSIA

This determines when the turbine can be ramped up to rated speed. After the slow roll timer has decremented to 0, and the turbine exhaust pressure has been reduced to this value, the message READY TO RUN is displayed until the “Run At Rated” key that appears on the Steam System Screen is pressed to close the Chilled Liquid Pump Start contacts and initiate the ramp up to rated speed. When MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1, the Chilled Liquid Pump Start contacts are closed automatically when this message appears. If the vacuum pump has been stopped, it will be restarted if the exhaust pressure increases to this value during slow roll and the ramp up to rated speed.

PSP9 - Turbine Auxiliary Oil Pump Off

Screen: Turbine

Range: 10.0-18.0 PSIG

Default: 16.0 PSIG

This is only used when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It determines the turbine supply oil pressure at which the auxiliary oil pump will be stopped after the SSP7-Turbine Aux Oil Pump Activate speed has been achieved and the turbine shaft driven oil pump is producing sufficient pressure.

PSP10 - Turbine Auxiliary Oil Pump On

Screen: Turbine

Range: 8.0-12.0 PSIG

Default: 8.0 PSIG

This is only used when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It determines the turbine supply oil pressure at which the auxiliary oil pump will be restarted while the chiller is running at or above the SSP2-Minimum Rated Speed setpoint shown on the Speed Setpoints Screen if the turbine shaft driven oil pump is not producing sufficient pressure.

PSP12 – Open Ejector Steam Inlet

Screen: Vacuum

Range: 0-15.0 PSIA

Default: 5.0 PSIA

This is only used when the chiller is supplied with a steam condenser that uses a single vacuum pump and steam ejectors to maintain the required turbine exhaust pressure and MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Ejector. For the ejectors to operate efficiently, it is best to initially reduce the exhaust pressure with the vacuum pump. When the turbine exhaust pressure has decreased to this value, the Ejector Steam Supply Valve Actuator digital output is switched on (and latched on until the chiller is shutdown) to open the ejector supply valve and allow steam into the ejectors. After the ejectors are activated, the turbine exhaust pressure will decrease rapidly to the PSP5-Vacuum Pump Shutdown setpoint and the vacuum pump will be stopped. This must be set above the PSP5 value in order to automatically start the ejectors before the vacuum pump is stopped.

PSP13- Turbine Nozzle Solenoid #1 Activate

Screen: Steam System

Range: -14.7-100 PSIG

Default: 45.0 PSIG

This is only used when the turbine is supplied with pneumatically actuated nozzle valves and MSSP16-Turbine Load Solenoids is set for Enabled. When the chiller is running at or above the SSP2-Minimum Rated Speed, if the turbine first stage steam pressure has been continuously above this value for the TDSP2-Turbine Nozzle Solenoid #1 Delay, Turbine Nozzle Solenoid #1 Air Dump Solenoid is energized. This setpoint must be determined by a York Service Technician by increasing the load on the turbine (with both hand valves closed) and observing when the first stage pressure stops increasing even though the governor valve output signal continues increasing. The setpoint is 1-2 PSI below the observed pressure. Opening a nozzle valve allows steam to flow through more nozzles in the turbine nozzle block and increases the turbines potential capacity.

PSP14- Turbine Nozzle Solenoid #2 Activate

Screen: Steam System

Range: -14.7-100 PSIG

Default: 50.0 PSIG

This is only used when the turbine is supplied with pneumatically actuated nozzle valves and MSSP16-Turbine Load Solenoids is set for Enabled. When the chiller is running at or above the SSP2-Minimum Rated Speed, if the turbine first stage steam pressure has been continuously above this value for the TDSP3-Turbine Nozzle Solenoid #2 Delay, Turbine Nozzle Solenoid #2 Air Dump Solenoid is energized to increase the turbines potential capacity. This setpoint must be determined by a York Service Technician by increasing the load on the turbine (with Turbine Nozzle Solenoid Valve #1 energized) and observing when the first stage pressure stops increasing even though the governor valve output signal continues increasing. The setpoint is 1-2 PSI below the observed pressure.

PSP15- Turbine Nozzle Solenoid Deadband

Screen: Steam System

Range: 1.0-10.0 PSIG

Default: 5.0 PSIG

This is only used when the turbine is supplied with pneumatically actuated nozzle valves and MSSP16-Turbine Load Solenoids is set for Enabled. When a nozzle solenoid is energized, it will remain energized until the turbine first stage pressure has decreased below the activation pressure by this value.

Change Setpoints

Access Level Required: SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setpoints

Access Level Required: VIEW

Causes an instant return to the Setpoints Screen.

Configuration Setpoints

Access Level Required: VIEW

Causes an instant return to the Configuration Setpoints Screen 1.

Time Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various time delays pertaining to the operation of the chiller.

Speed Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed thresholds pertaining to the operation of the chiller.

Ramp Rate Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed setpoint and valve control signal ramp rates pertaining to the operation of the chiller.

TIME SETPOINTS SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 41 - TIME SETPOINTS SCREEN

OVERVIEW

This screen allows programming of various time delays pertinent to the operation of the chiller and the optional equipment supplied. It is also a gateway to screens for programming pressures, speeds, and ramp rates pertinent to the operation of the chiller. To view the results of a setpoint change, the applicable Screen name is also referenced. All setpoints require a login access level of Service or higher.

PROGRAMMABLE

TDSP2 – Turbine Nozzle Solenoid #1 Delay

Screen: Steam System
Range: 0-3600 Sec Default: 300 Sec

This is only used when the turbine is supplied with pneumatically actuated nozzle valves and MSSP16-Turbine Load Solenoids is set for Enabled. When the chiller is running at or above the SSP2-Minimum Rated Speed, if the turbine first stage steam pressure has been continuously above the PSP13- Turbine Nozzle Solenoid #1 Activate pressure for this delay, Turbine Nozzle Solenoid #1 Air Dump Solenoid is energized.

TDSP3 – Turbine Nozzle Solenoid #2 Delay

Screen: Steam System
Range: 0-3600 Sec Default: 100 Sec

This is only used when the turbine is supplied with pneumatically actuated nozzle valves and MSSP16-Turbine Load Solenoids is set for Enabled. When the chiller is running at or above the SSP2-Minimum Rated Speed, if the turbine first stage steam pressure has been continuously above the PSP14- Turbine Nozzle Solenoid #2 Activate pressure for this delay, Turbine Nozzle Solenoid #2 Air Dump Solenoid is energized.

TDSP4 – Chilled Liquid Pump Turn-On Delay

Screen: Evaporator
Range: 0-10 Sec Default: 5 Sec

The Chilled Liquid Pump Start Contact is closed as soon as the ramp-to-rated speed is initiated after the slow roll warm up of the turbine. However, anytime the speed remains above the SSP5-Chilled Liquid Pump Turn-On Speed continuously for this delay, the Chilled Liquid Pump Start Contact is closed. In some plants where there is not a dedicated chilled liquid pump for each chiller, this contact may be used to initiate the opening of a valve in the chilled liquid inlet line. In any case, a minimum chilled liquid flow must be established within the TDSP5- Chilled Liquid Flow Switch Check Delay in order to avoid a shutdown.

TDSP5 – Chilled Liquid Flow Switch Check Delay

Screen: Evaporator

Range: 0-60 Sec

Default: 10 Sec

Whenever the Chilled Liquid Pump Start Contact is closed, the flow switch must be closed within this time in order to avoid a shutdown. In some plants where there is not a dedicated chilled liquid pump for each chiller and this contact is used to initiate the opening of a valve in the chilled liquid inlet line, this delay may need to be increased if the valve actuator is slow. This will provide the additional time required for the valve to open sufficiently to establish the minimum flow required.

TDSP6 – Subcooler Level Valve Pulldown Delay

Screen: Condenser

Range: 0-1800 Sec

Default: 600 Sec

This is the time that the Subcooler Refrigerant Level Controller is inactive after startup with the level control valve output signal held at 100% to keep the valve fully open. This delay starts after the ramp up to rated speed has been completed and the TDSP17-Turbine Stabilization Delay has elapsed.

TDSP9 – Soft Shutdown Rampdown Timeout

Screen: Home

Range: 2-20 Min

Default: 10 Min

When a soft shutdown is initiated, the chiller will be shutdown after this delay regardless of the regardless of the speed or position of the vanes and hot gas valve.

TDSP11 – Hotwell Pump Shutdown Delay

Screen: Condensate

Range: 0-3600 Min

Default: 360 Sec

This determines how long the Hotwell Pump remains on after the drive train has coasted to a complete stop. During this delay, the Condenser Liquid Pump Start Contact remains closed, the oil cooler liquid solenoids remain energized, and the Turbine Steam Ring Drain Solenoid remains de-energized.

TDSP12– Turbine Auxiliary Oil Pump Postlube

Screen: Turbine

Range: 30-40 Min

Default: 30 Min

This is only used when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It determines how long the pump remains on to provide cooling oil to the turbine bearings after the drive train has coasted to a complete stop.

TDSP17– Turbine Stabilization Delay

Screen: Home

Range: 0-300 Sec

Default: 5 Sec

This determines how long the turbine runs after achieving SSP2-Minimum Rated Speed before the capacity controls are enabled. During this time, the speed increases to the SSP3-Fixed Rated Speed, the compressor vanes are opening to the PRVM-PRV Minimum Open Position, and a countdown timer displaying the time remaining in the stabilization cycle appears with the message TURBINE STABILIZING.

When MSSP7-Speed Control Mode is set for Variable, the capacity controls will attempt to reduce the speed to the SSP2-Minimum Rated Speed unless the head pressure increases as the hot gas valve closes and causes the calculated anti-surge minimum speed to increase above the minimum rated speed. This delay gives the speed control time to stabilize at the higher SSP3-Fixed Speed that is usually set well above the critical speed of the turbine.

When MSSP7-Speed Control Mode is set for Fixed, this delay should be set to 0 since the capacity controls will not attempt to reduce the speed towards the turbine critical speed. This allows the Hot Gas Bypass Valve to begin ramping closed and the vanes to begin ramping open as soon as SSP2-Minimum Rated Speed is achieved.

Change Setpoints

Access Level Required: SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setpoints

Access Level Required: VIEW

Causes an instant return to the Setpoints Screen.

Configuration Setpoints

Access Level Required: VIEW

Causes an instant return to the Configuration Setpoints Screen 1.

Pressure Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various pressure thresholds pertaining to the operation of the chiller.

Speed Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed thresholds pertaining to the operation of the chiller.

Ramp Rate Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed setpoint and valve control signal ramp rates pertaining to the operation of the chiller.

SPEED SETPOINTS SCREEN

Setpoint	Value
SSP1 - Slow Roll Speed	1000 RPM
SSP3 - Fixed Speed	4200 RPM
SSP4 - Overspeed Test Limit	5000 RPM
SSP7 - Turbine Auxiliary Oil Pump Activate	3000 RPM
SSP2 - Minimum Rated Speed	3200 RPM
SSP5 - Chilled Liquid Pump Turn-On Speed	1200 RPM
SSP9 - Maximum Rated Speed	4500 RPM
SSP10 - Maximum Speed Analog Input	5000 RPM

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 42 - SPEED SETPOINTS SCREEN

OVERVIEW

This screen allows programming of various speed thresholds pertinent to the operation of the chiller and the optional equipment supplied. It is also a gateway to screens for programming pressures, time delays, and ramp rates pertinent to the operation of the chiller. To view the results of a setpoint change, the applicable Screen name is also referenced. All setpoints except those in Red text require a login access level of Service or higher. The setpoints shown in Red text are programmed at the factory and can only be adjusted in the field using the Administrator password. This password changes daily and is based on the date. The password is obtained by contacting the local service office.

PROGRAMMABLE

SSP1 – Slow Roll Speed

Access Level Required: SERVICE

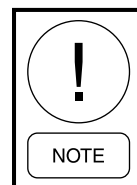
Screen: Steam System

Range: 750-1200 RPM

Default: 1000 RPM

This is the speed that the turbine will run at during the slow roll warm up. If MSSP6-Turbine Lubrication is set for Ring, this cannot be set below 1000 RPM in order to ensure that the turbine bearings are sufficiently

lubricated during the slow roll. It is recommended that all YST chillers be slow rolled at 1200 RPM to reduce wear on the compressor bearings.



This setpoint is NOT programmable when Turbine lubrication (MSS P6) is set for "RING". In this case the RPM is fixed at 1200 RPM.

SSP3 – Fixed Speed

Access Level Required: SERVICE

Screen: Steam System

Range: 3200-4700 RPM

Default: 3600 RPM

This is the constant speed that the turbine will run at when MSSP7-Speed Control Mode on Capacity Control Setpoints Screen 1 is set to Fixed. When MSSP7-Speed Control Mode is set to Variable, this is the speed that the turbine will ramp up to during the TDSP17-Turbine Stabilization Delay.

SSP4 – Overspeed Test Limit

Access Level Required: SERVICE

Screen: Auto/Manual

Range: 4500-5000 RPM

Default: 5000 RPM

This is the maximum Manual speed setpoint allowed during a mechanical overspeed test. With SSP9-Maximum Rated Speed set at 4500 RPM, the default value of 5000 RPM will be displayed as 111.1% in the Manual data field.

SSP7 – Turbine Auxiliary Oil Pump Activate

Access Level Required: SERVICE

Screen: Turbine
Range: 3000-3500 RPM Default: 3000 RPM

This is the speed at which the turbine auxiliary oil pump will be started during SYSTEM COASTDOWN regardless of the turbine supply oil pressure. It is also the speed at which the auxiliary oil pump will be stopped during the ramp up to rated speed if the turbine shaft driven oil pump is producing sufficient oil flow to increase the turbine supply oil pressure above the PSP9-Turbine Auxiliary Oil Pump Off pressure. This setpoint also determines when the Steam Ring Drain Solenoid Valve is closed during the ramp up to rated speed and opened during coastdown.

SSP2 – Minimum Rated Speed

Access Level Required: TEST OPERATOR/
ADMINISTRATOR

Screen: Steam System
Range: 3200-3600 RPM Default: 3200 RPM

This is the minimum speed that the turbine will be allowed to run at during normal operation.

SSP5 – Chilled Liquid Pump Turn-On Speed

Access Level Required: TEST OPERATOR/
ADMINISTRATOR

Screen: Evaporator
Range: 1000-1600 RPM Default: 1500 RPM

The Chilled Liquid Pump Start Contact is closed as soon as the ramp-to-rated speed is initiated after the slow roll warm up of the turbine. However, anytime the speed remains above this value continuously for the TDSP4 – Chilled Liquid Pump Turn-On Delay, the Chilled Liquid Pump Start Contact is closed. In some plants where there is not a dedicated chilled liquid pump for each chiller, this contact may be used to initiate the opening of a valve in the chilled liquid inlet line. In any case, a minimum chilled liquid flow must be established within the TDSP5- Chilled Liquid Flow Switch Check Delay in order to avoid a shutdown.

SSP9 – Maximum Rated Speed

Access Level Required: TEST OPERATOR/
ADMINISTRATOR

Screen: Steam System
Range: 3200-4700 RPM Default: 4500 RPM

This is the maximum speed setpoint that the capacity/anti-surge controls will be allowed to send to the speed control PID logic during normal operation. This value is used by the logic as the equivalent to 100% speed.

SSP10 – Maximum Speed Analog Input

Access Level Required: TEST OPERATOR/
ADMINISTRATOR

Screen: Steam System
Range: 4000-5000 RPM Default: 5000 RPM

This is the maximum speed equivalent to a 20 mA input from the frequency-to-analog converter in the Turbine Box and is used for the speed input scaling.

SSP11 – Critical Band Base Speed

Access Level Required: TEST OPERATOR/
ADMINISTRATOR

Screen: Steam System
Range: 1800-5000 RPM Default: 2000 RPM

This is the lower end of the critical speed range of the Turbine. During ramp up to rated speed, the 17 second time delay for the under speed trip logic is initiated when the speed is above this value. If the speed increases above this value without the ramp to rated speed being initiated, the turbine is tripped on "Slow Roll Overspeed".

SSP12 – Critical Band Offset Speed

Access Level Required: TEST OPERATOR/
ADMINISTRATOR

Screen: Steam System
Range: 500-2000 RPM Default: 1000 RPM

This is added to the SSP11- Critical Band Base Speed value to determine the upper end of the critical speed range of the Turbine. During ramp up to rated speed, if the speed does not increase above the upper end of the critical speed range within 17 seconds from the time it increased above the SSP11-Critical Band Base Speed value, the turbine is tripped on "Turbine Underspeed".

Change Setpoints

Access Level Required: SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setpoints

Access Level Required: VIEW

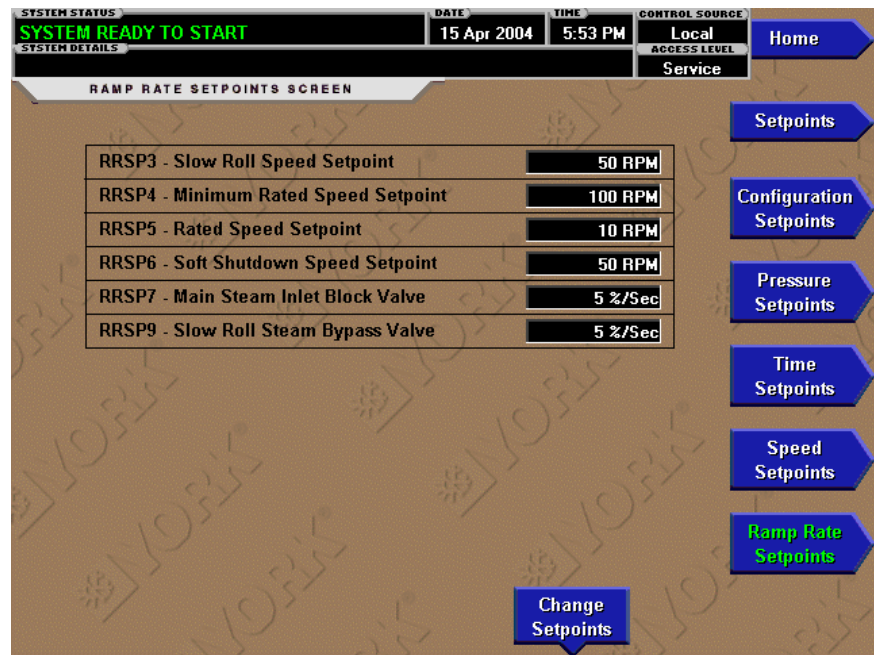
Causes an instant return to the Setpoints Screen.

Configuration Setpoints

Access Level Required: VIEW

Causes an instant return to the Configuration Setpoints Screen 1.

RAMP RATE SETPOINTS SCREEN



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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 43 - RAMP RATE SETPOINTS SCREEN

Time Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various time delays pertaining to the operation of the chiller.

Ramp Rate Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various speed setpoint and valve control signal ramp rates pertaining to the operation of the chiller.

OVERVIEW

This screen allows programming of various speed setpoint and control valve ramp rates pertinent to the operation of the chiller and the optional equipment supplied. It is also a gateway to screens for programming pressures, time delays, and speeds pertinent to the operation of the chiller. To view the results of a setpoint change, the applicable Screen name is also referenced. All setpoints require a login access level of Service or higher.

PROGRAMMABLE

RRSP3 – Slow Roll Speed Setpoint

Screen: Steam System
Range: 25-100 RPM/Sec Default: 50 RPM/Sec

This is the rate that the speed setpoint will increase from 0 to the SSP1-Slow Roll Speed when the slow roll warm-up is initiated.

RRSP4 – Minimum Rated Speed Setpoint

Screen: Steam System
Range: 100-200 RPM/Sec Default: 200 RPM/Sec

This is the rate that the speed setpoint will increase from SSP1-Slow Roll Speed to SSP2-Minimum Rated Speed when the ramp-to-rated speed is initiated.

RRSP5 – Rated Speed Setpoint

Screen: Steam System
Range: 1-200 RPM/Sec Default: 10 RPM/Sec

This is the rate that the speed setpoint will increase from 0 to the SSP1-Slow Roll Speed when the slow roll warm-up is initiated.

RRSP7 – Main Steam Inlet Block Valve

Screen: Steam System

Range: 1-100 %/Sec

Default: 5 % RPM/Sec

This is only used if MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1. It is the rate that the control signal being sent to the analog output controlling the Main Steam Inlet Block Valve is increased from 0-100% after the ramp-to-rated speed is initiated and decreased prior to unloading the chiller after a soft shutdown is initiated.

Change Setpoints

Access Level Required: SERVICE

This key enables the field selection cursor. The operator may then toggle between the programmable data fields using the Cursor Arrow keys.

NAVIGATION

Home

Access Level Required: VIEW

Causes an instant return to the Home Screen.

Setpoints

Access Level Required: VIEW

Causes an instant return to the Setpoints Screen.

Configuration Setpoints

Access Level Required: VIEW

Causes an instant return to the Configuration Setpoints Screen 1.

Pressure Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various pressure thresholds pertaining to the operation of the chiller.

Time Setpoints

Access Level Required: VIEW

Moves to a sub-screen that allows programming of various time delays pertaining to the operation of the chiller.

HISTORY SCREEN

SYSTEM STATUS
SYSTEM READY TO START

DATE
20 Apr 2004

TIME
2 40 PM

CONTROL SOURCE
Local

ACCESS LEVEL
Service

HISTORY SCREEN

Last Normal Shutdown
9:41:30 AM 19 Apr 2004 LOCAL STOP

Last Fault While Running
2:21:18 PM 14 Apr 2004 CONTROL PANEL - POWER FAILURE

Last Ten Faults

- 2:36:05 PM 20 Apr 2004 COMPR OIL - DIFFERENTIAL PRESSURE
- 2:32:19 PM 20 Apr 2004 START INHIBIT - VANE MOTOR SWITCH OPEN
- 2:25:09 PM 20 Apr 2004 COMPR OIL - LOW TEMPERATURE DIFFERENTIAL
- 2:23:08 PM 20 Apr 2004 COMPR OIL - LOW TEMPERATURE DIFFERENTIAL
- 9:42:26 AM 19 Apr 2004 CONTROL PANEL - POWER FAILURE
- 5:57:21 PM 16 Apr 2004 CONTROL PANEL - POWER FAILURE
- 5:46:16 PM 16 Apr 2004 COMPR OIL - DIFFERENTIAL PRESSURE
- 5:45:45 PM 16 Apr 2004 STEAM VALVE MALFUNCTION
- 5:44:56 PM 16 Apr 2004 CONTROL PANEL - POWER FAILURE
- 5:44:33 PM 16 Apr 2004 TURBINE - OVERSPEED

Select Fault
Normal

View Details

Print History

Print All Histories

Home

Trending

Custom View

Security Log

Alarm Silence

00661VIP

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 44 - HISTORY SCREEN

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.

Alarm Silence

Access Level required: VIEW

This key silences the audible alarm on the Power Panel which is activated on any warning or shutdown condition.

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

Access Level required: VIEW

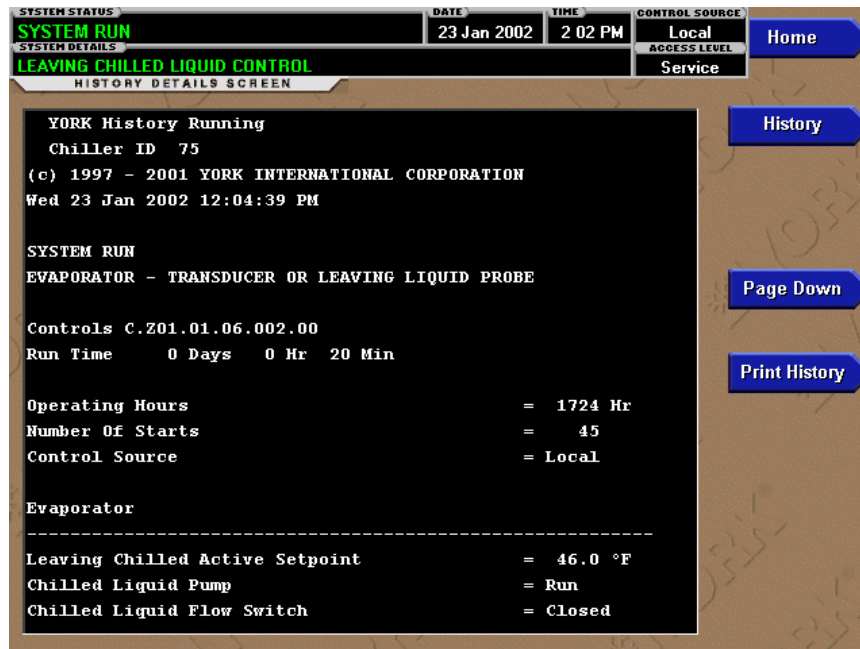
Causes a move to a sub-screen allowing the user to view the Custom Setup Screen.

Security Log

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



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 45 - HISTORY DETAILS SCREEN

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

Category	Setpoint	New Value
1 Motor	Pulldown Demand Limit	100 %
2 System	Chiller ID	0
3 System	Chiller ID	0
4 Oil Sump	Control Period	1.2 Sec
5 Oil Sump	Pressure Setpoint	40 PSID
6 System	Remote Analog Input Range	2-10 Volts
7 Evaporator	Sensitivity	50%
8 Evaporator	Restart Offset	2.0 °F
9 Evaporator	Leaving Chilled Local Setpoint	46.0 °F
10 Motor	Pulldown Demand Time	10 Min
11 Motor	Pulldown Demand Limit	90 %
12 Oil Sump	Standby Lube	Enabled
13 Compressor	Proximity Fault Clear	Yes
14 Compressor	High Speed Thrust Bearing Proximity Reference	40 Mils

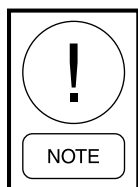
NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 46 - SECURITY LOG SCREEN

OVERVIEW

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 160.67-M3.

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

SYSTEM STATUS: SYSTEM RUN
DATE: 23 Jan 2002
TIME: 1 57 PM
CONTROL SOURCE: Local
ACCESS LEVEL: Service

Home

Security Log

Description: Motor Pulldown Demand Limit

Time: 1:47:27 PM
Date: 23 Jan 2002
Access Level: Service
User Id: 0

Old Value: 100 %
New Value: 100 %

Print

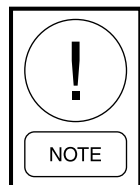
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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 47 - SECURITY LOG DETAILS SCREEN

OVERVIEW

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.



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

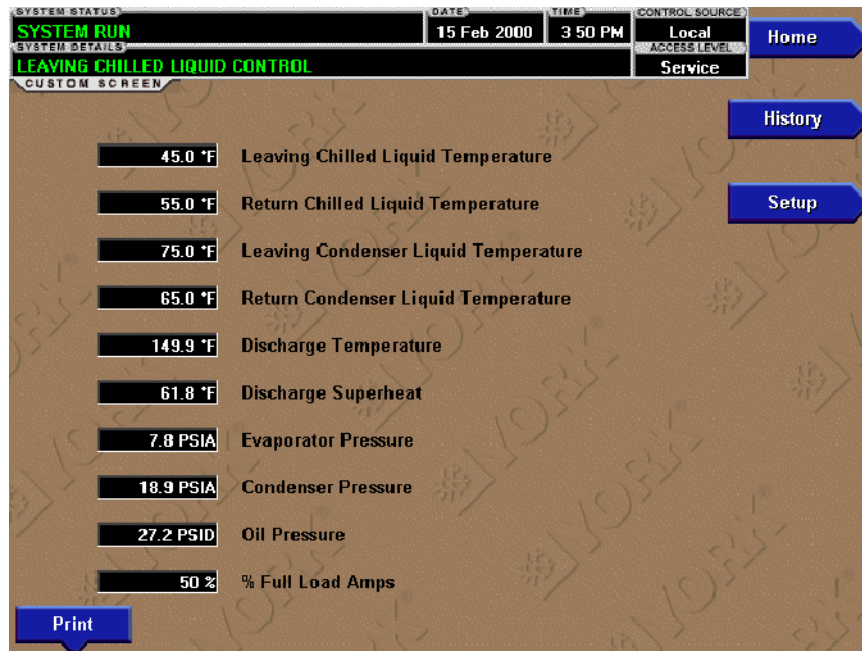
Causes an instant return to the Home Screen

Security Log

Access Level Required: SERVICE

Causes an instant return to the Security Log Screen.

CUSTOM VIEW SCREEN



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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 48 - CUSTOM VIEW SCREEN

OVERVIEW

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: SERVICE

Causes a jump to the sub-screen that allows selection of the parameters to be displayed.

CUSTOM VIEW SETUP SCREEN

The screenshot displays the 'CUSTOM VIEW SETUP SCREEN' interface. At the top, it shows 'SYSTEM STATUS' as 'SYSTEM RUN', 'DATE' as '08 Sep 1999', 'TIME' as '12:09 PM', and 'CONTROL SOURCE' as 'Local'. Below this, 'SYSTEM DETAILS' shows 'LEAVING CHILLED LIQUID CONTROL' and 'CUSTOM SETUP SCREEN'. On the right, there are buttons for 'Home' and 'Service'. The main area lists 'Custom Slot' numbers 1 through 10, each with a corresponding parameter name: Leaving Chilled Liquid Temperature, Return Chilled Liquid Temperature, Evaporator Pressure, Evaporator Saturation Temperature, Leaving Condenser Liquid Temperature, Return Condenser Liquid Temperature, Condenser Pressure, Condenser Saturation Temperature, Discharge Temperature, and Superheat Temperature. On the left, instructions state: 'Press Select button to start programming.', 'Use cursor keys to select desired parameter', and 'Press Enter key to input parameter'. On the right, there are buttons for 'Custom View', 'Select', and 'Page Down'. At the bottom, a black box displays 'YORK Slot #'s', '(c) 1997 - 1999 YORK INTERNATIONAL CORPORATION', 'Wed 08 Sep 1999 12:07:23 PM', '262 Operating Hours', '264 Number Of Starts', 'Evaporator', and '1792 Leaving Chilled Liquid Temperature'. The identifier '00325VIP' is at the bottom right.

FIGURE 49 - CUSTOM VIEW SETUP SCREEN

NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

OVERVIEW

This screen allows the Service technician to select up to 10 parameters for display on the Custom View Screen. Requires a login access.

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.

Clear Display

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

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.

TREND SCREEN



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 50 - TREND SCREEN

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.

The DATA SELECT key is used to display all trended Data Points simultaneously or select a single Data Point for display.

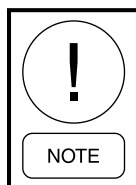
The parameters are sampled at the selected Data Collection Interval and plotted using 450 data points across the X-Axis. If the actual value of the sampled parameter is less than the Y-Axis label minimum for that parameter, the value will be plotted at the minimum value. Similarly, if the actual value 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. 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

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

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

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

SYSTEM STATUS
SYSTEM RUN
SYSTEM DETAILS
LEAVING CHILLED LIQUID CONTROL
TREND SETUP SCREEN

DATE: 23 Oct 2000 TIME: 1 57 PM CONTROL SOURCE: Local
ACCESS LEVEL: Service

Home

Data Point 1	Slot	Leaving Chilled Liquid Temperature	Trend
	Minimum	0.0 °F	
	Maximum	82.0 °F	
Data Point 2	Slot	Motor Run	Slot #s
	Minimum	Off	
	Maximum	On	
Data Point 3	Slot	Not Assigned	Select
Data Point 4	Slot	Not Assigned	Chart Type
			Triggered
Data Point 5	Slot	Not Assigned	Collection Interval
			1 Sec
Data Point 6	Slot	Not Assigned	Triggers

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

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NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 51 - TREND SETUP SCREEN

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 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 instan-

taneous 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:
 - $450 \times \text{Data Collection Interval} = \text{full screen seconds}$
 - $\text{full screen seconds} / 60 = \text{full screen minutes}$
 - $\text{full screen minutes} / 60 = \text{full screen hours}$
 - $\text{full screen hours} / 24 = \text{full screen days}$

3. 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 3 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. 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.

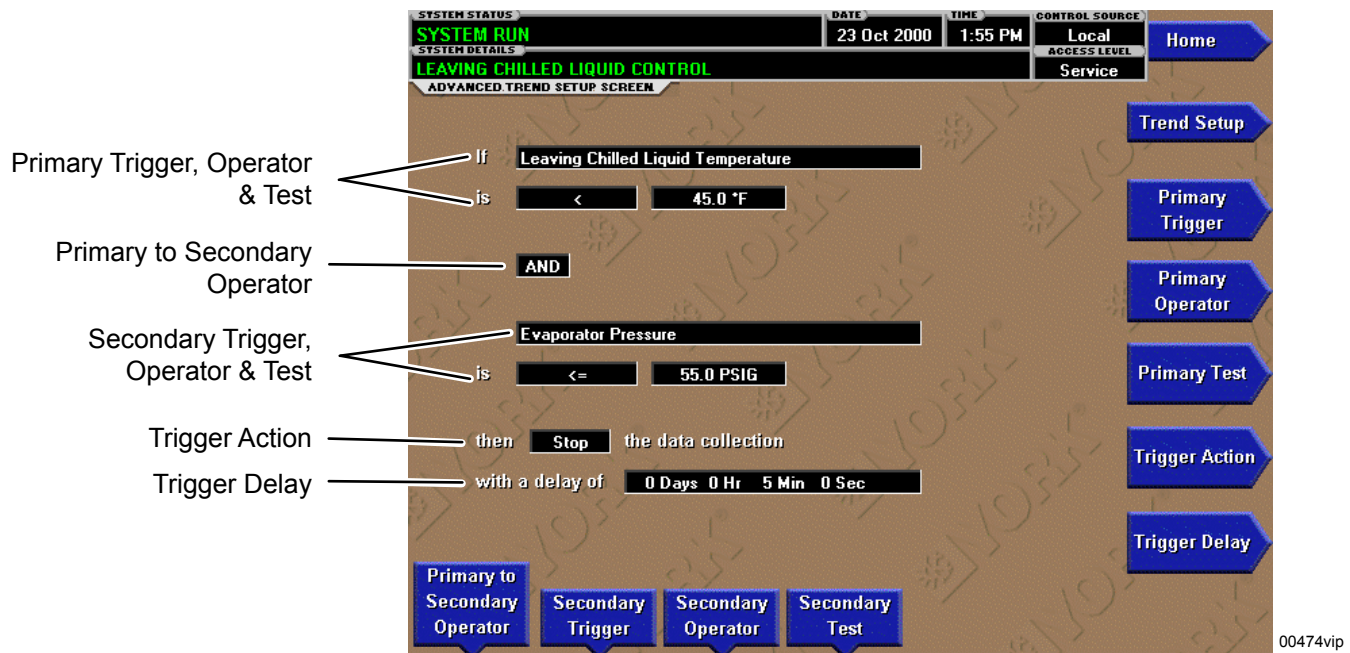
Slot Numbers

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

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



NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 52 - ADVANCED TREND SETUP SCREEN

OVERVIEW

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 manual).

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

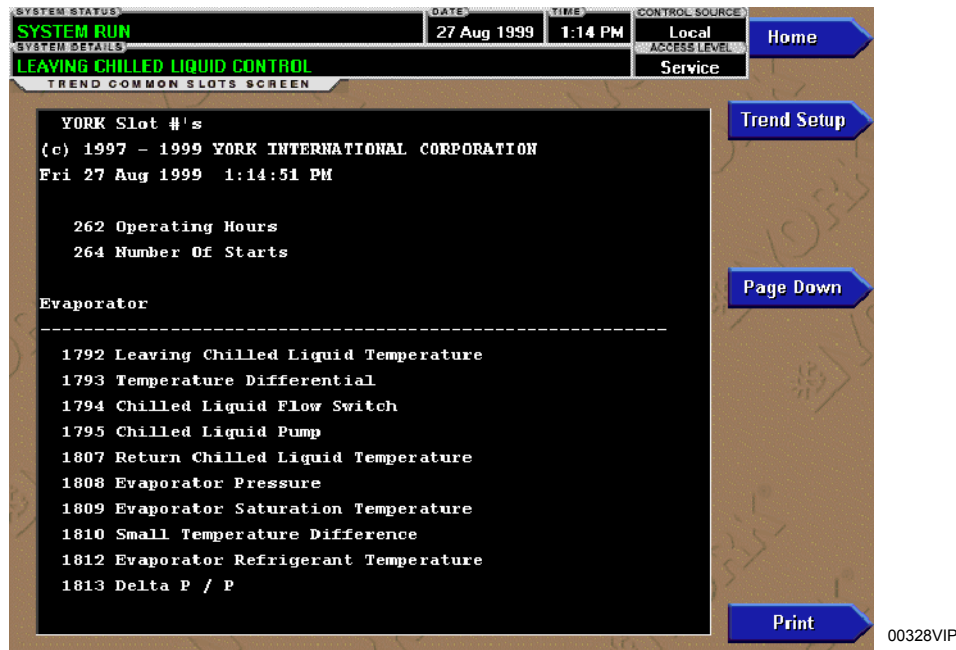
Home

Causes an instant return to the Home Screen.

Trend Setup

Causes an instant return to the Trend Setup Screen.

COMMON SLOTS SCREEN



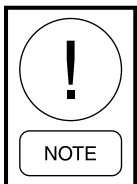
NOTE: OptiView™ Control Center Screens shown may NOT represent the exact screens according to the software version utilized.

FIGURE 53 - COMMON SLOTS SCREEN

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.



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
262	Operating Hours
264	Number Of Starts
EVAPORATOR	
1792	Leaving Chilled Liquid Temperature
1793	Temperature Differential
1794	Chilled Liquid Pump Start Contact
1795	Chilled Liquid Pump Start Contact
1807	Return Chilled Liquid Temperature
1808	Evaporator Pressure
1809	Evaporator Saturation Temperature
1810	Small Temperature Difference
1812	Evaporator Refrigerant Temperature
1813	Delta P/P
CONDENSER	
2645	Leaving Steam Condenser Liquid Temperature
2048	Leaving Condenser Liquid Temperature
2049	Condenser Liquid Flow Switch
2050	Condenser Liquid Pump Start Contact
2051	Return Condenser Liquid Temperature
2052	Condenser Pressure
2053	Condenser Saturation Temperature
2054	Small Temperature Difference
2057	High Pressure Switch
2059	Sub Cooling Temperature
2061	Drop Leg Refrigerant Temperature
COMPRESSOR	
1296	Discharge Temperature
1299	Discharge Superheat
1280	PRV Motor Switch
1281	PRV Position
1282	Pre-Rotation Vanes Opening
1283	Pre-Rotation Vanes Closing
1817	Liquid Line Solenoid
2063	Vent Line Solenoid
OIL SUMP	
1539	Oil Pump Run Output
8193	Sump Oil Pressure (LOP)
8192	Pump Oil Pressure (HOP)
1536	Oil Pressure
1537	Oil Sump Temperature
1542	Oil Heater Output
1543	Oil Return Solenoid

SLOT NO.	DESCRIPTION
VARIABLE SPEED OIL PUMP	
8197	Oil Pump Drive Command Frequency
PROXIMITY PROBE	
8225	High Speed Thrust Bearing Proximity Differential
8223	High Speed Thrust Solenoid
	Subcooler Level
2073	Subcooler Level Setpoint
2064	Subcooler Level
2066	Control Output Signal
HOT GAT BYPASS	
1976	Hot Gas Ratio Calculation
2046	Temp Setpoint
2045	Hot Gas Temp Calculation
2001	HGV Ramp
1978	Control Output Signal
PRE-ROTATION VANES	
1281	PRV Position
1993	PRV Ramp
1989	PRV Command
1280	PRV Motor Switch
SPEED CONTROL	
2848	Turbine Speed
2832	Control Output Signal
CAPACITY CONTROL	
2004	Capacity Ratchet Mode
2042	Capacity Ratchet: HGV Drive
2043	Capacity Ratchet: PRV Drive
2044	Capacity Ratchet: SPD Drive
2563	Anti-Surge Calculated Min. Speed
1984	Anti-Surge Calculated Min. PRV
2040	Temperature Controller: Selected Override
2031	Override Limit
2024	Temperature Controller: Control Percentage
2022	Temperature Controller: Control Mode
2019	Head Pressure
STEAM CONTROL	
2816	Inlet Temperature
2817	Inlet Pressure
2829	First Stage Pressure
2818	Exhaust Pressure
2830	Inlet Valve
2831	Slow Roll Value

MASTER SLOT NUMBERS LIST FOR USE WITH TREND FEATURE (CONT'D)

SLOT NO.	DESCRIPTION
2826	Governor End Bearing Temperature
2823	Shaft End Bearing Temperature
	TURBINE VIBRATION SENSOR
2824	Governor End Horizontal Vibration
2825	Governor End Vertical Vibration
2821	Shaft End Horizontal Vibration
2822	Shaft End Vertical Vibration
	TURBINE SOLENOIDS
2835	Turbine Rotation
2844	Trip Solenoid
2834	Trip Valve Limit Switch
2845	Vacuum Solenoid
2833	Inlet Limit Switch
2837	Oil Cooler Solenoid
2840	Bypass Solenoid
2839	Gland Solenoid
2841	Nozzle #1 Solenoid
2842	Nozzle #2 Solenoid
2843	Steam Ring Drain Solenoid
	TURBINE OIL/BEARINGS
2828	Oil Temperature
2827	Oil Pressure
2873	Aux Oil Pump Run Output
2836	Aux Oil Pump Contact

SLOT NO.	DESCRIPTION
	HOTWELL LEVEL
2576	Condensate Level
2578	Hotwell Level Control Outoput Signal
2586	Pump #1 Run Output
2579	Pump #1 Aux Output
2587	Pump #2 Run Output
2580	Pump #2 Aux Contact
2581	Low Level Switch
2582	High Level Switch
	VACUUM SYSTEM
2592	Pump #1 Run Output
2593	Pump #1 Aux Contact
2595	Pump #1 Sealing Water Solenoid
2594	Pump #1 Sealing Water Flow Switch
2596	Pump #2 Run Output
2597	Pump #2 Aux Contact
2599	Pump #2 Sealing Water Solenoid
2598	Pump #2 Sealing Water Flow Switch
2608	Ejector Actuator
	FLOW SWITCH
2084	Evaporator Flow
2080	Condenser Flow
2846	Steam Flow

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

STATUS MESSAGES

“Start Inhibit”

The chiller is prevented from being started due to the reason displayed on the Details Line of the Status bar.

“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 START/STOP control switch to the STOP-RESET (O) position.

“System Ready To Start”

The chiller is shut down but will start upon receipt of a Local or Remote start signal.

“Start Sequence Initiated”

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 on the SETUP SCREEN. The Pre-lube duration must never

be changed by anyone other than a qualified Service Technician. The standard Prelube duration is 50 seconds. A countdown timer displaying the time remaining in the prelube cycle also appears with this message.

“System Starting”

The main start relay K18 on the York I/O board is on to energize the Turbine Trip Valve Air Dump Solenoid and open the trip valve. The Turbine Trip Valve Limit Switch input is not energized indicating that the trip valve has not yet opened. When MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1, this message will remain until the turbine is rotating at 500 RPM indicating that slow rolling has commenced.

“Ready To Begin Slow Roll”

The Turbine Trip Valve Limit Switch input is energized indicating that the trip valve has opened but the BEGIN SLOW ROLL Key has not been pressed. This message will remain until the “Begin Slow Roll” key that appears on the Steam System Screen is pressed to initiate the slow roll warm-up of the turbine.

“Waiting For Steam Flow”

When MSSP4-Turbine Start Mode is set for Manual, this message will appear after the “Begin Slow Roll” key that appears on the Steam System Screen has been pressed to initiate the slow roll warm-up of the turbine. This message will remain until the operator has opened the slow roll bypass valve to admit sufficient steam flow to begin slow rolling the turbine. It will be displayed until the turbine speed has increased to 500 RPM.

“Slow Rolling”

The ramp up to the SSP1-Slow Roll Speed shown on the Speed Setpoints Screen has been initiated and the turbine speed has increased to 500 RPM indicating that slow rolling has commenced. A countdown timer displaying the time remaining in the slow roll cycle also appears with this message. This time will usually begin decrementing anywhere from 15-30 minutes depending on the inlet steam temperature and the MSSP17-Turbine Stage Count shown on the Configuration Screen 1. However, if a chiller start is initiated within 15 minutes of the last “Run At Rated” command, the calculated slow roll time is reduced to 5 minutes because the turbine rotor is still hot and the shaft has not been stationary long enough to bow. In this case the display would start decrementing at 4 minutes.

“Turbine Idling – Insufficient Vacuum”

The turbine is rotating at the SSP1-Slow Roll Speed shown on the Speed Setpoints Screen, the slow roll timer has decremented to 0, but the turbine exhaust pressure is not below the PSP6-Ready To Run pressure entered on the Pressure Setpoints Screen. During slow roll, the vacuum pump is started automatically if the exhaust pressure increases above this setpoint.

“Ready To Run”

The turbine is rotating at the SSP1-Slow Roll Speed shown on the Speed Setpoints Screen, the slow roll timer has decremented to 0, and the turbine exhaust pressure has been reduced to the PSP6-Ready To Run pressure shown on the Pressure Setpoints Screen. This message will remain until the “Run At Rated” key that appears on the Steam System Screen is pressed to close the Chilled Liquid Pump Start contacts and initiate the ramp up to rated speed. When MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1, the Chilled Liquid Pump Start contacts are closed automatically when this message appears.

“Ramping To Rated Speed”

The Chilled Liquid Flow Switch contacts have closed, the ramp up to the SSP2-Minimum Rated Speed shown on the Speed Setpoints Screen has been initiated and the turbine speed has increased above the SSP5-Chilled Liquid Pump Turn-On Speed shown on the Speed Setpoints Screen indicating that ramp up to rated speed has commenced.

“Turbine Stabilizing”

The turbine has achieved minimum rated speed and is increasing to the SSP3-Fixed Rated Speed shown on the Speed Setpoints Screen. The compressor vanes are opening to the PRVM-PRV Minimum Open Position shown on the Capacity Control Setpoints Screen 2. This message will remain until the capacity controls are enabled after the TDSP17-Turbine Stabilization Delay shown on the Time Setpoints Screen has elapsed. A countdown timer displaying the time remaining in the stabilization cycle also appears with this message.

“System Run”

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

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.

Motor Drive Running

The YK Optiview Electric Driveline panel can initiate liquid level control will be accomplished using the YST Optiview panel. The YST panel will control the liquid level valve with an analog output signal, based on the liquid level setpoint programmed in the YST Optiview Panel, as compared to the actual liquid level being sensed by the YST Optiview panel.

The run contact on the electric driveline panel will be connected to the I/O board terminals 1 and 9 on the YST panel. When the I/O board input to terminal 9 is on (120 vac), the level control in the YST will be enabled.

When the YST driveline is shut down and the Electric driveline panel run contact closes, the level control is enabled the same as it would be if the YST panel achieved the system run mode after a normal startup sequence. The two signals cannot be switched between the panels when the drive selection is made. The level control will be disabled on the electric driveline panel.

All time delays and ramping functions associated with the YST subcooler level control will operate the same as if the YST turbine had been started and achieved the system run mode after a normal startup sequence.

The SYSTEM STATUS bar will display the text MOTOR DRIVE RUNNING and the SYSTEM DETAILS bar should display the text SUBCOOLER LIQUID LEVEL CONTROL ENABLED.

SOFT SHUTDOWN MESSAGE

Soft Shutdowns are initiated by the following:

1. “Leaving Chilled Liquid – Low temperature”
2. “Remote Stop”
3. “System Cycling – Contacts Open”
4. Operator Initiated at Keypad

While the chiller is unloading during any Soft Shutdown, if a Local Stop is initiated with the START/STOP control switch or any faults other than those list-

ed above occur, the Soft Shutdown is terminated and it will immediately perform a “System Coastdown”.

“Chiller Unloading Before Shutdown”

A Soft Shutdown is in effect. The LCLT Controller SP is ramping up to a value equal to the return chiller liquid temp +5 °F and the chiller capacity controls are unloading the chiller. The chiller will be shutdown when the hot gas valve signal has increased to 95% (if HGV is Enabled) or the Soft Shutdown logic has been unloading the chiller longer than the TDSP9-Soft Shutdown Rampdown Timeout minutes entered on the Time Setpoints Screen (if HGV is Disabled).

“System Coastdown”

The chiller has shut down and the Post-run lubrication is being performed. The actual duration is determined by the length of time required for the drive train to coast to a complete stop.

“Compressor Shtdn; Turbine Cooldown”

This message only applies to when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It appears when the chiller has been shut down and rotation has ceased for 35 seconds. The compressor oil pump has been stopped and the turbine auxiliary oil pump will remain on until the TDSP12-Turbine auxiliary Oil Pump Postlube time shown on the Time Setpoints Screen has elapsed.

START INHIBIT MESSAGE

“Start Inhibit - Vanes Uncalibrated”

This message will only appear during initial testing and set up of a new panel or if the Microboard or BRAM (U38) memory device on the Microboard has been replaced. The pre-rotation vane position potentiometer calibration procedure must be performed before the chiller may be operated.

“Vane Motor Switch Open”

The chiller is inhibited from starting because the Pre-rotation Vanes are not fully closed.

“Condenser – High Pressure – Stopped”

The condenser pressure has exceeded 160.0 PSIG (R134a), 240.0 PSIG (R22) while the chiller is shutdown. A special reset procedure is required to clear this message and allow the chiller to be started. Refer to Form 160.67-M3, Section 23.

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 U38 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 – Setpoint Override”

A blank BRAM battery-backed memory device (IC location U38 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 – Compr 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 – Condenser Or Evaporator Xder Error”

The Evaporator pressure Transducer is indicating a higher pressure than the Condenser Pressure Transducer after the chiller has been running for 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”

The output of the Subcooler Refrigerant Level Sensor is > 5.1VDC. This is indicative of a Level Sensor failure. While this condition exists, the Subcooler Level Control Valve is driven to the full open position. This message automatically clears when the Refrigerant Level sensor output is within range.

“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. This message automatically clears when the Condenser pressure decreases to 5 PSIG below the Setpoint.

“Warning - Mpu Failure”

The difference between MPU#1 and MPU#2 analog input signals is greater than 3% and generally indicates a defective magnetic pickup or frequency to analog converter. The panel logic selects the higher of the two analog input signals for the speed control algorithm and display, so a failure of one magnetic pickup will not prevent the chiller from being started or operating. This message will automatically clear when the magnetic pickup problem has been resolved.

“Warning - Evaporator Low Pressure Override”

The evaporator pressure is below the setpoint of the Evaporator Pressure Controller and the lower signal selector relay is selecting its output to control the chiller capacity. This message will automatically clear when the evaporator pressure has returned to normal and the Leaving Chilled Liquid Temperature Controller is controlling the capacity of the chiller. Refer to the Capacity Controls Screen descriptions for additional details.

“Warning - Condenser High Pressure Override”

The condenser pressure is above the setpoint of the Condenser Pressure Controller and the lower signal selector relay is selecting its output to control the chiller capacity. This message will automatically clear when the condenser pressure has returned to normal and the Leaving Chilled Liquid Temperature Controller is controlling the capacity of the chiller. Refer to the Capacity Controls Screen descriptions for additional details.

“Warning - Turbine Power Limiter Override”

Depending on the MSSP8-Power Limiting Mode setpoint on Capacity Control Setpoints Screen 1, the capacity of the chiller is being limited by either the Governor Valve Position Limit Controller or the Turbine Horsepower Limit Controller to control the turbine power output. This message will automatically clear when the load returns to normal and the Leaving Chilled Liquid Temperature Controller is controlling the capacity of the chiller. Refer to the Capacity Controls Screen descriptions for additional details.

“Warning – Automatic Capacity Control Is Not Available”

The chiller is running with all capacity control devices in the Manual mode.

“Warning – Hotwell Condensate Low Level”

The condensate level in the steam condenser hotwell has been below the low-level switch actuation point causing the input to the Digital I/O Expansion Board to be open for 5 continuous seconds. This message will automatically clear when the level rises above the actuation point of the switch closing the input to the Digital I/O Expansion Board.

“Warning – Hotwell Condensate High Level”

The condensate level in the steam condenser hotwell has been above the high-level switch actuation point causing the input to the York I/O board to be open for 5 continuous seconds. This message will automatically clear when the level drops below the actuation point of the switch closing the input to the York I/O board.

“Warning – Turbine – Supply Oil Low Pressure”

This message only applies to when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It appears when the input signal from the Turbine Supply Oil Pressure Transmitter is below the PSP10-Turbine Auxiliary Oil Pump On setpoint shown on the Pressure Setpoints Screen indicating that the shaft driven oil pump on the turbine is not providing sufficient oil pressure and the auxiliary oil pump is started. This check is bypassed at speeds below the SSP7-Turbine Auxiliary Oil Pump Activate setpoint shown on the Speed Setpoints Screen. This message will automatically clear when the supply oil pressure increases to 0.1 PSIG above the PSP10-Turbine Auxiliary Oil Pump On setpoint.

“Warning – Turbine Auxiliary Oil Pump Overrun”

This message only applies to when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It appears when the input signal from the Turbine Supply Oil Pressure Transmitter is below the PSP9-Turbine Auxiliary Oil Pump Off setpoint shown on the Pressure Setpoints Screen indicating that the shaft driven oil pump on the turbine is not providing sufficient oil pressure and the auxiliary oil pump has been running for 5 minutes. This check is bypassed at speeds below the SSP7-Turbine Auxiliary Oil Pump Activate setpoint shown on the Speed Setpoints Screen. This message will be displayed until the Warning Reset Key on the Home Screen is pressed in the OPERATOR (or higher) access mode. This also resets the overrun timer so that the message will appear again if the oil pump starts and runs for 5 minutes.

“Warning - Turbine – Supply Oil High Temperature”

This message only applies to when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It appears when the input signal from the Turbine Supply Oil RTD Temperature Transmitter is above the TSP8-Turbine Supply Oil High Temperature Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. The message will automatically clear when the input signal decreases to 0.1 °F below the Alarm Setpoint.

“Warning - Turbine – Shaft End Bearing High Temperature”

This message only applies to when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. It appears when the input signal from the Turbine Shaft End Bearing RTD Temperature Transmitter is above the TSP4-Turbine Shaft End Brg High Temp Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. The message will automatically clear when the input signal decreases to 0.1 °F below the Alarm Setpoint.

“Warning - Turbine – Governor End Bearing High Temperature”

This message only applies to when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. It appears when the input signal from the Turbine Governor End Bearing RTD Temperature Transmitter is above the TSP6-Turbine Governor End Brg High Temp Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. The message will automatically clear when the input signal decreases to 0.1 °F below the Alarm Setpoint.

“Warning – Turbine Exhaust Steam High Pressure”

The input signal from the Turbine Exhaust Steam Pressure Transmitter has been above the Turbine Exhaust Steam High Pressure setpoint shown on the Alarm/Shutdown Setpoints Screen for 10 seconds. This check is bypassed until the chiller is in the System Run mode. This message will automatically clear when the exhaust steam pressure decreases to 0.1 PSIA below the Turbine Exhaust Steam High Pressure setpoint.

“Warning – Vacuum Pump Overrun”

This message only applies to chillers equipped with steam ejectors and a single vacuum pump on the steam condenser when MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Ejector. The message appears if the vacuum pump has been running continuously for 15 minutes after the chiller is in the System Run mode. This could indicate either an ejector malfunction or a major leak in the steam condenser or exhaust piping. This message will be displayed until the Warning Reset key on the Home Screen is pressed in the OPERATOR (or higher) access mode. This also resets the overrun timer so that the message will appear again if the vacuum pump starts and runs continuously for 15 minutes.

TURBINE EXCESSIVE VIBRATION WARNING MESSAGES

When MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1, the turbine must be fitted with two proximity probes on each end of the turbine to protect the turbine from excessive shaft vibration. The “Horizontal” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the right side when facing the governor end of the turbine. The “Vertical” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the left side when facing the governor end of the turbine. When MSSP4-Turbine Start Mode is set for Manual, MSSP13-Turbine Shaft Vibration Sensors must be set for Enabled on Configuration Screen 1. When the sensors are enabled, the following messages are also enabled:

“Warning - Turbine - Shaft End Horizontal Vibration”

The input signal from the Turbine Shaft End Horizontal Vibration Transmitter is above the TVSP1-Turbine Vibration Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The message will automatically clear when the input signal decreases to 0.1 Mil below the Alarm Setpoint.

“Warning - Turbine - Shaft End Vertical Vibration”

The input signal from the Turbine Shaft End Vertical Vibration Transmitter is above the TVSP1-Turbine Vibration Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The message will automatically clear when the input signal decreases to 0.1 Mil below the Alarm Setpoint.

“Warning - Turbine - Governor End Horizontal Vibration”

The input signal from the Turbine Governor End Horizontal Vibration Transmitter is above the TVSP1-Turbine Vibration Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The message will automatically clear when the input signal decreases to 0.1 Mil below the Alarm Setpoint.

“Warning - Turbine - Governor End Vertical Vibration”

The input signal from the Turbine Governor End Vertical Vibration Transmitter is above the TVSP1-Turbine Vibration Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The message will automatically clear when the input signal decreases to 0.1 Mil below the Alarm Setpoint.

“Warning – Turbine Condensate Drain Tank High Level”

The condensate level in the turbine condensate drain tank has been above the high-level switch actuation point causing the input to the York I/O board to be open for 5 continuous seconds. This message will automatically clear when the level drops below the actuation point of the switch closing the input to the York I/O board.

“Warning - Inlet Steam Out Of Range”

The inlet steam temperature has been over 50°F above the DST - Design Steam Temperature or the inlet steam pressure has been over 150% of the DSP - Design Steam Pressure for 15 continuous minutes. These setpoints are shown on the Capacity Controls Setpoints Screen 2. This check is bypassed until the turbine is slow rolling or the chiller is in the System Run Mode. The message is automatically cleared when both conditions have decreased below the above setpoints.

“Warning – Turbine Inlet Steam High Pressure”

The input signal from the Turbine Inlet Steam Pressure Transmitter is above the PSP16-Turbine Inlet Steam High Pressure setpoint shown on the Alarm/Shutdown Setpoints Screen. This message will automatically clear when the inlet steam pressure decreases to 0.1 PSIG below the Turbine Inlet Steam High Pressure setpoint.

“Warning – Turbine Exhaust Steam High Pressure”

The input signal from the Turbine Exhaust Steam Pressure Transmitter has been above the PSP7-Turbine Exhaust Steam High Pressure setpoint shown on the Alarm/Shutdown Setpoints Screen for 10 seconds. This check is bypassed until the chiller is in the System Run Mode. This message will automatically clear when the exhaust steam pressure decreases to 0.1 PSIA below the Turbine Exhaust Steam High Pressure setpoint.

“Warning – Lead Hotwell Pump Fault”

This message only applies to chillers equipped with dual hotwell pumps when MSSP10-Hotwell Pump Mode on Configuration Screen 1 is set for Dual. It appears when the lead hotwell pump contactor auxiliary contact has failed to close within 5 seconds after the run output was energized to start the pump. The standby pump has been started in order to continue the start up or operation of the chiller. This message is also displayed if the auxiliary contact opens anytime the run output is on indicating that the pump motor protector in the Power Panel may have stopped the pump. This message will be displayed until the Warning Reset Key on the Home Screen is pressed in the OPERATOR (or higher) access mode. This also resets the standby pump start logic so that the faulted pump (if fault condition has been corrected) can again be used for standby operation without shutting down the chiller.

“Warning – Lead Vacuum Pump Sealing Water No Flow”

This message only applies to chillers equipped with dual vacuum pumps when MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Dual. It appears when the lead vacuum pump sealing water flow switch has not closed within 10 seconds after the lead pump sealing water solenoid has been energized. The standby pump sealing water solenoid has been energized to start the standby pump in order to continue the start up or operation of the chiller. This message is also displayed if the sealing water flow switch opens while the associated solenoid is energized indicating a possible failure of the solenoid coil. This message will be displayed until the Warning Reset key on the Home Screen is pressed in the OPERATOR (or higher) access mode. This also resets the standby pump start logic so that the faulted sealing water solenoid (if fault condition has been corrected) can again be used for standby operation without shutting down the chiller.

“Warning – Lead Vacuum Pump Fault”

This message only applies to chillers equipped with dual vacuum pumps when MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Dual. It appears when the lead vacuum pump sealing water flow switch has not closed within 10 seconds after the lead pump sealing water solenoid has been energized or the lead vacuum pump contactor auxiliary contact has failed to close within 5 seconds after the run output was energized to start the pump. The standby pump sealing water solenoid has been energized to start the standby

pump in order to continue the start up or operation of the chiller. This message is also displayed if the sealing water flow switch opens while the associated solenoid is energized indicating a possible failure of the solenoid coil. It is also displayed if the vacuum pump motor contactor auxiliary contact opens anytime the run output is on indicating that the pump motor protector in the Power Panel may have stopped the pump. This message will be displayed until the Warning Reset Key on the Home Screen is pressed in the OPERATOR (or higher) access mode. This also resets the standby pump start logic so that the faulted sealing water solenoid or pump (if fault condition has been corrected) can again be used for standby operation without shutting down the chiller.

“Warning – Vacuum Pump Overrun”

This message only applies to chillers equipped with steam ejectors and a single vacuum pump on the steam condenser when MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Ejector. The message appears if the vacuum pump has been running continuously for 15 minutes after the Chiller is in the System Run Mode. This could indicate either an ejector malfunction or a major leak in the steam condenser or exhaust piping. This message will be displayed until the Warning Reset key on the Home Screen is pressed in the OPERATOR (or higher) access mode. This also resets the overrun timer so that the message will appear again if the vacuum pump starts and runs continuously for 15 minutes.

“Warning – Mechanical Overspeed Test In Progress”

The operator has pushed the Overspeed Test key on the Auto/Manual Screen. The software overspeed shutdown at the SSP8-Overspeed Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen is disabled to allow the operator to manually increase the Speed Setpoint up to the SSP4-Overspeed Test Limit shown on the Speed Setpoints Screen.

“Warning – Conditions Override Vgd”

The Stall Detector Voltage exceeded twice the High Limit for the Extreme Stall Duration, the VGD control is disabled and the VGD is opened. This message will be displayed until the Stall Detector Voltage is less than twice the High Limit setpoint and the Warning Reset key on the Home Screen is pressed in the SERVICE (or higher) access level.

“Warning – Condenser Or Vgd Failure”

The Condenser pressure Voltage and the Stall DC Pressure Voltage have been greater than 0.28 volts apart for 3 minutes, the VGD control is disabled and the VGD is opened. This message will be displayed until the two voltages are within 0.28 volts and the Warning Reset key on the Home Screen is pressed in the SERVICE (or higher) access level.

COMPRESSOR EXCESSIVE VIBRATION WARNING MESSAGES

Since proximity probes cannot be fitted on a single stage compressor due to internal space limitations, casing mounted accelerometers are occasionally used as the only alternative. However, the alarm setpoint and delay may need to be set high enough to prevent nuisance alarms due to stall or surge conditions. Mechanical vibration problems should remain fairly steady at a high level; aerodynamic problems will appear and disappear. Therefore, it is recommended that the normal operating vibration levels be recorded and the vibration levels be monitored to provide an indication of developing mechanical problems.

When MSSP18-Compressor Vibration Sensors is set for Enabled on Configuration Screen 1, the compressor must be fitted with two accelerometers on the rotor support. The “Horizontal” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the right side of the rotor support when facing the shaft end of the compressor. The “Vertical” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the left side when facing the shaft end of the compressor. When the sensors are enabled, the following messages are also enabled:

“Warning - Compressor - Horizontal Vibration”

The input signal from the Compressor Horizontal Vibration Transmitter is above the CVSP1-Compressor Vibration Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The message will automatically clear when the input signal decreases to 0.1 In/Sec below the Alarm Setpoint.

“Warning - Compressor - Vertical Vibration”

The input signal from the Compressor Vertical Vibration Transmitter is above the CVSP1-Compressor Vibration Alarm setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The message will automatically clear when the input signal decreases to 0.1 In/Sec below the Alarm Setpoint.

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, a soft shutdown sequence is initiated.

“Local Stop”

A local shutdown command has been received by placing the Keypad Start-Run-Stop/Reset Switch in the stop (O) position.

“Place Start/Stop Control Switch In Run Position”

The Control Center is in either the Digital or ISN Remote Mode. The operator is requested to place the START/STOP Control Switch on the front of the control center in the RUN (■) position so that the Control Center will accept a Remote Start/Stop Command. When Turbine Start Mode is set for Manual on Configuration Screen 1, the Remote start command will only cause the chiller startup to progress as far as the “BEGIN SLOW ROLL” message.

“Compr Standby Lube In Process”

If Standby Lube is enabled on the Oil Sump Screen, this message appears for 2 minutes every 24 hours if the chiller has not been running in the past 24 hours. A countdown timer is also displayed showing the time remaining in the lube cycle.

CYCLING SHUTDOWN MESSAGES**“Control Panel – Power Failure”**

A Control Power failure has occurred. If the power failure occurred while the chiller was running, it may automatically restart when power is restored. 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. If configured for auto-restart, the chiller start sequence will be automatically initiated 35 seconds after the chiller has coasted to a complete stop. If the power failure duration was less than 6 minutes when power is restored, a complete postlube sequence will be performed. 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 160.67-M3.

“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, a soft shutdown sequence is initiated. The chiller will automatically restart when the contacts close 35 seconds after the drive train has coasted to a complete stop.

“Compr 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.

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. This safety is enabled when the chiller is stopped and during the first 10 seconds of prelude.

“Compr 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 COMPR OIL – LOW TEMPERATURE DIFFERENTIAL message description.

“Compr 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 160.67-M3. The chiller will automatically restart when the contacts close.

“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, a soft shutdown sequence is initiated. The chiller will automatically restart when the temperature increases to the programmed Restart Temperature Setpoint 35 seconds after the drive train has coasted to a complete stop.

“Leaving Chilled Liquid – Flow Switch Open”

The Chilled Liquid Flow Switch has remained open for 2 continuous seconds while the chiller was running or failed to close during the Start Sequence. This check is bypassed for a programmable delay after the chilled liquid pump start contacts are closed. These contacts are closed after the turbine slow roll warm-up has been completed and the ramp up to rated speed has been initiated. The chiller will automatically restart when the flow switch closes.

“Condenser – Flow Switch Open”

The Condenser water flow switch has remained open for 2 continuous seconds while the chiller was running or failed to close during the start sequence. This check is bypassed for 45 seconds after the condenser liquid pump start contacts have been closed and the message "START SEQUENCE INITIATED" is displayed. The chiller will automatically restart when the flow switch closes.

“Expansion I/O – Serial Communications”

Serial communications between the Microboard and the Frick Analog I/O Board has been interrupted for at least 20 seconds.

“Proximity Probe – Low Supply Voltage”

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 ≥ 19.7 VDC.

SAFETY SHUTDOWN MESSAGES**“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 START/STOP switch is placed in the STOP-RESET (O) position.

“Internal Error – Cannot Create Task”

A program execution error occurred in providing requested task handle.

“Internal Error – No Timer Handles Available”

A program execution error occurred in providing requested timer handle.

“Control Panel – Power Failure”

A Control Power failure has occurred. If the power failure duration was less than 6 minutes, the remainder of the “System Coastdown” is performed upon restoration of power. The chiller can be started after the START/STOP control 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 160.67-M3.

“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 160.67-M3. The chiller can be started after the evaporator pressure increases to the restart threshold and the START/STOP control switch is placed in the STOP-RESET (O) position.

	SHUTDOWN (PSIG)	RESTART (PSIG)
Water Cooling - R22 - R134a	54.3	54.4
	25.0	25.1
Brine Cooling - R22 - R134a	25.0 to 54.3 as programmed	+0.1 > Shutdown threshold
	6.0 to 25.0 as programmed	+0.1 > Shutdown threshold

“Evaporator – Low Pressure - Smart Freeze”

Smart Freeze protection is activated and has shutdown the chiller because the evaporator temperature has been below the Smart Freeze threshold for greater than the allowable number of seconds. If the Evaporator Refrigerant Temperature sensor is Enabled, (using procedure in Service Manual 160.67-M3), this parameter is used as the evaporator refrigerant temperature and the freeze threshold is 32.8°F. If this sensor 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:

$$\# \text{ seconds to freezing} = (4053.7) / (\text{freeze threshold} - \text{evap. refrigerant temp.})$$

Smart Freeze is activated only if the feature has been Enabled by a Service technician and the Leaving Chilled Liquid temperature Setpoint is $< 38.0^\circ\text{F}$.

“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 $+25.0^{\circ}\text{F}$. If the Transducer and Thermistor are accurate, the Evaporator Saturated temperature should not be $> 2.5^{\circ}\text{F}$ warmer nor $> 25.0^{\circ}\text{F}$ 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 after the chiller is running at or above the minimum rated speed. The chiller can be started after the START/STOP control 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 Sensor has been enabled by a Service technician using instructions in YORK Service Manual 160.67.M2
- Not in Brine cooling mode
- Smart Freeze is enabled
- Evaporator Temperature Sensor or Evaporator Saturation Temperature is indicating a temperature of $< 32.0^{\circ}\text{F}$.

The chiller can be started after the temperatures are within 3.0°F of one another and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Condenser – High Pressure Contacts Open”

The contacts of the electro-mechanical high pressure safety device, have opened because this device has detected a pressure > 180.0 PSIG (R134a) > 265.0 (R22). The contacts will automatically close when the condenser pressure decreases to < 120.0 PSIG (R134a) < 205 PSIG (R22). The chiller can be started after the contacts close and the START/STOP control switch is placed in the STOP-RESET (O) position.

“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 START/STOP control switch is placed in the STOP-RESET (O) position.

“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 START/STOP control 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 START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr Discharge – High Temperature”

The discharge temperature, as sensed by the Discharge Temperature Thermistor, has increased to $> 220.0^{\circ}\text{F}$. The chiller can be started after the temperature decreases to $< 220.0^{\circ}\text{F}$ and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr Discharge – Low Temperature”

The discharge temperature, as sensed by the Discharge Temperature Thermistor, has decreased to $< 30.0^{\circ}\text{F}$. The chiller can be started after the temperature increases to $> 30.0^{\circ}\text{F}$ and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr Oil – High Temperature”

The oil temperature, as sensed by the Oil Temperature Thermistor, has increased to $> 180.0^{\circ}\text{F}$. The chiller can be started after the temperature decreases to $< 180.0^{\circ}\text{F}$ and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr 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 START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr Oil - High Differential Pressure”

The differential oil Pressure increased to >120.0 PSID 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 <120.0 PSID and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr 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 START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr 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 START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr 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 START/STOP control switch is placed in the STOP-RESET (O) position.

“Compr 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 START/STOP control switch is placed in the STOP-RESET (O) position.

1. The differential oil pressure was <35.0 PSID; 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.

“Compr Thrust Bearing – Proximity Probe Clearance”

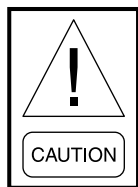
The clearance between the compressor high speed thrust collar and the tip of the Proximity Probe has increased $> +10$ mils or decreased > -25 mils (for 2 continuous seconds) from the Reference Position. The minimum allowed clearance is 23 mils. Therefore, if the Reference position is <47 mils, the shutdown will occur when the actual clearance is < 22 mils.



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.

“Compr Thrust Bearing – Proximity Probe Out Of Range”

The clearance between the compressor high speed thrust collar and the tip of the Proximity Probe has decreased to < 17 mils.



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.

“MPU Failure”

This message will appear if the chiller is being operated with only one magnetic pickup and the remaining input signal drops 1.0 mA below the calibrated minimum input signal which generally indicates a defective frequency to analog converter. The chiller can only be started after at least one of the speed input signals is within the calibrated range and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine Exhaust Steam High Pressure”

The input signal from the Turbine Exhaust Steam Pressure Transmitter has been above the PSP7-Turbine Exhaust Steam High Pressure setpoint shown on the Alarm/Shutdown Setpoints Screen for the TDSP7-Turbine Exhaust High Pressure Timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen. This check is bypassed until the chiller is in the System Run Mode. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Turbine Mechanical Trip”

The Turbine Trip Valve Air Dump Solenoid is energized but the Turbine Trip Valve Limit Switch contact is open indicating that the trip valve has not opened or has been closed by the hand trip knob on the turbine, a mechanical over-speed trip, a failure of the pneumatic air supply, or a mechanical valve actuator failure. This check is bypassed until the TDSP15-Turbine Mechanical Trip timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen has elapsed after the Turbine Trip Valve Air Dump Solenoid is energized. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Excessive Start Delay”

The system prelube has been completed but the operator has failed to press the Begin Slow Roll key on the Steam System Screen to initiate the slow roll warm-up within the TDSP8-Excessive Start Delay Timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Excessive Slow Rolling Trip”

The turbine has been slow rolling longer than the calculated slow roll warm-up time plus the TDSP1-Excessive Slow Roll Timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen. This indicates that the operator has failed to press the “Run At Rated” key that appears on the Steam System Screen to close the Chilled Liquid Pump Start contacts and initiate the ramp up to rated speed. When MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1, this would indicate that the vacuum pump has failed to reduce the turbine exhaust pressure to the PSP6-Ready To Run pressure shown on the Pressure Setpoints Screen, thereby preventing the automatic ramp up to rated speed. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Hotwell Pump Fault”

When MSSP10-Hotwell Pump Mode on Configuration Screen 1 is set for Dual, this message appears when the lead hotwell pump has failed, the standby pump start has been initiated, but the standby hotwell pump contactor auxiliary contact has failed to close within 5 seconds after the run output was energized to start the pump. This message is also displayed if the auxiliary contact opens anytime the run output is on indicating that the pump motor protector in the Power Panel may have stopped the pump. This message also appears when MSSP10-Hotwell Pump Mode is set for Single and a failure occurs. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Vacuum Pump Sealing Water No Flow”

When MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Dual, this message appears when the lead vacuum pump has failed and the standby vacuum pump start has been initiated. The standby sealing water flow switch has not closed within 10 seconds after the standby pump sealing water solenoid has been en-

energized. This message is also displayed if the standby sealing water flow switch opens while the associated solenoid is energized indicating a possible failure of the solenoid coil. This message also appears when MS-SP11-Vacuum Pump Mode is set for Single or Ejector and a failure occurs. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Vacuum Pump Fault”

When MSSP11-Vacuum Pump Mode on Configuration Screen 1 is set for Dual, this message appears when the lead vacuum pump has failed and the standby vacuum pump start has been initiated. The standby sealing water flow switch has not closed within 10 seconds after the associated solenoid has been energized or the lead vacuum pump contactor auxiliary contact has failed to close within 5 seconds after the run output was energized to start the pump. This message is also displayed if the standby sealing water flow switch opens while the associated solenoid is energized indicating a possible failure of the solenoid coil. This message also appears when MSSP11-Vacuum Pump Mode is set for Single or Ejector and a failure occurs. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Turbine Underspeed”

There fault conditions that will display this message are as follows:

- **Failure to Achieve Slow Roll Speed:** The turbine has begun rotating but has not achieved the SSP1-Slow Roll Setpoint speed shown on the Speed Setpoints Screen within the TDSP16-Slow Roll Underspeed Timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen.
- **Failure to Maintain Slow Roll Speed:** The turbine speed has been continuously running at a speed that is less than the SSP1-Slow Roll Setpoint minus 100 RPM for longer than 60 seconds.
- **Failure to Ramp Achieve Minimum Rated Speed:** During ramp up to rated speed, the turbine been running within the critical speed band for longer than 17 seconds. The critical speed band is determined by the values entered for SSP11 and SSP12 on the Speed Setpoints Screen.

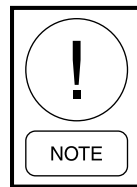
- **Failure to Maintain Minimum Rated Speed:** The turbine has been continuously running at a speed below 3100 RPM for longer than 20 seconds.
- The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Steam Valve Malfunction”

The Turbine Rotating (Speed Switch) contacts are closed or a speed sensor analog input is greater than 20 RPM without the Turbine Trip Valve Air Dump Solenoid being energized. This indicates that the turbine has begun rotating due to a possible steam leak through the trip valve. The drive train will normally coast to a complete stop within 6 minutes after a shutdown. After 0 RPM is detected, this safety is enabled until a start is initiated and the speed setpoint is increased to open the Governor Valve and begin rotation. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Turbine – Supply Oil Temperature Out Of Range”

This message only applies when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It appears when the input signal from the Turbine Supply Oil RTD Temperature Transmitter is below 32 °F. This is outside the normal operating range and generally indicates a defective transmitter or RTD sensing element. The chiller can only be started after the transmitter input is indicating a temperature that is within range and the START/STOP control switch is placed in the STOP-RESET (O) position.



An input signal above 302 °F would also indicate a defective transmitter or RTD sensing element but will generate a normal safety shutdown message since this value exceeds the safety setpoint.

“Turbine – Supply Oil High Temperature”

This message only applies to when the turbine is supplied with an auxiliary Oil Pump and MSSP6-Turbine Lubrication Type is set for pump on the Configuration Screen 1. It appears when the input signal from the Turbine Supply Oil RTD Temperature Transmitter is above the TSP9-Turbine Supply Oil High Temperature Shutdown setpoint shown on the Alarm/Shutdown

Setpoints Screen. The chiller can only be started after the transmitter input signal decreases to 0.1 °F below the Shutdown Setpoint and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine – Shaft End Brg Temperature Out Of Range”

This message only applies to when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. It appears when the input signal from the Turbine Shaft End Bearing RTD Temperature Transmitter is below 32 °F. This is outside the normal operating range and generally indicates a defective transmitter or RTD sensing element. The chiller can only be started after the transmitter input is indicating a temperature that is within range and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine – Governor End Brg Temperature Out Of Range”

This message only applies to when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. It appears when the input signal from the Turbine Governor End Bearing RTD Temperature Transmitter is below 32 °F. This is outside the normal operating range and generally indicates a defective transmitter or RTD sensing element. The chiller can only be started after the transmitter input is indicating a temperature that is within range and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine – Shaft End Bearing High Temperature”

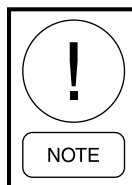
This message only applies to when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. It appears when the input signal from the Turbine Shaft End Bearing RTD Temperature Transmitter is above the TSP5-Turbine Shaft End Brg High Temp shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. The chiller can only be started after the transmitter input signal decreases to 0.1 °F below the Shutdown Setpoint and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine – Governor End Bearing High Temperature”

This message only applies to when the turbine is supplied with bearing RTD sensors and MSSP14-Turbine Bearing Temperature Sensors is set for Enabled on the Configuration Screen 1. It appears when the input signal from the Turbine Governor End Bearing RTD Temperature Transmitter is above the TSP7-Turbine Governor End Brg High Temp Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. The chiller can only be started after the transmitter input signal decreases to 0.1 °F below the Shutdown Setpoint and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine – Supply Oil Pressure Out Of Range”

This message only applies to when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It appears when the input signal from the Turbine Supply Oil Pressure Transmitter is above 29.8 PSIG. This is outside the normal operating range and generally indicates a defective transmitter. The chiller can only be started after the transmitter input is indicating a pressure that is within range and the START/STOP control switch is placed in the STOP-RESET (O) position.



An input signal less than 0 PSIG while the auxiliary oil pump is running or while the turbine is running would also indicate a defective transmitter but will generate a normal safety shutdown message since this value exceeds the safety setpoint.

“Turbine – Supply Oil Low Pressure”

This message only applies to when the turbine is supplied with an auxiliary oil pump and MSSP6-Turbine Lubrication Type is set for Pump on the Configuration Screen 1. It appears when the input signal from the Turbine Supply Oil Pressure Transmitter is below the PSP8-Turbine Supply Oil Low Pressure shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed for the first 45 seconds of the prelube after the message “START SEQUENCE INITIATED” is displayed. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Hotwell Condensate Low Level”

The condensate level in the steam condenser hotwell has been below the low-level switch actuation point causing the input to the Digital I/O Expansion board to be open for 5 continuous minutes. The chiller can only be started after the level rises above the actuation point of the switch closing the input to the Digital I/O board expansion, and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Hotwell Condensate High Level”

The condensate level in the steam condenser hotwell has been above the high-level switch actuation point causing the input to the York I/O board to be continuously open for the TDSP13-Hotwell High Level Timeout delay shown on the Time Delay Alarm/Shutdown Setpoints Screen. This message is also displayed and the chiller shut down if the Hotwell Level Transmitter input signal connected to the Analog I/O Expansion Board remains continuously above the HLSP2-Hotwell High Level Cutout setpoint for same time delay. The chiller can only be started after the level falls below the actuation point of the switch and programmable shutdown setpoint, and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine Overspeed”

The speed has exceeded the SSP8-Overspeed Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

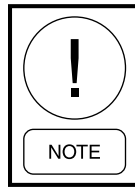
“Slow Roll Overspeed”

The speed has exceeded the SSP11-Critical Band Base Speed setpoint shown on the Speed Setpoints Screen without the ramp to rated speed being initiated. The START/STOP Control Switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Compr Thrust Bearing-Limit Switch Open”

(All except "J" Compressors)

The High Speed Thrust Bearing Limit Switch Contacts, connected to TB7-313 and TB7-324 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 Technician.

“Mechanical Overspeed Test Failure”

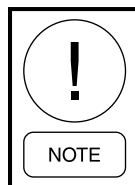
The turbine mechanical overspeed trip mechanism failed to trip the turbine and the speed exceeded the SSP4-Overspeed Test Limit shown on the Speed Setpoints Screen for 2 seconds. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Compr Thrust Bearing Proximity Probe Uncalibrated”

This message will only appear during initial testing and set up of a new panel or if the Microboard or BRAM (U38) memory device on the Microboard has been replaced. The proximity probe calibration procedure must be performed before the chiller may be operated.

TURBINE VIBRATION SHUTDOWN MESSAGES

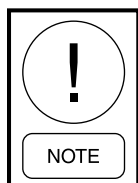
When MSSP4-Turbine Start Mode is set for Auto on Configuration Screen 1 the turbine must be fitted with two proximity probes on each end of the turbine to protect the turbine from excessive shaft vibration. The “Horizontal” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the right side when facing the governor end of the turbine. The “Vertical” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the left side when facing the governor end of the turbine. When the MSSP4-Turbine Start Mode is set for Manual, MSSP13-Turbine Shaft Vibration Sensors must be set for Enabled on Configuration Screen 1. When the sensors are enabled, the following messages are also enabled:



After the probe cables are connected to the transmitters, the zero on all vibration transmitters must be adjusted to provide a 4.0mA output to ensure the proper operation of these messages.

“Turbine – Shaft End Horizontal Vibration Out Of Range”

The input signal from the Turbine Shaft End Horizontal Vibration Transmitter is more than 0.5 mA below the calibrated minimum input signal, which generally indicates a defective transmitter, probe or cable. The chiller can only be started after the transmitter input is within the calibrated range and the START/STOP control switch is placed in the STOP-RESET (O) position.



An input signal above 5 Mils would also indicate a defective transmitter or proximity probe but will generate a normal safety shutdown message since this value exceeds the safety setpoint.

“Turbine – Shaft End Vertical Vibration Out Of Range”

The input signal from the Turbine Shaft End Vertical Vibration Transmitter is more than 0.5 mA below the calibrated minimum input signal. This is outside the normal operating range and generally indicates a defective transmitter, probe or cable. The chiller can only be started after the transmitter input is within the calibrated range and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine – Governor End Horizontal Vibration Out Of Range”

The input signal from the Turbine Governor End Horizontal Vibration Transmitter is more than 0.5 mA below the calibrated minimum input signal, which generally indicates a defective transmitter, probe or cable. The chiller can only be started after the transmitter input is within the calibrated range and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine – Governor End Vertical Vibration Out Of Range”

The input signal from the Turbine Governor End Vertical Vibration Transmitter is more than 0.5 mA below the calibrated minimum input signal, which generally indicates a defective transmitter, probe or cable. The chiller can only be started after the transmitter input is within the calibrated range and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Turbine - Shaft End Horizontal Vibration”

The input signal from the Turbine Shaft End Horizontal Vibration Transmitter is above the TVSP2-Turbine Vibration Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen.

This check is bypassed during shutdown until the start sequence is initiated. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Turbine - Shaft End Vertical Vibration”

The input signal from the Turbine Governor End Horizontal Vibration Transmitter is above the TVSP2-Turbine Vibration Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Turbine - Governor End Horizontal Vibration”

The input signal from the Turbine Governor End Horizontal Vibration Transmitter is above the TVSP2-Turbine Vibration Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Turbine - Governor End Vertical Vibration”

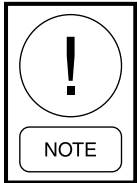
The input signal from the Turbine Governor End Vertical Vibration Transmitter is above the TVSP2-Turbine Vibration Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

COMPRESSOR EXCESSIVE VIBRATION SHUTDOWN MESSAGES

Since proximity probes cannot be fitted on a single stage compressor due to internal space limitations, casing mounted accelerometers are occasionally used as the only alternative. However, the shutdown setpoint and delay may need to be set high enough to prevent nuisance shutdowns due to stall or surge conditions. Mechanical vibration problems should remain fairly steady at a high level; aerodynamic problems will appear and disappear. Therefore, it is recommended that the normal operating vibration levels be recorded and the vibration levels be monitored to provide an indication of developing mechanical problems.

When MSSP18-Compressor Vibration Sensors is set for Enabled on Configuration Screen 1, the compressor must be fitted with two accelerometers on the ro-

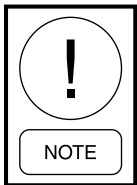
tor support. The “Horizontal” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the right side of the rotor support when facing the shaft end of the compressor. The “Vertical” designation refers to the proximity probe installed at approximately 45 degrees from the vertical center on the left side when facing the shaft end of the compressor. When the sensors are enabled, the following messages are also enabled:



After the accelerometer cables are connected to the transmitters, the zero on all vibration transmitters must be adjusted to provide a 4.0 mA output to ensure the proper operation of these messages.

“Compressor Horizontal Vibration Out Of Range”

The input signal from the Compressor Horizontal Vibration Transmitter is more than 0.5 mA below the calibrated minimum input signal, which generally indicates a defective transmitter, accelerometer, or cable. The chiller can only be started after the transmitter input is within the calibrated range and the START/STOP control switch is placed in the STOP-RESET (O) position.



An input signal above 2.0 In/Sec would also indicate a defective transmitter or accelerometer but will generate a normal safety shutdown message since this value exceeds the safety setpoint.

“Compressor Vertical Vibration Out Of Range”

The input signal from the Compressor Vertical Vibration Transmitter is more than 0.5 mA below the calibrated minimum input signal, which generally indicates a defective transmitter, probe, or cable. The chiller can only be started after the transmitter input is within the calibrated range and the START/STOP control switch is placed in the STOP-RESET (O) position.

“Compressor - Horizontal Vibration”

The input signal from the Compressor Horizontal Vibration Transmitter is above the CVSP2-Compressor Vibration Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

“Warning - Compressor - Vertical Vibration”

The input signal from the Compressor Vertical Vibration Transmitter is above the CVSP2-Compressor Vibration Shutdown setpoint shown on the Alarm/Shutdown Setpoints Screen. This check is bypassed during shutdown until the start sequence is initiated. The START/STOP control switch must be placed in the STOP-RESET (O) position before starting the chiller.

SECTION 3 - PRINTERS

3



23887A

OKIDATA MICROLINE 184



23889A

WEIGH-TRONIX



00085VIP

SEIKO DPU-414

FIGURE 54 - 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 set-points (Printer, Setpoints)
- **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.
- **Trend** - 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 may differ.

- Figure 55 - Status
- Figure 56 - Setpoints
- Figure 57 - Sales Order
- Figure 58 - History
- Figure 59 - Security Log
- Figure 60 - Trend
- Figure 61 - Custom Screen

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** –

Model: DPU414-30B (Power supply PW4007-U I required)

Dimensions: 6.3 in. wide x 6.7 in. deep

Paper: 4.4 in. wide

Type: Thermal

Purchase: Reptron Electronics Phone: 800-800-5441 ext 4686 Fax: 813-891-4056 Attention Nancy Arthur, Account Manager narthur@reptron.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.

**YORK UPDATE
CHILLER ID 0**(c) 1997 - 2004 YORK INTERNATIONAL CORPORATION
Tue 20 Apr 2004 4:46:25 PMSYSTEM READY TO START
CONTROL PANEL - POWER FAILUREControls C.E09.12.00.000.00.551
Run Time 0 Days 0 Hr 0 MinOperating Hours = 65 Hr
Number Of Starts = 5
Control Source = Local**Evaporator**-----
Leaving Chilled Active Setpoint = 42.1 ~F
Chilled Liquid Pump Start Contact = Open
Chilled Liquid Flow Switch = Open
Leaving Chilled Liquid Temperature = 42.0 ~F
Return Chilled Liquid Temperature = 58.0 ~F
Evaporator Pressure = 34.5 Psig
Evaporator Saturation Temperature = 39.4 ~F
Evaporator Refrigerant Temperature = 40.0 ~F
Small Temperature Difference = 2.0 ~F**Condenser**-----
Condenser Liquid Pump Start Contact = Open
Condenser Liquid Flow Switch = Open
Leaving Condenser Liquid Temperature = 94.3 ~F
Return Condenser Liquid Temperature = 85.0 ~F
Condenser Pressure = 116.3 Psig
Condenser Saturation Temperature = 96.2 ~F
Small Temperature Difference = 1.9 ~F
Drop Leg Refrigerant Temperature = 90.0 ~F
Sub Cooling Temperature = 6.2 ~F**Compressor**-----
Discharge Temperature = 120.0 ~F**Oil Sump**-----
Oil Pump Run Output = Off
Sump Oil Pressure (LOP) = 33.1 Psig
Pump Oil Pressure (HOP) = 32.9 Psig
Oil Pressure = 0.0 Psid
Oil Sump Temperature = 136.4 ~F
Oil Heater Output = On
Oil Return Solenoid = Off**Variable Speed Oil Pump**-----
Oil Pump Drive Command Frequency = 25.0 Hz
Variable Speed Oil Pump Control Mode = Auto**Proximity Probe**-----
High Speed Thrust Bearing Proximity Different = 2 Mils**Subcooler Level**-----
Subcooler Level Setpoint = 0 %
Subcooler Level Pulldown Time Remaining = 0 Sec
Subcooler Level = 50 %
Control Output Signal = 100 %
Subcooler Level Auto/Manual Mode = Auto**Hot Gas Bypass**-----
Hot Gas Ratio Calculation = 100 %
Temp Setpoint = 40.9 ~F
Hot Gas Temp Calculation = 0 %
HGV Ramp = 100 %
Control Output Signal = 100 %
HGV Auto/Manual Mode = Auto**Pre-Rotation Vanes**-----
PRV Position = 0 %
PRV Ramp = 0 %
PRV Command = 0 %
PRV Motor Switch = Open
PRV Auto/Manual Mode = Auto**Speed Control**-----
Speed Setpoint = 0 RPM
MSSP7 - Speed Control Mode = Variable Speed
Turbine Speed = 0 RPM
Control Output Signal = 0.0 %
Turbine Rotation = Open
Speed Setpoint Auto/Manual Mode = Auto**Capacity Control**-----
Capacity Ratchet Mode = Hot Gas
Capacity Ratchet: HGV Drive = 100 %
Capacity Ratchet: PRV Drive = 7 %
Capacity Ratchet: SPD Drive = 71.1 %
Anti-Surge Calculated Min. Speed = 3200 RPM
Anti-Surge Calculated Min. PRV = 7 %
Temperature Controller: Selected Override = None
Override Limit = 100.0 %
Temperature Controller: Control Percentage = 0.0 %
Temperature Controller: Control Mode = Inactive
Head Pressure = 81.8 Psid
PD1 - Maximum Pressure Differential = 70.0 Psid
PD2 - Minimum Pressure Differential = 45.0 Psid
MVP1 - High Head Minimum PRV = 5 %
MVP2 - Low Head Minimum PRV = 0 %
MSP1 - High Head Minimum Speed = 4500 RPM
MSP2 - Low Head Minimum Speed = 3600 RPM**FIGURE 55 - SAMPLE PRINTOUT (STATUS)**

Steam Control	

Inlet Temperature	= 358.9 ~F
Inlet Pressure	= 136.0 Psig
First Stage Pressure	= 41.2 Psig
Exhaust Pressure	= 1.5 Psia
Inlet Solenoid	= Off
Inlet Valve	= 0 %
Bypass Solenoid	= Off
Inlet Limit Switch	= Closed
Slow Roll Valve	= 0 %
Turbine Vibration Sensor	

Governor End Horizontal Vibration	= 0.5 Mils
Governor End Vertical Vibration	= 0.5 Mils
Shaft End Horizontal Vibration	= 0.5 Mils
Shaft End Vertical Vibration	= 0.5 Mils
Turbine Solenoids	

Turbine Rotation	= Open
Trip Solenoid	= Off
Trip Valve Limit Switch	= Open
Vacuum Solenoid	= Off
Inlet Limit Switch	= Closed
Oil Cooler Solenoid	= Off
Gland Solenoid	= Off
Nozzle #1 Solenoid	= Off
Nozzle #2 Solenoid	= Off
Steam Ring Drain Solenoid	= On
Condensate Drain Tank High Level Switch	= Closed
Turbine Oil / Bearings	

Oil Temperature	= 110.5 ~F
Oil Pressure	= 18.1 Psig
Governor End Bearing Temperature	= 170.1 ~F
Shaft End Bearing Temperature	= 149.5 ~F
Aux Oil Pump Run Output	= Off
Aux Oil Pump Contact	= Open
Aux Oil Pump Manual Mode	= Disabled

Hotwell Level	

HLSP1 - Hotwell Condensate Level	= 50.0 %
Condensate Level	= 50.4 %
Hotwell Level Control Output Signal	= 49.6 %
Pump #1 Run Output	= Off
Pump #1 Aux Contact	= Open
Pump #2 Run Output	= Off
Pump #2 Aux Contact	= Open
Low Level Switch	= Closed
High Level Switch	= Closed
Hotwell Level Control Auto/Manual Mode	= Auto
Vacuum System	

Pump #1 Run Output	= Off
Pump #1 Aux Contact	= Open
Pump #1 Sealing Water Solenoid	= Off
Pump #1 Sealing Water Flow Switch	= Open
Pump #2 Run Output	= Off
Pump #2 Aux Contact	= Open
Pump #2 Sealing Water Solenoid	= Off
Pump #2 Sealing Water Flow Switch	= Open
Ejector Actuator	= Off
Flow Sensor	

Evaporator Flow	= 2628 Gal/Min
Condenser Flow	= 4312 Gal/Min
Steam Flow	= 14496 Lb/Hr

FIGURE 55 - SAMPLE PRINTOUT (STATUS) (CONT'D)

YORK SETPOINTS**CHILLER ID 0**

(c) 1997 - 2004 YORK INTERNATIONAL CORPORATION

Tue 20 Apr 2004 4:48:56 PM

Software Versions

```

-----
Controls                = C.E09.12.00.000.00.551
BIOS                    = C.OPT.00.01
Kernel                  = 1.19
GUI                     = 0.35
SIO                     = 1.23
GPIC                    = 0.05
Exp I/O                 = 0120204302003

```

System Information

```

-----
System Language          = English
Data Display Mode        = English
Control Source           = Local
Remote Analog Input Range = 0-10 Volts
Clock                   = Enabled

```

Options

```

-----
Prelube                  = Standard
Chilled Liquid Pump Operation = Standard
Refrigerant Selection    = R134a
Power Failure Restart    = Auto
Liquid Type              = Water
Flow Switch              = Analog

```

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                      = 57600 Baud
Data Bits                 = 8 Bits
Parity                    = None
Stop Bits                 = 1 Bit

```

Evaporator

```

-----
TSP1 - Leaving Chilled Local Setpoint = 42.1 ~F
Leaving Chilled ISN Setpoint          = 42.1 ~F
Leaving Chilled Modem Setpoint        = 42.1 ~F
Leaving Chilled Analog Setpoint       = 42.1 ~F
Leaving Chilled Digital Setpoint      = 42.1 ~F
TSP2 - Remote Range                   = 10.0 ~F
Restart Offset                        = 0.0 ~F
Restart Setpoint                      = 42.1 ~F
Shutdown Offset                       = 4.0 ~F
Shutdown Setpoint                     = 38.1 ~F
Brine Low Evaporator Cutout           = 25.0 Psig
Smart Freeze                          = Off
Refrigerant                           = Enabled

```

Condenser

```

-----
High Pressure Warning Threshold = 162.5 Psig
Drop Leg                        = Enabled
Oil Sump

```

```

-----
Compressor Oil Pump Package = Variable
Speed
Standby Lube                 = Enabled

```

Variable Speed Oil Pump

```

-----
Pressure Setpoint          = 35 Psid
Control Period             = 0.9 Sec

```

Proximity Probe

```

-----
High Speed Thrust Bearing Proximity Reference = 50 Mils

```

Misc. Setpoints

```

-----
HGVRAT - Hot Gas Valve Ratio Bypass = 5 %
HLSP2 - Hotwell High Level           = 90.0 %
LCVM - Subcooler Level Valve Minimum Position = 25 %

```

Configuration Setpoints

```

-----
MSP1 - High Head Minimum Speed = 4500 RPM
MSP2 - Low Head Minimum Speed  = 3600 RPM
MSSP1 - Capacity Ratchet Mode HGV Reselection = 3 %
MSSP2 - Capacity Ratchet Mode PRV Reselection = 3 %
MSSP3 - Capacity Ratchet Mode SPD Reselection = 3 %
MSSP4 - Turbine Start Mode      = Auto
MSSP6 - Turbine Lubrication Type = Pump
MSSP7 - Speed Control Mode      = Variable Speed
MSSP8 - Power Limiting Mode     = Pressure
MSSP10 - Hotwell Pump Mode     = Dual
MSSP11 - Vacuum Pump Mode      = Dual
MSSP13 - Turbine Shaft Vibration Sensors = Enabled
MSSP14 - Turbine Bearing Temperature Sensors = Disabled
MSSP15 - Turbine First Stage Pressure Sensor = Enabled
MSSP16 - Turbine Nozzle Solenoids = Enabled
MSSP17 - Turbine Stage Count   = 7
PRVM - PRV Minimum Open Position = 0 %
MVP1 - High Head Minimum PRV   = 5 %
MVP2 - Low Head Minimum PRV    = 0 %

```

Pressure Setpoints

```

-----
PD1 - Maximum Pressure Differential = 70.0 Psid
PD2 - Minimum Pressure Differential = 45.0 Psid
PSP5 - Vacuum Pump Shutdown        = 1.5 Psia
PSP6 - Ready To Run Turbine Exhaust Pressure = 5.0 Psia
PSP7 - Turbine Exhaust Steam High Pressure = 3.5 Psia
PSP8 - Turbine Supply Oil Low Pressure = 8.0 Psig
PSP9 - Turbine Auxiliary Oil Pump Off = 16.0 Psig
PSP10 - Turbine Auxiliary Oil Pump On = 6.0 Psig
PSP12 - Open Ejector Steam Inlet = 5.0 Psia
PSP13 - Turbine Nozzle Solenoid #1 Activate = 45.0 Psig
PSP14 - Turbine Nozzle Solenoid #2 Activate = 50.0 Psig
PSP15 - Turbine Nozzle Solenoid Deadband = 5.0 Psig

```

Ramp Rate

```

-----
RRSP1 - Temp Control Setpoint Ramp Rate = 0.2 ~F/Sec
RRSP2 - Hot Gas Valve Ramp Rate         = 10.0 %/Sec
RRSP3 - Slow Roll Speed Setpoint        = 50 RPM
RRSP4 - Minimum Rated Speed Setpoint    = 100 RPM
RRSP5 - Rated Speed Setpoint            = 10 RPM
RRSP6 - Soft Shutdown Speed Setpoint    = 50 RPM
RRSP7 - Main Steam Inlet Block Valve    = 5 %/Sec
RRSP8 - PRV Ramp Rate                   = 10.0 %/Sec
RRSP9 - Slow Roll Steam Bypass Valve    = 5 %/Sec
RRSP10 - Subcooler Level Control Setpoint Ram = 0.1 %/Sec

```

FIGURE 56 - SAMPLE PRINTOUT (SETPOINTS)

Speed Setpoints		Evaporator PID	
-----		-----	
SSP1 - Slow Roll Speed	= 1000 RPM	PSP1 - Evaporator Pressure Controller	= 30.0 Psig
SSP2 - Minimum Rated Speed	= 3200 RPM	Evaporator - HGV: Proportional	= 1.00
SSP3 - Fixed Speed	= 4200 RPM	Evaporator - HGV: Integral	= 5.00
SSP4 - Overspeed Test Limit	= 5000 RPM	Evaporator - HGV: Derivative	= 0.00
SSP5 - Chilled Liquid Pump Turn-On Speed	= 1200 RPM	Evaporator - PRV: Proportional	= 1.00
SSP7 - Turbine Auxiliary Oil Pump Activate	= 3000 RPM	Evaporator - PRV: Integral	= 5.00
SSP8 - OverSpeed Shutdown	= 4900 RPM	Evaporator - PRV: Derivative	= 0.00
SSP9 - Maximum Rated Speed	= 4500 RPM	Evaporator - SPD: Proportional	= 1.00
SSP10 - Maximum Speed Analog Input	= 5000 RPM	Evaporator - SPD: Integral	= 5.00
		Evaporator - SPD: Derivative	= 0.00
Time Setpoints		Condenser PID	
-----		-----	
TDSP1 - Excessive Slow Roll Timeout	= 1200 Sec	PSP2 - Condenser Pressure Controller	= 145.0 Psig
TDSP2 - Turbine Nozzle Solenoid #1 Delay	= 300 Sec	Condenser - HGV: Proportional	= 1.00
TDSP3 - Turbine Nozzle Solenoid #2 Delay	= 100 Sec	Condenser - HGV: Integral	= 5.00
TDSP4 - Chilled Liquid Pump Turn-On Delay	= 2 Sec	Condenser - HGV: Derivative	= 0.00
TDSP5 - Chilled Liquid Flow Switch Check Dela	= 10 Sec	Condenser - PRV: Proportional	= 1.00
TDSP6 - Subcooler Level Valve Pulldown Delay	= 10 Min	Condenser - PRV: Integral	= 5.00
TDSP7 - Turbine Exhaust Steam High Pressure T	= 600 Sec	Condenser - PRV: Derivative	= 0.00
TDSP8 - Excessive Start Delay Timeout	= 1200 Sec	Condenser - SPD: Proportional	= 1.00
TDSP9 - Soft Shutdown Rampdown Timeout	= 10 Min	Condenser - SPD: Integral	= 5.00
TDSP10 - Temp Control Override Transfer Delay	= 5 Sec	Condenser - SPD: Derivative	= 0.00
TDSP11 - Hotwell Pump Shutdown Delay	= 360 Sec		
TDSP12 - Turbine Auxiliary Oil Pump Postlube	= 30 Min	Hotwell Level PID	
TDSP13 - Hotwell High Level Timeout	= 10 Sec	-----	
TDSP14 - AntiSurge Update Delay Time	= 30 Sec	HLSP1 - Hotwell Condensate Level	= 50.0 %
TDSP15 - Turbine Mechanical Trip Timeout	= 5 Sec	Hotwell Level: Proportional	= 5.00
TDSP16 - Slow Roll Underspeed Timeout	= 100 Sec	Hotwell Level: Integral	= 0.00
TDSP17 - Turbine Stabilization Delay	= 120 Sec	Hotwell Level: Derivative	= 0.00
		Hotwell Level: Offset	= 50.0 %
Temperature Setpoints		Subcooler Level PID	
-----		-----	
TSP3 - Hot Gas Valve Temp Controller Diff.	= 1.1 ~F	LSP1 - Subcooler Refrigerant Level	= 50 %
TSP4 - Turbine Shaft End Bearing Warning	= 210.0 ~F	Subcooler Level: Proportional	= 1.00
TSP5 - Turbine Shaft End Bearing Shutdown	= 219.9 ~F	Subcooler Level: Integral	= 5.00
TSP6 - Turbine Governor End Bearing Warning	= 210.0 ~F	Subcooler Level: Derivative	= 0.00
TSP7 - Turbine Governor End Bearing Shutdown	= 219.9 ~F		
TSP8 - Turbine Supply Oil Warning	= 129.9 ~F	Governor PID	
TSP9 - Turbine Supply Oil Shutdown	= 135.0 ~F	-----	
Vibration		Governor Slow Roll Speed: Proportional	= 1.00
-----		Governor Slow Roll Speed: Integral	= 5.00
TVSP1 - Turbine Shaft Vibration Warning	= 3.0 Mils	Governor Slow Roll Speed: Derivative	= 0.00
TVSP2 - Turbine Shaft Vibration Shutdown	= 3.0 Mils	Governor Min Rated Speed: Proportional	= 1.00
		Governor Min Rated Speed: Integral	= 5.00
Flow Sensor		Governor Min Rated Speed: Derivative	= 0.00
-----		Governor Rated Speed: Proportional	= 1.00
FSE1 - Steam Flow Sensor Enable	= Disabled	Governor Rated Speed: Integral	= 5.00
FSP1 - Steam Flow Sensor Range	= 24000 Lb/Hr	Governor Rated Speed: Derivative	= 0.00
FSP4 - Steam Flow Transmitter Signal Type	= Linear		
FSE2 - Evaporator Flow Sensor Enable	= Enabled	Governor Position Limit PID	
FSP2 - Evaporator Flow Sensor Range	= 6000 Gal/Min	-----	
FSP5 - Evaporator Flow Transmitter Signal Typ	= Linear	GSP1 - Power Limiting Governor Position	= 100.0 %
FSE3 - Condenser Flow Sensor Enable	= Enabled	Governor Valve Position: Proportional	= 1.00
FSP3 - Condenser Flow Sensor Range	= 8000 Gal/Min	Governor Valve Position: Integral	= 5.00
FSP6 - Condenser Flow Transmitter Signal Type	= Linear	Governor Valve Position: Derivative	= 0.00
Temperature Controller PID		First Stage Pressure Limit PID	
-----		-----	
TSP1 - Leaving Chilled Local Setpoint	= 42.1 ~F	PSP3 - Power Limiting Turbine First Stage Pre=60.0 Psig	
Temperature Controller - HGV: Proportional	= 1.00	First Stage Pressure: Proportional	= 1.00
Temperature Controller - HGV: Integral	= 5.00	First Stage Pressure: Integral	= 5.00
Temperature Controller - HGV: Derivative	= 0.00	First Stage Pressure: Derivative	= 0.00
Temperature Controller - PRV: Proportional	= 1.00		
Temperature Controller - PRV: Integral	= 5.00		
Temperature Controller - PRV: Derivative	= 0.00		
Temperature Controller - SPD: Proportional	= 1.00		
Temperature Controller - SPD: Integral	= 5.00		
Temperature Controller - SPD: Derivative	= 0.00		

FIGURE 56 – SAMPLE PRINTOUT (SETPOINTS) (CONT'D)

YORK SALES ORDER**CHILLER ID 3**

(c) 1997 - 2004 YORK INTERNATIONAL CORPORATION

Tue 20 Apr 2004 4:51:41 PM

Order Information

Commissioning Date	= 28 Jul 2004
Job Name	= UConn Co-Gen
Job Location	= Storrs, CT
Model Number	= YSTWFYDJ4-KD7
York Order Number	= 03-105495-01
Panel Serial Number	= JLR-071
Chiller Serial Number	= GANM 285180

Design Load - Evaporator

Passes	= 2
Design Working Pressure	= 150
Fouling Factor	= .0001
Pressure Drop	= 18.5
Nozzle Arrangement In	= B
Nozzle Arrangement Out	= C
Leaving Temperature	= 42.0
Return Temperature	= 54.0
GPM	= 4200
Tubes	= 182

Design Load - Condenser

Passes	= 2
Design Working Pressure	= 150
Fouling Factor	= .00025
Pressure Drop	= 23.8
Nozzle Arrangement In	= 12
Nozzle Arrangement Out	= 13
Leaving Temperature	= 94.34
Return Temperature	= 85.0
GPM	= 6300
Tubes	= 261

Design Load - Steam Condenser

Passes	= 1
Design Working Pressure	= 150
Fouling Factor	= 85
Pressure Drop	= 12.2
Nozzle Arrangement In	= Bottom
Nozzle Arrangement Out	= top
Leaving Temperature	= 100.16
Return Temperature	= 94.34
GPM	= 6300
Tubes	= 0.049

Turbine Information

horsepower	= 1613
steam pressure	= 125
steam temperature	= 353
# NozzLES	= 13
Expansion Ratio	= 1.1
# OL Nozzles	= 1
Exhaust Pressure	= 2.8

System Information

Refrigerant	= R134a
Tons	= 2100
Gear Code	= PS
Liquid Type	= Water
Brine Percent	= 0
Power [volts/ph/hz]	= 460/3/60

FIGURE 57 - SAMPLE PRINTOUT (SALES ORDER)

YORK HISTORY 1
CHILLER ID 0

(c) 1997 - 2004 YORK INTERNATIONAL CORPORATION
Tue 20 Apr 2004 3:20:19 PM

SYSTEM RUN
LOCAL STOP

Controls C.E09.12.00.000.00.551
Run Time 0 Days 0 Hr 33 Min

Operating Hours = 65 Hr
Number Of Starts = 5
Control Source = Local

Evaporator

Leaving Chilled Active Setpoint = 42.1 ~F
Chilled Liquid Pump Start Contact = Closed
Chilled Liquid Flow Switch = Closed
Leaving Chilled Liquid Temperature = 42.0 ~F
Return Chilled Liquid Temperature = 58.0 ~F
Evaporator Pressure = 34.5 Psig
Evaporator Saturation Temperature = 39.4 ~F
Evaporator Refrigerant Temperature = 40.0 ~F
Small Temperature Difference = 2.0 ~F

Condenser

Condenser Liquid Pump Start Contact = Closed
Condenser Liquid Flow Switch = Closed
Leaving Condenser Liquid Temperature = 94.3 ~F
Return Condenser Liquid Temperature = 85.0 ~F
Condenser Pressure = 116.3 Psig
Condenser Saturation Temperature = 96.2 ~F
Small Temperature Difference = 1.9 ~F
Drop Leg Refrigerant Temperature = 90.0 ~F
Sub Cooling Temperature = 6.2 ~F

Compressor

Discharge Temperature = 120.0 ~F

Oil Sump

Oil Pump Run Output = On
Sump Oil Pressure (LOP) = 33.1 Psig
Pump Oil Pressure (HOP) = 89.4 Psig
Oil Pressure = 56.5 Psid
Oil Sump Temperature = 136.5 ~F
Oil Heater Output = On
Oil Return Solenoid = On

Variable Speed Oil Pump

Oil Pump Drive Command Frequency = 25.0 Hz
Variable Speed Oil Pump Control Mode = Auto

Proximity Probe

High Speed Thrust Bearing Proximity Different = 2 Mils

Subcooler Level

Subcooler Level Setpoint = 50 %
Subcooler Level Pulldown Time Remaining = 0 Sec
Subcooler Level = 50 %
Control Output Signal = 100 %
Subcooler Level Auto/Manual Mode = Auto

Hot Gas Bypass

Hot Gas Ratio Calculation = 100 %
Temp Setpoint = 41.0 ~F
Hot Gas Temp Calculation = 0 %
HGV Ramp = 90 %
Control Output Signal = 100 %
HGV Auto/Manual Mode = Auto
Pre-Rotation Vanes

PRV Position = 0 %
PRV Ramp = 7 %
PRV Command = 7 %
PRV Motor Switch = Open
PRV Auto/Manual Mode = Auto

Speed Control

Speed Setpoint = 0 RPM
MSSP - Speed Control Mode = Variable Speed
Turbine Speed = 4276 RPM
Control Output Signal = 100.0 %
Turbine Rotation = Open
Speed Setpoint Auto/Manual Mode = Auto

Steam Control

Inlet Temperature = 358.0 ~F
Inlet Pressure > 358.0 Psig
First Stage Pressure = 41.0 Psig
Exhaust Pressure = 1.6 Psia
Inlet Solenoid = ~F
Inlet Valve = 100 %
Bypass Solenoid = Off
Inlet Limit Switch = Closed
Slow Roll Valve = 0 %
Governor End Bearing Temperature = 170.1 ~F
Shaft End Bearing Temperature = 150.2 ~F

Turbine Vibration Sensor

Governor End Horizontal Vibration = 0.5 Mils
Governor End Vertical Vibration = 0.5 Mils
Shaft End Horizontal Vibration = 0.5 Mils
Shaft End Vertical Vibration = 0.5 Mils

Turbine Solenoids

Turbine Rotation = Open
Trip Solenoid = On
Trip Valve Limit Switch = Closed
Vacuum Solenoid = On
Inlet Limit Switch = Closed

FIGURE 58 - SAMPLE PRINTOUT (HISTORY)

Oil Cooler Solenoid	= On	Vacuum System	
Gland Solenoid	= On	-----	
Nozzle #1 Solenoid	= Off	Pump #1 Run Output	= On
Nozzle #2 Solenoid	= Off	Pump #1 Aux Contact	= Closed
Steam Ring Drain Solenoid	= Off	Pump #1 Sealing Water Solenoid	= On
Condensate Drain Tank High Level Switch	= On	Pump #1 Sealing Water Flow Switch	= Closed
		Pump #2 Run Output	= Off
Turbine Oil / Bearings		Pump #2 Aux Contact	= Open
-----		Pump #2 Sealing Water Solenoid	= Off
Oil Temperature	= 110.7 ~F	Pump #2 Sealing Water Flow Switch	= Open
Oil Pressure	= 18.0 Psig	Ejector Actuator	= Off
Governor End Bearing Temperature	= 170.1 ~F		
Shaft End Bearing Temperature	= 150.2 ~F	Flow Sensor	
Aux Oil Pump Run Output	= Off	-----	
Aux Oil Pump Contact	= Open	Evaporator Flow	= 2616 Gal/Min
Aux Oil Pump Manual Mode	= Disabled	Condenser Flow	= 4512 Gal/Min
		Steam Flow	= 14448 Lb/Hr
Hotwell Level			

HLSP1 - Hotwell Condensate Level	= 50.0 %		
Condensate Level	= 50.1 %		
Hotwell Level Control Output Signal	= 49.9 %		
Pump #1 Run Output	= On		
Pump #1 Aux Contact	= Closed		
Pump #2 Run Output	= Off		
Pump #2 Aux Contact	= Open		
Low Level Switch	= Closed		
High Level Switch	= Closed		
Hotwell Level Control Auto/Manual Mode	= Auto		

FIGURE 58 – SAMPLE PRINTOUT (HISTORY) (CONT'D)

**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

FIGURE 59 - 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

FIGURE 60 - 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

FIGURE 61 - SAMPLE PRINTOUT (CUSTOM SCREEN REPORT)

The following factors can be used to convert from English to the most common SI Metric values.

TABLE 1 - SI METRIC CONVERSION

MEASUREMENT	MULTIPLY ENGLISH UNIT	BY FACTOR	TO OBTAIN METRIC UNIT
Capacity	Tons Refrigerant Effect (ton)	3.516	Kilowatts (kW)
Power	Horsepower	0.7457	Kilowatts (kW)
Flow Rate	Gallons / Minute (gpm)	0.0631	Liters / Second (l/s)
Length	Feet (ft)	0.3048	Meters (m)
	Inches (in)	25.4	Millimeters (mm)
Weight	Pounds (lbs)	0.4538	Kilograms (kg)
Velocity	Feet / Second (fps)	0.3048	Meters / Second (m/s)
Pressure Drop	Feet of Water (ft)	2.989	Kilopascals (kPa)
	Pounds / Square Inch (psi)	6.895	Kilopascals (kPa)

TEMPERATURE

To convert degrees Fahrenheit (°F) to degrees Celsius (°C), subtract 32° and multiply by 5/9 or 0.5556.

Example: $(45.0^{\circ}\text{F} - 32^{\circ}) \times 0.5556 = 27.2^{\circ}\text{C}$

To convert a temperature range (i.e., a range of 10°F) from Fahrenheit to Celsius, multiply by 5/9 or 0.5556.

Example: $10.0^{\circ}\text{F range} \times 0.5556 = 5.6^{\circ}\text{C range}$

NOTES



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