YORK
BY JOHNSON CONTROLS

Service Information

File In/With: N/A	SI0271
	New 813

Equipment Affected: YK Chillers with OptiView Control Panel

YK CENTRIFUGAL CHILLERS - SOFTWARE ENHANCEMENTS (V.25)

GENERAL

Beginning May 2013, enhanced software will be supplied in new production YK chillers and replacement microboard kit 331-02430-601. This software is backward compatible to all previous YK chillers equipped with microboard 031-02430-000 or 031-02430-001. The enhancements are listed below.

The Panel Software version and program card part number is: C.OPT.01.25C.308 (P/N 031-02474-001)

The EPROM BIOS Software Version: C.OPT.00.04 (P/N 031-02429-002)

The following program issues and display errors have been corrected:

Low Oil Temperature Differential History Log - The Low Oil Temperature Differential Start Inhibit is excluded from the Fault History Log since it is not a shutdown fault.

Proximity Probe Calibration - The Proximity Probe Calibrationis is added to the events shown in the security log.

Condenser Pump Output at Bootup - Corrected the condition which previously closed the Condenser Pump run output momentarily upon bootup.

Heat Recovery Head Pressure Control PID Windup Issue - In previous software a windup occurred with the heat recovery and head pressure control PID control loop. This issue was fixed giving better control.

Display of ECLT on Heat Pump Screen - The Heat Pump screen now correctly displays the Return Condenser Liquid Temperature.

Incorrect Display of MVSSS KW - The largest size MVSSS starters now correctly displays the amount of displayed KW.

Incorrect MVSSS Starter Model - The Solid State Starter (SSS) Screen for the MVSSS now correctly displays:

<Max Starting Current>**K**<Max Motor Current>-<Voltage Code>

Work on this equipment should only be done by properly trained personnel who are qualified to work on this type of equipment. Failure to comply with this requirement could expose the worker, the equipment and the building and its inhabitants to the risk of injury or property damage.

The instructions on this service bulletin are written assuming the individual who will perform this work is a fully trained HVAC & R journeyman or equivalent, certified in refrigerant handling and recovery techniques, and knowledgeable with regard to electrical lock out/tag out procedures. The individual performing this work should be aware of and comply with all Johnson Controls, national, state and local safety and environmental regulations while carrying out this work. Before attempting to work on any equipment, the individual should be thoroughly familiar with the equipment by reading and understanding the associated service literature applicable to the equipment. If you do not have this literature, you may obtain it by contacting a Johnson Controls Service Office.

Should there be any question concerning any aspect of the tasks outlined in this bulletin, please consult a Johnson Controls Service Office prior to attempting the work. Please be aware that this information may be time sensitive and that Johnson Controls reserves the right to revise this information at any time. Be certain you are working with the latest information.

Product Technical Support

Leaving Chilled Liquid Shutdown Temperature

The past logic that set the Shutdown Temperature to its minimum for 10 minutes on a LCHLT Setpoint increase has been changed to a variable slope.

NAME	CALCULATION	LOWEST VALUE	HIGHEST VALUE
Shutdown Temperature	LCHLT Setpoint - Shutdown Temperature Offset, or Lowest Value, whichever is highest. (value ramped as described below)	*W: 36.0 °F *S: 34.0 °F *B: 6.0 °F	C: 69.0 °F H: 85.0 °F
W = Water Mode, Smart Freeze Disabled C = Cooling Mode	S = Water Mode, Smart Free Enabled H = Heat Pump	B = Brine Mode enabled	

On startup, the Shutdown Temperature is set to the calculated value.

On a LCHLT Setpoint decrease or Shutdown Temperature Offset increase, the Shutdown Temperature is decreased immediately.

On a LCHLT Setpoint increase or Shutdown Temperature Offset decrease, the Shutdown Temperature is increased at a rate of 0.05 °F/sec.

Leaving Condenser Liquid Shutdown Temperature

The logic that set the Shutdown Temperature to its maximum for 10 minutes on a LCLT Setpoint decrease has been changed to a variable slope.

NAME	CALCULATION	LOWEST VALUE	HIGHEST VALUE
Shutdown Temperature	LCLT Setpoint + Shutdown Temperature Offset, or Highest Displayed Value, whichever is lowest (value ramped as described below)	66.0 °F	125.0 °F

On startup the Shutdown Temperature is set to the calculated value.

On a LCLT Setpoint increase or Shutdown Temperature Offset increase, the Shutdown Temperature is increased immediately.

On a LCLT Setpoint decrease or Shutdown Temperature Offset decrease, the Shutdown Temperature is decreased at 0.05 °F/sec.

Maximum Limit for LCHLT Setpoint

The maximum limit for the local and remote LCHLT setpoint was changed from 70.0°F to 72.0°F.

Warning – DC Bus Active

A non-annunciating warning has been added to alert the user that the MVVSD, VSD or Harmonic Filter DC bus voltage is above 50 VDC posing a potential safety issue if the cabinet is opened. This warning is active when the chiller is in the Stopped State and is automatically cleared in any other state. The warning message reads “Warning – VSD – DC Bus Active” in yellow text. The Warning Relay is not activated for this warning. This warning only applies when the Motor Drive Type is VSD 50Hz, VSD 60Hz, or MVVSD. VSD 50 and 60Hz includes Vyper and Raptyr designed drives.

Stall Voltage Precision

The precision of the Stall Voltage and programmable High Limit and Low Limit has been changed from tenths to hundredths. The programmable limits have been changed as follows:

PROGRAM SETTING	SCREEN	MODE	MINIMUM	MAXIMUM	DEFAULT
High Limit	VGD Setpoints	Service Access	0.35 V	1.20 V	0.60 V
Low Limit	VGD Setpoints	Service Access	0.30 V	0.80 V	0.50 V

Auto VSD Speed Control at Wide Open Vanes

The, ACC control did not allow the VSD speed to be increased to control capacity until the PRV position was greater than or equal to 98% PRV position. Once above 98% PRV, VSD speed increases were allowed until the PRV position fell below 95%. This has been changed to allow speed increases when the PRV position is above 95% and released when the PRV position falls below 93%. This change was needed because of inconsistent PRV readings or the PRV's being out of calibration.

Subcooler Tube Failure

Liquid Level Setpoint Not Achieved Warning

An Automatic Reset Warning has been added that displays the message "Warning – Liquid Level Setpoint not Achieved". This warning is set when all of the following are true for 10 continuous minutes:

- Chiller is Running
- Run Time > 30 minutes
- Refrigerant Level > (Refrigerant Level setpoint +15%) OR Refrigerant Level < (Refrigerant Level set-point -15%)

It is released when:

- Chiller is not Running
- (Refrigerant Level setpoint -15%) < Refrigerant Level < (Refrigerant Level setpoint +15%)

When this warning occurs, it shall be added to the security log.

Refrigerant Level Control Modifications

Refrigerant level control should not be set to Disable on variable orifice chillers. To correct the misuse of the feature, operation of the outputwas changed as follows:

If the Refrigerant level control is disabled:

- Refrigerant Level Lower (open) output is de-energized
- Refrigerant Level Raise (close) output is energized

Loss of Subcooler Liquid Seal Warning

If the chiller has been running for 30 minutes or more and the Drop Leg Temperature is less than the Return Condenser Liquid Temperature continuously for two minutes, the following warning message is displayed:

"Warning - Loss of Subcooler Liquid Seal"

This warning requires a manual reset when the above conditions are no longer true. The message "Loss of Subcooler Liquid Seal Warning Reset" is added to the Security Log when the warning is reset.

Motor Controller Fault Monitoring

The software will continuously monitor the fault code registers for as long as a motor controller fault indication (115V fault signal or 'fault present' bit in the comms packet) exists. If the 'first fault' code changes, the panel displays the new code on the System Details line. If the 'first fault' type changes from Cycling to Safety, the internally

posted, generic “Motor Controller” fault is updated to Safety as well. If the ‘first fault’ type changes from Safety to Cycling, the internally posted, generic “Motor Controller” fault remains as a Safety.

In the event of a VSD fault, the panel currently polls the drive for fault codes and a status snapshot, which are logged in the fault history. Subsequently, the panel repeatedly attempts “clear fault” commands to the drive until all VSD fault indications are absent, but it does not pay any further attention to the fault codes.

This change applies to all motor controller types.

Isolation Valves for Brine Applications

An option has been added to install motorized isolation valves with limit feedback on both the discharge and the liquid lines. The outputs to both valves will be placed in parallel. The valve feedback will be placed in series. When this option is disabled, the outputs will be placed into the open position and the inputs ignored.

Isolation Valve I/O

BOARD	REFERENCE	HEADER / TERMINAL	ITEM
I/O Board	K6	J19-44 / 152, 153	Isolation Valves Open Output
I/O Board	K7	J19-43 / 154, 155	Isolation Valves Close Output
I/O Board	U11C	J19-19 / 82, 1	Isolation Valves Opened Feedback
I/O Board	U11D	J19-20 / 95, 1	Isolation Valves Closed Feedback

Isolation Valve Configuration

PROGRAM SETTING	SCREEN / BUTTON	MODE	LOW LIMIT	HIGH LIMIT	DEFAULT
Isolation Valves	Setup Screen	Service Access	Choices: Disabled Enabled		Disabled

System Screen Changes for Isolation Valves

The following have been added to the System Screen to the right of the Evaporator when the Isolation Valves are enabled.

- Text heading “Isolation Valves”
- LED with label “Closing”

  Will be illuminated when “Isolation Valves Close Output” is energized and “Isolation Valves Closed Feedback” is not energized.
- LED with label “Closed”

  Will be illuminated when “Isolation Valves Close Output” is energized and “Isolation Valves Closed Feedback” is energized.
- LED with label “Opening”

  Will be illuminated when “Isolation Valves Open Output” is energized and “Isolation Valves Opened Feedback” is not energized.
- LED with label “Opened”

  Will be illuminated when “Isolation Valves Open Output” is energized and “Isolation Valves Opened Feedback” is energized.

Isolation Valve Control

If the Isolation Valves option is enabled:

When the compressor enters prelube and while the compressor is running:

- Isolation Valves Open output is energized.
- Isolation Valves Close output is de-energized.

When the compressor is stopped, after coastdown:

- Isolation Valves Open output is de-energized.
- Isolation Valves Close output is energized.

If the Isolation Valves option is disabled:

- Isolation Valves Open output is energized.
- Isolation Valves Close output is de-energized.
- Status of the Isolation Valves Opened or Closed inputs is ignored.

Faults

"Isolation Valves - Not Closed"

This cycling fault is set when the following conditions exist for 3 continuous seconds:

- Isolation Valves Close Output is energized > 40 seconds, but Isolation Valves Closed Feedback is not energized

This cycling fault is released when Isolation Valves Closed input is energized.

"Isolation Valves - Not Opened"

This safety fault is set when the following conditions exist for 3 continuous seconds:

- Isolation Valves Open Output is energized > 40 seconds, but Isolation Valves Opened Feedback is not energized.

This safety fault is released when the Compressor is in stopped state and the Compressor switch is placed into the stop position.

History Report

When the Isolation Valve option is enabled, the state of the Isolation Valves (Closed, Opening, Opened, Closing) will appear on the Status Report under the Condenser heading.

DATA LOGGING

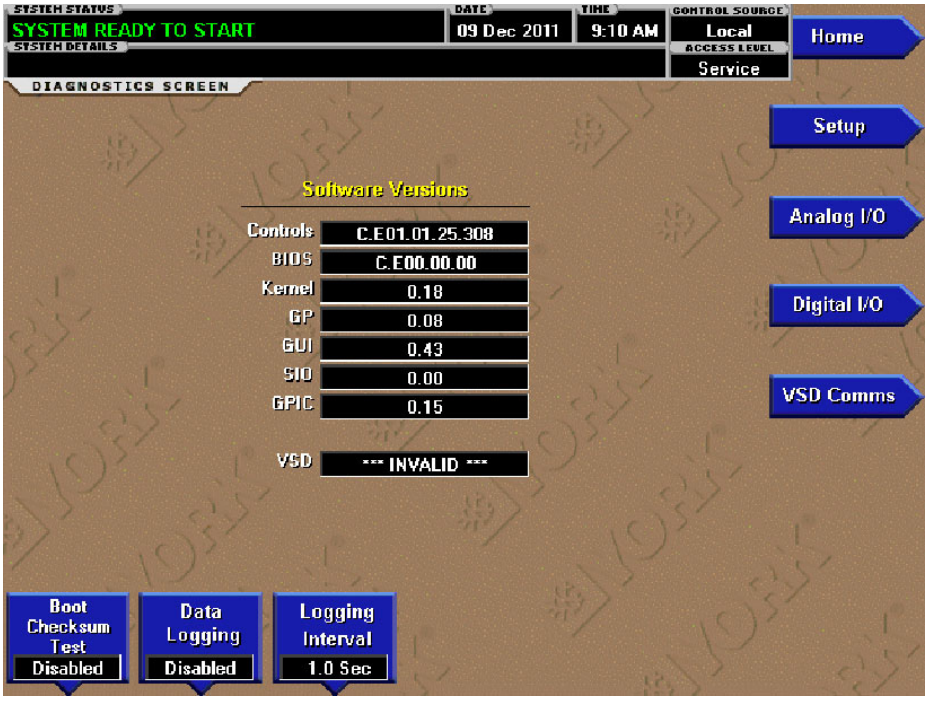

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FIGURE 1 - DIAGNOSTIC SCREEN

Data Logging Control

When Data Logging is enabled, data values are serially transmitted to the RS-232 port at an interval defined by the Data Logging Interval. The data will be comma separated with a carriage return and line feed transmitted at the end of each transmission interval. All data transmitted at each interval will be from the same snapshot in time.

Respective data shall be converted to Metric units when the Data Display Mode is set to Metric.

While Data Logging is enabled, the automatic fault data print is disabled.

Data Logging Configuration

Two buttons have been added to the Diagnostic screen to allow someone at Service Level to enable and set the time interval for logging data to a PC connected to the control panel serial port.

PROGRAM SETTING	MODE	LOW LIMIT	HIGH LIMIT	DEFAULT
Data Logging	Service Access	Choices: Disabled Enabled		Disabled
Data Logging Interval	Service Access	0.1 sec	60.0 sec	sec

The following is a list of all data values that are included in Data Logging and the heading text that shall be included as the first line of data logging when it is enabled:

TABLE 1 - DATA LOGGING

NUMBER	DATA VALUE	HEADING TEXT
CHILLER DATA		
1	Date (DD/MM/YYYY format)	Date
2	Time (24 Hour format)	Time
3	Elapsed Time (seconds since data logging started)	Elapsed Time
4	Entering Chilled Liquid Temperature	ECHLT
5	Leaving Chilled Liquid Temperature	LCHLT
6	Active LCHLT Setpoint	LCHLT Setp
7	Remote LCHLT Setpoint	LCHLT Remote Setp
8	Entering Condenser Liquid Temperature	ECLT
9	Leaving Condenser Liquid Temperature	LCLT
10	Evaporator Press	Evap Press
11	Condenser Press	Cond Press
12	Delta Pressure	Delta P
13	Delta P / P	Delta P/P
14	Motor Current %FLA	Motor Curr
15	Active Motor Current Setpoint	Motor Curr Setp
16	PRV Position	PRV Pos
17	PRV Control Mode	PRV Mode
18	HGBP Command Position	HGBP Cmd
19	HGBP Control Mode	HGBP Mode
20	Condenser Refrigerant Liquid Level	Liquid Level
21	Active Refrigerant Level Setpoint	Act Level Setp
22	Level Control State	Level Control State
23	Evaporator Small Temperature Difference	Evap Small Temp Diff
24	Evaporator Saturation Temperature	Evap Sat Temp
25	Evaporator Refrigerant Temperature	Evap Refrig Temp
26	Evaporator Flow Switch	Evap Flow Switch
27	Condenser Small Temperature Difference	Cond Small Temp Diff
28	Condenser Saturation Temperature	Cond Sat Temp
29	Condenser Drop Leg Temperature	Cond Drop Leg Temp
30	Condenser Flow Switch	Cond Flow Switch
31	Subcooling	Subcooling
32	Discharge Temperature	Discharge Temp
33	Discharge Superheat	Discharge Sheat
34	Discharge Pressure	Discharge Press
35	Stall Detector Voltage	Stall Detector Voltage
36	Stall Detector High	Stall Detector High
37	VGD Control State	VGD State
38	VGD Control Mode	VGD Mode
39	Surge Detected	Surge Detected
40	Surge Count	Surge Count
41	Motor Run	Motor Run
42	Oil Pump Pressure	Oil Pump
43	Oil Sump Pressure	Oil Sump

TABLE 1 - DATA LOGGING

NUMBER	DATA VALUE	HEADING TEXT
44	Oil Differential Pressure	Oil Diff Pressure
45	Oil Pump Command Frequency	Oil Pump Cmd Freq
46	Oil Pump Pressure Setpoint	Oil Pump Pres Setp
47	Proximity Differential	Prox Diff
48	Thrust Bearing Limit Switch	Thrust Limit Swtch
49	Stall Detector Board Output Voltage	Stall Det Volt
50	HGBP Valve Opening	HGBP Valve Open
51	HGBP Valve Closing	HGBP Valve Close
VSD DATA		
#	Data Value	Heading Text
52	ACC Delta P / P	ACC Delta P/P
53	ACC Surge Detection	ACC Surge
54	ACC Surge Frequency	ACC Surge Freq
55	ACC Surge Map Count	ACC Map Count
56	VSD Command Frequency	VSD Cmd Freq
57	VSD Output Frequency	VSD Output Freq
58	VSD Control Mode (Auto/Manual)	VSD Mode
59	VSD DC Bus Voltage (Highest of the 6 for MVVSD)	VSD DC Bus
60	VSD Output Voltage	VSD Output Volt
61	VSD Phase A Current	VSD Phase A Cur
62	VSD Phase B Current	VSD Phase B Cur
63	VSD Phase C Current	VSD Phase C Cur
64	VSD Trigger SCR On	VSD SCR On
65	VSD Converter Heatsink Temperature	VSD Conv Temp
66	VSD Phase A Heatsink Temperature	VSD Phase A Temp
67	VSD Phase B Heatsink Temperature	VSD Phase B Temp
68	VSD Phase C Heatsink Temperature	VSD Phase C Temp
69	VSD Inverter Baseplate Temperature	VSD Inv Temp
IEEE 519 DATA		
#	Data Value	Heading Text
70	Filter Running	Filter Run
71	Filter Precharge Contactor	Filter Precharge
72	Filter Supply Contactor	Filter Contactor
73	Filter DC Bus	Filter DC Bus
74	Filter Baseplate Temperature	Filter Base Temp
75	Filter L1 – L2 RMS Voltage	Filter L1-L2 Volt
76	Filter L2 – L3 RMS Voltage	Filter L2-L3 Volt
77	Filter L3 – L1 RMS Voltage	Filter L3-L1 Volt
78	Filter L1 – N Peak Voltage	Filter L1-N Volt
79	Filter L2 – N Peak Voltage	Filter L2-N Volt
80	Filter L3 – N Peak Voltage	Filter L3-N Volt
81	Filter L1 RMS Filter Current	Filter L1 Filter Cur
82	Filter L2 RMS Filter Current	Filter L2 Filter Cur
83	Filter L3 RMS Filter Current	Filter L3 Filter Cur

NUMBER	DATA VALUE	HEADING TEXT
84	Filter L1 RMS Supply Current	Filter L1 Supply Cur
85	Filter L2 RMS Supply Current	Filter L2 Supply Cur
86	Filter L3 RMS Supply Current	Filter L3 Supply Cur
87	Filter Maximum Total Demand Distortion	Filter Max Demand
SSS DATA		
#	Data Value	Heading Text
52	SSS Phase A Current	SSS Phase A Cur
53	SSS Phase B Current	SSS Phase B Cur
54	SSS Phase C Current	SSS Phase C Cur
55	SSS Phase A Voltage	SSS Phase A Volt
56	SSS Phase B Voltage	SSS Phase B Volt
57	SSS Phase C Voltage	SSS Phase C Volt
LCSSS DATA		
#	Data Value	Heading Text
52	LCSSS Phase A Current	LCSSS Phase A Cur
53	LCSSS Phase B Current	LCSSS Phase B Cur
54	LCSSS Phase C Current	LCSSS Phase C Cur
55	LCSSS Phase A Voltage	LCSSS Phase A Volt
56	LCSSS Phase B Voltage	LCSSS Phase B Volt
57	LCSSS Phase C Voltage	LCSSS Phase C Volt
58	LCSSS Phase A Temperature	LCSSS Phase A Temp
59	LCSSS Phase B Temperature	LCSSS Phase B Temp
60	LCSSS Phase C Temperature	LCSSS Phase C Temp

Seal Lubrication Timer and Warning

When Standby Lube is enabled, seal lubrication is performed by running the Oil Pump for two minutes. Seal lubrication is performed once every twenty-four hours since the Oil Pump was last run for at least two minutes. It was found that the twenty-four hour time period could drift by several hours. This was corrected. Also, the “Warning – Seal Lubrication In Progress” was changed to be a non-annunciating warning.

Remote Analog Hot Water Setpoint

The Hot Water Setpoint on the Heat Recovery screen did not control the remote analog signal when in Remote Source at View Access level. The setpoint worked properly in Service mode. This has been corrected to work properly in all access modes.

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