The Controller

January

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"Advanced technological solutions at an affordable cost."

LOGIC Technologies, Inc.

Inside this issue:

Ideas for articles of interest?
Please submit articles or requests to:
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HOW TO SWITCH YOUR SWING COMPRESSOR

This article will guide you through the steps to switch your swing compressor whether it be from a low side to high side swing or vice versa.

Please note that you will need to change the valving in the refrigeration piping before you continue with this procedure. Also, if the discharge of the compressor is valved to a different line, you will need to edit the High Discharge Value and the Discharge Start Inhibit settings for the compressor. To do so, skip to step 14 before proceeding.

Step 1 : Select F1 – 〈P〉rocess Displays.

Step 2 : Select F4 – 〈V〉iew Current Compressor Information.

Step 3 : Select Stage 〈I〉nfo.

Step 4 : Select 〈R〉esequence Compressors.

Step 5 : Select the record you wish to change with your mouse. STD is the default record.

Step 6 : Select the number three – Change Compressor Staging Sequence.

Step 7 : Select the compressor # (the number of the swing compressor you are working on) system ID.

Step 8 : With your mouse, select the vessel ID you wish to assign the swing compressor to.

Step 9 : Select the Mode (The level of sequence that the compressor will start 1st, 2nd etc.) using your keyboard and press enter.

Step 10 : Press 〈Esc〉ape. (Continued)

Training Information and Schedule

Training Enrollment

LOGIC Technologies, Inc. conducts in-depth training sessions at our facility on a monthly basis. Two free sessions are included with each system purchased. Additional training sessions are available for a nominal fee. Operator training sessions are $450 per person and advanced training sessions are $750 per person. We provide lunch for each class day; however, all other travel expenses are your responsibility.

Operator-Level Sessions

This class session provides in-depth coverage of the use of our system to maintain the daily operations of a refrigerated facility. The class is conducted by Gordon Simpson or one of our senior engineers who have many years of experience designing refrigeration control systems. In effect, the classes are taught in layman's terms by someone who fully understands the issues faced by refrigeration operators.

January 16-18
February 13-15
March 13-15
April 10-12
June 12-14
July 10-12
September 11-13
October 16-18
December 11-13

Advanced SST Sessions

This class session provides in-depth coverage of the screen and report development tools. Also, briefly covering the script language used to develop control algorithms. These classes are conducted by senior members of our engineering staff. Prior technical expertise is a pre-requisite for this course.

May 15-17
August 14-16
November 13-15

*Seating is limited, make your reservations early by contacting

Kim Smith

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Step 11 : Select the number five. Activate the current selection at this time.

Step 12 : Stop all Inactive and Standby Compressors (Y/N): See Below.

Yes - This option will stop any compressors you have reassigned as inactive or standby.

No - This option will NOT stop any compressors you have reassigned as inactive or standby. Instead, the compressors, if running, will continue to run.

Step 13 : This will take you to the <V>iew Current Compressor Information screen. Here you should see the swing compressor with the new vessel ID assigned to it. At this point your system should pick up and go with the new swing compressor assignment.

*The following are the steps to change the High Discharge Value and the Discharge Start Inhibit settings for the compressor.

Step 14 : From the main menu select F5 - <S>ystem Displays.

Step 15 : Select F4 - <P>rocess Master File Editors.

Step 16 : Select F7 - <C>ompressor Control Information.

Step 17 : With the keyboard, select the compressor to edit.

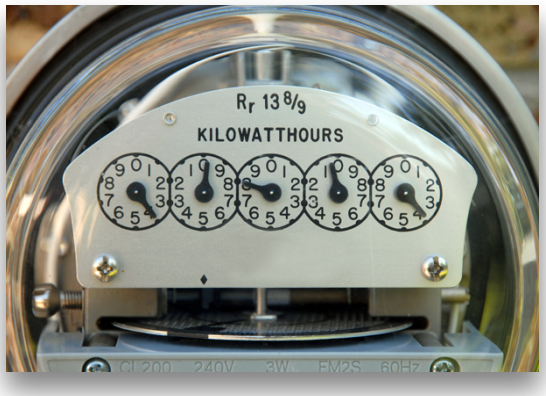
Step 18 : Select <C>hange Information and hit enter until you reach the entries for High Disch Val; SysAnalog and the Disch. Start Inhibit.

Step 19 : Enter the data required for the newly adjusted swing compressor.

Step 20 : <Esc>ape back to the Main Menu.

TRUE ENERGY MANAGEMENT CONTROL

As you know, energy costs associated with a refrigerated facility can be astronomical. A properly implemented automation system can dramatically reduce these costs; however, you need to make sure the system being provided can deliver more than empty promises. Our refrigeration control system provides the most comprehensive set of energy management features available in the industry. (Continued)



When these features are properly implemented and maintained, variable energy cost saving results are achieved immediately. Listed below are a few of the many energy management features provided by the system. Certain features listed require additional equipment for implementation.

Standard Features:

-Overall Consumption-Based Coherent Control Algorithms: Our primary development goal is to achieve and maintain a system's set-points using the least amount of power equipment possible…

-Proportional VFD Compressor & Fan Control: The initial costs of VFD units can be quickly recovered through our proportional control schemes…

-Temperature Setback Scheduling: Time of day / day of week set-point schedules can be used to reduce overall KW consumption during peak power charge periods…

-Unlimited Engine Room Schedule Configurations: (Seasonal, product load, KW reduction, etc…) Unlimited engine room schedules to configure lead-lag compressor start sequences to suit your facility's needs…

-Comprehensive Defrost Scheduling & Full Blast Run-Time Interval (BRTI) Support. Energy-efficient operations cannot be accomplished with blocked evaporator coils…

-Shed Load by Demand Power Features: System scheduling capabilities can quickly be configured to minimize power consumption during peak charge per KWH times…

-Floating Head & Suction Pressure Control Schemes: Controlled variance of system pressures based on ambient or operational conditions dramatically reduce power consumption…

-PID-Based Liquid Level Control

Proportional vessel level control can eliminate pressure fluctuations resulting in unnecessary compressor start / stop operations…

-System Energy Consumption Monitor Capability Real-time and historical analysis tools viewed locally or from a remote site assist you in maintaining energy efficient operations…

-Detailed Energy Consumption Reports: Detailed reports are always available for analysis along with full report development tools for customization…

BEST PRACTICES FOR INSTALLING VFD'S

The use of variable frequency drives (VFD's) to control the speed of an AC induction motor has many benefits-including: energy savings, higher reliability, reduced wear and tear, tighter motor speed control, etc.

VFD's have also changed significantly over the years from a technology standpoint. VFD's, when operating, generate heat and the voltage output waveform is not a perfect sine wave which can present some challenges.

However, following some best practices upon installation can help to insure a successful VFD operation. Most VFD's fail because of improper installation techniques, not because of a poor quality product!

Here's a list of best practices to help insure a successful VFD install!

Install Input Line Reactors-VFD's generate electrical noise and harmonics which can be sent back up the incoming line and cause problems for other electronic equipment.

Install an Output Filter for long motor lead lengths over 100 Feet-The inverter section of a VFD creates a series of voltage pulses created from the DC bus. The pulses travel down the motor cables to the motor. These pulses are then reflected back to the VFD. If the reflected voltage pulse is combined with another subsequent pulse, peak voltages can be at a destructive level to the VFD and the motor. (Continued)

Use/Install VFD Shielded Cable from the VFD to the motor–Many installations still use THHN wire pulled through conduit. This type of wire is not recommended. THHN wire has a high capacitance which leads to high cable charging current–which reduces the useable current at the motor. The impedance mismatch of THHN wire to the motor impedance amplifies the reflected wave phenomena leading to overvoltage spikes in the cable. VFD shielded cable addresses this issue. The cable is more rugged, it has an XLPE insulation which protects better against Corona discharge and has foil or braided shields that effectively shield against high and low noise frequencies. The cable also needs to be effectively shielded at both the motor and VFD end to mitigate noise.

Always Earth Ground the Motor and VFD–since VFD's generate noise it's a good practice to ground the motor and VFD together at a common point but separate from any other equipment. Also the grounding conductor should not be run close to any type of communication/signal wires.

Verify/Check Normal Operating Temperature of the VFD–**All VFD'S generate heat** and have a normal operating temperature. All VFD's need adequate air flow and cooling. Most manufacturer's publish this data in the user manual. Sometimes a heat rise calculation needs to be done in order to determine if additional cooling is required. (Ventilation fans, ac units, vortex coolers). Excessive heat will cause the VFD to fail prematurely.Environmental issues also need to be taken into consideration.(elevation, dust, dirt, humidity, vibration)

Verify/Specify Inverter Duty Rated Motors–If this is a new installation, specify inverter duty–rated motors–which are designed to be used with VFD's. Older standard motors can be used with VFD's as long as they are matched properly. Inverter duty–rated motors typically offer better performance.

Install Protective Devices ahead of the VFD–It's a good practice to install MCP's (motor circuit protectors) or high speed fuses (High Speed Class J)in front of the VFD. In case of a short circuit at the motor–these devices will protect the electronics of the VFD and also meet the NEC requirements for branch circuit protection.

Annually do a "Health Check" on your VFD's–Annually it's a great idea to check on your installation. Check the cooling fan on the drive and clean if dirty. Check all wires and motor terminations to make sure they are tight. Check the VFD shielded cable for nicks or wear.

Please note these recommendations are good "rule of thumb" approaches. Following the VFD manufacturer's instillation recommendation will help to prevent premature failures. Also, partnering with your local VFD supplier is good practice. They can provide training, troubleshooting and engineering expertise to help you have a successful installation. Any additional information can be found at:
http://www.driveflex.com/about–vfds/faq/

https://www.controleng.com/single–article/vfd–efficiency–three–best–practices/b4e5f456f260fbd35bc49503390d27ce.html

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