

What's New

ALCO Names Yorkland Controls a Stocking Distributor

Although the focus of Yorkland will be in the promotion and application of electronic refrigeration devices, Alco's complete line is in stock at our locations.

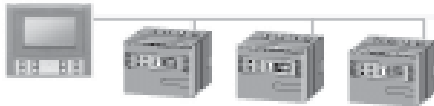
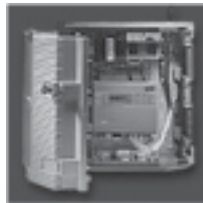


Product info on www.yorkland.net:

- Honeywell Flame Net
- Alco's Stepper Valve Diagnostic Tool
- C75 UEI's New Powerful Handheld Analyzer
- Honeywell EXCEL Web Server - Building Manager

Johnson Controls

Did you know that multiple Dx9100 Generic Controls can be viewed from one common LCD Display? One display provides Facility Management functions such as Scheduling, Trending, Alarming and Equipment set point adjustments and overrides. Custom Graphics can also be created.



CPC Introduces the E2 for Supermarkets and Convenience stores

The leader in supermarket controls for more than 20 years CPC has raised the bar once again. The Einstein E2 for both supermarkets and convenience stores brings an entirely new level of flexibility and efficiency to customers that seek a reliable, easy to use controller that provides a platform for future expansion. E2 is the fastest, most powerful controller ever developed by CPC with dramatically improved processing speeds and enhanced communications. E2 boasts a diverse array of control applications and algorithms, onboard Ethernet communications and a big boost in onboard memory, all of which combine to make E2 the most powerful controller available today. The E2 CX replaces existing electromechanical controls in both new and existing convenience stores.



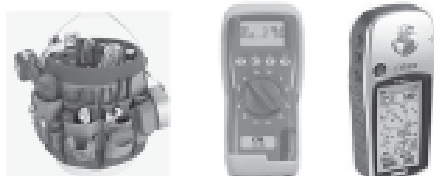
McDonnell Miller Promotion

McDonnell Miller has introduced new flow controls. Check out our site www.yorkland.net for additional details including our seasonal promotion.



Bucket Boss Promotion Continues

Every purchase of Johnson Control products qualifies for monthly mini-prizes and for our grand prizes including an ETrex GPS and Sony PDA. Stop by any of our locations and complete a draw form.



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P470 - Condenser Head Pressure Control & High Pressure*

Electronic Refrigeration Products Come of Age

The introduction of generic refrigeration controllers, interfaces, and a wider selection of valves means that these devices can now be applied to relatively less complex refrigeration systems.

Until recently, the use of electronic refrigeration controls had been limited to higher-end mechanical and process cooling applications. The initial higher cost of utilizing these devices was justified in these applications since the benefits outweighed the cost.

Electronic stepper valves (see sidebar), sensors and controllers for the operation of multi-evaporator, multi-compressor systems are commonly used in supermarkets. Customers and contractors can quickly commission the system, become aware of problems before they become catastrophic, and diagnose the system's parameters with minimal disruption. Equipment runs more efficiently and accurately. Energy use can be monitored, profiled and communicated.

The benefits can be applied to simpler systems due to the lower device cost, and more recently, because of the availability of generic interfaces. The interface drivers allow the electronic regulators (stepper valves) to be controlled by standard control signals from a wide range of controller manufacturers. The entire benefits of the stepper valve could then be realized.



EXD-U00
Alco Generic Modules

Refrigeration control manufacturers (mainly the Rack control manufacturers) designed their controls around the stepper valves. Since not all stepper valves are designed the same - the result is that each stepper valve can only be controlled by that control manufacturer's pulsed signal and unique control algorithm - limiting not only valve choice but applications in which the valve could be applied to.

The generic drivers take a standard control signal 0-10 vdc or 4 to 20 ma and converts it to a stepper signal. Customers now have a choice in which manufacturer's controller to use.

For example, an air handler controlled by DDC can have its control modified to control a stepper valve in a hot gas bypass application - provided there is extra capacity in the control for analog sensors and outputs. The valve would modulate capacity and also act as a solenoid valve by shutting the bypass down during the pump down cycle... (see Figure 1)

Figure 2 shows how an air handler can also control capacity by means of evaporative control. The stepper valve piped in the suction line modulates based on the discharge air temperature.

The stepper valve in many applications can act as both the modulating valve and "solenoid" valve - removing the need for a dedicated solenoid valves.

Refrigeration systems utilizing the drivers and generic controls can operate more efficiently and are easier to integrate to existing or future building management systems. One common monitoring system for both the HVAC and refrigeration facility makes it easier for operators and contractors to see the interrelationship of these systems- providing the opportunity for energy savings and increased operating efficiency.

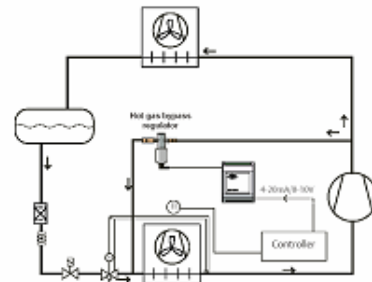


Figure 1

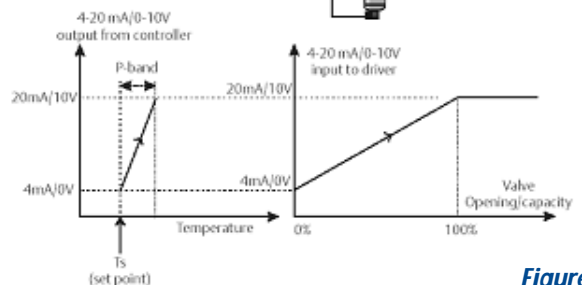
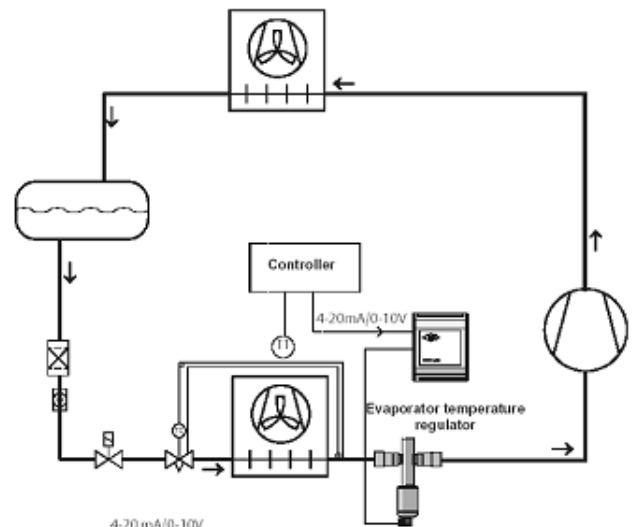


Figure 2

Electronic Refrigeration Products come of age, cont'd.

An example of how information from the HVAC system can be used to save energy is to look at how defrost cycle is initiated. Most defrost cycles are initiated and terminated by time using electric heating elements— whether defrost is actually needed or not. By integrating the initiation of defrost with the HVAC system, outdoor air and internal humidity can be measured with the initiation of defrost “optimized”- starting and ending the defrost cycle only when needed.

Applying refrigeration controls and stepper valves to existing and new applications has a potential to save customers money in two major areas: increased system performance and decreased energy use. With information from these systems, the contractor’s time is better spent analyzing and recommending system improvements, rather than reacting to system problems or failures. The result – contractors can offer their customers higher value-added services.

Stepper Valves*

While stepper valves are relatively new to the refrigeration industry, they’ve actually been around for a number of years. There’s nothing complicated or mysterious about them. The stepper motor that drives the valve is like any other electric motor and should be thought of as such. It works, acts, and behaves like an electric motor, it operates with a square wave instead of a sine wave like a standard AC motor. You’re probably very familiar working with AC and DC electric motors, so a stepper motor shouldn’t present any real difficulties once you’re familiar with the correct service techniques.

As far as the refrigeration system is concerned there’s no difference between a stepper valve and a conventional valve. Stepper expansion valves perform the same way as a thermo expansion valve, controlling the evaporator superheat by regulating the flow in the evaporator coil.

A stepper regulator works the same way as a conventional regulator by opening and closing to control the evaporator pressure which in turn controls the evaporator temperature.

There are two types of motors used on these valves — unipolar and bipolar. The names refer to the direction of the current flow through the motor windings.

A simple unipolar motor with a simple drive circuit is shown in **Figure 1**. As the transistors Q1, Q2, Q3, and Q4 are turned on in pairs, the current flows from +V through the motor winding, through the transistor that’s on to ground, completing the current path. The transistors are turned on in the following four-step sequence Q2Q4, Q1Q4, Q1Q3, and Q2Q3. This sequence is repeated until the desired valve

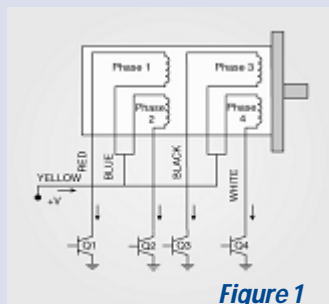


Figure 1

position is reached. To reverse the direction of the valve, the sequence is reversed. As you can see from the diagram, the current can only flow through the motor windings in one direction. Therefore, the magnetic field caused by the current flow creates only one magnetic pole, hence the name unipolar.

A bipolar motor with a simple control-bridge circuit is shown in **Figure 2**. With the bipolar motor the current can flow in either direction through the windings. Current is reversed by turning on transistors Q1 through Q8. The sequence is in four-steps: Q1Q4 and Q6Q7, Q2Q3 and Q6Q7, Q2Q3 and Q5Q8, and then Q1Q3 and Q5Q8.

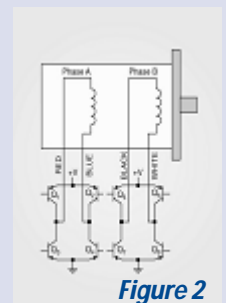


Figure 2

With the current flowing in either direction through the same winding, a magnetic field in either direction will be generated, hence the name bipolar.

The easiest way to identify which type of stepper valve is in the system is to count the number of terminals on it. A unipolar stepper motor valve will have five terminals and a bipolar stepper valve will only have four leads.



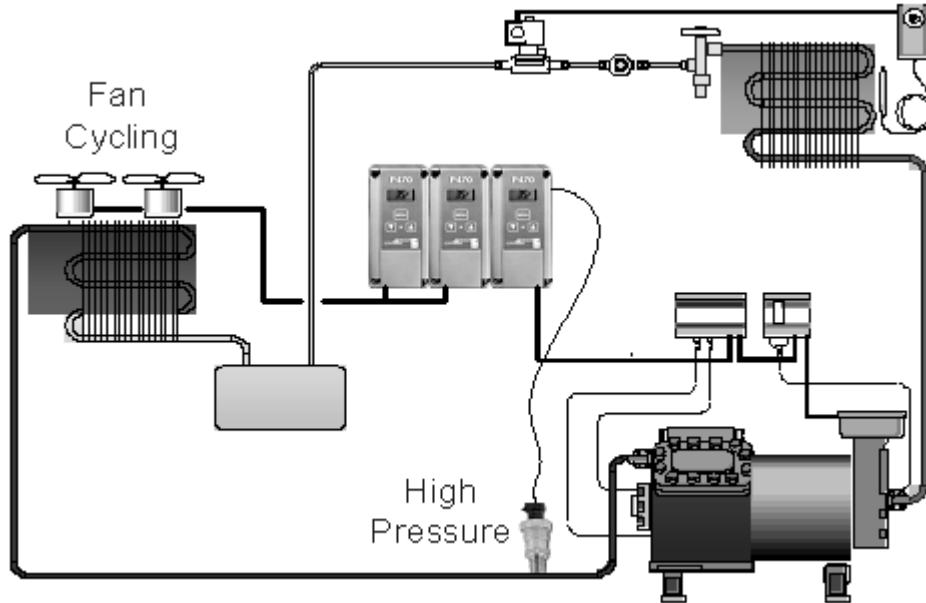
Typical stepper valve

* Alco Engineering Team

Application Note

P470 - Condenser Head Pressure Control and High Pressure

JOHNSON
CONTROLS



Advantages:

- Single Point pressure sensing removes need for extra controls
- 24 VAC & 120/240 VAC Models available
- Removes Capillaries
- Accurate control
- Reduced installation time
- Displays all Pressures
- Four P470 controls can utilize same sensor
- Reduced Diagnostic Time
- Anti-Short cycling delay built in to reduce nuisance lockouts and extend compressor life
- Field selectable ranges up to 750 pounds
- Lockable front key pad
- Controls can be mounted up to 100 feet away from sensor

Bill of Material – List Price per unit

- P470 Control \$ 159.50
- P399 Sensor \$ 200.00

** All Taxes Extra*

For more information on this and other applications contact us at:

Toronto : 416.661.3306
Mississauga: 905.624.3301

Or complete the following and fax to :
416.661.3320:

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