Yorkland Controls
ENVIRONMENTAL SOLUTIONS

WINTER 2003

Controls Connection

What's New

New Training Session Dates

Our 2003 Training schedule has been announced. To register on line, visit us at **www.yorkland.net.**

CPC COMPUTER PROCESS CONTROLS

Computer Process Controls (CPC) – an Emerson Electric division – has appointed Yorkland Controls a stocking distributor. CPC is a leader in supermarket and industrial refrigeration control systems. With recent new products targeting convenience stores, CPC products are positioned to deliver complete refrigeration and building automation solutions.

Honeywell Control Contractor Program

Honeywell has introduced a contractor program featuring new OPEN Protocol products. The program allows contractors to receive marketing and product support from Honeywell and Yorkland.

Low cost DDC and building automation products for LIGHT COMMERCIAL BUILDING SYSTEMS (LCBS) are included in the program. For further information contact Yorkland.

Johnson Hotel System

A new low economical control system – tailor made for the hotel industry has been announced. The system features standalone (in room) control capabilities such as Occupancy sensing, door switches and remote and wireless control. Call us to get further product information.

Johnson Metasys Support

JOHNSON CONTROLS AUTHORIZED BUILDING CONTROLS SPECIALIST

Yorkland Controls continues to provide Metasys support as an Authorized Building Controls Specialist for Johnson Controls. Via Yorkland Controls, Johnson will be announcing new contractor training, installation and marketing programs…stay tuned.

Honeywell Pneumatics

With the addition of the Honeywell pneumatics product line, Yorkland can now increase our pneumatic service levels - for all customers - for all the major pneumatic manufacturers.

Fireye's Integrated Scanner and Amplifier

The Fireye Simplicity **65UV5-1000 scanner and amplifier** does not require and external amplifier, control panel or cabling which reduces installation time in single burner applications. Flame On-Off and safety functions are preformed in the scanner !

For further information, contact Paul Tervit at ptervit@yorkland.net

In this Issue

Optimizing Chiller Plant Performance

Background

In most commercial facilities, the chiller plant represents a significant percentage of the total building electrical consumption. Although maximizing the efficiency of the chiller plant is a very important part of managing the facility's mechanical system, many building operators are unable to maximum system efficiency. Very few systems have the capability to provide the necessary data to operators so that operators may verify the success of efficiency improvement measures.

Key factors that made chiller optimization difficult:

1. Accurate chiller system assessments must account not only for the chiller operation, but also must look at the impact on the ***cooling lower, condenser water pumps and chilled water pumps.*** (see figure 1)

2. Very few buildings have accurate system curve data to provide a guide for optimizing performance. The chiller manufacturers provide data on the chillers, the pump manufacturers provide data on the pumps and the tower manufacturers provide data on the towers, but there is rarely actual performance data which reflects the interaction of all components.

To accurately assess the effects of changes made to plant operation, the total kW for all of the components must be measured and summed. Typically this was is expensive and often requires shutdown and rewiring of the chiller plant

Low Cost KW sensors and Direct Digital Controls make Chiller Optimization a reality.

The use of installed automation controls and new sensing technologies provide an opportunity for **payback of all installation costs within a year or less** for most building owners.

Measurement of a few simple variables combined with state-of-the-art power sensing products permits the building owner to implement a very successful program of chiller optimization in a relatively short time. Ongoing monitoring using graphics-based operator interfaces allows the operator to precisely determine the impact of changes in a timely and efficient manner.

The total kW for the system is calculated by summing the values determined above:

KW(total) =
kW(chiller) + kW(pumps) +
kW(tower)

Using this input data to measure power, the building operator can adjust the temperature differential on the condenser and chilled water loops while measuring the kW consumed by the total chiller plant (chiller, pumps and towers). By measuring the volume of water (GPM) flowing in the system and the differential temperature (DT) of the chilled water supply, the user can calculate the efficiency of the system using the formula:

Efficiency =
KW(total)/[(GPM *DT)/24]

Generic Controllers such as the **Honeywell XL15C** and **Johnson Controls DX9100** have built in calculation modules that are used to display calculations such as the above efficiency formula. An LCD display may be used to show the operator the real-time efficiency as well as past performance (trending). For stand alone (no Building Automation System) chiller applications, the use of these LCD displays reduces the need for a full functioning graphical software.

Johnson and Honeywell Generic Controllers are shown below.

Johnson DX1900

Honeywell XL 15C

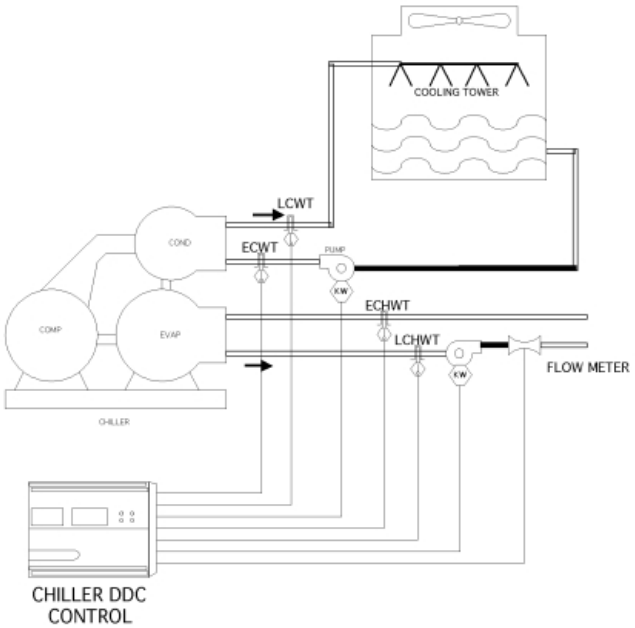


Figure 1

Implementation:

Successful implementation requires the following:

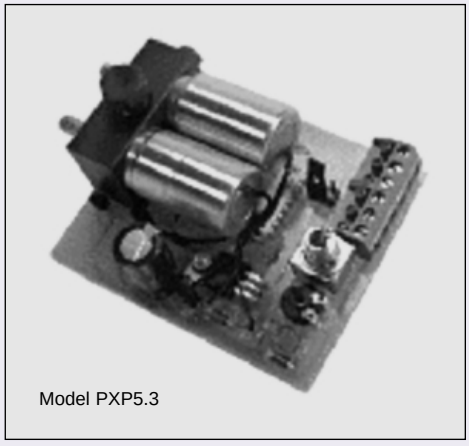
1. DDC Controller with analog inputs;
2. Graphical user interface for plotting and trending multiple variables;
3. Entering and leaving condenser water temp (ECWT & LCWT) sensor(s) to measure the water temperature entering and leaving the condenser;
4. Entering and leaving chilled water temp (EChWT & LChWT) sensor(s) to measure the entering and leaving chilled water temperatures at the evaporator;
5. Chilled water flow (in GPM) to calculate the tons of cooling;
6. Veris **single phase** power sensors(see sidebar note) for the chiller, pump(s) and tower electrical supply leads

Installation instructions – KW Sensors:

1. Turn off power to the motor(s)
2. Mount the KT so that the conductor wire to the load is approximately centered in the KT
3. Verify that the KT is oriented properly (i.e., the arrows on the label point in the direction of the load
4. Connect the voltage leads from the KT to the voltage source corresponding to the phase being sensed (Line to line for three phase loads). Observe all electrical codes.
5. Connect the output leads to the analog input to the automation panel
6. Start the motor and verify that the power sensed by the KT is correct (within the expected range) by using a hand-held ammeter and voltmeter

Electric to Pneumatic Transducers

Retrofitting existing pneumatic systems with generic DDC controls can be economically implemented with Electric to Pneumatic (EP) transducers. These devices convert the DDC signal (either 0-10vdc or 4 – 20ma) to a pneumatic signal which allow for existing valves and damper actuators to be used with the new control signals. The ACT model PXP shown features selectable control inputs, manual override of the pneumatic device and control signal feedback.



Model PXP5.3

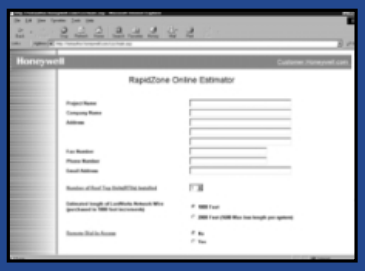
Single phase power sensor theory of operation:

Mechanical loads such as chillers, pumps and cooling towers are balanced loads, which means that the power drawn by each of the three phases is equal. Installation costs are lowered by measuring the power on a single phase of the load and using software to determine the total power load. The sensor uses a split core, high accuracy current sensor combined with an integral voltage sensor and the associated circuitry to produce an analog output (4-20 mA) proportional to the power (kW) being sensed. The approach is superior to calculated methods using current sensors because the kW transducer captures power factor and voltage, providing a much higher level of accuracy than calculated values.

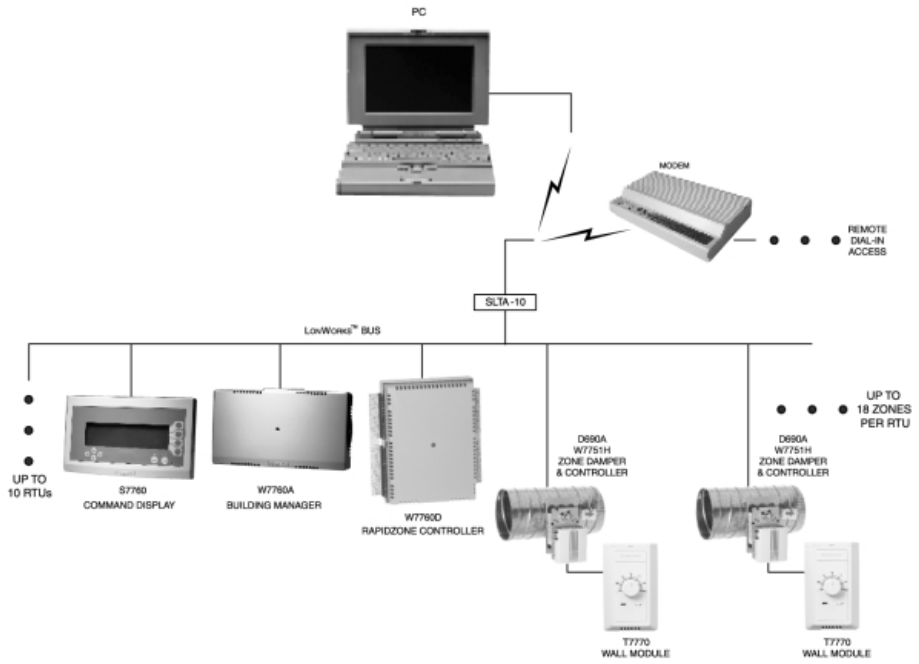
The **VERIS 6200, 6300** and **6400** kilowatt transducers (KT's) represent the perfect solution to monitoring power on balanced loads such as motors. These transducers offer an excellent alternative to current sensors which do not capture power factor and thus can provide significant errors when used to calculate motor loads. The KT's are available in 3 sizes (300 A, 800A and 2400 A) with respective openings of 1.25", 2.50" and 2.50" x 7.75". Standard outputs are for pulse (kWH) and analog (kW). The KT's provide for easy installation directly in the motor control center or other electrical panel.

RapidZone Commercial Zoning System

Honeywell's RapidZone Commercial Zoning System features easy, on-line estimating and more.



Head for the profit zone—fast!
Visit : www.yorkland.net



Features

- Room-by-room control of temperatures for up to 18 zones and fresh air control for the system (Lockout temps, plus economizer, modulated zone, and zone reheat control)
- Quick, on-line estimating tool: customer.honeywell.com/ Rapidzone
- Remote dial-up alarming and diagnostics
- Computer-generated wiring diagram
- Self-guided configuration software
- 8 time-of-day schedules, holidays, daylight savings
- CO2-based ventilation
- Command Display Panel user interface

RapidZone Commercial Zoning System

On-Line Estimating Tool

This convenient, Web-based selection tool guides you through every step of estimating and component selection. Produces an accurate component checklist—complete with line-item pricing for all components—in minutes.

Configuration Software

No need for programming skills with RapidZone's configuration software. Just click on each component listed and assign a zone.Choose the pre-selected setpoints and schedules, or easily customize.

Remote Diagnostics and Alarms

Use RapidZone's Command Display or a PC with modem and Honeywell's Serial LONTALK Adapter for convenient off-site system access.

Save time on service calls.

RapidZone automatically establishes the following alarms and logs:

- Bypass (occupancy override) log
- Discharge and outside air temperatures
- Run-time logs for fan and all staged heat/cool outputs
- CO2 levels
- Duct pressure and bypass damper
- Heat/cool/fan fail

Wiring Diagram

RapidZone produces its own wirings chematic customized for each job. The automatically-generated diagram can save hours of wiring time at installation, and ensures easier trouble shooting and service calls. It's excellent customer documentation, too.

Honeywell

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