SUPERSEDES:
Nothing

FORM 50.40-OV17.0 (389)

AUXILIARY HOT WATER LOOP

INTRODUCTION

One of the more important Preventive Maintenance checks to be performed on R-11 Centrifugal chillers is leak detection. Because the refrigerant, R-11, is in a vacuum at temperatures below 74.53°F, non-condensables can enter the refrigerant system through leak points if the compressor is operating, or if it's in a non-operational state.

Leaks in an R-11 system are not uncommon. They occur because of vibration from operation and misalignment, gasket deterioration, the improper tightening of fittings, seal damaged as well as other reasons. When leaks do occur, moisture-laden air can enter the system reducing efficiency and, consequently, leading to premature failure.

Because of the very nature of R-11 systems and their environment, leaks are a reality. And because leaks are a reality, leak detection is the primary method to control the situation.

Traditionally, there have been two leak detection methods used in the industry; pressurization with hot water from an external source and pressurization through nitrogen. Pressurization through hot water requires a convenient hot water source. Hot water is diverted through the chiller evaporator water system until a positive pressure is attained. Pressurization through nitrogen requires that a cylinder of nitrogen be used to charge the refrigerant system to a positive pressure. After the leak checking procedure is complete, the nitrogen has to be evacuated from the system, many times with sizable quantities of the R-11 refrigerant, a member of the fluror-carbon family.

The entire process of pressurization, leak checking and returning the system to normal can take from one to two days. And because leak checking on R-11 systems must be done at least once each year, the total cost of keeping up with leak detection and repair can be costly.

A NEW TWIST TO AN OLD METHOD

A simplified method of pressurizing a system for leak detection has been developed by York. In essence, a water loop is constructed between the chilled water inlet and outlet pipes of the evaporator with a circulator pump and a quick recovery resistance water heater. Through a simplified control system, the water heating loop can be manually activated to raise pressure in the evaporator +5 PSIG. At this point, the system can be easily tested for leaks.

What used to be a time consuming and disruptive task can now be as easy as pressing a button.

Z011789RGK-5

INSTALLATION

Installation is easy. There is no need to disturb shell internals or external shell insulation. Controls are conveniently mounted on or near the chiller control panel. Specific components are included in a kit which can be ordered directly from York, PA. Common component can be obtained locally.

AN ADDED BONUS

In many situations, R-11 systems can be idled for various time periods due to seasonal shutdowns or because of planned redundancy. During these non-operational time periods, non-condensables entering the system are still a threat because system temperatures can be low enough for the R-11 refrigerant to be in a vacuum.

The auxiliary hot water loop can be of help here, as well. Through a simple electronic controller, the loop can be activated anytime the system is non-operational. The system temperature can be raised to generate a slight positive pressure and eliminate the problem of non-condensables entering the system during a shutdown period. This control can be ordered from York.

When the chiller system is started again, the auxiliary hot water loop will be automatically de-energized.

A PERFECT ENHANCEMENT

The auxiliary hot water loop is a perfect enhancement for a CodePak customer. For that matter, it can be retrofitted to any R-11 Centrifugal system; any make or any model.

This is a perfect enhancement because it simplifies an essential task of leak checking an R-11 system; a key element in Preventive Maintenance.

Also, a perfect enhancement because it adds protection to an R-11 system during off season shutdowns.

SATISFIES CUSTOMER OBJECTIVES

The auxiliary hot water loop contributes to all major customer objectives:

- Minimizes downtime,
- Reduce operating costs,
- Extends equipment life,
- Generates peace of mind.

SATISFIES SERVICE DISTRICT OBJECTIVES

This is a win-win enhancement for those districts with total service agreements

- Reduces cost of leak detection,
- Makes frequent leak check maintenance possible,
- Protects the system during non-operational periods.

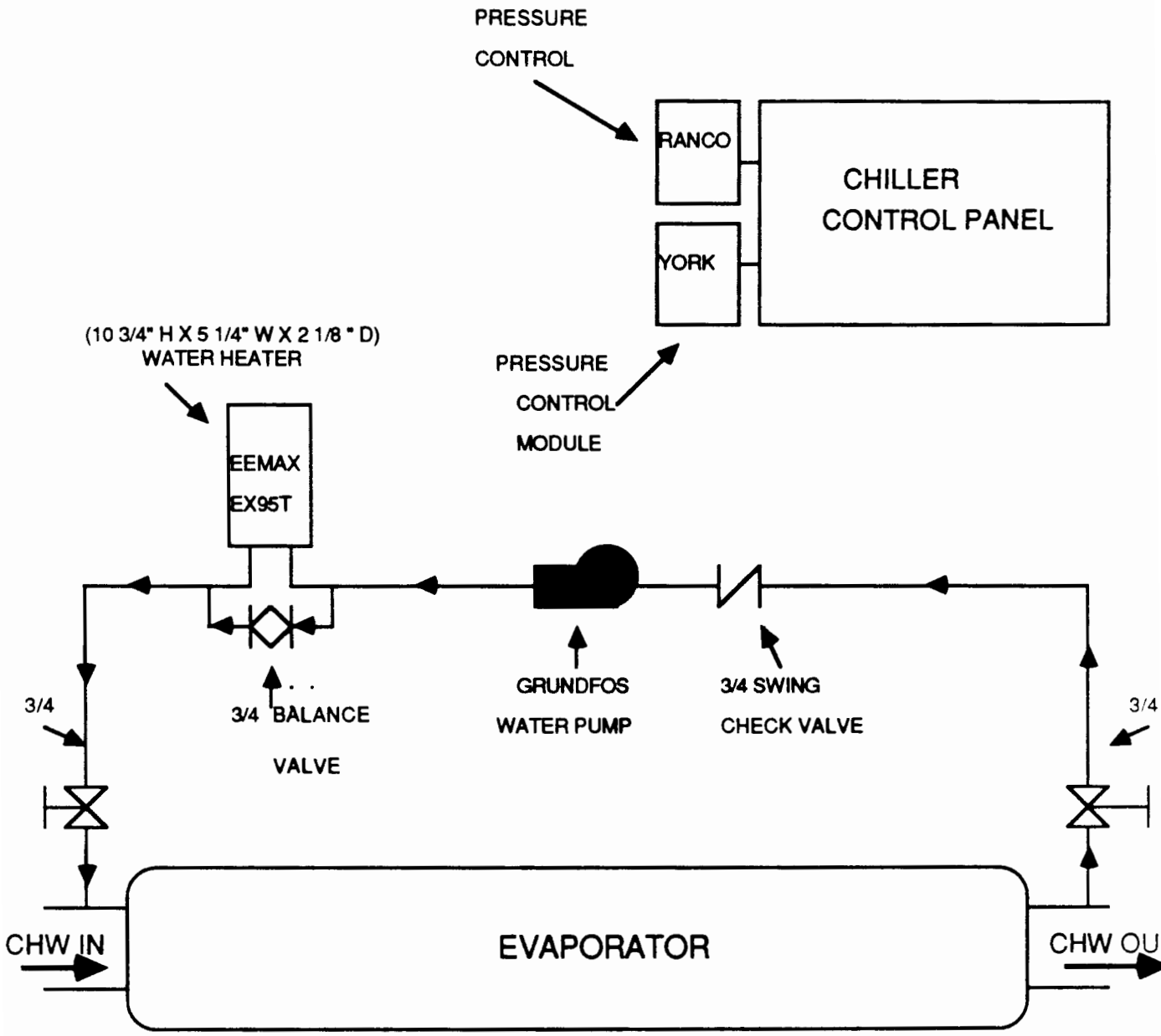
SYSTEM AND COMPONENTS DIAGRAM

A diagram of the auxiliary hot water loop and its essential components follows. A wiring diagram for reference is also included.

EXHIBIT A

AUXILIARY HOT WATER LOOP

SYSTEM AND COMPONENT DIAGRAM



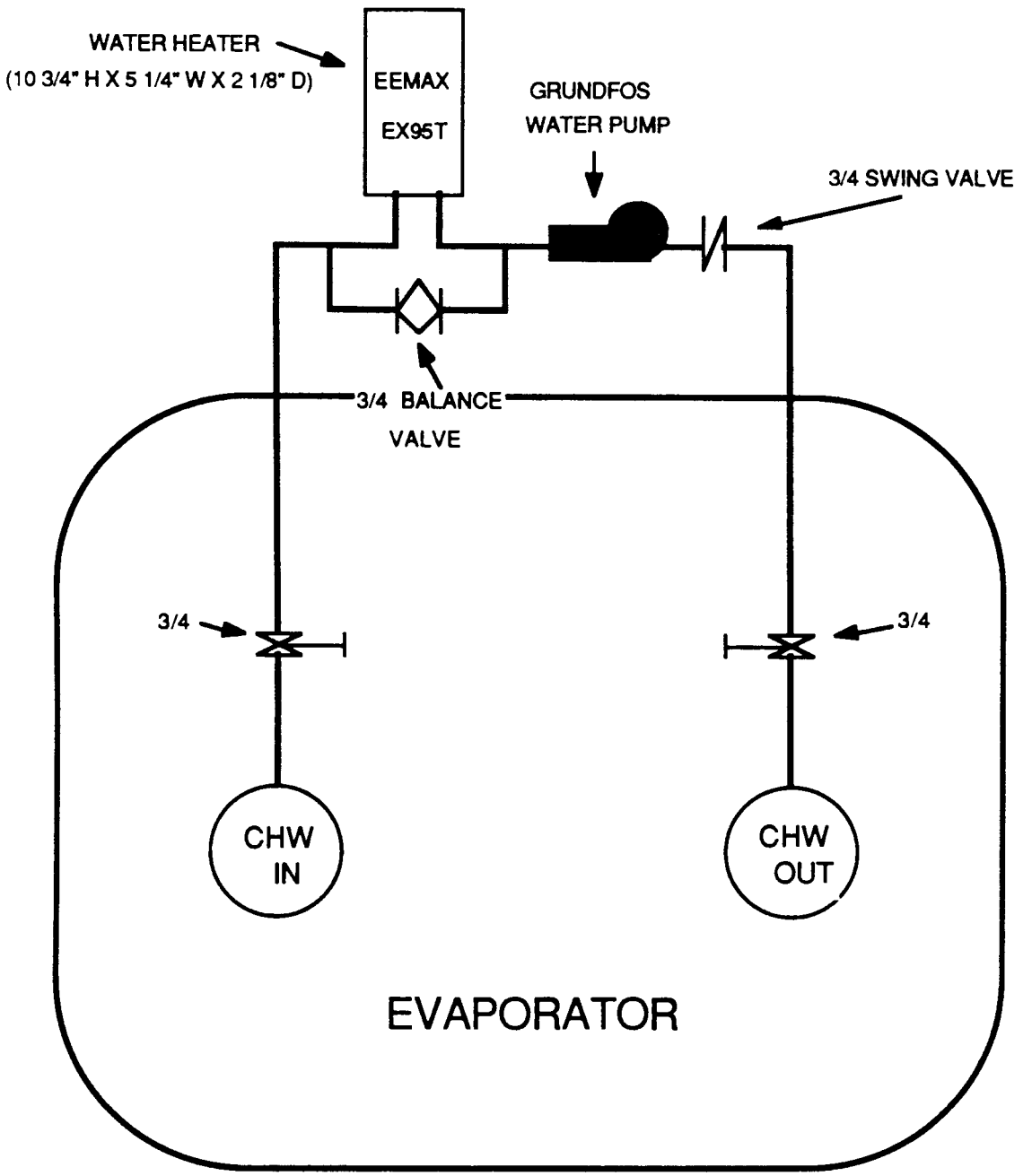
SINGLE AND THREE PASS CHILLERS

1-16-89

EXHIBIT B

AUXILIARY HOT WATER LOOP

SYSTEM AND COMPONENT DIAGRAM



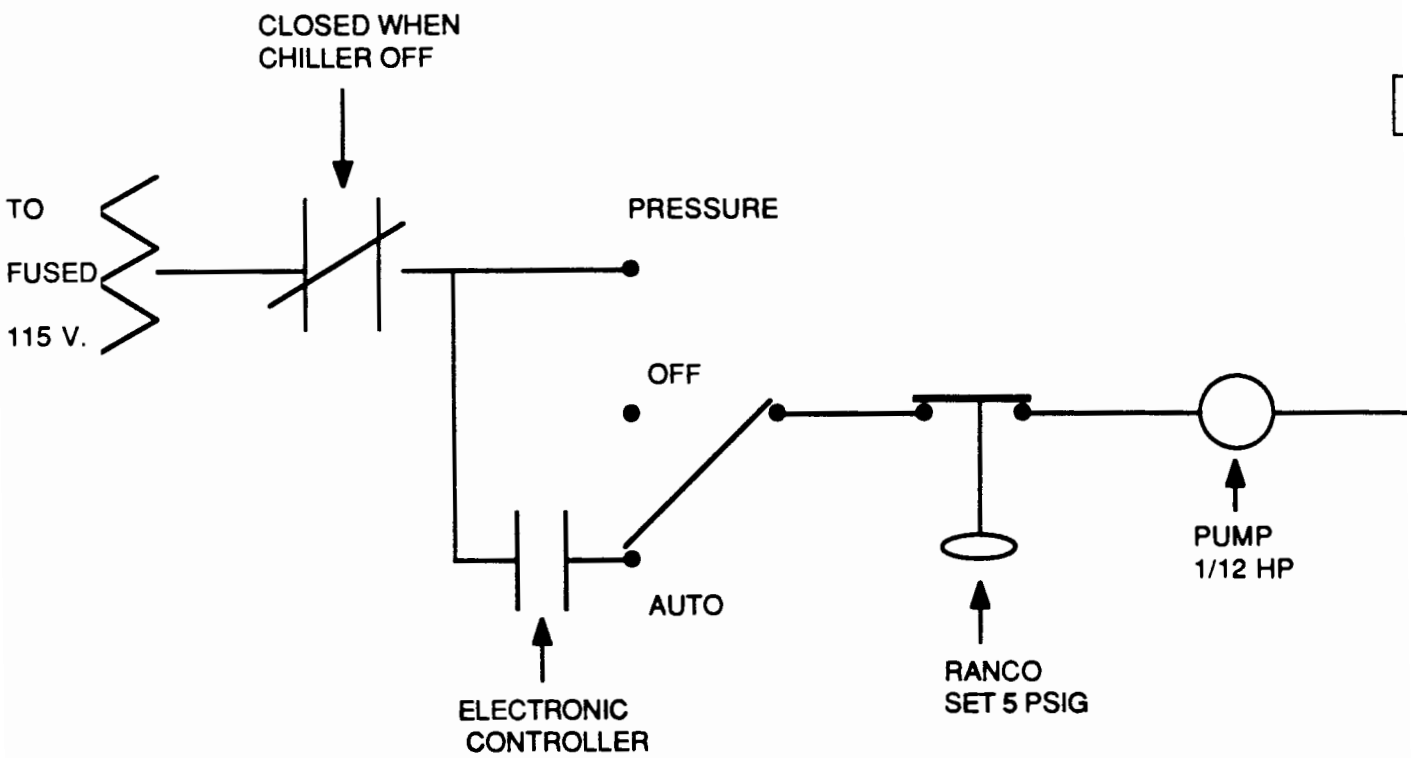
TWO AND FOUR PASS CHILLERS

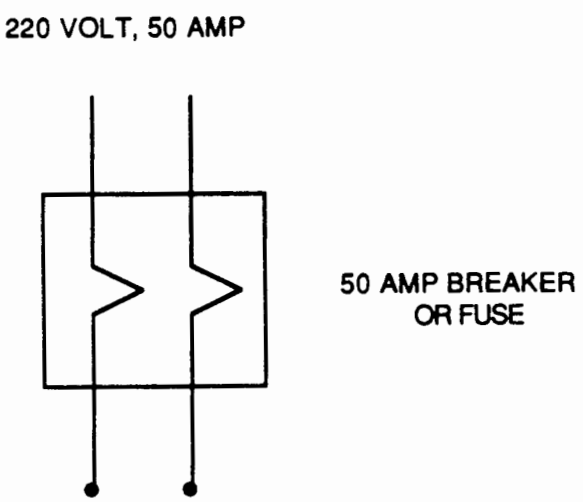
1-27-89

EXHIBIT C

AUXILIARY HOT WATER LOOP

WIRING DIAGRAM





2-21-89