Redi Controls, Inc.

Installation Operation & Maintenance Manual

Literature No. 1099-01

SavAll II™

2 Inch & 3 Inch
Flange Connection

Refrigerant Charge
Protection System.....

....For use on
Centrifugal Chillers

Refrigerants R-11,
R-113, & R-123

Patent Pending

Vessel ASME Certified

Revised Technically as of February 1, 1999
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9 GENERAL INFORMATION 9

4 YOU ARE URGED TO READ THIS MANUAL COMPLETELY BEFORE INSTALLING AND/OR OPERATING THIS UNIT

Upon Receiving Your Unit

Inspect the unit for possible damage caused during shipping. **Contact** Equipment Servicing **before attempting to use a damaged unit.** (800) 626-8640 or (317) 865-4130.

Warnings and Cautions

NOTE: *Warnings and Cautions appear in highlighted boxes as illustrated below at appropriate points throughout this manual. Give special attention to these items.*

Warnings: are provided to alert you to potential hazards that could result in serious personal injury and damage to your equipment. Warnings may appear in this manual or on the equipment. Heed all Warnings.

Cautions: are designed to alert you to situations that may result in damage to your equipment.

Personal safety and the proper operation of your equipment require strict observance of these precautions.

EQUIPMENT SHOULD BE INSTALLED AND OPERATED ONLY BY QUALIFIED PERSONNEL

Warning: Certain servicing procedures may expose you to harmful materials and dangerous conditions. To minimize the possibility of injury, follow safety procedures and instructions described in this manual, on product labels and in material safety data sheets provided.

NOTE: *The manufacturer has a continuous equipment improvement policy and reserves the right to change specifications and design of its products without notice.*

Specifications

- **R-11 Condensing Capacity – 100,000 BTU/Hr @ 105º F sat. Temp./65º F city water**
- **Cooper shell, tubes and tube sheets**
- **Adjustable setting 75º to 110º F**
- **City water connections – ¾" NPT**
- **150 lb 4-bolt slip flanges – *specify 2" or 3"***
- **Flanges face to face – 8.5" (*approx*.)**
- **Overall length – 48"**
- **Floor support mounting – 1" NPT**
- **Installed weight – 56 lbs.**

Contents of the SavAll II™ Installation Kit

Each "kit" includes: One SavAll II™ Unit
One Temperature actuated water valve
Two flange gaskets per flange size ordered
One ¾" Brass pipe nipple
One Installation & Operation Manual

Field-Provided Items

Furnished by installer:

3/4" Copper Tubing and fittings
¼" O.D. copper tubing and fittings
One ¾" water shut-off valve
1" NPT pipe (approx. 4 feet) for floor support
One 1" NPT floor support flange
"Optional" flow switch

General Overview

The **Function** of the **SavAll II™ System** is to prevent or limit loss of refrigerant in the event of system over-pressurization. Operation of the **SavAll II™ System** is completely automatic and is independent of system operational status.

Operation of the **SavAll II™ System** is totally passive, meaning it does not require controls, sensors, pumps or electricity to operate. Therefore, there is virtually nothing that can fail to prevent operation of the **SavAll II™ System** when most needed, not even a total power outage.

Generally, **most** conditions leading to over-pressurization in a "low pressure refrigerant' centrifugal chiller are **slow occurring**. Under these conditions, the **SavAll II™ System** can help maintain chiller pressure below the pressure setting of the safety relief protection until the problem is corrected. Under **fast rising** pressure conditions, the SavAll II™ may or may not be able to maintain pressure below the relief setting. However, should discharge occur, the **SavAll II™ System** will significantly shorten relief time, thereby lessening the severity of refrigerant loss.

Operation

The **SavAll II™ System** responds instantaneously to rising refrigerant temperature in the chiller anytime the saturated vapor temperature exceeds a predetermined maximum level (typically 90º F for R-11) by circulating cold city water through the shell & tube heat exchanger. Cool city water flowing freely through the heat exchanger's 31 "fluted" condensing tubes is usually more than sufficient to stabilize rising chiller pressure at a safe level well, below the rupture disc setting.

As rapidly as warm refrigerant vapor is generated, it is drawn into the cold heat exchanger, where it re-condenses to liquid. The liquid then falls by gravity to the bottom of the heat exchanger and flows back into the chiller. This cycle continues until the cause of the excess heat has been removed, at which time city water flow through the heat exchanger automatically stops.

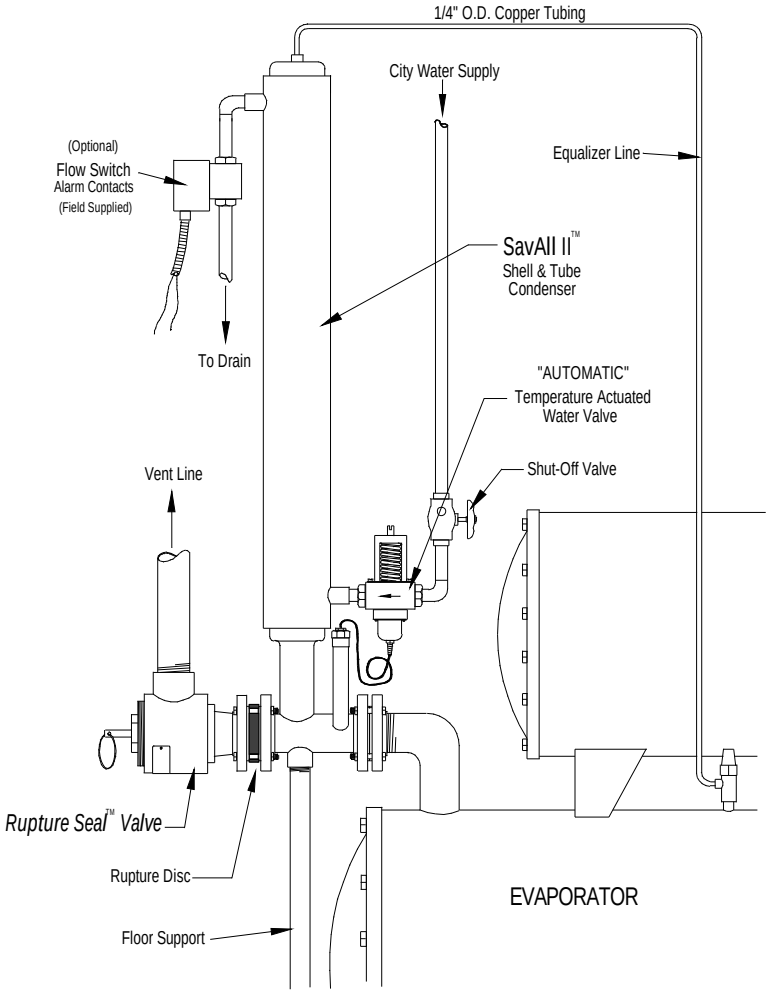

Figure 1.-*Typical Installation*

RuptureSeal **"Back-up Relief Valve"**

The purpose of the **RuptureSeal™** valve is to back-up the **SavAll II™ System** in the event of fast rising pressure or sudden pressure spike. Should such an event occur, the **Rupture Seal™** valve provides relief closure once the **SavAll II™ System** gets system pressure under control

Installation

Location

The **SavAll II™** installs between the chiller and the chiller's safety relief system (see Figure 1 on Page 5).

To Install

1. Using standard servicing procedures, bring the chiller up to atmospheric pressure.
2. Remove the chiller's existing rupture disc. If the rupture disc is to be reused, carefully set disc aside.
3. **This step will require two people to perform safely!** Using new flange gasket provided, bolt the **SavAll II™** unit to the chiller flange (with the sensor bulb well next to the chiller flange – see Figure 1 on Page 5). Before tightening bolts, align the **SavAll II™** unit vertically.
4. Finish tightening flange bolts.
5. Install floor support pipe and floor flange (field supplied). **NOTE: The floor support MUST be installed to support the combined weight of both the SavAll II™ and the RuptureSeal™ valve.**
6. Next, if installing a model **RS RuptureSeal™ valve** – using the installation instructions provided with the **RS valve**, install the chiller's existing carbon rupture disc and the valve on the outlet flange of the (see Figure 1 on Page 5).

   If installing a model **NRS RuptureSeal™ valve** -- discard the chiller's old carbon rupture disc and install the **NRS** valve on the outlet flange of the **SavAll II™** as per installation provided with the valve.
7. Rotate valve assembly to desired position and finish tightening flange bolts.
8. Using ¼" O.D. copper tubing, connect the **equalizer port** located at the top of the **SavAll II™** to an angle valve or other appropriate location open to the evaporator. The equalizer line **MUST** remain open to the evaporator at all times.

Installing the Automatic Water Valve

1. Using the ¾" brass pipe nipple provided and appropriate pipe thread sealant, attach the outlet of the **automatic water valve** to the **city water inlet** at the bottom of the **SavAll II™** condenser (see Figure 1 on Page 5). **Be sure the flow directional arrow on the valve body is pointing toward the SavAll II™ condenser**.
2. **DO NOT** install the temperature-sensing element in the well at this time. Proceed to "**City Water Connection**".

City Water Connection

1. Using ¾" copper tubing, connect city water to the inlet of the automatic water valve. **NOTE: A water shut-off valve should be installed in the city water supply line near the automatic valve** (see Figure 1 on Page 5).
2. Using either ¾" copper tubing or PVC pipe, connect the water outlet at the top of the **SavAll II™** condenser to the nearest floor drain or other suitable location.

   NOTE: A field supplied flow switch may be installed at the outlet of the **SavAll II™** if alarm notification is desired.
3. Proceed to "**Automatic water Valve Calibration**".

Automatic Water Valve Calibration

1. The automatic water valve operating set point has been preset to 90º F at the factory and no further adjustment should be necessary. However, if it is desired to verify this set point or if a different set point is required, it must be done before the element is installed.

   Refer to the valve manufactures calibration instructions provided with the valve
2. Once calibration, if any, is completed, finish installing the temperature-sensing element. Carefully insert the element into the well as far as it will go. The element **MUST** go all the way into the well.
3. Apply appropriate pipe thread sealant to the element's threads and screw into the well tight. **NOTE: This is NOT a dry well and it MUST be leak tight**.
4. Next, holding the element in place, all the way in, tighten the compression nut firmly being careful not to over tighten. **NOTE: This fitting MUST also be leak tight**.
5. Finally, using standard leak test procedures, thoroughly leak test the entire installation.

Operation

1. For automatic operation, the city water supply valve **MUST remain OPEN** at all times.
2. The **SavAll's** equalizer line **MUST be OPEN** to the chiller evaporator at all times.
3. The **SavAll II™ System** requires no further attention or operator interaction.

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MAINTENANCE

Because the **SavAll II™ System** is a totally passive device, having few working components, virtually no maintenance is required.

Servicing Temperature Actuated Condenser Water Valve

Generally, the only system component that may ever require attention, is the Temperature Actuated Valve.

Manual Flushing: To flush valve, insert a screwdriver under each side of lower spring guide. Pry both guide and spring away from body to open valve.

Valve Adjustment: To raise valve opening temperature point, turn adjusting screw counter-clockwise; to lower valve opening temperature point, turn screw clockwise.

NOTE: *Valve closing point is not adjustable. The valve will close 3° to 5° below opening point.*

Service: Valve seat and disc, after long periods of operation, may become worn or pitted, thus allowing leakage through valve when closed. Internal parts can be replaced.

Renewal Kits containing seats, discs, retainers, diaphragms and all additional internal parts required to recondition the Johnson Controls Series V47 valve are available from your nearest Penn-Baso wholesaler. Order **Kit # STT16A-601R**.

Servicing RuptureSeal™ Back-up Relief Valve

Refer to Maintenance section of IOM furnished for the RuptureSeal™ Back-up Relief Valve

SavAll II™

Warranty

Within one year from date of purchase, Redi Controls will repair the **SavAll II™** product being used by the original purchaser, which is defective due to faulty materials or workmanship. Redi Controls has the right to repair or replace a defective part or replace the entire product.

To file a Warranty claim on any system or component, return the defective item to the Redi Controls, location as Redi Controls directs, freight prepaid.

This Warranty <u>does not</u> apply to or cover:

Damages beyond manufacturers' control.

Malfunctions that result from failure to properly install, operate or maintain product in accordance with instructions provided by manufacturer.

Failures of equipment due to abuse, accident or negligence.

Damages from, or part failures due to equipment not being installed per manufacturers' instructions, per applicable codes or ordinances, or in accordance with good trade practices.

Labor or other charges incurred in removing or reinstalling any product or part.

Damages resulting from use of product for any purpose other than for which it was designed and manufactured.

Any implied warranty of merchantability or fitness for any particular purpose, occurring after the Warranty Period.

Loss of use, loss of time, inconvenience, rental for substitute products, loss of business, loss of income, or any other consequential damages resulting from use or failure of any product.

Loss of refrigerant caused by a fast rising pressure condition for which this product was not designed (see General Overview on Page 4 of this Manual).

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