SERVICEFIRST™

Installation
Operation
Maintenance

EnviroPump
R11, R123 Patented Chiller
Pressurization System

Models: RRMA

RRMA-SVX01A-EN

SERVICEFIRST™

Table of Contents

General Information

Specifications

Electrical Power Requirements

- 460/480 VAC, 50/60 Hz, 3-Phase, 20-Amperes Heater.
- 120 VAC, 50/60 Hz, 1-Phase, 15-Amperes Controls, Liquid Pump and Vacuum Pump.

Dimensions (approximate)

- 40” high x 31” wide x 29” deep

Literature Change History

RRMA-SVX01A-EN (September 2002)

- Original issue of manual.

Warnings and Cautions

NOTICE:

Warnings and Cautions appear at appropriate sections throughout this manual. Read these carefully.

⚠ **WARNING -**Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ **CAUTION -**Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION –Indicates a situation that may result in equipment or property-damage-only accidents.

General Information

IMPORTANT
Environmental Concerns!

Scientific research has shown that certain man made chemicals if released to the atmosphere can affect the earth's naturally occurring stratospheric ozone layer and/or increase in greenhouse gas concentrations. In particular, several of the identified chemicals that may be affecting the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFC's) and also those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFC's) or (HFC's). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane® feels that all refrigerants need to be handled in a responsible manner.

Responsible Refrigerant Practices!

Trane® believes that responsible refrigerant practices are important to the environment, our customers and the air conditioning industry. All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering, recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and insure they are followed.

⚠ WARNING
Contains Refrigerant!

System contains oil and refrigerant and may be under positive pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants or refrigerant substitutes or refrigerant additives.

Failure to follow proper procedures or the use of non-approved refrigerants or refrigerant substitutes or refrigerant additives could result in death or serious injury or equipment damage.

General Information

Model Number Description

R	R	M	A	1	2	3	F	0	A0
1	2	3	4	5	6	7	8	9	10 11

Digit 1,2
Product Description
RR= Refrigerant Recovery

Digit 3
Model Identifier
M= EnviroPump

Digit 4
Development Sequence
A= Development Sequence “A”

Digit 5
Condenser Type
1= Air Cooled

Digit 6
Control type
2= Microprocessor

Digit 7
Connection Type
3= ¾” Flare w/ Ball Valve
5= Quick Connect

Digit 8
Unit Voltage
F= 575/60/3
G= 230-460/60/3, 220-415/50/3

Digit 9
Model Options
0= None

Digit 10, 11
Design Sequence
A0= First Design Sequence

General Information

Product Description

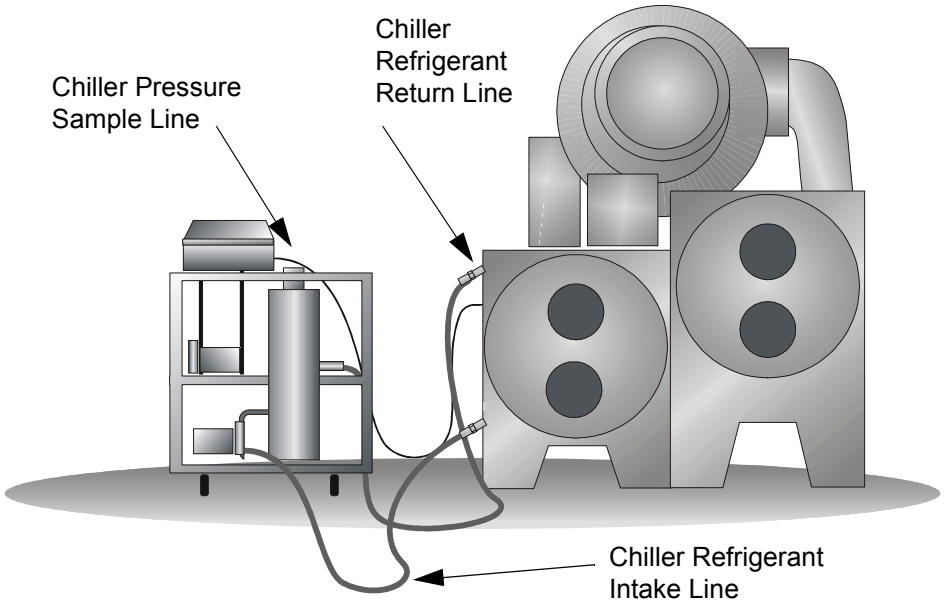
The EnviroPump is a portable system that heats low pressure chiller refrigerant to increase internal chiller pressure for the purposes of leak detection and other service procedures. EnviroPump's primary components consist of a liquid gear pump, 16 KW heat, microprocessor controls, solid state temperature sensors, pressure transducers and one high pressure switch. A 6 CFM vacuum pump is provided for initial removal of non condensable from the unit and refrigerant hoses. Also provide finial removal of refrigerant from unit back to the chiller.

Heating Refrigerant

After hoses are connected and valves are opened, chiller evaporator refrigerant is drawn through a liquid gear pump and forced through the EnviroPump heat exchanger. The heat exchanger is supplied by 16 KW electric heating element. Chiller refrigerant gains heat and travels back to the evaporator of the chiller, which in turn will increase chiller pressure.

The microprocessor receives data from temperature sensors on the inlet line and the outlet line as well as a pressure transducer connected via a 1/4" refrigerant hose to the chiller evaporator. When refrigerant is heated to a point that generates the desired pressure, the unit stops heating refrigerant and continues to monitor the chiller's evaporator pressure. EnviroPump will reenergize to maintain pressure whenever the pressure transducer reads a 1/2 psi drop below desired pressure. The unit incorporates various safeties to protect against overheating, over pressurization, and vapor damage to the liquid gear pump.

Figure 1 — Component Description



General Information

Shipping Contents

Furnished with EnviroPump are:

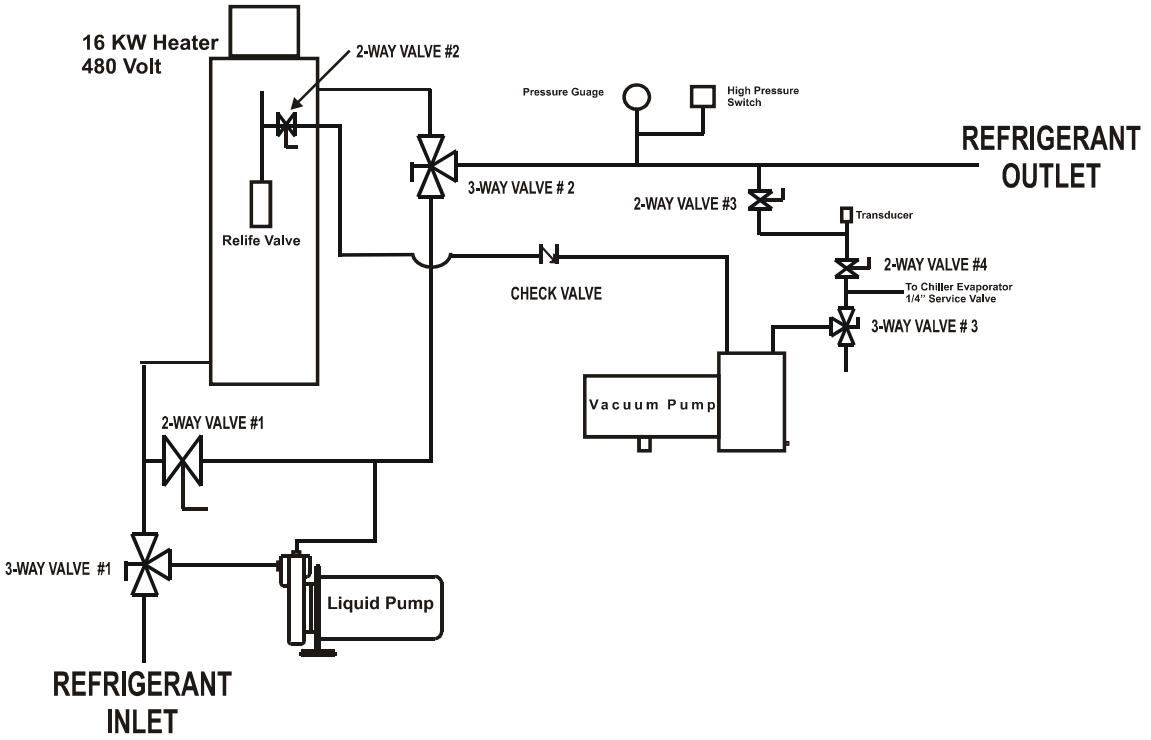
- (1) 10-ft. 3/4” low pressure refrigerant hoses equipped with isolation valves and flares
- (1) 20-ft. 3/4” low pressure refrigerant hoses equipped with isolation valve
- 100 ft., 120 VAC power cord for controls
- 50 ft., 480 VAC power cord for Heater

Peak Performance

For optimum performance a 3/4” inlet and outlet must be used on the evaporator. Turn off chilled water pumps and Isolate chiller water valves . For maximum performance and to decrease pressurization time drain the water from the chillers evaporator water bundle.

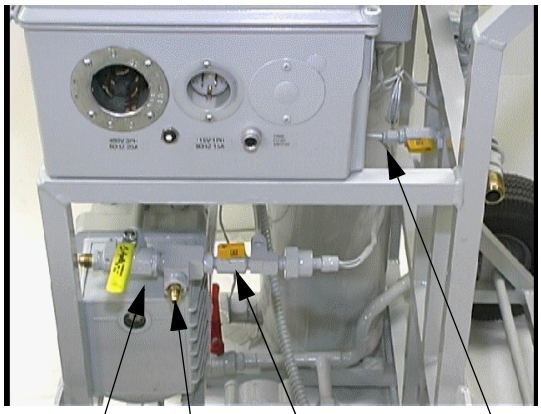
Note: A 3/4 “ Inlet and Outlet on the chillers evaporator must be used to ensure that the refrigerant flow is not decreased and cause the unit to trip on high pressure.

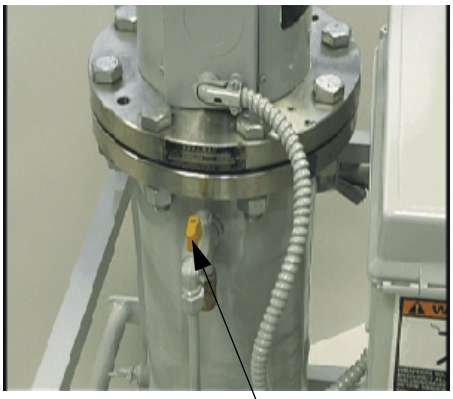
Figure 2 — EnviroPump Pressurization Unit and Pad

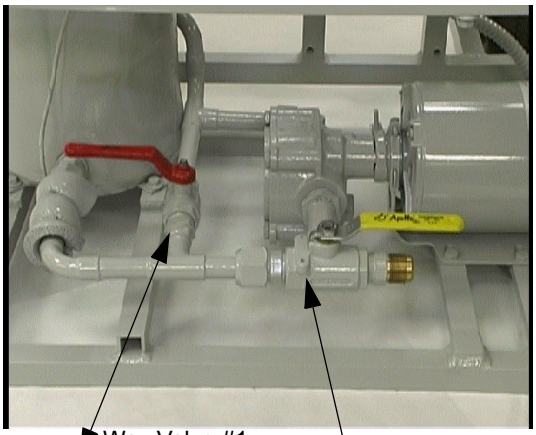


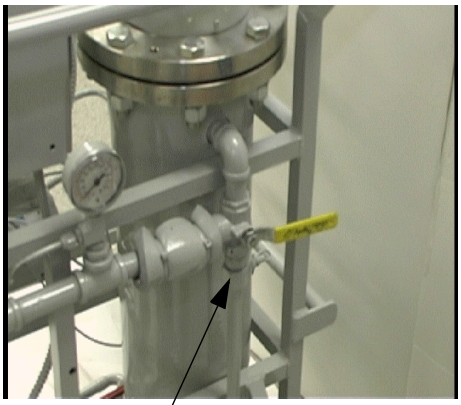
General Information

Figure 3 — Product Description









Operation

Operating Procedures

Evacuating Unit And Hoses

1. Turn the chiller and chilled water circulating pumps off. Make sure they cannot restart. Valve off chilled water supply and the return to the chiller evaporator.
2. Connect the 100 ft. 120 VAC power cord to EnviroPump's control box and the 480
3. VAC 3-phase maximum 20 amp cord. Connect two of the supplied 3/4" refrigerant hoses to EnviroPump's intake and outlet ports, and to the chiller evaporator return port and to appropriate ports on the chiller evaporator barrel. For optimum performance, connect the intake to the lowest liquid point on the chiller evaporator and the return hose back to the chiller evaporator.
4. Connect a refrigerant hose to the 1/4" male flare pressure transducer sensor port on the EnviroPump and the other end of the 1/4" refrigerant hose to the chiller evaporator. This will monitor the chiller evaporator pressure. (See Figure 3 for location)
5. Set the valves on the vacuum pump and inlet port 3-way valve for initial removal of non condensable from the unit and hoses. Set 3-Way Valve #1 & 2 to a 45 Deg. Set 3-way valve # 3 to the left position. Set 2-way valves # 1,2,3,& 4 to the open position. (See Figures 2 and 3)
6. Evacuate EnviroPump and the refrigerant hoses by starting the unit in the vacuum pump mode. The EnviroPump will pull down to a 29" vacuum and then shut off. (See Page 12)

Chiller Pressurization

7. After unit and hoses has been evacuated set the 2-Way and 3-Way Valves as follows.
   Set 3-Way Valve # 1 & 3 to the left position.
   Set 3-Way Valve # 2 to the vertical position.
   Set 2-Way Valves # 1& 4 open.
   Set 2-Way Valves # 2 & 3 closed.

Note: It is very important to close 2-Way Valves # 2 & 3 to insure that liquid refrigerant does not get into the vacuum pump and transducer.

It is also very important to open 2-Way Valve # 4 to insure that the chiller evaporator pressure is being sensed for proper unit operation.

Important: By pressing "Cancel" you may also scroll chiller evaporator pressure inlet and outlet temperature, heater temperature and ambient temperature. Press "Enter" to freeze the display on a particular screen, and "Cancel" to return to the main screen.

Operation

8. Open the chiller liquid valve to allow refrigerant to migrate into the unit this will ensure that the liquid primes. Then open chiller return valve and start the EnviroPump in the pressurization mode (See page 12).
9. At this point, the display lights up indicating the unit has power and prompting you to press ***"Start".***
10. EnviroPump now asks you to **"Select Pressure To Maintain"** from the range of 0 PSIG to 10 PSIG. Use the "< > " keys to scroll to the desired value, then press ***"Enter".***
11. The liquid gear pump and heater is monitored by a pressure switch And temperature sensor and will deactivate if the pressure exceeds 40 Psi or temperature exceeds 175 deg. F. Refrigerant cycling and automated operations commence with the screen displaying **Chiller Evaporator Pressure** as well as the **Selected Pressure to Maintain.**
12. When the desired chiller pressure is achieved, the liquid gear pump and heater shut down. However, the microprocessor continues to monitor the temperature sensors and pressure transducer. Should the transducer indicate a 1/2 psi drop in evaporator pressure, the liquid gear pump and heater will start again to automatically reheat refrigerant until the desired pressure level is once again achieved. In this manner, EnviroPump will automatically maintain chiller pressure indefinitely.
13. After chiller pressurization is complete press the stop button to turn the unit off.

CAUTION
Equipment Damage!

For any reason you do not see liquid refrigerant in the top sight glass during this process, shut the unit down by pressing the stop button and reprime the liquid refrigerant pump. Failure to do so may lead to equipment damage.

Removal of Refrigerant from Unit after Pressurization is Complete

1. start the EnviroPump in the liquid pump mode (See page 12) Then change the following valves to drain the heater of liquid refrigerant and send it back to the chillers evaporator.

    - Close service valve on liquid from chiller
    - Leave chiller return valve open
    - 3-Way Valve # 1 to the right position
    - 3-Way Valve # 2 to the horizontal position
    - 2-Way Valve # 1 closed.

Operation

Note: It is very important the valve setting be set in the order above so the liquid pump does not deadhead.

2. Watch the liquid sight glasses on the side of the heater vessel and when all the liquid refrigerant is gone stop the unit by pressing the stop button.
3. Close the chiller return service valve.
4. Press the stop button to turn unit off.

Removal of Refrigerant Vapor from Unit and Hoses

1. To remove the refrigerant vapor form the unit and hoses and to put the refrigerant back into the chiller set the valves in the following position.

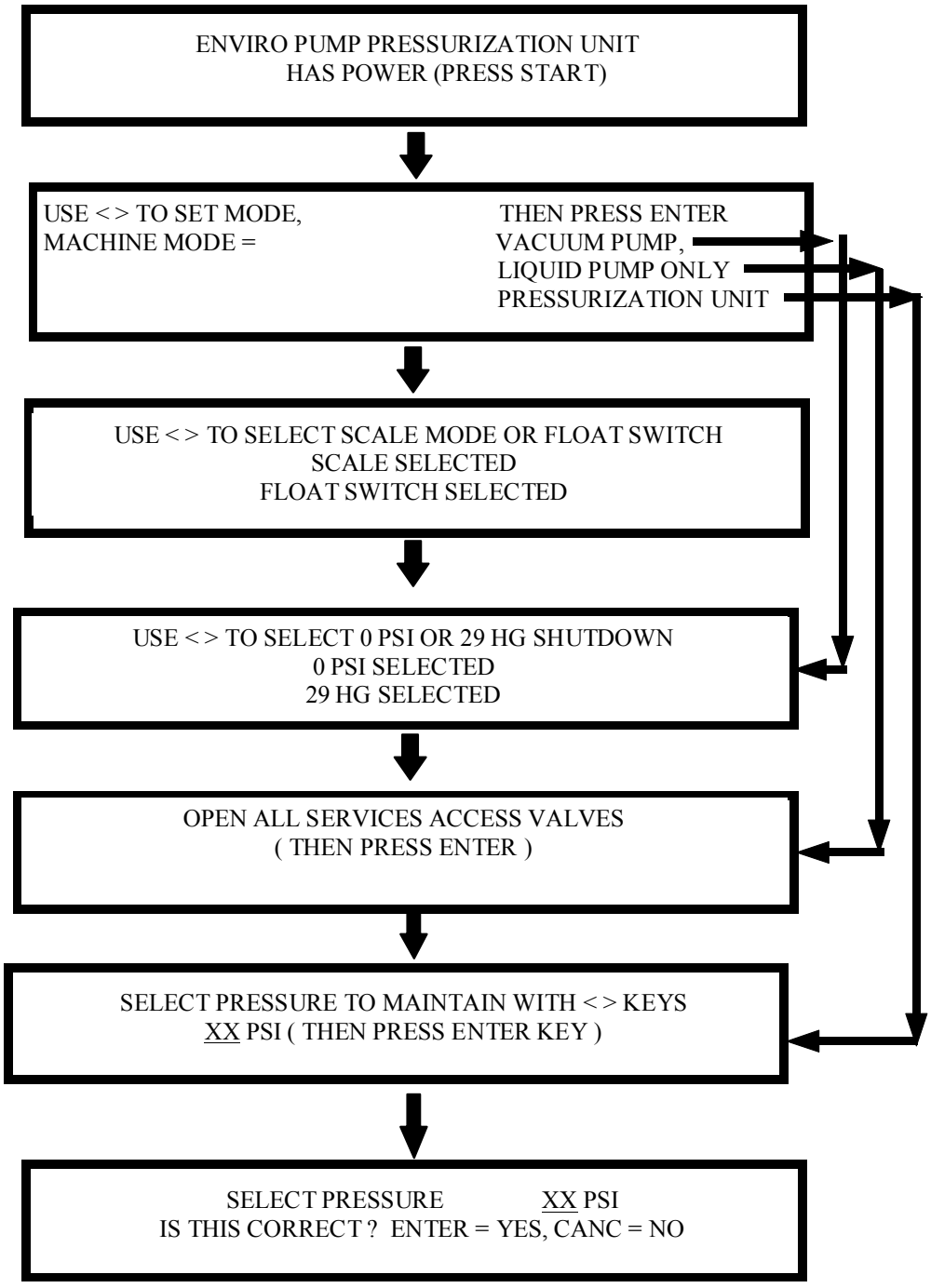
   Set 2-Way Valves # 1, 2, and 3 to the open position.
   Set 2-Way Valve # 4 to the closed position.

2. At this point both 3/4” isolation valve on the chiller should be in the closed position and the chiller 1/4” service valve should be open.
3. Evacuate EnviroPump and the refrigerant hoses by starting the unit in the vacuum pump mode. The EnviroPump will pull down to a 29” vacuum and then shut off (See Page 12).
4. Press the stop button to turn the unit off.
5. Turn off all power 115 VAC & 480 VAC to the unit and disconnect power cords.
6. Make sure all service valves on the chiller are closed and remove all hoses from the unit.

Operation

EnviroPump Display Sequence

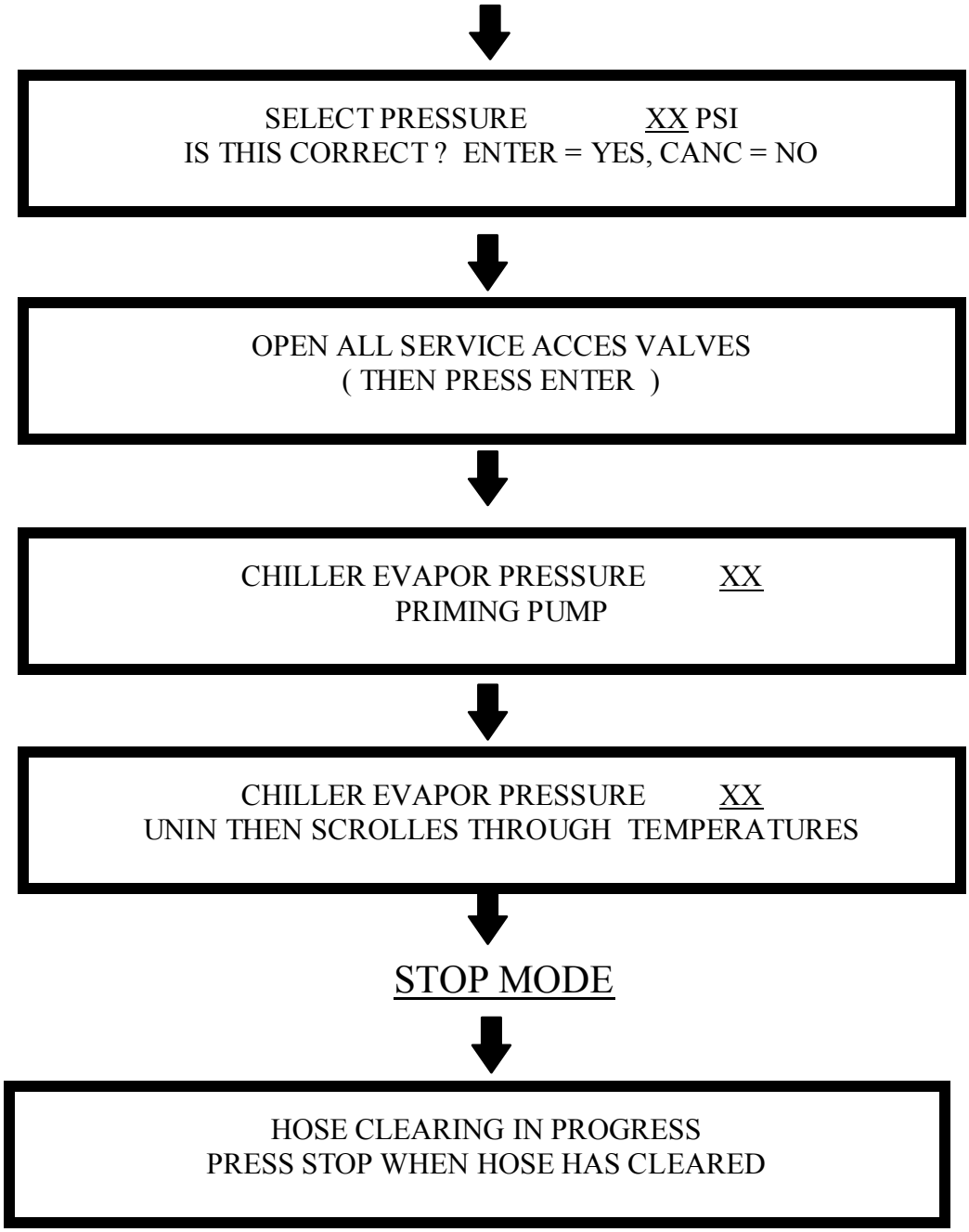
Normal Sequence of Operation



Operation

EnviroPump Display Sequence

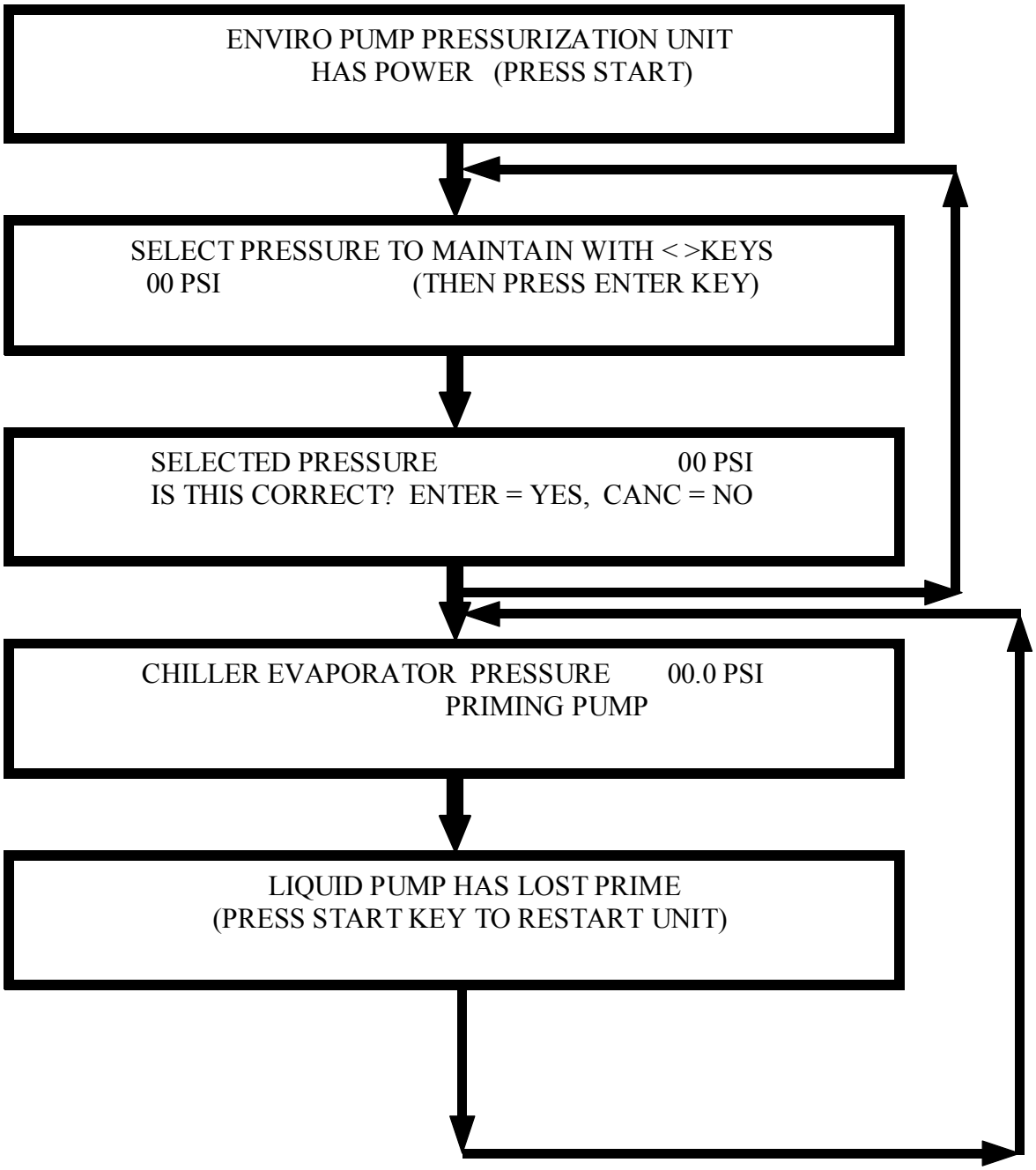
Normal Sequence of Operation



Operation

EnviroPump Display Sequence

Sequence when Pump does not Prime



Calibration

Important: Before attempting to operate this equipment, the pressure transducers must be calibrated for your specific location.

Due to the high degree of sensitivity of this equipment, the pressure transducers must be properly calibrated to take into effect the variations in pressure at various elevations before this equipment will operate accurately.

Please follow these procedures to properly calibrate the pressure transducers:

1. At power up, the unit will display:

   “ENVIROPUMP PRESSURIZATION UNIT HAS POWER (PRESS START)”

2. At this screen you must press “CANCEL” twice within 5 seconds to enter the CALIBRATION mode. The display will then show the following:

   “OPEN PRESSURE TRANSDUCERS TO ATMOSPHERE (THEN PRESS ENTER KEY)”

3. Now, with no hoses connected and no refrigerant in the EnviroPump unit, open all valves on the EnviroPump unit to the atmosphere and press “ENTER”.

4. The screen will then display the following message:

   “PRESS ENTER TO CALIBRATE THIS TRANSDUCER SYSTEM PRESSURE XX PSI”

   The system is displaying the raw, uncalibrated reading from the transducer. If you press “ENTER”, it will calculate a calibration value and store it in the computer’s nonvolatile memory. If you press “CANCEL”, a new calibration factor will not be calculated.

5. Unit will then display the following message:

   “ENVIROPUMP PRESSURIZATION UNIT HAS POWER (PRESS START)”

6. This completes the calibration procedures.

NOTE

It is recommended that these calibration procedures be performed if any of the following events occur:
A. Anytime a new pressure transducer is installed on the unit.

B. Anytime that the unit is moved to a substantially different altitude or is exposed to significantly different atmospheric pressure.

C. Anytime that pressure readings appear to be questionable or there is any reason to doubt the accuracy of the transducer readings.

⚠ WARNING
Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing.
Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

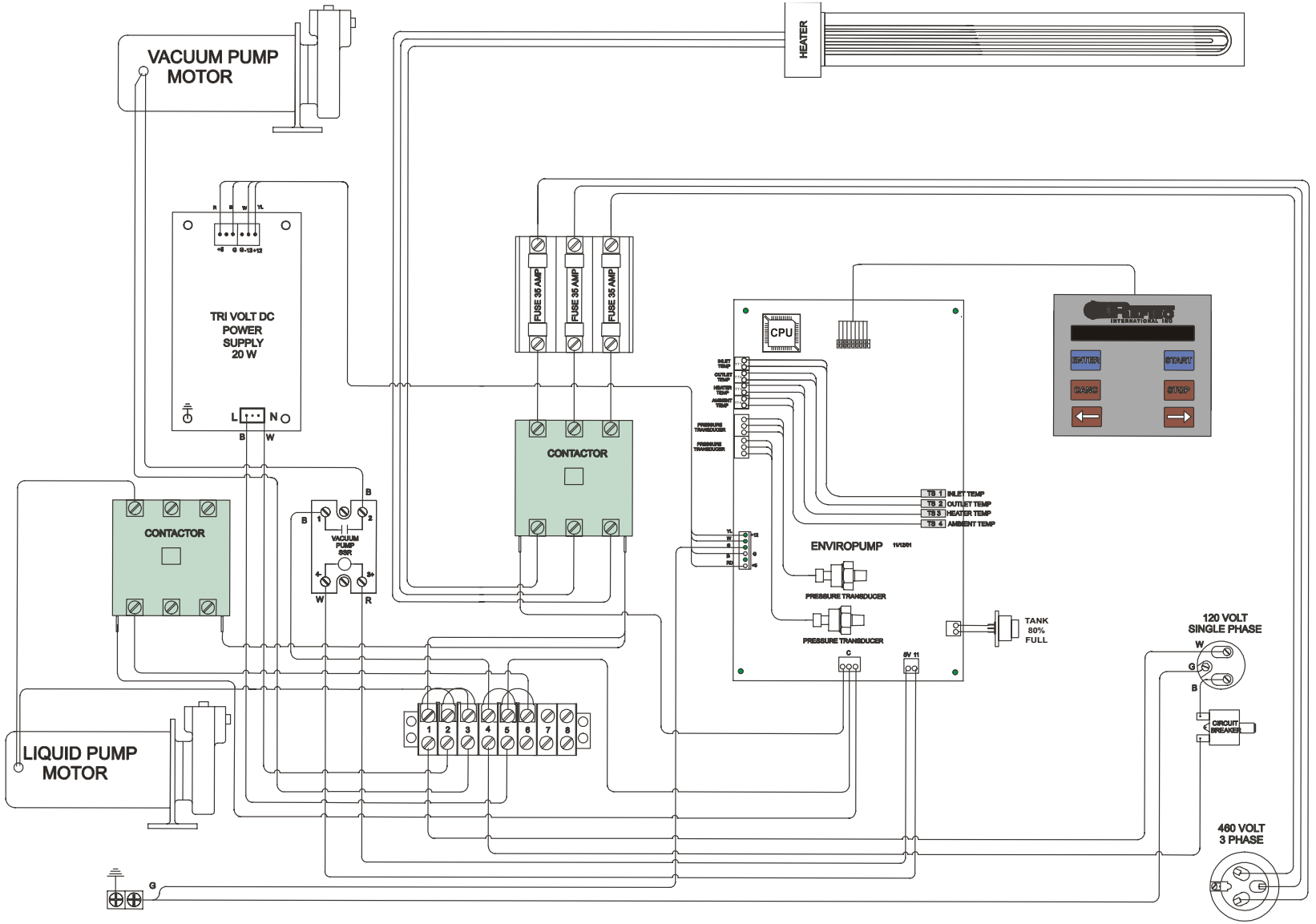
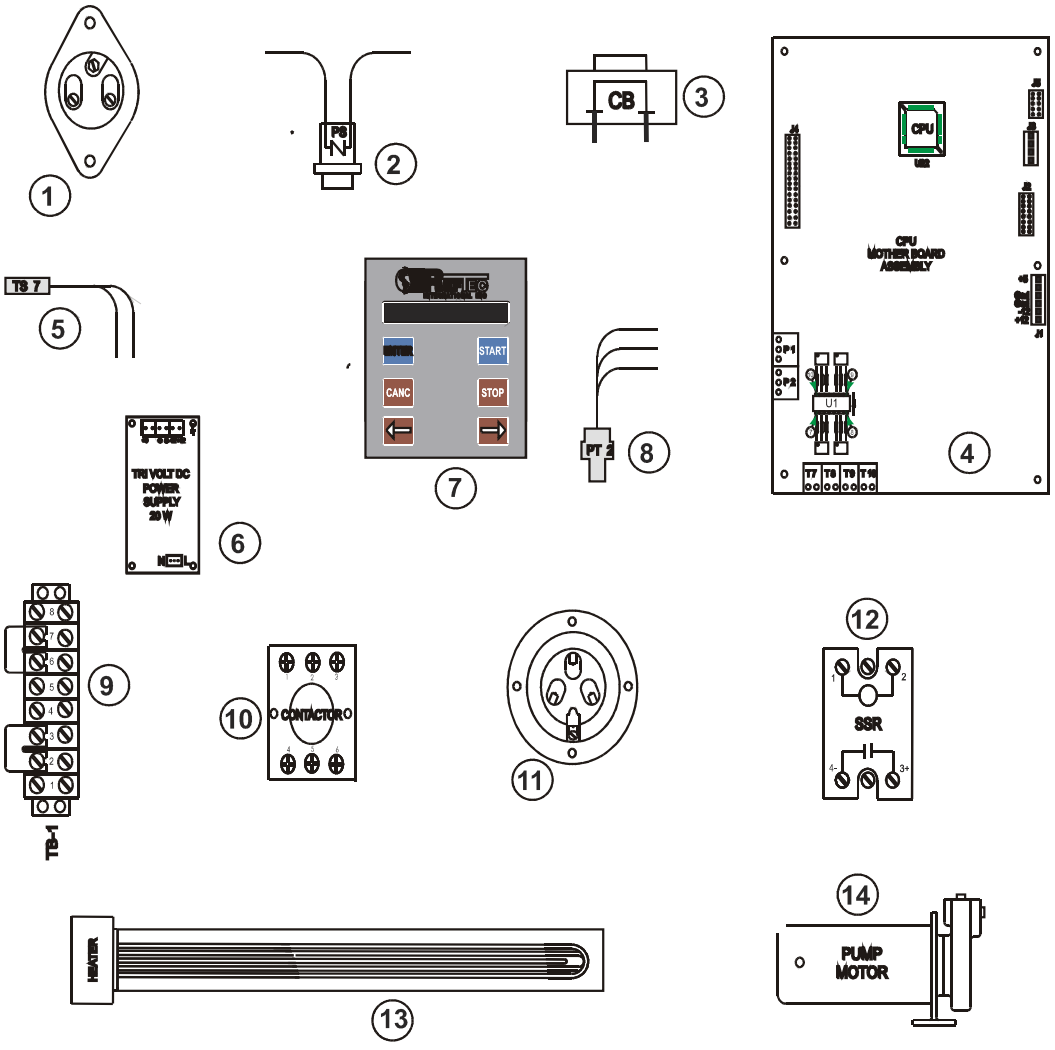


Figure 4 — Block Wiring Diagram

Parts List

Electrical Parts Breakdown

1. Male Inlet - 15 A, 125 VAC, 2 P, 3W GRD
2. High Pressure Switch 6 Amp Contacts 24-240 Volt 40 PSI Open Manual Close
3. Circuit Breakers– 15 Amp, 250 VAC
4. CPU Mother Board Assembly
5. (4) Temperature Sensors
6. Power Supply - 20 W, 115 V, 1A / 230 V, 0.6 A
7. Display Board Assembly & Keypad
8. Pressure Transducer -14.7 to 25 Psig
9. Terminal Block
10. (2) Contactor Amp 460 3 Ph 110 VAC Coil
11. (1Male Inlet 480 VAC 50 Amp 4 Wire
12. Solid State Relay-120/240 VAC 50A
13. Heater 16 KW 480 Volt, 60 Hz, 3Ph 20.0 Amp
14. Liquid Gear Pump 3/4 Hp 1725 RPM, 115 VAC 1 Ph



Troubleshooting

⚠ WARNING
Contains Refrigerant!

System contains oil and refrigerant and may be under positive pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants or refrigerant substitutes or refrigerant additives.

Failure to follow proper procedures or the use of non-approved refrigerants or refrigerant substitutes or refrigerant additives could result in death or serious injury or equipment damage.

Troubleshooting Procedures

If functional difficulties are experienced and the preceding maintenance checks do not resolve the problem, refer to the following troubleshooting chart for assistance.

Troubleshooting Guide

The following guide is provided to assist in analyzing problems that could occur.

- Symptom: Describes what is happening
- Cause: Suggests possible sources
- Solution: Describes what must be done

Symptom	Cause	Solution
No Display.	No 115 V power to unit, contras needs to be adjusted.	Check 115 V power supply, Adjust contras on back of PC board on trim pot.
Pump and or heater does not come on.	High pressure switch tripped. Unit trip on high temperature. No 480 V, 3 phase power.	Reset high pressure switch. Allow unit to cool down. Check incoming power.
Loss of refrigerant flow.	Restriction in refrigerant hoses. Pump lost prime. Valve setting incorrect.	Clear restriction. Liquid not being returned to evaporator. Check valve settings.
Displayed temperatures are not correct.	Faulty temperature sensor or wiring connection. Component failure on PC board.	Replace sensor or repair wiring. Replace PC circuit board.
Displayed pressure is not correct.	Faulty pressure transducer sensor or wiring connection. Component failure on PC board. Transducer out of calibration.	Replace transducer or repair wiring. Replace PC circuit board. Recalibrate transducer.

SERVICEFIRST™

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La Crosse, WI 54601-7599

Literature Order Number	RRMA-SVX01A-EN
Filing Hierarchy	Service Products/Tools and Test Equipment/Refrigerant Handling
Date	September 2002
Supersedes	New
Stocking Location	Inland - La Crosse