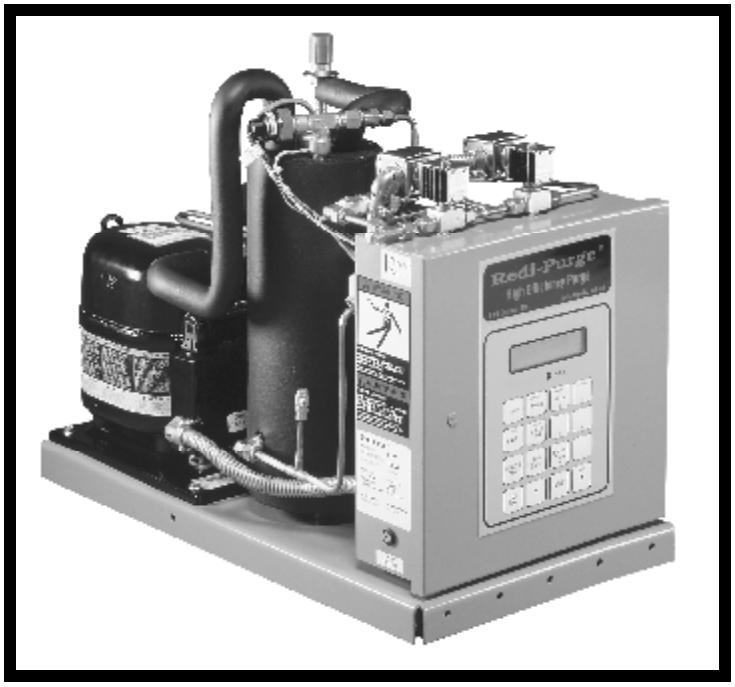
REDI CONTROLS, INC.

Installation, Operation & Maintenance Manual

Literature No. 1078-05-1

Redi-Purge™
Model HPP-4A-C3

Microprocessor Controlled Purger



AUTOMATIC AIR PURGER

for use on

High Pressure Refrigeration Systems
and Refrigerant Storage Vessels

R-12, R-22, R-134a, R-502, R-114 etc.

Revised Technically as of December 14, 2006
This Copy was printed as of June 11, 2010

GENERAL INFORMATION

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. If you received a damaged unit **contact Redi Controls, Inc immediately. DO NOT attempt to use a damaged unit.** Call (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.

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SPECIFICATIONS

Electrical Power Requirements:	120 VAC, 60 Hz, 1-Phase, 15 Amp Fused Circuit
Remote Alarm Relay (RY7) Contact Rating:	120 VAC; 5 Amps
Operating Environment:	50°F to 110°F
Dimensions (approximate):	20" H x 25" L x 16W
Refrigerant Charge R-134a:	12 oz.
Weight (approximate):	95 Lbs.
Shipping weight (approximate):	115 Lbs.

NOTE: *Purger retains approximately five (5) lbs of System's refrigerant charge (see* **Caution** *on Page 8).*

Contents of Model HPP-4A-C3 Redi-Purge™ Installation Kit

Each "kit" includes:
- One Model HPP-4A-C3 Redi-Purge™ Unit
- One Installation, Operation and Maintenance Manual
- Two ¼" O.D. Sweat Ball Valves
- One ¼" Flare Filter-Drier
- Two ¼" O.D. Sweat Moisture Indicators

Field-Provided Items

To be furnished by installer:
- Purge Unit mounting hardware
- Electrical conduit and wiring materials
- 1/4-inch copper refrigerant tubing
- Fittings

Preliminary "Kit" Inspection

Before installing the new Model HPP-4A-C3 Redi-Purge™ Unit, check the data on the new purge unit nameplate and verify that the model number and voltage are correct for the application.

INSTALLATION

Before You Start

The **Model HPP-4A-C3 Automatic Purger** is designed to automatically remove non-condensables from ***high pressure refrigeration systems, refrigerant storage vessel, Etc.*** using or containing R12, R-22, R-134(a), R-502, R114 or one of many other refrigerants listed in this manual. The Model HPP-4A-C3 Automatic Purger is designed to assure the highest efficiency in preventing refrigerant from escaping to the atmosphere through the purge process.

This section discusses the proper procedures for installing the HPP-4A-C3 purge unit on an existing high pressure chiller or refrigerant storage vessel.

WARNING: This unit <u>MUST NOT be installed on any system containing flammable refrigerant</u> of any refrigerant mixture containing a flammable gas.

WARNING: Installing or servicing refrigerant support equipment can be hazardous due to system pressures and dangerous voltages. Only qualified service personnel should work on such equipment.

Caution: The Model HPP-4A-C3 High Pressure Purger will retain approximately 5 lbs. of the main system's refrigerant charge. The effect this may have on operation of the main system <u>MUST</u> be taken into account.

Installing the Unit

NOTE: It <u>is not</u> necessary to remove the refrigerant from the chiller or storage vessel to install the Model HPP-4A-C3 purge unit.

Installation of the **Model HPP-4A-C3 Redi-Purge™** unit requires certain wiring and hardware modifications to chiller. To insure proper installation, it is important that the installer thoroughly read and understand the following installation instructions.

NOTE: The installer should record all modifications made to the refrigeration system during installation and include with the refrigeration system's maintenance records.

Location

The Model HPP-4A-C3 Purge Unit is not location sensitive and may be located near the chiller (or storage vessel) up to a maximum of 30 feet line length. Location relative to the foul gas pick-up point and drain back point is not critical and may be mounted higher or lower as required.

Mounting

Some fabrication may be required to mount the HPP-4A-C3 Purger. The installer is responsible for the mounting method, design and required materials.

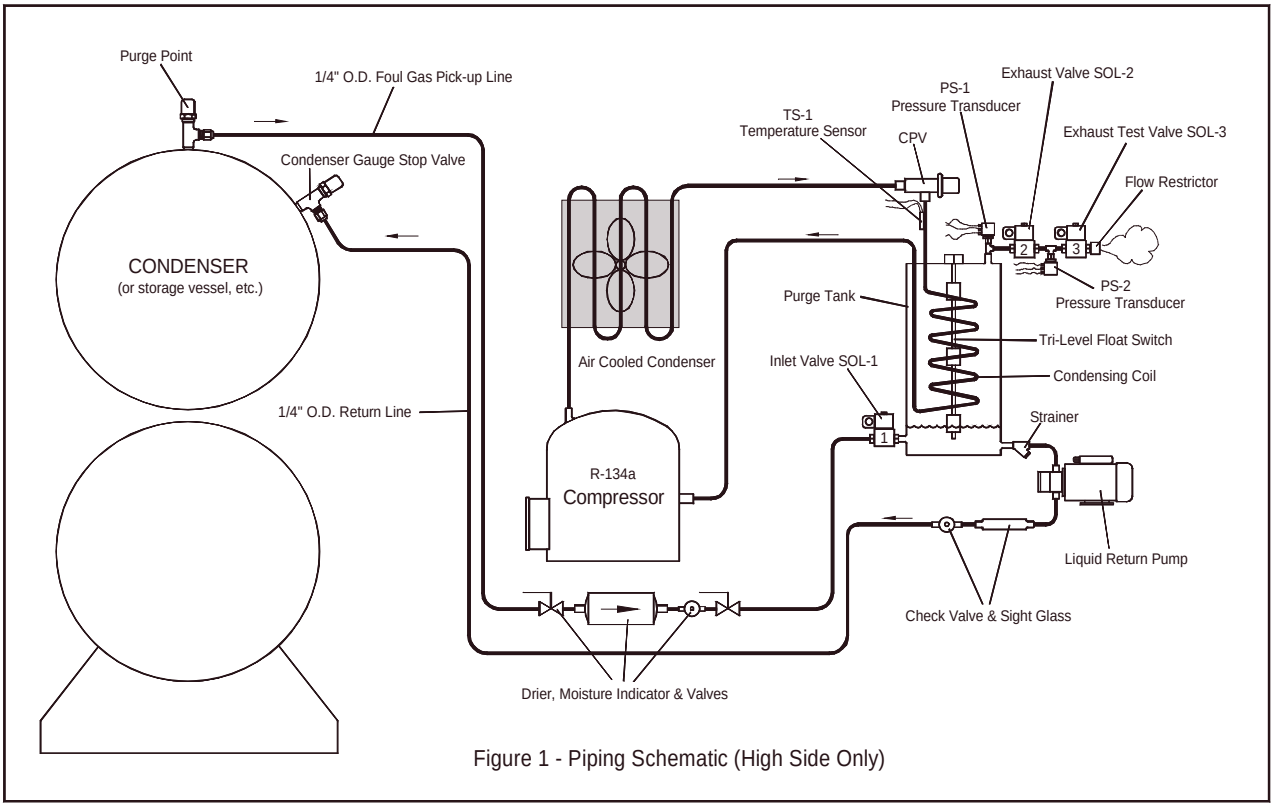


Figure 1 - Piping Schematic (High Side Only)

Figure 1 – Piping Schematic (High Side or Storage Vessel ONLY)

Schematic for High---Low piping on the following page)

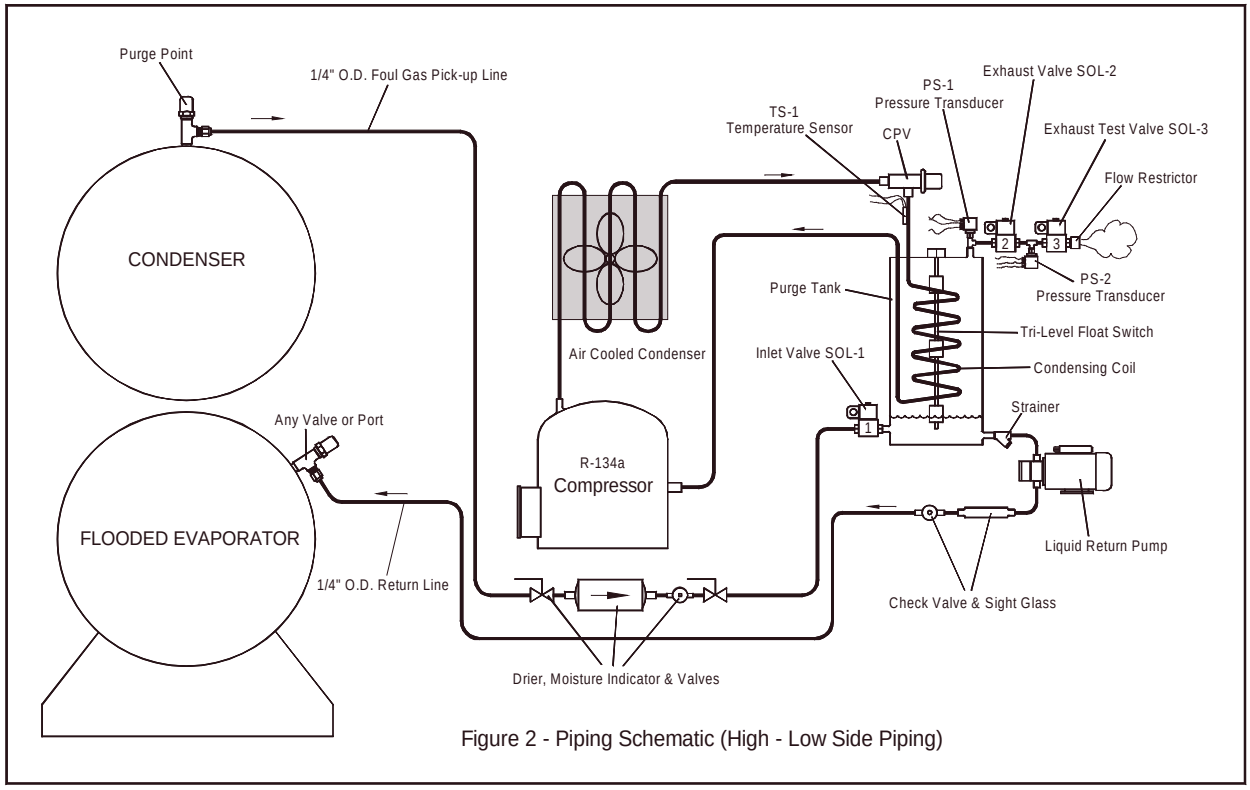


Figure 2 - Piping Schematic (High - Low Side Piping)

Figure 2 – Piping Schematic (High – Low Side Piping)

Determining the correct piping method

Figures 1 & 2 illustrate two distinct piping methods. Before you begin piping the HPP-4A-C3 Purge Unit you **MUST** first determine which method is correct for your application. In general; if you are installing the purge unit on a system utilizing a positive displacement compressor such as a ***reciprocating compressor*** you MUST plum the purge unit as illustrated in ***figure 1 (High Side Only piping).*** This would apply to all ***direct expansion (DX)*** systems. If the purger is being used to purge a ***refrigerant storage vessel*** then it will have to be installed as in figure 1.

If the HPP-4A-C3 purger is being installed on a *centrifugal chiller* or any system with a ***flooded evaporator*** you may choose either of the two piping methods illustrated in figures 1 & 2.

Piping Hook-up (High Side Only Connection) See Figure 1

When applying the **Model HPP-4A-C3** Purge Unit to a ***Direct Expansion (DX) system*** or ***refrigerant storage vessel*** both the foul gas pick-up and liquid refrigerant return lines **MUST** be connected to the ***chiller condenser*** (storage vessel) as illustrated in Figure 1.

1) Using ¼" O.D. copper tubing (maximum 30 feet length) plum from the ***foul gas pick-up point*** on the chiller condenser (or storage vessel) to ***Inlet Solenoid Valve SOL-1*** on the HPP-4A-C3 unit***.*** Install ***filter-drier***, ***ball valves*** and ***moisture indicator*** from Installation Kit in the line as illustrated in Figure 1.

2) Using ¼" O.D. copper tubing (maximum 30 feet length) plum from the outlet port of the ***Liquid Return Pump*** to any point on the chiller condenser (or storage vessel) ***other than the foul gas pick-up point***. Typically this line is teed into the condenser pressure gauge line. Install ***moisture indicator*** from Installation Kit as illustrated in Figure 1.

WARNING: Connecting foul gas pick-up line and the liquid return line to the same point on the vessel will result in purge unit malfunction.

Piping Hook-up (High – Low Side Connection) See Figure 2

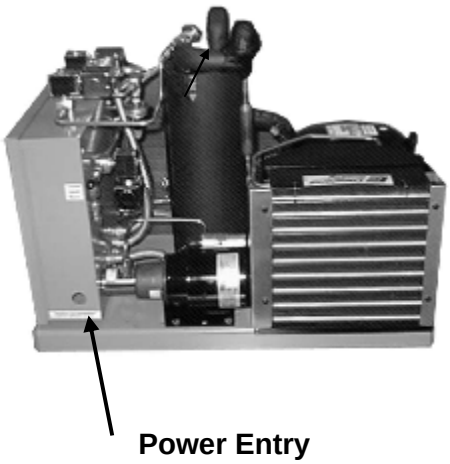
When applying the HPP-4A-C3 Purge Unit to a *flooded evaporator* system, such as a centrifugal chiller, the *liquid refrigerant line* may be routed to the evaporator as illustrated in Figure 2. However, either of the two piping methods illustrated in Figures 1 & 2 may be used. **READ WARNING BELOW!**

WARNING: Under no circumstance ever connect the liquid refrigerant return line of the HPP-4A-C3 Purge Unit to the low side or suction line of a reciprocating or any other positive displacement compressor. Doing so will result in catastrophic damage to the compressor. The liquid refrigerant line of the HPP-4A-C3 Purge Unit can ONLY be connected to the LOW SIDE of a FLOODED EVAPORATOR system.

Electrical Connections

WARNING: Be sure to open and lock-out all electrical disconnects to prevent possible injury or death caused by electrical shock.

The HPP-4A purge unit requires a single ***120 VAC, 60 HZ, 15 Amp Fused circuit.***



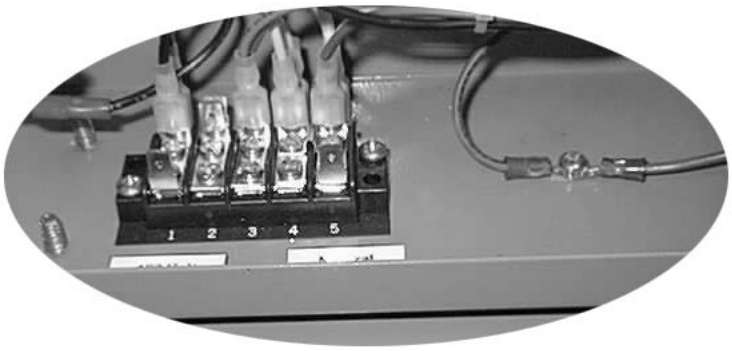
Connect 120 VAC power to HPP-4A terminal strip as follows:

1) Connect 120 Volt line to terminal 1
2) Connect neutral line to terminal 5
3) Connect ground wire to Ground Lug.

NOTE: The HPP-4A-C3 Purge Unit operates whether or not the chiller is operating and does not require a chiller run signal. Therefore, the 120 VAC power supply to the purge unit may be from any convenient power source.

Remote FAULT Alarm connections

Form-C relay **RLY-8** on the Microprocessor Board can be used to provide remote FAULT alarm enunciation.



Preliminary Power-Up and Checkout

Upon initial “power-up” the unit display will read:

Battery Fault
Press Reset

After resetting the display will change to read:

Select refrigerant type
Press enter

Programming Purger for System Refrigerant Type

NOTE: Failure to program the correct refrigerant type will cause improper purge operation and possible loss of refrigerant to the atmosphere during the exhaust cycle.

Preprogrammed Refrigerant Types

Before the **HPP-4A-C3** Purge Unit can be put into operation it must first be ***programmed for the refrigerant type*** **in the system being purged.** The microprocessor is preprogrammed with five most often used refrigerant types for you to choose from. If the refrigerant in your system is one of these go to “***Selecting a Preprogrammed Refrigerant Type”*** and make selection.

The five (5) preprogrammed refrigerant types are: R-12, R-134a, R-22, R-114 and R-502

However, if your refrigerant type is different from the preprogrammed refrigerants then proceed to ***“Manually Programming refrigerant Types”*** and manually program in the refrigerant type as instructed.

Selecting a Preprogrammed Refrigerant Type

1) Press ***“Refrigerant Type”*** keypad switch and enter the access code **“47”** by pressing key 4 and then key 7.

2) Using the ***Enter/Scroll key*** scroll through the five preprogrammed refrigerant types until the applicable refrigerant type is displayed.

3) Press the ***STOP key*** to enter refrigerant type selected then exit “Refrigerant Selection” mode. The display will change to read:

System ready
Select Mode

4) Press **“*Manual”*** or ***“Auto”*** keypad switch to begin purge operation. (see page 22)

Manually Programming Refrigerant Type

Find the applicable refrigerant type from the ***"Purge Exhaust Pressure (psig)"*** list below and program in the indicated ***purge exhaust initiate*** and ***purge exhaust terminate*** psig.

1) Flip switch #7 on DIP Switch to "ON" position.
2) Press Keypad Switch #6 and the display will ask for a code: enter 47.
3) Use the "Scroll Key" to view the following setting options:

- Max Exhaust (this is the purge exhaust initiate pressure setting)
- Min Exhaust (this is the purge exhaust terminate pressure setting)

4) First scroll to **"Max Exhaust"** and enter in the ***purge exhaust initiate psig.***
5) Next, scroll to **"Min Exhaust"** and enter in the ***purge exhaust terminate psig***.
6) Press the **"STOP"** key to enter values and exit programming mode.
7) Flip DIP **Switch #7** back to the **OFF** position.
8) Press ***"Manual"*** or ***"Auto"*** keypad switch to begin purge operation. (See page 22).

Purge Exhaust Pressure (psig)

NOTE: **The data provided in the following list is provided for general reference only! *It is the responsibility of the installer to double-check and verify saturated pressures corresponding to the initiate and terminate temperatures* indicated below by referring to the refrigerant manufacturer's published data, i.e. P/T chart. Redi Control, Inc. *will not accept responsibility* for accuracy of data or improperly entered values.**

Refrigerant Type		Purge Initiate (PSIG at 65ºF)	Purge Terminate (PSIG at 30ºF)
MO59	Isceon	90	42
MO79	Isceon	134	70
FR-12		55	21
Freezone		56	22
FX-220	Atochem, Forane	92	41
FX-40	Atochem	154	80
G2018c	China Sun Group	112	55
GHG-HP		65	27
GHG-X5		62	30
HC12a	OZ Technology	54	22
HX4	Hoechst	129	64
MP-33	DuPont	61	25

Continued next page

Refrigerant Type		Purge Initiate (PSIG at 65ºF)	Purge Terminate (PSIG at 30ºF
NARM-12	Moncton Refrigerants	85	38
NARM-22	Moncton Refrigerants	97	45
OZ-12	OZ Technology	45	16
R-400		30	10
R-401A	Suva, Genetron MP39	70	30
R-401B	Suva, Genetron MP66	76	33
R-401C	Suva MP52 (not marketed in U.S.)	56	22
R-402A	Suva HP80	138	71
R-402B	Suva HP81	128	64
R-403A	Isceon 60-S, Starten 69	123	62
R-403B	Isceon 69-L, RX1	130	67
R-404A	Suva HP62, Atochem FX-70	138	71
R-505A	ATG-405A, China Sun G2015	72	31
R-406A	Autofrost, McCool, GHG-406A, X3	52	20
R-407A	ICI Klea-60	116	55
R-407B	ICI Klea-61	133	66
R-407C	Suva 9000, Reclin HX3, Klea-66	106	50
R-407D	ICI Klea-407D	88	39
R-408A	Atochem FX-10	130	66
R-509A	Atochem FX-56	67	28
R-410A	Suva 9000, AZ-20	186	98
R-410B		184	97
R-411A	China Sun Group G2018a	98	46
R-411B	China Sun Group G2018a	109	54
R-412A	ICI Arcton (R) TP5R	71	31
R-413A	Isceon 49	70	30
R-414A	GHG-X4, Chill-it, Autofrost-X4	55	22
R-414B	ICOR Hot Shot	63	26
R-415A	Moncton, NARM 502	110	53
R-416A		60	20
R-500	Freon, Genetron, Isotron, etc.- 500	77	36
R-501		109	55
R-502	Freon, Genetron, Isotron, etc. – 502	126	65
R-507A	Genetron, Selkane, Reclin-507A	133	69
R-509A	ICI Arcton ® TP5R2	133	69

Figure 3 - Major Components - Side 1

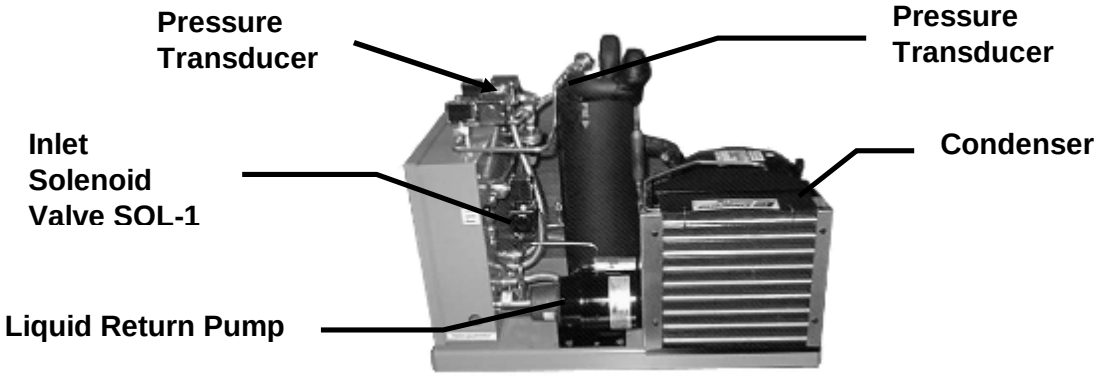


Figure 4 - Major Components - Side 2

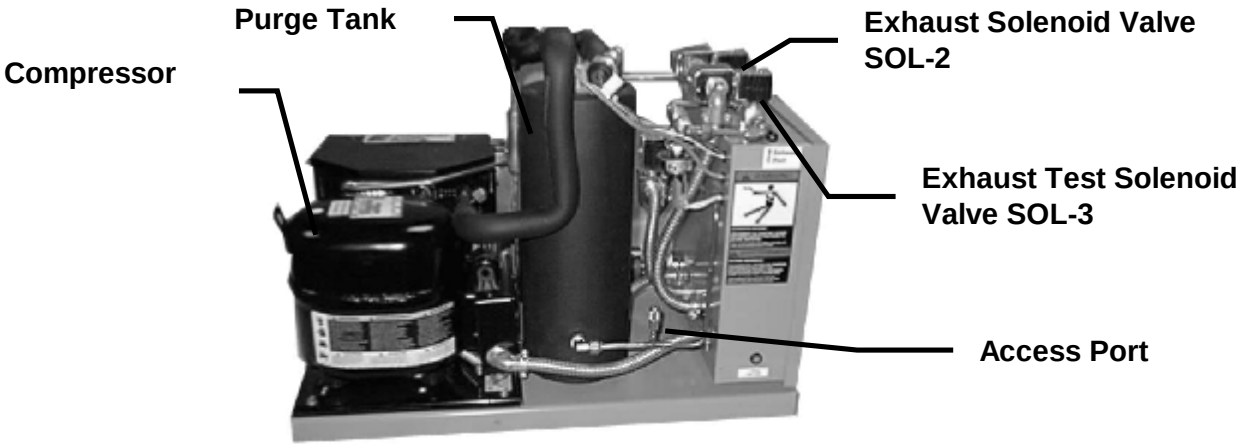


Figure 5 - Front & Inside Views of Electrical Box

Operating Sequence

Pre-Chill

Upon initial power-up or anytime power is interrupted and reapplied the purge unit will always start in the ***Pre-Chill mode***, the display will read:

Prechill
PT Temp XXX

In the Pre-Chill mode inlet solenoid valve SOL-1 is de-energized (closed) and the purge unit refrigeration compressor starts. The Pre-Chill cycle terminates when purge tank **evaporator temperature reaches 20° F**.

NOTE: Once pre-chill temperature has been reached from then on anytime during purge operation if purge tank temperature rises above 50° F, purge operation is terminated and a Temperature FAULT initiated. The display will read:

PT Temp Fault (purge tank temperature fault)
Temp XXX

Non-condensable Accumulation Cycle

Upon completion of the pre-chill cycle the purger enters the ***Non-condensable Accumulation*** cycle. During the Non-condensable Accumulation cycle the refrigeration system continues running and inlet solenoid valve SOL-1 is energized (opened). Refrigerant vapor and any non-condensables present (foul gas) flows from the condenser (storage vessel) into the HPP-4A purge tank.

The entering refrigerant vapor condenses and accumulates at the bottom of the purge tank while any non-condensables present accumulate at the top of the purge tank.

The Non-condensable Accumulation Cycle is a ***10 minute timed cycle***. The display will read:

Accumulating
Time mm:ss (minutes/seconds remaining in cycle)
Alternating With: **Auto or Manual** (indicates operating mode)

At the conclusion of each 10 minute non-condensable accumulation cycle a **Post-Chill** is initiated and purge tank pressure is tested for presence of non-condensables to determine if an ***Exhaust Cycle*** is necessary.

However, anytime the ***condensed refrigerant level*** in the purge tank rises to the ***middle float switch*** a ***drain cycle*** is initiated. During the drain cycle inlet solenoid valve ***SOL-1 remains energized*** (open), the refrigeration system continues operating and the ***Liquid Return Pump*** is energized. See Drain Cycle.

NOTE: The 10 minute non-condensable accumulation cycle is temporarily halted during the Drain Cycle. At the end of the drain cycle the non-condensable accumulation cycle resumes completing whatever time remains in the cycle.

Post-Chill

At the conclusion of each ***completed 10 minute non-condensable accumulation cycle*** a ***1 minute Post-Chill*** cycle is initiated. At the completion of the 1 minute Post Chill cycle purge tank pressure tested, via pressure transducer PT-1, to determine if an Exhaust Cycle is required. During Post Chill inlet solenoid valve SOL-1 is de-energized (closed) and the refrigeration system continues operating. The display will read:

Post Chill
mm:ss (seconds remaining in cycle)

The purpose of the Post-Chill cycle is to ***assure maximum separation of refrigerant vapor and non-condensables*** and determine if a non-condensable exhaust cycle is required. If at the conclusion of the post chill cycle pressure in the purge tank is ***higher*** than the ***purge exhaust initiate value***, as programmed during initial start-up, then a ***Non-condensable Exhaust Cycle*** is initiated. If the pressure is lower than ***purge exhaust initiate value*** then the exhaust cycle is bypassed and the purger initiates the next ***non-condensable accumulation cycle.***

Non-condensable Exhaust Cycle

During a ***Non-condensable Exhaust Cycle*** inlet solenoid valve SOL-1 is de-energized (closed) and the refrigeration system continues operating. ***Exhaust Solenoid Valves SOL-2 and SOL-3*** are both energized (opened) allowing non-condensables to exhaust through the ***flow restrictor*** to the atmosphere until purge tank pressure drops below the ***purge exhaust terminate*** value programmed at initial start-up. The display will read:

Exhaust
Tank PSI XXX (purge tank pressure)

At the conclusion of the Exhaust Cycle the next ***non-condensable accumulation*** **cycle** is initiated.

Post Exhaust - Solenoid Valve Test

On ***High Pressure Refrigerant*** purge systems it is absolutely imperative that the exhaust solenoid valve close tightly following each exhaust cycle. A leaky valve or failure of valve to close can result in ***catastrophic loss of refrigerant to the atmosphere***. Therefore, it is essential that a means be employed on high pressure purge units to detect a leaking or open exhaust solenoid valve and ***immediately stop refrigerant discharge***

Therefore, at the conclusion of each ***Non-condensable Exhaust Cycle*** both Exhaust Solenoid Valves **SOL-2** and **SOL-3** are monitored by ***Pressure Transducer PT-2*** for proper closure or leakage. If either exhaust solenoid valve fails the test, purge operation is immediately terminated and a ***Post Exhaust FAULT*** is initiated. The display will indicate:

Post Exhaust (post exhaust solenoid valve test)
Fault SOL-2 or SOL-3

An Exhaust Timeout FAULT is also initiated if the exhaust cycle fails to terminate after **2 minutes**. This usually indicates a Pressure Transducer PT-2 failure. The display will indicate:

Exhaust Timeout
FAULT Push Reset

WARNING: DO NOT attempt to resume operation until the cause of the fault is determined and corrected. Continual resetting of the Post-Exhaust Solenoid Valve Test FAULT will result in loss of refrigerant.

How the Exhaust Solenoid Test Functions

At the conclusion of each non-condensable exhaust cycle ***Fail-Safe Exhaust Solenoid Valve SOL-3*** immediately de-energizes (closes***)*** while the ***Primary Exhaust Solenoid Valve SOL-2*** remains energized (open) for an additional ***30 seconds.*** At the end of 30 seconds Primary Solenoid Valve SOL-2 (closes). The pressurized volume between the two solenoid valves is monitored by ***Pressure Transducer PT-2*** during the entire non-condensable accumulation cycle. If pressure increases, indicating a leaking or open SOL-2, a **SOL-2 FAULT** is initiated. If pressure decreases, indicating a leaking or open SOL-3, a **SOL-3 FAULT** is initiated. During the fault condition both exhaust solenoid valves are de-energized (closed) assuring that at least one of the two valves will prevent catastrophic discharge of refrigerant to the atmosphere until the defective solenoid valve has been replaced.

Drain Cycle

The Drain Cycle is controlled by the ***low*** and ***middle*** liquid level float switches of the tri-level float switch.

When condensed refrigerant level in the purge tank rises to the level of the ***middle*** float switch a ***drain cycle*** is initiated. During the drain cycle, inlet solenoid valve SOL-1 remains energized (open), the refrigeration system continues operating and the ***liquid refrigerant return pump*** is energized. The display will read:

Draining
Time mm:ss (time remaining in drain cycle)

The Drain Cycle is a ***60 second timed cycle*** that is terminated either when the liquid level reaches the ***Empty*** level float switch or the ***60 second*** timed period times out. At the conclusion of the Drain Cycle the current 10 minute non-condensable accumulation cycle resumes and completes whatever time remains.

Should the ***middle*** level float switch ***remain actuated for 60 seconds continuous***, indicating the liquid level is not dropping, a ***drain*** **FAULT** is initiated. The display will read:

Drain Fault

Most likely cause of Drain FAULT is a middle level switch failure. Other possible causes are; drain pump de-coupling or failure, closed valve or blockage in drain line, clogged inlet pump strainer, defective microprocessor board.

WARNING: DO NOT reset or attempt to operate purge until defective liquid level float switch has been replaced. Continued operation with defective liquid level switch will result in loss of refrigerant.

High Liquid Level FAULT

Should the ***middle*** level float switch fail to actuate on rising liquid level the liquid will continue rising until the ***upper*** level float switch is actuated. Should this occur, purge display will indicate:

Drain Fault
MFS Failure (middle float switch failure)

Most likely cause of FAULT is Middle Level Switch failure. Other possible cause, defective Microprocessor Board.

OPERATION

Keypad

Operation of the Model HPP-4A-C3 Purger is accomplished via a 16 Key LCD Display Keypad.

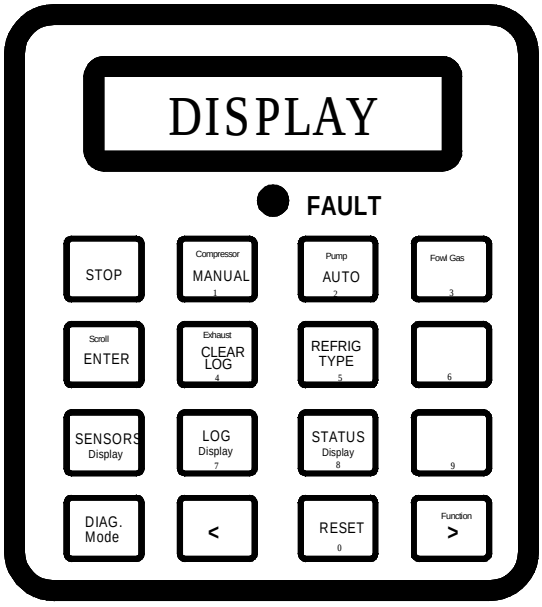


Figure 6 – Display Keypad

LCD Display

The panel LCD display is back lighted to facilitate viewing in low light ambient conditions. The back light is activated when any Keypad Switch is pressed. If the operator simply wishes to activate the back light, push the “STATUS” switch. The back light automatically goes off after 30 minutes of no keypad activity.

NOTE*:* The LCD back light automatically activates during any **“FAULT”** condition and remains activated until the “FAULT STATUS” is reset.

Keypad Switch Functions

All purge unit functions are controlled via the multi-function 16-switch keypad and a LCD display located on the front of the purge unit Electrical Box.

NOTE: Some keypad switches have multiple functions. The same switch may serve more than one purpose depending upon the mode you are in (e.g., the “CLEAR LOG” & “REFRIG TYPE” switches are also used to test the exhaust solenoids when in the “Diagnostic Mode”).

STOP Keypad Switch

The **STOP** keypad switch is used to terminate purge operation. Pressing the STOP Keypad Switch terminates purge operation regardless of current operating status.

MANUAL Keypad Switch

The **MANUAL** mode keypad switch is used to initiate manual purge operation. Once manual operation is initiated the purger will run continuously until operation is terminated by depressing the STOP Key. The display will read:

Manual Mode
R-type (type for factory programmed refrigerants and **Custom** for field programmed)

AUTO Keypad Switch

The **AUTO** mode keypad switch is used to initiate automatic purge operation. When in the "AUTO" mode, the purger will **duty cycle ON** and OFF based on purge exhaust activity. If there are no non-condensables exhaust cycles during three consecutive non-condensable accumulation cycles the purger will **duty cycle** "**Off" for 90 minutes**. At the end of 90 minutes, the purger will initiate another 3-cycle sequence. The display will read:

Auto Mode
R-type (programmed refrigerant type)

NOTE: *The purger will continue operating in the* ***ON Duty Cycle*** *mode as long as there is purge exhaust activity.*

ENTER Scroll Keypad Switch

When in the **Sensors Display, Log Display** or **Refig Type** mode, the **ENTER Scroll** keypad switch is used to scroll through the various displays.

CLEAR LOG Keypad Switch

The **CLEAR LOG** keypad switch is used to **clear or zero out the Last 24-Hour purge exhaust log**. Data may be cleared at anytime by pressing the **CLEAR LOG** key followed by depressing **RESET**.

LOG Keypad Switch

The **Log** keypad switch is used to display log values then use the Enter key to scroll through displays (see page 25 for log items displayed).

STATUS Keypad Switch

The **Status** keypad switch allows operator to display current purge unit operating mode. The STATUS keypad switch can also be used to exit LOG, CLEAR LOG, and SENSOR Display.

DIAG. (Mode) Keypad Switch

The **DIAG. Mode** keypad switch is used to enter the Diagnostics Mode. The DIAG. Mode can only be accessed by depressing the DIAG. Key and then entering the **access code number. (See "Diagnostic Mode" beginning on Page 27 for Operation of Diagnostics.)**

SENSOR Keypad Switch

The **Sensor** keypad switch is used to display sensor values. Use the Enter key to scroll through displays, i.e. temperature sensor and pressure transducer.

RESET Keypad Switch

The **RESET** keypad switch is used to re-initiate purge operation following a purge fault condition (see "FAULT DISPLAYS" on Page 25). RESET is also used in conjunction with the CLEAR LOG Key (page 22) to reset (*clear*) the "LAST 24-Hour" Purge Exhaust Log.

(Compressor) Keypad Switch

The **(Compressor)** keypad switch is used when in the DIAG. Mode to operate and test the purge unit'' refrigeration system (see "Diagnostic Mode" on Page 27).

(Pump) Keypad Switch

The **(Pump)** keypad Switch is used when in the DIAG. Mode to operate and test the Liquid Return Pump (see "Diagnostic Mode" on page 27).

(Foul Gas) Keypad Switch

The **(Foul Gas)** keypad switch is used when in the "Diagnostics" Mode to manually operate the Inlet Solenoid Valve SOL-1 (see "Diagnostic Mode" on Page 27).

(Exhaust) & Refrig. Type Keypad Switch

The **(Exhaust)** keypad switch is used when in the DIAG. Mode to test operation of the Exhaust Solenoid Valves SOL-2 (see "Diagnostic Mode" on Page 27).

(Refrigerant Type) Keypad Switch

The **(Refrigerant Type)** keypad switch is used when in the DIAG. Mode to test operation of the Exhaust Test Solenoid Valve (see “Diagnostic Mode” on Page 27).The Refrigerant Type keypad switch is **ONLY** used at initial start-up to ***initially program in the refrigerant type being purged***.

NOTE: Failure to program the correct refrigerant type will cause improper purge operation and can result in serious loss of refrigerant.

Sensor Displays

Purge Tank Pressure

Displayed: **Purge Tank**
Psig XXX

Purge Tank Temperature

Displayed: **Purge Temp**
Degree F

Exhaust Pressure

Displayed: **_____ psig**

Software Version

_____ Indicates microprocessor software version.

Log Display

Last 24-hour Exhaust (log)

The microprocessor controller continuously monitors and displays daily purge exhaust activity. This log is called **"Last 24-hour Exhaust Log".**

Displayed **last 24 hr**
Num of ex xxx (xxx = number of exhausts)

This display indicates an average number of exhaust cycles that has occurred during the previous 24-hour. This log may be reset to zero ("0") at any time (see "CLEAR LOG" on page 22).

Selected Refrigerant Type (log) Displays programmed refrigerant type.

Displayed **refrigerant**
selected r-XXX (r-xxx = refrigerant type)

Exhaust Set Points

Displayed **Maximum**
Minimum)

Software Version

_____ Indicates microprocessor software version.

Fault Displays

Purge Tank Temperature Fault (Purge Tank temperature above 50° F)

Displayed: **PT Temp Fault**
Temp XXX

Temperature Sensor Fault (probable causes; defective temperature sensor or microprocessor board)

Displayed: **T sensor fault**
Temp XXX

Pressure Transducer Fault (probable causes; defective pressure sensor or microprocessor board)

Displayed: **PT-1 or PT-2 Fault**
Press XXX

Post Exhaust Test Fault

(Test leakage of Solenoids 2 or Solenoid 3)

Displayed: **Post Exhaust**
Fault SOL-2 or SOL-3

Exhaust Time-out Fault

(Possible causes; failed Solenoid 2 or Solenoid 3 or plugged exhaust line)

Displayed: **Exhaust Timeout**
Fault Push Reset

Drain Fault (probable causes; closed drain valve, pump failure, stuck middle float switch, etc.)

Displayed: **Drain fault**

High Liquid Level Fault (probable cause middle float switch failure)

(Test for failure of middle level float switch)

Displayed: **Drain fault**
MFS Failure

Battery Fault (probable causes; Unit power OFF 10 days or longer or battery defective)

Displayed: **Battery Fault**

The microprocessor board incorporates a permanent ***self-charging*** back-up battery that prevents loss of critical data during power-down or power failure. The battery will maintain stored data for approximately 10 days. Battery failure can occur when the purge unit is without power for a long period of time.

NOTE: Following a Battery FAULT allow purge unit to stand 2 hours with power ON before attempting to RESET.

Diagnostic Mode

The Diagnostic Mode allows the operator to test and /or troubleshoot the various purge unit components by allowing manual operation, either individually, all at once, or in any combination, **see Warning below**.

To enter the **Diagnostic Mode,** press the DIAG. Key. The display will read:

enter code

Immediately enter access code number **"47"** by depressing the **"4"** and **"7"** numbered Keypad Switches.

NOTE: There is a 10-second time limit to enter the access code number. If either the 10-second time limit is exceeded, or if an improper keystroke entry is made, the "DIAG." Mode will automatically self abort.

Once the proper access code has been entered, the display will change to read:

Diagnostics Mode
Outputs (C,P,I or E)

The operator may now manually start and stop the components listed below. The active component or components will be indicated and displayed as:

C = Condensing Unit
P = Liquid Return Pump (To test Pump install jumper between analog pins 9 and 12)
I = Inlet Solenoid Valve
E = Exhaust Solenoid
2 = Test Exhaust Solenoid

To exit the Diagnostic Mode, depress the "STOP" Keypad Switch.

WARNING: Opening both the "Inlet" and "Exhaust" Solenoid Valves simultaneously will allow pressurized refrigerant vapor to escape from the refrigeration system through the purge unit to the atmosphere.

NOTE: Purge activity ceases when unit is in the Diagnostic Mode.

(Compressor) Keypad Switch

The "Compressor" Keypad Switch is used in the DIAG. Mode to manually operate the purge unit'' refrigeration system.

(Pump) Keypad Switch

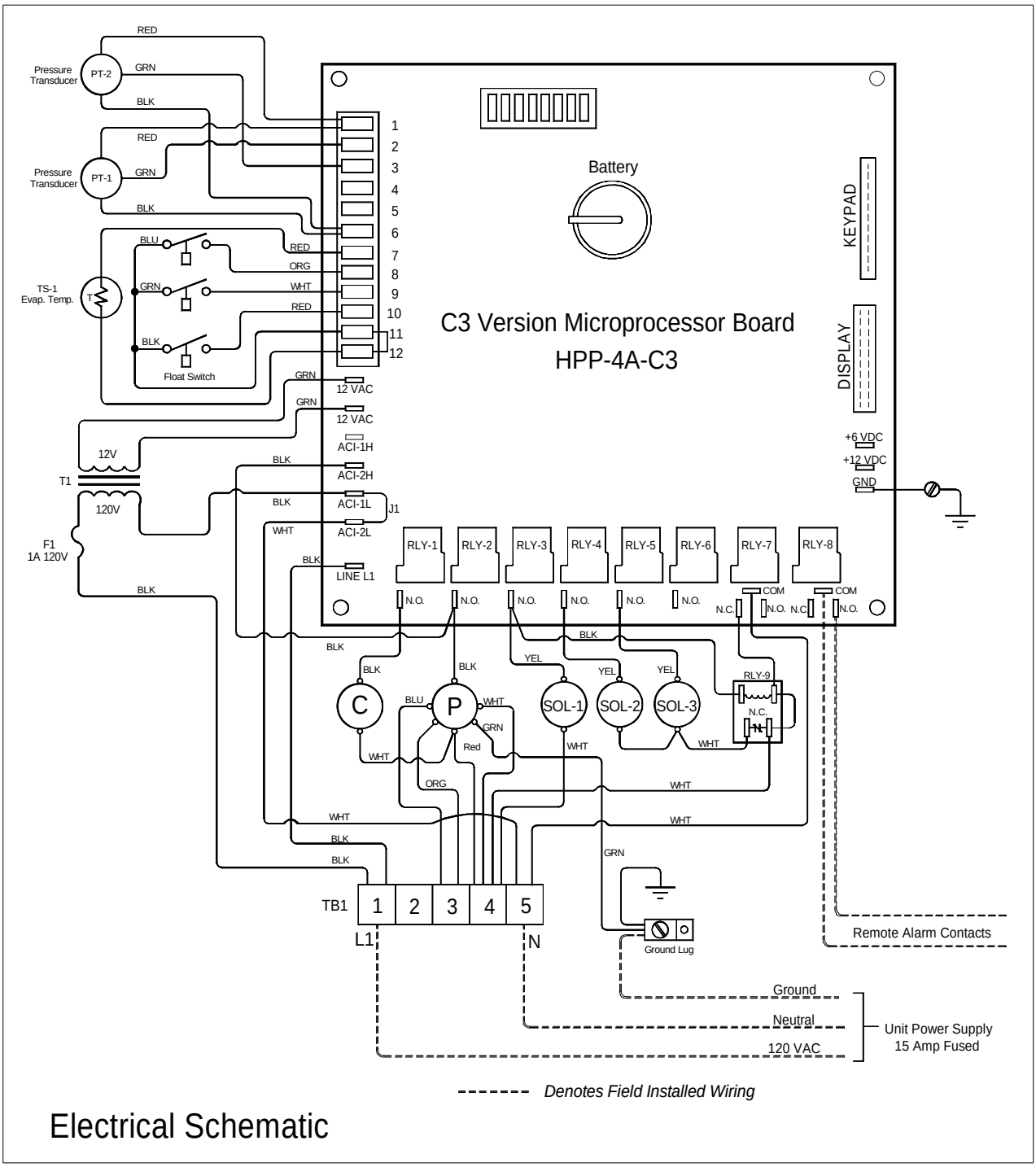
The “Pump” Keypad Switch is used when in the “Diagnostics” Mode to manually operate the Liquid Drain Pump.

(Foul Gas) Keypad Switch

The “Foul Gas” Keypad Switch is used when in the “Diagnostics” Mode to manually operate Inlet Solenoid Valve SOL-1.

(Exhaust) & (Refrig Type) Keypad Switches

The “Exhaust” & “Refrig Type” Keypad Switches are used in the DIAG. Mode to test operation of Exhaust Solenoid Valve SOL-2 and Fail Safe (Test) Solenoid Valve SOL-3.



Electrical Schematic

Figure 7 - Electrical Schematic

MAINTENANCE

Periodic Maintenance

The following maintenance procedures are required to assure efficien t and reliable purge operation.

Weekly

Check the foul gas pick-up line moisture indicator. If indicator shows ***wet*** replace filter-dryer.

NOTE: it is absolutely imperative that the filter-drier be properly maintained. Excessive moisture accumulation will cause purge operation problems and possible damage.

Semi-Annually

Clean the refrigerant system air-cooled condenser coils. Using compressed air, blow out dust from coils from the fan side.

Trouble Shooting the Microprocessor Board

Troubleshooting Chart

Symptom	Cause	Solution
All circuit board LED's off.	No Power to board F1 Fuse blown	Restore power Replace Fuse
Fuse is good, Verify 12 volts AC @ the two spade terminals labeled 12 VAC and 12 VAC (green wires) on the left side of the circuit board.	If there is no voltage, transformer T1 is defective	Replace Transformer
There is 12 VAC, but the circuit board does not function. Verify that there is +5 volts DC between terminals labeled +5V and GND. Also Verify that there is +12 volts DC between terminals labeled +12V and GND on the circuit board.	If either of these voltages are not present, the Circuit Board is defective	Replace Circuit Board

REDI CONTROLS, INC.

Equipment Warranty

Within one year from the date of purchase, REDI CONTROLS will repair any REDI CONTROLS' 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 unit to the address below, or other location as REDI CONTROLS directs, freight prepaid.

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

- Damages beyond REDI CONTROLS**'** control.
- Malfunctions that result from failure to properly install, operate or maintain a product in accordance with instructions provided by REDI CONTROLS.
- Failures of equipment due to abuse, accident or negligence.
- Damages from, or part failures due to equipment not being installed per REDI CONTROLS' instructions, per applicable codes or ordinances, or in accordance with good trade practices.
- Labor or other charges incurred in removing or reinstalling any REDI CONTROLS product or part.
- Damages resulting from use of a REDI CONTROLS 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 REDI CONTROLS product.

Inquiries to: REDI CONTROLS at 755 E. Main Street, Greenwood, Indiana, 46143

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