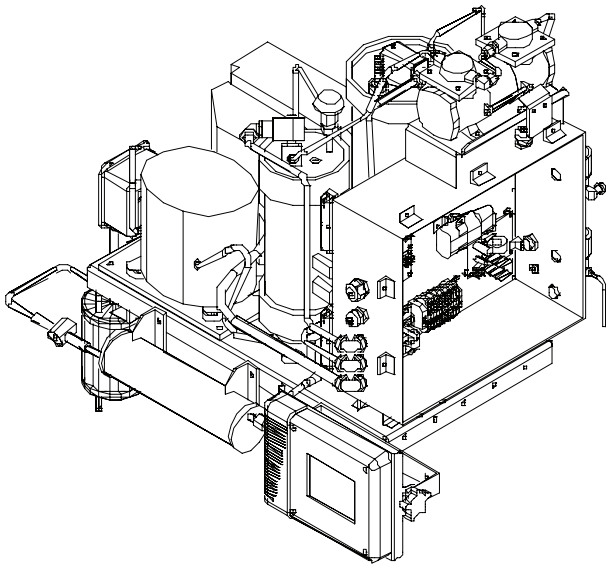
Installation Instructions

EarthWise™ Purge



Model Number PRGF

X39640653040

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

August 2020 **PRGF-SVN001B-EN**

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠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, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

Important 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 according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and 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 follow them.

⚠WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state electrical codes.

⚠WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- **All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.**
- **Non-Trane personnel should always follow local regulations.**

Copyright

Trademarks

Revision History

- Change to PRGF with R513a refrigerant for the condensing unit.
- Changes to Chiller RUN Section
- Model Number Description
- Clarification of text in various areas
- Model PRGD
- Incorporate R404a Condensing Unit
- Redesigned Purge Tank
- CH530 Controls
- Automatic Carbon regeneration.
- Updated for Trane Technologies.

Table of Contents

Model Number Description

All standard Trane products are identified by a multiple character model number that precisely identifies a particular type of unit. An explanation, of the alphanumeric identification codes used for Trane EarthWise™ purge units, is provided on this page. Its use will enable the owner/operator, installing contractors, and service engineers to define the operation, components and options for any specific unit.

P	R	G	F	A	1	1	1	A	A	0
1	2	3	4	5	6	7	8	9	10	11

Digit 1,2,3 PRG = Purge

Digit 4 – Development Sequence

F = EarthWise purge

Digit 5 – Enclosure Type

A= Standard Enclosure
B= NEMA4 style
C= NEMA4 style with Heresite Condensing Unit
S= Special*

Digit 6 – Control Options

0= Without Power Supply
1= With Power Supply

Digit 7 – Control Interface

1= Purge Interface
0= Chiller Interface

Digit 8 – Hertz

1= 115/60/1
2= 110/50/1

Digit 9 – Vacuum Pump

A= Standard Vacuum Pump
B= High Vacuum Pump

Digit 10,11 – Design Sequence

A0= 1st Design Sequence

General Information

Specifications

Performance Specifications	
Electrical Power Requirements ***Note:*** *Voltage range is +10%, -15%*	115 Vac, 60 Hz, 1-Phase, 10.3 Amps 110 Vac, 50 Hz, 1-Phase, 10.3 Amps
Fault Relay Output Rating	120 Vac, 1 Amp
Operating Environment	34° F (1°C) to 110° F (43°C); 5% to 95% relative humidity, non-condensing
Storage Environment	-40° F (-40°C) to 150° F (66°C); 5% to 95% relative humidity, non-condensing
Mounting	Direct-mounted on condenser shell above liquid-level of highest condenser. Optionally mounted below condenser using liquid separator.
Dimensions (Approx.)	25" high (635 mm) x 31 1/2" wide (800 mm) x 23 1/8" deep (587 mm) with filter drier canister and DynaView installed
Weight	140 lbs. (64 Kg) with filter drier canister installed

⚠WARNING

Hazardous Service Procedures!

Failure to follow all precautions in this manual and on the tags, stickers, and labels could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, MUST follow precautions in this manual and on the tags, stickers, and labels, as well as the following instructions: Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized.When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks.

Purge Nameplate

The nameplate is located on the top of the control panel. Always provide the model number, serial number and product description information from the nameplate when making inquiries, or ordering parts or literature for the purge unit.

Figure 1. Typical purge nameplate

TRANE

MODEL NO: PRGFA001AA0
SERIAL NO: L18G09795

RATED VOLTAGE;110/50/1, 115/60,1
TOTAL UNIT AMPS:10.3 AMPS
MIN CKT AMPACITY:12.3 AMPS
MAX OVERCURRENT
PROTECTIVE DEVICE:15 AMPS

FACTORY CHARGED:.1.00 LBS OF R513A
DESIGN PRESSURE:HIGH SIDE 335 PSIG
LOW SIDE 175 PSIG

UNIT SUITABLE FOR USE WITH
REFRIGERANTS:R123, R11, R113

SERVICE LITERATURE:PRGF-SVN01A-EN
PRGF-SVX001A-EN

MANUFACTURED UNDER ONE OR MORE OF THE
LISTED U.S. PATENTS OWNED BY
AMERICAN STANDARD INC.: 5,031,410

EarthWise™ Purge Conversion Package

The Trane EarthWise purge conversion package is designed for application on low-pressure centrifugal chillers, whether electrically or pneumatically controlled.

Note: *The EarthWise purge is not designed to be applied to air-cooled chillers.*

Conversion Package Contents

Each EarthWise purge conversion "kit" includes the items shown in Figures 3 through 5 as well as the items described below that are field provided.

Field Provided Items

In addition to the factory provided components in the conversion kit, the items listed below must be provided by the installer:

- Custom brackets (if needed) to mount purge on condenser
- Electrical conduit and inter-connection wiring (if needed)
- Miscellaneous electrical connectors
- 1/4" copper refrigerant tubing
- 3/8" copper refrigerant tubing
- 5/8" copper refrigerant tubing
- Copper couplings, flare nuts, and tees
- 5/8" OD ball valve (required for units with heat recovery or auxiliary condensers only)
- Insulation for 5/8" vapor line
- 3/8" black nylon tubing for line to outside vent
- Evaporator shut off valve for 1/4" regeneration line
- Thermal grease
- See optional purge valve kit (below) for other field provided items
- Insulation as required

Optional Purge Valve Kit

The following items are sold as a recommended option. All of the parts listed below must be compatible with R-123, R-11, and R-113.

Note: *If the optional purge valve kit is not purchased, these parts must be field provided.*

- 1/4" NPS tee
- 1/4" C ball valve
- 1/4" coupling
- 3/8" NPS tee
- 3/8" C ball valve
- 3/8" coupling
- 7/8" ftg x 5/8" C bushing
- 7/8" ftg x 7/8" elbow
- Coupling
- 5/8" C x 1.2" NPTE adapter
- 1/2" NPS elbow
- 5/8" ODS ball valve

Conversion Package Inspection

Before installing the new purge, compare the data on the purge nameplate with the corresponding ordering and shipping information to verify that the proper conversion package was shipped.

If a thorough inspection of the conversion package reveals damage or material shortages, file a claim with the carrier immediately. Specify the extent and type of damage found, and notify the appropriate Trane sales office.

Do not install a damaged purge unit without the Trane sales representative's approval!

Note: *The purge's sealed refrigeration system can be easily bench tested through temporary connection of 110 Vac power to the purge at the time of inspection. See the unit wiring diagram for connection points.*

Table 1. Description of contents in purge conversion kit (some components for units ordered with human interface only)

Number	Description	Qty	Only in Units with Human Interface
1	Bracket; Purge mounting	2	
2	Screw; 0.25-20 x 1.00 thd rolling	4	
3	Module; DynaView	1	X
4	Bracket; Human Interface mtg	1	X
5	Nut; 8-32 hex lock	4	X
6	Bushing; 0.75 ID x 1.00 OD snap	1	X
7	Cable; 4 stranded	1	X
8	Bracket; Human Interface unit mtg	1	X
9	Screw; 0.25-20 x 0.50 thd rolling	2	X
10	Insulation; 3" x 5" temperature well	2	X
11	Knobs; 0.31-18 with studs	2	X
12	Screw; 8-32 x 2.0 (attached to DynaView)	4	X
13	Cable Connector; (attached to DynaView)	1	X
14	Filter Drier	1	
17	Screw; 0.25-20 x 0.50 thd rolling	2	
19	Seal; 0.38 O-ring face	2	
21	Sight Glass	1	
22	O-ring (attached to filter drier)	2	
23	Tube; 0.375 OD	1	

Figure 2. Purge mounting

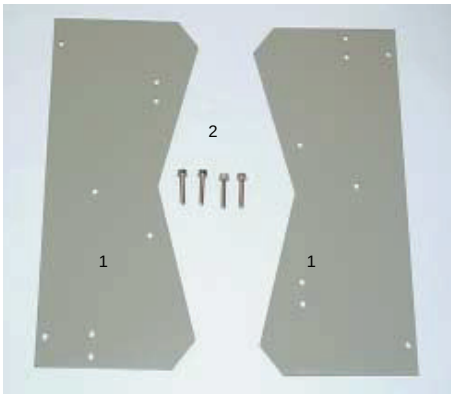
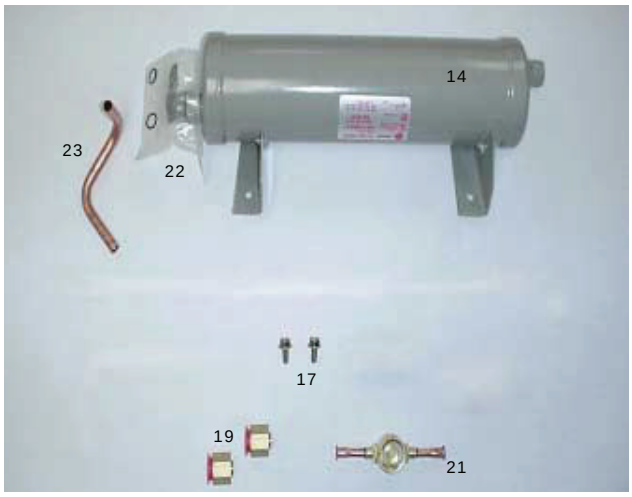


Figure 3. Human interface mounting (units ordered with human interface only)

Figure 4. Filter drier assembly



Installation

Removing Old Purge Unit

Replacing an existing purge unit with the new EarthWise™ purge requires that the existing purge system be disconnected and removed from the chiller. To be certain that the retrofit procedure is performed properly, carefully review the instructions in this section.

⚠WARNING

Explosion Hazard and Deadly Gases!

Failure to follow all proper safe refrigerant handling practices could result in death or serious injury. Never solder, braze or weld on refrigerant lines or any unit components that are above atmospheric pressure or where refrigerant may be present. Always remove refrigerant by following the guidelines established by the EPA Federal Clean Air Act or other state or local codes as appropriate. After refrigerant removal, use dry nitrogen to bring system back to atmospheric pressure before opening system for repairs. Mixtures of refrigerants and air under pressure may become combustible in the presence of an ignition source leading to an explosion. Excessive heat from soldering, brazing or welding with refrigerant vapors present can form highly toxic gases and extremely corrosive acids.

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

Preparation

Before actual removal of the old purge system can begin, perform the following procedures to prepare the unit for the removal procedure.

1. Shut the chiller down and disconnect all electrical power.
2. Remove refrigerant charge from the chiller.
3. Evacuate the chiller to 4 mm Hg (0.53 kPa) to remove all refrigerant vapor.
4. Pressurize chiller with dry nitrogen until the evaporator pressure gauge indicates 0 psig.
5. Close the angle valve on the condenser to isolate the purge tank refrigerant inlet line.
6. Close the angle valve on the evaporator (if present) to isolate the purge tank liquid return line or carbon tank regeneration.

Purge Removal Procedure

Disconnecting Electrical Connections

Disconnect all electrical connections at the connection points provided in the existing purge unit control panel and in the chiller control panel.

Purge Water Connections

Disconnect the existing water supply and return lines to the purge tank (if applicable). These lines may be capped off or dismantled since the EarthWise™ purge system does not require water connections.

Purge Refrigerant Connections

1. Disconnect and remove the existing vapor line (if not 5/8″) from the unit condenser to the purge compressor inlet. This line will be replaced with a 5/8″ line from the condenser to the new purge tank inlet connection during the purge installation procedure.
2. Remove the existing 1/2″ shutoff valve (if present) from the fitting on the condenser shell. This valve will be replaced during the purge installation procedure.
3. Disconnect the 1/4″ copper liquid return line from the purge tank to the shutoff valve on the evaporator or condenser (if present). The liquid return line must be 3/8″.

Note: *The 1/4″ line may be reused for the carbon regeneration line if the length is sufficient.)*

4. Remove the shutoff valve from the evaporator or condenser if it is not 3/8″ or larger.

Removing Old Purge Unit

Usually, the existing purge unit is mounted on an integral base located on the upper surface of one of the unit condensers. Unbolt the base from its mounting brackets and remove the purge unit from its mounting location.

⚠CAUTION

Heavy Objects!

Proper lifting equipment must be present to remove the existing purge and mount the EarthWise™ purge. Use of a step ladder may be necessary. Failure to follow these safety procedures may result in minor injury or equipment damage.

EarthWise™ Purge Installation

Replacing an existing older model purge unit with the EarthWise purge requires a number of wiring and hardware changes. To insure that the EarthWise purge retrofit procedure is performed properly, carefully review the instructions in this section.

Important: *Record a detailed description of changes made during the purge retrofit process. Be sure to add a copy of this report to the permanent chiller record for future reference.*

General

The EarthWise purge is designed to be adapted for use on low-pressure centrifugal water chillers. In order to insure proper purge unit operation, the pressure differential between the purge condensing tank and the chiller condenser must be kept to a minimum. If this differential is too high due to flow restrictions or liquid buildup on the purge unit suction side, the purge tank will not drain properly.

Purge Mounting Location

The purge assembly must be mounted above the liquid level of the chiller's highest condenser. A liquid refrigerant separator may be necessary if the purge needs to be mounted below the chiller's condenser liquid level (refer to the "Liquid Refrigerant Separator (Optional)"section in this manual). For proper operation of the gravity liquid return, a minimum pressure drop must exist between the chiller condenser and the purge (Refer to "Purge Vapor Line Construction," p. 15"). If the unit is equipped with a heat recovery or an auxiliary condenser, refer to "Auxiliary Condenser and Heat Recovery Units," p. 16" section in this manual.

Important: *For proper purge unit operation, the chiller condenser purge gas connection must include the 5/8" ball valve. Any liquid that forms in the 5/8" line must run back to the condenser or an external line heater must be installed on the 5/8" line near the condenser shell to boil off any accumulated refrigerant.*

⚠CAUTION

Equipment Damage!

The EarthWise purge unit must be configured to accommodate R-11 refrigerant through the DynaView when used with an R-11 chiller. Refer to the "Human Interface," p. 11 section of this manual. Failure to follow this safety precaution could result in equipment-only damage.

Figure 5. Typical unit top dimensions and layout

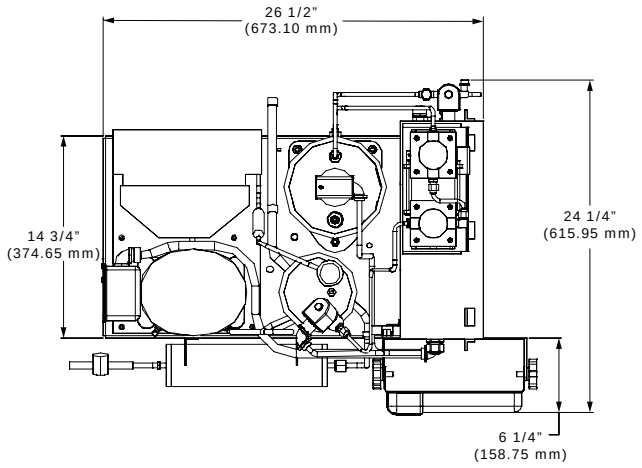
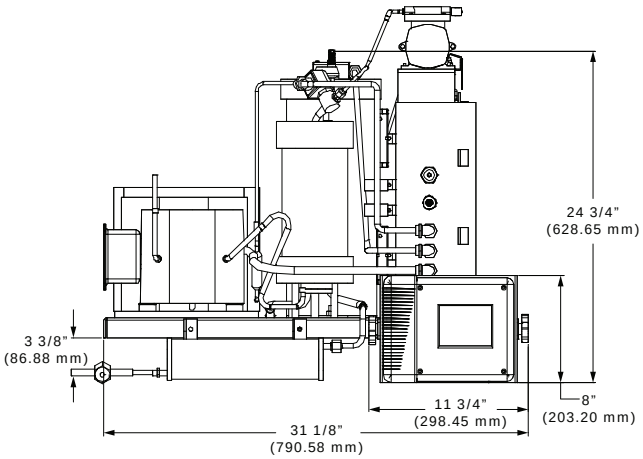


Figure 6. Typical unit front dimensions and layout



Mounting Procedure

⚠CAUTION

Heavy Objects!

Proper lifting equipment must be present to remove the existing purge and mount the EarthWise™ purge. Use of a step ladder may be necessary. Failure to follow these safety procedures may result in minor injury or equipment damage.

Purge

The EarthWise purge unit is mounted on an integral base as shipped. Mount the purge unit on the mounting brackets, using four (4) 1/4-20 thread-forming screws (brackets and screws provided in conversion kit).

Position the purge assembly at the proper mounting location and weld the brackets to the upper surface of the chiller's highest condenser.

Note: *If the mounting brackets provided in the conversion kit cannot be used, it will be necessary to fabricate custom brackets to mount the purge on the condenser.*

Important: *Always check chiller model number and condenser nameplate to determine if condenser is an ASME-coded vessel. If it is, all applicable ASME and local codes concerning repairs to coded vessels must be observed.*

Human Interface

The human interface ships separate from the purge unit. It can be removed and relocated elsewhere on the chiller or to another convenient location near the chiller. See Figure 7.

The Aftermarket purge requires the refrigerant type to be set manually through the human interface (DynaView).

To change the refrigerant type in the human interface (DynaView), follow the steps below:

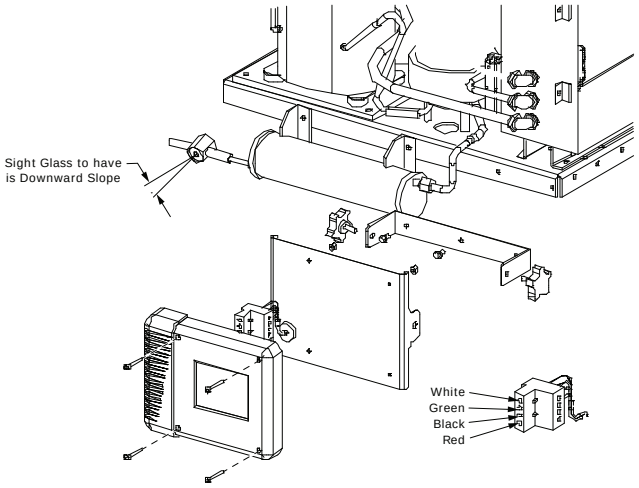
1. Select the "Settings" tab.
2. Select "Purge" from the menu.
3. Select "Refrigerant Type" from the menu.
4. Choose the correct refrigerant for your chiller.
5. Return to the previous menu and verify that the correct refrigerant is shown for refrigerant type.

⚠CAUTION

Equipment Damage!

The EarthWise purge unit must be configured to accommodate R-11 refrigerant through the DynaView when used with an R-11 chiller. Refer to the Human Interface section of this manual. Failure to follow this safety precaution could result in equipment-only damage.

Figure 7. Filter drier canister mounting connections/ human interface



Thermal Well

The liquid return line temperature does not ship with the temperature probe inserted into the well. The probe must be inserted into the well. Be sure that there is adequate thermal grease in the well.

Electrical Connections

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

Electrical wiring for the EarthWise™ purge unit requires that four power connections be made to the chiller control system; two connections for power from the chiller control panel and one from the chiller RUN signal.

Electrical requirements are:

- 115 Vac, 60 Hz, 1-Phase, 10.3 Amps.
- 110 Vac, 50 Hz, 1-Phase, 10.3 Amps.

Note: *Voltage range is +10%, -15%*

Note: *Use Class 1, 14 AWG copper wire and metal conduit. All field-installed wiring must comply with applicable NEC and local electrical codes.*

Important: *Do not run Purge AC power supply circuit in same conduit with any low-voltage (<30 Volt) wiring.*

Power Wiring

The 115 Vac main hot line should be connected to the fused purge output or to a similar connection point in the chiller control panel that previously provided power for the original purge unit. See Figure 8 and Figure 9.

Use the 7/8" (22 mm) diameter hole on the back side of purge control panel for 115 Vac power access. Power supply terminations must be field connected to terminals 3X1-2 (Hot) and 3X1-7 (Neutral) in purge control panel.

Chiller RUN Signal

A 115 Vac chiller run signal must be supplied to 3A6, J2-2 whenever the chiller is running. The Dual High Voltage Input LLID looks for a 115 Vac potential difference across J2-2 and J2-1 to indicate the chiller is on. This signal may be sourced from 3X1-4 and switched using a field-supplied relay, or this signal may come from the hour meter, start counter, or similar device that can provide 115 Vac whenever the chiller is on.

If the Chiller RUN Signal is sourced from 3X1-4, a field-supplied, normally open relay (5K91) will be required. The contacts must be wired between 3X1-4 to 3A6, J2-2. The relay coil must be energized from the chiller control panel by wiring it in parallel with the hour meter, start counter, or other similar device that is only energized when the chiller is operating. The common terminal (3A6-J1) should be returned to the purge neutral (3X1-8).

Alternatively, a Chiller RUN Signal may be provided to 3A6, J2-2 with a 115 Vac source directly from the hour meter, start counter, or other device that is powered only when the chiller is on. The common terminal (3A6, J2-2) should be returned to the purge neutral, 3X1-8. See Figure 8.

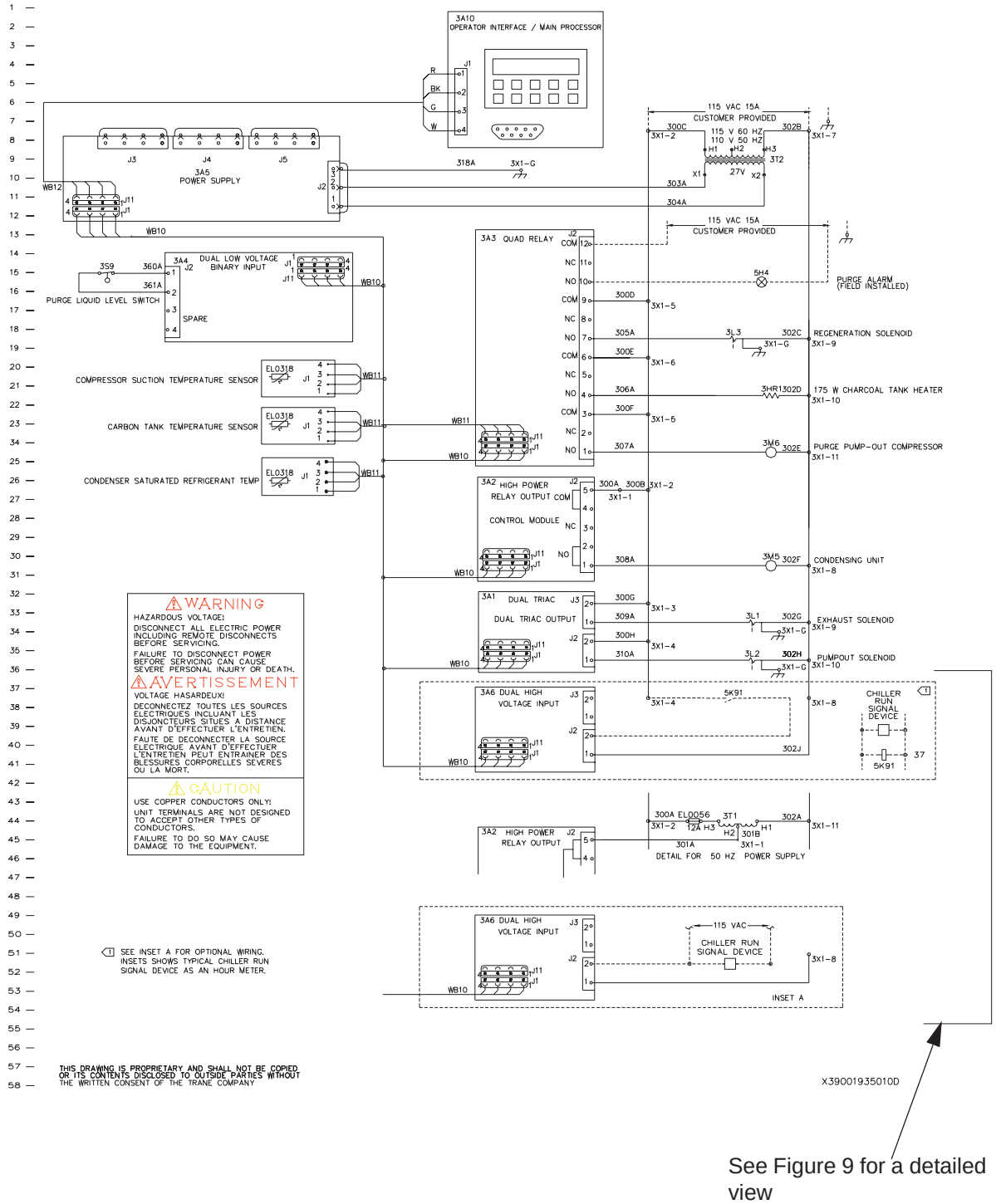
Remote Human Interface

Guide the DynaView Cable (Item #7 of Figure 3) through the control panel, Human Interface Bracket, and Bushing (Items #4 and 6 of Figure 3) before connecting the Cable Connector (Item #13 of Figure 3). Connect the Cable Connector as shown in Figure 7.

If the retrofit human interface is remotely mounted from the purge, factory wiring must be replaced. Maximum wire length is 25 feet (7.6 m).This is not provided on chillers that have CH530 or AdaptiView controls.

The purge based human interface is not provided on chillers with CH530 style controls. For these systems, the CenTraVac controls provide the interface duties.

Figure 8. EarthWise™ purge field wiring



See Figure 9 for a detailed view

Figure 9. Detailed view of the EarthWise™ purge field wiring

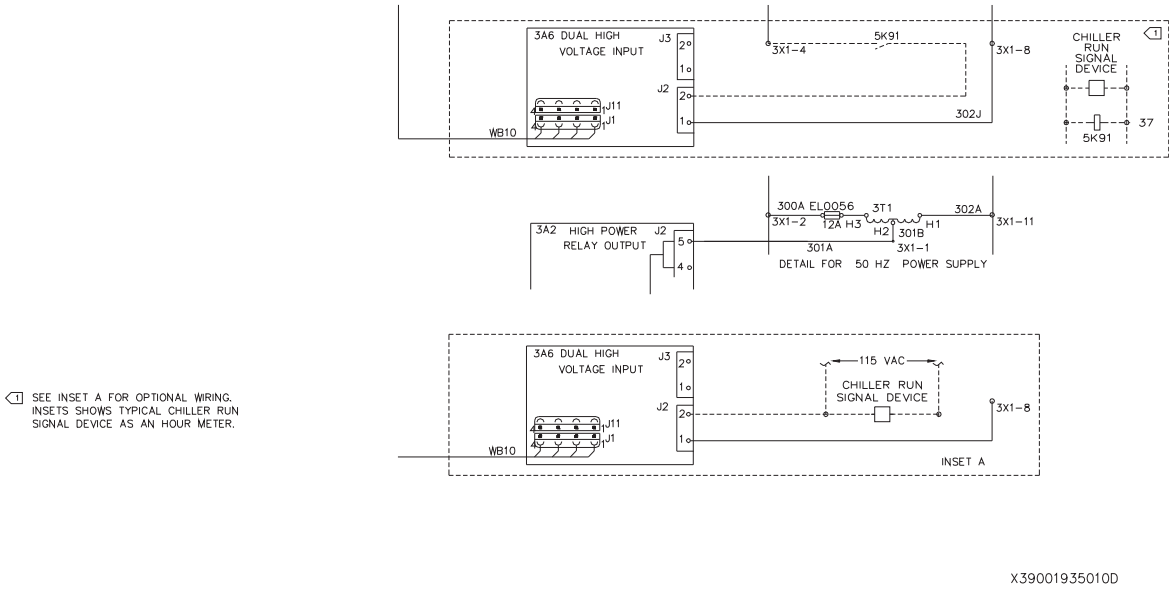
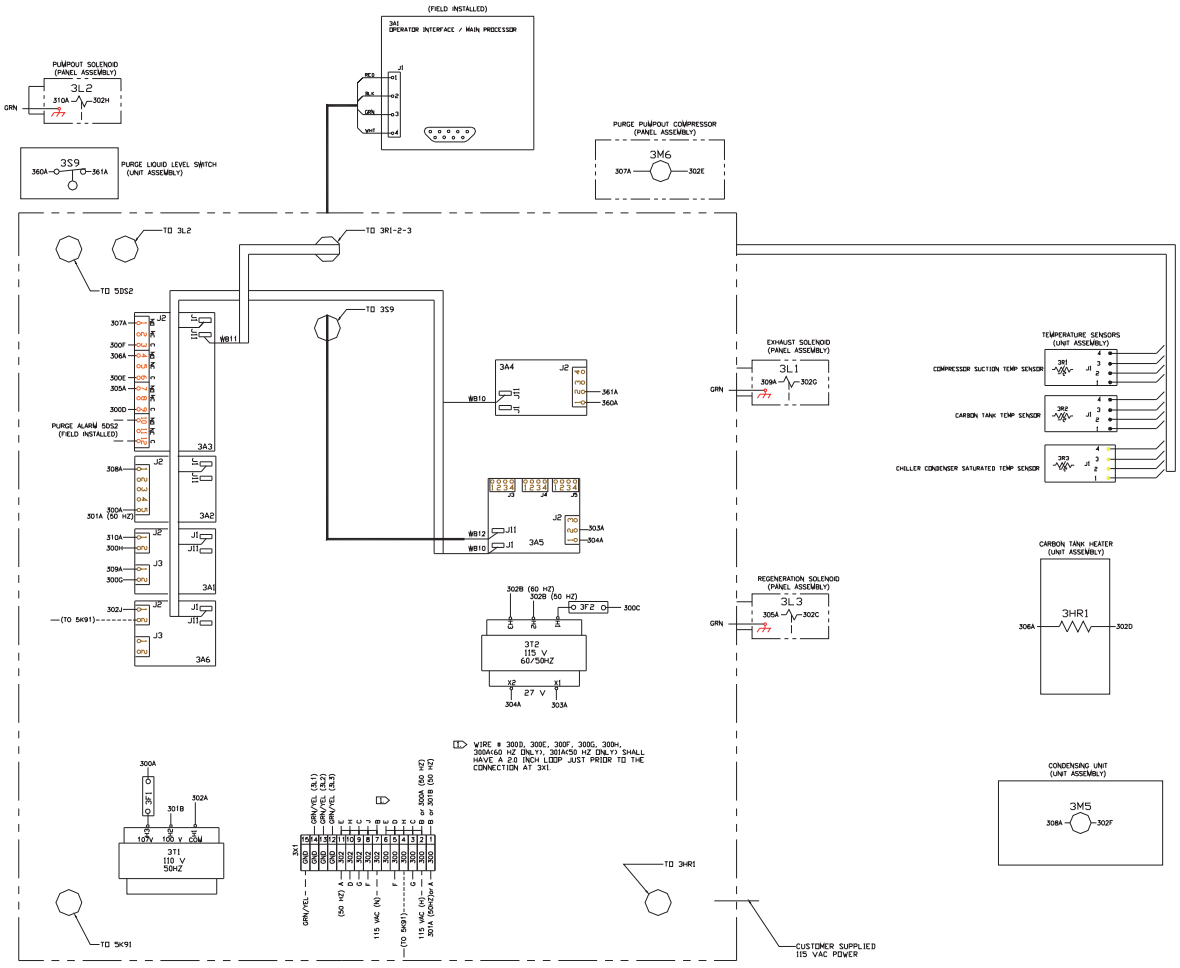


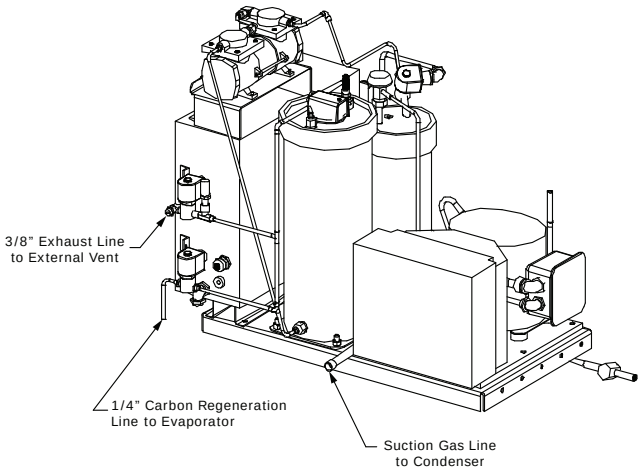
Figure 10. EarthWise™ purge connection diagram



Remote Fault Indication

A fault condition can be remotely enunciated by connecting to module 3A3 at J2-12 (common) and J2-10 (normally open) or J2-11 (normally closed). When a fault indication occurs the contacts change state. Contact rating is 120 Vac, 1 Amp.

Figure 11. Purge component layout back view



Refrigerant Line Connections

The EarthWise™ purge requires refrigerant connections at four points:

1. Suction gas connection between purge tank and chiller condenser;
2. Liquid return connection from purge tank and filter dryer canister to chiller condenser;
3. Purge carbon tank discharge connection for connecting a vent line to outdoor atmosphere; and
4. Carbon regeneration line from the carbon tank to the chiller evaporator.

Refrigerant connection sizes and locations are shown in Figure 5, Figure 6, and Figure 11.

General Recommendations

There are two major points of concern when installing the EarthWise purge:

1. To insure that all liquid refrigerant returns to the chiller condenser under all circumstances, whether the chiller is running or not; and
2. That the purge gas pickup is connected at the appropriate point on the condenser shell to move accumulated air to the purge tank. This point is typically beneath an internal baffle plate inside the condenser, which may also involve an internal pickup tube(s). The original purge pickup point is recommended.

Purge Vapor Line Construction

Important: *Always check the chiller model number and condenser shell nameplate to determine if it is an ASME vessel. If it is, all applicable ASME and local codes concerning repairs to ASME rated vessels must be followed.*

The purge vapor line which runs from the chiller condenser to the purge tank must be constructed of 5/8" refrigerant-grade copper tubing and designed for the lowest possible pressure drop. The vapor line should be insulated to minimize condensation in the line.

The shutoff valve provided on the chiller, typically an angle or solenoid valve, must be replaced with the 5/8" ball valve provided in the optional conversion kit. The valve should be located as close to the condenser as possible.

Model CVHE and later-vintage CVHB Trane chillers have 1/2" NPT connections, which can easily be configured for the 5/8" valve. However, Model PCV, CV, OCV, LCV, CVHA and early CVHB Trane chillers have 3/8" NPT vapor connections. In these cases, the larger coupling provided with the kit should be welded over the existing 3/8" NPT port.

Note: *A minimum 1/2" (13 mm) inside diameter must be maintained throughout the entire vapor line.*

Some smaller CFC-113 Model PCV and LCV Trane chillers have a 1/4" NPT condenser purge connection. In these cases, the 1/4" coupling must be removed and replaced with the larger one provided with the new purge.

Carbon Regeneration Line

The 1/4" copper tubing and valve are field supplied and are not included in the loose parts box. The connection for the regeneration line to evaporator may be different depending on which chiller the purge is installed on. The connection to the evaporator should be above the liquid line of the evaporator, and must be installed if there is no existing connection. Maintain a slope for the entire length of the copper tubing back to the evaporator. The valve for the regeneration line must be fully open when the system is in operation.

Other Considerations

- Maintain a minimum of a two-inch per foot (150 mm/m) slope (pitch) for the entire length of the vapor line to allow any liquid that may accumulate in the line to drain back to the condenser.
- Avoid vertical runs over six (6) inches (152 mm).
- Use long-radius bends in the tubing wherever possible to avoid excessive pressure drop.
- The 5/8" ball valve must be fully open when the system is in operation.

Liquid Return Line

To obtain proper liquid refrigerant return, the pressures at the condenser vapor pickup point and at the liquid return

connection to the condenser must be the same. For this reason, the vapor and liquid connections should be located as closely together as possible to avoid problems which can result from pressure gradients within the condenser.

Use 3/8" refrigerant-grade copper tubing and pitch the line at a minimum rate of 2"/ft. (151 mm/m) toward the condenser. Avoid vertical runs of copper tubing.

On units with internal purge pickup points, the liquid return should be located close to the corresponding internal pickup location.

⚠WARNING

Explosion Hazard and Deadly Gases!

Failure to follow all proper safe refrigerant handling practices could result in death or serious injury. Never solder, braze or weld on refrigerant lines or any unit components that are above atmospheric pressure or where refrigerant may be present. Always remove refrigerant by following the guidelines established by the EPA Federal Clean Air Act or other state or local codes as appropriate. After refrigerant removal, use dry nitrogen to bring system back to atmospheric pressure before opening system for repairs. Mixtures of refrigerants and air under pressure may become combustible in the presence of an ignition source leading to an explosion. Excessive heat from soldering, brazing or welding with refrigerant vapors present can form highly toxic gases and extremely corrosive acids.

Refrigerant Line Installation Procedure

The following procedure is recommended when making EarthWise™ purge refrigerant line connections. Refer to Figure 13.

1. Weld the 7/8" ID machined-steel coupling (for purge vapor line) to the condenser shell at the appropriate point on the shell. Be sure to slope properly (refer to "Purge Vapor Line Construction").
2. Weld the 3/8" pipe coupling (for liquid return line) to the condenser shell near the gas line outlet connection (see Step 1 above).
3. Drill a 7/8" (22 mm) hole through the purge vapor line coupling into the condenser shell.

⚠CAUTION

Tube Damage!

To prevent condenser tube damage, use extreme caution when enlarging outlet opening.

4. Drill a 3/8" (10 mm) hole through the liquid line coupling into the condenser shell.

⚠CAUTION

Tube Damage!

Use extreme caution when drilling into condenser to avoid damage to internal tubes.

5. Braze the 7/8" elbow into the coupling and the 5/8" reducer into the elbow. Install 5/8" copper tubing and the 5/8" ball valve. Be certain to maintain proper pitch to the purge connection point (refer to "Purge Vapor Line Construction").
6. Install the 3/8" angle valve on the 3/8" liquid return coupling.
7. Install the factory provided 3/8" liquid line, filter drier and moisture indicating sight glass as shown in Figure 7.

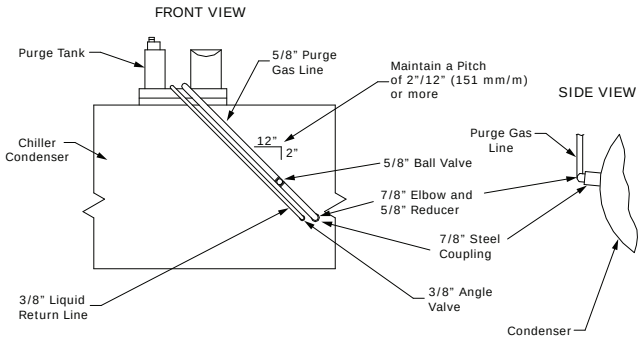
Note: *The face of the moisture indicating sight glass should be pointed slightly downward to assure liquid contact with internal moisture sensor.*

8. Install 3/8" copper tubing from the purge to the 3/8" liquid return angle valve.

Other hardware that may be provided for alternate installation setups can be used only if careful attention is paid to the two major points discussed under "General Recommendations," p. 15.

In applications where the mechanical room is warm enough to cause liquid refrigerant in the liquid return line to boil (causing vapor lock), it is advisable to insulate the liquid return line. It is also advisable to insulate the liquid return line for all duplex chillers and chillers with water flow in series.

Figure 12. EarthWise™ purge gas and liquid lines, for single condenser chiller



Auxiliary Condenser and Heat Recovery Units

Important: *Be sure to follow all applicable codes when installing discharge vent line.*

When the EarthWise purge system is applied to a heat recovery unit or a unit with an auxiliary condenser, some additional considerations must be taken into account.

Purge Mounting Location

In the case of units with auxiliary or heat recovery condensers, the purge must be mounted above the liquid level of the highest condenser.

Purge Tank Vapor Line

The purge gas line must be connected to both the cooling and auxiliary or heat recovery condensers. Be sure to pitch properly.

Shutoff valves must be provided at both condensers so the line can be closed off from the non-operating condenser. Refer to Figure 13.

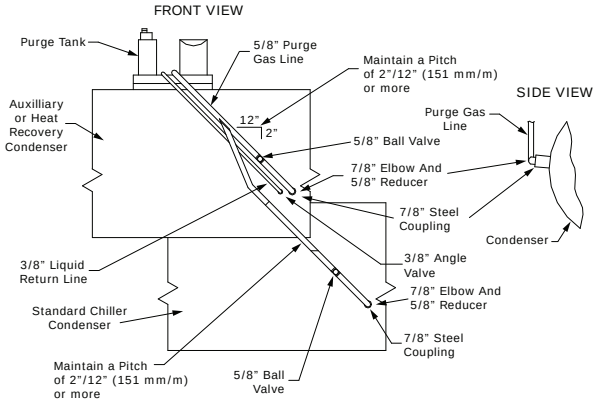
Purge Liquid Return Line

The 3/8" liquid return line from the purge tank must be connected to the auxiliary or the heat recovery condenser at a point that is below the purge tank outlet connection, but above the condenser liquid level. Install the standard 3/8" shutoff valve (if not already provided), as previously described in "Liquid Return Line," p. 15. Refer to Figure 13.

Purge Exhaust Vent Line

Connect the discharge vent line using 3/8" O.D. black, nylon, tubing to the connection on the purge exhaust solenoid valve. The discharge must be at atmospheric pressure and operate at a minimum pressure drop. A minimum of a 3/8" line is required. In many cases, this line will tie into the vent line for the chiller rupture disc.

Figure 13. EarthWise™ purge gas and liquid lines, for heat recovery or auxiliary condenser units



Liquid Refrigerant Separator (Optional)

The Liquid Refrigerant Separator allows the EarthWise™ purge to be installed below a chiller's condenser liquid level. This may be necessary when space or other considerations prevent the purge from being installed in its typical location on top of the condenser. The liquid refrigerant separator provides the pressure isolation that is needed to return liquid refrigerant to the evaporator.

Important: *The liquid refrigerant separator is not typically needed when the EarthWise purge is mounted on top of the chiller condenser and its refrigerant is returned to the chiller condenser in the normal prescribed manner.*

Package contents:

Qty	Description
1	Liquid Refrigerant Separator
2	1/4-20 x 0.75" screws to mount Liquid Separator
1	Installation Instructions

Field provided items:

- 1/4" copper tubing
- 3/8" copper tubing
- 5/8" copper tubing
- 5/8" copper "T" tee
- Ball valve for evaporator regeneration line
- Connection fittings for the evaporator regeneration line

Mounting Procedure

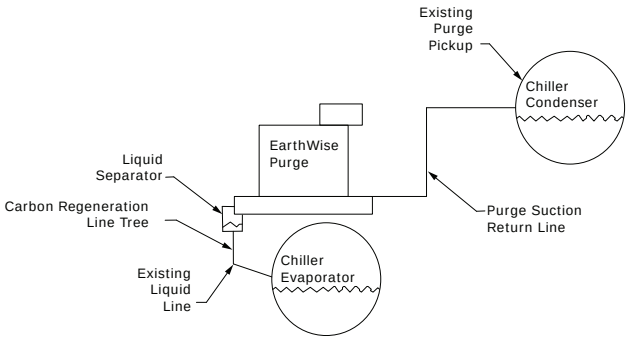
Mount the liquid refrigerant separator to the purge base in the preferred mounting location as shown in Figure 15. Drill holes into the purge base as necessary or use existing holes in the purge base.

⚠WARNING

Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

Figure 14. Typical liquid separator installation



Refrigerant Line Connections

The EarthWise™ purge liquid separator requires three refrigerant connections:

1. Vapor connection between the purge liquid separator and the purge suction gas line.

- Install a 5/8" "T" in the purge vapor line which runs from the chiller condenser to the purge tank (see Figure 16). Install 5/8" copper tubing from the "T" to the liquid separator. Slope the line to allow any refrigerant to drain into the liquid separator.

2. Liquid return connection from the liquid separator to the moisture indication sight glass.

- Install 3/8" copper tubing from purge liquid separator to the sight glass.

3. Liquid return connection from the liquid separator to the chiller evaporator.

- Install 3/8" copper tubing from the purge liquid separator to an access valve on the chiller evaporator. Maintain a minimum two inch per foot pitch toward the evaporator.

Maintenance

Routinely check the purge moisture indicating sight glass and change the filter drier as necessary. It is important to maintain the chiller's refrigerant charge in a dry condition.

Figure 15. Liquid separator mounting location (preferred)

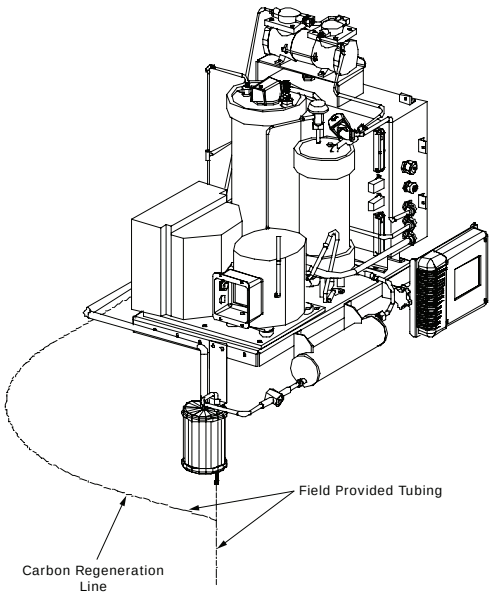


Figure 16. Liquid separator mounting connections

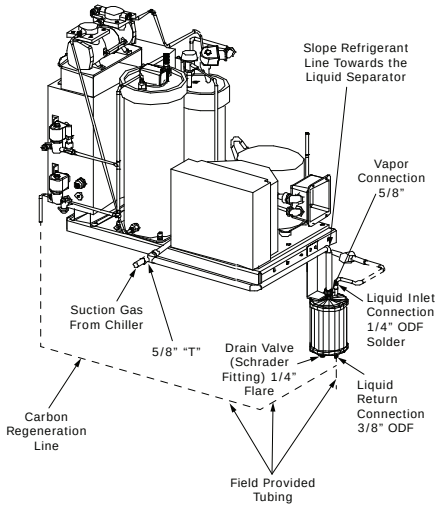
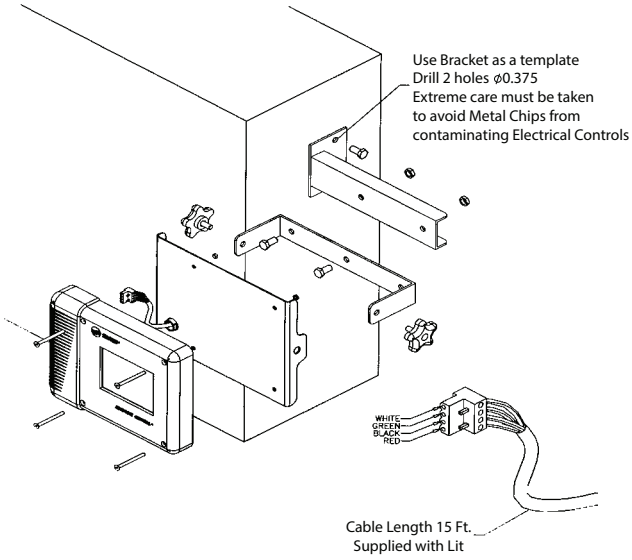


Figure 17. Remote mounting cable and optional bracket



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