Installation Instructions

CenTraVac™ Water-cooled Chillers

Hot Gas Bypass Field Installation

Model Numbers: CVHE, CVHF, CVHG

This document applies to service offering applications only.

⚠ 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 2023 **SO-SVN007A-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.

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/national 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.**

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Revision History

Document updated to reflect Service Offering number.

General Information

The following instructions show the hot gas bypass installation on CVHE, CVHF, or CVHG CenTraVac™ chillers. When the hot gas bypass option is ordered through Trane Parts for field installation, the following is shipped in this kit: a hot gas bypass valve with actuator, piping, pipe flanges, flange gaskets, and hardware to attach the flanges to the valve. A temperature sensor (4R16), bulb well, hot gas bypass actuator control relays (1A12) and hot gas bypass valve closed inputs (1A4) will also be included if not already on the unit.

Notes:

- *New O-rings also need to be ordered for the suction elbow.*
- *Conduit and additional wiring need to be provided locally.*

Installation

⚠WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. For variable frequency drives or other energy storing components provided by Trane or others, refer to the appropriate manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

⚠WARNING

Refrigerant May Be Under Positive Pressure!

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.
System contains refrigerant and may be under positive pressure; system may also contain oil. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or non-approved refrigerant additives.

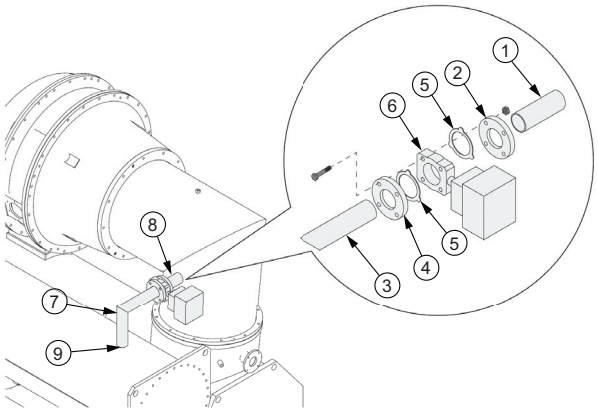
⚠CAUTION

Refrigerant at Freezing Temperature!

Direct contact with liquid refrigerant could result in minor or moderate injury.
Avoid contact with skin. If working with refrigerant is necessary, you MUST wear all Personal Protective Equipment (PPE) including eye protection, safety gloves, long sleeves, and pants. In case of contact, treat the injury similar to frostbite. Slowly warm the affected area with lukewarm water and seek immediate medical attention.

1. Stop the chiller and properly remove the refrigerant or nitrogen holding charge. Refer to CTV-SVX05*-EN (*Installation, Operation, and Maintenance: Refrigerant Handling Guidelines*).

Figure 1.

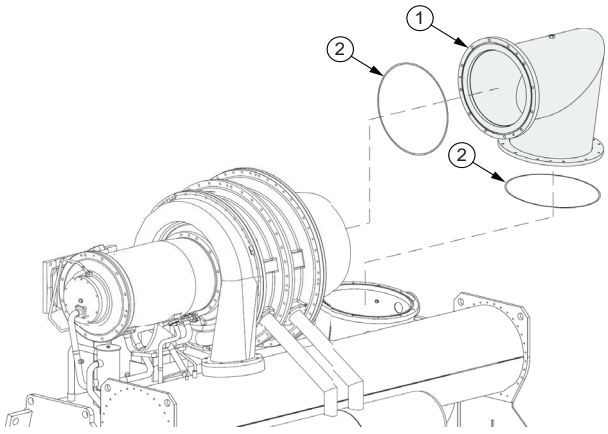


Notes:

- *For stick welding, use AWS E7016 or E7018 stick electrodes.*
- *For MIG or TIG welding, use AWS ER70S-6 filler metal.*

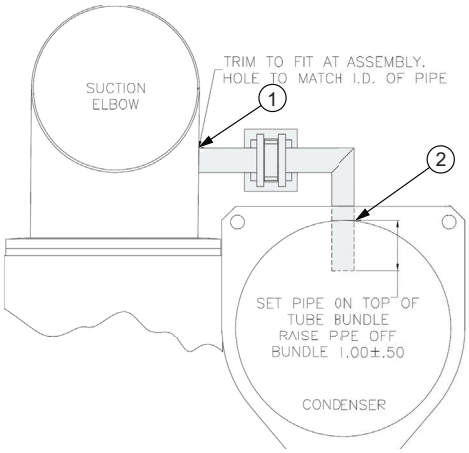
2. Remove insulation from the suction elbow around the area where the hot gas bypass connection will be made.
3. Weld the straight pipe (Figure 1, Item 1) to one of the provided pipe flanges (Figure 1, Item 2) for the suction elbow connection.
4. Weld the appropriate angled pipe (Figure 1, Item 3) to the other pipe flange (Figure 1, Item 4) for the condenser connection.
5. Allow welds to cool, and then bolt the flange assemblies, with gaskets (Figure 1, Item 5), to the hot gas bypass valve (Figure 1, Item 6).
6. Locate the hot gas bypass assembly on the condenser and suction elbow where it will be installed and fit the down pipe to the condenser (Figure 1, Item 7).
7. Weld the down pipe to the flange pipe assembly.
8. Mark the suction elbow (Figure 1, Item 8) and condenser (Figure 1, Item 9) for cutting.

Figure 2.



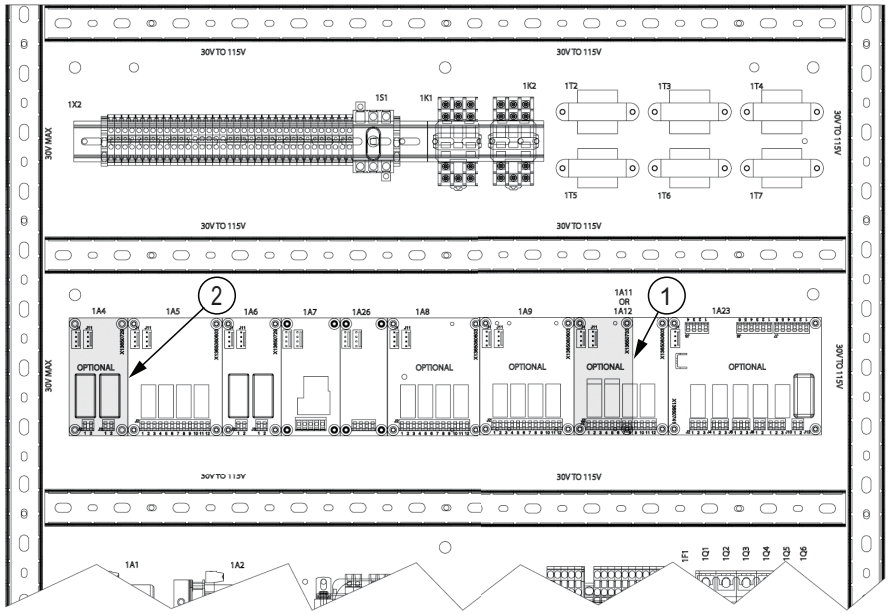
9. Prior to cutting, remove the suction elbow (Figure 2, Item 1) from the unit in order to avoid contamination of the unit with excess metal shavings.
10. Where marked in Step 8, cut a hole in the suction elbow using a hand plasma cutter with the appropriate plasma cutting tip for the metal thickness.
11. Replace the suction elbow removed in Step 9. Use new O-rings (Figure 2, Item 2) when replacing.
12. Where marked in Step 8, cut a hole in the condenser using a hole saw to avoid hot slag from falling on tubes.
13. Use a magnet to clean the inside of the shell of all metal shavings.

Figure 3.



14. Locate the hot gas bypass assembly on unit and weld piping to suction elbow (Figure 3, Item 1) and condenser (Figure 3, Item 2).

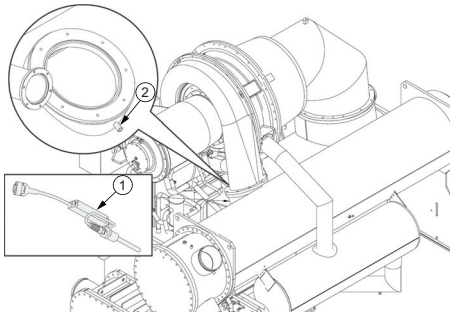
Figure 4.



15. If not already on unit, install the (1A12) I/O module (Figure 4, Item 1) to the control panel with the provided hardware.
16. Wire the valve to the I/O module in accordance with the provided schematic on the last page.
17. If not already on unit, install the hot gas bypass valve closed input (1A4) (Figure 4, Item 2) with the provided hardware.

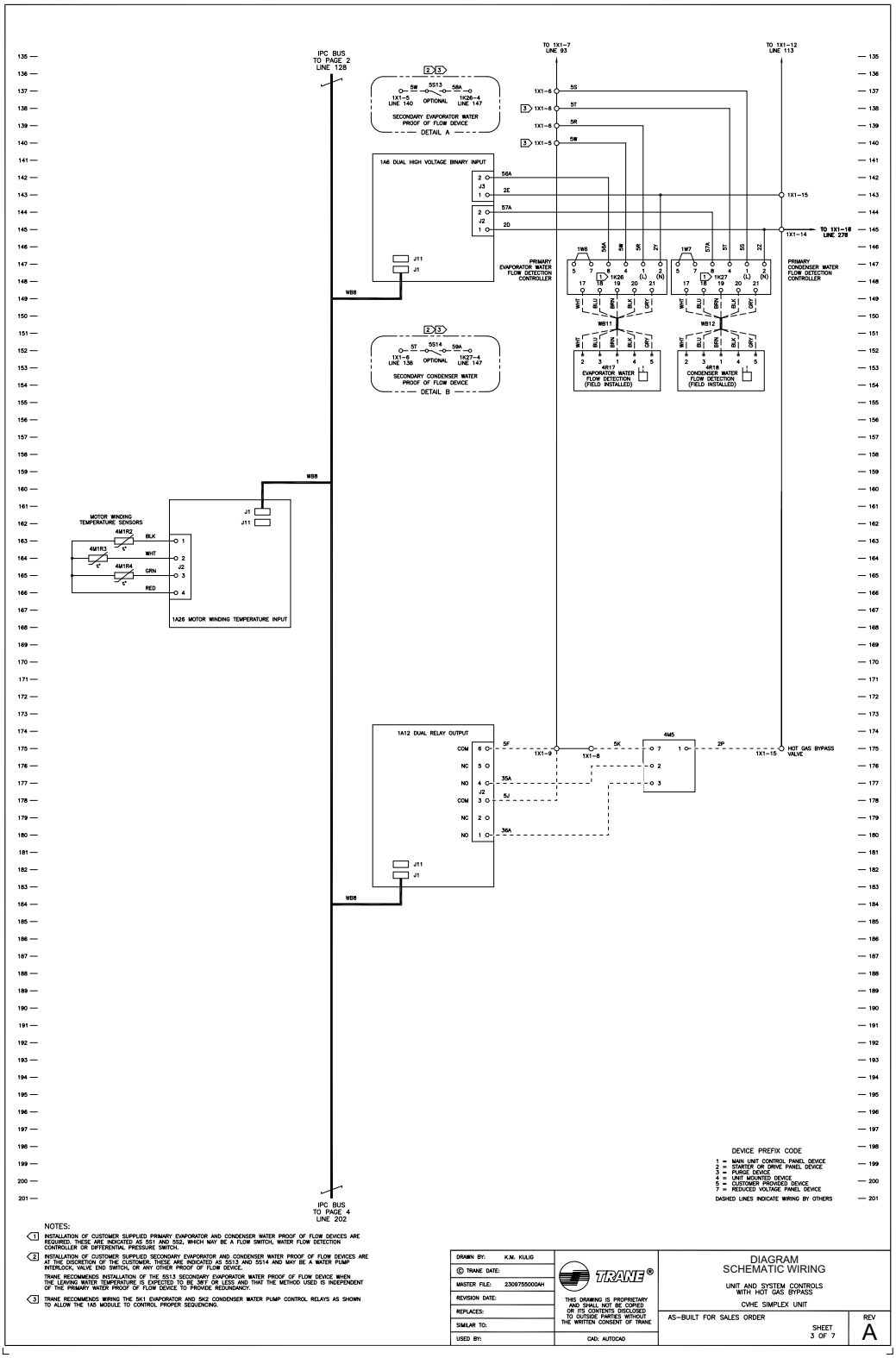
Note: *The added modules need to be bound to the controller with Tracer™ TU or TechView™ and the HGBP option needs to be enabled in the menu.*

Figure 5.



18. If not already on unit, install the bulb well and discharge gas temperature sensor (4R16) (Figure 5, Item 1). The coupling is located on the front side of the condenser compressor discharge connection (Figure 5, Item 2).
19. Replace insulation on the suction elbow.
20. Paint as required.

Figure 6.



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SO-SVN007A-EN 31 Aug 2023
Supersedes PART-SVN218C-EN (Aug 2021)