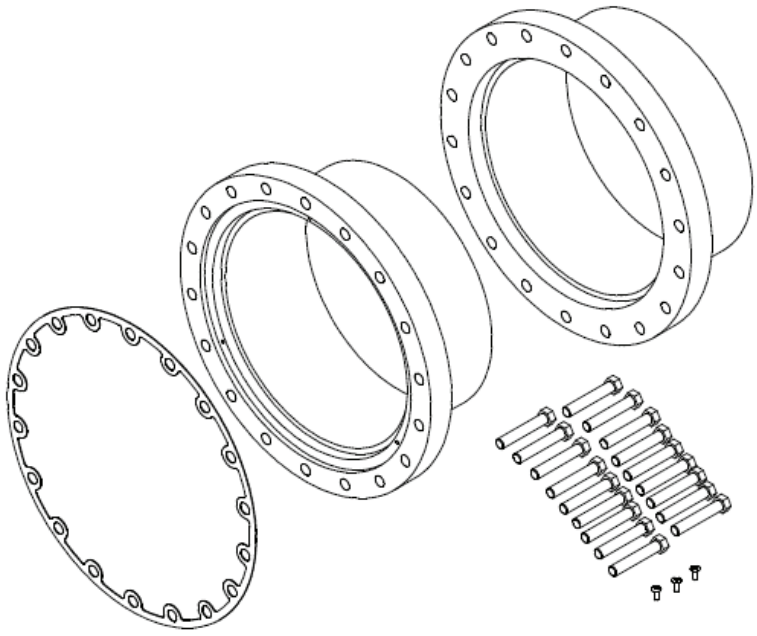
TRANE®

Installation

Economizer Flange Rebuild Kits



Models: CVHE, CVHF, CVHG, CDHF, CDHG, KIT14853, KIT14854, KIT14855, KIT14856, KIT14857, KIT14858, KIT14859, KIT14860, KIT14861

PART-SVN104C-EN

General Information

Literature change history

PART-SVN104A-EN (May 2007) manual first release.

PART-SVN104B-EN (March 2008) corrected figure 3 graphic and modified orifice transfer pattern instructions.

PART-SVN104C-EN (January 2009) updated part numbers.

Warnings and Cautions

NOTICE: Warnings and Cautions appear at appropriate sections throughout this literature. 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.

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 such as HCFCs and HFCs.

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 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.

General

This information documents the process of installing newer design economizer flanges on existing CVHE, CVHF, CVHG, CDHF and CDHG centrifugal chillers. See the Table 1 below for the design sequence that applies.

For help in selecting the correct part numbers to order see the latest version of PART-SVB18A-EN.

For units with free cooling, kits can only be applied for the flange connection on the condenser side of the economizer. They are not for use on the evaporator side if the chiller has free cooling as an option. Units with free cooling as an option have a "D" as the 9th digit in the model number description.

Table 1. Design sequence changes by model

CVHE		CVHF		CVHG		CDHF		CDHG	
Shell size	Design sequence[a]	Shell size	Design sequence[a]	Shell size	Design sequence[a]	Shell size	Design sequence[a]	Shell size	Design sequence[a]
080	4K	250	3A	250	2T	250	1L	250	1K
050	4M	210	3A	210	2T	210	1L	210	1K
032	4M	142	2Y	142	2P				
		080	3C	080	2V				
		050	3F	050	2X				
		032	3F	032	2X				

[a] The unit needs to have a design sequence before the one listed; otherwise it already has the new style economizer flanges installed. The design sequence can be found as the 10th and 11th digits in the model number description.

In order to eliminate heat distortion upon installation, the flange is welded to a short section of pipe in the factory.

The orifice is now held in place by three screws that go into predrilled and tapped holes in the orifice flanges. The use of screws better holds the orifice in place, and allows for easier factory assembly and reassembly in the field.

Component identification

Inspect parts to make sure all parts have been accounted for and are undamaged before starting to perform the installation.

Table 2. Economizer to evaporator flange kit parts

Item	KIT14853	KIT14854	KIT14855	KIT14856
Gasket #	GKT04112	GKT04113	GKT04096	GKT04089
Evaporator orifice flange	X16200245010	X16200245020	X16200245030	X16200245040
Evaporator pipe flange	507103310100	507103320100	507103330100	507103360100
Quantity of X25143100010 (Hex bolts)[a]	9	10	12	16
Quantity of X25020270010 (Torx screws)	3	3	3	3

[a] Hex bolts are 7/16-14 x 2.5 inch, grade 5.

Table 3. Economizer to condenser flange kit parts

Item	KIT14857	KIT14858	KIT14859	KIT14860	KIT14861
Gasket #	GKT04112	GKT04113	GKT04096	GKT04089	GKT04099
Condenser orifice flange	507103380100	507103400100	507103420100	507103440100	507103460100
Condenser pipe flange	507103370100	507103390100	507103410100	507103430100	507103450100
Quantity of X25143100010 (Hex bolts)[a]	9	10	12	16	18
Quantity of X25020270010 (Torx screws)	3	3	3	3	3

[a] Hex bolts are 7/16-14 x 2.5 inch, grade 5.

Installation

Refrigerant removal

⚠ 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, refrigerant substitutes, or refrigerant additives.

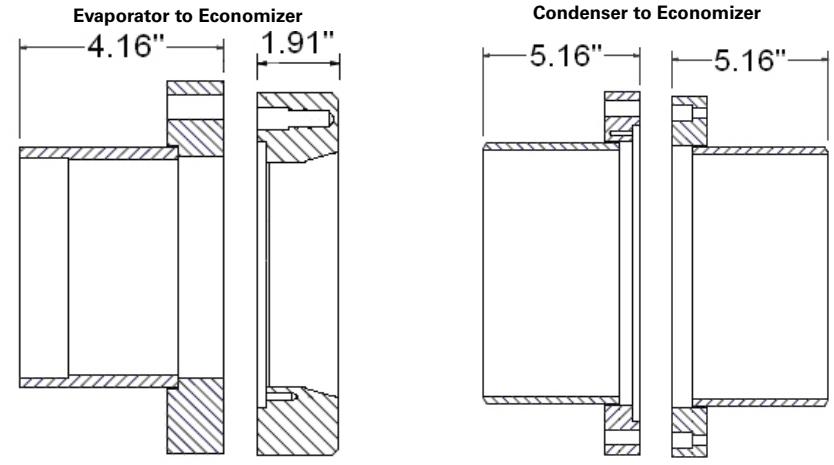
Failure to follow proper procedures or the use of non-approved refrigerants, refrigerant substitutes, or refrigerant additives could result in death or serious injury or equipment damage.

For refrigerant charge removal instructions see Refrigerant Handling Guidelines for Centrifugal Chillers, CTV-SVX05A-EN, or newest version.

Removal of existing flanges

Make measurements to find the proper location for cutting of both sides of the condenser to economizer connection and on the piping side of the economizer to evaporator connection. Note that the evaporator orifice will move the mating surface to the evaporator out and that the evaporator flange assembly is an internal slip fit. See Figure 1 for lengths needed to make cuts at the proper locations. Figure 1 applies for all kits.

Figure 1. New flange widths



After the measurements have been taken and marked, remove the economizer and make the three required cuts to the piping. Note that the flange inside the evaporator sump is not cut out, the new flange will be welded directly to the existing evaporator sump flange.

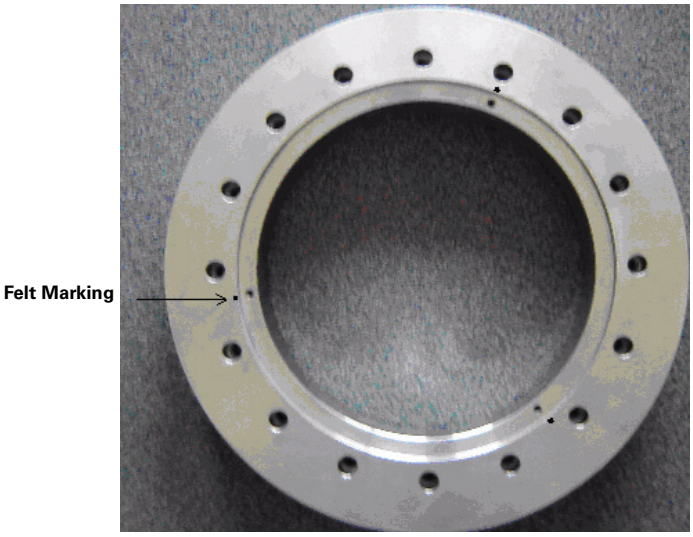
For economizer removal instructions see CVHE-SVN04A-EN or newer version if available.

Before the new flanges are welded on, the pattern for the three holes that need to be drilled into each of the orifice plates should be transferred from the evaporator orifice flange and the condenser orifice flange assembly to the respective orifice plates.

One way to transfer the pattern is to do as follows:

1 Use a magic marker to mark the face of both of the orifice flanges where the three 1/4 inch holes are already drilled and tapped, see Figure 2.

Figure 2. Orifice flange marking



2 Place the orifice in the flange and from each of the three marks that were made measure 3/8 inch towards the center of the orifice and put a mark there that will serve as a center mark for the hole to be drilled.

3 Drill a 5/16 inch clearance hole in the three places on each orifice plate that were just marked.

4 Attach the orifice plate with the Torx screws to check the fit of the plate and adjust if necessary. Make sure to remove the orifice plates before doing any welding.

Installation of new flanges

All welds need to be made with a low hydrogen rod, either E7016 or E7018, or Mig welded using ER70S-6 as the metal filler.

If welds are performed via Mig welding, do not use self fluxing wire, use a gas shield instead.

All welding should be performed by a qualified welder.

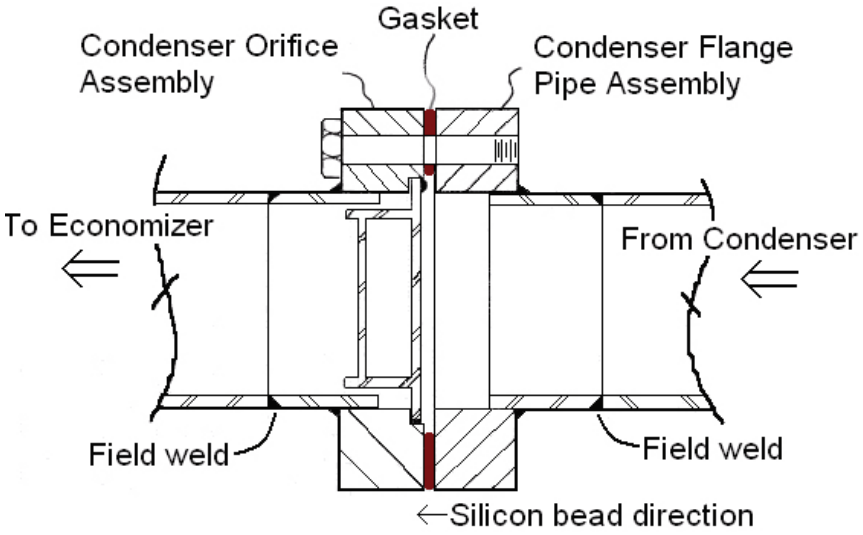
Weld the evaporator orifice flange onto the existing evaporator sump flange.

Note: To hold the evaporator orifice flange in place use the section of economizer to evaporator pipe that was removed in order to make room for the new evaporator flange pipe assembly.

Note: Due to ground clearance issues, it may be easier to weld the evaporator orifice flange to the existing evaporator sump flange from inside of the flange. Even if the structural weld is made from the inside, a weld should be made as far as possible around the outside for cosmetic purposes and for reassurance against leaks.

Next, weld the new condenser flange orifice assembly to the pipe going from the economizer to the condenser. Attach the new condenser flange orifice assembly to the pipe coming from the economizer so the orifice will face the right direction as shown in Figure 3.

Figure 3. Assembly of condenser orifice flanges



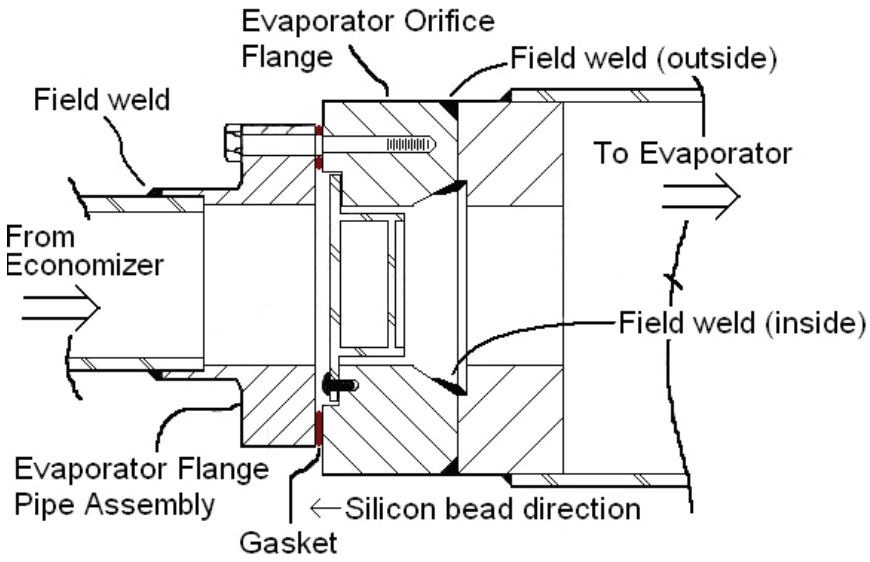
After the orifice flanges are welded, reattach the orifices with the three TORX screws. Torque the screws to 40 in-lbs.

Weld the condenser flange pipe assembly to the pipe coming from the condenser.

Clean any debris off of the faces of the flanges and set the gaskets in place. The side of the gasket with the silicon bead should face towards the heads of the flange connecting bolts as noted in Figure 3 and Figure 4 (p. 8)

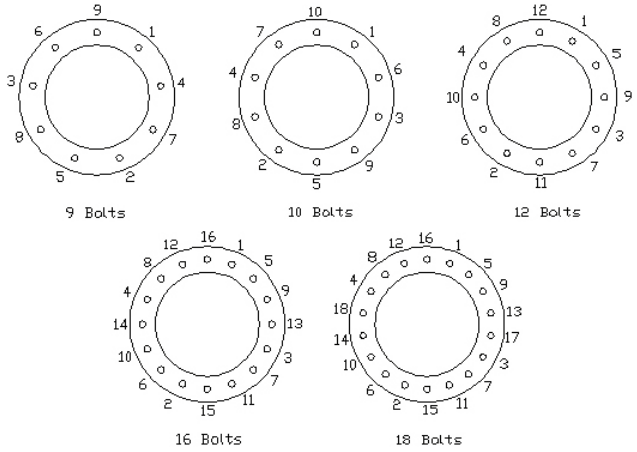
Move the economizer back into position and weld the evaporator flange pipe assembly to the pipe coming out of the economizer going to the evaporator. As the economizer pipe will fit into the evaporator flange pipe assembly, adjustments can be made to handle misalignment. Before performing the final weld, the condenser to economizer flanges should be loosely bolted together to ensure proper alignment on both sides of the economizer.

Figure 4. Assembly of evaporator orifice flange



Bolt both sets of flanges together with the 7/16-14 x 2.5 inch Hex bolts. First tighten the bolts to 30 ft-lbs using a star pattern shown in Figure 5. After all bolts are tightened to 30 ft-lbs, tighten the Hex bolts further to 55 ft-lbs again using a star pattern.

Figure 5. Bolt tightening sequences



Leak testing

⚠ WARNING
Hazardous Pressures!

When using dry nitrogen cylinders for pressurizing units for leak testing, always provide a pressure regulator on the cylinder to prevent excessively high unit pressures. Never pressurize unit above the maximum recommended unit test pressure as specified in applicable unit literature. Failure to properly regulate pressure could result in a violent explosion, which could result in death or serious injury or equipment or property-only-damage.

After the economizer has been fully reattached to the chiller, pressurize the chiller with 2 to 3 psig dry nitrogen along with trace R22 and check all of the welds with CHM00245 or other leak detecting solutions. If no leaks are present, raise the pressure up to 5 to 8 psig and retest the welds. After leak testing, torque the hex bolts again to 55 ft lbs using a star pattern. If positive pressure leak tests are successful, conduct a vacuum leak test according to CVHE-SVU01F-EN, Commissioning Procedures Section B1.

Recharging refrigerant

See CVHE-SVU01F-EN (or newer version if available) for information on recharging CVHE, CVHF and CVHG centrifugal chillers.

Finishing

Cover welds with zinc rich cold galvanizing compound before applying a finish coat of paint. New parts are to be painted executive beige after installation is complete. Spray paint may be obtained locally, or a 12 oz. can of executive beige may be ordered as PAI00061.

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