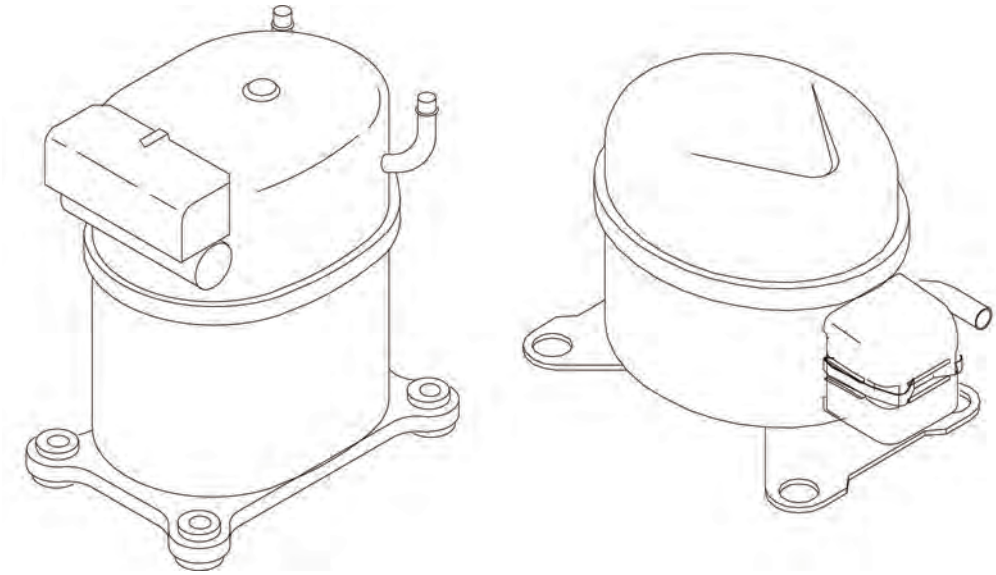
REFRIGERATION COMPRESSOR KIT

(R-134A and R-404A Refrigerant)

Installation Manual



Release Date: September 01, 1994

Publication Number: 3724INS

Revision Date: October 15, 2012

Revision: B

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The products, technical information, and instructions contained in this manual are subject to change without notice. These instructions are not intended to cover all details or variations of the equipment, nor to provide for every possible contingency in the installation, operation or maintenance of this equipment. This manual assumes that the person(s) working on the equipment have been trained and are skilled in working with electrical, plumbing, pneumatic, and mechanical equipment. It is assumed that appropriate safety precautions are taken and that all local safety and construction requirements are being met, in addition to the information contained in this manual.

This Product is warranted only as provided in Cornelius' Commercial Warrant applicable to this Product and is subject to all of the restrictions and limitations contained in the Commercial Warranty.

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Contact Information:

To inquire about current revisions of this and other documentation or for assistance with any Cornelius product contact:

www.cornelius.com

800-238-3600

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This document contains the original instructions for the unit described.

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Printed in U.S.A.

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SAFETY INSTRUCTIONS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

Safety Overview

- Read and follow **ALL SAFETY INSTRUCTIONS** in this manual and any warning/caution labels on the unit (decals, labels or laminated cards).
- Read and understand ALL applicable OSHA (Occupational Safety and Health Administration) safety regulations before operating this unit.

Recognition

Recognize Safety Alerts
 *This is the safety alert symbol. When you see it in this manual or on the unit, be alert to the potential of personal injury or damage to the unit.*

DIFFERENT TYPES OF ALERTS

DANGER:
Indicates an immediate hazardous situation which if not avoided **WILL** result in serious injury, death or equipment damage.

WARNING:
Indicates a potentially hazardous situation which, if not avoided, **COULD** result in serious injury, death, or equipment damage.

CAUTION:
Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury or equipment damage.

SAFETY TIPS

- Carefully read and follow all safety messages in this manual and safety signs on the unit.
- Keep safety signs in good condition and replace missing or damaged items.
- Learn how to operate the unit and how to use the controls properly.
- **Do not** let anyone operate the unit without proper training. This appliance is **not** intended for use by very young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.
- Keep your unit in proper working condition and do not allow unauthorized modifications to the unit.

QUALIFIED SERVICE PERSONNEL

WARNING:
Only trained and certified electrical, plumbing and refrigeration technicians should service this unit. **ALL WIRING AND PLUMBING MUST CONFORM TO NATIONAL AND LOCAL CODES. FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY, DEATH OR EQUIPMENT DAMAGE.**

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Safety Precautions

This unit has been specifically designed to provide protection against personal injury. To ensure continued protection observe the following:

WARNING:
Disconnect power to the unit before servicing following all lock out/tag out procedures established by the user. Verify all of the power is off to the unit before any work is performed.

Failure to disconnect the power could result in serious injury, death or equipment damage.

CAUTION:
Always be sure to keep area around the unit clean and free of clutter. Failure to keep this area clean may result in injury or equipment damage.

Shipping And Storage

CAUTION:
Before shipping, storing, or relocating the unit, the unit must be sanitized and all sanitizing solution must be drained from the system. A freezing ambient environment will cause residual sanitizing solution or water remaining inside the unit to freeze resulting in damage to internal components.

INTRODUCTION

CONTENT OF THIS INSTALLATION MANUAL

This Installation Manual provides a general outline of the procedures used to remove an inoperative compressor and install the refrigeration compressor kit.

The manual content includes **Required Supplies and Tools and Equipment** needed; the procedure to remove the inoperative compressor, install the new compressor kit, and to test the installation. Also included in this manual is a special procedure to replace compressors in the 1050XR and 1550XR Cooling Units.

WARNING:
Disconnect power to the unit before servicing. Follow all lock out/tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

WARNING:
Only trained and certified electrical, plumbing and refrigeration technicians should service this unit.

All wiring and plumbing must conform to national and local codes. Failure to comply could result in serious injury, death or equipment damage.

REQUIRED SUPPLIES, TOOLS AND EQUIPMENT

Required Supplies

1. Brazing alloy “Phos-Copper”, “Silfos’“or equivalent is required for copper-to-copper connections. These alloys contain about 15% silver. Brazing alloy. “Easy-flow” or equivalent is required for copper-to-steel connections. This alloy contains about 50% silver.
2. Flux for use with copper-to-steel connections.

Required Tools and Equipment

Tools and equipment needed for installing this kit is listed in the following table. Equivalent items may be substituted.

Required Tools and Equipment		
Item No.	**Name and Description**	**Use**
1	Torch, Oxy-fuel (acetylene, propane, etc)	Brazing
2	Torch tips size No. 2 or 3	Brazing
3	Vacuum pump and gaging with 50-micron blank-off pressure. Alternately a pump having 28.5 in. HG minimum	Removing vapor from system
4	Refrigerant recovery system	Removes refrigerant from the refrigeration system
5	Charging cylinder, visual-indicating type with a refrigerant scale and temperature correction curve, or a closed container with an accurate scale. Charging equipment must be accurate to ±.125 oz.	Charging the reworked refrigeration system with refrigerant.
6	Pinch-off tool	To seal process lines after charging system with refrigerant.
7	Ammeter, clamp-on type 0-50 amp range	To measure power consumption
8	Voltmeter, 0-300VAC	To measure line voltage
9	Ohmmeter, 0-10 and 0-100,000 ohms ranges	To check resistance of electrical circuitry
10	Electronic Leak Detector capable of detecting at least 1/2 ounce/year or “Snoop” fluid	To detect refrigerant leaks
11	Dry Nitrogen (-75° F dew point)	To purge refrigeration system before brazing all system connections.
12	Line tapping valve (two)	To connect Refrigerant Recovery System to refrigeration system.
13	Flame Shields	Protects system components.
14	Refrigeration gauges and Manifold Set W/Hoses	Used to evacuate and charge system with refrigerant.

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COMPRESSOR KIT INSTALLATION

REMOVING OLD COMPRESSOR AND DUAL INLET STRAINER/DRIER

Removal of Refrigerant- In starting work, be advised that the following notes are directly applicable:

NOTE: Do not change compressor until it is proven inoperative.

WARNING:
Only trained and certified electrical, plumbing and refrigeration technicians should service this unit.

All wiring and plumbing must conform to national and local codes. Failure to comply could result in serious injury, death or equipment damage.

WARNING:
Disconnect power to the unit before servicing. Follow all lock out/tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

NOTE: Environmental Protection Agency (EPA) Federal Government rules for refrigerant recovery *must* be followed and carried out by certified Personnel. If you have any questions, contact your employer or the EPA.

WARNING:
To avoid possible fatal electric shock or serious injury, disconnect electrical power from the unit before starting kit installation.

WARNING:
To avoid electrical shock even after electrical power has been disconnected from the Unit, discharge the start capacitor by momentarily touching both terminals at the same time using an insulated screwdriver.

1. Tag electrical wires connected to the compressor for identification.

Remove refrigerant gas from refrigeration system as follows:

IMPORTANT: *Do not* vent refrigerant gas to the atmosphere. A Refrigerant Recovery System must be used to reclaim refrigerant from the refrigeration system.

NOTE: Work in a well-ventilated area. Fumes from brazing may contain toxic gases.

NOTE: The line-tapping valves are to be temporarily installed in the refrigeration system to connect the Refrigerant Recovery System to the refrigeration system. After refrigerant recovery has been completed, remove the line-tapping valves.

NOTE: To maintain factory warranty, *do not* permanently install line-tapping valves or poppet-type valves in the refrigeration system. These valves have a potential for leaks.

2. At the compressor, install a line-tapping valve in the suction process line as shown in Figure 1.
3. At the dual inlet drier, install a second line-tapping valve on the discharge process line as shown in Figure 1.

WARNING:
To avoid eye injury, wear protective glasses or goggles while working with refrigerant or brazing.

4. Connect Refrigeration gauges and Manifold Set to both of the line tapping valves installed in the process lines.
5. Connect Refrigerant Recovery System to the Refrigeration Gauges and Manifold Set, then reclaim refrigerant from the refrigeration system.
6. Disconnect Refrigerant Recovery System, then connect dry nitrogen source to the Refrigeration Gauges and Manifold Set. Break refrigeration system vacuum with dry nitrogen to “0” PSIG.
7. Disconnect Refrigeration Gauges and Manifold Set from both of the line tapping valves installed in the process lines.

Removal of Existing Compressor

1. Slide suction line insulation as far as possible away from work area to prevent heat damage.
2. Place heat shields around electric wiring, insulation, and painted surfaces to protect from accidental heat damage.

⚠ WARNING:
Nitrogen pressure must equal atmospheric pressure before heat is applied to system tubing.

3. With refrigeration system pressure at 0-psi, use torch to remove suction and discharge lines from the compressor ports.
4. Remove cap tube and liquid lines from the dual inlet strainer/drier. Discard old dual inlet strainer/drier.
5. Remove mounting clips or bolts securing the compressor, then remove the old compressor.

Installing Kit

(see Figure 1)

1. Polish tubing ends with emery cloth or a wire brush. Do not allow grit to enter tubing. Carefully clean tubing ends.
2. Place new compressor in position on the Unit, then secure compressor with clips or bolts.

   IMPORTANT: The dual inlet strainer/drier and the new compressor *must* not be uncapped for more then 10-minutes before brazing them into the refrigeration system.

3. Install new suction process line in compressor suction process port (low-side). Do not braze connections at this time.
4. Insert discharge line into compressor discharge port.

   NOTE: The suction filter/drier (if provided in the kit) must be installed in a vertical position in the suction line close to the compressor as shown in Figure 1.

5. Insert suction line into compressor suction line port. Cut a section out of suction line to allow installing the new suction filter/drier in a vertical position in the suction line. Do not braze connections at this time.

⚠ CAUTION:
The new discharge or liquid dual inlet strainer/drier must be installed in a horizontal position for proper system operation.

6. Install a new dual inlet strainer/drier as follows:

   NOTE: Cap tube *must* not be cut off more than 2-inches (Notch cap tube with a file, then break tube off). Cap tube *must* not be inserted more than 1/2-inch into dual inlet strainer/drier opening.

   A. Install new dual inlet strainer/drier in horizontal position. Insert liquid line and cap tube into drier ports. *Do not* insert cap tube more than 1/2- inch into drier port. Do not braze connections at this time.

   B. Insert new discharge process line (high-side) into dual inlet strainer/drier port. Do not braze connections at this time.

Nitrogen Flushing and Brazing

Flush the refrigeration system with “dry” nitrogen (-75° F dew point) as follows:

1. Connect nitrogen source to both process lines of the refrigeration system to purge the system before brazing system connections.
2. Purge the refrigeration system with dry nitrogen for at least 10-minutes, then disconnect nitrogen source.

   NOTE: Work in a well-ventilated area. Fumes from brazing may contain toxic gases.

3. Braze all refrigeration system connections.

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4. Clean flux from all brazed copper to steel connections with cold water and a wire brush.

Testing System for Refrigerant Leaks

1. Connect Refrigeration Gauges and Manifold Set to both of the refrigeration system process lines.
2. Connect Refrigerant Charging Cylinder to the Refrigeration Gauges and Manifold Set, then pressurize the refrigeration system to saturation with clean refrigerant of the type specified on the Unit serial plate.
3. Leak check the entire refrigeration system.

   NOTE: If a leak is suspected but cannot be detected, tape a poly or heavy paper envelope over the area to capture the gas. Wait 10 minutes then check the content of the envelope for refrigerant.
4. Disconnect the Refrigerant Charging Cylinder from the Refrigeration Gauges and Manifold Set.

Charging the Refrigeration System

⚠ WARNING:
Disconnect power to the unit before servicing. Follow all lock out/tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

1. Connect Refrigerant Recovery System to the Refrigeration Gauges and Manifold Set.
2. Reclaim the refrigerant from the refrigeration system, then disconnect the Refrigerant Recovery System from the Refrigeration Gauges and Manifold Set.
3. Connect Vacuum Pump to the Refrigeration Gauges and Manifold Set.
4. Evacuate the refrigeration system to at least 100-microns.
5. Disconnect Vacuum Pump from the Refrigeration Gauges and Manifold Set.

   NOTE: It is not necessary to operate the refrigeration system to recharge it with liquid refrigerant.
6. Connect Refrigerant Charging Cylinder to the Refrigeration Gauges and Manifold Set.
7. Charge the refrigeration system using the type of refrigerant and exact amount specified on the Unit serial plate.
8. Disconnect Refrigerant Charging Cylinder from the Refrigeration Gauges and Manifold Set.
9. Apply electrical power to the Unit.
10. Operate the unit for a short period of time. The evaporator tank should frost entirely over contact area.
11. Using a crimp tool, Pinch off suction process line tube twice starting from free end. Leave crimp tool applied to inner pinch.
12. Cut suction process line tube approximately 1/2 inch from outer pinch and fill open end with copper brazing alloy.
13. Remove crimp tool.
14. Repeat steps 11, 12 and 13 on discharge process line.
15. Check both process lines for leaks.
16. Apply electrical power to the Unit and allow it to operate. Check for proper operation.

Installing Kit in 1050XR and 1550XR Cooling Units

⚠ WARNING:
Disconnect power to the unit before servicing. Follow all lock out/tag out procedures established by the user. Verify all power is off to the unit before performing any work.

Failure to comply could result in serious injury, death or damage to the equipment.

To install a kit in either the 1050XR and 1550XR cooling units, proceed as follows:

1. Remove back access grille (on side where power switch is located) to expose the compressor terminal cover.
2. Remove compressor terminal cover.
3. Perform electrical check on the compressor to confirm if it is inoperative.
4. If compressor is inoperative, drain water from evaporator tank.
5. Remove back panel for access to the compressor, See Figure 2.
6. Remove screws securing electrical box to rear panel.

   NOTE: Do not vent refrigerant to atmosphere.
7. Install one line tapping valve on suction process line on the compressor, and a second line tapping valve on the discharge process line located on the dual inlet strainer/drier.
8. Connect Refrigerant Recovery System to the refrigeration system.
9. Using Refrigerant Recovery System, remove refrigerant from the refrigeration system.
10. At each side panel, remove screws which support cabinet bulkhead to which evaporator is secured.
11. In front panel, loosen, but do not remove screws which support cabinet bulkhead to which evaporator tank is secured.
12. To gain clearance between top of compressor and cabinet bulkhead, raise cabinet bulkhead up from 3/4 to 1 inch and prop with a piece of 1 x 2 inch wood cut to length.
13. At the compressor, remove hex head bolts, grommet spacers and grommets securing compressor to the base.
14. Slide the compressor toward the rear of the Unit, allowing compressor to slide off base mounting pads to gain maximum clearance between top of compressor and cabinet bulkhead.
15. Refer to main text of this manual for procedure to replace a compressor.
16. Using new grommet spacers and grommet kit, secure the compressor in place.
17. Connect electrical wiring to compressor and attach protective cover.
18. Apply electrical power to unit.
19. Start and run system for about 5 minutes. Empty evaporator tank should frost entirely over contact area.
20. Remove electrical power from unit.
21. Pinch off and weld process line as described in main text.
22. Fasten cabinet bulkhead in position using removed and loosened screws.
23. Fill evaporator tank with water.
24. Install top cover.
25. Apply electrical power to unit.
26. Operate unit.

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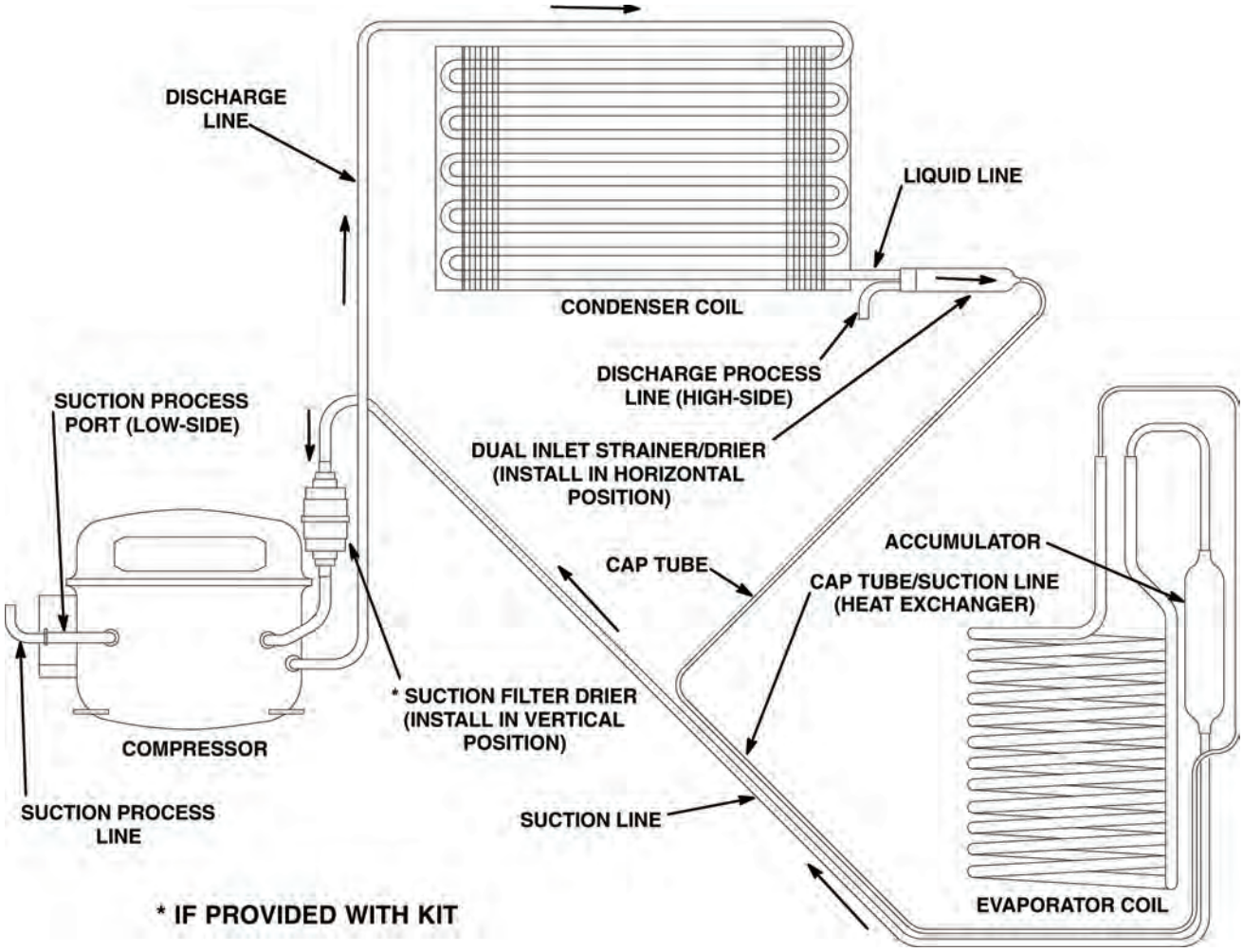

Figure 1.

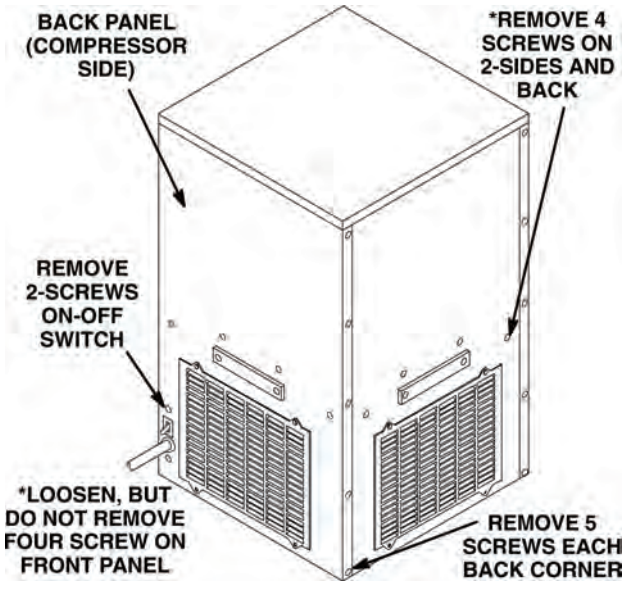

Figure 2.

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