

REFRIGERATION

SYSTEMS

INSTALLATION

MANUAL



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TOOLS REQUIRED FOR UNCRATING AND INSTALLATION OF THE REFRIGERATION SYSTEM



- **SAFETY GLASSES**
- **PRY BAR**
- **HAMMER**
- **ADJUSTABLE OPEN END WRENCH (2)**
- **DRILL DRIVER**
- **PENCIL**

CEILING MOUNTED REFRIGERATION SYSTEM

GENERAL INFORMATION

This Refrigeration System was produced utilizing the latest in manufacturing technology, the highest quality materials available, along with innovations that make it a distinctive product in its field. Despite rigid controls in the production of the product, there is no substitute for thoroughly reading and UNDERSTANDING the instructions that follow. The result will be an orderly and efficient installation. Please take the time to follow the steps explicitly!

UNPACKING & INSPECTION--CEILING MOUNT SYSTEM

Check the Delivery Receipt for the number of pieces that made up the shipment and make sure that the number of pallets, boxes or crates agrees with that number. Each piece should be clearly marked with the same five-digit order number that appears on the Delivery Receipt as the shipper's number.

Examine the general condition of the shipment and, as soon as unpacking is completed, carefully inspect all parts for possible shipping damage. If damaged parts are discovered, contact the supplier immediately.

It is recommended the condensing unit be elevated from the deck a minimum of 12"-18" to ensure the condenser fan is not drawing or pulling heat reflected off the building roof or pavement in a grade level installation in which the summer heat may exceed +120°F. Ambient temperature around the system should be less than +90°F and 50% RH.



Delivery Receipt



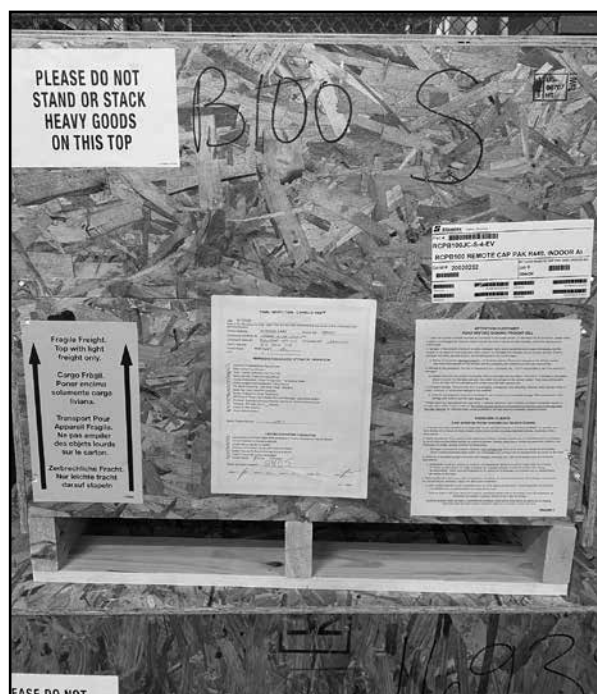
UNPACKING & INSPECTION FOR REMOTE REFRIGERATION SYSTEMS

Check the Delivery Receipt for the number of pieces that made up the shipment and make sure that the number of pallets, boxes or crates agrees with that number. Each piece should be clearly marked with the same five-digit order number that appears on the Delivery Receipt as the shipper's number.

Examine the general condition of the shipment and, as soon as unpacking is completed, carefully inspect all parts for possible shipping damage. If damaged parts are discovered, contact the supplier immediately.

For outdoor systems it is recommended the condensing unit be elevated from the deck a minimum of 12"-18" to ensure the condenser fan is not drawing or pulling heat reflected off the building roof or pavement in a grade level installation in which the summer heat may exceed +120°F.

For indoor systems the ambient temperature around the system should be less than +90°F and 50% RH.



GENERAL INSTALLATION INSTRUCTIONS

This section has the general instructions for installing the ceiling mounted Refrigeration System. Before proceeding, also see the following section on mounting "Remote Systems with Electric Vaporizer", if applicable.

Note: Proper "temporary" support of the ceiling panel with the cut out must be added during the installation of the refrigeration.

Note: Due to the weight of these systems (approximately 150 lbs.), it is highly recommended that proper lifting equipment, such as a fork lift or material lift, be utilized during installation. Be sure to allow for sufficient airflow around the condenser. A 4" minimum clearance is required above the condensing unit. If multiple units are located in the same area, be sure they do not exhaust hot air into one another. Refer to section titled "Locating and Mounting Condensing Units" for details. In addition to allowing for proper airflow, consideration should be given to the final mounting location of the refrigeration system relative to the customer location to avoid any possible risk of noise impacting the customer experience.

Position the insulated evaporator section of the Refrigeration System over the hole in the walk-in ceiling section. Special care should be used when positioning the evaporator section over the ceiling cut-out. Be sure not to damage the gasket underneath the evaporator section.

Fasten latches and seal perimeter as described in the Latch and Diffuser Installation Instructions found on pages 6 and 7. When reinstalling the diffuser panel, make sure the ceiling section divider on the panel seals against the black gasket. Some adjustment may be required by simply bending the ceiling section divider slightly forward or backward. This will prevent any short cycling of discharge and return air.

Note: On smaller refrigeration systems, you may elect to install the system on the ceiling section while the section is still on the floor. **CAUTION!** Make sure to fasten down the system to the ceiling panel. The ceiling section and the refrigeration system may then be erected together in the normal sequence of assembly as shown in the Kold Locker™ Walk-in Installation Instructions. This method is not practical and should not be used with larger systems of 100 series or above.

GENERAL INSTALLATION INSTRUCTIONS

Some systems require a permanent connection to an electrical service and a connection at the junction box located within the condensing unit housing. Refer to the serial tag for all pertinent electrical data. These systems must be connected to a power supply disconnect switch and wired according to local and national electric codes. With some models, no plumbing drain is required. For models requiring an optional condensate vaporizer (see page 12 for installation details).

Wiring Instruction for The Two-Piece Refrigeration System

Note: Do not mount power disconnect to the condensing unit housing

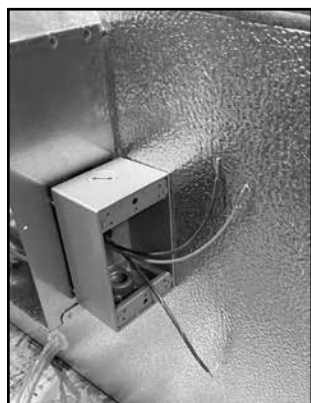
After the equipment is properly located on the walk-in: Each piece of equipment is pre wired to a designated termination in the J-box. Electrical power connections are provided and labeled appropriately. For a close-coupled system use the wiring harness provided to complete the final electrical connection between the condensing unit sections directly to the evaporator section. Note the diagrams for electrical details.



This will require a single point power connection at the electrical J-box on the condensing unit base. Refer to serial tag for electrical circuit requirements.

Remote Applications (Power Drop Situations)

Each piece of equipment is pre-wired to a designated termination in the J-box. Electrical power connections are provided and labeled appropriately. Complete power connections in J-box electrical provided. See serial tag for each component for electrical specifications.



CAPSULE PAK™ LATCH AND DIFFUSER INSTALLATION INSTRUCTIONS

1. Remove diffuser from ceiling panel before installing ceiling panel (Figures 1 and 2)



Figure 1



Figure 2

2. Lift Capsule Pak™ into position on top of walk-in. Note: Do not slide Capsule Pak™ into position as cowl gasket damage will occur. If the Capsule Pak™ must be slid into position, place Capsule Pak™ on a piece of cardboard prior to moving to prevent gasket damage.
3. Inspect cowl gasket to ensure proper placement (Figure 3)



Figure 3



Figure 4

4. Secure interior latches (Figure 4)
5. Seal cowl to ceiling at gasket seam above diffuser panel using provided silicone (Figure 5)



Figure 5

6. Replace diffuser panel removed in step 1.

CONNECTING REFRIGERATION BASE TO THE EVAPORATOR (INDOOR CLOSE-COUPLED MODELS)

Carefully align the condensing unit and evaporator section at the refrigeration connections using the alignment bolts provided on the evaporator section. Position the condensing unit's slots over the positioning bolts on the evaporator section. Fasten the bolts securely to the evaporator section.



MAKING REFRIGERATION CONNECTION (CLOSE-COUPLED SYSTEMS)

By employing self-sealing refrigeration couplings, the condensing unit section, evaporator section, and the connecting tubing are separately pre-charged with refrigerant and leak tested at the factory before shipment. Carefully align the Condensing unit and evaporator section at the refrigeration connections using the alignment bolts provided.

1. Remove the dust caps and plugs from the couplings and inspect them to see if the synthetic seals are intact.



2. Using a clean cloth, wipe the coupling seals and threaded surfaces to prevent the inclusion of any dirt or foreign material in the system.

3. Lubricate the synthetic seal in the male half of the couplings with refrigeration oil and thread the two coupling halves together BY HAND to ensure proper mating of the threads. Note: Make certain that the insulated suction line is connected to the coupling half marked "Suction Line" and that the bare tube liquid line is connected to the coupling half marked "Liquid Line".

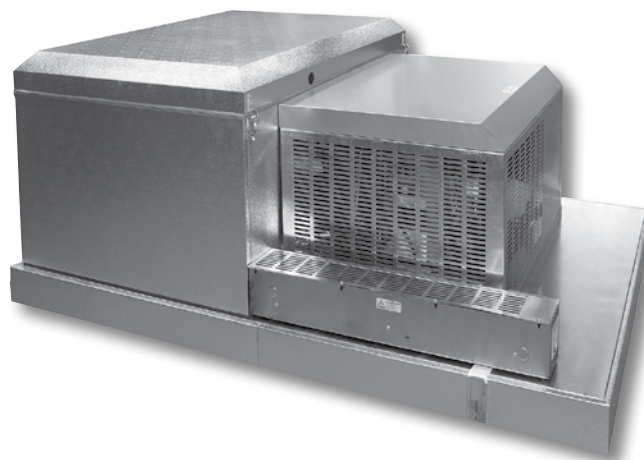
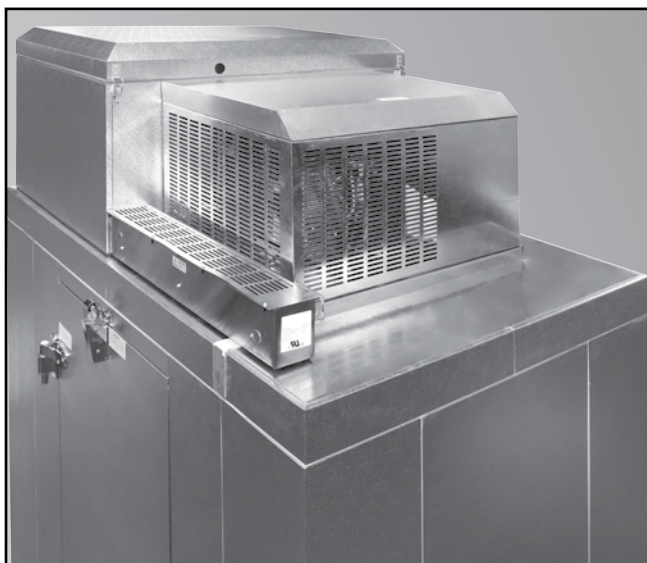


OPTIONAL FEATURE - ELECTRIC CONDENSATE VAPORIZER

Indoor Capsule Pak™ Applications (do not use condensate vaporizer for an outdoor application)

The vaporizer is intended to be mounted in the orientation shown below. Note the location of the condensate drain coming from the evaporator and locate the vaporizer so the condensate water will drain into it. Use the supplied plastic tubing and copper elbow and extend the drain into the vaporizer. Cut the plastic tubing to the desired length.

Provide power to the electric vaporizer per local national electrical codes. Avoid locating vaporizer below any electrical enclosures.



OPTIONAL FEATURE - ELECTRIC CONDENSATE VAPORIZER**Capsule Pak™ Applications using kit number 133141 (208/230 Volt Models Only)**

Confirm the unit is disconnected from the power supply then remove housing from condensing unit. Route the drain line from the evaporator section plastic tubing, copper elbow and clamps from kit as shown in Figure 1. Remove hole plug from vaporizer and position so that copper tube extends into pan as shown in Figure 2. Make sure the end of the copper elbow is pointing down and not up inside the vaporizing pan so it does not create a trap. Remove hole plug and feed power supply cord through hole in control panel and connect leads at terminal block posts and ground wire to ground stud per local and national electric codes as shown in Figure 3. Secure cord with strain relief and use wire clamp as needed to locate cord. Replace condensing unit housing and energize unit.

WARNING: THE VAPORIZER IS HOT AND THE COVER MUST BE USED!

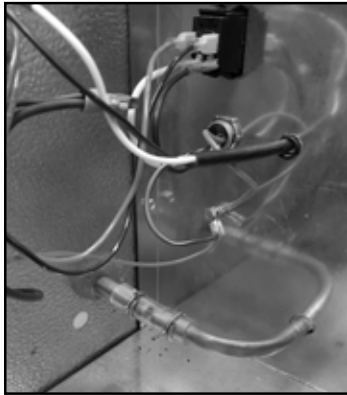


Figure 1



Figure 2

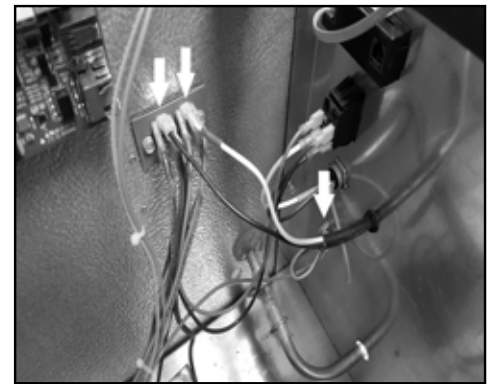


Figure 3

Vaporizer electrical specification for 132962 and vaporizer electrical for 133141 vaporizer kit noted below.

MODEL:	132962
VOLTAGE/HZ/PH:	120/60/1
TOTAL AMPS:	2.9
WATTS:	350
MFG DATE:	<input type="text"/>
	M / Y

CALUS 146974

MODEL:	133141
VOLTAGE/HZ/PH:	240/60/1
TOTAL AMPS:	1.5
WATTS:	350
MFG DATE:	<input type="text"/>
	M / Y

CALUS 166027

FOR REMOTE SYSTEMS WITH ELECTRIC VAPORIZER

Set the Refrigeration System evaporator section over the hole in the ceiling section. Align the evaporator with the clips provided and lock in place. Remove the Diffuser Panel from the ceiling inside the walk-in to gain access to four latches located along the perimeter of the cowl. Refer to the Latch and Diffuser Installation Instructions found on pages 6 and 7. Seal the seam using silicone provided. When reinstalling the Diffuser Panel, make sure that the ceiling section divider located on the panel seals against the black gasket. Some adjustment may be required by simply bending the ceiling section divider slightly forward or backward. This will prevent any short cycling of discharge and return air.

Fasten the evaporator section down to the ceiling using the provided drive screws, which can be found taped to the side of the insulated evaporator section. Secure interior latches.

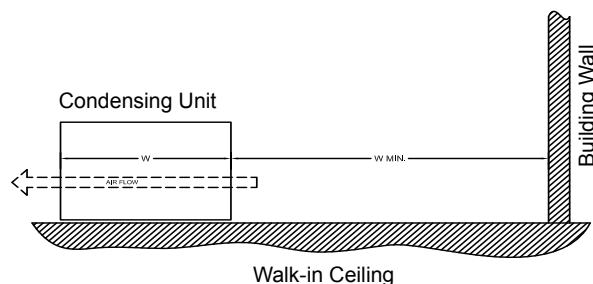
CAUTION! This must be done to prevent the entire refrigeration system from moving during operation.

LOCATING AND MOUNTING CONDENSING UNITS

Condensing units (CU's) must be located where there is an unrestricted supply of clean, fresh air. Do not locate units where air discharge from one will enter into the air intake of others nor where the air flow is toward a wall or obstruction. Avoid locating units in restricted spaces where heat will build up and can enter the condenser. There must be room around the unit for regular inspection and service. Nor-Lake recommends 200CFM in any area where condensing units may be located. Air flow should be sufficient to maintain an ambient temperature of no more than 85°

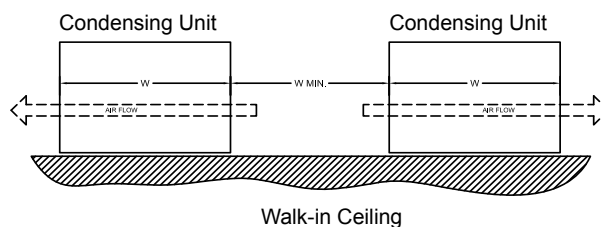
Walls or Obstructions

The units should be located so that air may circulate freely. For proper air flow, all sides of the unit should be a minimum of the width of the condensing unit away from any wall or obstruction. It is preferred that this distance be increased whenever possible.



Multiple units

For units placed side by side, the minimum distance between units should be the width of the largest unit. If units are placed end to end, the minimum distance between units should be 4 feet.



Roof mounted condensing units must have adequate support for their operating weight. Corrosive atmospheres require custom design condensers.

It is recommended the condensing unit be elevated from the deck a minimum of 12"-18" to ensure the condenser fan is not drawing or pulling heat reflected off the building roof or pavement in a grade level installation in which the summer heat may exceed +120°F

WALL MOUNTED REFRIGERATION SYSTEMS

INSTALLATION INSTRUCTIONS

Note: If the system to be wall mounted is a freezer model 100 or 150 or cooler model 075, please see the next section with special instructions on mounting these units.

Carefully raise the entire refrigeration system and insert the projecting sleeve of the evaporator section into the opening of the walk-in wall. While supporting the system, lock it into position by turning the locks exactly as you did when locking the walk-in sections together. Make sure that the locks are positively engaged and insert the plug buttons into the lock access holes when finished. Refer to Figure 1.

Wall-mounted systems require a permanent connection to an electrical service and a connection at the junction box located within the condensing unit housing. Refer to the serial tag for all pertinent electrical data. These systems must be connected to a power supply disconnect switch and wired according to local and national electric codes.

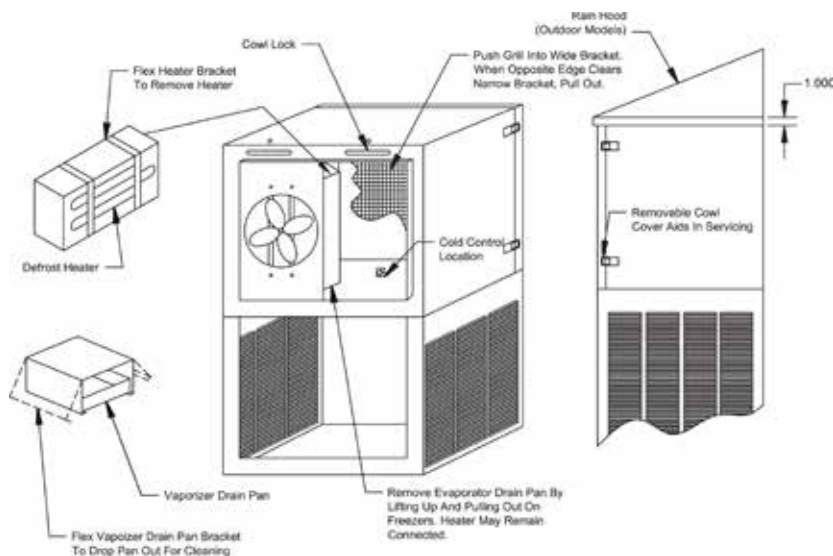


Figure 1.
Wall Mounted Refrigeration System

No plumbing drain is required, under normal conditions, for indoor installations. A built-in hot gas vaporizer dissipates the condensate moisture automatically. In outdoor installations, the condensate should be plumbed to the nearest drain. In outdoor installations, consult local building codes for proper handling of condensate water.

Note: All drain lines must have a P-trap installed. Check local building codes. Outside drain lines must also be wrapped with a suitable heater wire if they are ever subjected to below freezing temperatures. Outdoor installations also require the attachment of the rain hood that will divert rainfall from the upper surface of the evaporator housing. See Figure 1 for an illustration.

Be sure to allow for sufficient airflow around the condenser. A minimum clearance of six inches is required for installation and a minimum of two feet is required for service consideration. Ambient temperature around an indoor system should be less than 90°F and 50% RH. Ambient temperature around an outdoor system should be less than 100°F and 50% RH. If multiple units are located in the same area, be sure they do not exhaust hot air flows into one another. In addition to allowing for proper airflow, consideration should be given to the final mounting location of the refrigeration system relative to the customer location to avoid any possible risk of noise impacting the customer experience.

Please see the section "Instructions for Pre-Charged Lines" if the installation of this system involves the use of pre-charged lines to connect the evaporator and condenser sections.

Freezer Models 100 and 150 or Cooler Model 075

1. After uncrating, before attempting to attach the refrigeration system to the walk-in, a substantial temporary support should be built. The support should be approximately 28 inches high and placed directly below the wall opening of the walk-in.

Note: Due to the weight of these systems it is highly recommended that proper lifting equipment, such as a fork truck, be utilized during installation.

2. Lift the refrigeration system onto the temporary support. Determine whether the coil section sleeve is positioned properly so that it can be inserted into the opening without being bent or damaged. Shim the system appropriately so that this can be accomplished.

3. Carefully slide the entire system so that the coil section sleeve enters the opening without disturbing the temporary support below the refrigeration system. Continue until the gasket around the coil section contacts and seals around the entire perimeter of the coil section. Shim the system and adjust it accordingly so that the gasket seal will be uniform on all four sides.

4. Using the section-latching wrench provided for the erection of the walk-in, insert the wrench into the latch access holes of the coil section. Turn each of the locks clockwise until the latches engage the strikes in the walk-in. Turn the lock until a full stop is encountered. **DO NOT REMOVE THE TEMPORARY SUPPORT!**

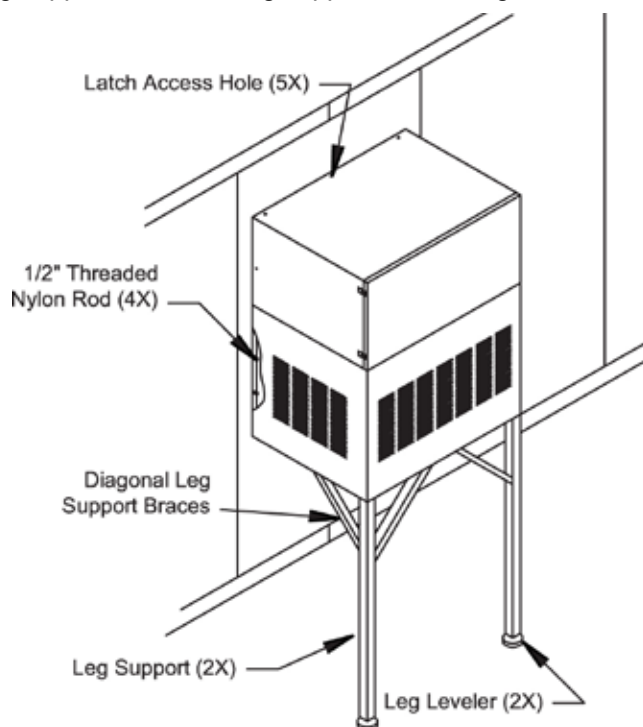
5. Remove the louver assembly and drill four 9/16" diameter holes through the two upright angles of the condensing unit section. Drill completely through the walk-in wall and insert the 1/2" threaded nylon rods. Secure with the flat washers and nuts provided. Refer to Figure 2.

6. With the leveling screws threaded completely into the leg support, insert the leg support into the leg retainers at the outer corners of the condensing unit section. Unscrew the leg leveling screws until they contact the floor or other supporting surface. Note: If the supporting surface is extremely uneven, suitable shimming material must be provided under one or both of the leg supports.

7. Attach the diagonal leg support braces using the threaded fasteners provided. Make the final adjustments to the leg leveling screws so that they serve as supporting devices to the outer edge of the refrigeration system.

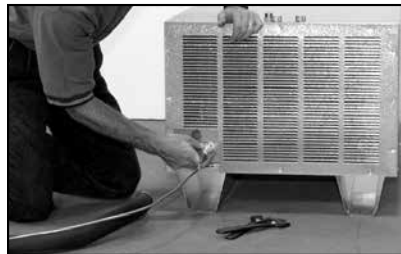
8. Insert plug buttons into each of the latch access holes.

9. Remove the temporary support assembly that was provided in Step 1.



INSTRUCTIONS FOR PRE-CHARGED LINES - REMOTE SYSTEMS

By employing self-sealing refrigeration couplings, the condensing unit section, evaporator section, and the connecting tubing are separately pre-charged with refrigerant and leak tested at the factory before shipment. Follow steps 1-8 below to install the connecting tubing at both the condensing unit and the evaporator section.



1. Carefully uncoil the suction line. This is the line covered with a continuous length of sponge rubber insulation.

2. Carefully uncoil the liquid line. The liquid line is the smaller diameter, bare copper tube.

3. Before making any connections, determine the routing of both lines and carefully hand bend them to suit the situation. Keep any bend radius rather large to prevent kinking the tubing. It is a general practice to route the suction and liquid line parallel and close together in the installation.

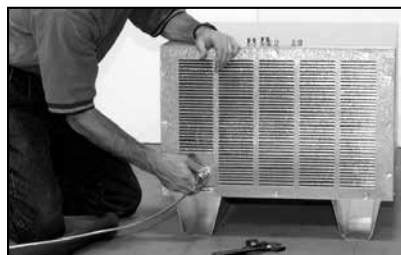
4. Remove the dust caps and plugs from the couplings and inspect them to see if the synthetic seals are intact.

5. Using a clean cloth, wipe the coupling seals and threaded surfaces to prevent the inclusion of any dirt or foreign material in the system.

6. LUBRICATE the synthetic seal in the male half of the couplings with refrigeration oil and thread the two coupling halves together BY HAND to ensure proper mating of the threads. **Note:** Make certain that the insulated suction line is connected to the coupling half marked "Suction Line" and that the bare tube liquid line is connected to the coupling half marked "Liquid Line".

Note: Always use two wrenches on the coupling body hex nut and on the union to prevent twisting of the tube while tightening the connections as described in the next step.

7. Using the proper size wrench on the union nut, tighten until the coupling bodies bottom, or until a definite resistance is felt. Tighten an additional 1/6 to 1/4 turn. This final turn is needed to compress the spring loaded fitting allowing the free flow of refrigerant and to seal the coupling. We advise leak checking the couplings to ensure there are no leaks.



Note: legs shown in photos are not standard but instead, an optional item.

Connecting to the Condensing Unit Side

8. Once the suction line is connected, the sponge insulation must be pulled up to cover the quick connects. Tie or tape off the insulation to prevent air infiltration and reduce water/ice formation on the suction line.

All valves are open and the system is ready for operation. Remember, the refrigeration couplings on this system are self sealing and, if the need ever arises, the couplings may be disconnected without any loss of refrigerant.

IMPORTANT: Since this system is equipped with pre-charged refrigerant lines, it is the installing contractor's responsibility to ensure that the quick connect refrigerant couplings are properly mated and are leak free. It is also their responsibility upon start-up to check the system for proper operation and make any necessary temperature control or thermal expansion valve adjustments.

Note: A drain line is required to be run by the contractor for this type of installation.

CAUTION: Line set must not exceed 3 feet longer than required length to complete connection or improper oil return may result in compressor failure. Contact the Service Department with model and serial number for further assistance. This information is also included on a tag attached to the line set.

Some systems require a permanent connection to an electrical service and a connection at the junction box located within the condensing unit housing. Refer to the serial tag for all pertinent electrical data. These systems must be connected to a power supply disconnect switch and wired according to local and national electric codes. Do not attach power disconnect to the condensing unit housing.

1. All systems with a wire harness will have a “K” at or near the end of the model number.
Example: RCPB100DC-A-50K.
2. These systems will come with the wire harness already wired to the condensing unit section of the refrigeration system.
3. These wire harnesses will have approved seal tight conduit and connectors.
4. Before power is connected to the condensing unit section it should first be wired to the evaporator section with the wire harness provided.
5. Remove the control box cover on the evaporator section.
6. Make the proper connections inside the control box on the evaporator section as shown in the wiring diagram provided with the system.
7. Replace the cover on the control box when wiring is completed.
8. Now power can be brought to the condensing unit section of the refrigeration system.

If you do not have the wiring diagram, contact the factory for the correct one. Have your model and serial number available when you call.

OUTDOOR SYSTEMS UTILIZING A MEMBRANE ROOFING MATERIAL

1. After the walk-in is completely assembled, place the curb face down on top of the ceiling sections (curb is fastened to crate base during shipping and must be removed and installed prior to membrane roof installation). To ensure proper opening alignment, mark the outside portion of the curb on the ceiling sections with a marking pencil.
2. Remove the paper from the gasket and position the curb, gasket side down, on the pencil line. Press down firmly. Note: Movement of the curb is very difficult after the gasket adheres to the ceiling section. Refer to Figure 1.

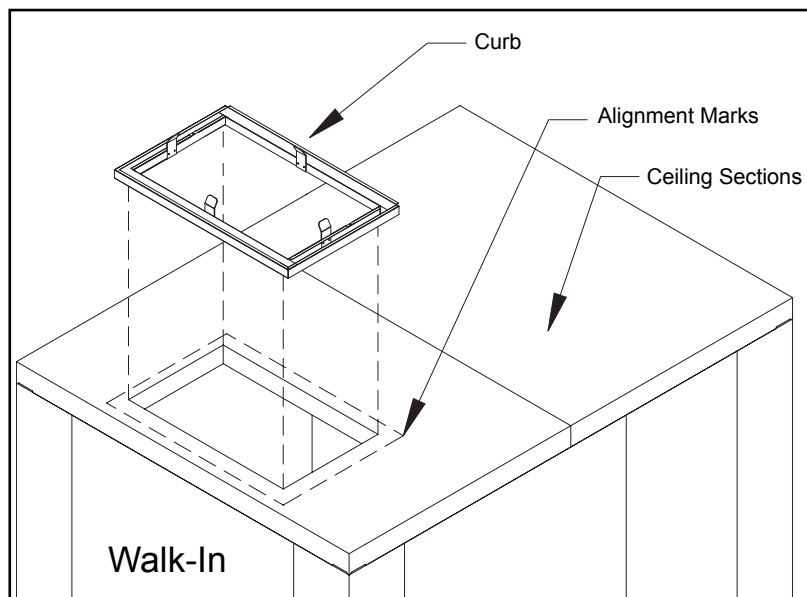


Figure 1

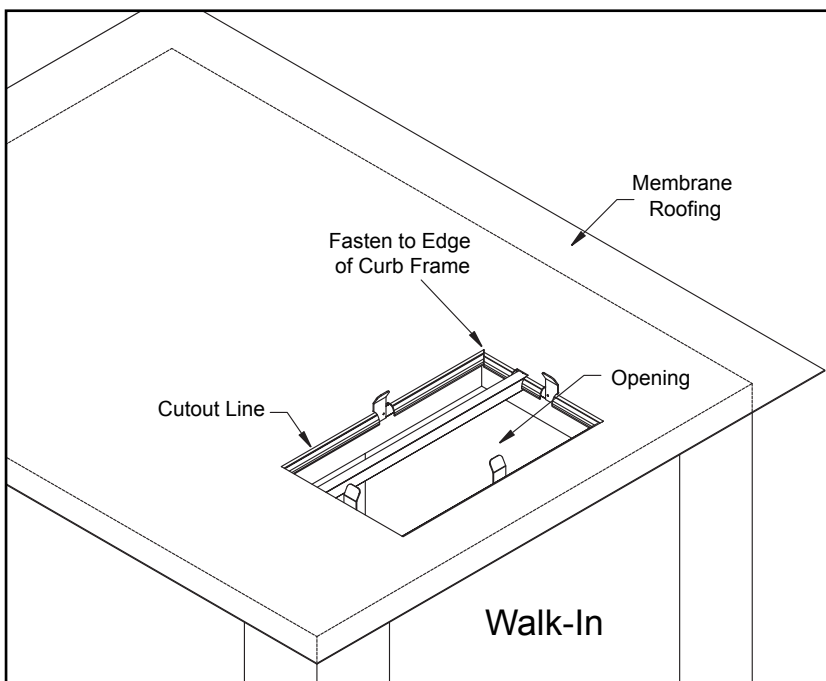


Figure 2

3. Lay the membrane roofing material over the walk-in ceiling sections and curb leaving a six inch overhang on all four sides of the walk-in. Using an utility knife, cut a hole in the membrane roof approximately 1-1/2" in from the edge of the opening. (The resulting hole in the membrane will be smaller than the ceiling opening). Fold the 1-1/2" membrane flaps into the opening, notching the membrane around the locators and divider. Use either sheet metal screws, caulk, glue, etc. to fasten the membrane roofing material to the inside edge of the curb frame. Refer to Figure 2. Do not make any penetrations in the top of the membrane roof. Any needed penetrations should be through the side wall to maintain the integrity of the roof.

4. Set the Refrigeration System over the opening in the curb. Remove Diffuser Panel from the ceiling inside the walk-in to gain access to four latches located along the inner perimeter of the cowl. Refer to the Latch and Diffuser Installation Instructions found on pages 8-9. Use the Lock Extensions supplied with the curb to bridge the distance between the latches and strikes. Seal the latched seam as described in the instructions. When reinstalling the Diffuser Panel, make sure that the ceiling section divider located on the panel seals against the black gasket. Some adjustment may be required by simply bending the ceiling section divider slightly forward or backward. This will prevent any short cycling of discharge and return air.

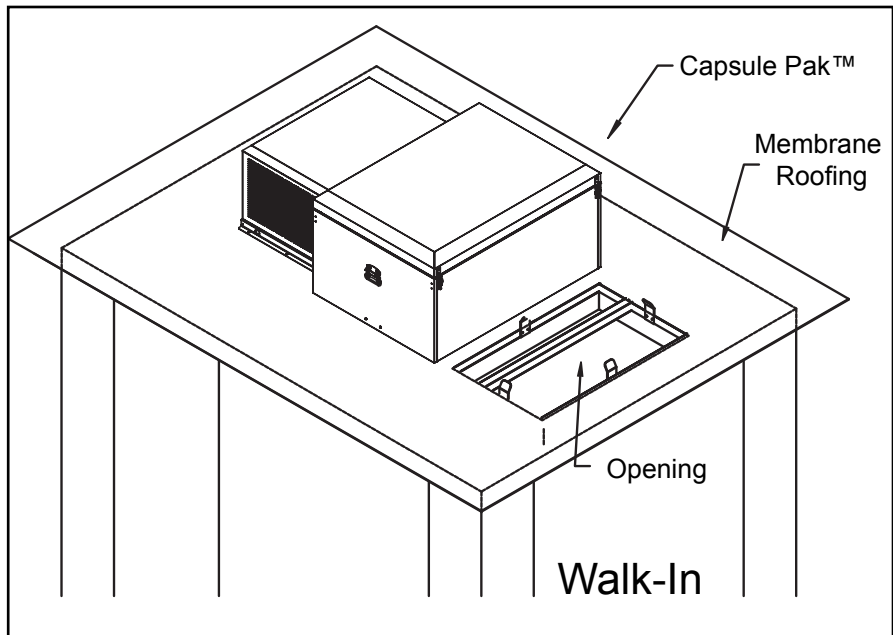


Figure 3

Before proceeding to step 5, pull membrane straight and smooth before installing the trim.

Note: Seal gasket at top of curb with silicone.

5. Fold all four corners of the membrane roofing material over the walk-in corners as shown in Figure 4.

6. Attach the trim and door hood (if your walk-in is equipped with them) by using the provided pan head sheet metal screws. Ensure the trim and membrane roof material cover the joint between the ceiling and wall panels. Refer to figure 5. Note: The trim may have to be cut to fit.

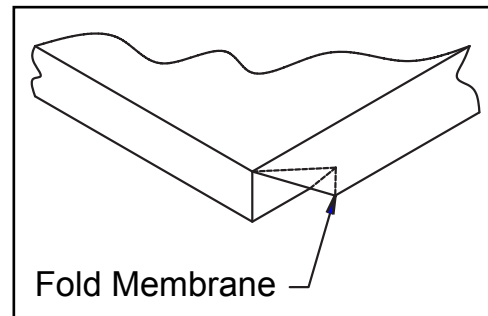


Figure 4

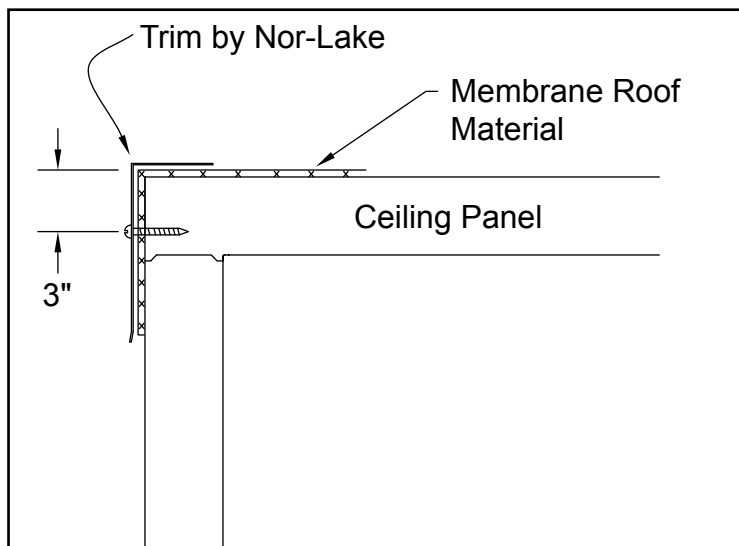


Figure 5

7. Trim off all excess membrane roofing material from under the trim with a utility knife. Do not allow the knife to cut the metal panel, as this will damage the coating and cause rust.

NOTE: In outdoor installations, the condensate line should be plumbed to the nearest drain and a P-trap installed near the end. Check local building codes. Outside drain lines must also be wrapped with a suitable heater wire and insulated if they are ever subjected to below freezing temperatures.

OPERATION

STANDARD TEMPERATURE (COOLER) SYSTEMS

The Enviro-Control™ system is a highly efficient electronic controller that regulates an electronic expansion valve in response to evaporator superheat and return air temperature, featuring demand defrost fan control technology. This system will operate differently from previous system you may have worked with in the past. Refer to the controller instructions located in the condensing unit for additional information.

Important: It is the installing contractor's responsibility to check the operation upon start-up and make necessary temperature adjustments as required for proper operation.

Note: Capsule Pak™ Refrigeration Systems that are designed for outdoor installation will be fitted with electric crankcase heaters, electrically heated condensate drain tubes and automatic head pressure control valve.

Refrigeration Controller

Capsule Pak™ refrigeration systems may be equipped with an electronic programmable temperature control or an advanced, electronic control system. See separate instructions on the operation of the electronic temperature control.

Defrost Cycle (Cooler System)

One of two different controls are utilized. The first is a Dixell control which is a digital thermostat that uses a conventional style defrost system. The controller stops the condensing unit. During this time, the evaporator fans continue to run, blowing +35-38°F air over the fins. This process will warm the evaporator above +32°F. After 15 minutes, the condensing unit should restart.

The other control method is the Enviro-Control which uses an automatic on-demand defrost algorithm that eliminates unnecessary defrosts typically associated with time-based alternatives which reduces energy consumption.

LOW TEMPERATURE (FREEZER) SYSTEMS

The low temperature, automatic electric defrost Capsule Pak™ refrigeration system utilizes one of two different controls. First, a Dixell control which is digital thermostat that uses a programmable set point and a differential for the refrigeration cycle. Second is the Enviro-Control with a programmable set point and a preset algorithm to cycle the fans and compressor in order to maintain a tighter room temperature.

Important: It is the installing contractor's responsibility to check the operation upon start-up and make necessary temperature control adjustments as required for proper operation.

Note: Capsule Pak™ Refrigeration Systems that are designed for outdoor installation will be fitted with electric crankcase heaters, electrically heated condensate drain tubes, automatic head pressure control valve, and the "pump-down cycle".

Defrost Cycle

There are two types of defrost cycles. The first is in the Dixell control. This process uses a conventional style defrost system. This controller stops the condensing unit every 6 hours. The display will read DEF. The evaporator fans will turn off and the electric heaters will turn on.

The other is the Enviro-Control which uses an automatic or demand defrost algorithm that eliminates unnecessary defrosts typically associated with time based alternatives which reduces energy consumption. For additional information see the controller instructions located in the condensing unit section of the refrigeration system.

Defrost Cycle Termination

The Dixell control will heat the evaporator coil to 50°F or 36 minutes whichever comes first.

The Enviro-Control will run the coil heater until the coil is above 32°F. At this point it will work very different than a traditional defrost cycle. The heaters will pulse on and off allowing the heat to radiate through the coil until both coil sensing probes reach 50°F or 40 minutes whichever happens first. The fan(s) in the evaporator housing will not start, however, until the fan delay cycle has expired. See the "Fan Delay" below.

Fan Delay

When a defrost cycle is terminated the evaporator fan(s) will not start until the evaporator coil temperature is reduced to about +20°F. Once this temperature is reached, the fan delay cycle will turn the fans back on continuing the refrigeration cycle.

The fan delay feature is an important part of defrosting. If the fan(s) was permitted to start immediately following a defrost period, the heat that accumulated in the evaporator housing would be circulated throughout the walk-in, raising the temperature considerably. In addition, any droplets of moisture that remained clinging to the fins of the evaporator coil would be blown into the storage space. The fan delay feature provides for a short refrigeration cycle WITHOUT the evaporator fan(s) to prevent these conditions.

Note: During the initial startup of a Capsule Pak™ Refrigeration System on warm walk-in, the evaporator fan(s) will not start until the evaporator coil reaches +20°F. Further, the evaporator fans may cycle "on" and "off" several times until the evaporator coil reaches and maintains +20°F.

Drain Tube Heater

Low temperature ceiling mounted Capsule Pak™ Refrigeration Systems may employ a low wattage, electric heater strip. This heater is spirally wound around the condensate drain tube that extends from the drain pan below the evaporator coil to the evaporator section housing wall. This heater is energized continually to allow the free flow of the condensate water to the outside of the evaporator section. The discharged water should then be removed per local code. The heater and drain tube are covered with an insulated tape.

NOTE:

Indoor application: If the condensate vaporizer is not used the condensate line should be plumbed to the nearest drain and a P-trap installed near the end. Check local building codes.

Outdoor application: Drain lines must have a P-trap installed at the termination point and be wrapped continuously with a suitable heater wire and insulated if they are ever subjected to below freezing temperatures.

MAINTENANCE

WARNING: When servicing any Capsule Pak™ Refrigeration System or performing any maintenance procedure, always disconnect the main power supply.

The condensing unit is accessible by removing the condensing unit housing. The evaporator coil section is accessible by unlatching and removing the evaporator section housing cover. For access to the fan blade(s) and for oiling the fan motor on some models, remove the louver on the walk-in ceiling.

Cleaning the Condenser and Evaporator Coils

The efficiency of the refrigeration system, to a great extent, depends upon the unrestricted flow of air through the condenser and evaporator coils. For this reason both coils should be as clean as possible at all times and should have an unrestricted supply of air.

Cleaning the condenser should be done at a minimum of every 3 months.

A vacuum cleaner with a bristle attachment can be used to clean the coil. If debris on the coil cannot be removed easily, a bristle brush can be used to loosen it by gently brushing in the same direction as the fins so as not to damage them and restrict air flow. An air compressor can be used to clean the condenser coil also. The air flow should be directed through the coil from the fan motor side. A damp hand towel can be blocked against the opposite side so that the majority of the dust will be captured in the towel minimizing the mess in the room.

NOTE: Do not use corrosive cleaners as they may damage the copper tubing or welds.

Hot Gas Vaporizer Pan

Condensate from the evaporator pan is discharged into a hot gas vaporizer pan, which is located in the condensing unit housing. Here the hot discharge gas from the compressor elevates the temperature of the water and it vaporizes into the atmosphere. This pan should be cleaned periodically to remove solids that remain after the moisture is evaporated. **Do not scrub the copper tubing very hard or use corrosive cleaners as this may damage the copper lines or welds.**

MALFUNCTION

POSSIBLE CAUSE

SOLUTION

Compressor will not start - no hum

1. Unplugged or power off
2. Fuse blown or removed
3. Overload tripped
4. Control stuck open
5. Wiring incorrect

1. Plug in service cord or turn power on
2. Replace fuse
3. Determine reasons and correct
4. Repair or replace
5. Check wiring against the diagram

Compressor will not start - hums but trips on overload protector

1. Improperly wired
2. Low voltage to unit
3. Starting capacitor defective
4. Relay failing to close

1. Check wiring against the diagram
2. Determine reason and correct
3. Determine reason and replace
4. Determine reason, correct or replace

Compressor starts and runs, but short cycles on overload protector

1. Low voltage to unit
2. Overload defective
3. Excessive head pressure
4. Compressor hot — warm ambient conditions

1. Determine reason and correct
2. Check current, replace overload protector
3. Check ventilation or restriction in refrigeration system
4. Check refrigerant charge, fix leak if necessary

Compressor operates long or continuously

1. Short of refrigerant
2. Control contact stuck
3. Evaporator coil iced
4. Restriction in refrigeration system
5. Dirty condenser —warm ambient conditions
6. Warm ambient

1. Fix leak, add charge
2. Repair or replace
3. Determine cause, defrost manually
4. Determine location and remove restriction
5. Clean condenser
6. Address ambient conditions

Compressor runs fine, but short cycles

1. Overload protector
2. Cold control
3. Overcharge
4. Air in system
5. Undercharge

1. Check wiring diagram
2. Differential too close - widen
3. Reduce charge
4. Purge and recharge
5. Fix leak, add refrigerant

Starting capacitor open, shorted or blown

1. Relay contacts stuck
2. Low voltage to unit
3. Improper relay

1. Clean contacts or replace relay
2. Determine reason and correct
3. Replace

Relay defective or burned out

1. Incorrect relay
2. Voltage too high or too low

1. Check and replace
2. Determine reason and correct

Refrigerated space too warm

1. Control setting too high
2. Refrigerant overcharge
3. Dirty condenser
4. Evaporator coil iced
5. Not operating
6. Air flow to condenser or evaporator blocked
7. Warm ambient conditions

1. Reset control
2. Purge refrigerant
3. Clean condenser
4. Determine reason and defrost
5. Determine reason, replace if necessary
6. Remove obstruction for free air flow — no storage on top of walk-in
7. Ambient conditions should be 90° or less

Standard temperature system freezes the product

1. Control setting is too low
2. Control points stuck

1. Reset the control
2. Replace the control

Objectionable noise

1. Fan blade hitting fan shroud
2. Tubing rattle
3. Vibrating fan blade
4. Condenser fan motor rattles
5. General vibration
6. Worn fan motor bearings

1. Reform or cut away small section of shroud
2. Locate and reform
3. Replace fan blade
4. Check motor bracket mounting, tighten
5. Compressor suspension bolts not loosened on applicable models - loosen them
6. Replace fan motor

Water overflowing from evaporator drain pan or condensate vaporizer pan

1. Air leak between refrigeration system and walk-in panel.
2. Drain line from evaporator drain pan to condensate vaporizer is blocked with foreign material.
3. Drain line from evaporator drain pan to condensate vaporizer is blocked with ice.
4. Walk-in operating in high humidity environment (heavy door usage).

1. Check that refrigeration system is properly set in panel opening.
2. Clean blockage from inside of drain line.
3. Check that drain line heater (on freezers) is working and repair or replace as required.
4. Plumb drain line from evaporator to floor drain or replace high gas vaporizer with electric vaporizer. Consult factory for further information.

