HYGIENIC AIR HANDLING UNITS

SSTP Installation Instructions

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GLOBAL COLD CHAIN ALLIANCE®

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General

Please read the following instructions before attempting to rig or install EVAPCO SSTP evaporator units. These installation instructions are not intended to replace the knowledge and experience of a licensed installation contractor. It is rather provided to familiarize the installation personnel with the SSTP system. Also read the "General Precautions and Safety Procedures" Section on the back page for important safety information.

Receiving

Carefully inspect the unit(s) upon arrival to make certain that no damage has occurred during shipment. All items should be checked against the bill of lading to ensure that all crates and cartons have been received. All components should be carefully checked for damage. Any visible damage should be immediately noted on the bill of lading and a claim submitted to the transportation company. If after further inspection, concealed damage is found, again a claim should be made at once to the transportation company. This procedure is essential to preserve your right to reimbursement for any transportation damage. EVAPCO Incorporated will gladly assist you in any way, however, all damage claims must be filed through the transportation company.

The refrigerant coil on all EVAPCO evaporators is shipped from the factory with a low pressure nitrogen charge. Quickly open the valve located on the coil headers to hear or feel escaping nitrogen. Once it has been determined that the coil is charged, the valve should be closed. It is recommended that this charge be maintained until just prior to connecting refrigerant piping to the unit.

A coil not showing signs of a nitrogen charge may have been damaged during shipment. If this is suspected, the coil should be pressure tested with dry nitrogen gas to ensure that it is leak-free. Please notify EVAPCO, before installation, of any evaporator that has lost the factory nitrogen charge.

Unit Handling

The unit is designed to be lifted via the four lifting lugs located at the base of the unit (see Figure 1). The unit should never be pulled or pushed since this could damage the structure and integrity of the unit.

The unit must be lifted via a spreader bar. The spreader bar must extend the full width of the unit so the chains or slings hang vertically. Make sure that the lifting chains are not in a position to damage protruding items as coil connections, door handles and control panels.

All rigging materials are to be provided by others.

Note: The SSTP unit is a slightly unbalanced load. Therefore, make sure appropriate measures are taken to lift the unit properly.

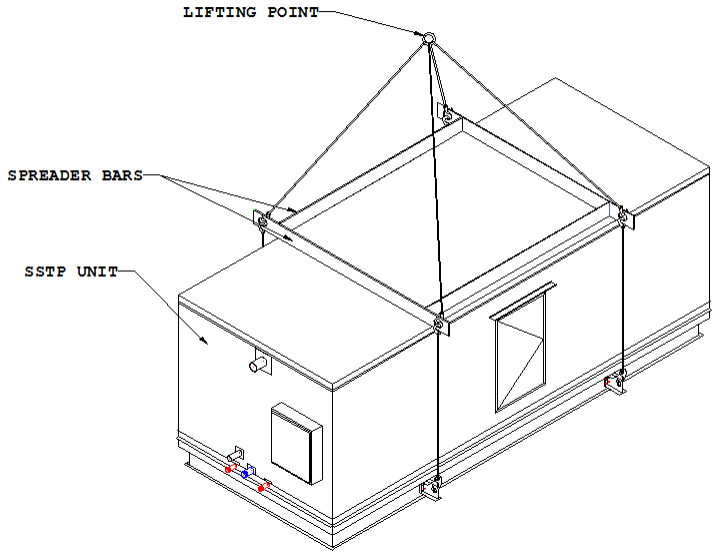


Figure 1

Unit Support

The unit must be mounted level. The unit can either be mounted on the roof deck or mounted up on structural steel, above the roof.

To ensure proper drain pan drainage and refrigeration coil operation, the unit must be mounted level. It is recommended that the unit be supported around the full perimeter unless special considerations have been made. The unit can be supplied with an optional pitched base to compensate for the pitch in the roof of the facility.

If the unit is mounted up on structural steel, off from the roof, the structural support base must support the unit around the full perimeter of the unit base.

Note: If the unit is mounted up on structural steel, above the roof, the unit must have an insulated bottom.

Unit Location

The unit is complete with at least two service doors, one on each side of the unit. Accessibility to the doors should be reviewed prior to final installation. If the unit is located near the edge of the roof, consult local codes and OSHA requirements, which may dictate railings or other safety devices along the building edge to facilitate safe personnel access to the unit. On lower temperature applications the doors are provided with perimeter 120 volt heating cable.

Roofing/Unit Interface

Once the unit is installed, the lifting lugs must be removed (see Figure 2).

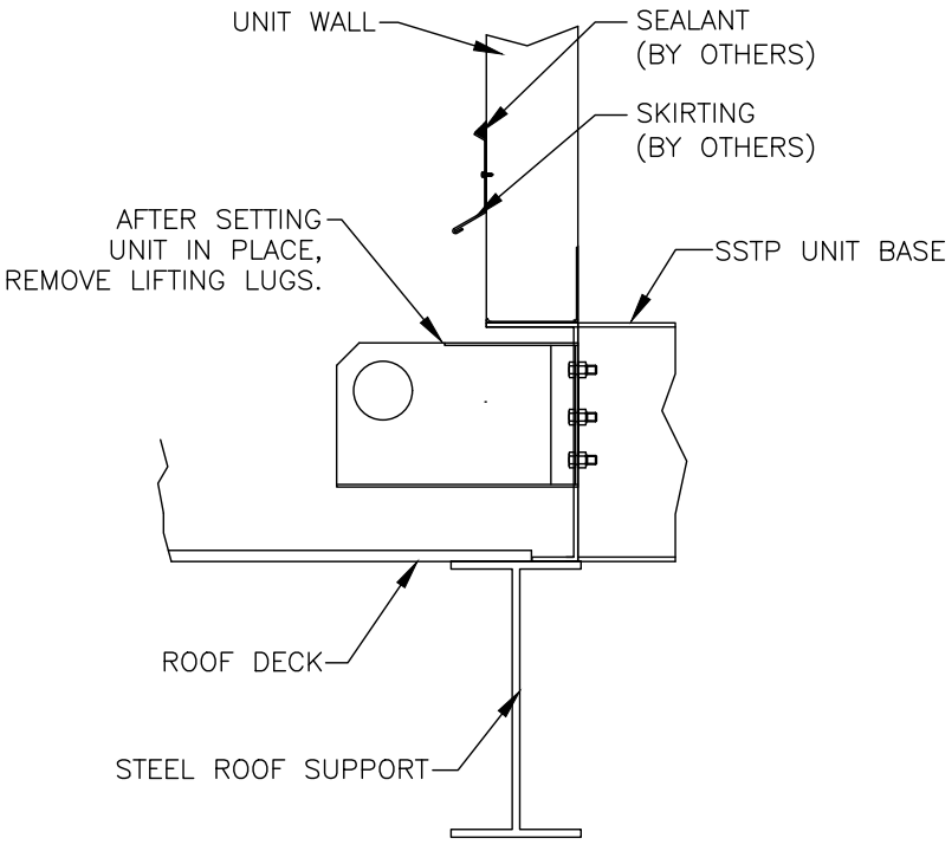


Figure 2

First, insulate up to the base of the unit and provide an insulation cant around the perimeter of the unit. The insulation should be a minimum of 16" for the flashing on a standard unit. Please note a standard base is 12", if the base is taller or a pitched base, the insulation may need to be go higher than 16". A good rule of thumb is a minimum of 4" above the bottom of the cam-lock panel. The interface between the building roofing material and the SSTP unit is critical. The SSTP unit is designed so the roofing material is flashed into the side of the unit. This flashing joint must be air and vapor tight. The following is a typical installation detail (see Figure 3). However, the type of interface is dependent upon the type of roofing material and its specific installation and application details.

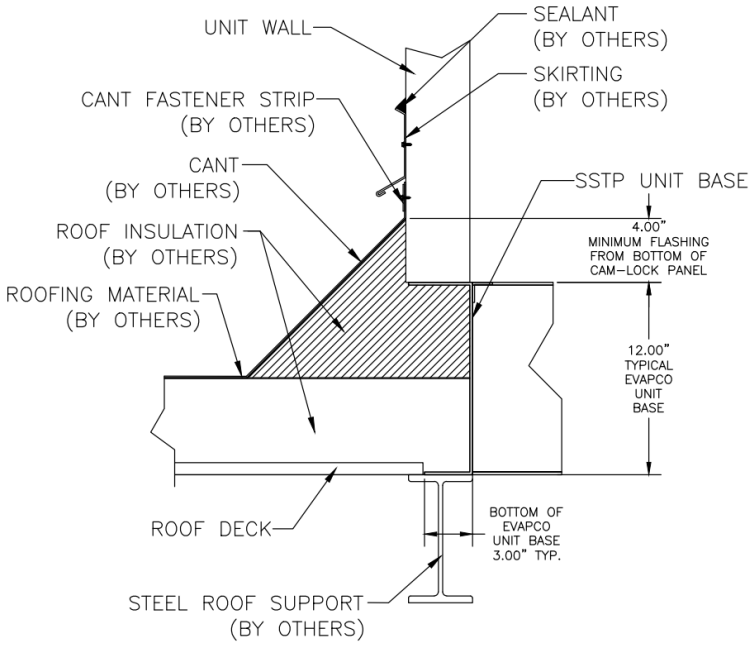


Figure 3

The unit can be fastened or welded to the roof structure. If welding, extreme caution should be exercised so as not to damage the insulation located behind the structural base of the unit. Also, during welding, the protective coating on the unit base will likely be destroyed. Recoat all welds to prevent rust and/or deterioration of the unit base.

If the unit is mounted over an interstitial space or off the roof on structural steel the unit should have an insulated bottom. See figure 4 for mounting on roof deck. Insulated duct (by others) is extended from the refrigerated space to the bottom of the SSTP unit. See figure 5 for suggested details. The duct-unit bottom interface installation is critical in preventing condensation or frost on the outside of the duct. A thermal brake (saw cut works) in the duct and on the bottom of the unit (both by installation contractor) is required to prevent the thermal bridge.

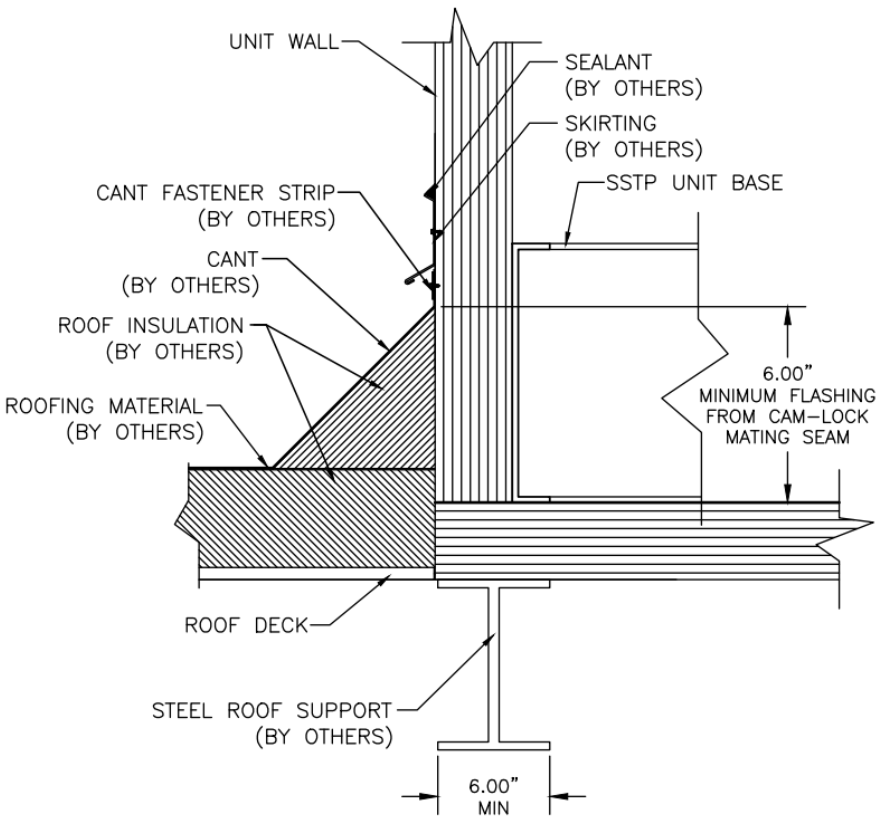
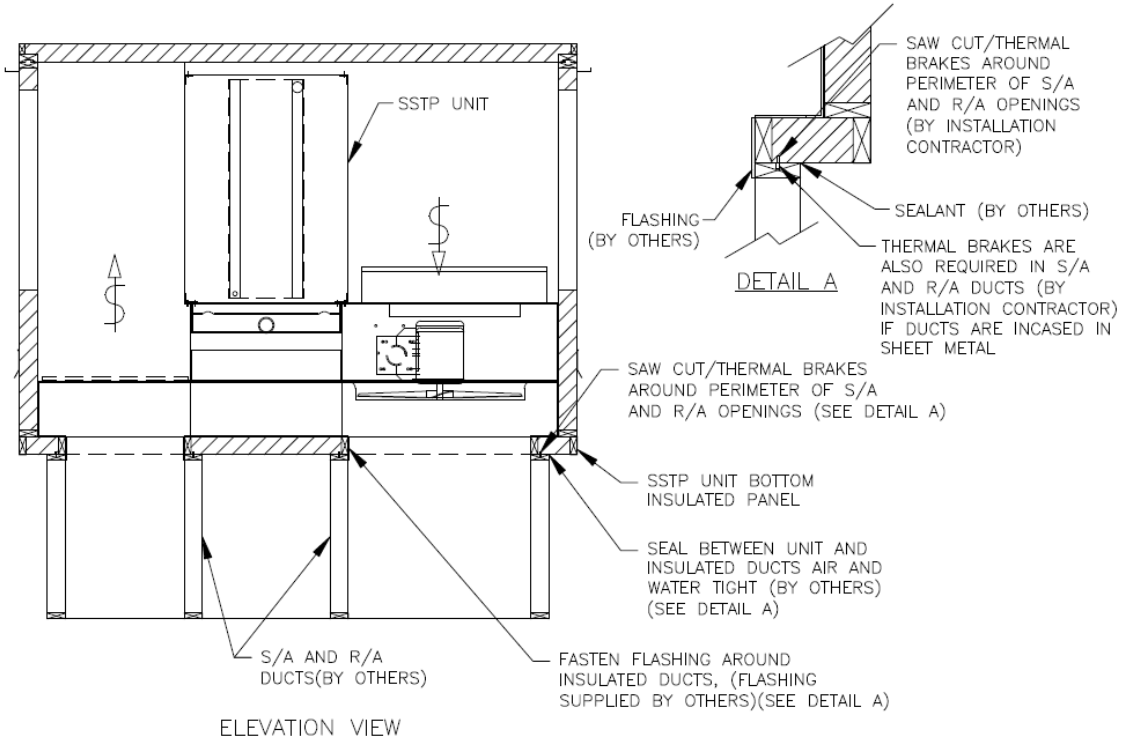


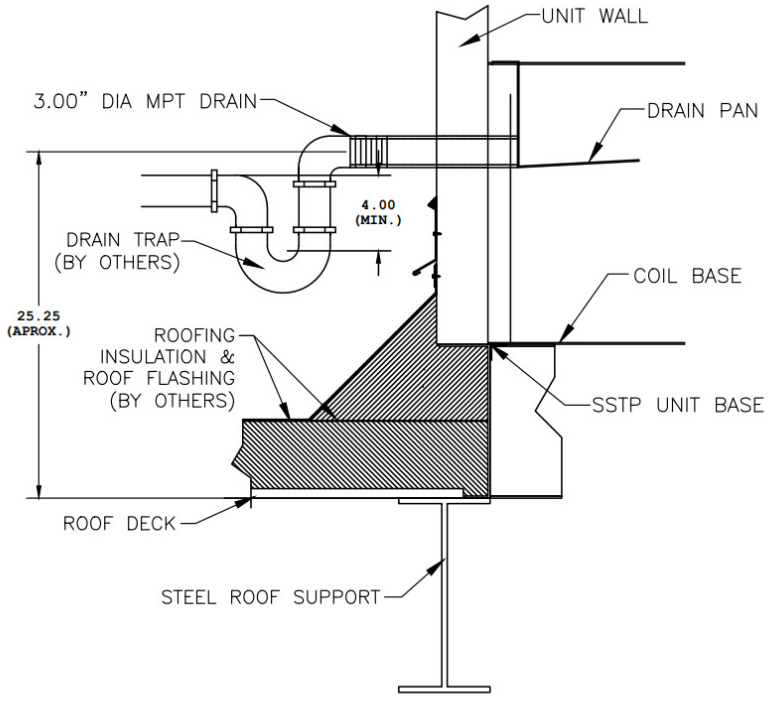
Figure 4

Figure 5



Drain Pans

The unit must be installed in a level position so the drain pan will drain completely. The drain connection extends out the side of the unit's insulated wall. To drain properly, a field supplied P-trap must be installed on the drain connection and the drain line should have a pitch of at least 1/4" per foot. A seal of a minimum of 4" is required. Do not reduce the diameter of the piping on the drain before the trap (see Figure 6). Depending upon the room temperature, and the plant's geographical location, the drain, drain trap and drain piping extensions, (if used), may need to be heat traced. If heat tracing is located on the exterior of the pipe, it must also be insulated. If the heat tracing is run on the inside of the piping, insulation is generally not necessary.



Piping

The coil connections and the hot gas pan connections, (if supplied); extend through the side of the unit for field connection to the refrigeration system.

Caution: The field installed piping cannot be supported from the unit coil connections. The field piping must be fully supported external to the unit and the coil connections. Every effort must be made in the field piping to keep stresses to a minimum on coil connections to:

a) Allow for thermal expansion and contraction of the field piping.

b) To minimize the transmittal of vibration through the piping to the unit coil(s).

All piping to the unit must meet all state and local codes. It is recommended that all IIAR good piping practices be followed.

As described earlier, all evaporators are shipped from the factory with a low pressure nitrogen charge. The unit should remain charged as long as possible before final piping connection to prevent moisture from entering the coil.

The refrigerant piping system must be properly evacuated to remove non-condensing gases and moisture prior to charging.

Fan/Motor Assembly

The unit is completely tested at the factory. However, it is strongly recommended all of the motor base bolts and fan hub assemblies be checked for tightness before starting the unit.

Note: The fan blades on the unit are a cast aluminum construction. Extremely caution must be exercised when tightening the hub bolts on the fans. Please refer to the attached fan hub tightening instructions. Failure to use the instructions can cause cracking in the hub and possible failure in the fan blade.

Controls

The unit may be supplied with an optional control package. This typically includes a fused disconnect switch and motor starter(s), one starter for each fan motor. The main circuit fuses and the individual overloads for the motor(s) are sized for the break horsepower at operating the conditions.

If fan cycling is used for energy conservation, remember all fans must be stopped prior to starting a fan that has been de-energized in the economizer cycle. Typically the fans in the off mode will be rotating backward, and therefore, will overload if started while rotating backward.

Electrical

All field wiring to the SSTP unit must be in accordance with the National Electric Code and all state and local codes.

Please refer to the electrical wiring diagram supplied with the unit. It is essential that all controls are wired in accordance with the wiring diagram and all safety devices are wired and operational.

Upon startup of the unit, "bump" the fan motors to ensure that the fans are rotating in the proper direction.

Note: Electrical overloads should be sized for the operating brake horsepower of the motor. However, if this is unknown, use the motor horsepower times the air density correction factor as shown in the table below:

Air Density Correction Factor	
Room Temperature	Factor
+50° F	1.04
+30 F	1.08
+20 F	1.11
0 F	1.15
-10 F	1.18
-20 F	1.21
-30 F	1.23
-40 F	1.26

The SSTP evaporators are frequently used in cold temperatures where the air is more dense possibly causing them to draw greater than nameplate amps. The correction factors in the above table use standard air conditions (70°F air) as a basis. Operating the units over the nameplate in cold atmospheres will not damage the motor due to the increased cooling efficiency of the refrigerated air flowing across the motor.

Caution: Before wiring the unit, make certain the electrical characteristics stamped on the unit motor, control transformer, and that shown on the wiring diagram agree with the available power source.

Discharge Head Installation

The discharge head (optional accessory) is complete with hanging points so it can be easily hung from the ceiling. All hanging points, as illustrated in figure 5, must be used for proper installation. **The discharge head should not be hung from the supply air ductwork.**

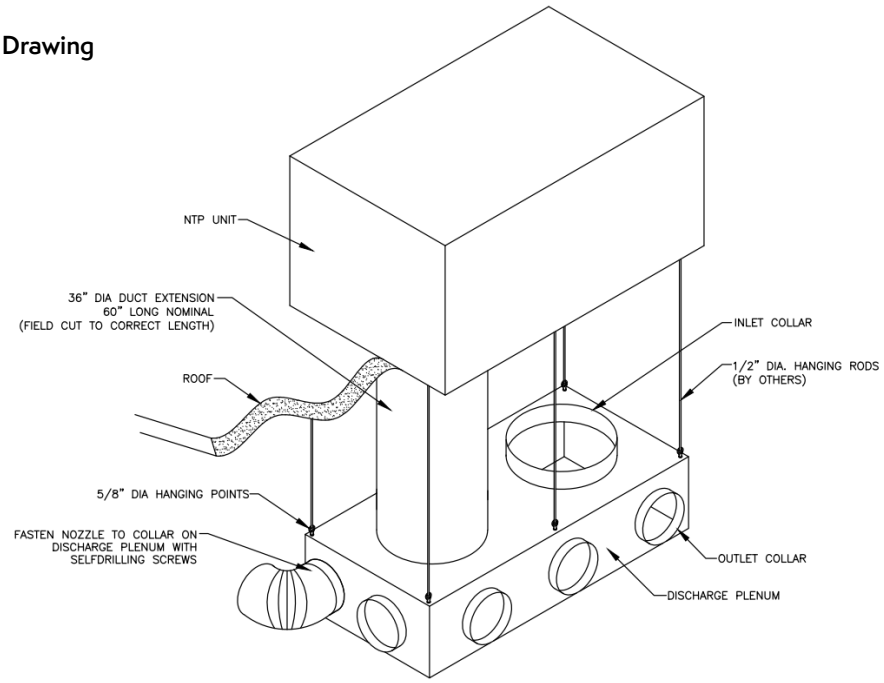
Individual diameter ducts are shipped loose to extend from the unit fan(s) to the discharge plenum inlet. The duct extensions are furnished in two pieces that telescope to allow adjustment from 36" to 60" in length. See the drawing below for installation and fastening details. Ductwork is installed by installation contractor.

For insulated bottom units, opening in the bottom of the unit and discharge plenum head will be rectangular. The duct work between the unit and the discharge plenum head will need to be insulated and **supplied by others** (see Figure 5).

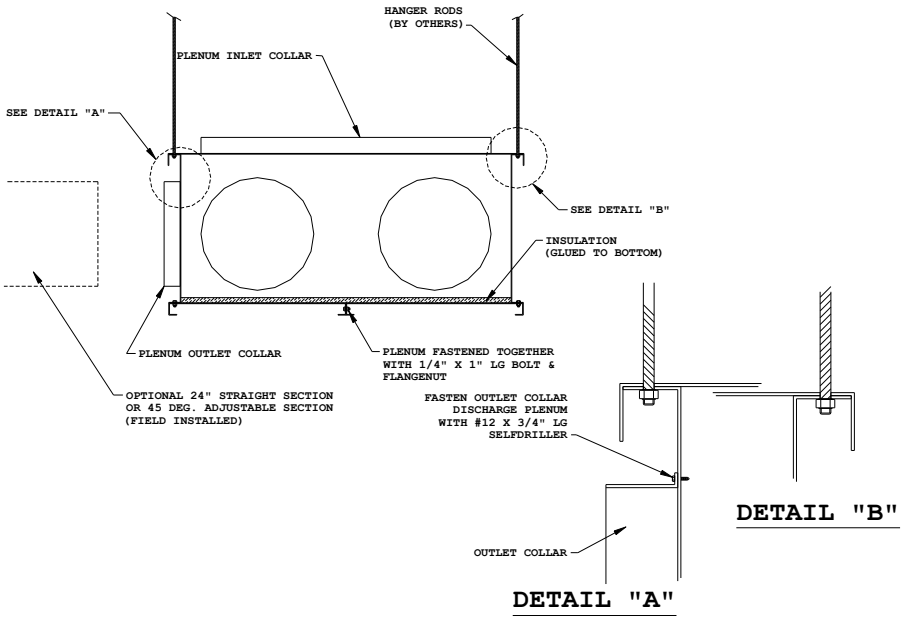
The discharge nozzles (optional - depending on the installation) from the distribution head are also shipped loose for field mounting. The discharge nozzles should be mounted and sheet metal screwed to the discharge head collar. Adjustable nozzles should be adjusted for proper air distribution and then fixed in that position.

Duct extensions past the return air (on four way models only) are also shipped loose for field mounting. These extensions are also two piece design. See the attached drawing for mounting and fastening details.

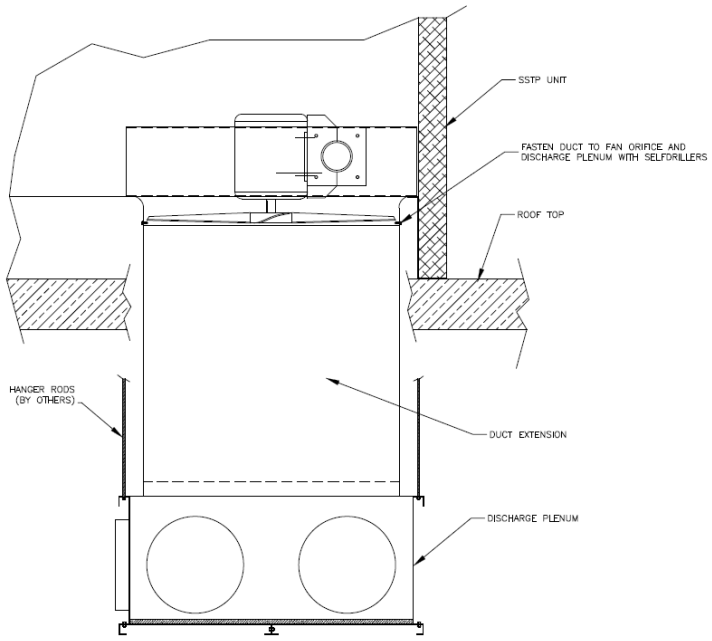
Discharge Head Installation Drawing



Discharge Head End View Drawing



Discharge Head Duct Mounting Drawing



Maintenance

During normal operation, very little maintenance is required. Listed below are general instructions related to the operation of the evaporators.

All fan motors have sealed bearings with low temperature grease, if required, and do not require periodic re-greasing.

If any solution is used in the cleaning of the evaporators, or if any other substance makes contact with or is introduced into the atmosphere surrounding an evaporator, it must be non-corrosive and compatible with galvanized steel or aluminum, depending upon the material supplied with the unit.

For units equipped with water defrost, the water quality should be such that it does not corrode the galvanized steel and/or aluminum surfaces. The maximum temperature of the water used for defrost shall be 60˚F.

General Precautions and Safety Procedures for EVAPCO Evaporators

1) Caution must be employed in the use of any refrigerant. Wherever people or product may be exposed to the refrigerant, frequent visual inspections should be made, and continuous monitoring is recommended for the detection of any defect or malfunction which may result in the release of refrigerant. Electronic detection devices should be used for warning of the presence of refrigerants in the atmosphere. In addition, temperature monitoring devices should be used constantly to warn against the loss of refrigerant capacity or temperature rise in refrigerated spaces which may prove harmful to people, product, or equipment. **Only experienced, qualified personnel should service, operate, and maintain refrigerant equipment.**

2) Where there are liquid lines, or any lines which may contain liquid refrigerant, certain precautions must be taken to avoid hydraulic shock or hammer, and hydraulic lock-up. Hydraulic lock-up may occur when the ambient temperature causes a temperature increase in a section full of trapped liquid. If the evaporator coil is part of this trapped section, serious damage may result from the expansion of the liquid. Hydraulic shock caused by liquid accumulation in hot gas lines or suction lines used for hot gas defrost can also cause coil damage. Traveling at high velocity, the energy of a liquid slug may be sufficient to break coil header caps or plugs from their lines. For hot gas defrost applications, the units should never be operated without a check valve or some other device which will prevent liquid refrigerant from draining into and accumulating in the hot gas pan coil.

For more information on this subject, see IIAR II or ASHRAE Standard 15.

3) If isolating an evaporator, remove liquid refrigerant from the coil or section to be isolated before hand valves are closed in order to protect equipment, personnel, and product. Pump out lines to remove liquid accumulation which, in combination with high flow velocities, may produce hydraulic shock or hammer.

4) Refrigeration coils and unit coolers must not be used with refrigerants other than the type indicated on the certified drawings from the factory. Likewise, the type of feed should not be different than that which is specified on the certified drawings. The coils must never be subjected to pressures in excess of 280 psig.

5) All refrigerant piping systems must be properly evacuated to remove non-condensing gases and moisture prior to charging.

Rev. 1-3-2024

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