



PN 20200

HEAT PIPE COIL
INSTALLATION MANUAL

MARCH 1, 2000
REVISED

HPC - HEAT PIPE COILS

Installation, Operation & Maintenance Instructions

COVERS MODELS:

B = Basic Heat Pipe Coil

U = In-Line, Wrap Around

T = Tilt

FB = Face and Bypass

IDEC = Indirect Evaporative Cooling

SPECIFY COLMAC QUALITY

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INSTALLATION AND MAINTENANCE INSTRUCTIONS FOR HEAT PIPE COILS

CODE REQUIREMENTS

The installation of Colmac heat pipe coils and all other Colmac supplied equipment must conform to all local, state, and federal laws and regulations applying at the site.

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WARNING - CAUTION

DO NOT OPERATE EXHAUST AIR FLOW OVER THE HEAT PIPE COIL WITHOUT THE SUPPLY AIR FLOW ON, UNLESS SPECIFICALLY APPROVED IN WRITING BY COLMAC. THIS IS REFERRED TO AS A SOAK CONDITION.

EXHAUST FAN OPERATION SHOULD BE ELECTRICALLY INTERLOCKED THROUGH AUXILIARY CONTACTS FOR DIRECT DRIVEN SUPPLY FAN. FOR BELT DRIVEN SUPPLY FAN USE A SUITABLE AIR FLOW SWITCH.

DO NOT EXCEED THE MAXIMUM SOAK TEMPERATURE AS INDICATED ON THE NAMEPLATE.

DO NOT OPERATE THIS HEAT PIPE COIL AT CONDITIONS OTHER THAN THE DESIGN CRITERION FOR THIS HEAT PIPE COIL. THIS APPLIES TO AIR FLOW VOLUME AS WELL AS TEMPERATURE.

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WARNING - CAUTION

THE EXCHANGER SHOULD BE LIFTED WITH THE TUBES LEVEL.

THE HEAT PIPE TUBES HAVE A LIQUID CHARGE HERMETICALLY SEALED INSIDE EACH TUBE. **THE CENTER OF GRAVITY OF THE EXCHANGER WILL SHIFT APPRECIABLY DURING HOISTING.**

COUNTERFLOW DESIGN ARRANGEMENT:

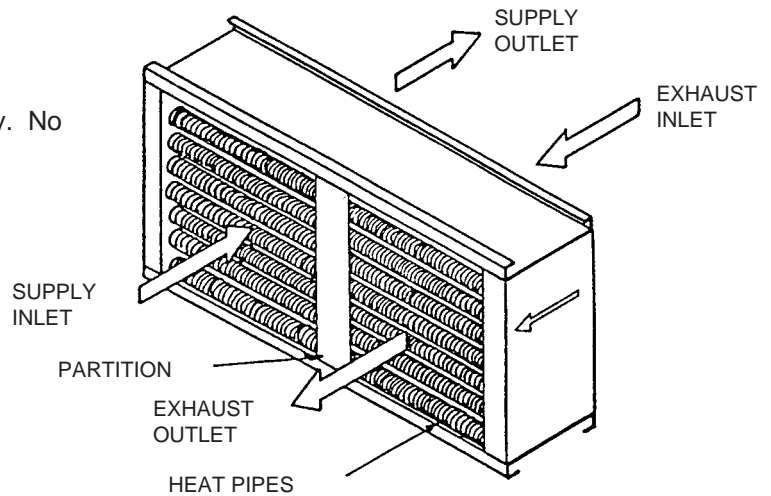
The heat pipe coil must be installed in a counterflow arrangement. The supply and exhaust air streams must flow in opposite directions through each respective side of the exchanger as marked on the exchanger end covers. Air stream position in the exchanger and stream directions cannot be interchanged unless approved by Colmac.

SUPPORT REQUIREMENTS:

The heat pipe heat exchanger must be mounted rigidly. No more than 1/8" total bow end to end is allowable.

FLANGE CONNECTIONS:

The heat pipe coil is manufactured with a dividing partition and frame such that standard duct flanges can be screwed to the frame. Use 3/16" dia. by 3/8" long self tapping sheet metal screws. Space as required. Do not allow drill bit to penetrate over 1/2" into the coil end boxes. Use of gaskets or sealants on the flange faces is recommended.

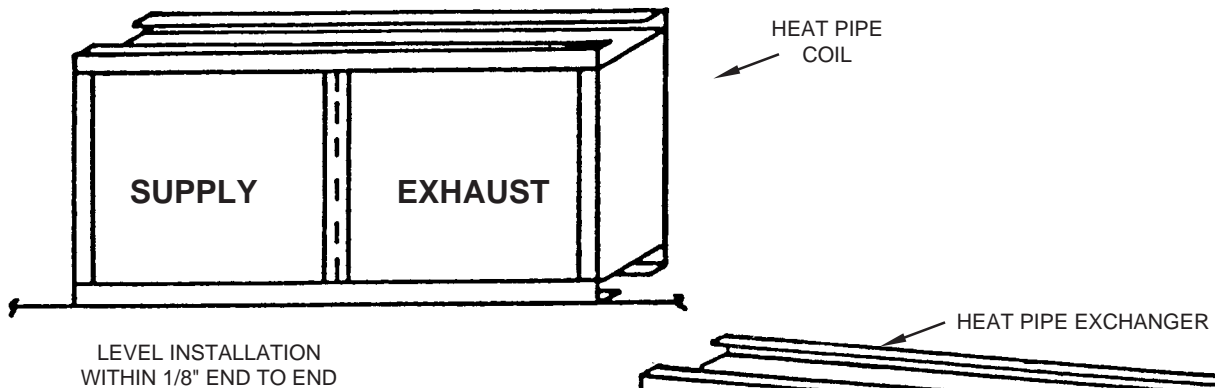


DUCTING SYSTEM:

The duct system supplying the exchanger should be in accordance with good engineering practice in establishing a uniform air flow across the entire coil face surface.

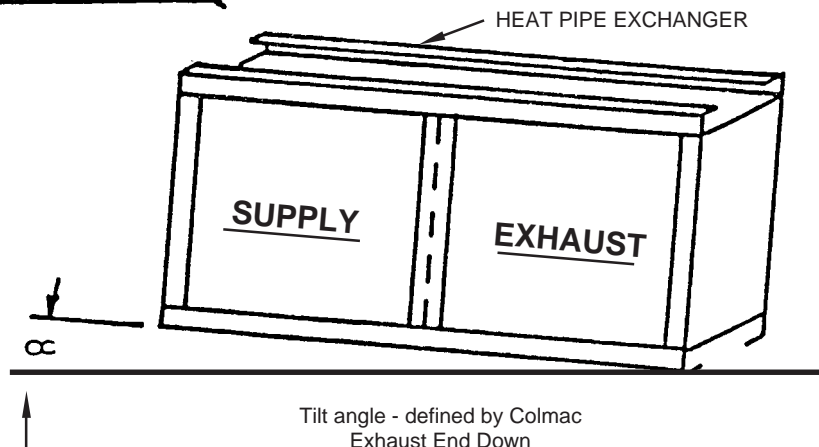
HEATING, VENTILATING, AIR CONDITIONING INSTALLATION

When using the heat pipe coil for heating, ventilating, and air conditioning (summer/winter recovery) it must be installed level within 1/8 inch end to end.



HEAT RECOVERY ONLY INSTALLATION:

When using the heat pipe coil for heat recovery only it must be installed with the exhaust end tilted down. Colmac defines the tilt angle in its approved submittals.



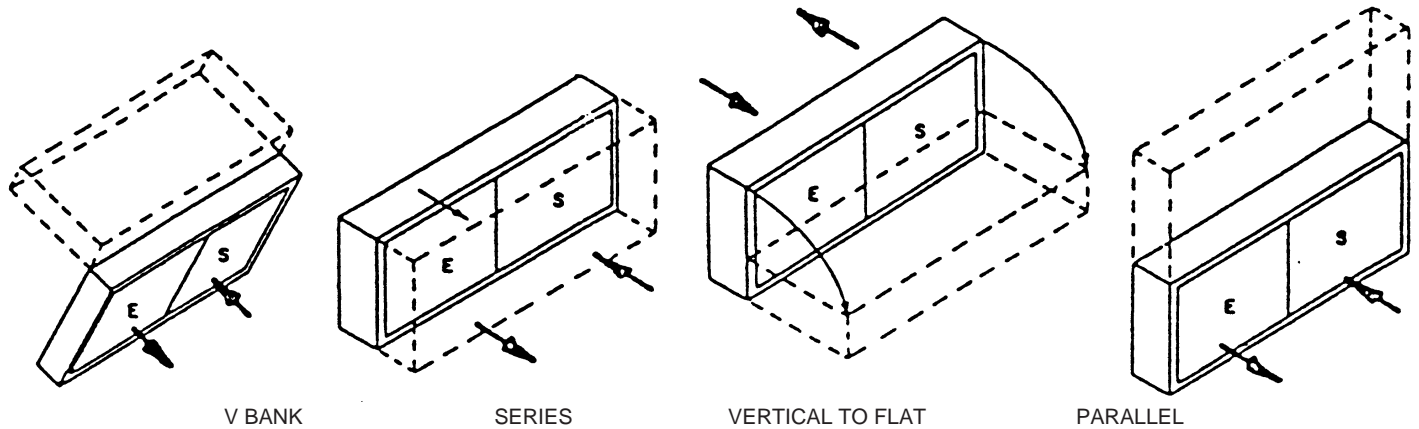
MULTIPLE EXCHANGER INSTALLATION

Systems requiring two or more heat pipe coils to be mounted in parallel may utilize several methods for installation as shown below. Heat pipe coils can be stacked or mounted so that air flows are at any angle between horizontal to vertical, such as in the V-Bank. Installation must be in accordance with the approved Colmac submittals.

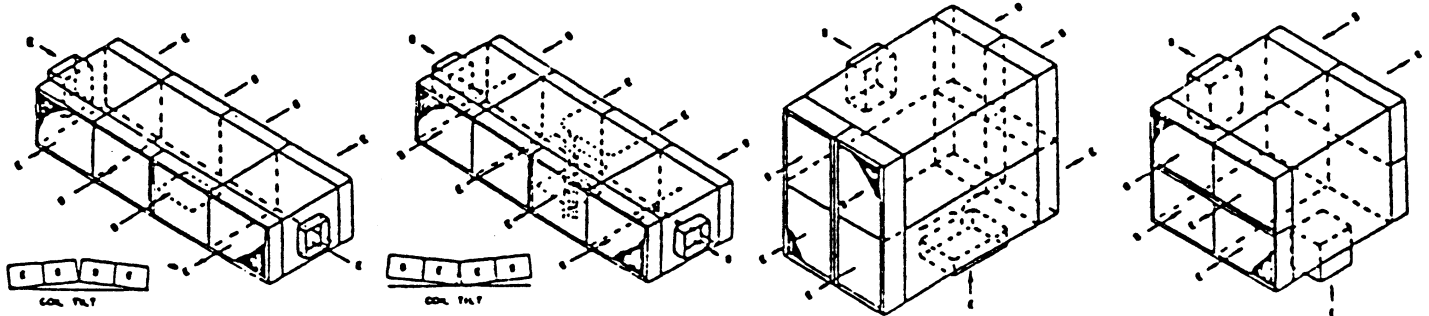
Heat pipe coils mounted atop one another must be well sealed at their common flange junction to prevent air or water (condensate) leakage between the coil flanges.

Heat pipe coils mounted in series should have access doors available between the coils for inspection and cleaning. This is particularly important when dirty or non-filtered airstreams are used on either side.

Colmac heat pipe coils may be installed in a variety of configurations and positions.

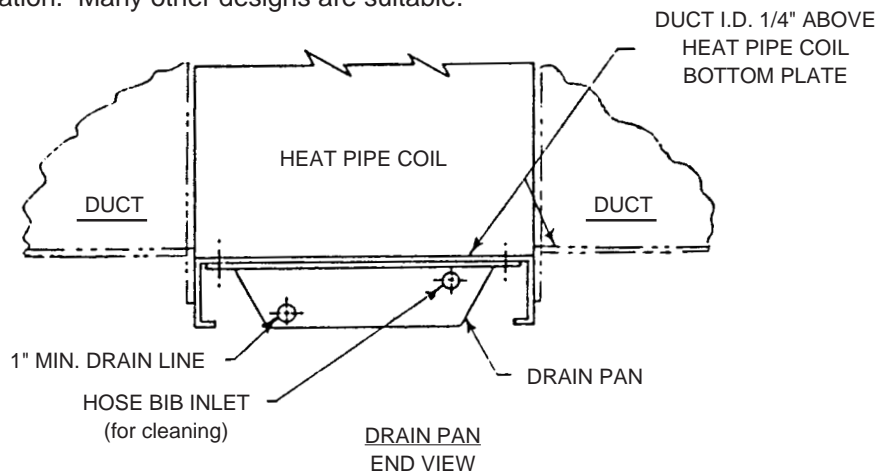


Typical arrangement of modules in larger air volume systems which require multiple coil designs.



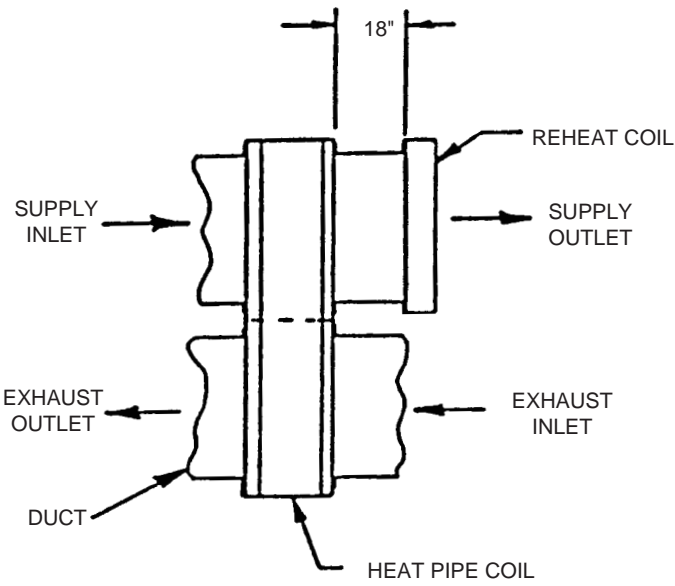
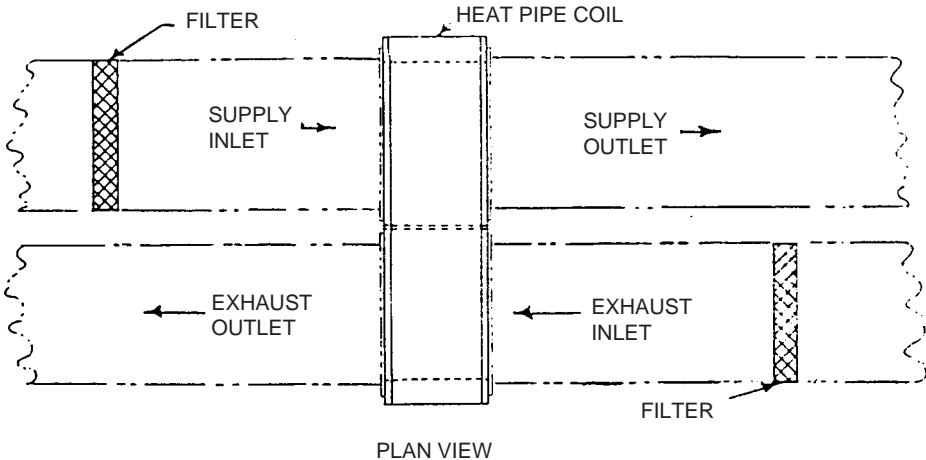
DRAIN PAN INSTALLATION

Drain pans are recommended under the ENTIRE coil both as a condensate collection and for cleaning. Shown is a typical recommended installation. Many other designs are suitable.



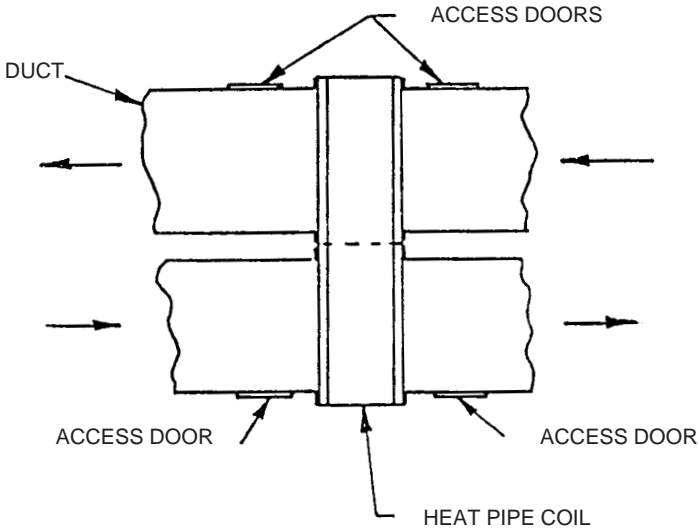
FILTRATION REQUIREMENTS

Heat pipe coil performance specifications are based on clean air and a clean surface. It is required that adequate filtration be utilized in both air streams to insure optimum performance and minimum coil maintenance.



REHEAT COILS

Reheat coils when used must be a minimum of 18 inches downstream from the heat pipe coil face on the supply side outlet.

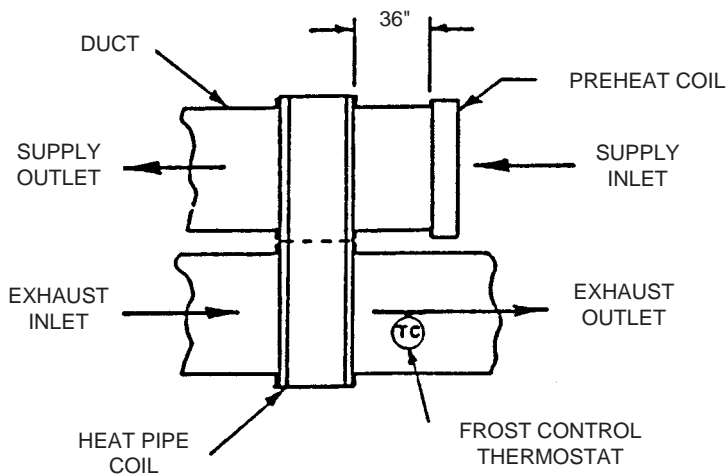
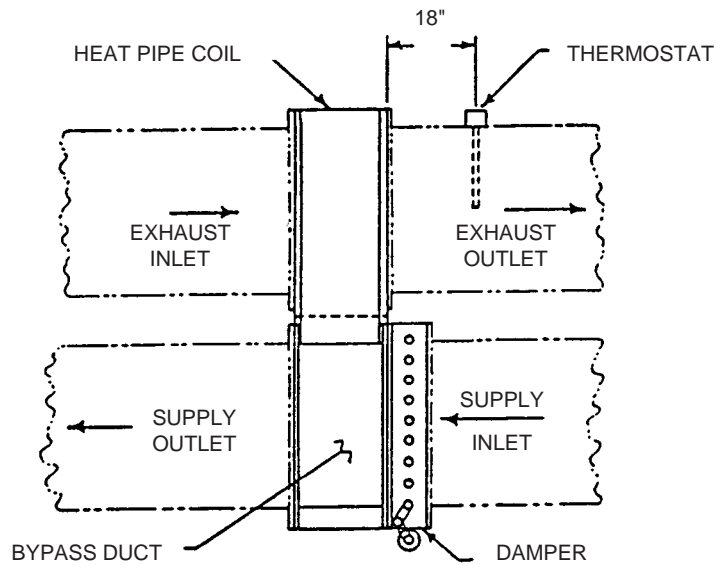


ACCESS DOORS

Access doors should be provided to allow periodic inspection of the coil faces and to facilitate cleaning when necessary.

FROST CONTROL-OPTIONAL FACE / BYPASS DAMPER:

The face/bypass damper should be located on the supply side of the coil. A frost control thermostat is located in the leaving exhaust air flow. If the leaving exhaust air temperature goes below a preset value (usually 36F) the temperature controller modulates the damper to maintain the preset exhaust temperature. The bypass can be around, over, or under the coil.



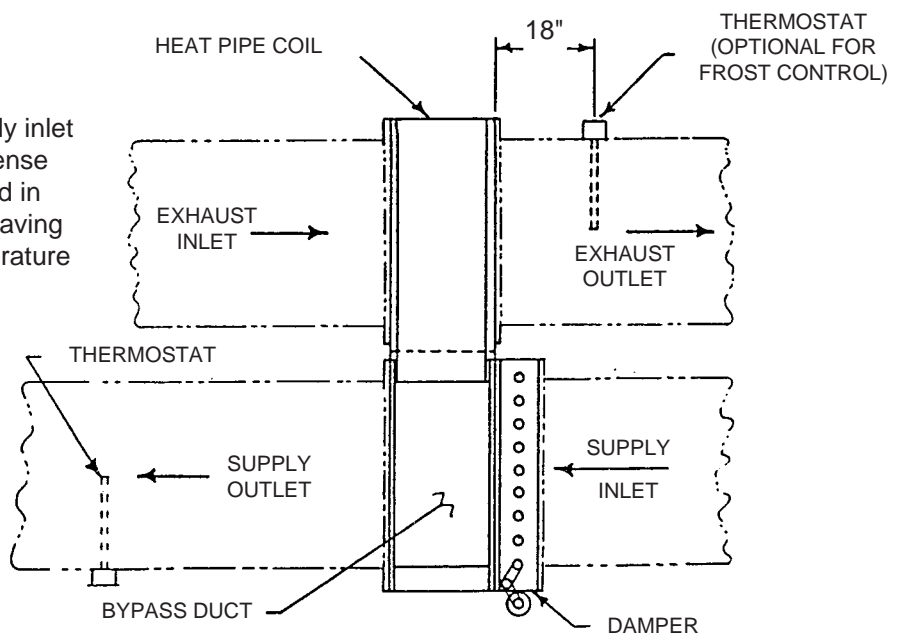
FROST CONTROL-OPTIONAL PREHEAT COIL

The preheat coil must be installed on the inlet supply side of the heat pipe coil. A frost control thermostat senses the leaving exhaust air flow temperature. If the leaving exhaust air temperature goes below a preset temperature (normally 36F) the controller energizes the supply to the heating coil to maintain the preset temperature. Any heating coil must be installed a minimum of 3 feet from the supply face inlet of the heat pipe coil.

TEMPERATURE MODULATION-OPTIONAL:

Locate the face/bypass damper on the supply inlet side of the heat pipe coil. A thermostat to sense the supply air leaving temperature is required in the leaving supply duct. When the supply leaving air temperature is above the set point temperature of the thermostat, the dampers modulate to maintain the set temperature. Be certain to locate the temperature sensor far enough downstream of the heat pipe coil to be certain that it reads mixed air.

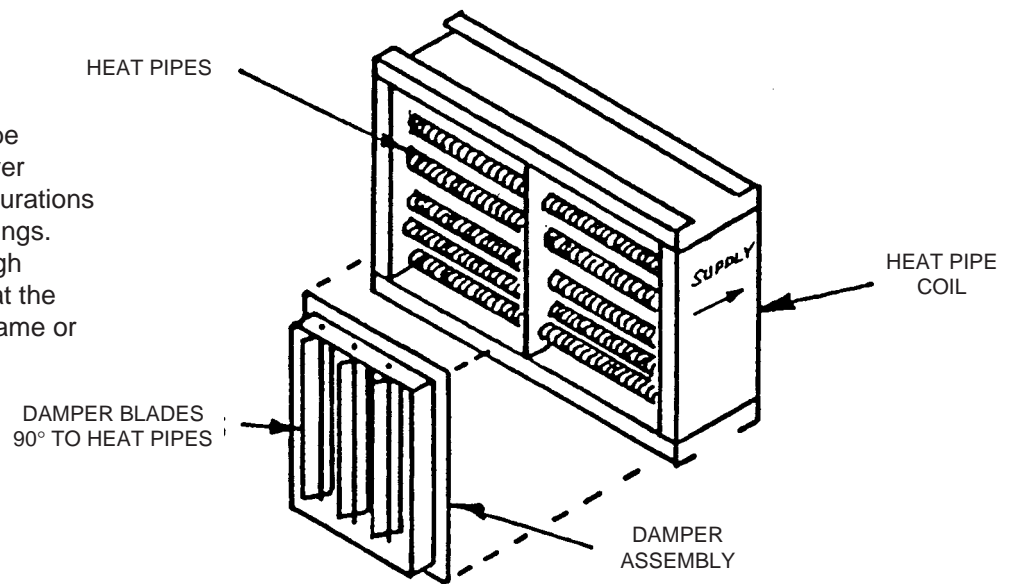
These same dampers can be used for frost control by installing a frost control thermostat in the leaving exhaust air stream and a selecting relay to assure frost protection takes first priority.



PLAN VIEW

DAMPER INSTALLATION:

Blades on face dampers must be perpendicular to the heat pipe tube length to insure proper air flow over the finned surfaces. Other configurations may adversely affect capacity ratings. Dampers to be installed far enough upstream of the exchanger so that the blades do not jamb against the frame or heat pipes.



SPRAY WASH INSTALLATION AND MAINTENANCE

INSTALLATION:

Install spray nozzle array as shown on the submittal drawing. Detergent injection system and controls can be placed in any convenient location for easy access. It is recommended that they be installed in a non-freezing location near the work area. Liquid line and drain line must be insulated if either are exposed to freezing conditions. Pressure to farthest nozzle should be as specified. Check local codes for connection to the water line. Code may require a vacuum breaker or back flow preventer.

System wash should occur when fans are not running. An electrical lockout is desirable. Wash cycle will vary as conditions dictate. Close inspection of the fin surfaces should be made to determine the effect of the detergent in removing the build up. A different detergent or more frequent cleaning may be required.

MAINTENANCE:

Nozzles should be cleaned periodically. A test of nozzle spray patterns should be observed. Any clogged nozzles should be cleaned or replaced. Solenoid valves should be checked for operation. The drain should be cleaned of any debris or clogging.

INDIRECT EVAPORATIVE COOLING-OPTIONAL

INSTALLATION:

Install face spray nozzle array as shown on the submittal. Connect piping manifolds to recirculating water system comprised of recommended components to supply the amount of spray water shown on the drawing. A drain system must be provided to recover the sprayed water to a sump, if not included with the unit. The IDEC performance is based on recirculated water unless stated otherwise. A water treatment specialist should be consulted to recommend a treatment program and bleed off rate to control scaling, corrosion and algae. Drain line should be insulated if exposed to freezing conditions. Water lines and sump must be drained prior to freezing conditions.

MAINTENANCE:

Nozzle spray pattern should be observed periodically. Any clogged nozzles should be cleaned or replaced. Sump, strainer and lines should be cleaned periodically. Suitable pump maintenance should be performed. The coil fins and other metal surfaces should be checked for corrosion or scale buildup. Changes to the water treatment program may be necessary if these conditions exist. The water level control should be checked frequently for proper operation. Water waste may occur if it malfunctions.

LIFTING AND RIGGING REQUIREMENTS:

Lifting lugs are not provided. Appropriate straps must be used to hoist the heat pipe coil in place.

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CAUTION

THE EXCHANGER SHOULD BE LIFTED WITH THE TUBES LEVEL.

THE HEAT PIPE TUBES HAVE A LIQUID CHARGE HERMETICALLY SEALED INSIDE. **THE CENTER OF GRAVITY OF THE EXCHANGER WILL SHIFT APPRECIABLY DURING HOISTING.**

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The straps must be well spaced because of the center of gravity shift that will be experienced during the hoisting process. Bridging between the flanges of the top and bottom plates is necessary to prevent bending of the flanges during hoisting. **Due care must be exercised.**

