

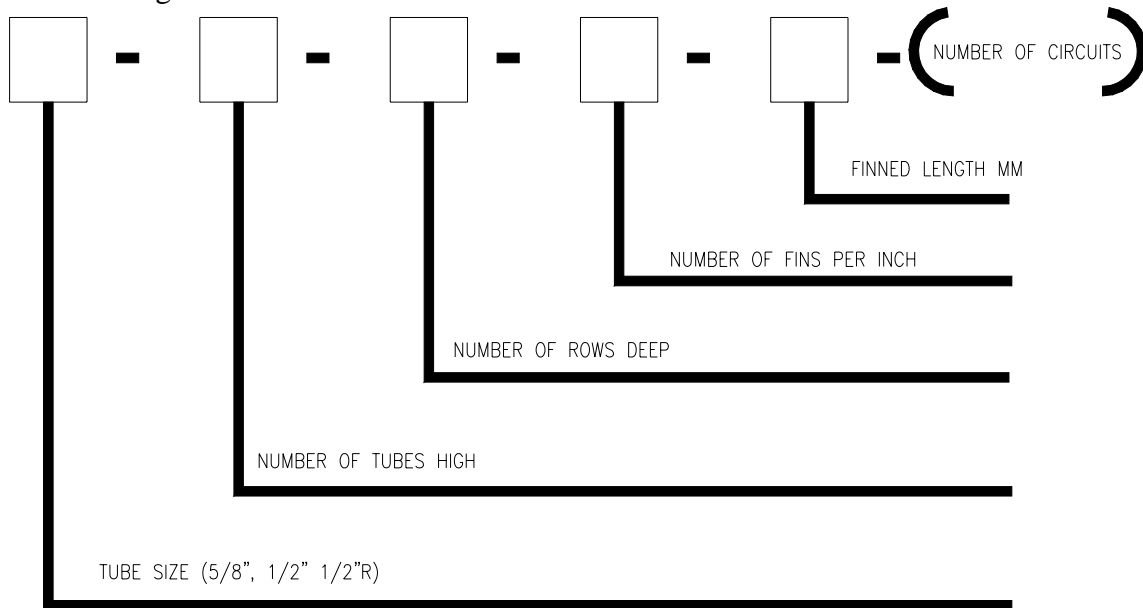
**INSTALLATION, OPERATION
AND MAINTENANCE
INSTRUCTIONS**

STEAM HEATING COILS

NOMENCLATURE

To enable us to quickly identify the relevant design details of our coils they have been provided with a code.

The meaning of the code is described below.



The number of tubes high will be the finned height divided by the tube pitch. The tube pitch for 5/8" is 50.8mm .

The number of circuits is the number of legs in each header.

INSTALLATION

Before installation check the coil for any minor fin damage and use a fin comb to reinstate the fins.

Check that the handing of the coil is correct for your application. The handing is determined whilst looking in the direction of airflow and relates to the position of the connections.

Steam coils must be installed in a way that promotes condensate drainage. This will aid in preventing destructive water hammer, freezing and the build up of corrosion within the coil.

Coils are not to be used with the tubes inclined upwards.

Where coils are incorporated into ducting, it is important that they are properly installed. Suitable sealing methods should be employed to prevent air bypassing the finned area of the coil.

The ducting should be fitted to the coil by removing the end covers (where fitted) and drilling through the coil platework and bolting into position. Care should be taken to protect the headers and return bends by using a piece of wood or sheet metal behind the platework being drilled. A suitable sealant should be used to seal the joints and when replacing the end covers.

Access should be provided to both ends of the coil, without the need to remove any of the external pipework, for the purpose of inspection, cleaning and maintenance.

PIPING

Coils should be piped according to any relevant local codes of practice.

Where threaded connections are supplied, the only approved method of jointing method is by use of Boss white and hemp. The thread fitted to the coil is to be supported at all times whilst making joints. All external piping is to be supported independently from the coil.

The use of flexible connections or swing joints is recommended.

Trap each coil section separately. Locate the trap a minimum of 360mm below the condensate connection of the coil if the method of control is On /Off (non- modulating). Locate the trap a minimum of 460mm below the condensate connection of the coil if used with a modulating control valve.

Use only continuous draining styles of traps such as inverted bucket or float and thermostatic type. Only use a float and thermostatic trap on coils with a steam supply from a modulating valve.

Do not allow the steam pressure to fall below 0.35 barg.

Never oversize control valves; (bigger is not better).

Fit a vacuum breaker to the steam supply line. Also install a vacuum breaker on the downstream side of the coil when steam pressure is to be modulated.

When condensate must be lifted into overhead or pressurized return mains, a vented condensate receiver must be installed with a correctly sized steam pressure pump to return the condensate.

Provide venting of non-condensable gases from each coil section.
 To ensure condensate drainage from steam supply lines install a drip trap.
 From the outlet to the steam trap the piping should be the same size as the outlet connection.
 To allow for service, manual valves should isolate the coil and control valves.
 Fluid filters are recommended.

Piping preheat systems

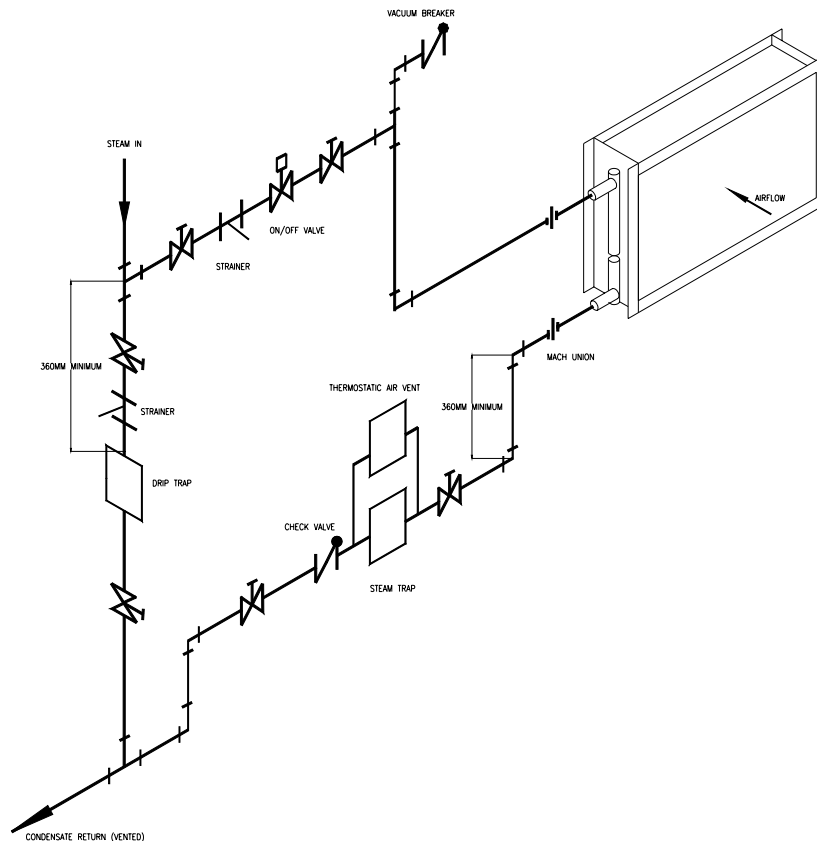
When designing steam heating coils to heat fresh air or to preheat a process air streams which are below 0°C use the following guidelines.

Modulating steam supply valves are not recommended for preheat systems. The steam supply must be on or off. To control air temperature use face and bypass dampers.

Maintain a minimum steam pressure of 0.35 barg to coils exposed to air temperatures below 5°C.

Design for face velocities less than 4 m/s. Design coil ductwork to evenly distribute air across the face of the coil.

Preheat coils should be trapped with inverted bucket or float and thermostatic traps that are properly sized according to the manufacturers recommendations.



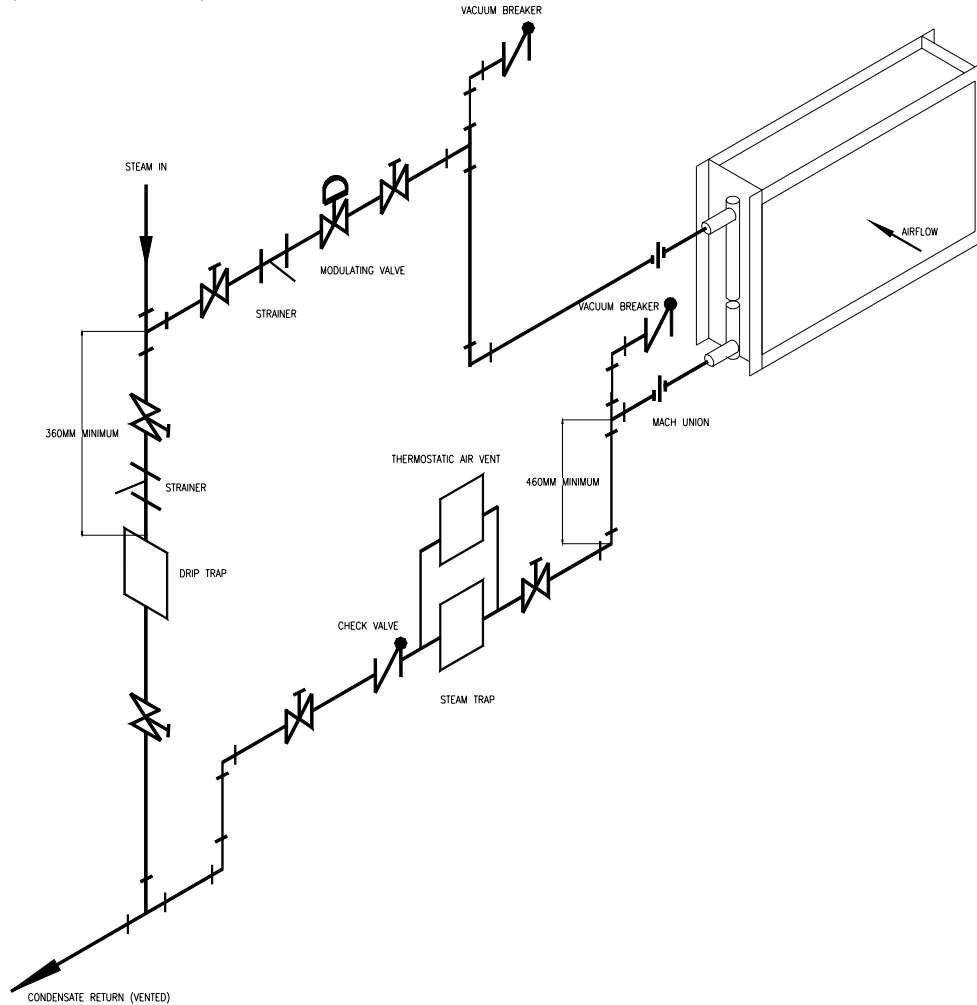
PIPING REHEAT COILS

The following instructions apply to steam heating coils used to heat air downstream of a preheater or recirculated air from a warm source.

Usually, steam coils installed in reheat applications are supplied via a modulating steam valve which responds to the changing air temperature.

It is critically important that only properly sized float and thermostatic type steam traps are used. This type of trap operates to continuously drain the coil of condensate at all load levels. Inverted bucket traps should not be used and will not operate correctly when modulating steam supply valves are installed.

It is also critically important, when modulating steam valves are used, that vacuum breakers are fitted to the coil inlet downstream of the modulating valve and between the coil outlet connection and the steam trap. During part load operation, the steam supply valve may reduce the steam pressure in the coil to the point that a vacuum can be formed in the coil matrix. Unless vacuum breakers are properly installed, condensate will be pulled into the coil causing premature failure due to thermal shock or hydraulic shock (water hammer)



COMMISSIONING PREPARATION

Once the coil is installed and all joints are sealed, a nitrogen pressure test should be carried out on the system. Refer to the design working pressure of the coil to determine suitable pressures for test.

Prior to initial start up clean the surface of the coil.

Clean the piping system and blow down all the strainers.

COMMISSIONING

On start up, feed steam slowly into the coils to avoid thermal shock.

Allow the steam to be within the coil for a minimum of 15 minutes before starting fans or opening dampers.

Once system has stabilized at its operating temperature check and tighten all bolted connections.

Start fans and open dampers

Measure, record and adjust the airflow to within 20% of design.

Measure and record the air pressure drop.

Measure and record air on temperature.

Measure and record air off temperature.

Note: do not exceed maximum working pressures or velocities.

FREEZE PROTECTION

All coils should be protected from frost.

It is not possible to fully drain water out of a coil matrix when the tubes are horizontal. If you wish to drain down the system for frost protection the following procedure should be adopted.

1. Drain water from coil.
2. Blow out remaining droplets of water with compressed air.
3. Completely fill the coil with inhibited antifreeze of appropriate concentration for the minimum temperature that will occur.
4. Drain antifreeze solution from coil and replace vents and drains.
5. The antifreeze should be recovered and may be used to repeat the procedure on other coils.

Note: Use of inhibited antifreeze is important as uninhibited product may cause formicary corrosion within the pipes.

MAINTENANCE

Finned surfaces should be inspected regularly and cleaned if necessary.

Filters should be regularly changed to maintain constant air flows.

Coil should be inspected for signs of corrosion

Circulating steam should be kept free from impurities and corrosive elements.

Check operation of system components.

Check all connections and tighten if necessary.