

Instructions for installation, operation and maintenance on BTN coils

Description

The coil is built of copper or steel tubes and aluminium fins. The finned coil body is fabricated of tubes mechanically expanded to the fins. The fins are manufactured as plates without slots, to prevent dust and fibres from being caught in the finned coil body. The standard casing is made of galvanised sheet steel. Other materials are possible : stainless steel, aluminium, copper.

Safety Precautions and Warnings

Read all the instructions before you handle, install or do any maintenance work on the product. Permit only trained persons who have knowledge of the product and appropriate safety precautions to carry out any work on the coil.

Operating Pressure

The coil must only be used in a system that is rated for the max. permissible working pressure and the max. permissible working temperature specified during the order.

Connections

Connect the coil to the pipe work in such a manner that the expansion forces or the deadweight of the pipe work will not be applied to the liquid connections. Protect the connections against shocks, external tension and stress.

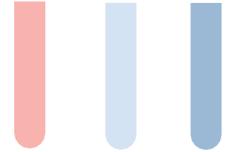
Protection against bursting due to freezing

If freezing is likely, do one of the following:

- Fill the heat exchanger with an appropriate quantity of suitable anti-freezing agent
- Drain all the water from both the pipe work and the coil. Do not refit the drain plugs to the coil until just before the system is filled with water. Blow compressed air through the coil to make certain that all water has been drained.

Cleaning

Use an environmentally compatible detergent only, i.e. one that won't damage the coil



High temperatures

The various components of the coil, such as the headers and casing can become hot while the coil is in use. Even air blown out of the coil may be hot as it leaves the coil.

When installing air heaters, which use 100°C or hotter water as a heating medium, great care should be exercised when opening air vents and gate valves in the system. Failure to do this may result in serious damage through water hammering or a discharge of steam. BTN assumes no responsibility for the connection of air heaters to the heating system, or for any damage, which may arise through faulty planning, installation or maintenance of such system. Piping, valves, etc. should be sized according to the pressure drop and function and not according to the size of the air heater connections.

Installation

Transport

Check that the coil hasn't been damaged during transport or while being unloaded. It is especially important to check the condition of the fins on the coil surface, headers and the tube bends on the backside of the coil. If transport damage is discovered, this must be reported to the shipper and to BTN. Also write a complaint on the consignment note.

Mounting

The coil shall be firmly secured at its location. Pipe connections on coils for water have male threads, DN15 to DN100 nominal pipe size. Flange connection is available as an accessory. Coils dedicated for evaporating medium are equipped with copper pipe for welding.

Inlet for the heating medium

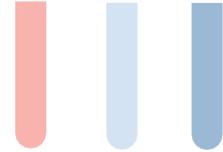
The coil is normally provided with labels that indicate how the inlet and the return piping is to be connected. If such labels are missing, connect the coil to the piping system as to obtain a counter-flow connection, i.e. the air and the water flows in opposite directions.

Venting / Draining

The headers of the water coil are equipped with plugged connections for venting and drainage. The system must be adequately vented to operate effectively. If freezing is likely, blow compressed air into the coil. This will ensure that it has been thoroughly drained.

Anti-freeze protection:

1. Anti-freeze protection on the water side. If the coil is equipped with a plugged connection for inserting a sensor into a finned tube, this feature should be utilised rather than an anti-frosting protection on the air side. If the sensor is located inside or on the return pipe, it must be combined with a flow monitor that will stop the fan or close the recirculated air damper if the water flow drops to its lowest permissible rate.



2. Anti-frosting protection on the air side: A mechanically freeze guard thermostat should have a bulb as a sensing device. A long capillary tube is theoretically better, however worse in practical applications because it is difficult or sometimes impossible to mount correctly. The bulb is fastened onto and along the surface of the second tube from the water outlet counted on the warm airside. If the capillary is too long, it can be rolled up and located next to the thermostat housing.

3. Non-temperature-compensated thermostat:

The thermostat cubicle should be mounted in a location where the temperature is higher than that required to trip the circuit breaker. In a cold plant room, it must be mounted in the airflow.

CAUTION! The casing of the air heater is often cold because the unheated air passes immediately inside the casing. If the thermostat is mounted on the casing of an air heater, which is usual, it should then not be fitted directly on the casing but be insulated by means of a wood-fibre board or the like.

Dismantling

Whenever a coil is to be dismantled and removed from a system, it is important that the coil be emptied of liquid. Further particulars see the paragraph dealing with venting/drainage above.

CAUTION! Liquids that are hazardous to the environment shall be collected in a vessel and be handed over for deposition or recycling. The coil must not be lifted before it has been emptied of liquid.

Maintenance and Service

General

The coil should be regularly inspected to prevent stoppages.

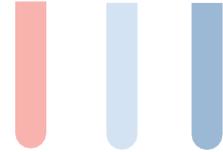
The following should be checked:

1. Fasteners - Check that no supporting bolts are defective.
2. Finned-tube body - Check that it isn't dirty or damaged.

Cleaning

Not even an effective air filter can remove all the dust from the air. Any dust deposits on the heat transfer surfaces will obstruct the airflow and impair the heat transfer. Coils must therefore be kept clean. Cleaning can suitably be carried out by any of the following methods or combinations of them.

1. Vacuum cleaning.
2. Blowing with compressed air, towards normal air direction.
3. Blowing clean with steam, towards normal air direction. **CAUTION!** Not coils that contain evaporative refrigerant.
4. Hosing or flushing with water (max. permissible water temp. 40°C for coils that contain evaporative refrigerant). If the heating surfaces are coated with greasy dust, first spray the entire coil with environmentally compatible solvent under low pressure. Then clean the coil with water using a high-pressure jet after 10-12 minutes.



CAUTION It is important to hold the nozzle perpendicular to the fins and not closer than 150 mm to prevent damaging the fins. Use a fin comb to straighten any deformed fins. The fin comb can be ordered from BTN.

The finned-tube body must not contain any traces of solvent after cleaning as remaining solvent will bind new dust. After cleaning, remove all fallen dust before starting the fan.

Measures to be taken if freezing is likely:

If the water in the coil should freeze, the coil will burst. This will allow the water to run out of the system, which may cause damage. The risk of freezing occurs in ventilation systems when outdoor air temperature is low in the following cases:

1. The heating medium has high temperature. Freezing is especially likely during autumn and spring. Adjust the water temperature to suit the outdoor air temperature.
2. Oversized coil - Lower the water temperature.
3. The heat supply ceases or is reduced -Close the outdoor air intake and stop all the fans.

Damages according to Figure 1 and Figure 2 above is depending on a low water flow in the coil, this can be avoided by using a separate circulation pump and circulation circuit.

CAUTION! If the system includes an air recirculation damper, open it if the heat supply has ceased or dropped. The pressure in the premises may then be sub-atmospheric, even if the fans are not running. Outdoor air may then be drawn in through the unit, which will give rise to freezing and cause the coil to burst. The anti-freeze thermostat must not be adjusted to such a low temperature that the risk of freezing is incurred.

If the building is unheated for an extended period of time during the winter, all pipes and coils must be thoroughly drained of water. Do not refit the drain plugs to the coils until just before the system is filled with water. Blow compressed air through the coils to make certain that all water has been drained.

Heating coils

Ensure that the outlet water temperature does not drop by an abnormal amount and that the water is always in circulation. Make sure that the valves are open, the pipes and the coils are thoroughly vented and the circulation pump is running, even if heating is temporarily interrupted.

Cooling coils

Cooling coils shall be emptied, if the air temperature is likely to drop below the freezing point of the cooling medium. Do not insert and tighten the drain plugs because the shut-off valves may leak and refill the coil with cooling medium. Blow compressed air through the coils to make certain that all water has been drained.

Repair

Parts and materials recommended by BTN must be used in order for the guarantee to apply.