

Manufacturing Inc.

10800

MODULAIR
FLUID COOLER

MODULAIR FLUID COOLER

Installation, Operation, Maintenance, & Service Instructions



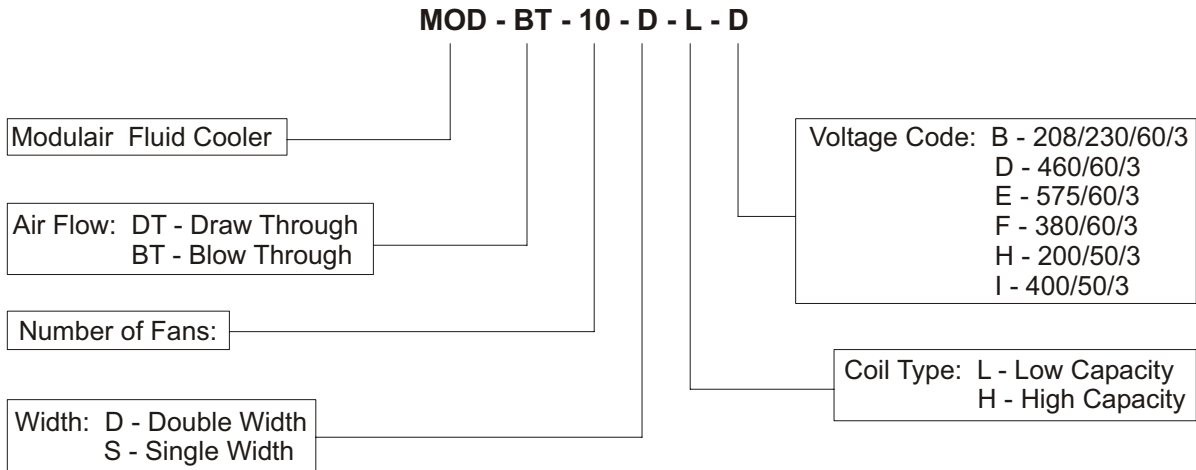
Colmac coils are rated in accordance with standard industry practice.

SPECIFY COLMAC QUALITY

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MODEL NOMENCLATURE



2. GENERAL DESCRIPTION

Colmac Modulair Fluid Coolers are multiple row compact finned tube coolers with electric motor direct drive fans. The fluid circulates in multiple passes through the tubes and cooling air flows over the exterior finned surface. They are designed to provide cooling of Water, Ethylene Glycol/ Water and Propylene Glycol /Water solutions in a variety of closed loop applications. The compact plate fin heat transfer surface provides a compact and efficient air cooled fluid cooler.

The fan motors are heavy-duty rigid foot mounted direct drive totally enclosed fan motors with moisture protected rainshields (slingers) suitable for an industrial environment. Motor insulation is Class F rated for 154 °F (67 C). Motors are 710 RPM for 50 HZ and 850 RPM for 60 HZ operation.

Colmac Modulair Fluid Coolers are designed for outdoor installation and require an unimpeded airflow for efficient operation. Locate the cooler no closer than the unit width from a wall or other obstruction. Avoid areas with adjacent walls to reduce the possibility of air recirculation of the hot outlet air into the air inlet side.

The published fan sound level is based on free field conditions with no sound reflecting surfaces. If the cooler sound level is important avoid installing the cooler within 30 feet of any large reflecting surface such as a building or wall. If this is not possible the installed sound level must be recalculated for the actual site condition.

3. RECEIVING

Inspect the equipment on receipt for shortages or damage. If a shortage or damage is found before uncrating note the discrepancies on the delivery receipt. If a shortage or damage is found after uncrating contact the carrier for a concealed damage inspection. Carefully check the finned tube bundle and fans for signs of damage caused by forklift trucks or from piling other goods on top of the fan screens.

The Colmac fluid coolers are shipped with 45" legs and braces attached. If 90" legs and braces are required, they are shipped loose. Lift these from the carrier and set them up on the foundation pad.

The fluid coolers are fitted with four lifting eyes on the top face of the cooler. Using a lifting beam as illustrated in Figure 1 carefully lift the cooler with an overhead crane and remove all the packing material. For 90" legs, move the cooler into position and set it down on the second set of legs. Install the bolts and fasten the cooler securely to the bottom legs. For the 45" legs, move the cooler into position and set it down on the foundation pad.

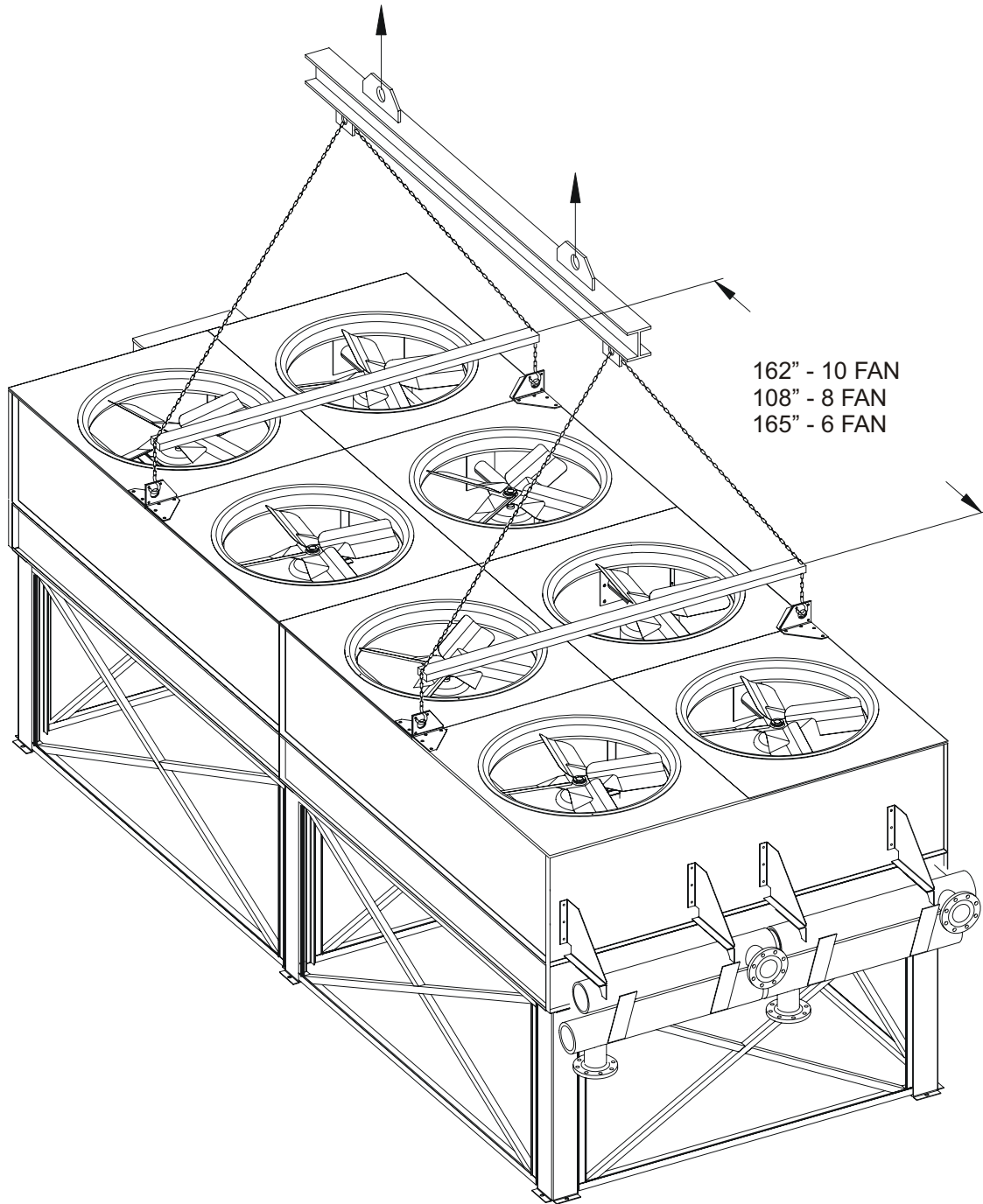


Figure 1.

4. INSTALLATION

MECHANICAL: If a Modulair pump skid and manifold are supplied as part of the fluid cooler package they should be assembled and aligned with the fluid cooler before the mechanical anchors are installed. Level the fluid cooler and install steel shims to fill any gaps under the support feet.

If butterfly valves are supplied install them at the cooler inlet and outlet flanges with shafts horizontal if possible to reduce trapped air. Separate flange gaskets are not required as the butterfly valves have a sealing surface.

Note: The fluid inlet must always be connected to the header on the air outlet side for counterflow operation.

After the flange bolts are installed tighten snug but do not torque. Next install the mechanical anchors at all the support legs and tighten down and then tighten the flange bolts.

Do not force flanges to come together. If flanges are not parallel they will require adjustments by either application of heat to the nozzle or by removal and rewelding. Contact Colmac for instructions.

ELECTRICAL: Each Colmac Modulair cooler is factory wired for single-point connections in the field to the weatherproof terminal box on each cooler. Standard construction does not include contactors and fused disconnects which must be supplied by others. Individual motor protection and fan cycling controls are available as optional extras.

All field wiring must comply with the National Electrical Code and all other state and local regulations. This includes providing proper and safe motor protection, fusing, disconnects and other basic equipment.

Check that the supply voltage matches the motor rated voltage. After the motors are connected jog them to check for fan obstructions and fan rotation. Change two of the electrical connections if the fan blade rotation is opposite to the arrow on the cabinet. Operate all the fan motors for several hours to allow the motors to dry.

5. FILLING

The fluid cooler is filled at the same time as the pump skid and manifold. Clean water is suitable for flushing and testing in warm weather but when the temperature is below freezing a glycol /water solution is required. The external piping must be flushed before connecting to the fluid cooler. Do not flush the system through the fluid cooler as dirt and welding debris from the piping can block the tubes. Vent all the air from the piping and cooler during filling. When the air is all vented, pressurize the system and check all of the flange joints for leaks. Retighten flange bolts where necessary. Drain the flushing fluid and replace with clean demineralized water and glycol solution of the specified ratio.

6. STORAGE

If the fluid coolers are to be stored or not operated for an extended period the fan motors may ingress moisture if they are not protected or operated regularly. In severe cases the moisture will reduce the insulation level of the windings or cause rusting of the bearings necessitating removal for repairs at a motor repair facility. This is a common problem with large generating installations when the coolers are often ready but commissioning of the main turbine-generator is delayed for several months.

The simplest remedy for installed coolers is to operate the fan motors for a few hours every week during the downtime period until regular operation resumes. The fan motors on stored coolers must be protected from the elements by covering with waterproof tarps.

7. OPERATION

Successful operation of Colmac Modulair fluid coolers requires proper maintenance and operating conditions that do not exceed the design temperatures and flows. Do not exceed the specified flow rate as excess tube velocity can lead to erosion of the tubes or headers.

To avoid thermal shock of the tubes liquid flow should be continuous. Do not operate the system with on/off liquid flow. Cycling the fan motors on all the coolers in sequence is the recommended method of temperature control rather than starting and stopping all the fans at the same time on one cooler.

8. MAINTENANCE

The direct drive fan motors are provided with doubled sealed shaft bearings. Periodic lubrication is not required.

Check the fan blades annually and remove any accumulations of dirt.

CLEANING INSIDE: When the glycol/water solution is maintained in its original condition the inside of the tubes will not require regular cleaning. If the glycol/water solution is allowed to deteriorate the inside of the tubes may become corroded or fouled and require cleaning. Disconnect the cooler from the pipe connections and fill with chemical cleaners suitable for copper tubes. Drain and flush with clean water after cleaning.

CLEANING OUTSIDE: Remove any debris that collects on the air inlet side of the finned tubes as this will reduce the airflow. The debris can often be removed by shutting off the fans and blowing air or a water spray in the reverse direction. A soft bristled brush with a water-detergent solution may be required to remove oily deposits followed by rinsing with clean water. Straighten any fins that may have bent during cleaning.

REPAIRS: Replacement parts are available from Colmac Coil Manufacturing Inc. Provide a description of the part and serial number of the cooler when ordering replacement parts. As Colmac Modulair coolers feature all brazed tube joints, leaks are unlikely to develop except by external damage or freezing. If repairs become necessary contact Colmac for specific instructions.

These instructions are intended for general use. If any difficulties are encountered please contact Colmac Coil Manufacturing Inc. for specific instructions.

Always provide the cooler serial number or drawing when requesting information or parts.



**COLMAC
COIL**

LIMITED WARRANTY

Manufacturing Inc.

WARRANTY

Colmac warrants that the product manufactured by it will be of the kind and quality described in its specifications, and will be free of defects in workmanship and material. Should any failure to conform to this warranty appear within a period of one year from the date of original installation or eighteen months from date of shipment to the purchaser, whichever comes first, Colmac shall, upon prompt written notification thereof correct such non-conformity at its option, by repair or replacement F.O.B. factory, of the defective part or parts.

In no event shall Colmac be responsible for providing working access to the defect, the removal, disassembly, replacement or reinstallation of any product, materials or structures to the extent necessary to permit Colmac to perform its warranty obligations, or transportation costs to and from the Colmac factory. The conditions of any tests shall be mutually agreed upon and Colmac shall be notified of and may be present at all tests that may be made.

GENERAL WARRANTY

To validate a claim, Colmac reserves the right to require that defective parts be returned to the factory, transportation charges prepaid.

Filters, fan belts, refrigerants, and oil are not included. This warranty does not apply to products or parts damaged by accidents, abuse, improper installation, lack of proper maintenance, unauthorized alterations, misapplications, improper applications, fire, flood, or acts of God. Furnishing of parts as described above shall constitute fulfillment of all Colmac obligations with respect to the warranty and replacement parts will be warranted only for the unexpired portion of the original warranty.

Products supplied by Colmac, but manufactured by others, are warranted only to the extent of the manufacturer's warranty.

THE WARRANTIES SET FORTH IN THIS PROVISION ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OF TRADE), EXCEPT OF TITLE AND AGAINST PATENT INFRINGEMENT.

The remedies provided above are the purchaser's sole remedies for any failure of Colmac to comply with its obligations. Correction of any non-conformity in the manner and for the period of time provided above shall constitute complete fulfillment of all the liabilities of Colmac whether the claims of the purchaser are based in contract, in tort (including negligence) or otherwise with respect to or arising out of the product furnished hereunder.

LIMITATION OF LIABILITY

Colmac, its contractors and suppliers shall not be liable in contract, in tort (including negligence and strict liability) or otherwise for damage or loss of other property or equipment, loss of profits or revenue, loss of use of equipment or power system, cost of capital, cost of purchased or replaced power or temporary equipment (including additional expenses incurred in using existing facilities), claims of customers of the purchaser or for any special, indirect, incidental, or consequential damages whatsoever.

The remedies of the purchaser set forth herein are exclusive and the liability of Colmac with respect to any contract, or anything done in connection therewith such as the performance of breach thereof, or from the manufacture, sale, delivery, resale, or use of any equipment covered by or furnished under the contract, whether in contract, in tort (including negligence and strict liability) or otherwise, shall not exceed the price of the equipment or part on which such liability is based.

See Selling Policy 1000 For Additional Terms and Conditions of Sale.

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