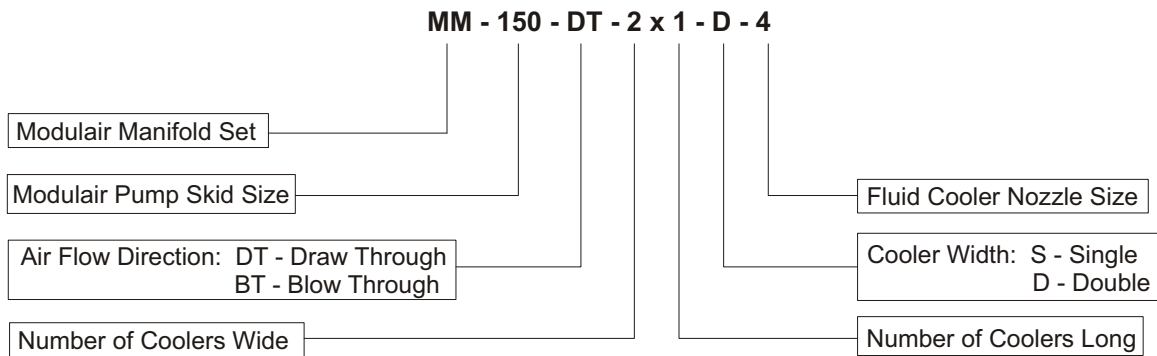


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1. MODEL NOMENCLATURE



2. GENERAL DESCRIPTION

Colmac Modulair Manifolds are the connecting link between Colmac Modulair Fluid Coolers and Colmac Modulair Pump Skids for cooling of Water, Ethylene Glycol/Water and Propylene Glycol/Water solutions in a variety of closed loop applications. The manifolds are designed to provide the pipe connection from the pump skid to the flanged inlet connections of the fluid cooler(s) and from the fluid cooler to the outlet connection(s). The manifolds are pre-engineered for the full Modulair flow range to connect from one to four fluid coolers.

Modulair manifolds are fabricated of carbon steel pipe to ASME B31.1 or ASME VIII and designed for 150 psig operating pressure. They are factory pre-fabricated and shipped in one piece except for the final connections to the pump skid which are designated as field welds for alignment. The manifolds are cleaned and painted on the outside with primer and one coat of enamel and shipped with ends covered.

3. RECEIVING

Inspect the equipment on receipt for shortages or damage. If a shortage or damage is found note the discrepancies on the delivery receipt. If a shortage or damage is found after unloading contact the carrier for a concealed damage inspection. Although the inlet and outlet manifolds are shipped in one piece, several small pieces will accompany the shipment such as the connecting flange, flange bolts and gaskets, inlet manifold support legs, outlet manifold support brackets, U bolts and butterfly valves (optional).

4. INSTALLATION

The fluid air cooler, pump skid and interconnecting manifold must all be leveled and aligned. Install steel shims to adjust the height of the pump skid or fluid cooler as required and add shims to fill any gaps under the support feet to avoid distorting the steel base.

Using temporary supports fit the outlet manifold first using the support brackets that bolt to the fluid cooler legs. Install the gaskets and bolts and tighten the bolts snug but do not torque tight. If butterfly valves are supplied a gasket is not required as the flange seals on the rubber facings of the valve. Bolt the outlet manifolds support brackets to the fluid cooler legs and adjust the height to support the manifold. Fasten the pipe U clamp to the bracket, torque the flange bolts and remove the temporary support.

Next install the inlet manifold to the fluid cooler inlet flanges with gaskets (or butterfly valves if supplied) and bolts using temporary supports for the manifold. Tighten the bolts snug but do not torque tight. Install the manifold support legs by securing the top section to the pipe with the U clamps and secure the bottom section to the foundation with mechanical anchors. Adjust the pump skid position to line up with the manifold inlet flange. Install the connecting flange gasket and bolts and tighten. To fix the manifold support legs drill ½ inch holes in the mating section at the pilot holes and fit ½ inch bolts. Remove the temporary supports and torque all the flange bolts.

The manifold connection flange and adjoining pipes are shipped loose. The final connections are to be field welded. First install the inlet manifold to the fluid cooler inlet flanges with gaskets (or butterfly valves if supplied) and bolts using temporary supports for the manifold. Tighten the bolts snug but do not torque tight.

Adjust the pump skid position to line up with the manifold inlet flange. Using the connecting flange with a 1/8 inch steel spacer to allow for gasket thickness check the required length of the connecting pipe. If it requires trimming either move the pump skid or cut off a section of the connecting pipe. Install the connecting flange with the steel spacer and tack weld to the pipe. Remove the manifold and weld with a qualified welding operator and then clean the inside and outside of the pipe. Reinstall the manifold, gaskets and bolts, tighten snug but do not torque.

Install the manifold support legs by securing the top section to the pipe with the U clamps and secure the bottom section to the foundation with mechanical anchors. To fix the manifold support legs drill ½ inch holes in the mating section at the pilot holes and fit ½ inch bolts. Remove the temporary supports and torque all the flange bolts.

Clean and paint the welded area with a primer and enamel.

5. FILLING

The manifold, pump skid and fluid cooler are filled at the same time. Open the vents during filling located on the pump outlet elbows, the outlet header and at the top of the bladder tank piping (for bladder tanks with a top connection). 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 first. When all the air is vented, shut off the valve to the expansion tank, pressurize the system and check all 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 repeating the filling and venting procedure.

6. STORAGE

The manifolds may be left outdoors for short-term storage if they are adequately protected from rain to avoid rusting the unpainted inside of the pipe. For long term storage the manifolds should be stored indoors or fitted with blind flanges and gaskets and pressurized with dry nitrogen

7. OPERATION

There are no specific operating instructions pertaining to the manifolds

8. MAINTENANCE

Inspect annually for external rusting of the manifold. Any rust spots should be cleaned to bare metal and repainted with primer and enamel.

If a flanged joint develops a leak first re-tighten the bolts. If it continues to leak the gasket should be replaced.

These instructions are intended for general use. If any difficulties are encountered please contact Colmac Coil Manufacturing Inc. for specific instructions. Always provide the serial number or drawing when requesting information or parts.



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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