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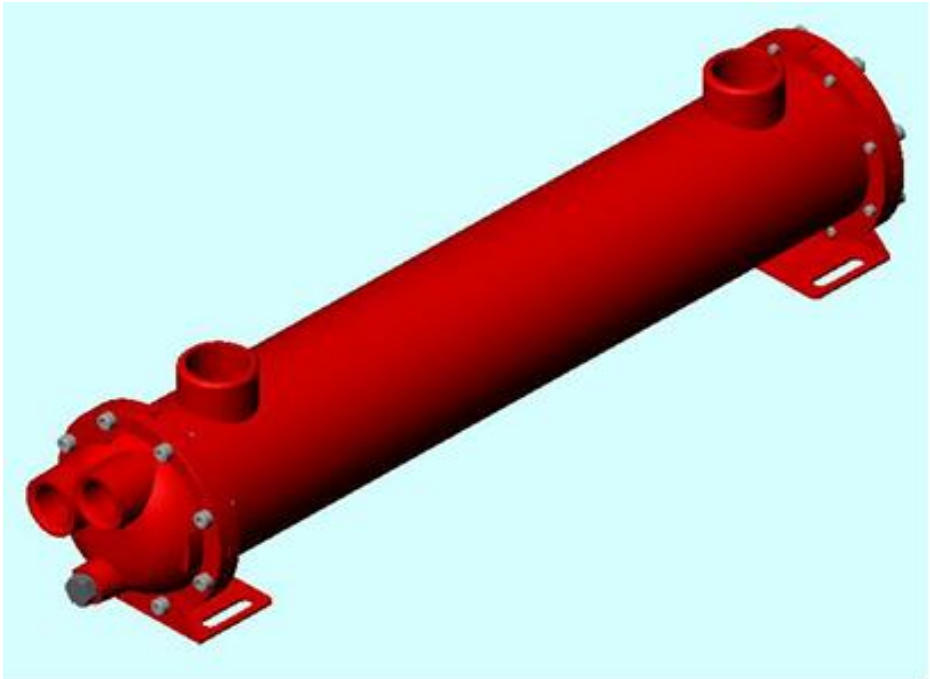
HEAT EXCHANGING EXCELLENCE SINCE 1919

USE AND MAINTENANCE MANUAL

Water-oil series MS
Shell and tube
Heat exchanger

External inspectable

MS 84 – 134 – 84/2 B CuNi



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1. INTRODUCTION

This manual should be considered an integral part of the heat exchanger and should be kept with it.
Keep this manual intact and available for the whole product life.
Carefully read the manual before installation of the heat exchanger.
The manual contains important information about safety.

2. WARNINGS



a) The heat exchanger has to be used only for that which it was designed. Any other use may cause damage to property and people, and therefore the manufacturer declines all responsibility for accidents arising from its misuse.



a) The heat exchanger must be used for the operating conditions (pressure and temperature) and for the fluid for which it was thermally and mechanically designed and for which it was evaluated the chemical compatibility. In the event of operating conditions other than those calculated the heat exchanger performance change and very serious damage to the unit might occur.



b) The pressures and flow rates of the fluids must be taken within the design limits to prevent vibration, erosion and in some cases breakage of the most stressed parts by the fluid dynamic action.



c) Before connecting the oil side and the cooling water side to the system verify that the hydraulic circuit meets the performance of the heat exchanger.



d) Do not touch the heat exchanger while it is running. During operation, some external surfaces may be hot.



e) Do not remove the nameplate of the heat exchanger. It reports the product specifications and contractual references that allow the traceability of the same. It is considered an integral part of the heat exchanger and should remain clearly visible on it.

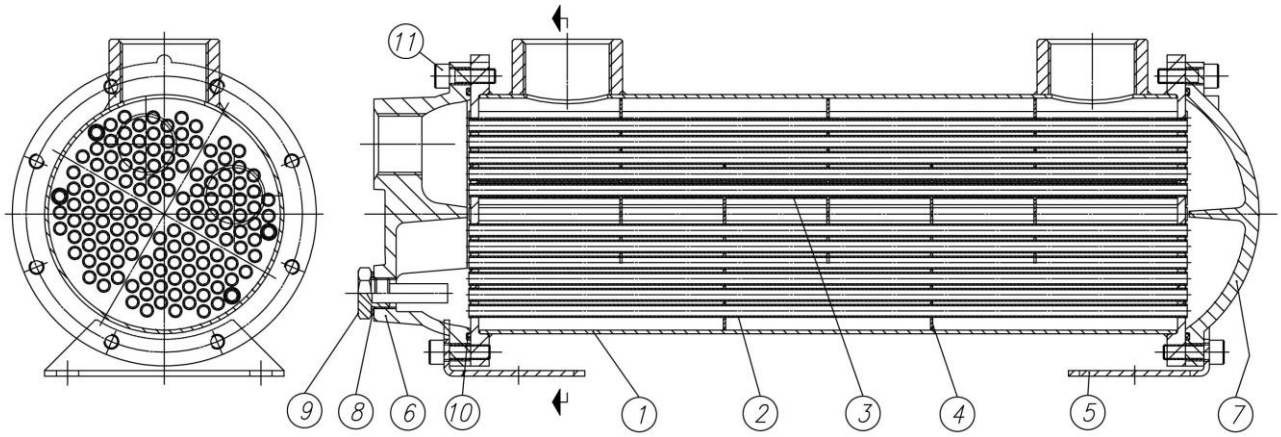
3. ASSEMBLY AND INSTALLATION

The water-oil heat exchanger are generally fixed in the return circuit. It is also possible to carry out a separate circuit through a self-contained pump. This is recommended when the outlet oil rates are variable. In this way, it is possible to obtain a better thermal performance.

The connection of the oil-water fittings must be carried out so that air can be easily blown out with the normal fluid circulation. This means that, if the exchanger is installed horizontal, water must flow in the lowest fitting and the oil fittings must be turned upwards; if otherwise it is vertical, the water fittings must be placed on the upper side and oil must flow in the lowest fitting.

Make sure to install the heat exchanger through its supports on suitable supports to hold the weight.

4. WATER-OIL HEAT EXCHANGER SCHEME



Ref.	Item description
1	Shell
2	Exchange tube
3	Tie rod
4	Baffle
5	Support
6	Front head
7	Rear head
8	Washer
9	Anode
10	O-Ring
11	Bolt

5. TECHNICAL SPECIFICATIONS OF USE

- Hot fluid inlet max. temperature: 120°C
- Cold fluid inlet max. temperature: 70°C
- Operating fluids: Mineral oil
Synthetic oil
Emulsified water
Water- Ethylene glycol
Only CuNi version: sea water (tube side)
- Maximum allowable operating pressure: 12 bar

N.B.: please contact our Technical Department in case of special applications.

When the system on which it is installed is fully operational, you should check if the amount of the water flowing through the heat exchanger is correct. This can be done easily by controlling its thermal gradient that should not be too low (too high flow rate), neither too high (low flow rate).

It is good practice to consider a temperature difference of 10°C when the inlet water temperature is 20°C and a temperature difference of 5°C with higher water temperatures.
It is also advisable to avoid that the water remains completely still within the heat exchanger because, when its temperature exceeds 50°C, the limestone contained in it starts to sediment significantly reducing quickly the opening of the tubes.

To avoid corrosive phenomena is necessary that the water mass flow rate does not exceed the maximum flow rate indicated on the catalogue.
If this value affects the thermal performance, contact our Technical Department.

In the hydraulic systems it is possible the occurrence of pressure peaks (fluid hammers) that could approach or exceed the maximum allowable pressure of the exchanger. In this case, it is recommended to supply it with a self-contained pump.
Warning: These pulsations move inside the oil at the sound velocity, therefore they cannot be gauged with standard manometers, but only with a proper electronic instrumentation.

6. PERIODIC MAINTENANCE

6.1. Shell side cleaning

The exchanger must be disassembled from the operating machine on which it is mounted.
To remove the impurities it is necessary to let a detergent circulate for a time, which can vary from 10 to 30 minutes. Later proceed removing the detergent through the circulation of hot water.

During this operation, Costante Sesino S.p.A. recommend to comply with the anti-pollution standards and to use the appropriate services for the collection of waste oil.

6.2. Tube side cleaning

It is recommended to check the exchanger every 2 or 3 months to avoid that calcareous sediments completely close the little tubes inside which water flows. In this case, the exchanger must be replaced.
To carry out the check it is necessary to disconnect the exchanger from the water inlet and outlet tubes and remove the two heads pos. 6 and 7 (see scheme in paragraph 4) which stop the water circuit.
Warning: Do not try to open or dismount the covers of the exchanger without having depressurized, drained and cooled to ambient temperature the unit.

To do that act on the bolts pos. 11 using an allen wrench.
Remove the O-ring pos. 10. If it is in good condition and there is no signs of significant crushing you can reuse it, otherwise we recommend the prompt replacement.

If the exchanger is slightly obstructed, it is recommended to use a solution with water and 15% hydrochloric acid or similar fluids, and let it circulate in the opposite direction of the normal water flow.
Warning: Care should be taken when using chemical cleaning fluids. Carefully follow the manufacturer's instructions and use systems of protection for the skin and eyes. When required use a respirator.

Remove afterwards any trace of the corrosive product letting some hot water flow for some minutes. If the exchanger is obstructed not by calcareous sediments but by mud or by other solid sediments, it is enough to use a cleaning rod inside the tubes and then rinse with a water jet.
Warning: Do not try to clean tubes using steam. This may overheat the pipes causing them to dilate with consequent breaking of the weldings.

In any case, before reassembling the two heads, it is necessary to check that the zinc anode pos. 9 is clean and not damaged; otherwise, it must be replaced.
If the zinc anode is worn out in a short time, it is recommended to check the efficiency of the earthing of the machine on which the exchanger is assembled; wandering currents could cause corrosion.
To remount the covers tighten the bolts pos. 11 using an allen wrench. Do not forget the mounting of the O-ring pos. 10.

7. TAMPERING

Any operation aimed to modify the heat exchanger, executed without prior authorization from the Constante Sesino S.p.A. will automatically result in the decline of the warranty provisions.

8. STORAGE

The heat exchanger has to be stored in a moisture free environment (<60%) and at a temperature (from 5 ° C to 30 ° C) such as to prevent condensation and oxidation to its internal parts.

9. DISPOSAL

The Costante Sesino S.p.A. heat exchangers are manufactured with fully recyclable materials.
Therefore they are disposable without any harm to the environment according to the rules and regulations in the area of use.

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