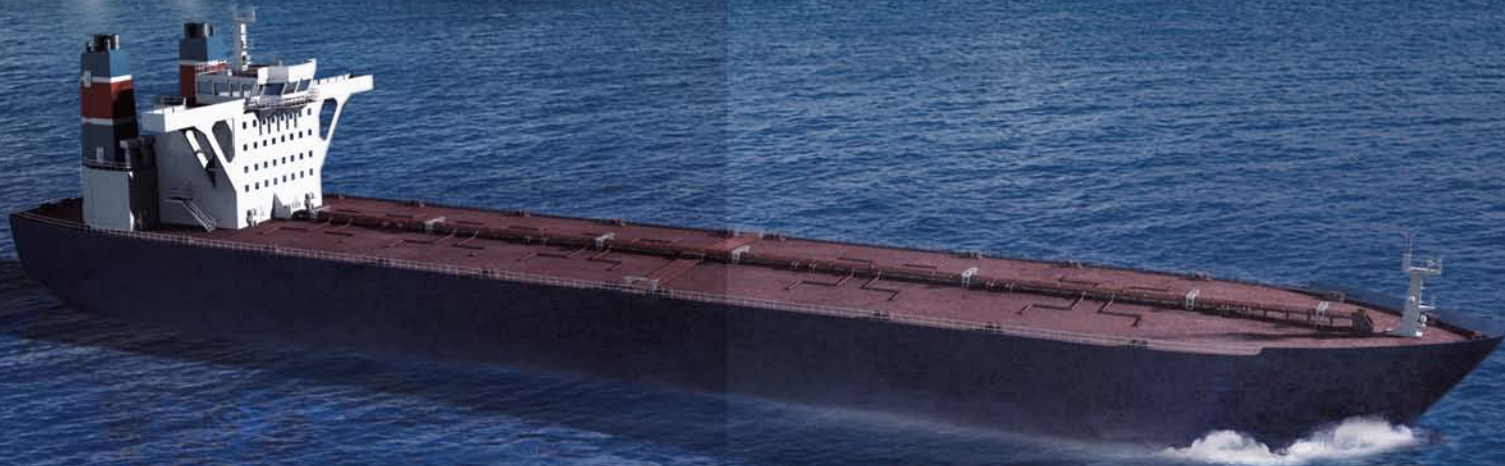


Auramarine – World's Number 1 in Fuel Oil Supply Systems

M G O

H a n d l i n g S y s t e m



Marine traffic moves towards lower sulphur emissions.








Auramarine Ltd has the solution.

Auramarine Ltd has superior experience in ship fuel systems and can offer fast, reliable and affordable service when switching to low sulphur fuel is needed.

Auramarine MGO Handling System

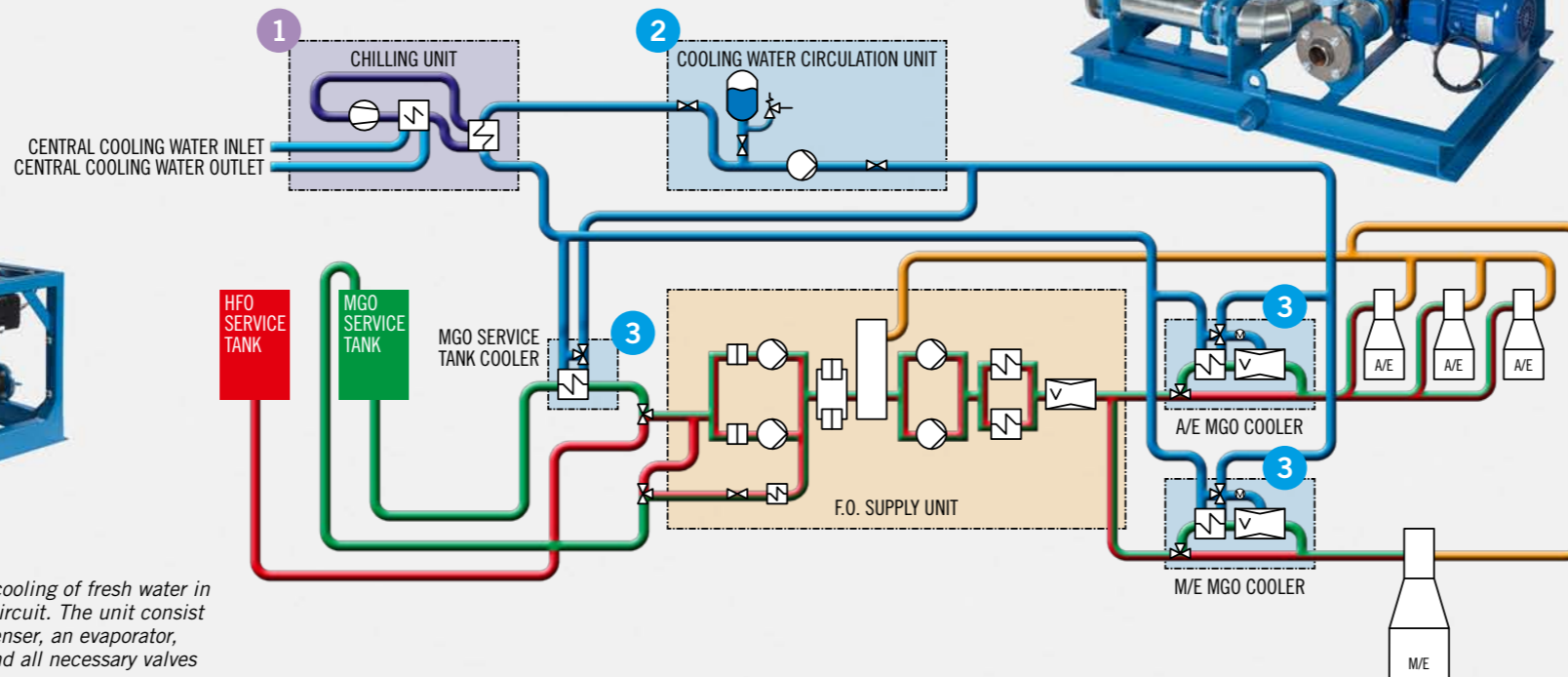
Auramarine MGO units and operating principle

-  Fuel oil feed line
-  Chilling unit circulation line
-  Waste heat removal
-  Cooling water circulation line
-  Fuel oil circulation line



1 Chilling Unit

A complete unit for the cooling of fresh water in the MGO cooling water circuit. The unit consists of a compressor, a condenser, an evaporator, filters, a control panel and all necessary valves and fittings for operation.



2 Cooling Water Circulation Unit

The complete unit for circulating cooling water between the chilling unit and the MGO coolers. The unit includes a circulation pump, an expansion tank, a pump starter and all the necessary valves and fittings for operation.



3 MGO Cooler Units at Service Tank Outlet and Engine Fuel Oil inlet lines

The purpose of the unit is to keep the viscosity of the MGO suitable for the engine. The unit contains a cooler, a viscosity sensor (range 0-10 cSt), a three way control valve on the water side for cooling control, a temperature transmitter on the MGO outlet line for mA signal to ECR and all necessary valves and fittings for operation.



Take the first step towards low sulphur fuels

Auramarine Ltd has been the world's leading manufacturer of fuel oil supply systems for ships for over 30 years. With over 10,000 skid mounted auxiliary units produced, Auramarine has superior experience in ship fuel systems and can offer fast, reliable and affordable service when switching to low sulphur fuel is needed. Auramarine's solution includes the planning, required technical equipment and alteration work. If the customer so wishes, the whole process can be carried out on turn-key basis.

Shipyards utilise technical arrangements to ensure the protection of the environment. Luckily

the aim of lower sulphur emissions can be reached through relatively small changes in the engine room. The changeover to using Marine Gas Oil requires expertise in fuel systems, so that well-intentioned changes do not place the durability of the engines or maritime safety in jeopardy.

Ship engines are different and vary in their capacity to use the low sulphur Marine Gas Oil. In principle, MGO is suitable for any engine, provided that the modifications are made correctly.

Ensuring lubrication: number one priority

Because of the lower viscosity of Marine Gas Oil, the lubrication requirements of the engine

manufacturer may not be met. In most marine diesel engines, the viscosity of the fuel needs to be at least 2.0 cSt. At normal temperature, the viscosity of MGO varies between 1-2 cSt, which means that sufficient engine lubrication can no longer be guaranteed. The viscosity can be improved with additives, but this is relatively costly. However, there is a much more affordable way of ensuring proper lubrication and sufficient viscosity.

Auramarine MGO Handling System

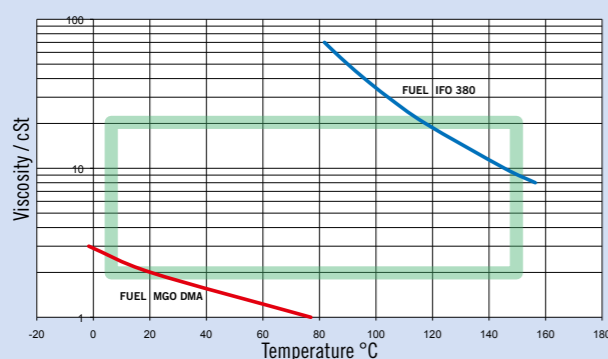
The solution offered by Auramarine is simple and reliable. Auramarine MGO Handling System cools Marine Gas Oil even below 20 degrees

Celsius, so that the viscosity and lubricity meet the requirements of the engine manufacturers. For the cooling of the MGO, Auramarine uses a system consisting of a Chilling unit, a Cooling Water Circulation unit and an MGO Cooler unit.

Stages of the alteration process

The complete process has to include a report on the starting conditions, an inspection of the existing equipment and the alteration work. As a turnkey supplier, Auramarine can assume responsibility for the proper follow-through of all these stages.

Temperature / Viscosity



Inside the green square, shown in temperature/viscosity diagram, is typical operation window of fuel for a big diesel engine. The challenge is to ensure a slow decrease of temperature, while maintaining correct viscosity and sufficient flow of fuel, when changing over from HFO to MGO.

The benefits of Auramarine's MGO solution in a nutshell

- Auramarine is the world's leading manufacturer of fuel oil supply systems for ships. We have expertise in both MGO and fuel system configurations. This is why we know the best and safest way to integrate the MGO solutions to existing configurations.
- Auramarine's MGO solutions can be applied to both old and new ships.
- The units of Auramarine's MGO system can be installed relatively freely, utilising the free space onboard. On the other hand, the units

can be formed into an integrated compact configuration.

- Auramarine delivers the MGO solutions also on a turn-key basis.
- Auramarine's MGO configuration consist of the best components that have been proven effective and durable.
- Our MGO solution is reliable and easy to use.
- Auramarine has a global maintenance network and a spare parts service that serves our customers 24/7.

An example of installation dimensions

Chilling Unit 90 kW

Horizontal installation
2400 x 1210 x 1600 Refrigerant R507
Vertical installation
1100 x 1100 x 1740 Refrigerant R507

Cooling water circulation unit 15 m³/h

1200 x 700 x 1000

MGO service tank cooler 10 kW

1150 x 575 x 1450

Main engine MGO cooler 50 kW

950 x 650 x 1700

Aux engine MGO cooler 10 kW

950 x 650 x 1500



Certified quality

The high quality of Auramarine operations is guaranteed by ISO 9001, ISO 14001 and ISO 3834-2 certificates.

A reliable partner

Auramarine is known as a reliable partner who provides services to its customers with professional expertise. During the past thirty years, we have delivered over 10 000 various auxiliary systems to customers all over the world. We ensure that the promised delivery times are met, and as an experienced manufacturer, we provide invaluable help also at the installation stage.

24/7

Auramarine has two extensive spare part facilities: one in Europe and the other in Asia. A standard spare part is posted within 24 hours of ordering and reaches its destination in 2–3 days. If necessary, we can also send a mechanic to carry out maintenance duties anywhere in the world at very short notice.

In case of emergency, call our Emergency service number. It is available 24 hours a day.



Dial +358 20 486 6003.

Take the first step towards lower sulphur emissions now, contact us:

AURAMARINE LTD.

P.O. Box 849
FI-20101 TURKU
FINLAND

Tel. +358 (0)204 86 5030
Fax +358 (0)204 86 5031

sales@auramarine.com
www.auramarine.com