



MARINE CHILLERS

CUSTOMER DRIVEN INNOVATION

multistack.com

 **MULTISTACK®**

WHY MARINESTACK

As one of the pioneers in the application of the Danfoss Turbocor magnetic bearing compressors, Multistack has 20 years of experience using and perfecting the technology. Multistack's proprietary controls platform, "FlexSys®", coupled with its "MultiPRO™" performance monitoring and optimization system, have produced industry leading efficiencies on both its marine and shore-based applications. Let Multistack show you how these systems can be deployed in both new vessels and retrofits of existing chiller systems aboard in-service vessels to save energy and reduce environmental impact.



Decarbonization

MagLev Marine chillers are a perfect stratagem in the cruise industry's planned transition away from high carbon footprint fossil fuel technology.

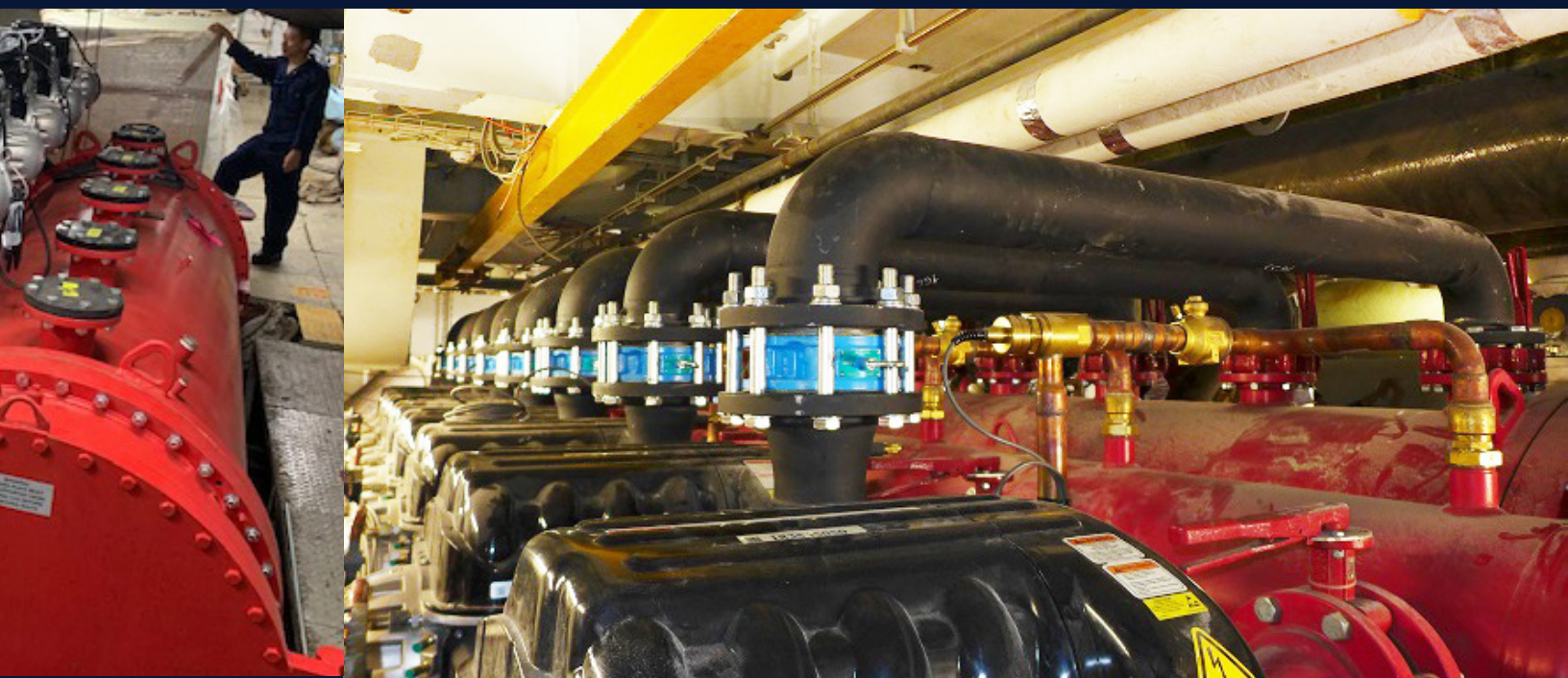
The Cruise Line International Association (CLIA) is committed to pursuing carbon neutral cruising by 2050 and reducing emissions by 40 percent by 2030. These aggressive goals require a deliberate and proactive response to attain and MagLev will be part of the path forward. MagLev Marine high-efficiency chillers have the potential to save 50% or more of the fuel consumed in providing air-conditioning and climate control aboard ship.

Configurable Flexibility

Whether a new build still in design or already in the yard we can configure your MagLev® Marine chiller to seamlessly integrate into your modular Lego-like ship building processes. The scalable modularity ensures that efficiency remains constant regardless of the cooling capacity required for your ship.

The retrofit of an existing vessel in dry-dock or in service can also benefit from the ability to build-to-suit and to take the MagLev Marine chiller in through hatches and down tight passageways into less than ideal machinery spaces.





Maintenance

MagLev Marine has no scheduled teardown for the compressors... EVER! That means an indefinite TBO! No scheduled rebuild, no oil to change, no bearings to wear... no metal-to-metal contact!

The only maintenance required is an occasional inspection of wiring and connections much as you would controls and, of course, the traditional water-side maintenance that your team and/or maintenance providers are already expert in undertaking.

The cutting-edge all aluminum magnetic compressors weigh only 135 kg and ensure that a compressor replacement can happen quickly and with minimal effort required.

Low Sound Signature Means Flexibility Too!

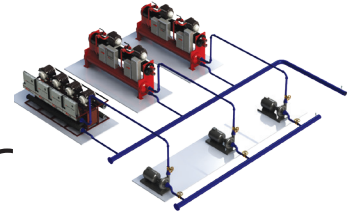
MagLev Marine's unbelievably low sound signature is less than most pumps. This means that chillers can be placed virtually anywhere aboard without fear of equipment noise affecting guests and allowing for the most economical piping layouts possible. The ultra-quiet MagLev also means that the crew will never be in danger of physical harm as is the case with legacy chillers.

Maximum controllability

Legacy chillers, especially centrifugals, are not able to turn down fully without significant reductions in entering sea water temperatures. Without those reductions (aka condenser relief) the chiller may become less controllable (surge) at light load in tropical waters since sea water is used for condenser cooling. A MagLev Marine chiller with its multiple magnetic compressors can unload to many times less than conventional equipment regardless of total chiller capacity and with very little entering sea water temperature reduction. As an example, a 6 MW MagLev Marine chiller can easily turn down to 350 kW.

Maximum Up-Time

MagLev Marine chillers are designed around multiple magnetic compressors that provide unparalleled redundancy yielding maximum up-time. If appropriately selected design capacity can be available even in the unlikely event of an N-1 compressor loss.

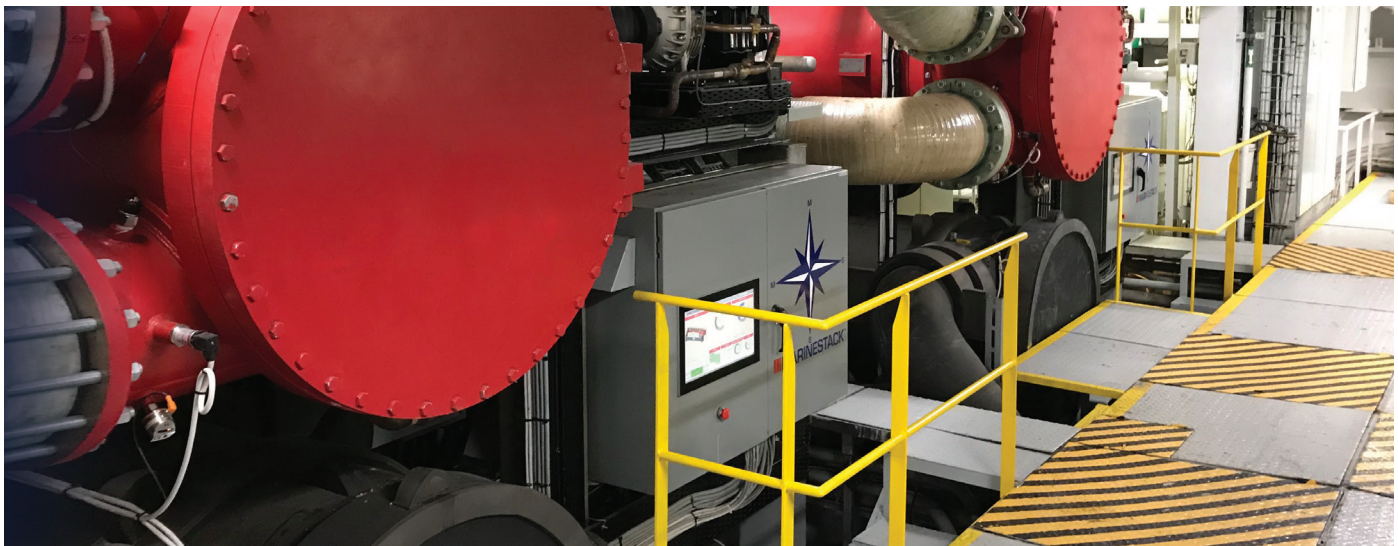
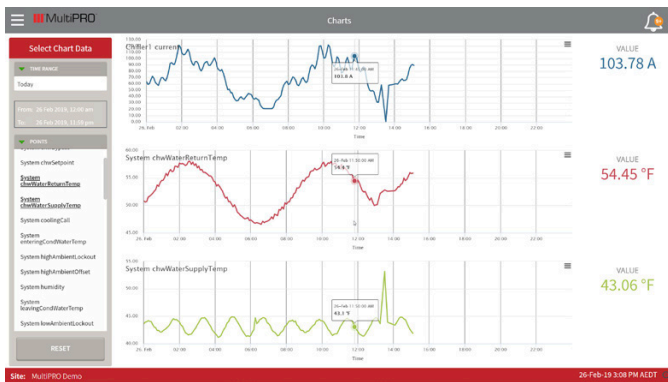


MultiPRO Central Plant Controller

MultiPRO is a state-of-the-art control solution. This central plant controller is optimized to make every part of your ship's mechanical room operate most effectively and reliably. Using intelligent sequencing algorithms, MultiPRO learns how your plant operates to continuously optimize your entire chilled water system. MultiPRO works with any chiller array and seamlessly interfaces with the existing automation system to deliver optimization of your entire system.

Features of MultiPRO include:

- remote monitoring so you can check the status of your chiller(s) from anywhere
- makes use of built-in Multistack logic to keep your ship efficient
- gives maintenance warnings so that you can keep your ship running smoothly anywhere in the world
- can be coded for any ship system, setup or structure
- intelligent sequencing
- optimized for better internet security
- built-in diagnostics allows for analysis of your ship's data in real time
- easy to use dashboard for monitoring performance





Multistack is the industry leader in
"Customer Driven Innovation".

Visit our web site at multistack.com
to learn how we can help solve
your marine chiller needs.



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