Application Literature
Industry Overview

ENSURING EFFICIENT RELIABILITY FOR MARINE THERMAL SYSTEMS

SUPERCHANGER®
Plate & Frame HE

PLATECOIL®
Prime Surface Plate HE

SUPERMAX®
Shell & Plate HE

ULTRAMAX®
Welded Plate HE

MAXCHANGER®
Welded Plate HE

TRANTER®
The heat transfer people

Plate Heat Exchangers Provide Extra Security at Sea

When you're miles from port and there's blue water breaking on deck, you need all your thermal systems running strong, reliably and efficiently. Since the sea isn't known for giving second chances, Tranter offers ways to optimize thermal systems aboard platforms and vessels with an extensive range of plate heat exchangers.

Our units are designed to provide maximum efficiency for various closed-circuit cooling systems at sea, as well as process other on-board applications including fresh water production and HVAC systems.

Titanium plates significantly enhance durability and long-lasting, uninterrupted performance in corrosive seawater cooling duties. Plus, their compact size and weight make them quick and easy to disassemble for inspection, cleaning and maintenance.

Why fill up engineering spaces and burden topsides with heavy, bulky equipment, when efficiency and economy are readily available with Tranter plate heat exchangers?

Marine HE Applications

- Large yachts
- Supertankers
- Offshore rigs
- ATBs
- Cruise ships
- Freighters
- Naval vessels
- FPSO vessels

Plate technology for reliability and efficiency offshore. From left: ULTRAMAX® Welded Plate, SUPERCHANGER® Plate & Frame, MAXCHANGER® Welded Plate, PLATECOIL® Prime Surface Plate and SUPERMAX® Shell & Plate.

PHE Standard Range General Specifications

	SUPERCHANGER® Plate & Frame Gasketed	PLATECOIL® Prime Surface Plate	SUPERMAX® Shell & Plate	ULTRAMAX® Welded Plate	MAXCHANGER® Welded Plate
PERFORMANCE					
Max. Pressure Rating, barg (psig)[a]	27.56 (400)	28 internal, 69 external (400 internal, 1000 external)	70 (1015)	35 (500)	70 (1015)
Max. Temperature Rating, °C (°F)	160 (320)	260 (500)	538 (1000)	150 (300)	538 (1000)
CONNECTIONS					
Max. Connections, DN (ANSI RF in.)	Contact Factory Also Studded Ports	2-3/4 in. NPT	400 (16)	250 (10)	50 (2)
MATERIALS					
Standard Plate Material[b]	304 SS, 316 SS, Titanium	Carbon Steel, 316L SS, Titanium	316L SS, Titanium	316L SS	316L SS, Titanium
Standard Frame/Shell Material[c]	Carbon Steel	SA-240, 302 SS, 304 SS, 304L SS, 316 SS, Monel®, Nickel, Inconel, Others	Carbon Steel, 316L SS	Carbon Steel	316L SS

[a] Ratings offered as a general guide only. Certain combinations of physical and fluid properties may affect individual product specifications. Contact the factory with your specific application data.

[b] Higher performance materials are available.

[c] Corrosion-resistant marine coatings available.

SUPERCHANGER® Plate & Frame

- Higher "U" values and close temperature approaches
- Unique turbulent flow design resulting in lower fouling
- Immediate availability (made in factories strategically located worldwide)
- Space saving and light weight
- Expandability and easy servicing
- Design flexibility makes them ideally suited for a wide variety of shipboard cooling and heating applications
- Conform to American Bureau of Shipping, U.S. Coast Guard, shock testing per MIL-S-901C (U.S. Navy), vibration testing per MIL-STD-167-1 (Ships), ASME U stamp per Sec. VIII Div. 1 and DNV (Det Norske Veritas)
- Worldwide OEM service and parts

PLATECOIL® Prime Surface Plate

- Multitude of design configurations and more than 300 different sizes
- Versatility in providing heating and/or cooling
- Surpass field-fabricated linear pipecoil in initial cost economy and thermal performance
- Available in carbon and stainless steel, titanium and higher alloys
- Conform to ASME, U.S. Coast Guard, DNV, ABS and Lloyds Register codes

SUPERMAX® Shell & Plate

- Welded construction comprises a pressure vessel of high integrity with good thermal cycling performance
- Optional flanged cover model allows the plate pack to be removed for cleaning
- Particularly suited for large flow imbalances—distillation vapor condensers, economizers, aftercoolers, intercoolers and related service
- Removable Cover HE is available as an option in all sizes

ULTRAMAX® Welded Plate

- Resists thermal fatigue and allows operation at high temperature and pressures
- True countercurrent flow for full LMTD
- Large capacity or multi-pass configurations
- Eight different plate lengths, up to heat exchange area of 0.989 m^2 (10.65 ft^2)

MAXCHANGER® Welded Plate

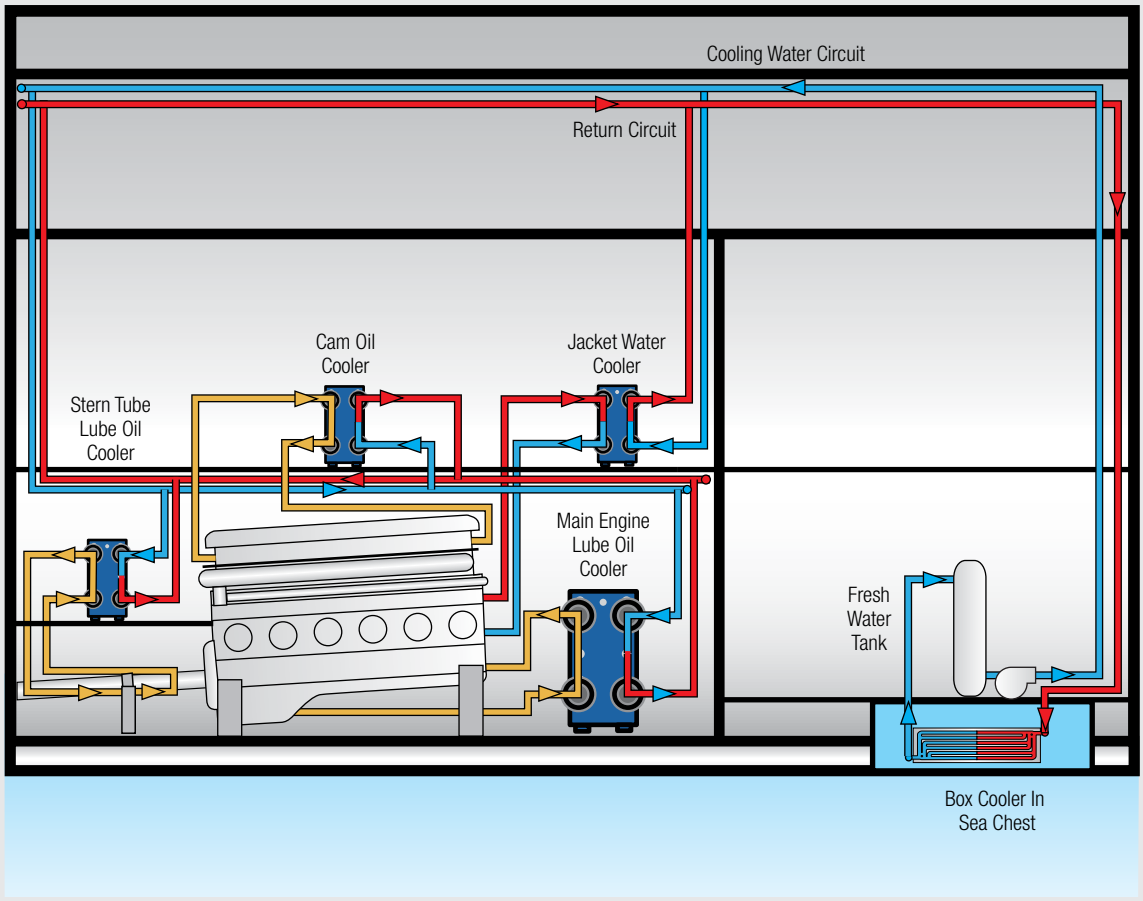
- Use where space is a premium or where gaskets cannot be used
- Efficiencies are comparable to a plate & frame HE
- Numerous alternate fitting locations and mounting configurations

Idea Notebook

Tranter heat exchangers are ideally suited for marine processes, with their reliability, easy maintenance, compact size and efficient performance.

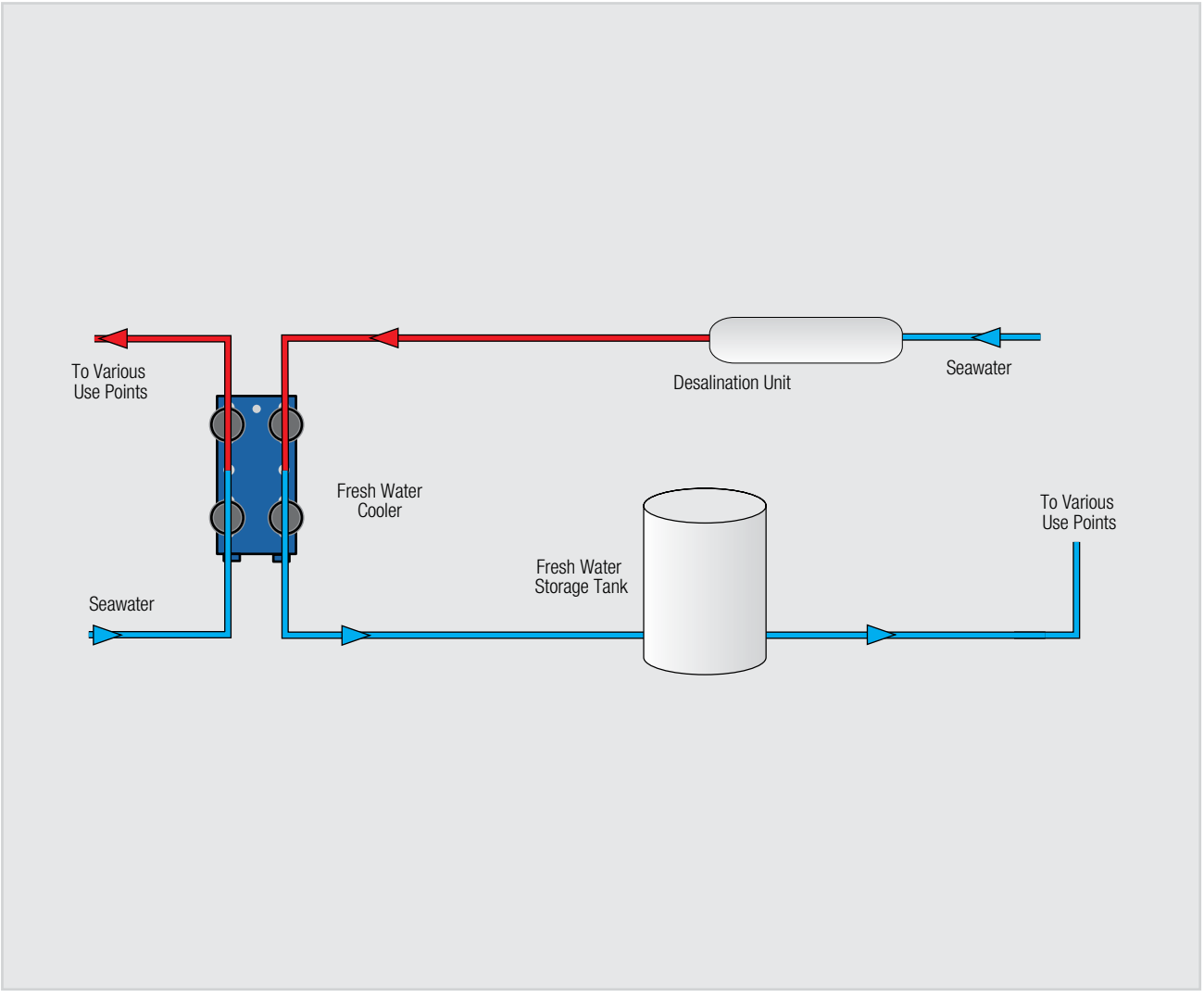
Plate Box Coolers

A bank of titanium PLATECOIL® panels installed in a vented sea chest transfers heat from the shipboard cooling circuit to external seawater, returning cooled fresh water to a storage tank for a variety of cooling purposes.



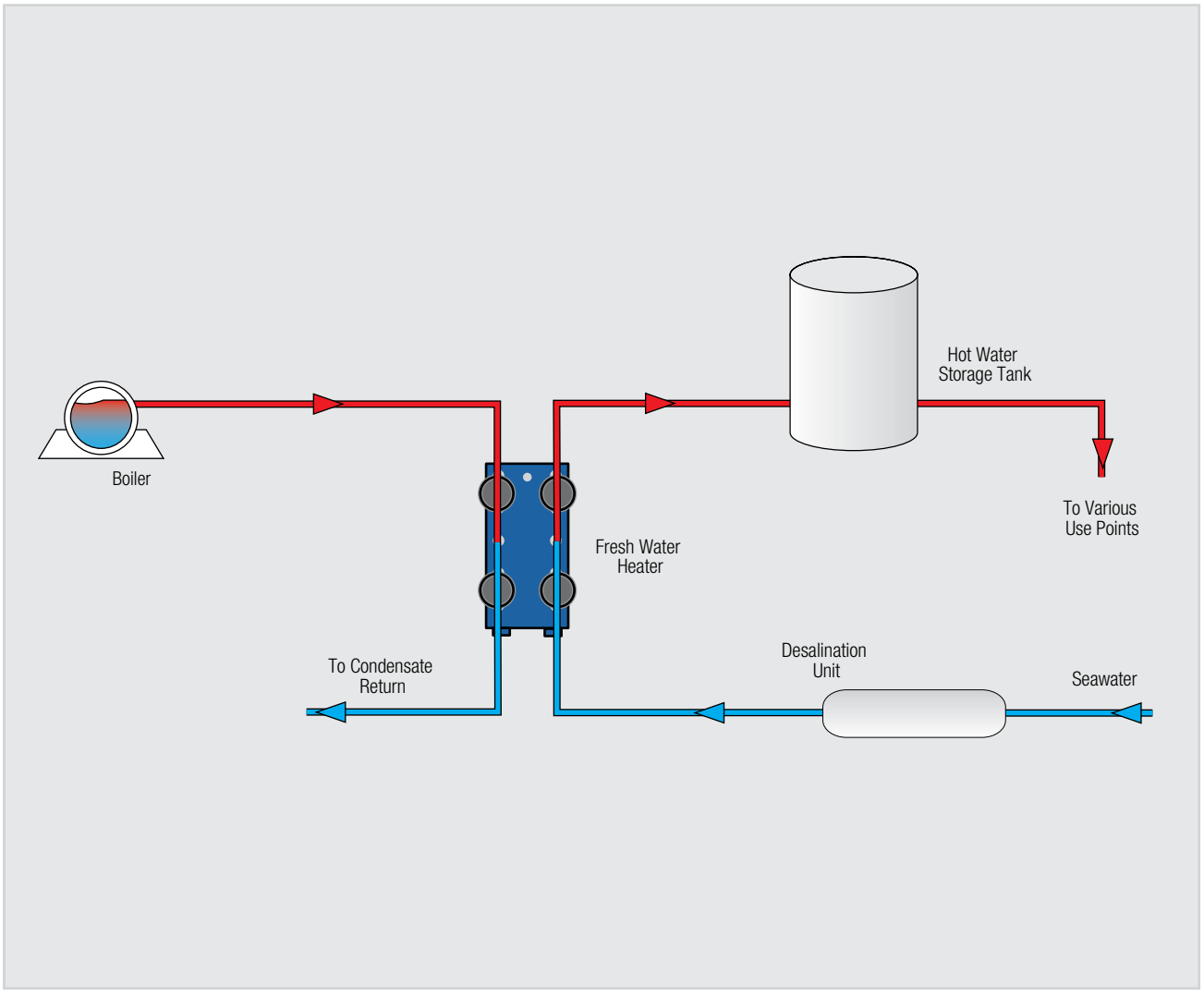
Central Fresh Water Cooler

Large SUPERCHANGER® units use seawater to cool the ship's central fresh water system. Titanium plates provide corrosion-resistant, trouble-free exchanger service. High turbulence between plates reduces biofouling. Large vessels use this centrally cooled fresh water for many other cooling requirements, eliminating the need for titanium in those applications.



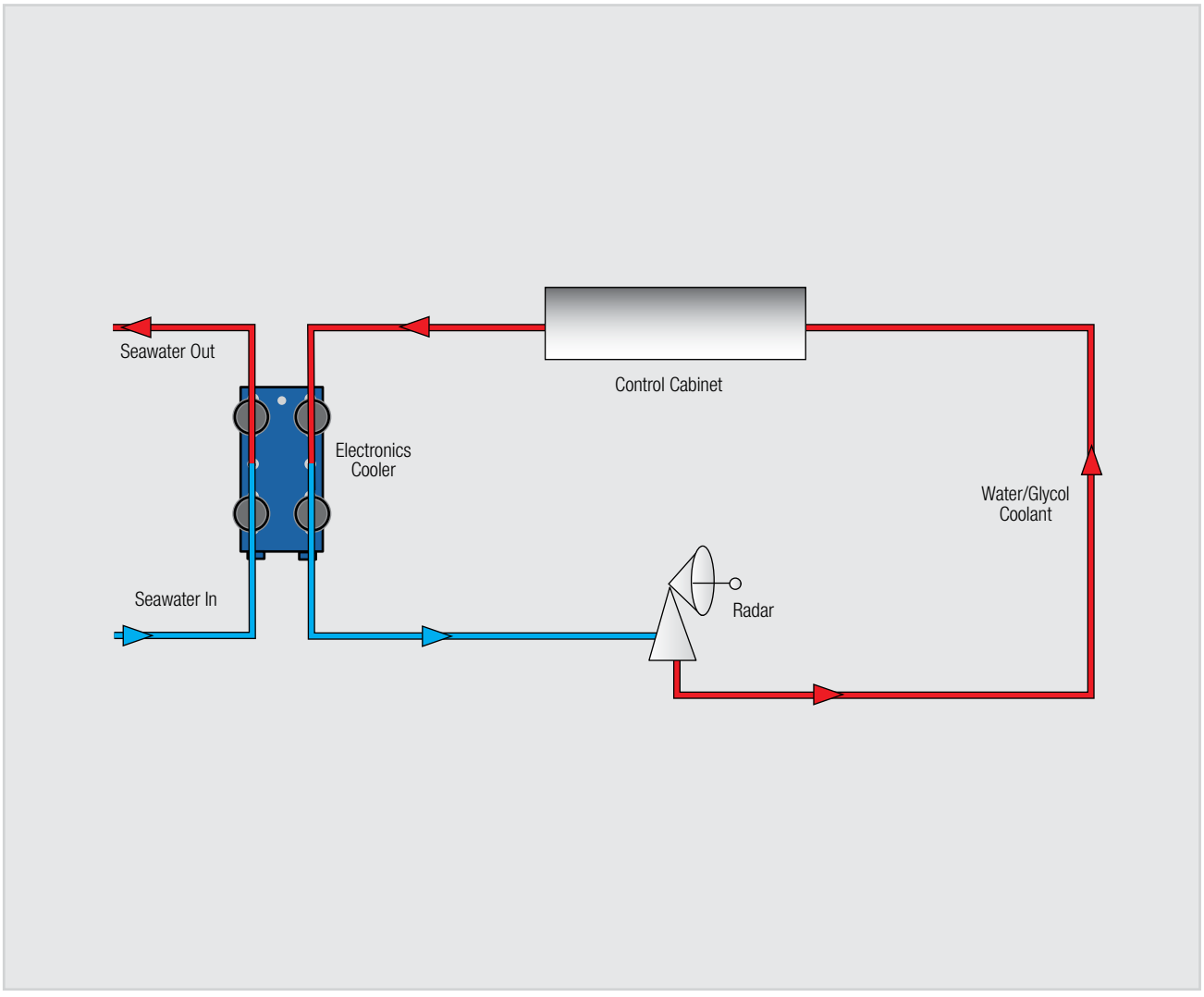
Heating Ship Service Water

Hot water for many uses is produced with steam through SUPERCHANGER units. Saturated steam at up to 8 bar (120 psi) and 176°C (350°F) can be used with EPDM gaskets. The heat transfer rates average about 6,814 W/(hr•m²•°C) [1,200 Btu/(hr•ft²•°F)] for this duty, resulting in a very compact unit.



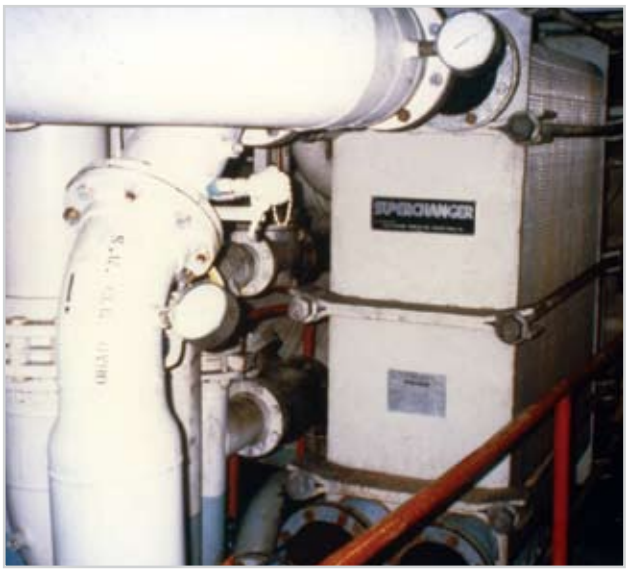
Cooling Electronic Gear

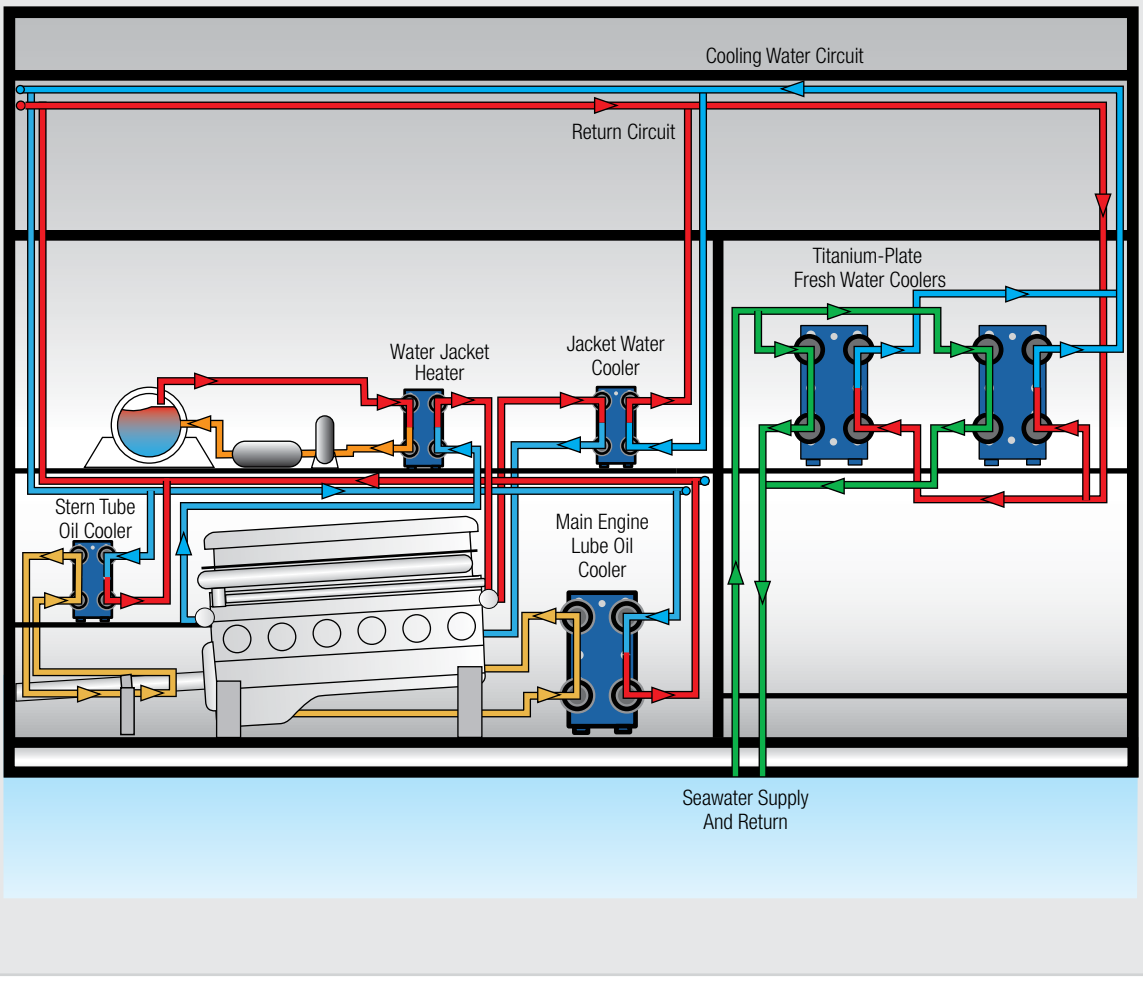
Critical electronic gear and radar/sonar control systems are typically cooled using deionized water. SUPERCHANGER exchangers are replacing S&T units constructed with Cu-Ni tubes. SUPERCHANGER HEs, with corrosion-resistant titanium plates, safely use seawater as a coolant without corrosion and in a lot less space.



Main Engine Jacket Water And Lube Oil Temperature Control

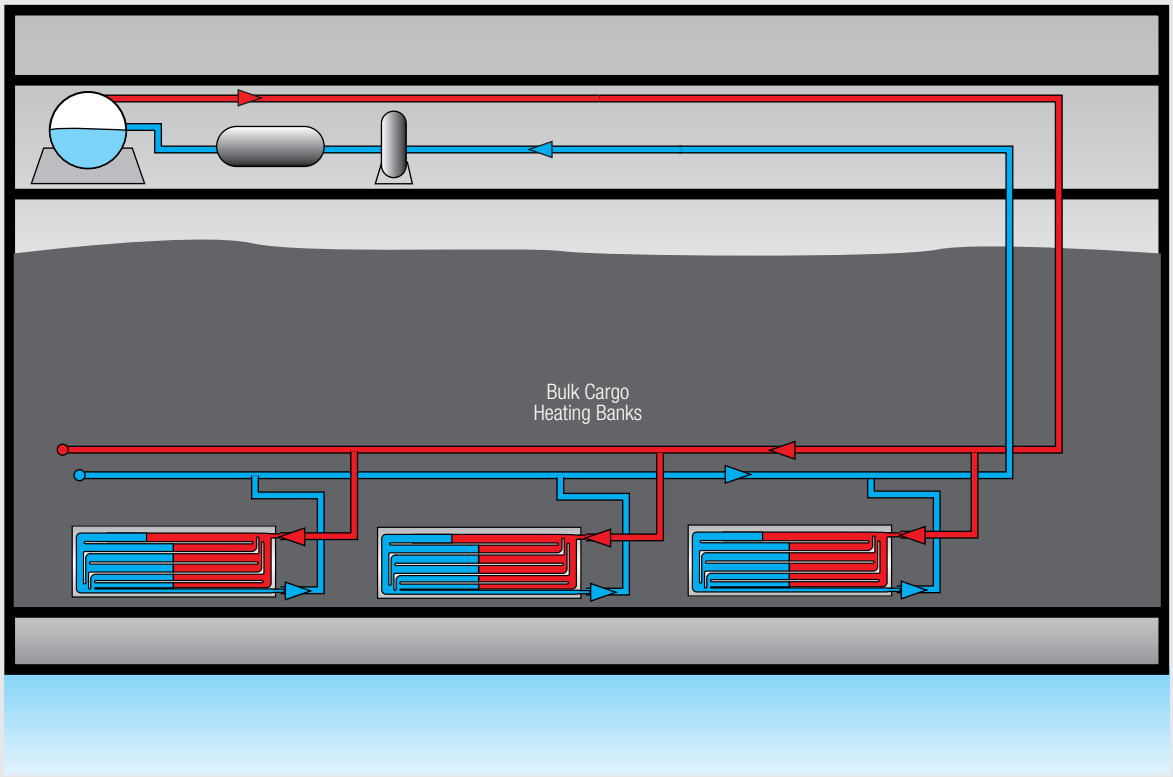
With titanium-plate SUPERCHANGER Plate & Frame Heat Exchangers, seawater can be used as a practical isolation circuit jacket water coolant in diesel engines. Stainless steel-plate SUPERCHANGER units instantaneously preheat jacket water prior to startup using steam as the heating medium. They are also effective lube oil coolers, cam oil coolers, steering gear coolers, bow thruster coolers and fuel oil conditioning heat exchangers for large engines. The cooling medium can be fresh water, or seawater when constructed with titanium plates.





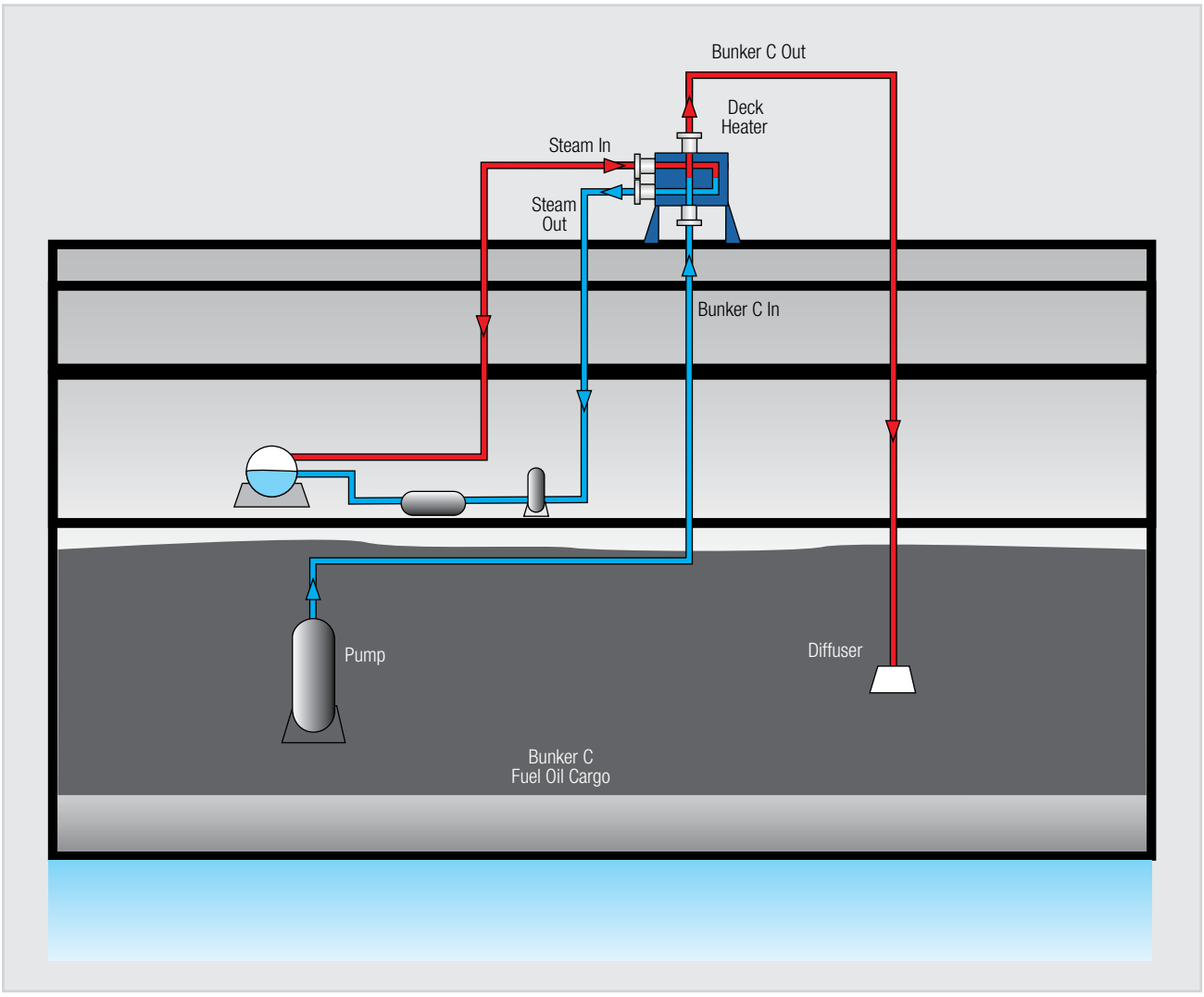
Cargo Heating

PLATECOIL banks, installed in cargo holds, maintain cargo temperature at 33°C to 160°C (93°F to 320°F) using steam, hot water or thermal fluids. They are easier to clean, lighter weight, install very quickly and do not interfere with coating application in cargo holds.



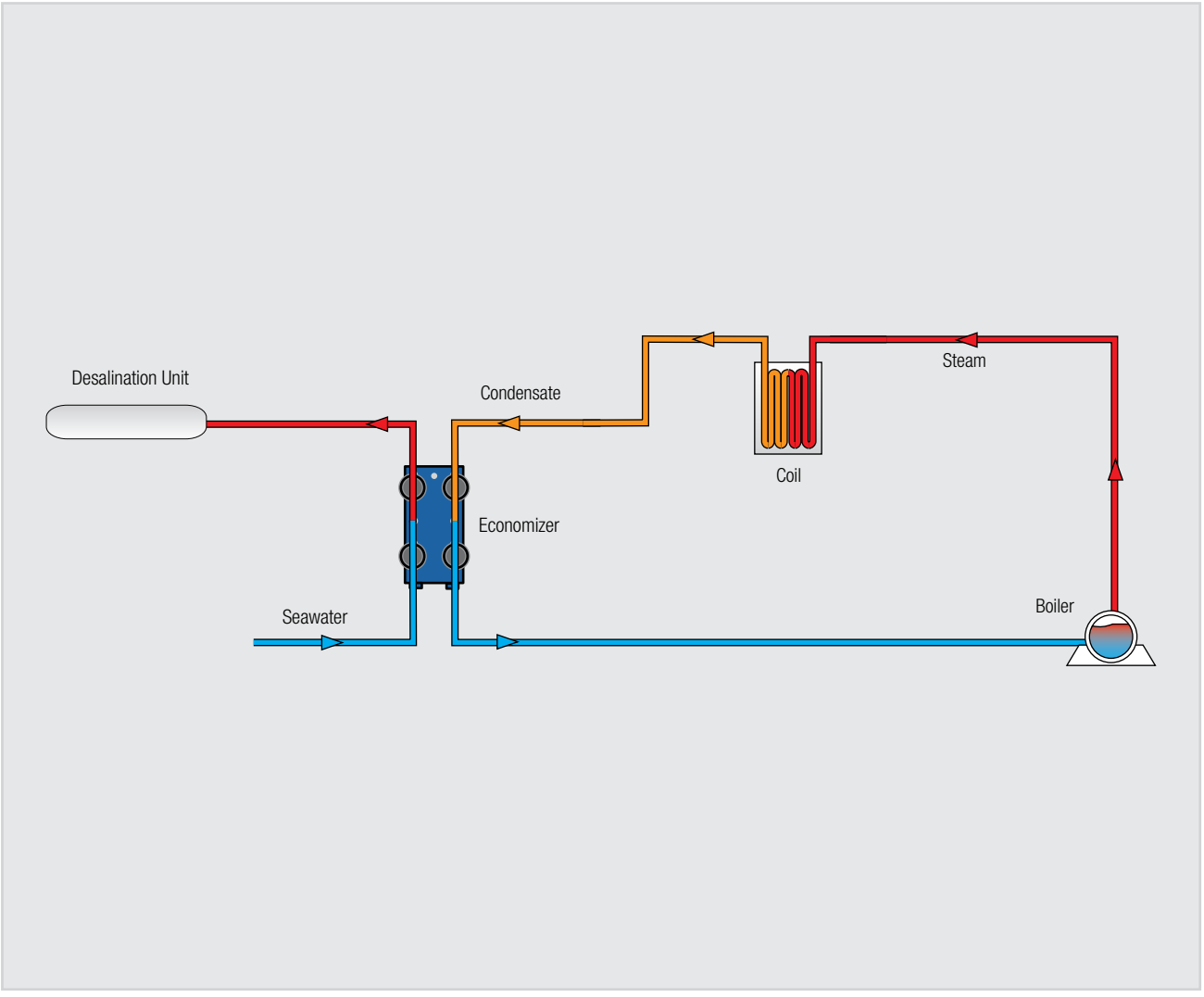
Deck Heaters

SUPERMAX® Shell & Plate exchangers used as deck heaters for direct cargo heating offer lower topside weight, smaller footprint and easier maintenance than shell & tube (S&T) units. High flow turbulence provides superior scaling and fouling resistance. SUPERMAX can use steam, heat transfer oil or hot water to heat cargoes such as bunker oils, edible oils, non-edible oils, *p*-xylene and crude oil.



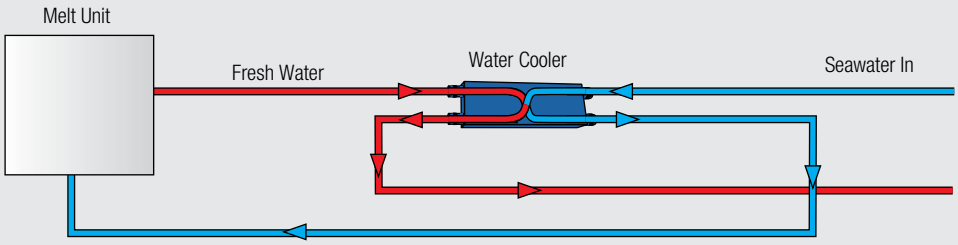
Heat Recovery From Hot Condensate

SUPERCHANGER heat exchangers are widely used both onshore and aboard ship to cool the steam condensate from various heating applications. This system can also be used for heat recovery, whereby seawater used for cooling is preheated on its way to the desalination unit.



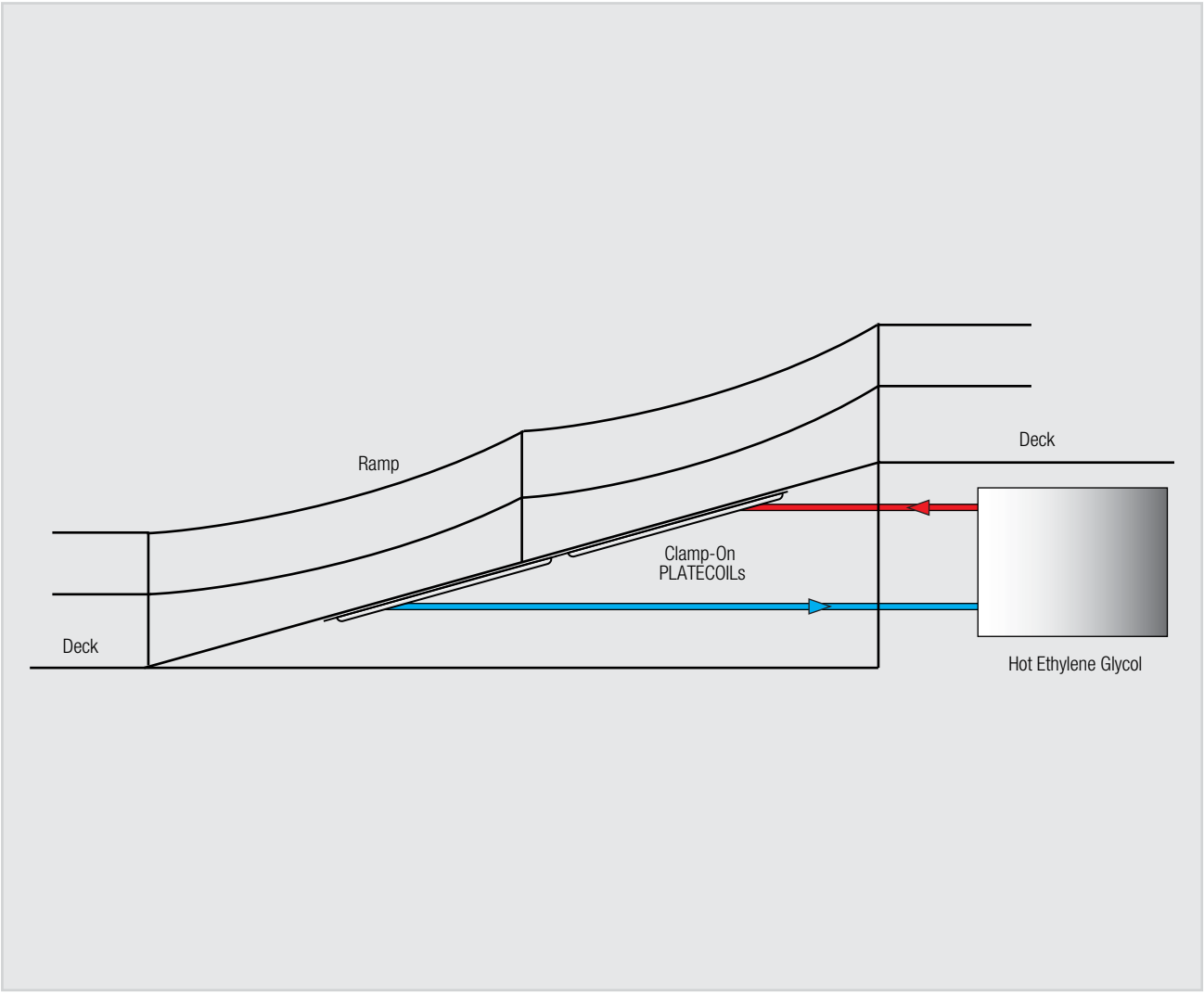
Plastic Waste Disposal

Hundreds of compact MAXCHANGER® units are installed on U.S. Navy ships to process plastic waste. They are used to cool a circulating water loop, which solidifies the plastic waste once it has been melted and compressed. Since seawater is the cooling media, titanium plates are necessary. But it was their light weight, small space requirements and maintenance-free construction that sold MAXCHANGER units for this application.



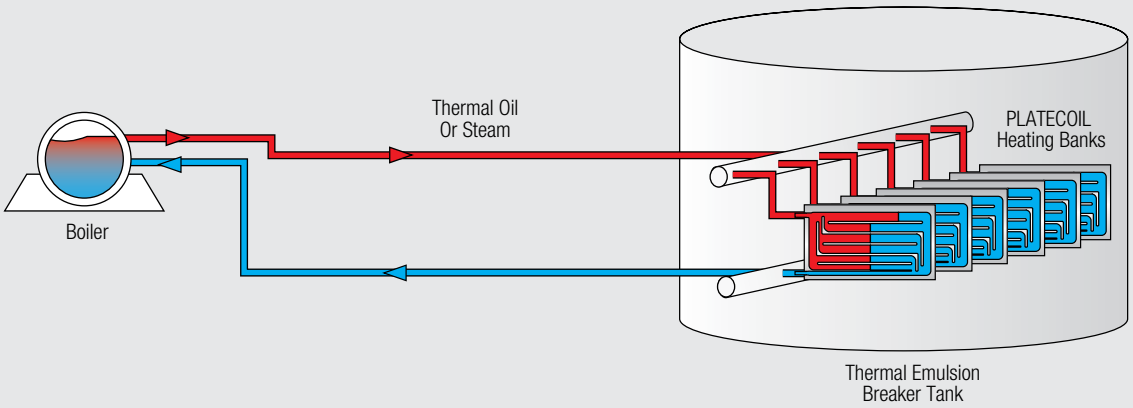
Superstructure And Gangway De-Icing

PLATECOIL Prime Surface units have been used beneath deck ramps on board ships to prevent icing during cold weather. Single-embossed PLATECOIL panels, circulating hot ethylene glycol, are attached to the underside of the deck ramp to keep them ice free. They are also used to heat ship superstructures, reducing above-waterline weight caused by ice.



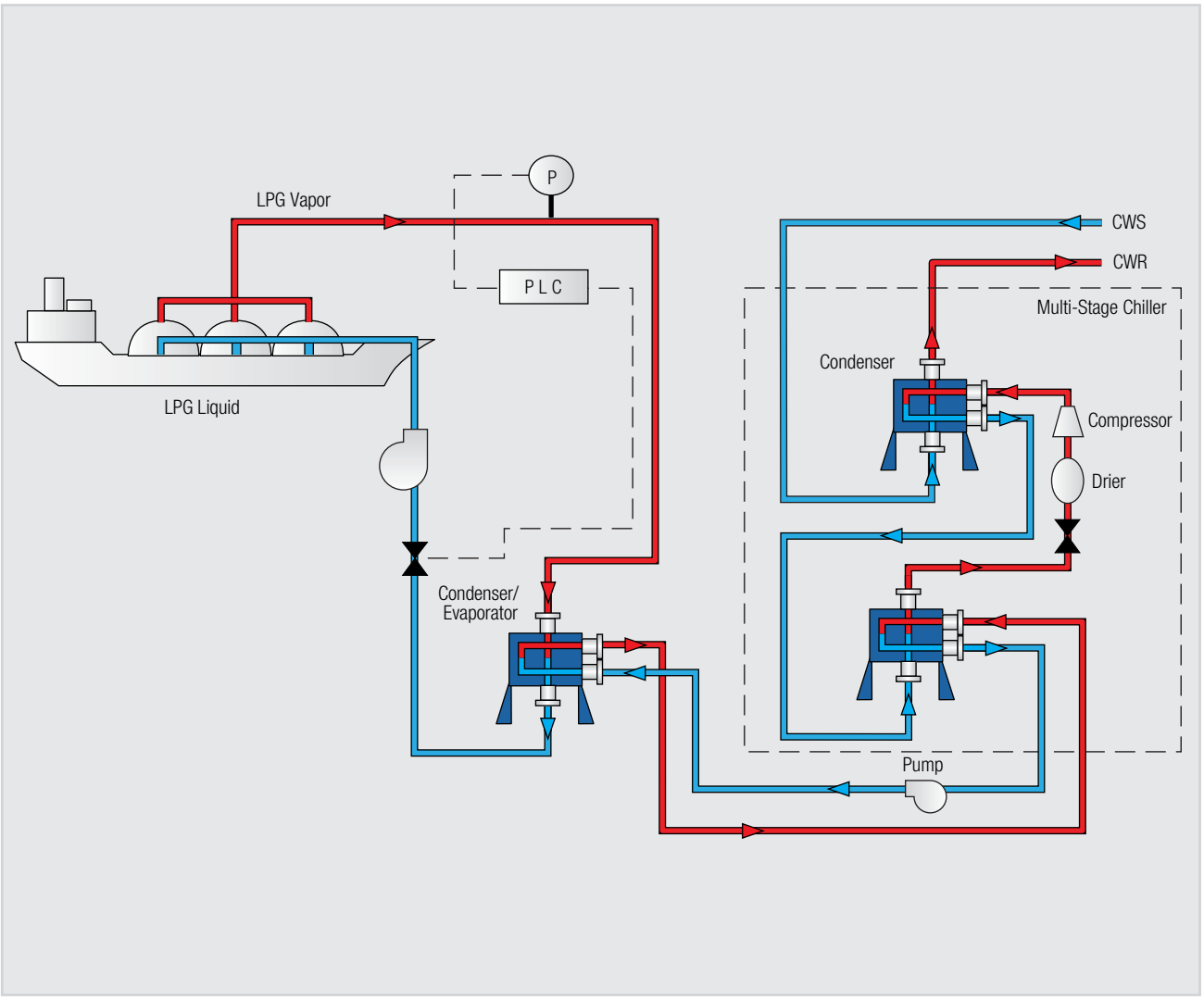
Thermal Emulsion Breaking For Recovered Oil

Recovering spilled oil is an important job made a lot easier with PLATECOIL Prime Surface Heat Exchangers. PLATECOIL banks heat heavy, recovered crude oil to separate oil from water and facilitate pumping out of the hold. And banks of PLATECOIL units are easy and economical to install and maintain.



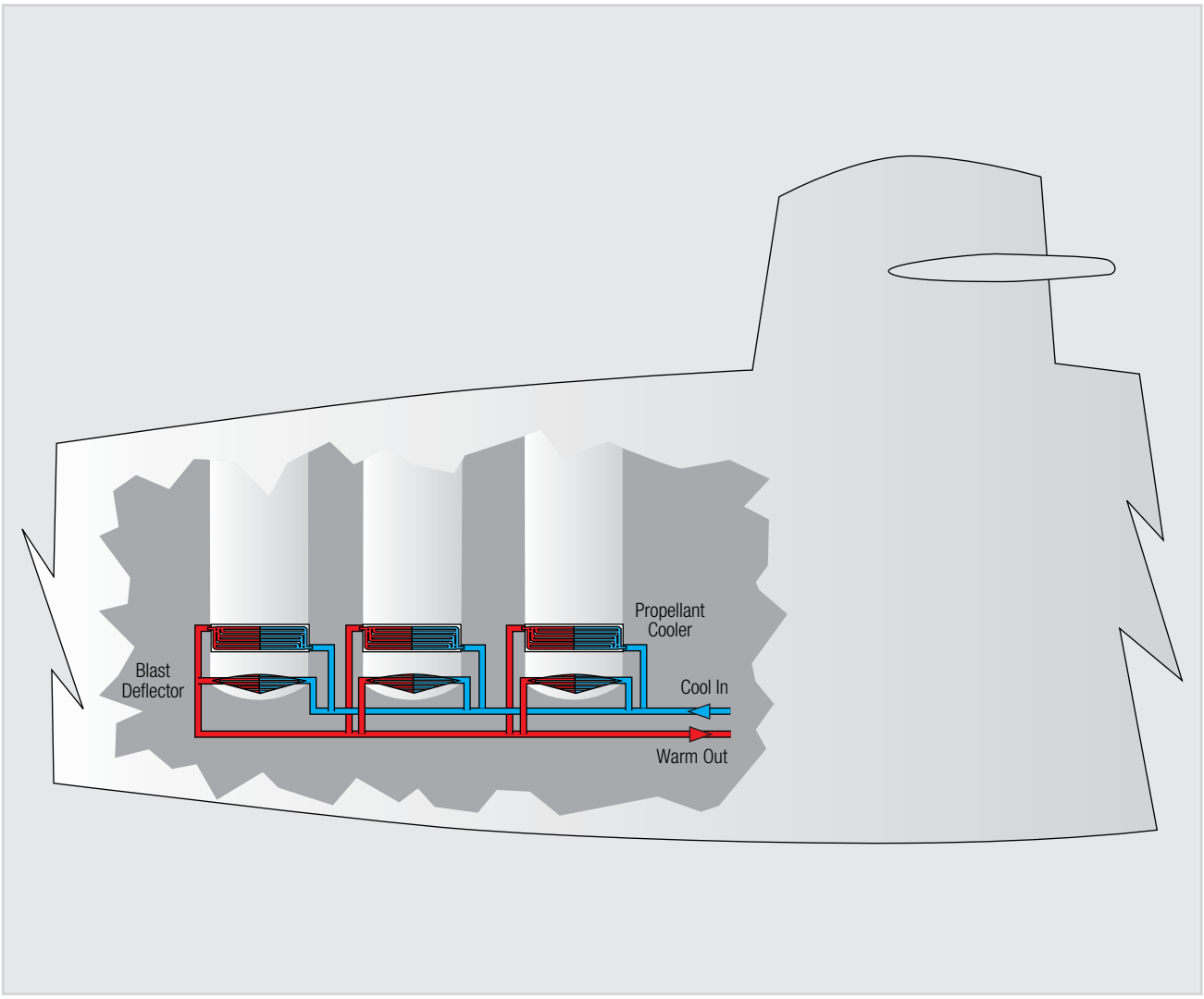
LPG Reliquefaction

SUPERMAX exchangers, configured as a multi-stage chiller and condenser system, can reliquefy LPG during transport. And multi-pass configurations perform well as condensers/ evaporators where flow imbalances are significant. Depending on capacity, ULTRAMAX® units can also be used in these applications.



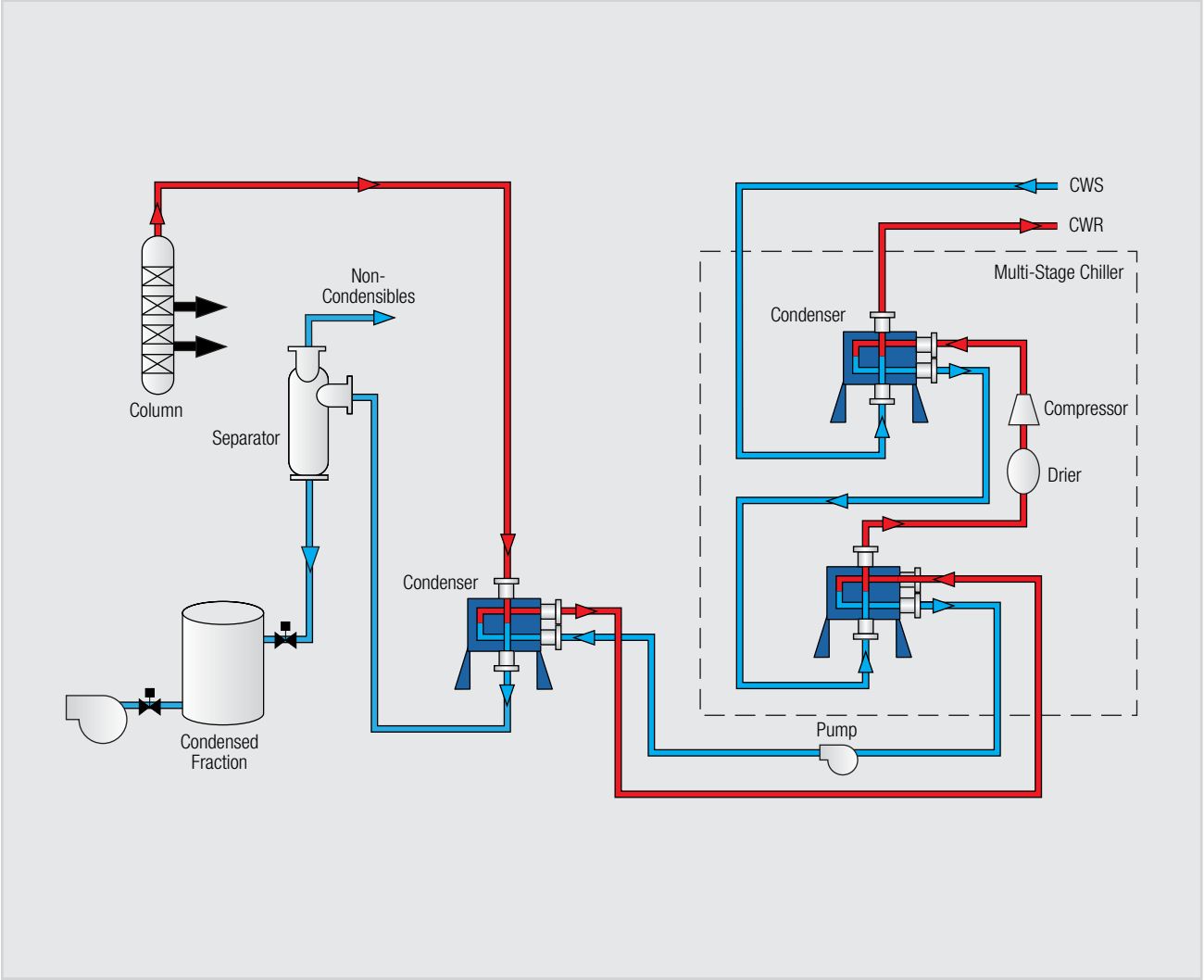
Temperature Control On Missile Tubes

PLATECOIL units, formed to the diameter of missile launch tubes, closely control the temperature of the solid propellant used in ICBMs deployed in the Trident II Missile Submarine Fleet. Also, PLATECOIL blast deflectors are used within launch tubes to facilitate hot missile launches.



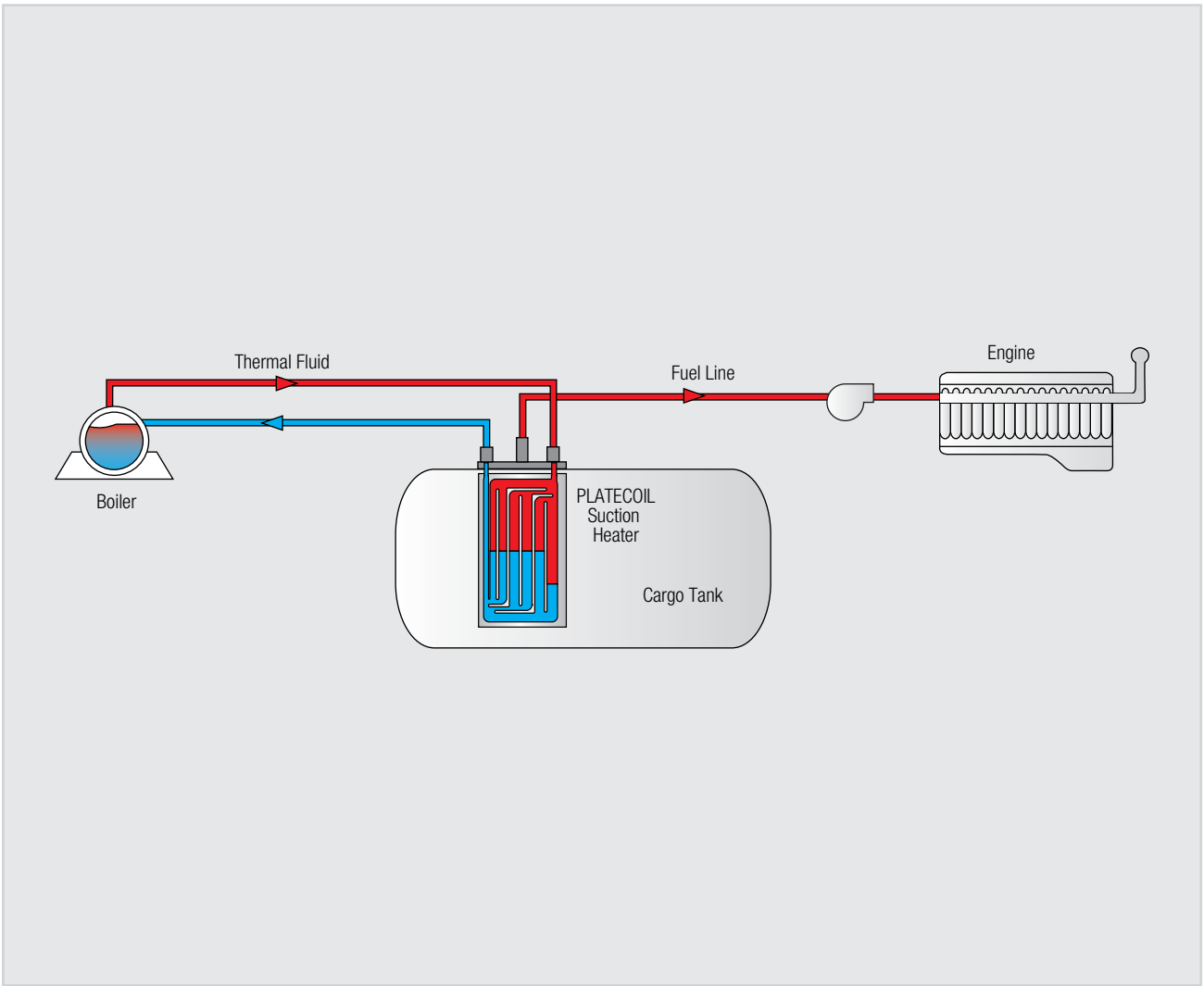
Noncondensibles Separation And Condensate Return

A SUPERMAX serves as a high-performing condenser for removing noncondensible fractions and returning condensates to process in offshore processing operations. With its available large-diameter shell-side nozzles, it can handle unbalanced flows found in gas/water exchanger service. SUPERMAX units can also be used as space-efficient chiller components.



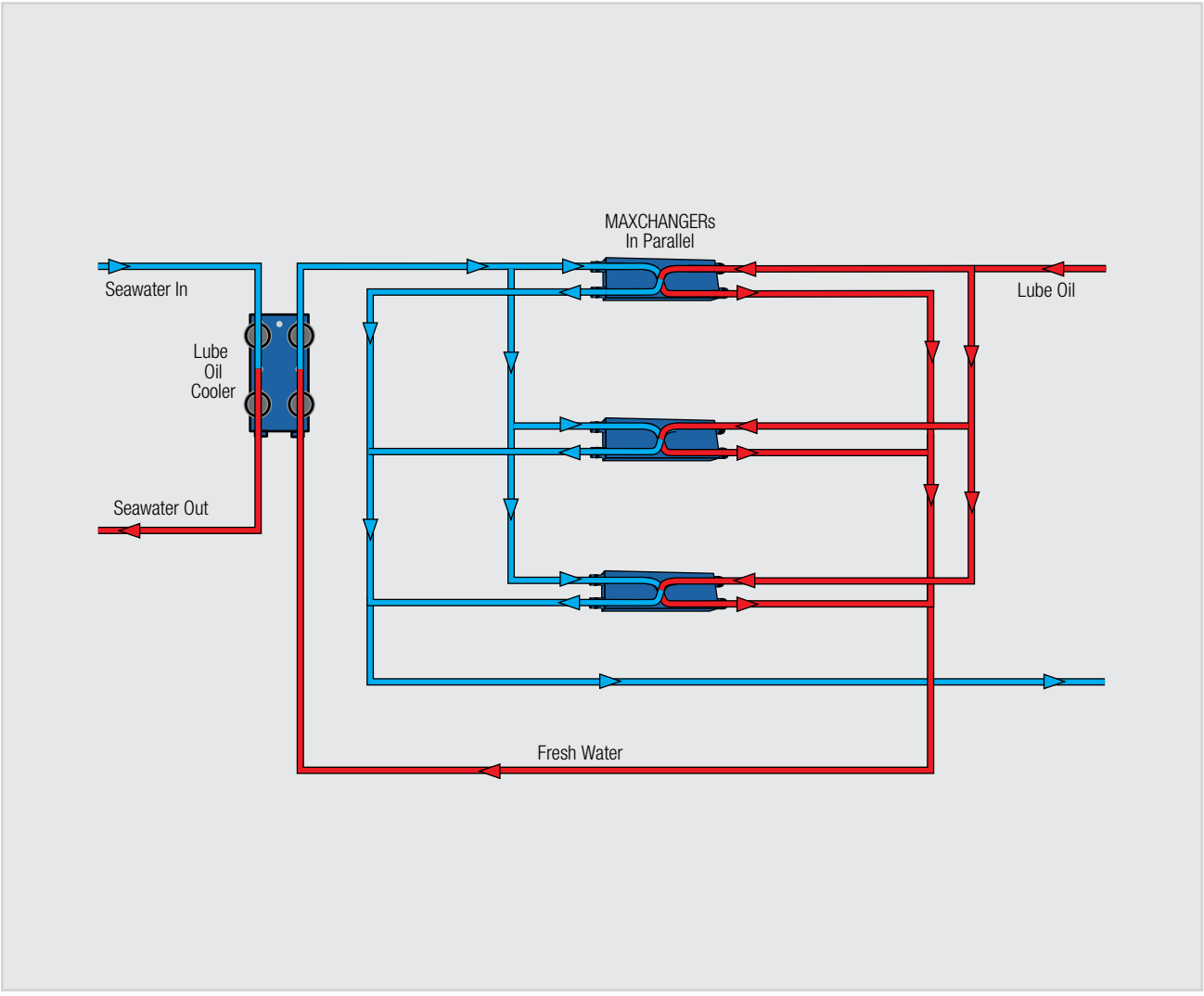
Suction Heaters

Box chamber suction heaters prefabricated from PLATECOIL comprise a more compact design approach than electric or hot oil whole-tank heaters. They employ the pump inlet as the heat source instead of the entire tank. Additionally, the hot suction heater walls help preheat the viscous liquid before it enters the pumping chamber, improving pumping efficiency. An alternate design uses PLATECOIL fabricated into a cylinder, with the suction extended through the center.



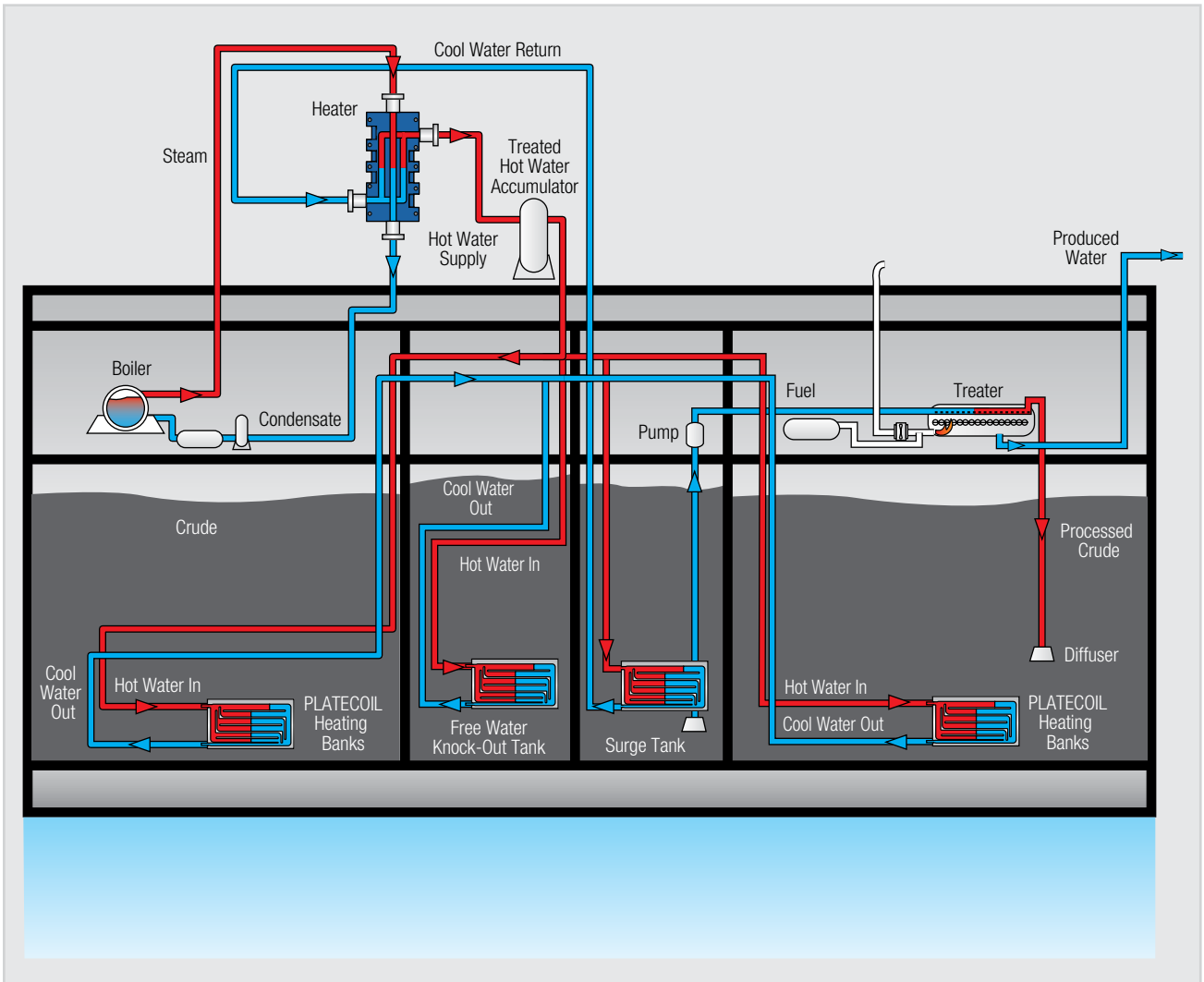
Lube Oil Cooling For Gas Turbine Powered Ships

Three MAXCHANGER units in parallel effectively cool engine lube oil. The advantage of this configuration is that the lube oil heat exchanger loop never needs to be opened. Cleaning is performed only on the seawater gasketed plate heat exchanger where bio-fouling can occur.

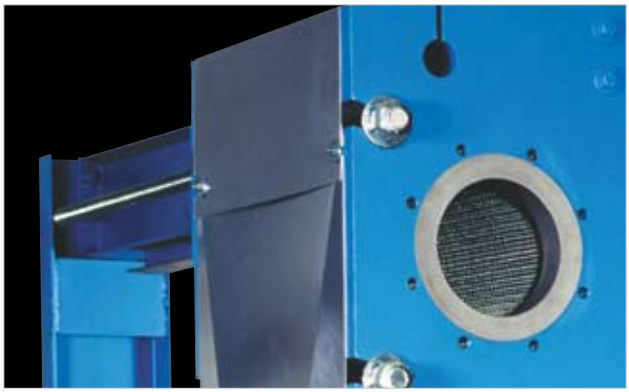


FPSO Applications

Space, weight and corrosion resistance are critical factors for process systems aboard FPSO vessels. ULTRAMAX or SUPERMAX exchangers serve as steam-powered heaters for the local heating medium circuit, which supplies heat for various processes throughout the vessel. These units require only 30–50% of the space and weigh up to 70% less than other typical exchangers. These efficiencies translate into less steel, lower purchase price, shorter lead time and less expensive delivery. Protection is provided by a PTFE coating and a special, three-layer epoxy paint on all tightening bolts. The units also offer the assurance of ABS certification and ASME Code stamps, as well as compliance with API662.



Maximize Maintenance Productivity and Efficiency with Plate & Frame Accessories



Shrouds

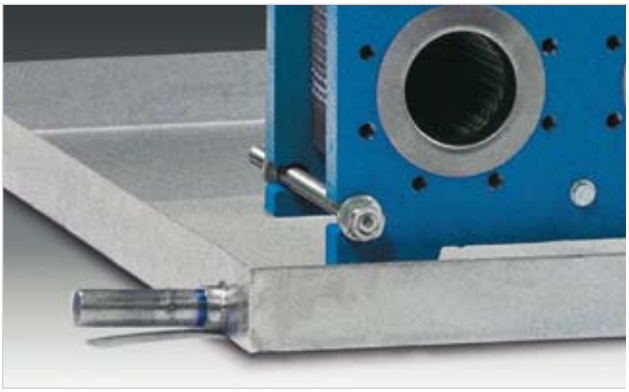
Shrouds provide protection in an aggressive environment, preventing damage to plates and gaskets.

Instruments And Gauges

Special flanges are available with outlets for drainage and ventilation, pressure gauges and sensors.

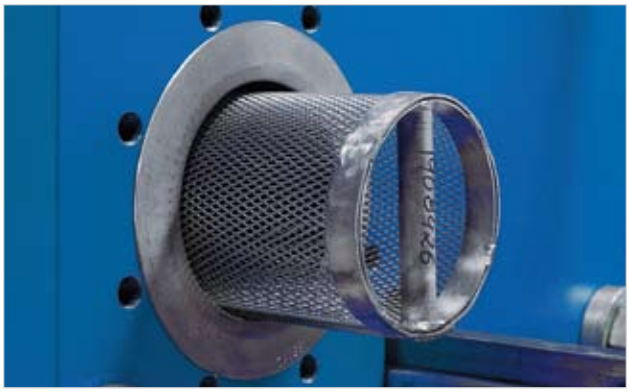
Hydraulic Tightening Devices

Hydraulic tightening devices facilitate assembly and reassembly of plate & frame heat exchangers fast, easily and securely.



Drip Pans

Drip pans prevent water and other liquids from flowing onto the floor when dismantling the heat exchanger.



Port Strainers

A strainer protects the plate pack from large particles that would otherwise foul and clog the channels. The length is adapted to the number of plates.

Other accessories include:

- Portable Clean-In-Place systems
- Backflush valves
- Wrenches
- Grounding lugs
- Molybdenum bolt coatings
- Tie-rod protectors
- HexWrap insulation

Quality, OEM Service and Maintenance Protect Your Plate HEs and Your Systems

Tranter offers extensive experience in both onshore and offshore applications. With manufacturing centers on three continents, Tranter sources systems close to major production and refining areas, minimizing lead-time and freight for accommodating tight project schedules.

Efficient operation is the key to optimum return of investment in your heat exchanger. Malfunctions and changes in heat transfer can have severe consequences on operational costs and may affect the product quality. Regular service and maintenance safeguard your exchanger's condition and allow you to maintain the optimum performance.

Tranter service only begins when the heat exchanger starts up. The Tranter service concept helps meet application requirements, prolongs the life of the exchangers and makes them top performers at all times.

With Tranter authorized service, you can always be sure that you get the right gaskets, the right plates, the friendliest service and our OEM Guarantee.

Authorized Service Guarantees
The Original Standards

To obtain additional information on operation and maintenance, contact your local Tranter, Inc., representative or the nearest Tranter, Inc., factory-authorized Service Center.

Tranter Service Center (USA)
Factory/Sales/Engineering Office
1900 Old Burk Highway
Wichita Falls, TX 76306
Tel: 1-800-414-6908 • Fax: 940-723-5131
E-mail: aftermarket@tranter.com

Tranter Midwest Service Center (USA)
30241 Frontage Road
Farmersville, IL 62533
Tel: 217-227-3470
E-mail: aftermarket@tranter.com

Tranter Service Center (USA)
1213 Conrad Sauer
Houston, TX 77043
Tel: 1-800-414-6908 • Fax: 713-467-1502
E-mail: aftermarket@tranter.com

Tranter Service Center (USA)
Bakersfield, CA
(Under construction)

Tranter International AB (United Kingdom)
Wakefield Factory
Tranter Ltd, Unit 50
Monckton Road Industrial Estate
Wakefield WF2 7AL England
Tel: +44-1924 298 393 • Fax: +44-1924 219 596
E-mail: info@uk.tranter.com

Tranter International AB (Sweden)
Regementsgatan 32
PO Box 1325
SE-462 28 Vänersborg Sweden
Tel: +46 521 799 800 • Fax: +46 521 799 822
E-mail: info@se.tranter.com

Tranter International AB (Germany)
Käthe-Paulus-Strasse 9
Postfach 10 12 14
DE-31137 Hildesheim Germany
Tel: +49-512 175 2077 • Fax: +49-512 188 8561
E-mail: info@de.tranter.com

Tranter International AB (Italy)
Via Ercolano, 24
IT-20052 Monza MI Italy
Tel: +39-039 28 282 210 • Fax: +39-039 834 315
E-mail: info@it.tranter.com

Tranter Ind e Com de Equip Ltda (Brazil)
Av. Leonil Cre Bortolosso, 88 Galpão 1
06194-971 Osasco, SP Brazil
Tel/Fax: +55 11 3608-4154
E-mail: vendas@tranter.com

Tranter India Pvt. Ltd. (India)
Gat. No. 985, Sanaswadi Tal. Shirur
Dist.Pune -421 208 (India)
Tel: +91-2137-392300 • Fax: +91-2137-392354
E-mail: sales@in.tranter.com

Tranter Service Center (Canada)
4080-78 Avenue
Edmonton, AB T6B 3M8 Canada
Tel: 780-465-4582 • Fax: 780-469-5448
E-mail: servicecanada@tranter.com

At the forefront of heat exchanger technology for more than 70 years

Tranter top quality, high-performance, proprietary products are on the job in demanding industrial and commercial installations around the world. Backed by our comprehensive experience and worldwide presence, Tranter offers you exceptional system performance, applications assistance and local service. Tranter is close to its customers, with subsidiary companies, agents, distributors and representatives located worldwide. Contact us for a qualified discussion of your needs.

TRANTER®
The heat transfer people

North America
Tranter, Inc.
Wichita Falls, TX USA
Tel: (940) 723-7125
Fax: (940) 723-5131
E-mail: sales@tranter.com

Europe
Tranter International AB
Vänersborg, Sweden
Tel: +46 521 799 800
Fax: +46 521-673 93
E-mail: info@se.tranter.com

Middle East/Africa/Asia
Tranter India Pvt. Ltd.
Pune, India
Tel: +91 20-30519300
Fax: +91 20-30519350
E-mail: sales@in.tranter.com

South America
Tranter Ind e Com de Equip. Ltda
Osasco, Brazil
Tel: +55 11 3608-4154
E-mail: vendas@tranter.com

China/Southeast Asia
Tranter China
Beijing, China
Tel: +86 10 6554 4920/21
Sales E-mail: paulyang@tranter.com.cn
Support E-mail: tina@tranter.com.cn

www.tranter.com

TIS-117-0908 650661