Polaris
PLATE HEAT EXCHANGERS

Plate Heat Exchangers for the HVAC World

100%

Customized solutions that provide reliable, unmatched heat transfer

Versatile and durable, economical and efficient

POLARIS PLATE HEAT EXCHANGERS EXCEL IN HVAC APPLICATIONS

In heating, ventilating and air conditioning, POLARIS Plate Heat Exchangers deliver superior engineering and manufacturing backed up by unsurpassed field experience. PHEs from POLARIS meet your most demanding requirements in a wide range of HVAC applications.

THE BENEFITS OF POLARIS PLATE HEAT EXCHANGERS

Custom solutions:
The versatility of POLARIS plates, patterns and pressing depths, enables top efficiency, effectiveness and long life.

Superb leak protection:
PHEs are built to prevent leaks and media mixing. If leaks should occur, they're quickly spotted so they can be repaired.

Better turbulence, less fouling:
Herringbone plates maximize turbulence to deter fouling, spread service intervals, and cut maintenance costs.

Local service and maintenance:
Our network of expert service partners has the skills to maintain, repair and upgrade your PHE quickly and correctly.

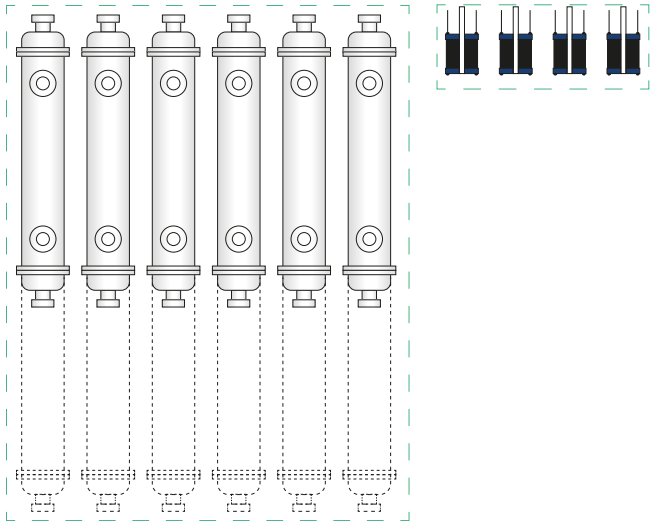
Low purchase and operating costs:
Superior efficiency lets smaller, less expensive units do the work of more costly alternatives, saving money at purchase. And we reduce operating costs through years of reliable service.

Space-saving single-pass design, with many advantages over shell-and-tube construction*

***POLARIS PHEs vs. Shell-and-Tube Exchangers**

All these advantages give POLARIS plate heat exchangers the edge over shell-and-tube units.

- Compact, efficient PHEs accomplish the same work in far less space than shell-and-tube models
- Close temperature approach maximizes temperature differential, minimizes surface requirements
- Advanced POLARIS gasket design virtually eliminates cross-contamination
- POLARIS PHEs' low hold-up volume cuts response times, gives better process control
- Versatility, expandability and easy maintenance are built into every POLARIS unit



HVAC APPLICATIONS FOR POLARIS PLATE HEAT EXCHANGERS

- **Free Cooling (waterside economizer) –** utilize a valuable energy-saving resource
- **Pressure Interceptor –** control static head pressure in tall buildings
- **Water-source Heat Pumps –** boost efficiency and improve cleanability in these HVAC units
- **Thermal Storage –** schedule in low-electrical-demand hours for operating savings
- **Cooling Tower Isolation –** isolate contaminated cooling water to avoid equipment damage
- **Geothermal Heating –** protect systems from dirty, corrosive geothermal water
- **District Heating/Cooling –** for superior performance in district systems

VALUE THROUGHOUT THE ENTIRE PROJECT

Product selection

Installation and commissioning

Optimized for your application

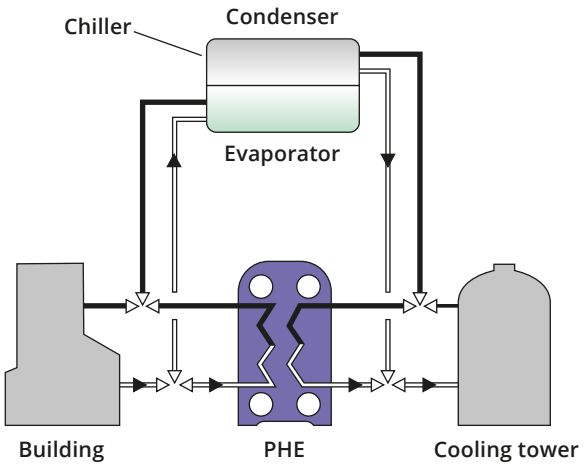
Product lifetime

After-sales service

POLARIS is with you every step of the way—from selecting the right product for you, to after-sales service.

Free cooling

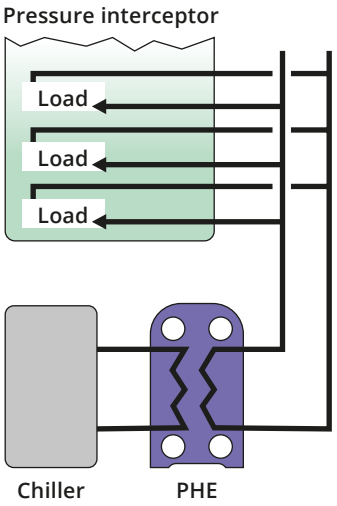
Building management often requires year-round cooling to handle heat from computers, lights and other building sources. POLARIS Plate Heat Exchangers employ the free cooling (or waterside economizer) concept to reduce hours of mechanical chiller operation. Taking advantage of ambient temperatures, tower flow can be diverted to the POLARIS PHE with the chiller turned off, achieving significant electric usage savings.



IN TYPICAL FREE COOLING INSTALLATIONS, RETROFIT IS EASY. SYSTEMS DON'T REQUIRE THE EXTRA DUCTWORK NEEDED WITH AIR-SIDE ECONOMIZERS AND THE PAYBACK PERIOD CAN BE VERY SHORT. CHILLER BYPASS EXTENDS CHILLER LIFE, AND POLARIS PHEs' CLOSE APPROACH TEMPERATURES ALLOW MORE ENERGY SAVINGS THAN IS POSSIBLE WITH OTHER TYPES.

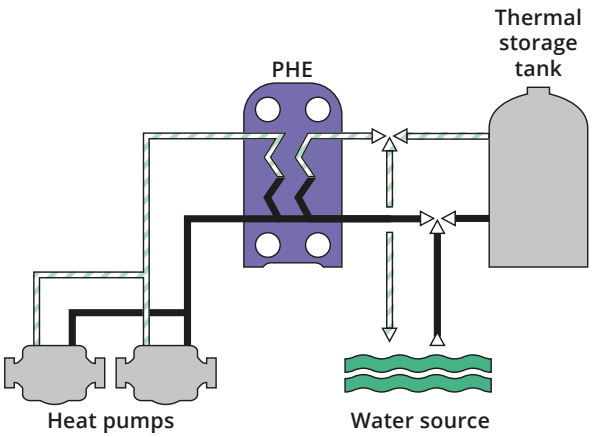
Pressure interceptor

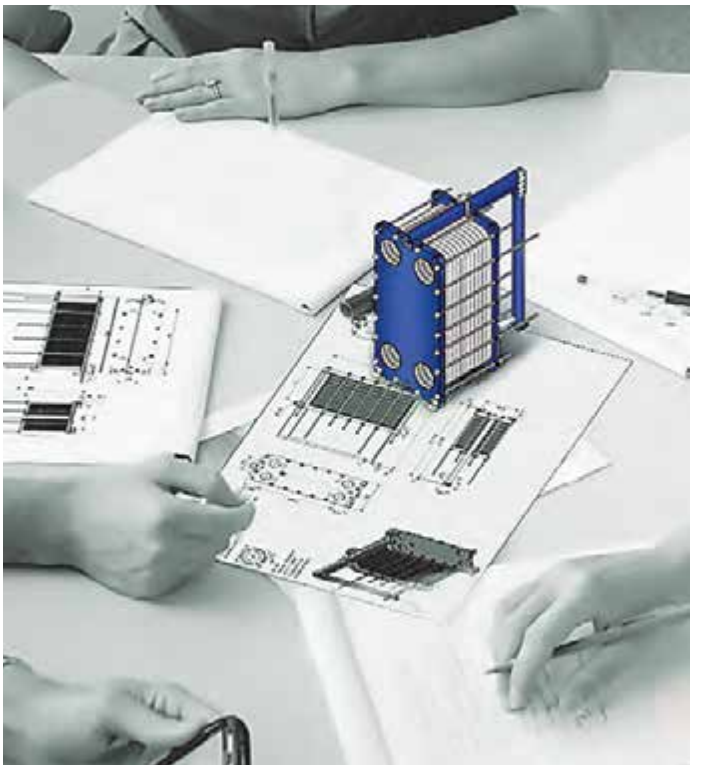
In tall buildings, static head pressure can be a problem. Pressure interceptor systems provide static head isolation. Where separate loops or zones at terminal units are employed, install a POLARIS PHE to isolate chillers or boilers from high system pressure. Pressure interceptor arrangements enable the use of considerably less expensive low-pressure pumps, valves, fittings and other components.



Water-source heat pumps

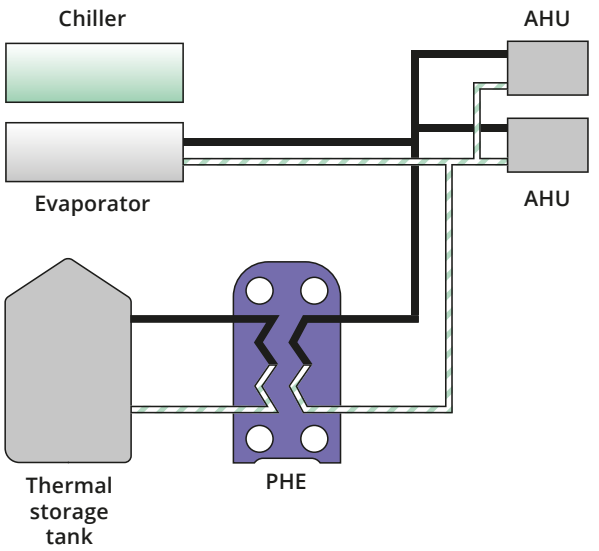
It's important to protect today's high-efficiency heat pumps from contaminants in water sources. By employing a water-source loop instead of outside air, POLARIS PHEs can improve sanitation and system efficiency. Open cooling towers served by plate heat exchangers replace less efficient, more costly closed-circuit coolers. And where the system employs well, ocean, lake or river water, the PHE isolates the system from possible contamination.





Thermal storage

Thermal storage systems save energy and money by operating refrigeration equipment during low-demand hours, chilling liquid or making ice in thermal storage tanks to provide cooling during peak demand periods. Building POLARIS PHEs into thermal storage systems makes it possible to keep storage water safely separate and increase system efficiency.



Cooling tower isolation

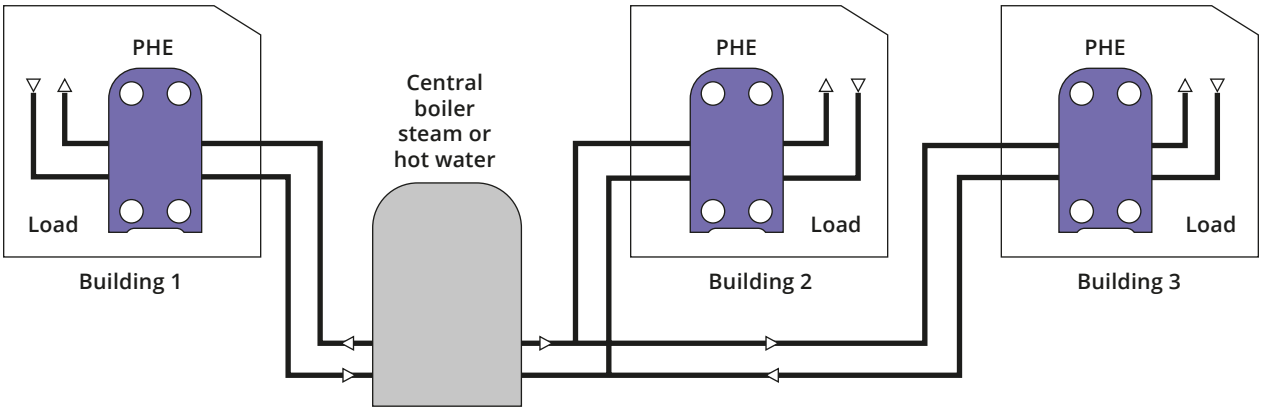
Cooling tower water is often contaminated with solids and atmospheric debris. Foul water pumped through expensive chillers or heat pumps may damage them. Using POLARIS PHEs to achieve cooling tower isolation can limit costly maintenance and avoid component replacement. With close approach temperatures and easy maintenance, our heat exchangers are ideal for this application, providing a reliable, effective way to secure the integrity of cooling water loops.

Geothermal heating

While geothermal energy sources can save money, the water containing the heat is usually dirty and corrosive. Low fouling tendencies make POLARIS PHEs (with properly specified plate material) the ideal equipment for isolating geothermal water from the building loop.

District cooling and heating

POLARIS plate heat exchangers are often used with low-pressure steam, hot water, or chilled water in district systems. Hot or cold water is sent through insulated pipes to buildings served by the system. PHEs in the buildings serve as instantaneous heaters or coolers, also providing building loop isolation and constant pressure drop to the central plant.



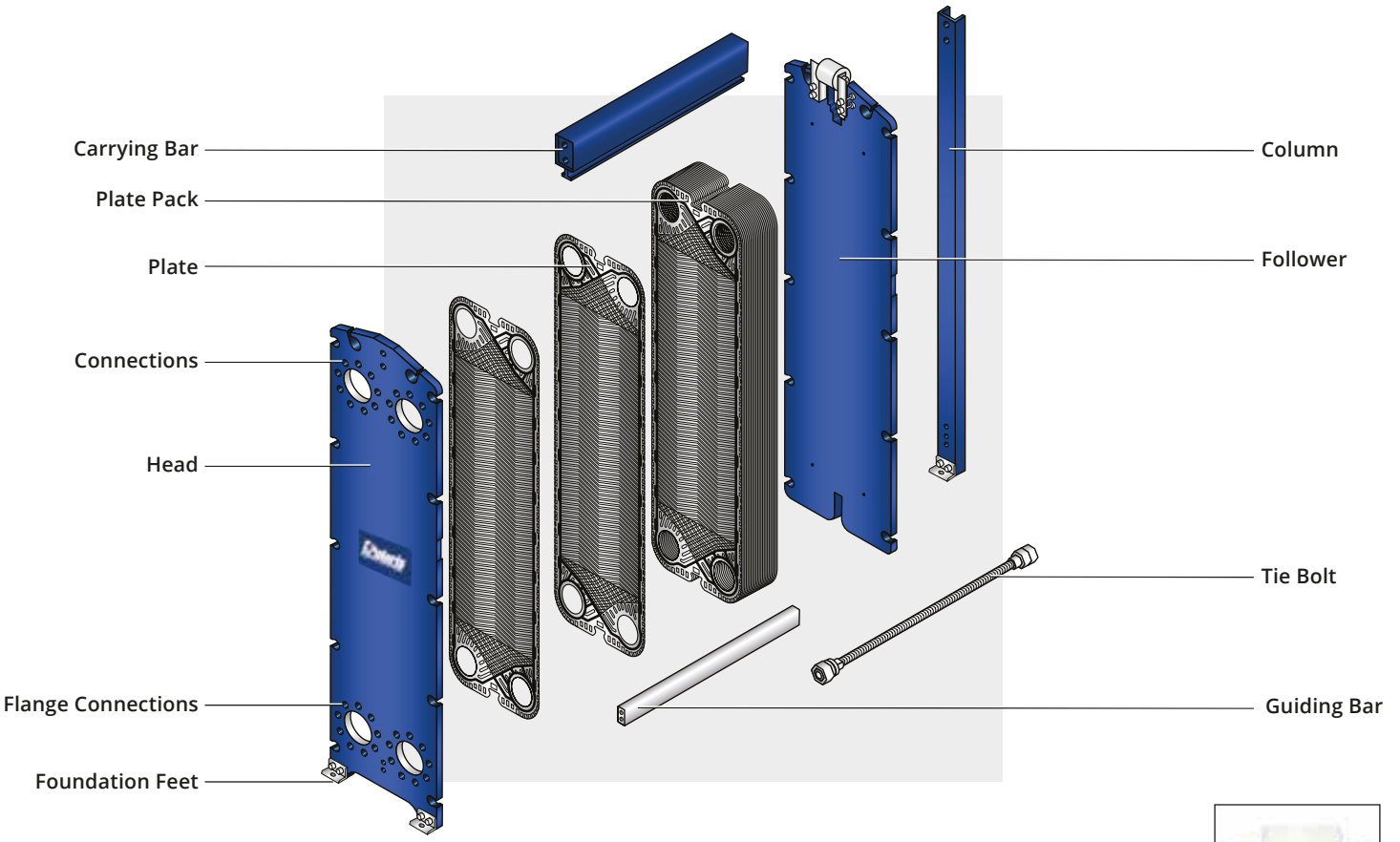
Waste heat recovery from boiler blowdown and condensate

Boiler blowdown, a major source of waste heat recovery facilitated with plate heat exchangers, makes many systems more economical. Increase your savings by using POLARIS PHEs to preheat incoming boiler feed water. Returning condensate in these waste heat recovery systems is cooled so it won't flash when drained to atmospheric pressure.

Waste heat recovery from condenser water

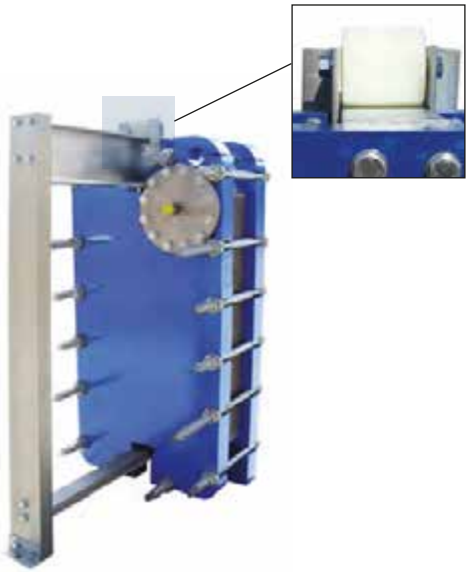
Depending on process and ambient conditions, water return from a chiller condenser to a cooling tower may be a source hot enough to preheat water. Installing a POLARIS plate heat exchanger on the line is an excellent way to recover waste heat from condenser water. Many users take advantage of this method to inexpensively heat swimming pools.

Anatomy of a plate heat exchanger



FRAME

A strong, rigid, durable frame is the foundation of any plate heat exchanger. POLARIS frames are designed according to prevailing national codes. They meet ASME Sec. VIII, Div. 1 construction standards, and are also designed to streamline assembly, service and maintenance.



FOLLOWER

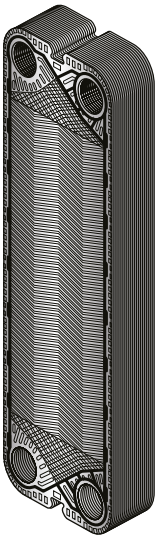
A large roller makes it easy to slide the follower back and forth, so it's easy to open and close a POLARIS PHE for service and maintenance. Optional inspection holes allow convenient examination of the plate pack interior—useful when media contain pulp or fiber, which can cause clogging.

HEAD

Standard POLARIS PHEs are single-pass units with all connections on the head. This configuration simplifies service and maintenance—no need to dismantle the pipe work to access the interior. The head and the column can be equipped with strong foundation feet that make it easy to secure the heat exchanger. This design also makes future plate pack expansion much easier.

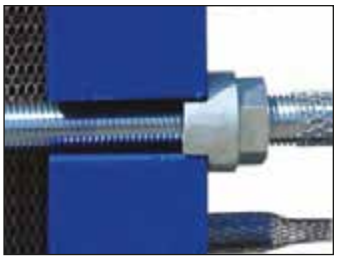
PLATE PACK

The heart of each POLARIS PHE is the plate pack, where heat transfer takes place. The pack is formed by plates featuring state-of-the-art plate pattern design. Each plate is fitted with a high-quality gasket to seal the heat exchanger, guide the flow, and align the plate. Combining POLARIS plate types and patterns delivers best PHE efficiency for the thermal requirement of the application.



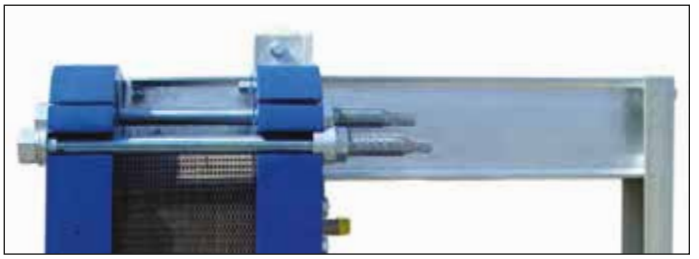
CONNECTIONS

Connections in POLARIS gasketed PHEs range from 1" to 26". Threaded pipes and flange connections designed according to all applicable standards eliminate the need for reducers in the piping system. To guard against corrosion, flange connections may be lined with rubber or clad in the same material the plates are made from, such as AISI 316 or titanium.



TIE BOLTS

To cut labor effort and assembly time, tie bolts are made to be tightened from the head side of the heat exchanger. This simplifies opening, closing, and tightening the heat exchanger.



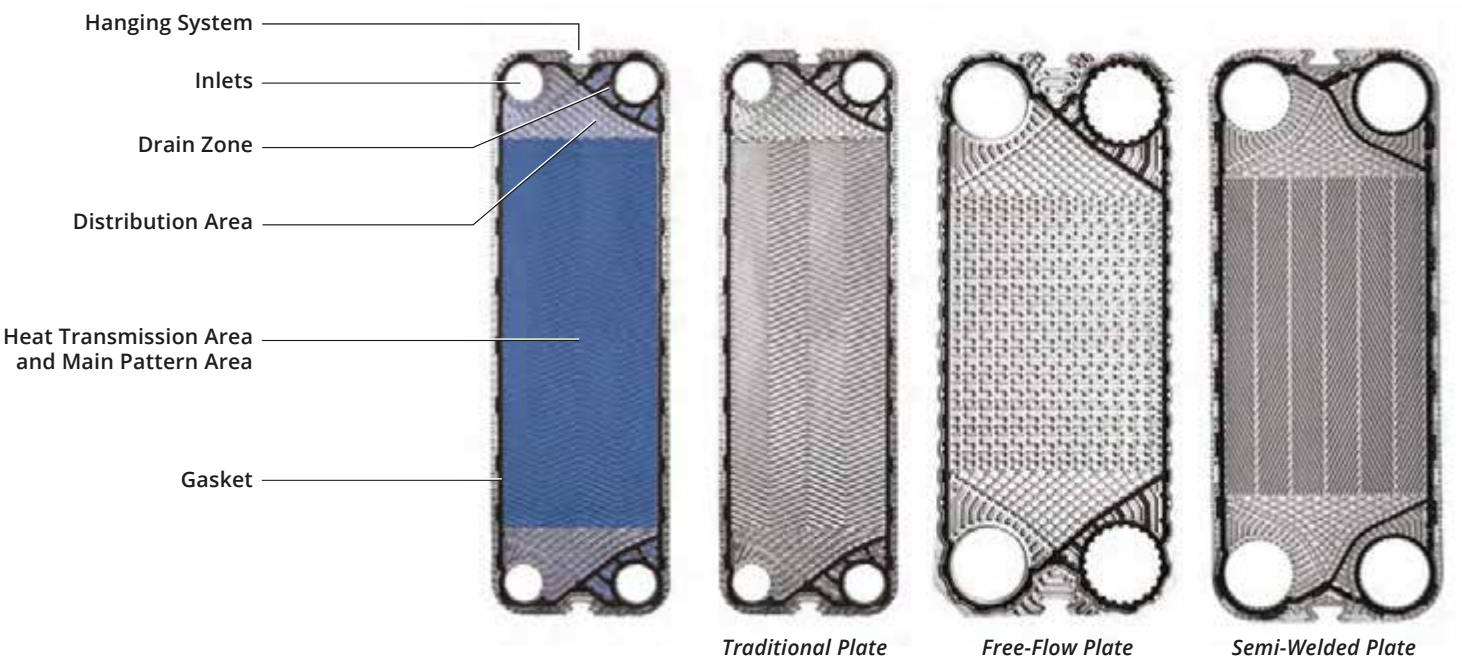
CARRYING BARS

Strong and durable, our carrying bars prevent distortion or slumping from the weight of the plate pack through years of operation. Plates slide easily along the bar, which is long enough to make room to clean the plates without removing them from the frame. Also, the carrying bar on our frames enables extraction of one plate while leaving the others in place.

GUIDING BARS

POLARIS' properly designed guiding bar helps prevent misalignment of the plate pack, properly supporting plates during assembly and when the PHE is opened for service. It's strong enough to withstand the side load of powerful tightening forces exerted when the heat exchanger is assembled.

Plates



The variety of our plates is key to our ability to deliver in so many HVAC applications. The many pressing depths and angles of our plates enable POLARIS PHEs to supply optimum solutions wherever they're installed.

Most plates are made of AISI 304/316 or titanium, but can also be made from other pressable materials, depending on media and temperatures. Plates form the plate pack, which is held firmly between the head and the follower of the frame. Corrugated patterns ensure turbulent flow in the entire heat transmission area, helping eliminate "dead zones."

HEAT TRANSMISSION AREA

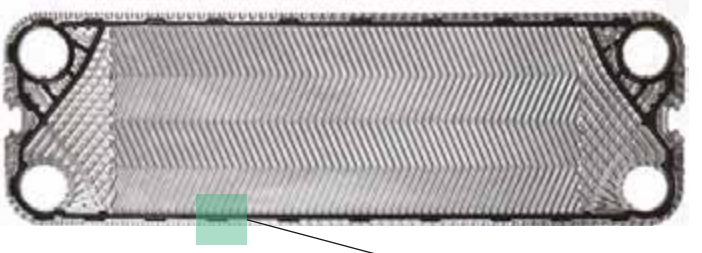
Our many years of experience in thermal design and plate pressing techniques is our greatest strength. Designs based on this knowledge maximize the heat transmission area of each plate, and improve the thermal efficiency of the entire pack. Our process knowledge enables us to develop heat transmission areas that perfectly match your requirements, delivering a plate size optimized for maximum efficiency.

DISTRIBUTION AREA

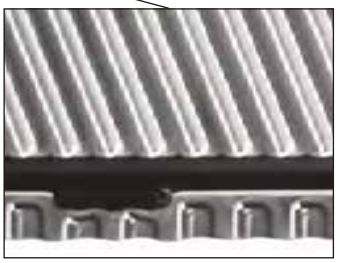
The distribution area on POLARIS plates features angled guiding channels that ensure an even distribution of the media across the entire plate, preventing "dead zones." Pressure drop in the distribution area is minimal. It's used in the heat transmission area instead, for better heat transmission.

HANGING SYSTEM

In our unique, reinforced hanging system, plates are securely suspended from the carrying bar and perfectly aligned by the guiding bar. In heat exchangers made without reinforced hanging systems, plate corners can collapse, causing leaks and plate replacement. Our system extends the lifetime of the plates and reduces service intervals.



EDGE REINFORCEMENT



POLARIS plates feature reinforced edges that strengthen the gasket groove and provide optimal support. The reinforcement is made by pressing the plates on both sides of the gasket groove, fixing the gasket securely in place and providing a solid foundation for adjacent plates.

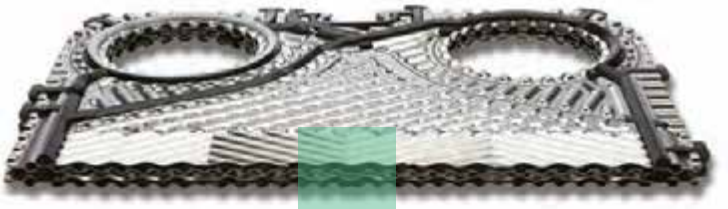
MAIN PLATE PATTERN

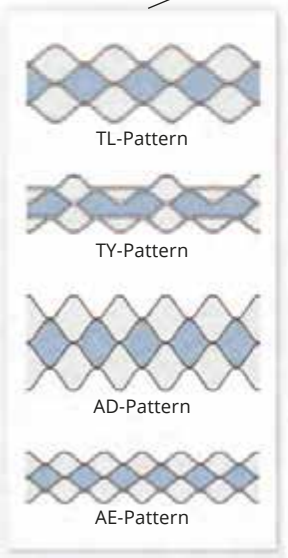
Pattern Properties
Each pattern is developed to handle specific duties and meet individual requirements. Allowed pressure drop for media in the heat exchanger correlates with the size of the unit. The size needed for the heat transmission area can be reduced if greater pressure drop is used, making it important to use the allowed pressure drop to the fullest.

Some patterns produce a lower level of heat transfer in exchange for a lower pressure drop, while other patterns offer higher heat transfer with a corresponding higher pressure drop. Patterns with very deep channels are suitable for high-viscosity media and those that cause fouling. Some patterns combine multiple channel depths in a single plate to handle the flow rate and thermal requirements for different media in a single heat exchanger.

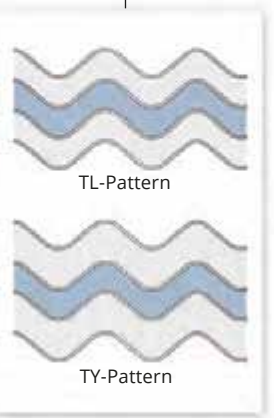
With a large variety of patterns for each plate size and an extensive plate range, POLARIS provides the best possible technical solution for your specific application.

Pattern Development and Innovation
Our plates feature state-of-the-art plate pattern design and are manufactured with the latest pressing technology. Our many years of experience with pressing tool design also allows for more uniform plate geometry.

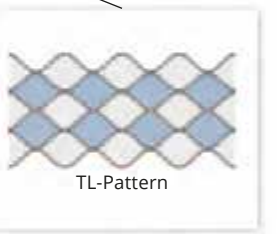




Traditional Plate Heat Exchangers



Free-Flow Plate Heat Exchangers

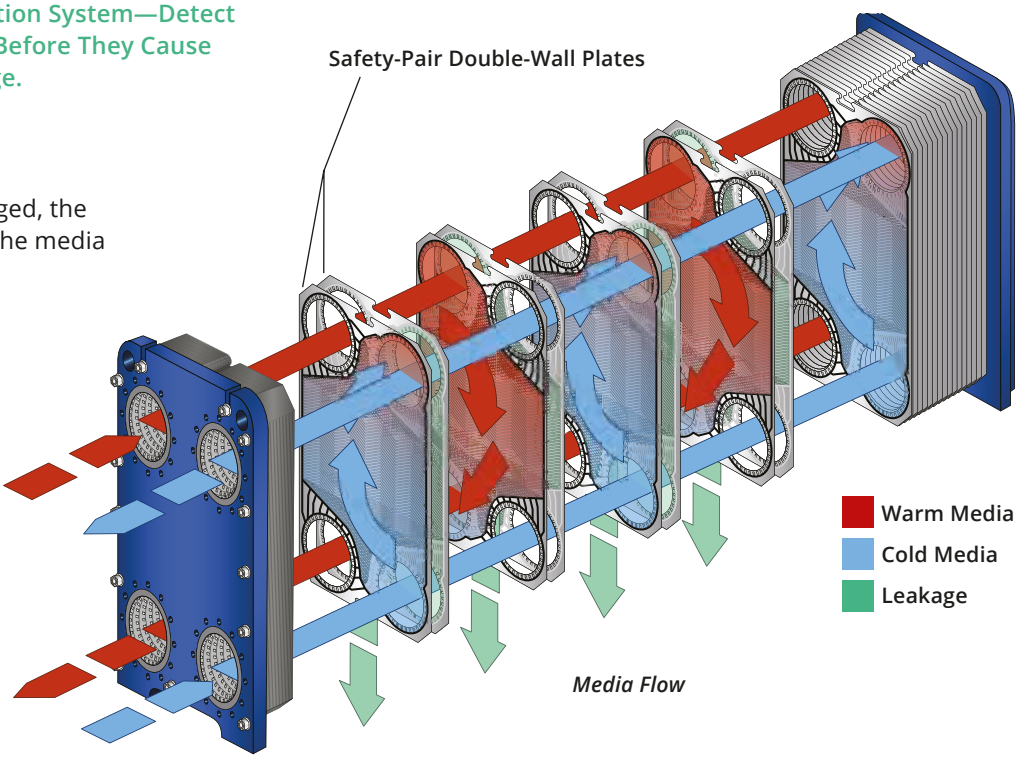


Semi-Welded Plate Heat Exchangers

Polaris Safety-Pair Double-Wall Plates

Ultimate Safety in a Leakage Protection System—Detect Leaks Before They Cause Damage.

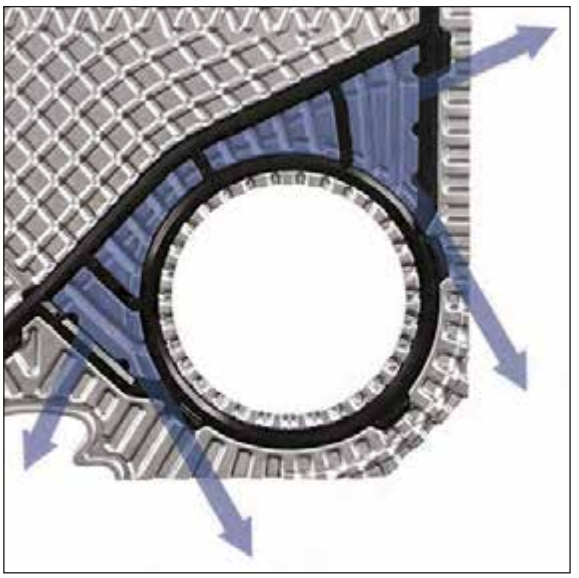
POLARIS Safety-Pair Double-Wall Plates are the ultimate safety measure for PHEs. Even in the unlikely event plates are damaged, the system eliminates the risk of mixing the media used in the heat exchanger. This is especially important for domestic water systems, where mixing of media could cause health hazards.



LEAKAGE DETECTION

The "double plate" system makes any leakage visible from outside the PHE. Leaks caused by corrosion damage or plate cracks enable maintenance personnel to quickly identify malfunctioning plates, and the heat exchanger can be taken out of service for repair.

Because any leaks are external instead of internal, the media will never combine. This makes Safety-Pair Double-Wall Plates the ideal solution when the heat exchangers utilize media that must not be allowed to mix.

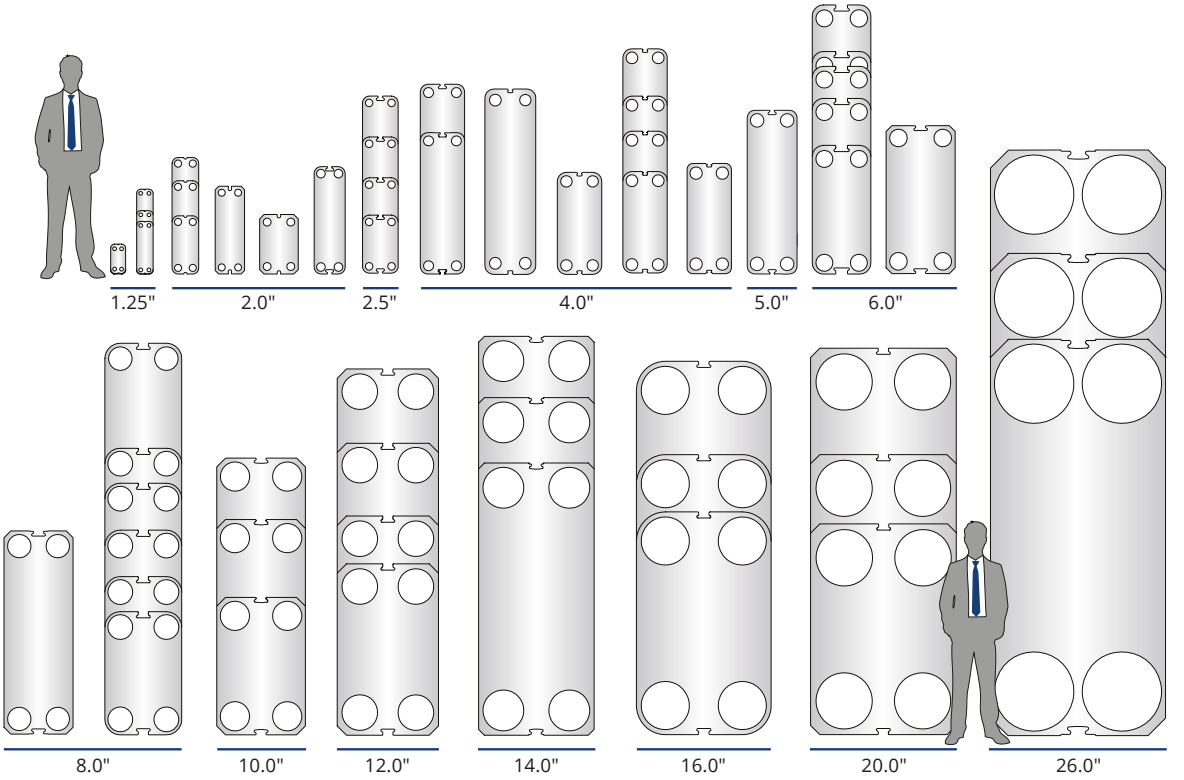


POLARIS plate drain zone.

POLARIS Safety-Pair Double-Wall Plate. The "double plate" inlets are welded together.

Plate range that covers all requirements

PLATES IN ALL SIZES



POLARIS offers the largest selection of traditional plate heat exchangers in the world. We have specialized in developing plate heat exchangers in close cooperation with our customers. We can perfectly match your individual requirements because we understand the process behind your applications.

Using the right plate for each individual application is very important, as it greatly impacts the efficiency of the entire installation. Several aspects define which plate is right, such as the plate pattern, plate and connection sizes, and plate material.

PLATES IN ALL SIZES

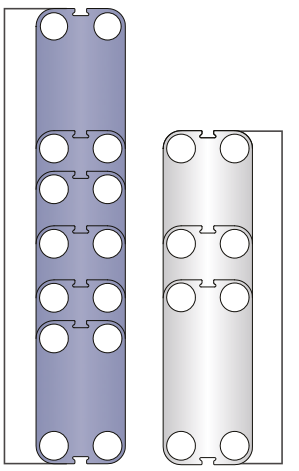
We feature plates with lengths up to 16 feet and a large number of different patterns for each heat exchanger type. It is important to match the length of the plates and the type of pattern to the individual thermal duty—some installations might require short plates, while others require long plates.

COVERING MOST REQUIREMENTS

We cover most requirements up to 32,000 gpm in a single-pass solution. It is beneficial to reduce the number of passes in a plate heat exchanger to a single pass, as it improves the efficiency of the heat transfer, and reduces the footprint of the heat exchanger. However, in order to do this, it is necessary to use plates and connections that match the size defined by the thermal requirements.

OPTIMAL SOLUTIONS

Our extensive plate selection ensures that we can provide the perfect plate and connection size for any requirements. Whether the application is large or small, the many sizes we manufacture enable us to meet the need in a wide variety of applications.



POLARIS Plate Range

Competitors' Plate Range

We cover all thermal requirements with plates of all sizes—including plates that lie outside the commonly manufactured plate sizes—to ensure that we can perfectly match any thermal requirements.

Gaskets

IN-HOUSE GASKET PRODUCTION

The gasket is an essential part of any plate heat exchanger. Only high-quality gaskets that fit the plate perfectly and seal tight can maximize the performance—and service life—of the units.

POLARIS gaskets are designed and developed according to the latest standards in rubber formulation and gasket design. We provide gaskets that meet all thermal requirements and are ideally suited to the media used in each heat exchanger.

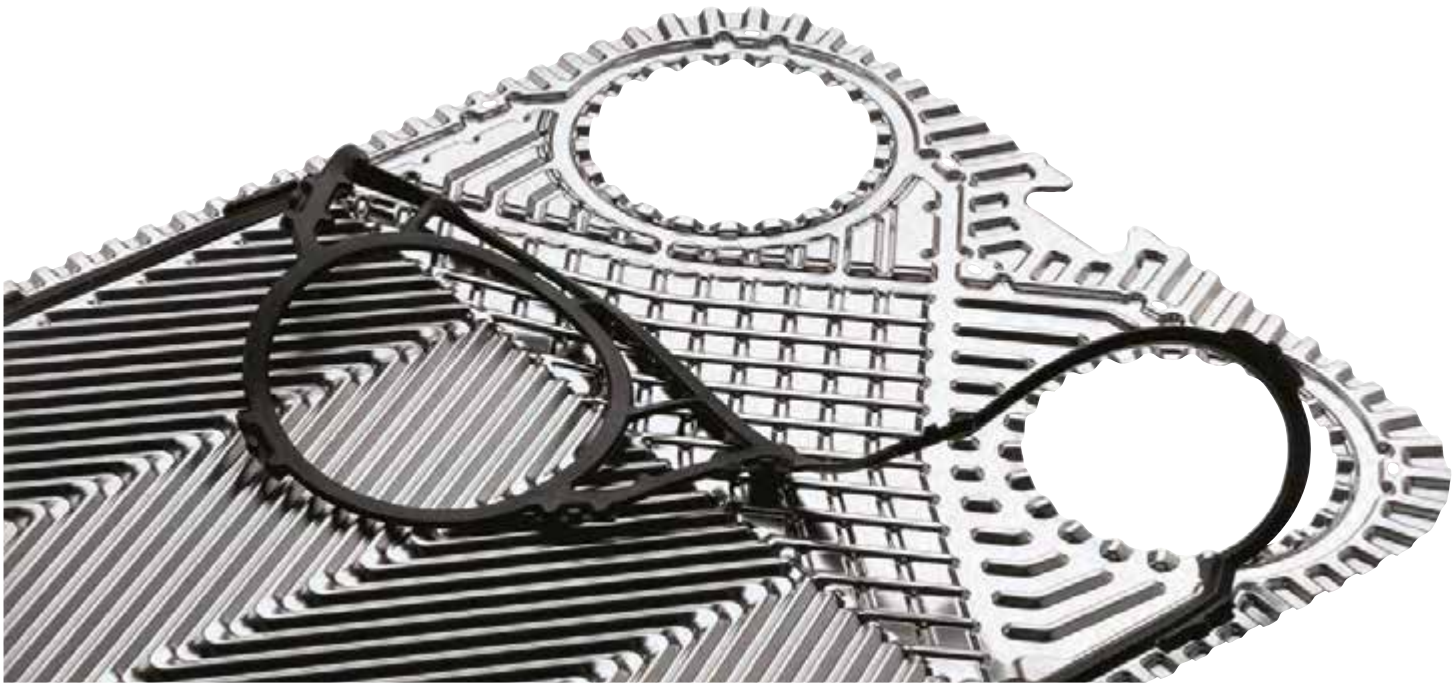
The result: superior performance thanks to perfect interaction between plate and gasket.

Our own in-house production and testing facilities ensure the uncompromising quality of our gaskets.

MATERIALS

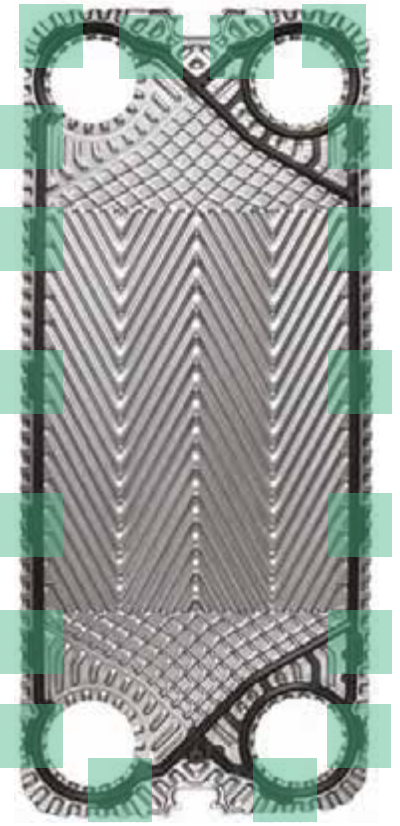
Gasket quality is a function of its design and materials. Composition of the rubber compound not only determines the gasket's lifetime and ability to maintain elasticity, but also its areas of application. Some gaskets are better suited for aggressive or foul media than others, so it is important to choose the right gasket for the right duty.

The unique design and low compression of POLARIS gaskets mean long service life. To meet all possible service needs, we use nitrile, EPDM, Viton, chloroprene, Hypalon, and butyl.



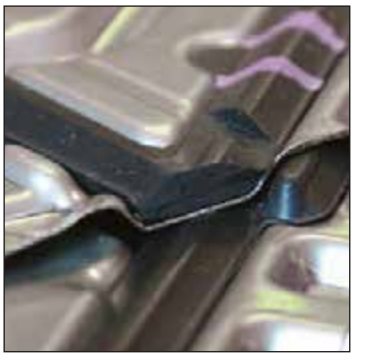
POLARIS PRES-TITE SYSTEM

POLARIS gasketed plate heat exchangers are fitted with the POLARIS Pres-Tite System, which “locks” the plates together and perfectly aligns the plate packs. Strong rubber buttons on the gaskets fit perfectly into the back of the adjacent plates for correct alignment.



POLARIS Pres-Tite rubber buttons are evenly spread out across the gasket, ensuring easy assembly and maintenance.

POLARIS Pres-Tite rubber button.



Buttons lock the plates together.

Service and Maintenance

We can help you avoid problems before they arise with a customized program, ranging from full maintenance support to an emergency service call. We will work out the most suitable schedule with you to carry out performance diagnostics, plate cleaning and inspections, fault checking with quick replacements, and repairs as required.

Our service department offers repairs, upgrades, and on-site cleaning of your plate heat exchanger installations of all brands.

POLARIS also works with independent, certified regional and national service companies who provide rapid response to your service needs. Skilled technicians will swiftly dismantle your heat exchangers and expertly clean each plate using economical, environmentally friendly methods.

If your plate heat exchanger is dirty or underperforming, our repair services will restore your installation to proper working order. We replace defective or worn gaskets, as well as damaged or leaking plates, with originals or high-quality replacements that perfectly match the specifications of your installation.

We will quickly have your installation up and running at full capacity again. Whatever your needs, dedicated service teams are standing by to help.

Technical specifications

Frame
Painted frame, blue RAL 5010. (Also available in other colors.) The frame is equipped with tie bolts placed around its edge.

Design Pressure
150/250/300/400 PSI. Other design pressures are available on request.

Design Temperature
-4 °F to 350 °F. Other design temperatures are available on request.

Connections
From 1" up to 26" flanges in carbon steel, rubber lined, or clad with AISI 316 or titanium.

Plate Material
AISI 304/316 stainless steel, titanium, Hastelloy, SMO-254. Other materials are available on request.

Gasket Materials
NBR, EPDM and Viton are standard. Other materials are available on request.

Performance Certificates
AHRI (LLHE-400)

Construction Standard
ASME Sec. VIII, Div. 1 / CRN

Classification Societies
ABS / BV / CCS DNV-GL / LRS / NKK RINA / RMRS / CR CSC BPV

Extra Equipment
OSHA-compliant safety shroud standard on all units. Modular removable insulated jacket, optional. Instrument flange, optional. Inline port strainer, optional. Drip tray, optional.

100% customized solutions that provide reliable, unmatched heat transfer

Polaris
PLATE HEAT EXCHANGERS

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