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ENGINEERING  
TOMORROW

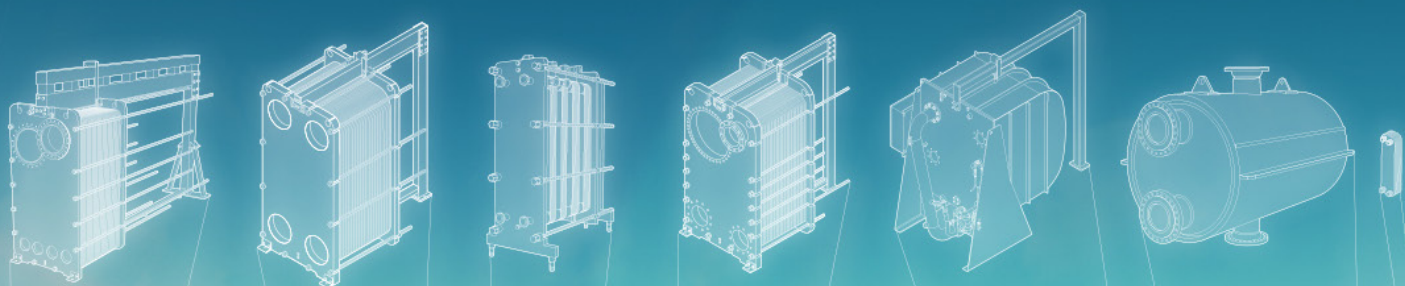
*Danfoss*

Heat exchangers

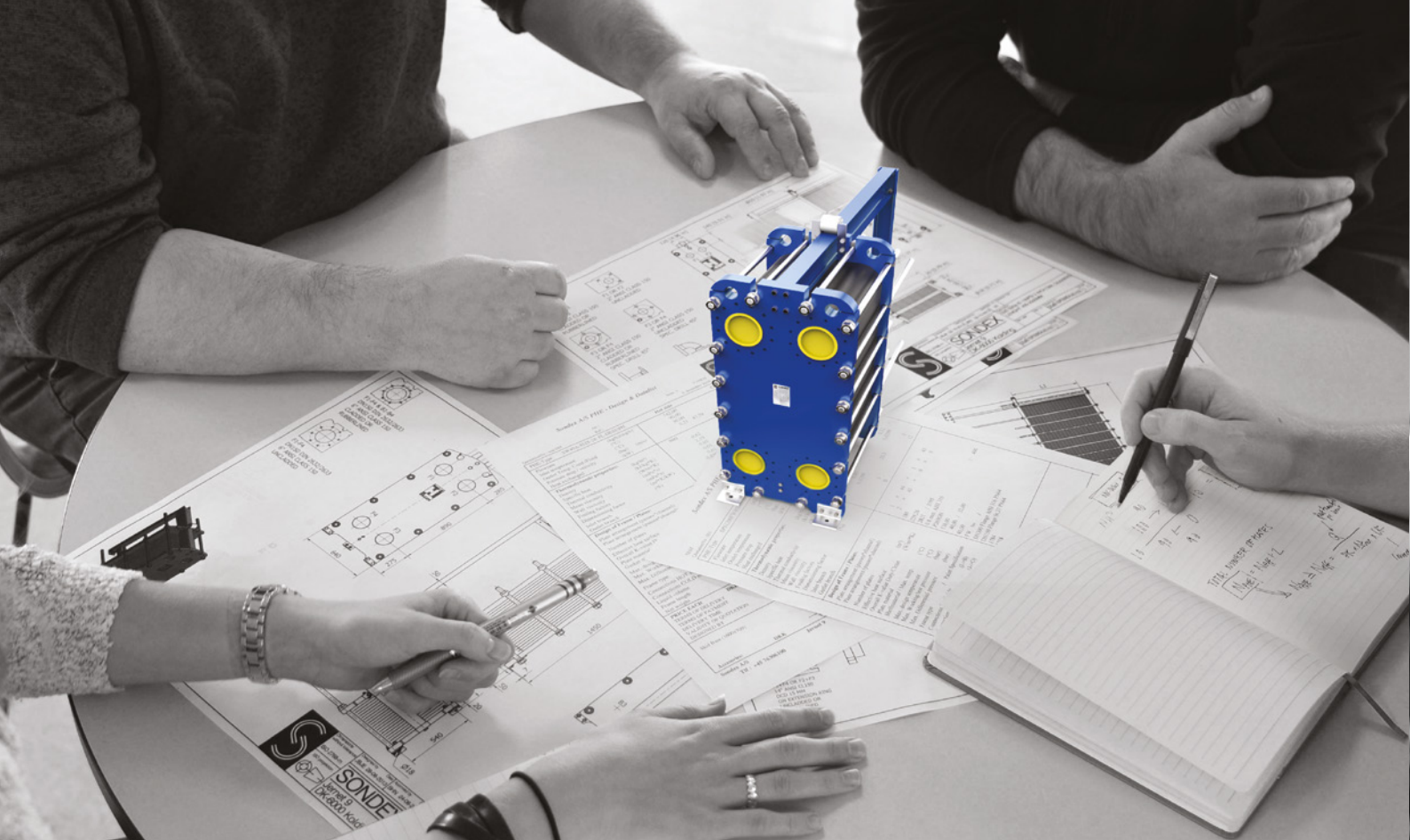
# A world of heat exchangers

Optimized heat transfer solutions  
for every application

Gasketed, welded, brazed heat exchangers, and freshwater distillers



**SONDEX**®



## Heat transfer solutions that **match your requirements**

**Next-generation SONDEX® heat exchangers from Danfoss are designed with a single purpose in mind - to create optimal heat transfer.**

Developing optimized solutions is a core value of our design philosophy and we have used our deep process knowledge and input from customers to create a second-to-none plate portfolio.

Our many plate varieties ensure that we can better configure our heat exchangers to match the exact requirements of your application and deliver a powerful solution that provides reliable, unmatched heat transfer while lowering the energy consumption of your connected systems.

We are always in direct contact with you to ensure that each heat exchanger is designed around your application and your media.

### **Closed-loop production**

We are specialized in the development and manufacture of heat exchangers. We do all our own tooling and have our own hydraulic presses in-house. This closed-loop production makes it easier to control and monitor the quality.

### **Efficiency is key**

The secret ingredient to an efficient installation is how closely your heat exchanger matches the thermal requirements of the duty.

If the heat exchanger is oversized, you will have paid too much for it. If it is undersized, you will either need additional heat exchangers, or you will have to add extra (expensive, non-regenerative) energy elsewhere in the process to reach the desired media temperatures.

## Value throughout the entire project



**Product  
selection**

**Installation and  
commissioning**

**Optimized for  
your application**

**Product  
lifetime**

**After-sales  
service**

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

Get in touch **today** and let us help you **lower your expenses** and **increase the performance** of your entire system

## Traditional plate heat exchangers

Our SONDEX® traditional plate heat exchangers are the ideal choice for a wide range of applications across numerous market segments. We have one of the largest plate portfolios in the world, and we configure each heat exchanger to meet your requirements. Innovative technologies and smart design make our traditional plate heat exchangers a stellar investment.

### Features and benefits

- Experience the benefit of a heat transfer solution that perfectly matches your requirements and lowers your energy consumption.
- High performance and a low pressure drop eliminate unnecessary burdens on your system and optimize overall system performance.
- The design results in a compact solution with a small footprint, simple installation, and easy access for maintenance.

### Common applications

- Marine applications, such as central and lubrication oil cooling.
- District cooling solutions using seawater and groundwater as a cooling source.
- District heating solutions using, for example, solar and geothermal energy as heating source.
- Food and dairy applications, including pasteurization, heat recovery, and duties that require gentle treatment.
- Chemical applications, for example waste heat recovery from condenser water.



S188

# Free Flow plate heat exchangers

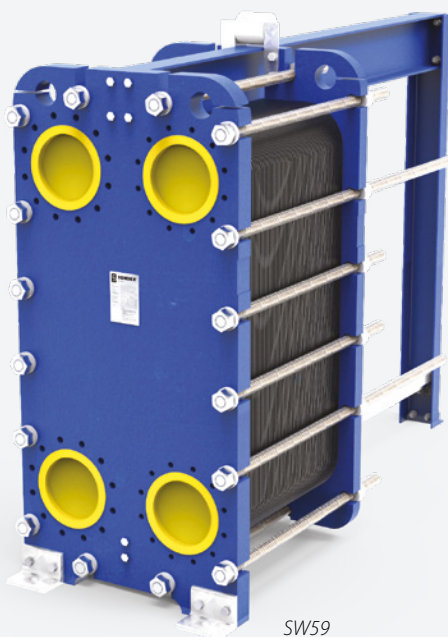
Our SONDEX® Free Flow plate heat exchangers are excellent choices for applications that use media with particle-rich contents, fouling tendency, or high viscosity. Each Free Flow heat exchanger is configured to suit your application and media type, with contact-free plate channels for an unimpeded flow and long intervals between cleaning.

## Features and benefits

- Gentle treatment and even distribution of the media provide the highest possible product output quality.
- High heat transfer efficiency and extended intervals between cleaning ensure operation for an entire campaign with minimum downtime and maximum value for money.
- Large plate gap designed to counteract fouling with sizeable plate channels and no stagnant zones.

## Common applications

- Sugar processing.
- Grain-based ethanol production.
- Cooling/heating of fibrous material, for example juice containing pulp.
- Heat recovery from industrial applications containing impurities like waste water or cellulose, for example.
- Heat recovery from fibrous waste streams in pulp and paper processing.



# Semi-welded plate heat exchangers

Our SONDEX® semi-welded plate heat exchangers are the prime choice for challenging applications that involve aggressive media or high pressure. We configure each heat exchanger according to your specifications and offer durable solutions designed to withstand extreme conditions and minimize the risks of operating with chemicals or refrigerants.

## Features and benefits

- High efficiency means that fewer plates are needed for high performance and consequently lowers the hold-up volume. Fewer plates also lowers the cost of each heat exchanger, as an added bonus.
- Engineered to use smaller amounts of potentially hazardous media, the SONDEX® semi-welded range is a safe and responsible choice for demanding duties.

- Unique gasket system intended for high working pressures and vacuum applications. A closed gasket groove keeps the gasket firmly in place and prevents misalignment of the plate pack during assembly and operation.

## Common applications

- Industrial refrigeration, including duties that use ammonia as a refrigerant.
- Evaporation and condensing duties.
- High pressure liquid/liquid applications.
- Chemical processing, for instance rich/lean amine treatment.

# Evaporators

Our SONDEX® evaporators are designed to handle advanced evaporation duties. Using semi-welded plate cassettes, the media are guaranteed to never mix. The plate cassettes are designed to ensure the optimal level of turbulence on both sides while providing an even distribution of the media for superior performance and product quality.

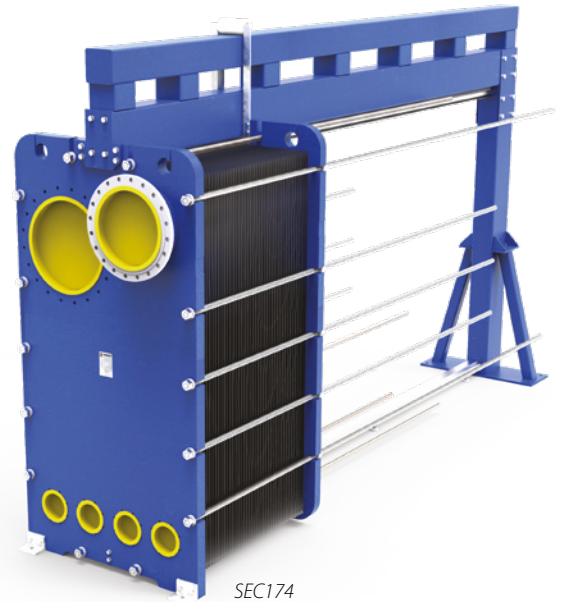
## Features and benefits

- Special plate design featuring an extra-large inlet connection for steam. Steam consumption can be reduced when operating with multi-stage evaporators, as the product vapor will serve as the heating media.
- Flexible design that makes it easy to increase capacity by adding additional cassettes or decrease it to save energy. Low residence time leads to perfect evaporation conditions and superior product quality.

- High performance, even with low temperature differences between the media, which is especially great for mechanical vapor recompression (MVR) and thermal vapor recompression (TVR).

## Common applications

- Food production, for example juice and alcohol processing.
- Sugar production, for example concentration of sugar content in sugarcane juice.
- Biogas production.
- Pulp and paper industry.
- Chemical industry.



# Condensers

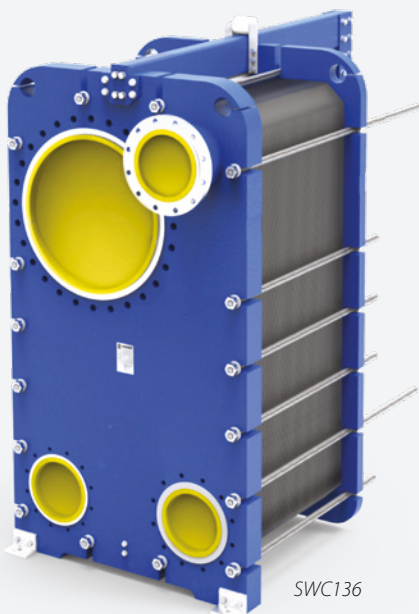
Our SONDEX® condensers are the perfect choice for special applications that regular plate heat exchangers cannot handle. Designed to accommodate high-volume vapor flows, this product features a large inlet for the vapor stream. This, combined with a short residence time creates the optimal condensation conditions – even for low-pressure vapor duties.

## Features and benefits

- Designed specifically for demanding condensation duties that benefit from a special asymmetric plate design that is unavailable for regular heat exchangers.
- Experience the high thermal efficiency of our SONDEX® heat exchangers and enjoy peace of mind with an ideal turbulent flow that reduces the risk of fouling.
- Special Multi-gap plate design that can lower the energy consumption considerably for condensation duties that differ in flow volume.

## Common applications

- Vapor condensation of fruit juice, for example, and pasteurization and cooling of soft drinks.
- Vacuum condensation duties, for example in sugar refineries.
- Biogas production.
- Pulp and paper industry.
- Chemical and petrochemical industries.



Closed-loop production. In-house **tooling** and **hydraulic presses** for increased **quality control**



## Sanitary plate heat exchangers

Our SONDEX® sanitary plate heat exchangers are made for applications with strict hygienic requirements and use FDA compliant materials. We care greatly about your end product and take the necessary steps to ensure the highest output quality. Each solution is designed based on your specifications to provide the perfect conditions for your product.

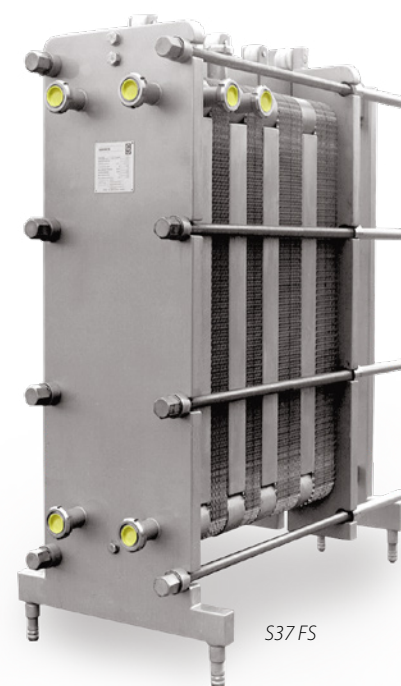
### Features and benefits

- Heat exchanger solutions that adhere to the strict hygienic demands of the industries and complies with FDA material standards.
- Plate technology made to provide the highest output product quality. We ensure gentle media treatment during processing with precise flow control, perfect temperature profiles, and the optimal residence time for all applications.

- Cladded or stainless steel frames designed to be easily accessible for quick and trouble-free inspection, maintenance, or cleaning – including cleaning in place (CIP).
- Get huge savings on your power consumption with our regenerative pasteurizers that can recycle up to 95% of the energy.

### Common applications

- Dairy/food/beverage industry  
- e.g. regenerative pasteurization applications
- Industries with sanitary requirements



Our extensive **plate portfolio** allows us to **match the requirements** of your application for the **optimal heat transfer** solution

## Plate and shell heat exchangers

Our SONDEX® plate and shell heat exchangers (SPS) are perfect choices for condensation and steam heating duties. A fully welded plate pack makes the heat exchangers well-suited for handling aggressive media as well as high pressure levels and temperatures. Less space demanding and much lighter in weight, they are good replacements for shell and tube heat exchangers.

### Features and benefits?

- Very adaptable heat exchanger. An excellent choice for handling condensation duties, especially duties without condensate sub-cooling. They are also perfect steam heaters of clean fluids, demineralized water, and clean thermal oils.
- The heat exchanger is designed to be highly resistant to thermal shocks as well as thermal and pressure fatigue making it very well-suited for cyclic duties and other duties with sudden, large fluctuations in temperature.

- Available in both bolted and fully welded designs. The fully welded types can handle higher temperatures and pressure levels than the bolted types, but cannot be opened for cleaning. This can instead be done with CIP (Cleaning in Place) systems.

### Common applications

- HVAC industry
- Marine/offshore industry
- Dairy/food/beverage industry
- Sugar industry
- Biogas industry
- Refrigeration industry
- Pulp and paper industry
- Heavy industry
- Mining industry
- Petrochemical industry
- Chemical industry
- Condensation
- Steam heating
- Oil coolers
- Gas heaters/coolers



SPS1200



# SondBlock heat exchangers

Our SONDEX® SondBlock heat exchangers are compact and durable solutions for challenging applications that involve aggressive media, extreme temperatures, and/or high pressure. As SondBlock heat exchangers have no exposed gaskets, they can replace shell and tube heat exchangers and cover the same duties, yet offer numerous advantages in terms of cost, size, and performance.

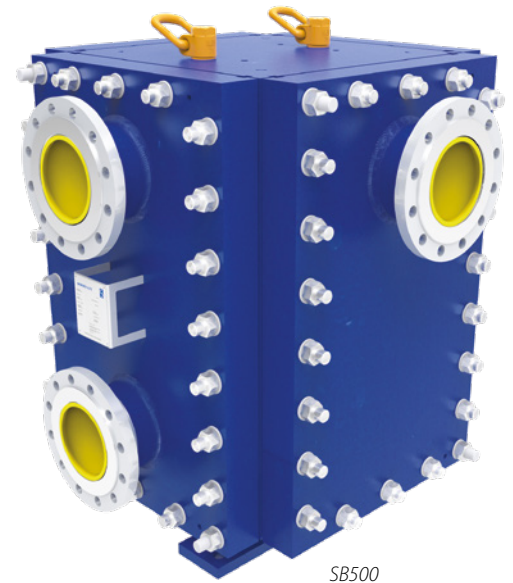
## Features and benefits

- Perfect as condensers that can be configured to handle duties with or without condensate sub-cooling. SondBlock heat exchangers are also good choices as steam heaters or reboilers for non-cyclic duties, and a smooth and stable steam control system.
- A very durable heat exchanger that excels at handling aggressive and fouling media. Able to handle aggressive media on both sides, it is a perfect solution for crude oil refineries and petrochemical plants. A top choice for the most challenging duties.

- Increased production output due to the extended uptime of the heat exchanger. Very low maintenance and service requirements. Removable side panels provide fast and easy access to the plate pack for inspection or cleaning.

## Common applications

- HVAC industry
- Pulp and paper industry
- Heavy industry
- Mining industry
- Petrochemical industry
- Chemical industry
- Oil and gas production
- Steam heaters and reboilers
- Partial condensers without condensate sub-cooling
- Partial condensers with condensate sub-cooling



SB500

# Spiral heat exchangers

Our SONDEX® spiral heat exchangers are the definitive solution for applications that require treatment of challenging fluids, such as sludges, slurries, waste water, liquids with high viscosity, and liquids that cause fouling or contain fibers and solids.



Spiral Ø1400

## Features and benefits

- The design allows for a countercurrent flow that makes it possible to achieve very close temperature approaches.
- Single-channel design that generates high shear rates which contribute to a self-cleaning effect, preventing clogging of the unit. Spiral heat exchangers are the perfect solution for high-viscosity media.
- The channel size is selected to fit the flow and qualities of the media. The many variations in diameters and widths of the spiral coil allow for many different combinations, which mean that we can create the optimal solution for every duty.
- Designed to handle a very aggressive temperature program and with a wide range of materials and plate thicknesses available, we customize each spiral heat exchanger to match the requirements of your application.

- Limited need for maintenance and cleaning ensures extended operational uptime. If particularly difficult media makes it necessary to clean, the hinged covers provide easy access to the entire heat transfer surface.
- Our spiral heat exchangers have minimal space requirements. Despite being small, the long, curved flow paths allow for very high heat transfer coefficients up to twice as high as their shell and tube counterparts.

## Common applications

- Dairy/food/beverage industry
- Biogas industry
- Wastewater industry
- Pulp and paper industry
- Heavy industry
- Petrochemical industry
- Chemical industry

# All-welded plate heat exchangers

SONDEX® all-welded plate heat exchangers provide very efficient heat transfer and are designed primarily for use in applications that involve aggressive, demanding media and high process temperatures, such as the chemical, petrochemical, refrigeration, and pharmaceutical industries, to name a few.

### Features and benefits

- Very compact, cost-effective units that take up minimal floor space are light in weight, while providing very efficient heat transfer, through the courtesy of a true counter-current flow.
- The gasket-free solutions feature a fully welded plate pack that enable them to work with very high pressure and temperatures. The risks of leaks are severely diminished with a completely welded heat exchanger.

- The plates in the completely welded plate pack are made from highly resistant materials guaranteed to withstand even the most extreme working conditions.

### Common applications

- HVAC industry
- Refrigeration industry
- Pulp and paper industry
- Heavy industry
- Mining industry
- Petrochemical industry
- Chemical industry



SAW23

# Brazed plate heat exchangers

Danfoss and SONDEX® brazed heat exchangers (XB/SL) have been consolidated into a single, combined product portfolio for complete coverage of all applications. The durable, permanently sealed heat exchangers feature advanced technology and superior safety measures designed to provide you with the ultimate in heat transfer with minimal operational costs.

- With the energy-optimized, tried-and-true Fishbone technology, or the revolutionary Micro Plate™ technology; the combined Danfoss and SONDEX® product range offers the ultimate in brazed heat transfer solutions.

### Common applications

- HVAC industry
- Dairy/food/beverage industry
- Refrigeration industry
- Evaporator and condenser applications
- Solar heating
- Oil units
- Heat recovery
- Engine cooling
- Evaporation and condensing
- Desuperheating
- Absorption systems
- Domestic hot water installations
- Process cooling
- Hydraulic oil cooling
- Laser cooling
- Water cooling and heating



XB / SL range

### Features and benefits

- Low operational costs, small hold-up volume, and high performance make our brazed heat exchanger solutions the ideal choice for many applications. Cut your costs and increase your profits with the help of our brazed portfolio.
- The permanently sealed heat exchangers offer a durable solution with an extended lifetime. Get peace of mind with the double-walled design that provides the ultimate protection against leaks.

We can **analyze** your **current setup** to determine if your installation can be **optimized with a SONDEX®** brand heat transfer solution

## Freshwater distillers

Our SONDEX® freshwater distillers are designed to produce domestic, process, or even drinkable water by evaporating seawater. The vapor from the evaporated seawater is condensed and filtered, leaving behind freshwater which can be chemically purified if it is intended for drinking water.

### Features and benefits

- High-vacuum design that lets the seawater evaporate at temperatures below 48 °C. This makes it possible to utilize excess heat from the cooling water of the engine jacket and put otherwise wasted energy to good use.
- Our freshwater distillers require minimal supervision after startup, as they are fully automated and operate according to the given water flow and pressure. Furthermore, they are designed to require very little maintenance.

- Featuring a salinometer, running-hour meter, and a chemical dosing unit by default, our freshwater distillers have all the equipment needed to ensure the correct salinity level for the desired freshwater output.
- Our multi-stage freshwater distillers are based on regenerative energy utilization and are very well-suited for producing large quantities of freshwater, especially when the available energy is limited and costly to produce.

### Common applications

- Marine/offshore industry
- Drinkable water production
- Process water production
- Domestic water production



SFD35

## Optimized heat transfer solutions for every application

### Heat transfer specialists

We design our heat exchangers in close cooperation with our customers to perfectly match the thermal requirements of any duty.

Throughout the years we have developed what has become the largest plate portfolio in the world. Having an option for every application and duty enables us to fine-tune each solution to the specific task at hand.

Optimized to minimize energy consumption and reduce service and maintenance costs, our heat exchangers have competitive prices and a long lifetime.

### Global presence, local proximity

Sondex A/S was founded in 1984 to provide customers with optimized, energy-efficient plate heat exchanger solutions. The company, rooted in Denmark, greatly expanded during the following years and quickly became an enterprise spanning the entire globe.

With many sales and production subsidiaries across the world, Sondex became a leading manufacturer of plate heat exchangers while remaining close to our markets with local sales and service teams.

### Sondex and Danfoss join forces

In July 2016, Danfoss acquired full ownership of Sondex. This step marked the merger of two strong players creating an even more powerful and agile heat exchanger partner.

### Transition into a product brand

During 2018, Sondex will become SONDEX® - a quality heat exchanger brand of Danfoss. Customers will benefit from one-stop shopping and the powerful infrastructure of Danfoss, as well as the heat transfer expertise of SONDEX®.

