MAKING MODERN LIVING POSSIBLE

Grow your business
Micro Plate Heat Exchangers

www.danfoss.com

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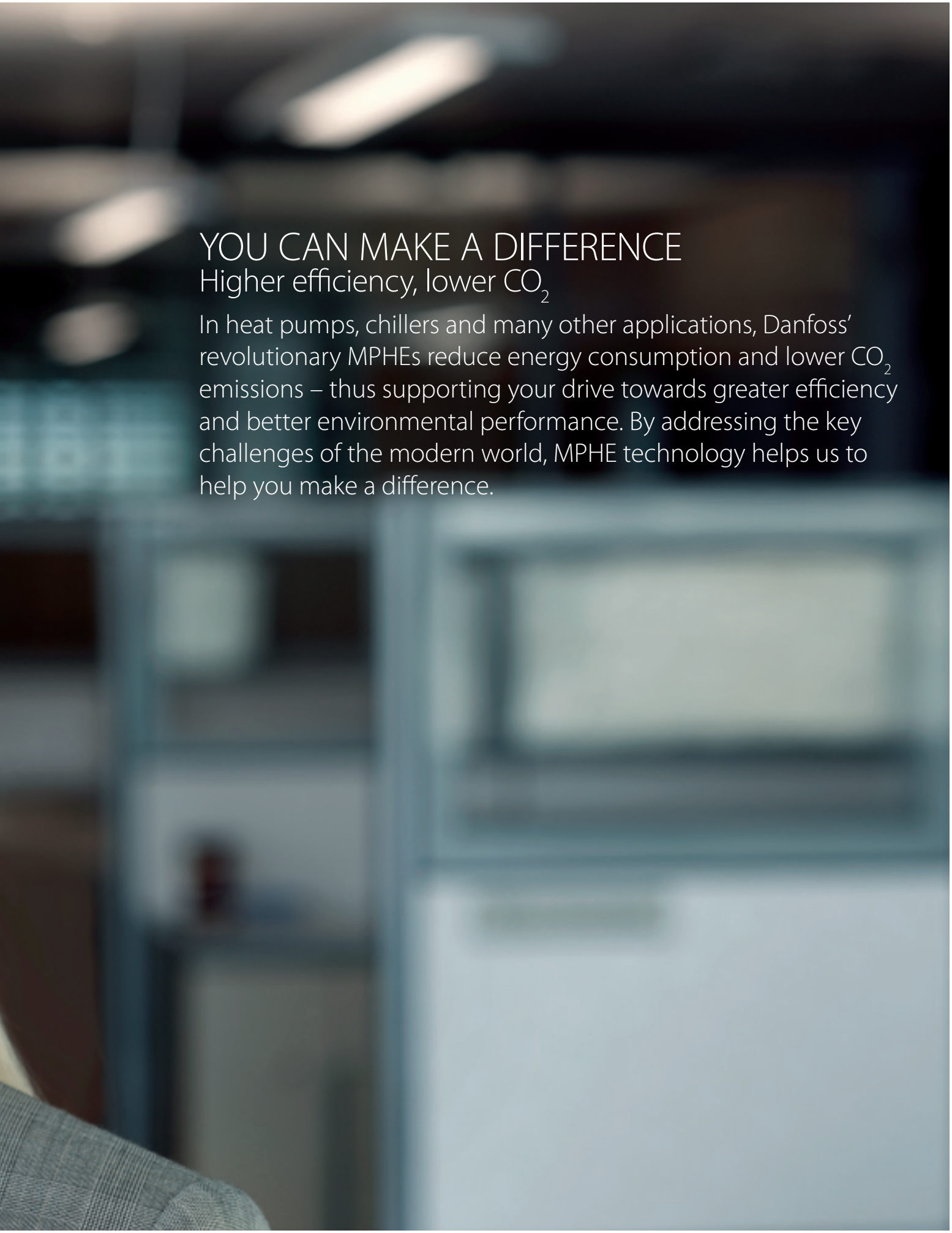


YOU CAN MAKE A DIFFERENCE

Higher efficiency, lower CO_2

In heat pumps, chillers and many other applications, Danfoss' revolutionary MPHEs reduce energy consumption and lower CO_2 emissions – thus supporting your drive towards greater efficiency and better environmental performance. By addressing the key challenges of the modern world, MPHE technology helps us to help you make a difference.

A WORLD OF APPLICATIONS

FINE-TUNED FOR BEST RESULTS

Whatever application you have in mind, there's an MPHE or the potential to produce one that will give optimal results. Thanks to the inherent flexibility of Micro Plate technology, today we have a new freedom to modify each heat exchanger to precisely match the demands of any application, offering efficient heat transfer, energy conservation and environmental responsibility – all in a single component.

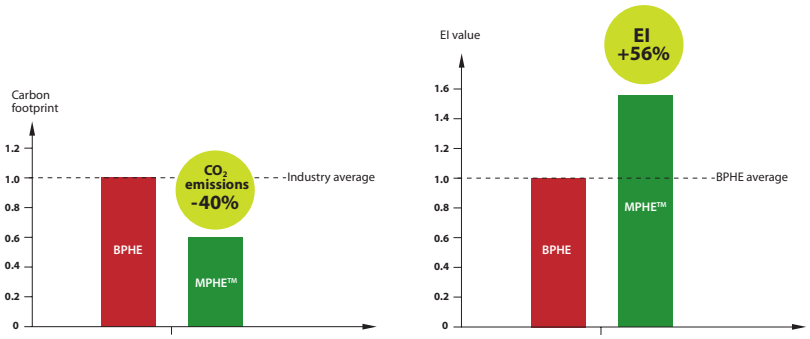
PAVING THE WAY TO A GREENER FUTURE

Putting the focus on high-performance heat exchangers, our ingenious new Micro Plate technology brings you stronger, lighter and slimmer heat exchangers that transfer heat even more efficiently than earlier models. Combining resource and energy efficiency with minimal use of refrigerants, MPHEs very clearly pave the way for the development of greener solutions, now and in the years to come.

LOOK INSIDE AN MPHE

A quantum leap in heat exchanger design

How often do you see a quantum leap in industrial design? It's certainly not every day. In the world of heat exchangers, it's not even every decade. The same basic heat exchanger model has been in use since the 1970s. Now, thanks to Danfoss' latest invention – the MPHE – that's all about to change.

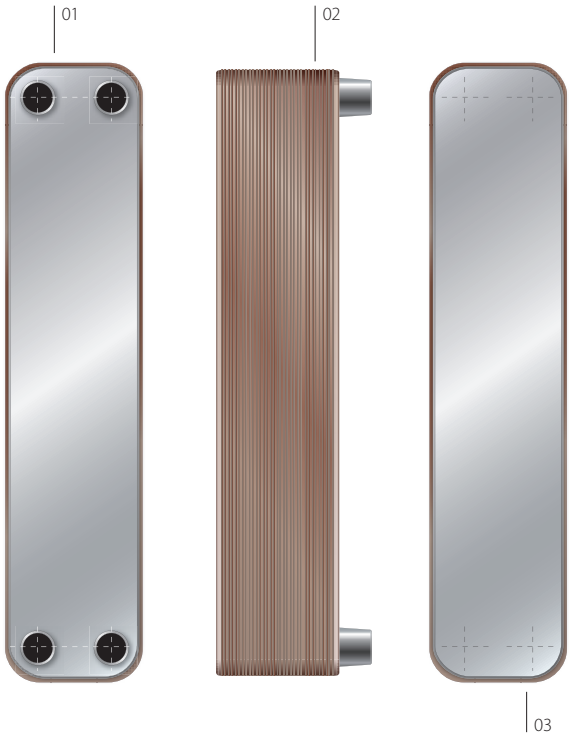


Our MPHEs improve the flow across the plate and utilisation of the surface area for better heat transfer. Compared with traditional brazed plate heat exchangers, MPHEs have an Exchanger Index (EI) value up to 56% higher under the same working conditions.

Lower hold-up volume; enhanced heat transfer; improved material utilisation; optimised pressure drop. Danfoss' new technology gives you all this, making it an excellent route to improved performance and lower environmental impact.

Read more about the specific applications and benefits on the following pages.

MPHE BENEFITS



01 INNOVATIVE TECHNOLOGY

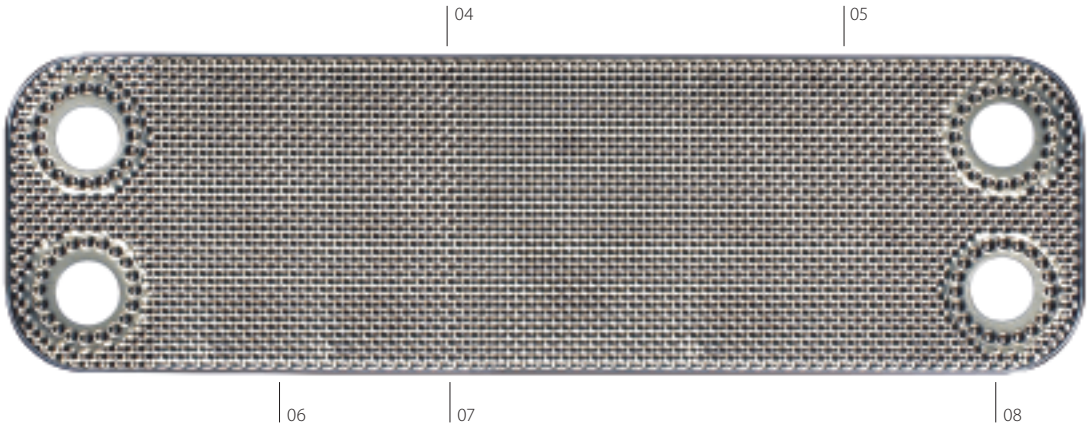
With a unique plate channel pattern, MPHEs from Danfoss extend the boundaries of heat exchanger technology. They deliver higher resource efficiency and enhanced heat transfer, thus taking you one step further towards the ultimate goal of sustainability.

02 OPTIMISED FOR YOUR APPLICATION

MPHEs offer an unusual degree of design freedom. Simply by varying the number, size and placement of indentations on the channel plate, they can be adapted to give the optimal heat transfer and minimal pressure drop in all kinds of applications. First out from Danfoss: the H-range, optimised for heat pump applications, and the C-range optimised for chiller applications. And there is more to come.

03 LOTS OF CHOICE

We offer a range of different MPHEs, designed for use in heat pumps, chillers and a broad variety of other applications. We are always on hand to help you identify the most suitable model, or to discuss adapting the channel plate pattern to get the best results in your product.



04 SPACE-EFFICIENT AND RELIABLE

In relation to shell-and-tube heat exchangers, our MPHEs are impressively compact; in relation to brazed plate heat exchangers they're more reliable (no gaskets to fail) and can work at higher temperature and pressure levels.

05 PROVEN PERFORMANCE

Based on tried and tested brazed plate technology, our MPHEs are proven reliable, cost-effective and energy-efficient. The point of differentiation between MPHEs and brazed plate heat exchangers is their channel plate pattern, which enhances heat transfer and allows for more flexibility in application design.

06 RAPID RESPONSE

Compared with brazed plate heat exchangers, MPHEs have a smaller hold-up volume and a lower refrigerant charge. The result is more rapid response to changes in temperature, as well as a reduction in carbon footprint.

07 THOROUGHLY TESTED

You can count on us to deliver top-quality products since all our MPHEs are pressure- and leak-tested prior to delivery. All the most common pressure vessel codes – including PED, UL/CSA and KHK – are available as standard.

08 COMPLIANCE WITH INDUSTRY STANDARDS

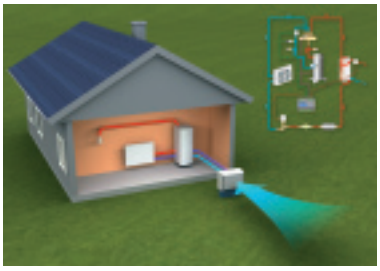
Our customers' peace of mind is assured by the fact that MPHEs meet the environmental and quality standards ISO 14000 and ISO 9001.


70 °C
Hot water
Possible due to higher approved working pressure of 48 bar.
€10 000
Annual savings
When reducing the number of suppliers by just one.


€3
Shorter development times
One month shorter product development time saves €3 per heat exchanger for the customer.

H-RANGE FOR HEAT PUMPS

Highest performer on the market

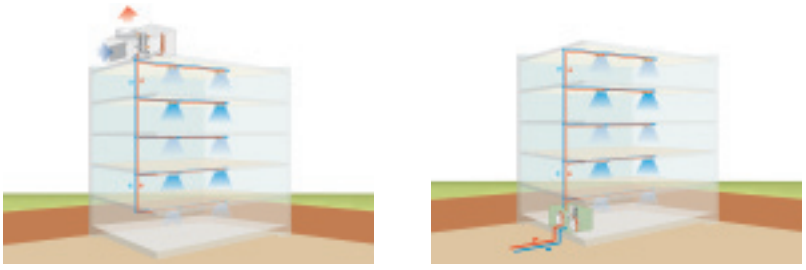


There are numerous heat exchanger models for heat pump applications on the market today, but none perform as highly as our new H-range MPHEs. That's because the H-range is designed specifically for use in ground source and air source heat pump systems. Each model is available fully optimised not only for different refrigerants but also for the job it has to do as a condenser or evaporator. The MPHE's unique channel plate design distributes refrigerant in an innovative way, boosting seasonal efficiency and ensuring efficient operation at full and part load.

Choose MPHEs from the H-range and take advantage of the built-in flexibility of the channel plate design to differentiate your product and take the lead on innovation. We offer complete coverage of the 3-150 kW capacity range, with 16 products based on just a four-product platform to help you streamline product development and make production leaner.

C-RANGE FOR CHILLERS

Increase chiller profits



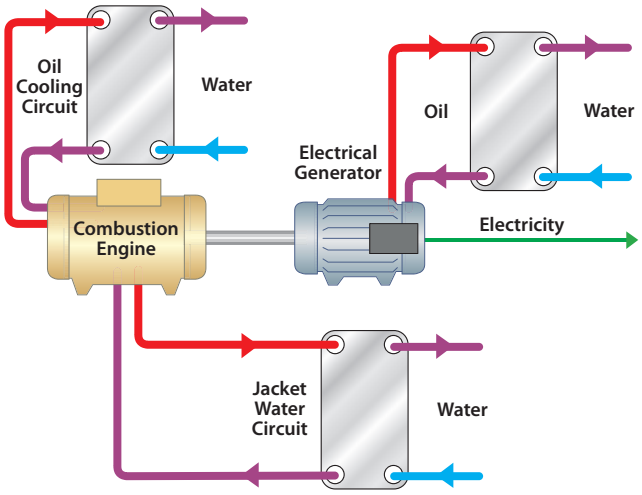
Whether you're producing air- or water-cooled chillers, you know how important it is to choose each component with care. Choosing the right heat exchanger is especially important since it determines the efficiency of heat transfer within your product.

Danfoss' C-range consists of dedicated heat exchangers optimised for chiller applications, to work as condensers or evaporators in your air- or water-cooled system. Suitable for the 300-550 kW (single circuit) and 100-550 kW (dual circuit) capacity ranges, our C-range products are adapted for use with today's preferred refrigerants and able to operate efficiently at full or part load.

Choose MPHEs from our new C-range and take advantage of their compact size and versatile design to develop more competitive chiller solutions that build the value of your brand.

D-RANGE FOR INDUSTRIAL APPLICATIONS

Long-term efficiency and reliability



Taking advantage of Micro Plate technology, with its innovative and compact channel plate pattern, our trustworthy D-range MPHEs combine enhanced heat transfer with a lower carbon footprint. Robust and resource-efficient, the D-range is designed to operate efficiently year after year with minimal maintenance in a whole range of applications.

GEARBOX COOLING

In gearbox cooling, such as in wind power generation systems, the high efficiency of D-range products at low flow rates gives them a special competitive advantage.

PRECISION COOLING

MPHEs are an efficient, compact solution offering reliable year-round operation for precision cooling. They are suitable for use in precision air conditioning units that are designed to run continually with minimal maintenance.

LUBE OIL COOLING

The reliability and compact form of D-range MPHEs comes into play in lube oil cooling systems, where space and access for maintenance are limited. In large marine engines, for example, MPHEs are small enough to be mounted on top of the engine itself.

FUEL HEATING

Our MPHEs perform well in systems using hot water and steam. Take advantage of this to pre-heat fuel oil, thereby reducing pollution and lowering your fuel consumption, especially during cold starts. Pre-heating also makes it easier to remove unwanted water from the oil.

€50

Optimised heat transfer

Employ future-proof heat transfer solutions and increase revenues by up to €50 per heat exchanger.

€51

Technology leadership

Differentiate your product and increase revenues by €51 per heat exchanger.

€25

One-stop shopping

By working with a single supplier you can save €25 per heat exchanger.

THE MAKING OF AN MPHE

Seven steps to a quality product

When you choose a new kind of heat exchanger for your application, you want to be sure it will perform smoothly. That's why we use every tool at our disposal in our factories in Asia and Europe to guarantee the efficiency, quality and, ultimately, reliability of the product we deliver to you. The manufacturing process involves seven steps, which are designed to secure the best results and give our customers peace of mind.

01. SIMULATION

Reinforcing the creativity of product developers, simulation improves the functionality of new products and speeds up time to market.

02. TOOLING

To ensure quality and guarantee consistency between production runs, we precision-mill our own press tools in an integrated CAD/CAM process.

03. LABORATORY

The Danfoss laboratory is third-party accredited and fully equipped for testing heat transfer capacity, flow distribution, strength and mechanical and thermal fatigue performance.

04. MATERIALS

The steel and other raw materials used in our products are bought exclusively from certified suppliers. This enables full traceability and ensures that all the materials used meet our stringent specifications.

05. PRESSING

Automatic integrated press lines are used to create the channel plate patterns on our MPHEs. This cost-effective manufacturing process guarantees consistently high quality.

06. BRAZING

Specially designed brazing programmes make it possible for Danfoss to manufacture leak-free and corrosion-resistant MPHEs. Heating and cooling cycles are precisely adapted to match each combination of materials and size of heat exchanger.

07. TESTING

Before shipping, all MPHEs, and indeed all Danfoss heat exchangers, are thoroughly leak- and pressure-tested, so we only deliver top-quality products to our customers.

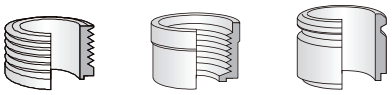

01 02 03 04
05 06 07

THREE RANGES
Unlimited possibilities

With three complete MPHE ranges at your disposal, we're confident you will find a model to suit your business, as well as all the relevant accessories to match it perfectly. Our H-, C- and D-ranges all offer a complete programme of optimised evaporator, condenser and single-phase products along with dual circuit solutions. They are fully compliant with regulations such as PED and UL, thus guaranteeing consistently high performance, reliability and safety.

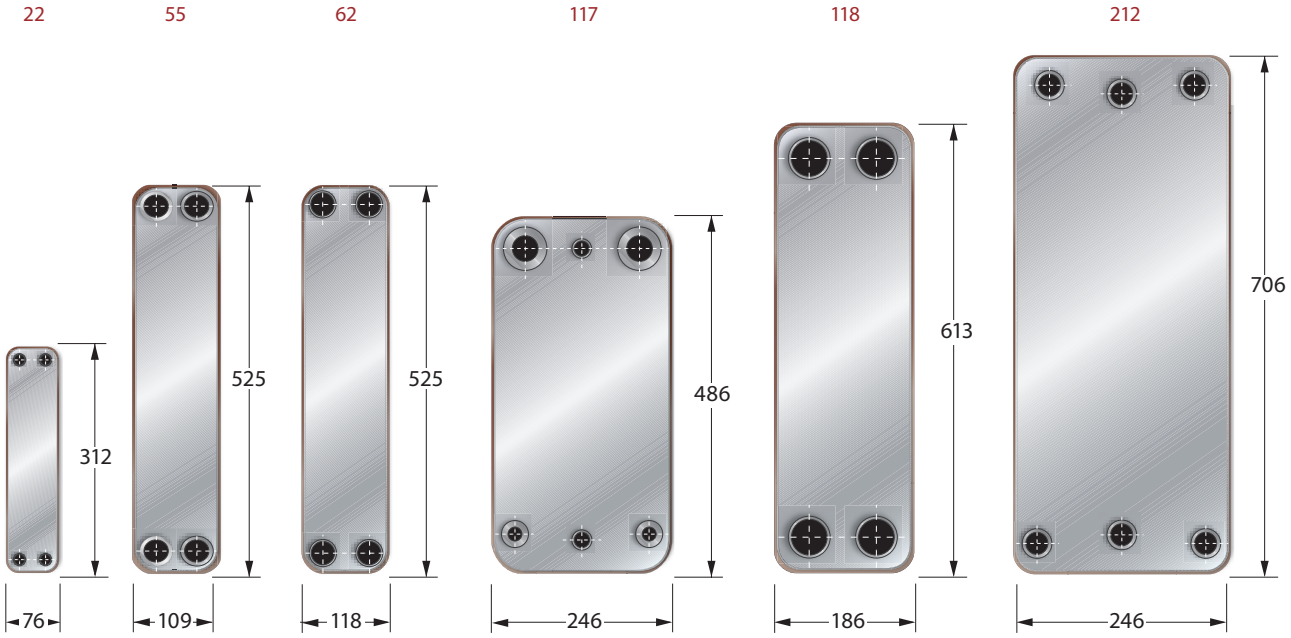
CLEAR FOCUS

By focusing on heat exchangers, we make it easier for you to do business with Danfoss. Nothing is left to chance! All basic research is conducted and products thoroughly tested and verified in our labs in Asia and Europe. Our production plants are all PED approved and ISO 14000 certified, so we can guarantee the durability and safety of any heat transfer application. What's more, our global presence ensures we are always there to support you and help increase your sales.



CONNECTIONS AND ACCESSORIES

We offer a range of connections and accessories designed to work in combination with your MPHEs. Whether you need a special type of insulation, tailor-made support legs or a hassle-free CIP cleaning unit, we provide the most compatible accessories for Danfoss products.



H-RANGE HEAT PUMPS	Function	Evaporator Condenser	Evaporator Condenser	Evaporator Condenser		Evaporator Condenser	
	Configuration	Single	Single	Single		Single	
	Capacity, kW	3-15	10-57	10-65		24-150	
	Platform	22	55	62		118	
C-RANGE CHILLER	Function	Evaporator Condenser	Evaporator Condenser	Evaporator Condenser	Evaporator Condenser	Evaporator Condenser	Evaporator Condenser
	Configuration	Single	Single	Single	Dual	Single	Single/Dual
	Capacity, kW	3-30	20-65	30-90	100-250	70-200	200-550
	Platform	22	55	62	117	118	212
D-RANGE BASELINE	Function	Single-Phase Evaporator Condenser	Single-Phase Evaporator Condenser	Single-Phase Evaporator Condenser	Evaporator Condenser	Single-Phase Evaporator Condenser	Single-Phase Evaporator Condenser
	Configuration	Single	Single	Single	Dual	Single	Single/Dual
	Max flow rate, m^3/h	5	12	16	45	36	100
	Platform	22	55	62	117	118	212

PROFESSIONAL, PERSONAL SUPPORT

Round the world and round the clock

As a customer-focused company, we pride ourselves on being able to guide you all the way from the first decision through installation to after care. Applying our unrivalled knowledge of heat exchanger applications, we offer you best-in-class technical and commercial support, 24/7.

Tell us about your business and we can suggest a replacement for your existing heat exchangers and calculate the gains from upgrading. Alternatively, we can propose a new MPHE design with a plate channel pattern modified to perform even better in your application. You can download our special software program from danfoss.com and carry out your own advanced heat exchanger calculations.

Thanks to widespread local operations, our skilled technicians are always close at hand to answer your questions after installation and help ensure your operations run smoothly from day one. Similarly, in the rare event of a malfunction, they can help you identify the cause and suggest a solution – no matter where your business is based.

Danfoss has local, regional and global training centres where you can learn more about our MPHEs. Attend a training course in person, or take advantage of our online education to study at your own convenience.

By partnering with Danfoss, you gain access to our many years of accumulated heat exchanger experience and knowledge. We support you through the different phases of your product's lifecycle with personal service, based on the unique needs of your business.

OPTIMISED FOR USE WITH PREFERRED REFRIGERANTS

REFRIGERANTS R407C, R410A, R134a

With environmental challenges in ever sharper focus, it is only natural that the use of refrigerants should come under close scrutiny. How is the industry responding to market demands for more environmentally friendly refrigerant solutions?

Older refrigerants are rapidly being phased out and environmentally preferred alternatives are taking their place. R407C, R410A and R134a are the ones most commonly used today.

OUR CONTRIBUTION

We at Danfoss are helping to advance this positive trend in two ways. First, by providing product lines that are fully optimised to work with modern refrigerants. Early laboratory tests also indicate that the basic construction of MPHEs is well adapted for use with natural refrigerants.

Second, we offer the market our unique MPHEs, which have smaller hold-up volumes and consequently a lower refrigerant charge than older heat exchanger models. This has the added benefit of reducing the need for inspections and in some cases eliminating it altogether.

HOW CAN WE ADD VALUE TO YOUR BUSINESS?

DANFOSS' COMPONENT PHILOSOPHY

Our studies show that even when you reduce the number of suppliers you work with by just one, you can reap significant financial benefits. The numerous small efficiency gains – one less order to place, one less delivery to manage – combine to give an impressive reduction in your overall costs, at the same time as reducing the carbon footprint of your product. Reducing your supplier base, even minimally, makes life that bit simpler. Working with Danfoss, a company that really understands the application, makes it simpler still.

COUNT ON IT!

At Danfoss, we've developed a methodology for measuring the value we can add to your business. We call this methodology 'Count on it'. What it means in practice is that before starting to work with a new customer, we conduct a thorough pre-study, taking the broadest possible range of factors into account. Based on the results of this pre-study, we calculate exactly how, and by how much, we can increase the profitability of your business. Why not meet us, no strings attached, and let Danfoss do the math?

Find out more on danfoss.com or talk to your local Danfoss representative today.

A NATURAL CHOICE – HEAT EXCHANGERS

Danfoss' revolutionary Micro Plate Heat Exchanger technology enables us meet customer demands for clear, core savings and a better environmental performance. Our focus on customer solutions means we can identify the best way to help you meet current and future challenges – environmental, economic, legal or political – and help your business grow.

Address

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