oilon

INDUSTRIAL HEAT PUMPS
AND WATER CHILLERS

ChillHeat

Optimized heating and
cooling performance

Affordable and environmentally friendly energy with heat pumps

Low-temperature waste heat contains valuable energy

Communities, industry, and energy production generate huge amounts of waste heat, which cannot be directly utilized because of its low temperature. However, this waste heat can be recovered by heat pumps with high efficiency ratio, producing hot air or hot water for heating houses and domestic hot water as well as in industrial processes. It can also be sold and channeled into the district heating network. There really is a multitude of choices.

A worthwhile investment

A heat pump is an investment with short payback period. Annual savings in energy can reach up to eighty percent – and the same goes for CO_2 emissions as well!

Extensive range and top-notch quality assurance

Our ChillHeat catalogue offers a wide range of optimized solutions to a variety of applications that are presented on the following page. All of our ChillHeat products are designed and manufactured in Finland. Factories are equipped with test benches, so every heat pump can be tested at the desired operating points before it is shipped to the client.

Heating and cooling – made in Finland

Founded in 1961, Oilon is a Finnish family-owned energy and cleantech company. Oilon has over 60 years of experience in generating heat for private residences as well as large residential buildings, district heating networks, and for a variety of industrial processes, and nearly 20 years of experience in high-capacity heat pumps and cooling solutions. Oilon is internationally renowned as a forerunner in the heating and refrigeration fields. Oilon also offers an extensive service network, guaranteeing long and cost-effective life for the products.

Combined heating and cooling

A single ChillHeat heat pump can be used for both heating and cooling at the same time, without any extra machinery involved. Valuable heat is available virtually for free, as it is generated as a by-process of cooling. The typical COP in these applications is between 5 and 6.

Heat recovery at refrigeration plants

(from ammonia, HFC, CO_2 condensers)

ChillHeat heat pumps use recovered waste heat at refrigeration plants to generate hot water, thereby substituting valuable primary energy. The COP in these applications is typically between 4 and 6.

Heat recovery from waste water

ChillHeat heat pumps can be used to recover waste heat from municipal or industrial waste waters. The recovered heat can be used for producing hot water, to be used in industrial processes or to be sold and channeled into the district heating network. The COP in these applications is typically between 3 and 5.

Ground source heat

Ground source heat is free geothermal energy stored in the ground. ChillHeat heat pumps can utilize this energy for heating, replacing expensive off-site heat sources. The COP in these applications is typically between 3 and 4.

Flue gas heat recovery

Flue gases from power plant and central heating plant boilers can be put to good use with ChillHeat heat pumps. The recovered heat can, for example, be channeled into the district heating network, improving the efficiency of the plant and increasing the total heat output. The COP in these applications is typically between 4 and 6.

Heat recovery from industrial processes (evaporators, cooling towers, driers)

In industry, a lot of waste heat is released into the environment due to the difficult heat recovery associated with low temperatures. ChillHeat heat pumps are able to utilize these heat sources and produce valuable heating energy for industrial processes or to be sold out. The COP in these applications is typically between 4 and 6.

Heat extraction from outdoor air

Together with an outdoor cooling unit, ChillHeat products can use outdoor air as a heat source. This free heat source can be put to use for heating spaces and producing hot water, among other things. The COP in these applications is typically between 2 and 4.

Water chiller applications

ChillHeat chillers are an energy-efficient cooling solutions for air conditioning, for cooling computer server rooms, and in industrial processes.

Refrigeration applications

ChillHeat chillers can provide energy-efficient refrigeration for industrial applications, ice rinks, or supermarkets.

Highest temperature

The highest temperature of the generated heat, throughout the entire capacity range.

COPtot= total coefficient of performance
COPc= cooling coefficient of performance
COPh= heating coefficient of performance

Oilon ChillHeat product family

One of the underlying ideas in the design of Oilon's ChillHeat product family has been to use a single machine both for cooling and heating. As a result, all ChillHeat products are well suited for heating and cooling applications, either as dedicated cooling/ heating solutions or as a combined solution.

The product family features optimal products for industrial applications, hotels, office buildings and schools, as well as for various other applications – such as waste heat recovery, ground source heating, air conditioning, or warehouse cooling.

All ChillHeat products are compact, reliable, and easy to use. The ChillHeat brand is a guarantee of high energy-efficiency. We achieve this by using only the highest quality components as well as by having a competent R&D department and a meticulous testing process. It is possible to connect several ChillHeat heat pumps in parallel for an even higher capacity heating or cooling solution. A versatile automation system enables energy-efficient and easy ChillHeat operation.

For more information on our ChillHeat products, please see the following table. With low evaporator temperatures, it is recommended to check the maximum liquid out temperature in the actual site conditions already at the quotation stage.

ChillHeat	P	S	RE
Heating capacity EN 14511 0/35	30 - 450 kW	180 - 2000 kW	210 - 420 kW
Max. temperature of heat produced *	120 °C	85 °C	62 °C
Min. temperature of cooling produced *	-7 °C	-12 °C	-15 °C
ChillHeat product suitability for various applications			
Combined heating and cooling	●●●	●●	●●
Heat recovery at refrigeration plants	●●●	●●●	●
Heat recovery from waste water	●●●	●●●	●●
Ground source heating	●	●●	●●●
Heat recovery from flue gases	●●●	●●●	●
Heat extraction from outdoor air	●	●●	●●●
Heat recovery from industrial processes	●●●	●●●	●
Water chiller applications	●	●●●	●●●
Refrigeration applications	●	●●	●●●

●●● Excellent

●● Good

● Limited

* The max. temperature of heat produced or the min. temperature of cooling produced depend on the dimensioning conditions.

ChillHeat products and optional equipment

Oilon ChillHeat products are compact, yet easy to service. Oilon ChillHeat heat pumps conform to the applicable European Union Directives and Regulations, such as Pressure Equipment Directive, Low Voltage Directive, Electromagnetic Compatibility Directive and Ecodesign Directive. Standard delivery includes a fixed control panel with ChillHeat automation and a Modbus RTU bus interface as standard.

Versatility is increased by several options that allow the product to be tailored to different applications.

Below are some of the options that can be included in the delivery based on preliminary engineering at the quotation stage.

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Features and options:

High capacity heat exchangers

High-capacity heat exchangers ensure optimal performance.

Subcooler

Improves the performance of the heat pump in almost every condition.

Economizer (option)

An option for S-series heat pumps that improves the heat pump's performance. The economizer is an optional alternative to the subcooler. It improves heat pump performance in certain operating conditions.

Additional cooling, liquid injection, and HHF motor (optional)

Options for S-series heat pump required in extremely demanding conditions. Extremely demanding conditions may require liquid injection, an HHF motor, or both.

Frequency converter (as standard or as an option)

An optional accessory for S- and P-series heat pumps compressor(s) that enables stepless control. As standard in models P30-P150 and S180-1200. An option for models P220-P450, S1500 and S2000.

Energy metering (option)

Energy metering(s) to measure the heat or cooling energy or both, produced by the heat pump.

Electrical measurement

Electrical measurement allows users to measure power consumption in relation to the heat pump’s energy output.

Optional bus interfaces (option)

In addition Modbus RTU, which is included as standard, there are other bus options available (Modbus TCP, Profibus, Profinet, Bacnet).

Gas detection (option)

A gas detector that detects possible refrigerant leaks.

Oilon ChillHeat
P30 - P450

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Highest temperature 120 °C

Large residential buildings

Combined cooling and heating

Heat recovery at refrigeration plant (from ammonia, HFC, CO_2 condensers)

Heat recovery from industrial processes (from circuits of evaporators, cooling towers, driers)

Heat recovery from waste waters

P series industrial heat pumps can be used for energy-efficient cooling and heating of buildings and industrial processes, and, at the same time, to utilize waste heat for heating purposes. Equipped with piston compressors, the heat pumps have an extremely wide range of output temperatures, making them a good choice for a wide variety of different applications.

They can produce temperatures as high as 120 °C with a good COP. These temperatures are suitable for direct use in district heating networks and other high-temperature applications.

Technical data

		P30	P60	P100	P150	P220
Compressor type, no. of compressors		piston, 1	piston, 2	piston, 2	piston, 2	piston, 3
No. of refrigerant circuits		1	1	1	1	2
Dimensions without cover and extra legs *	Height mm	1297	2091	2091	2091	2091
	Length mm	1079	1571	1571	1571	2723
	Width mm	750	911	911	911	911
Refrigerant		R134a R513A R450A R515B R1234ze R1233zd	R134a R513A R450A R515B R1234ze R1233zd	R134a R513A R450A R515B R1234ze R1233zd	R134a R513A R450A R515B R1234ze R1233zd	R134a R513A R450A R515B R1234ze R1233zd
Fuse size **	A, 3/N/PE 400 V 50 Hz	3x63A	3x125A	3x160A	3x200A	3x400A
Weight	kg	530	920	1200	1300	2300

The performance values of the ChillHeat products under different conditions are calculated using the Oilon Selection Tool selection program.

*) Dimensions without a frequency converter.

**) Fuse size dimensioned in the most demanding conditions. Request a review dimensioning from the supplier.

The final specifications are provided by the manufacturer. Oilon reserves the right to change specifications without prior notice.

Oilon ChillHeat
P300 - P450

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Technical data

		P300	P380	P450
Compressor type, no. of compressors		piston, 4	piston, 5	piston, 6
No. of refrigerant circuits		2	2	2
Dimensions without cover and extra legs *	Height mm	2091	2091	2091
	Length mm	2723	3866	3866
	Width mm	911	911	911
Refrigerant		R134a R513A R450A R515B R1234ze R1233zd	R134a R513A R450A R515B R1234ze R1233zd	R134a R513A R450A R515B R1234ze R1233zd
Fuse size **	A, 3/N/PE 400 V 50 Hz	3x630A	3x800A	3x800A
Weight	kg	2600	3100	3700

The performance values of the ChillHeat products under different conditions are calculated using the Oilon Selection Tool selection program.

*) Dimensions without a frequency converter.

**) Fuse size dimensioned in the most demanding conditions. Request a review dimensioning from the supplier.

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Oilon ChillHeat S180 - S580

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Highest temperature 85 °C

Large residential buildings

Heat recovery at refrigeration plants (from ammonia, HFC, CO_2 condensers)

Flue gas heat recovery (for instant flue gas scrubber)

Refrigeration applications

Heat recovery from industrial processes (evaporators, cooling towers, driers)

Oilon ChillHeat S180 - S580 industrial heat pumps offer high capacity in a compact size. The heat pumps are equally suited for water chilling and heating. They come equipped with energy-efficient and compact rotary screw compressors and plate heat exchangers, a proven solution that can produce temperatures up to +85 °C with a good COP.

S series heat pumps are especially suited for demanding applications in the process industry as well as for use as high-capacity preheaters in high-temperature applications. Where the heat pumps shine is utilizing waste heat from industrial processes and in large-scale water chilling that requires simultaneous heat recovery. Besides their use in the process industry, typical applications for the heat pumps include climate control for large buildings and district heating and cooling production.

Technical data

		S180	S280	S380	S490	S580
Compressor type, no. of compressors		screw, 1	screw 1	screw, 1	screw, 1	screw, 1
No. of refrigerant circuits		1	1	1	1	1
Dimensions without cover and extra legs*	Height mm	2091	2091	2091	2091	2091
	Length mm	2551	2551	2551	2551	2551
	Width mm	911	911	911	911	911
Refrigerant		R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze
Fuse size **	A, 3/N/PE 400 V 50 Hz	250	355	500	630	800
Weight	kg	2300	2900	3600	4000	4500

The performance values of the ChillHeat products under different conditions are calculated using the Oilon Selection Tool selection program.

*) Dimensions without a frequency converter.

**) Fuse size dimensioned in the most demanding conditions. Request a review dimensioning from the supplier.

The final specifications are provided by the manufacturer. Oilon reserves the right to change specifications without prior notice.

Oilon ChillHeat S600 - S2000

Highest temperature 85 °C

Large residential buildings

Heat recovery at refrigeration plants (from ammonia, HFC, CO_2 condensers)

Flue gas heat recovery (for instant flue gas scrubber)

Refrigeration applications

Heat recovery from industrial processes (evaporators, cooling towers, driers)

For applications requiring an especially high heating and cooling capacity, Oilon offers the ChillHeat S600 - S2000 range. Each heat pump has two efficient and reliable screw compressors with an extremely high capacity as well as shell and tube heat exchangers. The heat pumps can produce water temperatures up to +85 °C with a good COP.

S series heat pumps are especially suited for demanding applications in the process industry as well as for use as high-capacity preheaters in high-temperature applications. Where the heat pumps shine is utilizing waste heat from industrial processes and in large-scale water chilling that requires simultaneous heat recovery. Besides their use in the process industry, typical applications for the heat pumps include climate control for large buildings and district heating and cooling production.

Technical data

		S600	S800	S1000	S1200	S1500	S2000
Compressor type, no. of compressors		screw, 2	screw, 2	screw, 2	screw, 2	screw, 2	screw, 2
No. of refrigerant circuits		2	2	2	2	2	2
Refrigerant		R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze	R134a R513A R450A R515B R1234ze
Fuse size *	A, 3/N/PE 400 V 50 Hz	2x3x400	2x500	2x630	2x800	2x3x800	2x1250
Weight (indicative)	kg	3200	4000	4500	5300	6500	7500

The performance values of the ChillHeat products under different conditions are calculated using the Oilon Selection Tool selection program.

*) Fuse size dimensioned in the most demanding conditions. Request a review dimensioning from the supplier.

The final specifications are provided by the manufacturer. Oilon reserves the right to change specifications without prior notice.

Oilon ChillHeat RE210 - RE420

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Highest temperature 62 °C

Large residential buildings

Combined cooling and heating

Heat extraction from outdoor air or from waste heat source

Water chiller applications

Ground source heating

Cost-effective RE series industrial heat pumps produce cooling and heating in a compact package. Several RE industrial heat pumps can be connected in series, resulting in an energy efficient and flexible system that produces water temperatures up to +62 °C with a good COP. The heat pumps are reliable and easy to use, and they are efficient even at partial loads. RE heat pumps are especially well suited for ground source applications and space heating.

ChillHeat RE industrial heat pumps are also well suited for industrial process cooling and heating. They work well in ground source heating systems and are an excellent choice for providing cooling and heating for office buildings and similar properties. A versatile automation system enables reliable and energy-efficient operation even in demanding process conditions.

Technical data

		RE210	RE330	RE420
Compressor type, no. of compressors		scroll, 2	scroll, 3	scroll, 4
No. of refrigerant circuits		1	2	2
Dimensions without cover and extra legs	Height mm	2091	2091	2091
	Length mm	1571	2723	2723
	Width mm	911	911	911
Refrigerant		R410A	R410A	R410A
Fuse size *	A, 3/N/PE 400 V 50 Hz	3x200A	3x400A	3x400A
Weight	kg	1600	1800	2000

The performance values of the ChillHeat products under different conditions are calculated using the Oilon Selection Tool selection program.

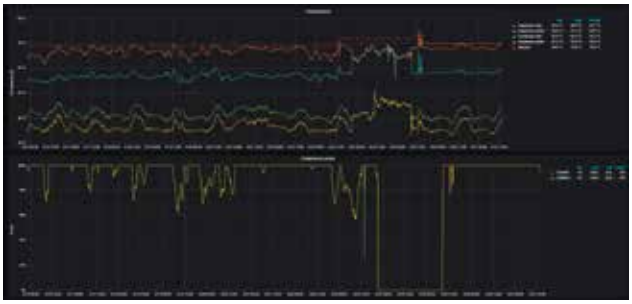
*) Fuse size dimensioned in the most demanding conditions. Request a review dimensioning from the supplier.

The final specifications are provided by the manufacturer. Oilon reserves the right to change specifications without prior notice.

Automation – an important aspect of energy efficiency

A versatile automation system enables the energy-efficient and smooth operation of the ChillHeat solution, which generates both heating and cooling either separately or concurrently.

The automation system in our ChillHeat products lays the basis for highly efficient operation and excellent usability. Ease of use and high quality of units, combined with an adaptive algorithm, guarantee our clients with trouble free operation and the full benefit of their investment. Our automation solutions offer versatile options for communication with different automation systems. We support the most common fieldbus protocols. The ability to monitor and program the equipment remotely ensures trouble free operation and cost-effective service and support as well as easy implementation of future process.



Choose the right pump model with Oilon Selection Tool

The Oilon Selection Tool can be used for the selections and dimensioning of single or grouped heat pumps or chillers.

After identified suitable selection there are available technical specifications and diagrams, dimensional and service space requirement drawings.

User license must be applied via the Oilon Sales.

ChillHeat display

(as standard in ChillHeat units)

- Clear and graphically informative user interface that controls one or multiple ChillHeat heat pumps.
  - Control according to the produced temperature(s) of the cold- or/and hot side(s) function(s).
  - In addition, control of the brine circulation pumps on the cold and/or the hot side.
- Modbus RTU bus interface as standard, optionally available Modbus TCP, Profibus, BACnet and Profinet bus interfaces.
- Remote monitoring possibility.

ChillHeat GlobalMonitor

(for further information, please contact our sales personnel)

- Remote monitoring of one or several ChillHeat heat pumps separately or as whole system.
- The client must organize an internet connection with a cable or mobile connection.
- Versatile and visual reporting and comprehensive subprocesses trends monitoring.
- Operations support and optimization as a remote service to destinations around the world.
- High usability, minimizing maintenance costs and downtime.

Co-operation, research and development

Refrigeration technology has been, and will continue to be, in development progress. New refrigerants are entering the market every year due to ever more stringent environmental legislation, necessitating changes in technical components that are used as well as in the overall design of equipment.

We carry out intense research and development work and actively cooperate with refrigerant and component suppliers in order to guarantee energy-efficient operation of our equipment under the most demanding conditions, while also taking future environmental legislation demands into account.

At the Kokkola factory and in the renewable energy research center in Lahti, Oilon company tests different configurations, refrigerant and component options in modern testing facilities. We also test different machines of said configurations and hardware in various operating conditions to offer the most reliable and optimized solutions for different client needs.

When looking for the best solution for different operating conditions, several important factors need to be taken into consideration

- required capacity
- reliability
- adjustability
- required minimum partial load
- energy efficiency
- space requirements
- noise level
- competitive pricing.

Continuous R&D work, learning and our numerous long-term references ensure that we are able to offer our clients the best possible equipment for different conditions and applications.

Quality assurance and product development

We are renowned for the high quality of our products, as well as the extensive maintenance service that we offer. Before any product is shipped to the client, we run it through a full spectrum of tests in our test bench under the same operational conditions that it will be expected to perform under, thereby ensuring reliable operation and optimal performance in different conditions. Thanks to full scale factory test runs it's possible to minimize the time need for plant commissioning and adjusting, which proves time savings for all site parties.

In the rapidly evolving heat pump business, the test bench is an important tool for R&D work as well. It provides us with a cost-effective, fast means to test computer-simulated solutions and to assess the compatibility of new components in various systems. We are continuously developing ever more energy-efficient, economical, and environmentally friendly solutions for our clients' needs.

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