



EXERGY



up to
120°C

Industrial Heat Pumps



RE/P/S Series
30-2000 kW

TRANE
TECHNOLOGIES

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.

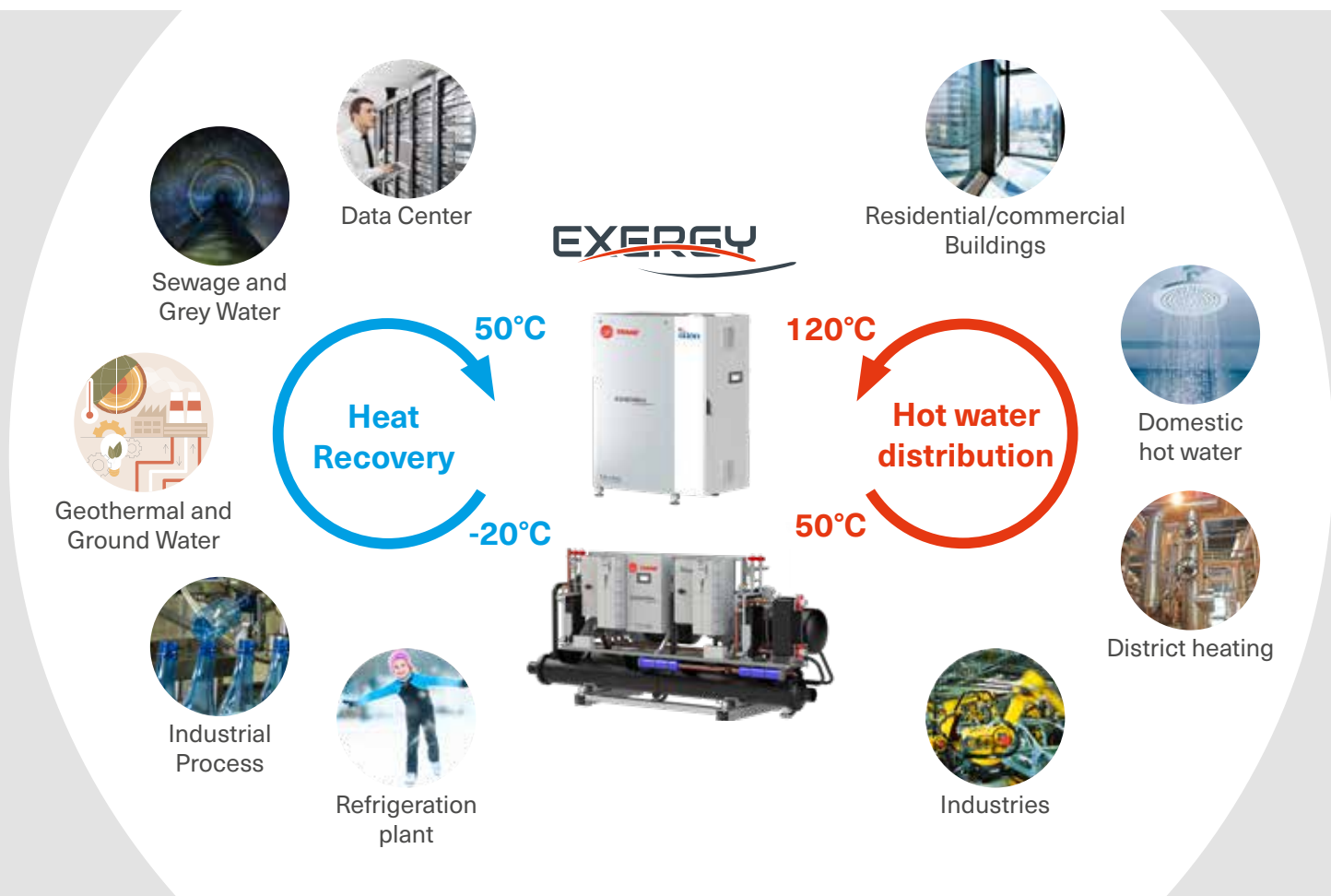
A worthwhile investment

A heat pump is an investment with short payback period. Annual savings in energy can reach up to eighty per cent – and the same goes for CO₂ emissions as well!

Extensive range and top-notch quality assurance

Our Exergy catalogue offers a wide range of optimized solutions to a variety of applications that are presented on the following page.

All of our Exergy products are factory tested. 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.



Combined heating and cooling

A single Exergy 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

(ammonia, HFC, CO₂)

Exergy 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

Exergy 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 solar energy stored in the ground. Exergy 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 Exergy 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. Exergy 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, Exergy 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 3 and 4.

Water chiller applications

Exergy products are an energy-efficient cooling solution for air conditioning, for cooling computer server rooms, and in industrial processes.

Refrigeration applications

Exergy products 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. An optional superheater can use part of the generated heat energy in order to raise the temperature further.

COP= coefficient of performance

Exergy product family

One of the underlying ideas in the design of Trane's Exergy product family has been to use a single machine both for cooling and heating. As a result, all Exergy 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 Exergy products are compact, reliable, and easy to use. The Exergy 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 Exergy heat pumps in parallel for an even higher capacity heating or cooling solution. A versatile automation system enables energy-efficient and easy operation.

With low evaporator temperatures, it is recommended to check the maximum water out temperature in the actual site conditions already at the quotation stage.

Exergy Product Family

| EXERGY | RE | P | S |
|---|--------------|-------------|---------------|
| Heating capacity EN 14511 0/35 | 210 - 420 kW | 30 - 450 kW | 180 - 2000 kW |
| Max. temperature of heat produced * | 62 °C | 120 °C | 85 °C |
| Min. temperature of cooling produced * | -15 °C | -20 °C | -15 °C |
| Exergy 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.

** In demanding conditions

Exergy products and optional equipment

Trane Exergy products are compact, yet easy to service. Standard delivery includes a fixed control panel with Exergy automation and a Modbus RTU bus interface. The versatility of the heat pumps can be further extended with optional extra equipment, making them suitable for a wide range of different applications. Having the same design language as the actual heat pump itself, extension modules can be used to equip the heat pump with extra pump and valve groups.

Options:

High capacity heat exchangers

Heat exchangers optimized for conditions guarantee good performance cost-effectively.

Subcooler

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

Economizer

An option for S-series heat pumps that improves the heat pump's performance.

Additional cooling & liquid injection

An option for S-series heat pump required in extremely demanding conditions.

Frequency converter

An optional accessory for S- and P-series heat pumps that enables stepless control.

Energy metering

Energy metering to measure the heat energy or cooling energy produced by the heat pump.

Electrical measurement

An optional equipment for measuring the power and energy consumption of the heat pump.

Optional bus interfaces

In addition to Modbus, bus interface options: Modbus TCP, Profibus, Profinet, Bacnet.

Gas detection

A gas detector that detects possible refrigerant leaks.



RE 210 - RE 420

Trane Exergy RE heat pumps are best suited for heating and cooling large residential buildings and industrial plants.

In our RE line, we use scroll compressors only from the most well-known and reliable compressor manufacturers.



- Large residential buildings
- Combined cooling and heating
- Heat extraction from outdoor air
- Water chiller applications
- Ground source heating

TECHNICAL DATA

| EXERGY | RE 210 | RE 330 | RE 420 |
|--|-----------------------|-----------|-----------|
| 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 |
| Weight | kg | 1600 | 1800 |

The performance values of the Exergy products under different conditions are calculated using the Trane 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. Trane reserves the right to change specifications without prior notice.

P 30 - P 450

Trane Exergy P-series heat pumps generate hot water up to 120 °C very efficiently even when running at partial capacity.

A culmination of years of research and development work, energy-efficient and reliable piston compressors keep the operating and maintenance costs down.



- Large residential buildings
- Combined cooling and heating
- Heat recovery at refrigeration plant (ammonia, HFC, CO₂)
- Heat recovery from industrial processes (evaporators, cooling towers, driers)
- Heat recovery from waste waters

TECHNICAL DATA

| EXERGY | P30 | P60 | P100 | P150 | P220 | P300 | P380 | P450 | | |
|--|--------------------------|------------|------------|------------|------------|------------|------------|------------|--------|--------|
| Compressor type, no. of compressors | piston, 1 | piston, 2 | piston, 2 | piston, 2 | piston, 3 | piston, 4 | piston, 5 | piston, 6 | | |
| No. of refrigerant circuits | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | | |
| Dimensions without cover and extra legs | | | | | | | | | | |
| Height mm | 1300 | 2091 | 2091 | 2091 | 2091 | 2091 | 2091 | 2091 | | |
| Length mm | 1080 | 1571 | 1571 | 1571 | 2723 | 2723 | 3866 | 3866 | | |
| Width mm | 740 | 911 | 911 | 911 | 911 | 911 | 911 | 911 | | |
| Refrigerant | R134a | R134a | R134a | R134a | R134a | R134a | R134a | R134a | | |
| | R513A | R513A | R513A | R513A | R513A | R513A | R513A | R513A | | |
| | R450A | R450A | R450A | R450A | R450A | R450A | R450A | R450A | | |
| | R1234ze | R1234ze | R1234ze | R1234ze | R1234ze | R1234ze | R1234ze | R1234ze | | |
| | R1233zd(E) | R1233zd(E) | R1233zd(E) | R1233zd(E) | R1233zd(E) | R1233zd(E) | R1233zd(E) | R1233zd(E) | | |
| Fuse size * | A, 3/N/PE 400 V 50 Hz | | 3x63A | 3x125A | 3x160A | 3x200A | 3x400A | 3x630A | 3x800A | 3x800A |
| Weight | kg | 530 | 1000 | 1200 | 1600 | 2300 | 2600 | 3100 | 3700 | |

The performance values of the Exergy products under different conditions are calculated using the Trane 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. Trane reserves the right to change specifications without prior notice.

S 180 – S 490

Trane Exergy S-series heat pumps generate hot water up to 85 °C very efficiently. The S series heat pumps come equipped with compact sized and energy-efficient rotary screw compressors, proven to be reliable.



- Large residential buildings
- Heat recovery at refrigeration plants (ammonia, HFC, CO₂)
- Flue gas heat recovery
- Refrigeration applications
- Heat recovery from industrial processes (evaporators, cooling towers, driers)

TECHNICAL DATA

| EXERGY | S 180 | S 280 | S 380 | S 490 |
|--|-----------------------|----------|----------|----------|
| Compressor type, no. of compressors | screw, 1 | screw, 1 | screw, 1 | screw, 1 |
| No. of refrigerant circuits | 1 | 1 | 1 | 1 |
| Dimensions without cover and extra legs | | | | |
| Height mm | 2091 | 2091 | 2091 | 2091 |
| Length mm | 2723 | 2723 | 2723 | 2723 |
| Width mm | 911 | 911 | 911 | 911 |
| Refrigerant | R134a | R134a | R134a | R134a |
| | R513A | R513A | R513A | R513A |
| | R450A | R450A | R450A | R450A |
| | R1234ze | R1234ze | R1234ze | R1234ze |
| Fuse size * | A, 3/N/PE 400 V 50 Hz | 3x250A | 3x355A | 3x400A |
| Weight | kg | 2300 | 2900 | 3600 |

The performance values of the Exergy products under different conditions are calculated using the Trane 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. Trane reserves the right to change specifications without prior notice.

S 600 - S 2000

Trane Exergy S-series heat pumps generate hot water up to 85 °C very efficiently. The S series heat pumps come equipped with compact-sized and energy-efficient rotary screw compressors, proven to be reliable.



- Large residential buildings
- Heat recovery at refrigeration plants (ammonia, HFC, CO₂)
- Flue gas heat recovery
- Refrigeration applications
- Heat recovery from industrial processes (evaporators, cooling towers, driers)

TECHNICAL DATA

| EXERGY | | S 600 | S 800 | S 1000 | S 1200 | S 1500 | S 2000 |
|--|-----------------------|----------|----------|----------|----------|----------|-----------|
| 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 |
| Dimensions without cover and extra legs | | | | | | | |
| Height mm | | 1900 | 1900 | 2091 | 2091 | 2091 | 2091 |
| Length mm | | 4700 | 4700 | 4700 | 4700 | 5500 | 5500 |
| Width mm | | 1000 | 1000 | 1150 | 1150 | 1600 | 1600 |
| Refrigerant | | R134a | R134a | R134a | R134a | R134a | R134a |
| | | R513A | R513A | R513A | R513A | R513A | R513A |
| | | R450A | R450A | R450A | R450A | R450A | R450A |
| | | R1234ze | R1234ze | R1234ze | R1234ze | R1234ze | R1234ze |
| Fuse size * | A, 3/N/PE 400 V 50 Hz | 2x3x400A | 2x3x400A | 2x3x630A | 2x3x630A | 2x3x800A | 2x3x1000A |
| Weight | kg | 3200 | 4000 | 4500 | 5300 | 6500 | 7500 |

The performance values of the Exergy products under different conditions are calculated using the Trane 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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Automation – an important aspect of energy efficiency

A versatile automation system enables the energy-efficient and easy operation of the Exergy function, which generates both heating and cooling either separately or concurrently.

The automation system in our Exergy products lays the basis for highly efficient operation and excellent usability. Ease of use and high quality combined with an adaptive algorithm guarantee our clients trouble free operation and the full benefit of their investment. Our automation solutions offer versatile options for communication between different automation systems. We support the most common fieldbus protocols, such as Modbus, Profibus, BACnet and Profinet, among others. 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.

Standard Control Features

- Clear and easy to use graphical user interface that controls one or multiple Exergy heat pumps
 - Control according to the temperature of the cold and/or hot solution produced
 - 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



Co-operation, research and development

Refrigeration technology has been, and will continue to be, under ongoing pressure to change. 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 our 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.

In our plants, we test different configuration, refrigerant and component options in modern test facilities. We also test different machines of said configurations and hardware in various operating conditions to offer the best products for different 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 and operational reliability 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. Thorough testing also minimizes the time required for installing and setting up the system, giving the client full benefit of the system as quickly as possible.

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.



Trane – by Trane Technologies (NYSE: TT), a global climate innovator – creates comfortable, energy efficient indoor environments through a broad portfolio of heating, ventilating and air conditioning systems and controls, services, parts and supply. For more information, please visit trane.eu or tranetechnologies.com.