

WATER SOURCE CHILLERS AND HEAT PUMPS

EW-HT

**WATER TO WATER HEAT PUMPS FOR VERY
HIGH TEMPERATURE WATER PRODUCTION
FROM 70 TO 280 KW.**



r R134a

r R513A

EW-HT

**LOWER IN GWP. ALWAYS
HIGH IN TEMPERATURE.**

**Water-source heat pump and chiller with dual
Scroll compressor.
From 70 kW to 280 kW.**

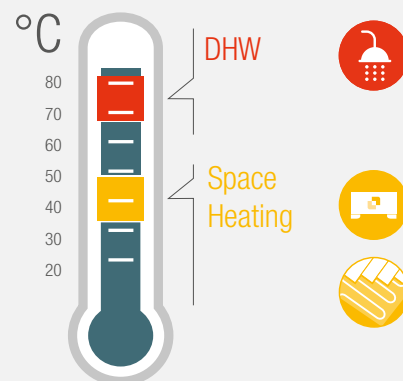
EW-HT[-C] is the ultimate **heat pump and chiller** solution for indoor installation equipped with dual scroll compressor and plate heat exchanger. Ideal for residential and commercial applications (water at very high temperatures) and IT Cooling (warmer water temperatures and heat recovery systems), the range can use R134a as refrigerant or contribute to a lower environmental impact thanks to the use of low GWP refrigerant R513A.



EFFICIENCY IN VERY HOT WATER PRODUCTION

Heating loads of residential and commercial buildings are typically aligned on two different temperature levels: one around 35-45°C for space heating, and the other around 65-75°C for domestic hot water.

While the first load can be covered by efficient and sustainable equipment such as heat pumps, solar collectors, district heating systems, etc., a concrete and reliable alternative to gas boilers for the high temperature loads until now had not been found.



ALL-ROUND SUSTAINABILITY

R513A

Fully committed to supporting the creation of a greener tomorrow, EW-HT-G05 combines brilliant efficiency with the use of a low GWP refrigerant that tackles both the indirect (due to the primary energy consumption) and the direct global warming impact.

INTEGRATION AND SYNERGY

The knowledge that one gets the best results not by optimising the single component but the whole system itself, leads to an increase in the level of integration and synergy between different kinds of devices and technologies.

Flexibility and aptitude to synergy make a good machine becomes the ideal solution for both new generation plants and refurbishment of already existing structures.



GAS NETWORK INDEPENDENCE

The most common means to produce very high-temperature water are gas boilers.

Nevertheless the gas network connection is not always dependable and sometimes it is not available at all.

Being dependent on an unreliable primary energy source is definitely risky, especially in applications where the service needs to be uninterrupted.

INDOOR INSTALLATION

Plant rooms are usually located within the buildings. Narrow spaces and tangled unorganised pipes are huge obstacles for the installation and maintenance operations of a machine.

Furthermore, raised noise levels and vibrations may seriously compromise the usability of the adjacent rooms.

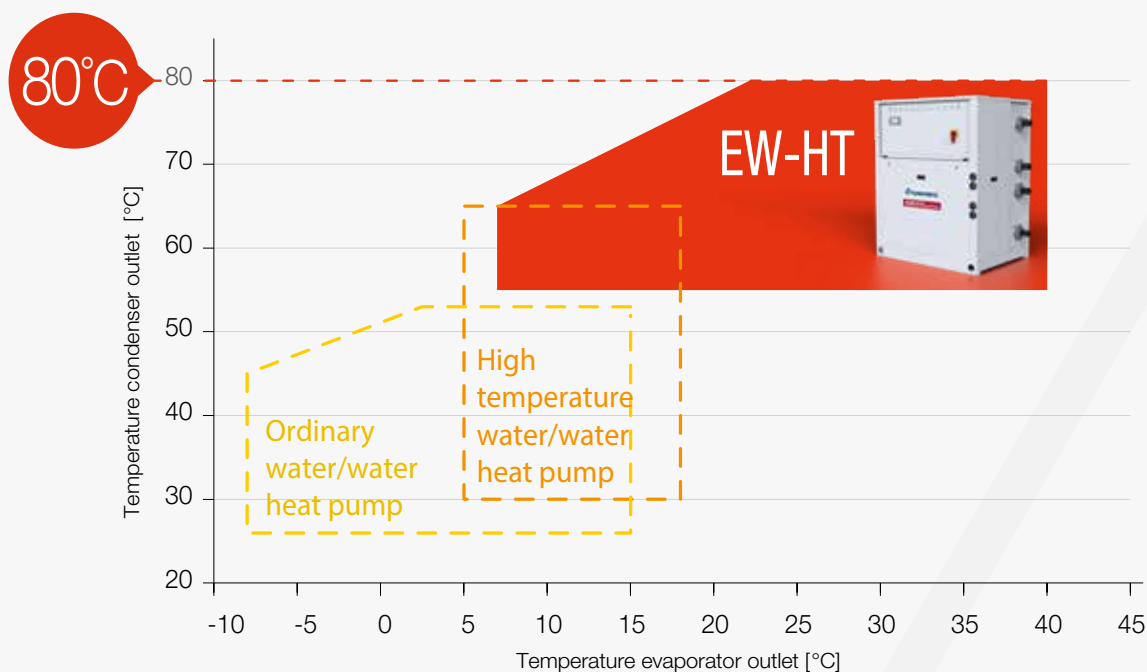
Today, reduced footprint, easy installation and quiet operation are crucial features for any technical unit.

EW-HT

THE REVOLUTION IN THE HOT WATER PRODUCTION

BEYOND ORDINARY OPERATING LIMITS

EW-HT redefines the heat pump operating limits: this unique heat pump exploits medium temperature water as a source to provide water up to 80°C. This incredibly extended operating range allows EW-HT to be perfectly integrated in any heating systems.



WHEN VERY HIGH TEMPERATURE WATER IS NEEDED, GAS BURNERS AND ELECTRIC HEATERS ARE NOT THE ONLY ANSWERS ANYMORE.

When very high temperature water is needed, gas burners and electric heaters are not the only answers anymore.

EW-HT makes it possible to have a very high temperature source without a gas burner, nor any electric heaters. It just needs an ordinary electric connection and a medium temperature water source.

The possibility to avoid fossil fuel is much more than a matter of energy saving and sustainability, it's also a matter of plant simplification: no gas network nor oversized electric connection are needed.



Energetic, environmental and economic advantages of heat pumps compared to traditional gas boilers are well known, but providing very high water temperature has always been the limit of these units. EW-HT revolutionizes this condition and opens the doors to a brand new application category for heat pumps.

ONE SINGLE UNIT FOR MANY APPLICATIONS

EW-HT is the ideal solution for every application where very high temperature water is needed.

RESIDENTIAL AND COMMERCIAL APPLICATIONS

In the era of heat pump technology maturity, most of the time domestic hot water production is still provided by gas or electric boilers. EW-HT offers a smart alternative: thanks to its innovative operating range, it fills the gap between the medium temperature level required by space heating terminals, and the high temperature level needed for domestic hot water. EW-HT is the perfect water temperature 'upgrader'.



IT COOLING

Heat recovery from server rooms and reuse to meet the heating load of the same building or to sell heat to neighbouring buildings or district heating system. In fact, its high leaving water temperature gives data centers more chances to reuse exhausted heat for wide applications, resulting in higher ERF.



INDUSTRIAL PROCESS

Industrial processes are characterised by many heat transfers: machines, motors, molds must be cooled, whereas material streams, air flows, working fluids must be heated or pre-heated. Medium/low temperature heat recovery is often not economical, so great amounts of thermal energy is simply lost. EW-HT represents the most important opportunity to recover and move this heat from one process to another, thereby avoiding kWh waste.



SUPERIOR RELIABILITY



Developed to be the only source of high temperature water for a building, EW-HT represents a no-compromise solution in terms of reliability. High quality components, accurate design, devoted control algorithms and redundancies grant uninterrupted unit operation in any conditions.

REDUCED SIZE AND NOISE LEVEL



This water to water heat pump is purposely designed to fit the requirement of indoor installation. The smart component disposal minimizes the footprint but still grants simple and safe access to the internal parts. Furthermore, as a result of a soundproofing oriented design and a dedicated acoustical enclosure, the units achieve a remarkable noise emission of only 70 dB(A).

ENERGY REUSE FACTOR



ERF is a measure of the amount of reused energy divided by the total amount of electrical energy supplied to a data center. Energy Reuse Factor (ERF) is set to become a new vital consideration for the design and operation of data centers.

EW-HT

RESIDENTIAL AND COMMERCIAL APPLICATIONS



Unbeatable integration

The perfect water temperature “upgrader”

Enhancing overall system efficiency

Ideal for...

- ✓ Residential and commercial buildings
- ✓ Hotels, resorts
- ✓ Wellness centers, SPAs
- ✓ Hospitals, nursing homes, clinics
- ✓ Schools, office buildings

Perfect with...

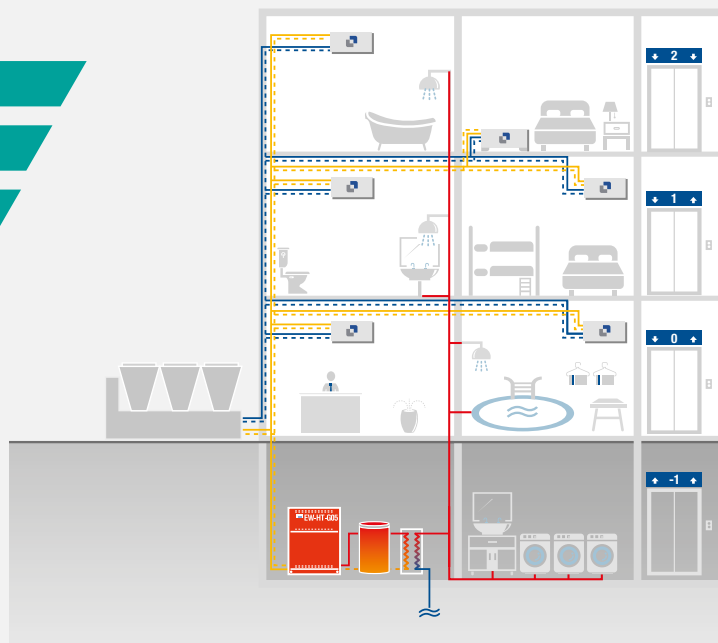
- ✓ 4-pipe system units
- ✓ District heating systems
- ✓ Medium temperature heat recovery
- ✓ Water to water heat pumps
- ✓ Solar heat collectors

Excellent in...

- ✓ Domestic hot water production
- ✓ Legionella disinfection and prevention

Ensuring comfort in residential and commercial buildings means fulfilling three different thermal loads: space cooling, space heating and domestic hot water.

In the last few years, 4-pipe system units are gaining more and more attention because of their superior efficiency in matching independent and simultaneous space cooling and heating loads. The only thing these units lack is domestic hot water production.



EW-HT is purposely developed to complete 4-pipe systems with unbeatable integration.

This unique heat pump uses a part of the medium temperature water provided by the 4-pipe unit as a source to produce very high temperature water, up to 80°C. The need for domestic hot water can be finally satisfied in an efficient and sustainable way, without worrying about legionella and saying goodbye to old boilers.

INDUSTRIAL PROCESS



New temperatures,
new usage opportunities

Making heat recovery
easy and profitable

Adaptability to any
kind of systems

Heat recovery is surely a recommended and cost-effective practice, especially in the industrial sector, where processes involve so many heat transfers between several different temperature levels. The ability to use any water stream up to 45°C as a source and the possibility to reach a water temperature production of 80°C is the key feature that makes EW-HT the perfect link between the different heat levels available. The heat removed from electric motors or industrial machines is transferred from medium-low temperature levels, which make it not usable, to higher temperature levels, which make it attractive for several usages.

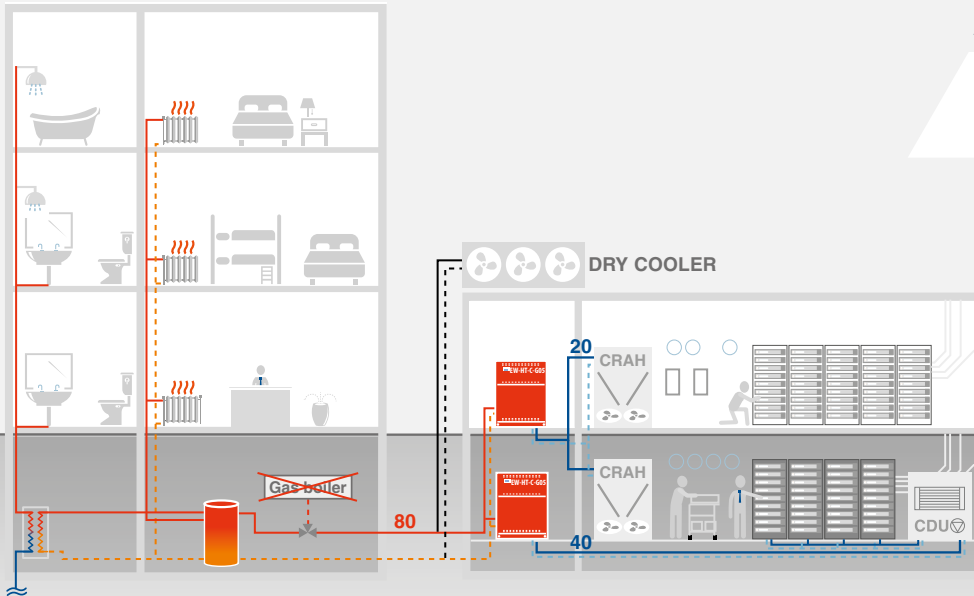
For many applications: the flexible link that completes today's systems and creates new usage opportunities

IT COOLING

No kWh wasted

Reduced carbon footprint

Wide application



Because of the high condenser leaving water temperature, EW-HT-C enables data centers to reuse exhausted heat for wide applications, resulting in having more chance to achieve higher ERF than lower temperature

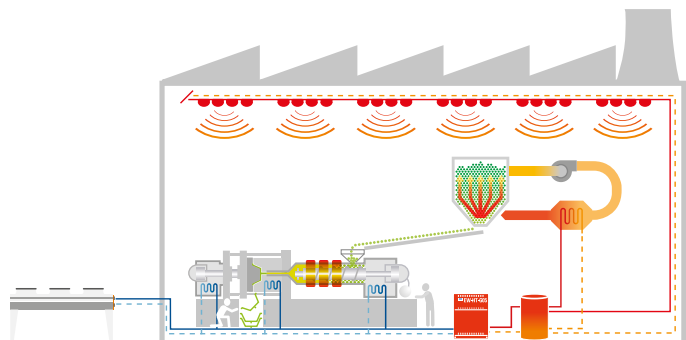
- ✓ No kWh wasted
- ✓ Reduced carbon footprint
- ✓ Possible to reuse heat in the same building, or sell heat to neighbouring buildings or district heating system
- ✓ Wide application
 - Room heating
 - Domestic hot water
 - District heating system (higher selling price at higher temperatures)

The wide range of evaporator leaving water temperature is suitable for both air-cooling and liquid-cooling systems.

- ✓ Efficient liquid cooling with “warm” chilled water
 - As secondary inlet temperature at CDU could be around 40°C or more, liquid cooling can enable higher chilled water, which optimize the overall performance of facility infrastructure.
- ✓ Flexible operation mode maximizes your efficiency
- ✓ Operation mode switches, adapted to heat demand and climate
 - Heat Recovery mode
 - Free Cooling mode
 - Chiller mode

The extraordinary operating range of EW-HT opens the doors to an infinite number of recovered heat usages, till now impossible.

Some examples are plastic or food drying, material pre-heating processes or also facilities space heating through high temperature ceiling radiant panels.



TECHNOLOGICAL CHOICES

CONTROL

W3000+ Controller: The customer has the same platform used on the larger machines and thus is facilitated in maintenance/start-up. Master-client function that manages up to 4 interconnected machines by rotation of them according to the working hours of each.

DEDICATED SCROLL COMPRESSORS

Fixed speed scroll compressors.
Specifically designed to work with High Temperatures
Operating envelope towards both high evaporating and condensing temperatures.
Balanced compression mechanism and robust components, for high durability, safety and silence.

HEAT EXCHANGERS

Plate heat exchangers
Blaze-welded dplate heat exchangers, dual circuit type.





INDEPENDENT REFRIGERANT CIRCUIT

Two independent refrigerant circuits in all sizes to grant: continuous and independent operation in any condition. Support the use of the extended operating range on the compressors.
High flexibility to the heating requests of the plant.

ELECTRONIC EXPANSION VALVE

Managed by proprietary dedicated logics to guarantee an excellent flow control and a highly precise temperature control in every load condition.

NEW INTRODUCED OPTIONS

The new EW-HT series is accompanied by a wide range of innovative options that further enhance the unit's performance.

External dry-cooler management:

It is mainly a dedicated logic for combining our chiller with the dry-cooler to achieve energy savings in IT cooling applications where the discharge water has higher temperatures and thus the effect of FC is enhanced.

Smart Grid Ready:

In case of electricity surplus, the heat pump can convert electrical energy into heat and thermally store it and then use it to boost the water temperature, when needed.

Leak detection systems:

EW-HT can be equipped with systems for early detection of refrigerant leakage than can also potentially shut-down the unit.

EW-HT

FOR DISTRICT HEATING:

Bringing 6-pipe system benefits to a larger scale

ON THE ROAD TO SMART CITIES:

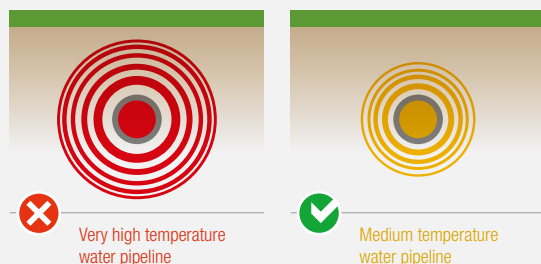
triggering renewables and cutting waste.

Favouring the development of systems based on medium temperature water loops, EW-HT unlocks attractive opportunities in district heating planning.

EASIER RENEWABLES DEPLOYMENT

Aiming to feed a medium temperature water loop, many sustainable technologies producing medium temperature heat become suitable to be the leading sources of the entire system.

Heat pumps, geothermal energy, process heat recovery and solar collectors can significantly enhance the share of renewables in the network source mix and, due to their aptitude for being localised production, favour the transition towards smart cities, where “passive users” become “active players”.



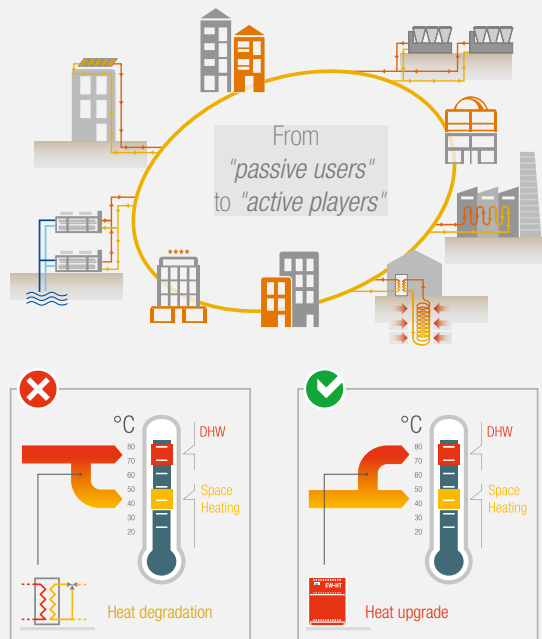
CUT OF PIPELINE HEAT LOSSES

Thermodynamics state that the rate of heat loss of a body is proportional to the temperature difference between the body and its surroundings. In other words, the higher the pipeline water temperature, the higher the heat losses.

In a district heating network, pipelines snake for several kilometres throughout an urban area or even an entire city. Lowering the city loop water temperature cuts heat losses and pipe insulation costs, really making a world of difference.

In district energy plants, a network of insulated pipes delivers hot and cold water from one or more centralized generation sites to nearby users. Efficiency gains and carbon savings explain the growing presence of district energy systems in urban planning. In these plants, the temperature of the water delivered depends on both consumers' needs and available heat sources. Usually the consumers are residential and commercial users, and the hot water, which is meant to cover both space heating and domestic hot water demands, is supplied at a very high temperature; however, lowering the water temperature can lead to further benefits.

A medium temperature water network can successfully cover the space heating demand and, thanks to EW-HT, can also be the source that produces domestic hot water, avoiding fossil fuels or electrical heaters.



HIGHER HEAT DISTRIBUTION EFFICIENCY

Circulating water at a very high temperature lowers heat distribution system efficiency and bins to “heat degradation”: before serving medium temperature hydronic terminals (fan coils, heating floors), the water temperature must be reduced.

EW-HT produces very hot water only when and where it is needed, avoiding unnecessary very high temperature pipelines and switching from a “heat degradation” scheme to a “heat upgrade” one.

“EXPERIENCE IS BY FAR THE BEST PROOF”

Waterfront

Genoa-Italy

Period:

2021 - 2024

Application type:

Residential buildings

System type:

Hydronic System, Air to Air System

Cooling capacity:

2000 kW

Heating Capacity:

2200 kW

Air flow:

30000 m3/h

Installed Units:

3x FX-W-G05 /H, 3x EW-HT,
7x WIZARD

PROJECT

Genoa will host one of the largest and most futuristic urban redevelopment projects on the border between land and sea. The master plan of the project, donated by the world-famous architect Renzo Piano to his city, will be called Waterfront di Levante and will occupy an area of approximately 110,000 m2 divided into 4 lots which will connect the Fiera del Mare area to the consolidated city.

CHALLENGE

Here the “hulls” will be built, a residential complex directly overlooking the sea and designed to respect the NZEB, Nearly Zero Energy Building, approach. These are the first two buildings in Liguria to be LEED certified, built with quality materials in full respect of the environment, with large glass surfaces to maximize the sea view and natural lighting. The project of the residential complex was entrusted to the Renzo Piano Building Workshop and OBR studios.

SOLUTION

For this project on the Levante Waterfront, Mitsubishi Electric will supply its heat pumps which, in addition to guaranteeing the ideal climate in any season, will also be used for the production of domestic hot water. Considering the proximity to the sea, the high efficiency FX-W-G05/H models will be installed for air conditioning and the EW-HT models will be installed for the production of domestic hot water, all of which will use the sea as a source. The FX-W-G05 /H unit in particular, was designed and re-adapted for the occasion to meet the needs of internal comfort and well-being, offering unbeatable levels of efficiency and a reduced environmental impact thanks to the use of the low GWP green refrigerant. The management of air exchange and re-circulation and primary ventilation will also be entrusted to the solutions of the Japanese company with the AHU WIZARD units, characterized by high-efficiency heat recovery systems and components capable of guaranteeing control of the air exchange conditions.





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