NETZERO+

HEAT PUMPS

CATALOGUE

NETZERO: MAXIMUM EFFICIENCY WITH THE MOST ADVANCED GROUND-SOURCE ENERGY

At NetZero we revolutionised ground-source energy with the first range of **heat pumps with variable speed compressor and Inverter technology**. Our heat pumps continuously adapt to real demand, eliminating the need for buffer tanks and reducing the size and cost of boreholes.

Compact, efficient and equipped with the main components, our heat pumps enable a simpler and more cost-effective installation without compromising top performance. NetZero leads the way in efficiency and sustainability in heating and cooling.

How ground-source installations work

Ground-source heat pumps, also known as brine-to-water heat pumps, **transfer heat from the ground or from a water source to a hydronic circuit**, which in turn distributes it to the building through another water circuit.

Ground-source systems stand out for their **lack of visual and acoustic impact**. However, they require a higher initial investment compared to air-source systems, due to the work required for heat collection (vertical boreholes, horizontal collection, phreatic collection, and other solutions).

The ground-source heat pump uses the thermodynamic cycle to provide heating, cooling and domestic hot water (DHW). In heating mode, it extracts heat from the ground or water and transfers it to the building. In cooling mode, it extracts heat from the building and dissipates it into the ground or water source.

In terms of efficiency, ground-source heat pumps offer higher performance than air-source heat pumps, which translates into **greater energy savings** and higher long-term cost-effectiveness.

TYPES OF COLLECTION SYSTEMS

Vertical boreholes

These wells consist of buried probes at depths between 80 and 150 metres.

Horizontal boreholes

These boreholes consist of probes buried horizontally at a depth of between 1 and 2 metres.

Groundwater collection

An open-circuit system that draws water from the groundwater table. After passing through a heat exchanger, the water enables the heat pump to extract energy.

Others

Geothermal baskets, thermoactive piles, geothermal pillars...

NetZero⁺ Inverter water-to-water heat pumps

NetZero's NetZero⁺ ground-source heat pumps can be coupled to any type of collection system thanks to their control strategies that adapt their operation to the characteristics of each type of source.

NetZero+ HP

WATER - WATER

Inverter ground-source heat pumps

- Inverter technology and Scroll compressor.
- Power ranges: 15-70 kW / 20-85 kW.
- Production of heating, active cooling, passive cooling, DHW and swimming pool.
- Control via the Internet with the ecoSMART easynet kit.
- Hybridisation with photovoltaic energy.
- Simultaneous production of heating and cooling.
- Hybridisation of collection sources with the ecoSMART e-source.
- Three-phase power supply (400V).
- Integrated energy and yield meters.
- Control of external auxiliary equipment (gas boilers, heating elements, etc.).
- **Variable speed compressor.**
- DHW recirculation control.
- **HTR technology** for DHW production, simultaneous production of services up to 70 °C without electrical support.

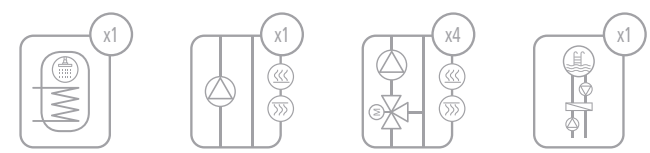
SERVICES

DHW | *Heating* | *Cooling* | *Swimming Pool*

EMISSION SYSTEMS

Radiators | *Fan coils* | *Underfloor heating and cooling*

MANAGEMENT OF PRODUCTION AREAS



DHW Management | *Management of 1 direct zone* | *Management of 4 mixed zones* | *Pool management*

Features

HTR
HIGH TEMPERATURE RECOVERY

INVERTER TECHNOLOGY

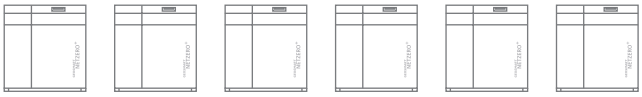
NetZero+ HP

MODELS

NetZero+ 15-70

NetZero+ 20-85

CASCADE



Simultaneous cooling and heating, the solution for high demands

The thermal needs of industrial, commercial and agricultural buildings present different energy demands than those of the residential sector. In many cases, such as hotels, fitness centres, spas, leisure centers or agricultural facilities, it is common to require simultaneous heating and cooling for a large part of the year. For these cases, a total heat recovery system with simultaneous production is the ideal solution. For this reason, NetZero has developed an exclusive technology for the efficient management of this type of installation.

The NetZero+ HP heat pumps are designed to handle these complex demands. Thanks to NetZero's advanced control strategies and their high modulation capacity, NetZero+ HP heat pumps can adapt their thermal power in real time, prioritising the most important demand at any given moment, and use ground-source collection in a modulated way, either as an energy source (heating mode) or as a dissipation system (cooling mode), to maintain an optimal thermal balance in any operating condition.

Ground-source solutions
NetZero⁺ HP

The ideal solution for a classic installation

Simultaneous production

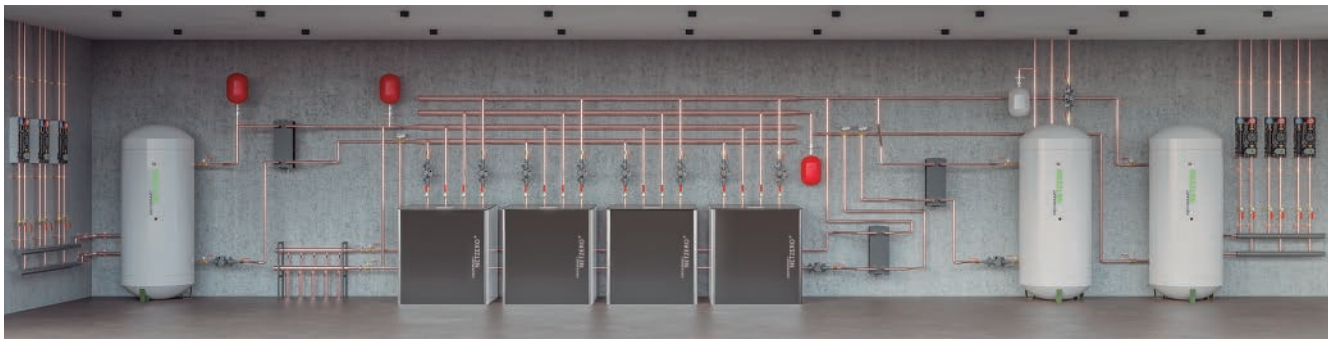
The NetZero⁺ HP heat pumps enable more efficient and simpler installations in both industrial applications and residential buildings with high thermal demands. Their ability to manage up to 5 heating and cooling zones, together with the integrated cycle inversion, ensures optimal adaptation to any type of demand. In addition, they offer the possibility of installing a DHW tank according to the needs of the building. Thanks to Inverter technology, with modulation ranges of up to 80%, the volume of the required buffer tanks is significantly reduced and can even be eliminated completely. Now, with the integrated HTR system, it is possible to produce DHW virtually free of charge, maximizing energy savings and system efficiency.

Cascade and simultaneous production

NetZero⁺ HP heat pumps can be installed in cascades of up to 6 units in parallel. This management capability is possible thanks to the use of the ecoSMART Supervisor manager, which allows an equal distribution of the operating hours of each unit in the cascade, optimising the life and efficiency of the system by seeking partial load operation of all heat pumps.

In addition, these heat pumps can manage heat recovery installations, simultaneous production of heat and cooling, with unique performance thanks to the exclusive control strategies developed by NetZero.

These two features make the NetZero⁺ HP ideal for installations where heating and cooling needs often occur simultaneously and represent a significant thermal power. In addition, the management capacity of the NetZero⁺ HP heat pumps is multiplied by the number of units that are part of the cascade, making this system more complete also in terms of control of the installation and its elements.



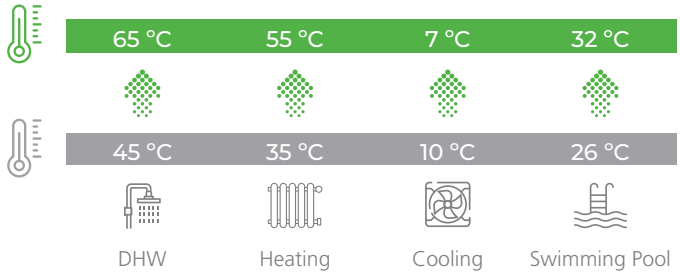
How photovoltaic hybridisation works

The heat pump is connected to an energy meter that measures the electrical balance between the installation and the grid. If the meter detects an injection reading corresponding to sufficient electrical power to start the system, the heat pump will activate a 'surplus mode.' This mode adjusts the setpoints of the installation's main services to store thermal energy, which will be fed into the grid if not consumed by this functionality.

This excess power is variable and can change over time, which is why the high modulating capacity of the NetZero+ and ecoAIR+ heat pumps is so important. The heat pump will adapt its consumption to consume only the excess energy available at any given time.

Once no excess energy is available, the heat pump will return to its normal operating mode, having stored as much energy as possible in the form of thermal energy for various services. This allows utilities to be supplied later without needing to restart the heat pump, significantly reducing electricity consumption from the grid.

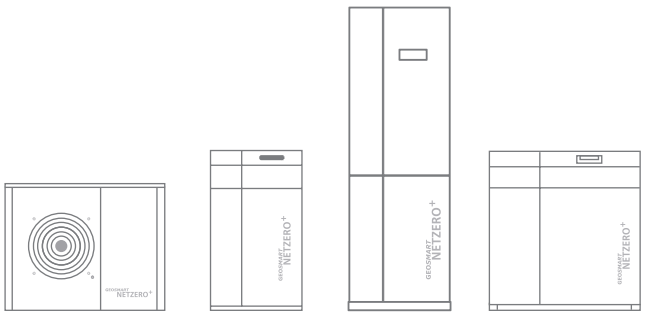
Setpoint temperatures



Unique hybridisation with photovoltaic panels

PV hybridisation is compatible with all types of installations and systems.

COMPATIBLE MODELS



ecoAIR+ *NetZero+ Basic* *NetZero+ Compact* *NetZero+ HP*

Functionalities

- Unique technology: European patent.
- Surplus management: storage of surplus renewable electrical energy as thermal energy.
- Tariff control: priority for heat pump operation during off-peak electricity price periods.
- Power limitation: modulation of the power consumed by the heat pump in order not to exceed an established maximum contracted power.
- Compatible with different production systems: photovoltaic, wind, hydroelectric...
- System that allows reducing or eliminating electric batteries for energy storag.

SOURCE MANAGEMENT

High power control

ecoSMART e-source

Combination of up to 3 collection sources

The ecoSMART e-source is a source manager designed for the NetZero+ HP heat pumps, allowing the integration of up to three types of heat sources (ground, air, phreatic and solar) in hybrid installations.

It incorporates an advanced defrost system, which avoids cycle reversal and allows sequential defrosting in installations with air units, guaranteeing high efficiency. Connected via pLAN, it optimizes performance by selecting the most efficient combination of sources at all times, reducing costs and improving system efficiency.

Among the exclusive functionalities of the ecoSMART e-source, it is worth mentioning the defrost management of the air sources. In this case, defrosting is performed without reversing the heat pump cycle and sequentially, allowing uninterrupted operation of the system.

In addition, the e-source activates and deactivates the sources based on the building's thermal demand, prioritising the first source and activating or deactivating the other two as needed.

- **Hybrid installations:** combination with NetZero+ HP heat pumps to integrate multiple energy sources, including ground, air, phreatic and solar.
- **High efficiency:** defrosting of air units without using the compressor and without the need to reverse the cycle.
- **High efficiency with several air sources:** sequential defrosting with more than one air unit.
- **Great versatility:** possibility of adapting to various energy sources to obtain greater control over the cost of the installation.

Control in community facilities

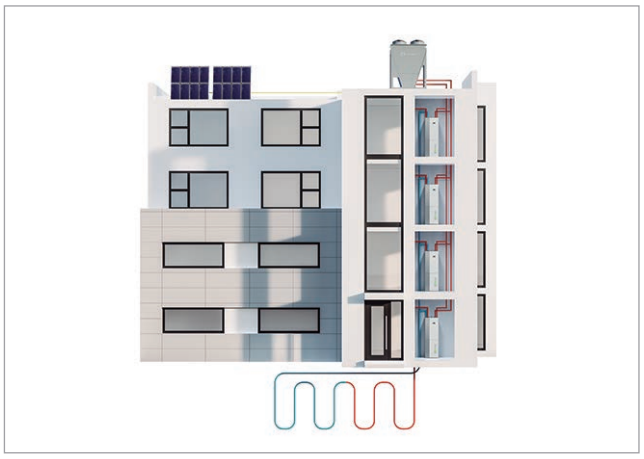
ecoSMART e-source community

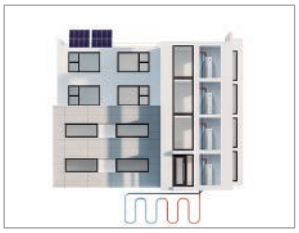
Combination of up to 3 collection sources

The ecoSMART e-source community is a system compatible with NetZero+ heat pumps, designed to manage installations with a common source of collection in community buildings. It allows the combination of up to three types of collection (ground-source, air-source and hybrid) and optimises performance with an advanced defrost system without cycle inversion.

It facilitates individualised management of heating, DHW and cooling, integrating energy meters to control individual and community consumption. In addition, the adaptive collection system and centralised defrosting maximise the useful life and performance of the installation.

- **Hybrid installations:** combination with NetZero+ HP heat pumps to combine several types of collection: air, ground and waste heat.
- **High efficiency:** defrosting of air units without the need to reverse the cycle.
- **Consumption control:** integrated energy meter for each house or common for the whole building.
- **High efficiency:** defrosting with dedicated air-source heat pump reduces defrosting time and improves seasonal performance.





Versatile solutions for buildings and communities

Decentralised installations

- Direct replacement of individual boiler installations.
- Compatible equipment: NetZero⁺ Compact models of the NetZero⁺ PRO and NetZero range, Basic models of the NetZero⁺ PRO and NetZero⁺.
- Compact size: 185 x 60 x 72 cm.
- Services: DHW, heating, active cooling.
- HTR technology: simultaneous production of DHW with cooling or heating.
- No buffer tank required.
- DHW tank included (165 l) in Compact models.

Centralised installations

- Direct replacement of boiler rooms.
- Different types of installation available.
- Compatible equipment: NetZero⁺ HP.
- Production of temperatures above 70º C.
- Services: DHW, heating, active cooling.
- HTR technology: simultaneous production of DHW with cooling or heating.

Compatible with heating and cooling networks

NetZero offers equipment compatible with heating and cooling networks, ideal for both residential and commercial applications. In addition, its technical office provides specialised support, providing customised designs and resolving queries for each installation.

REFERENCE PROJECTS

Multi-family building in Puishaven with a centralised heat pump system

Cascade of high-power water-to-water heat pumps with air-source collection
Netherlands

▶

78 dwellings in a multi-family building in the Netherlands have four NetZero NetZero+ HP 25-100 heat pumps with separate air collection through two air units that operate as independent sources. This 400 kW installation is capable of simultaneously producing heating and cooling, as well as DHW. Each apartment has an independent heating control unit.

Historic abbey with phreatic collection

Cascade of high-power water-to-water heat pumps
SPF: 4.1
United Kingdom

Two NetZero NetZero+ HP heat pumps provide heating and DHW to Bath Abbey, a historic building in the city of Bath (UK).

The installation captures up to 200 kW of thermal energy from the local hot springs, which maintain a constant temperature of 37 °C. These pumps heat the abbey and an adjoining office building via underfloor heating, achieving significant savings and reducing the carbon footprint.

Heat pump in combination with aquathermy

High power water-to-water heat pump
SPF: 3.2
Belgium

The recent renovation of Merode Castle, a Belgian historical monument dating back to the 14th century, faced significant challenges. These included adapting a heating system to work with the existing radiators, respecting the building's aesthetics and construction materials, and heating the castle's large interior spaces.

Thanks to the aquathermy, the heat pump captures the energy from the castle's moat and provides the energy needed to power the radiator circuit in combination with a back-up boiler and photovoltaic panels. Overall, the system achieves an impressive SCOP of 3.2 points.

NETZERO+

Respecting and protecting the environment has become a global priority. The best heating and cooling technologies focus on increasing efficiency and reducing pollutant emissions.

Our quality and environmental policy reflects our commitment to customer satisfaction and the preservation of the planet, through the design and manufacture of highly efficient climatisation systems with minimum emissions.

MADE FOR CANADA

No CO_2 emissions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