Guide Specifications

iMEX HP-N

AIR/WATER HEAT PUMP WITH AXIAL FANS AND INVERTER SCROLL COMPRESSORS

8-30 kW

December 2024

iMEX HP-N 002-008

Let's reinvent heating with heat pumps.
In our journey towards a sustainable future, innovation is enhancing electrical grids and power generation, making them more efficient and smarter and facilitating the integration of renewable energies.
As electricity becomes greener, the transition to all-electric heating systems using heat pumps is key to achieve net-zero emissions targets.
iMEX HP-N air-source heat pumps, with inverter compressor, deliver high water temperatures with maximum efficiency and silent operations; the ultimate sustainable solution to eliminate fossil fuels from your buildings.

1. GENERAL DESCRIPTION

Air source heat pump (ASHP) for outdoor installation, with variable speed drive (VSD) Scroll compressors in a single-circuit configuration, optimized for using R290 refrigerant.
All units are designed, produced, and checked in compliance with standards ISO 9001. Assembled with components supplied by premium manufacturers, the standard product is subject to:
• Electromagnetic Compatibility Directive 2014/30/EU;
• Machinery Directive 2006/42/EC;
• Pressure Equipment Directive 2014/68/EU.
All units are CE-certified and comply with EU ECODESIGN Directive 2009/125/EC and subsequent Reg 813/2013 minimum seasonal space efficiency requirements.
The performance is certified by Eurovent Chillers & Heat Pumps (LCP-HP) certification programme. Rated performances declared in accordance with EN14511:2022 and EN14825:2022 and verified by tests conducted by third-party laboratories.

2. HIGHLIGHTS

Cooling, heating and DHW from a single unit
The heat pump can efficiently provide hot water for space heating and sanitary purposes all-year round, even in extremely freezing weather. Furthermore, the unit can deliver chilled water for air-conditioning, operating up to 46 °C outdoor air temperature.
High performance in all conditions
The unit features variable speed technology on the compressors and fans, delivering high seasonal efficiency levels both in heating and cooling. Significant emissions and running costs reductions are guaranteed.
Extremely quiet operation

The heat pump is designed with an intense focus on acoustics, with innovative low-noise technologies on the compressor and the EC axial fans featuring an aerodynamic blade design. The result is an extremely quiet unit.

3. STRUCTURE AND CASING

Basement and panels made of galvanized carbon steel sheet subjected to phosphor degreasing treatment and painted with a polyester powder coating baked-on at 180 °C, to provide durable weatherproof protection. The structure and the panels finished in orange-peel RAL 7035P light grey with a matt surface finishing. The inner brackets are of carbon steel sheet painted with black RAL 9005 polyester powder coating.
The compressor compartment internally layered with thermal-acoustic insulation, composed of a 25mm layer in heat-bonded polyester fiber with a density of 40kg/m3 with open cells and 2mm layer of loaded rubber sheet of high specific weight (mass).
Self-supporting frame built to guarantee maximum accessibility for servicing and maintenance operations, thanks also to easily removable panels allowing a quick and easy access to the inside components from either side of the unit.

4. COMPRESSOR

Variable speed drive (inverter) scroll compressor qualified for R290, designed to deliver high efficiency and a wide operating envelope to cover all applications.
The compressor is hermetic, without sight-glass and Shrader valve to reduce risk of leakage. The power supply connection is not source of ignition. The compressor is fitted with a motor protection device for overheating, overcurrent and excessive temperatures of the supply gas and crankcase protection heater. The compressor is installed on rubber antivibration mounts and is complete with oil charge, specific for R290.

5. REFRIGERANT

R290 refrigerant gas, a low-GWP pure hydrocarbon (HC) with at least 99.5% or 99.9% purity, suitable for HVAC equipment.
According to Regulation (EU) 2024/573 of the European Parliament and of the Council of 7 February 2024 on fluorinated greenhouse gases, R290 features by an ODP (Ozone Depletion Potential) index of 0 (zero) and a GWP 100 (Global Warning Potential) value of 0.02, as indicated by IPCC AR6.
R290 is classified as a Class A3 (low toxicity, high flammability) according to EN 378-1:2020 and as a Class 1 gas (hazardous fluids) according to Directive 2014/68/EU [PED].

6. REFRIGERANT CIRCUIT

Refrigerant circuit complete with:

- drier filters;
- liquid receiver;
- pressure transducers (high and low pressure);
- electronic expansion valve;
- 4-way cycle inversion valve;
- high pressure safety pressure switch;
- relief valves to be ducted (high and low pressure) on models 006 and 008;

The refrigerant circuit is hermetically sealed on models 002 and 004.

7. OUTDOOR HEAT EXCHANGER

Finned coil exchanger made by 5mm internally corrugated copper tubes and aluminium fins. Copper pipes are brazed to the coil headers and joined, by mechanical expansion, to better adhere to the fin collar. The fins are appropriately spaced to ensure the maximum heat transfer and coated with a hydrophilic layer to ensure correct evacuation of the condensate water. The coil comes with a condensation collection tray integrated into the basement, with a hose for collecting condensate water.

8. FANS

Axial EC fans with integrated variable speed control, IP 54 protection rate, with external rotor and profiled metal sheet blades, housed in aerodynamic hoods and complete with safety grid. EC motor includes built-in thermal protection and meets the requirements of the current ErP Directive. Biomimetic blade design with a serrated trailing edge and unique rippled leading edge.
The fan assembly ensures smooth operation and high durability thanks to dynamic balancing on 2 levels and comes with VDE, UL, CCC, CE certifications.

9. INDOOR HEAT EXCHANGER

High-performance Brazed Plate Heat Exchanger (BPHE) with integrated distribution system. It is constructed as a plate package of corrugated channel plates (stainless steel plates AISI 304 on model 002 and 316/316L on models 004-008) and copper brazing.
The BPHE features a manual air bleed valve and drain valve and are equipped with external thermal insulation and anti-condensation cladding as per standard.
The unit is provided with an integrated flowmeter, to measure the water flow and protect the unit in case the flow rate is too low.
A metal mesh water filter is provided as per standard with the unit for installation in field. This filter must be installed on the heat pump return pipe to trap any impurities in the water circuit that may damage the units heat exchanger.

10. ELECTRICAL BOX

Integrated electrical box designed according to CEI EN 60335-1 / CEI EN 60335-2-40 / CEI EN 60204-1 featuring IPX4 protection grade on models 002-004. Sealed electrical box with IP54 on models 006-008, provided with a main disconnect switch with door-lock device.
The electrical box is complete with:

- Auxiliary component protection fuses;
- Compressor protection fuses;
- Fan motor circuit fuses;
- Electrical panel air cooling system (models 006-008);
- Leak detection signaling light (red) and detection system reset button (models 006-008);
- General alarm contact;
- 3-Way valve contact;
- Digital imputs: remote On/Off, remote Change over; Smart grid;
- SG Ready contacts.

11. ELECTRONIC CONTROL

Programmable microprocessor-based electronic controller, developed in compliance with the European RoHS directives, featuring a 32-byte microprocessor, delivering high power and operation processing speed. The control software and the operating parameters are saved to FLASH-MEMORY and E2prom, ensuring they are stored even in the event of power failures (without requiring a backup battery). The control board include 3 serial ports: a serial one, pLAN and two optional, Field Bus and BMS, so that supervision can be easily developed via the integration in third party systems by means of the most common protocols ModBus RTU and TCP/IP.
It is possible to connect 2 units in a modular configuration without the need for optional devices. The configuration can be extended up to 4, with the appropriate modularity kit.
The regulation logic features the complete management of the unit to deliver the maximum efficiency of the unit in all operating conditions, including advanced functions such as:

- Set-point management via climatic curves;
- Alarm management;
- Complete domestic hot water with anti-legionella cycles management;
- Consumption metering and performance measurement (visible to service);
- Anti-freeze control depending on the temperature of the evaporator outlet water;
- Anti-freeze heaters control (option);

- Leak detector maintenance warning (on models 006-008);

The controller is designed to be easily integrated with a smart grid, following its operating logic with 4 different operating logic and it is SG-Ready certified by Bundesverband Wärmepumpe (BWP).
Models 002-004 come with a remote touchscreen easy-to-use interface, with color 4,3" display, with integrated sensors for measuring room temperature and humidity. The interface shall be wall mounted and it is suitable for indoor installation. Models 006-008 come with integrated touchscreen easy-to-use interface, with color 4,3" display.

12. SAFETY EQUIPMENT

All models are provided with high-efficiency gas/water separator (supplied loose), to be mounted externally, that guarantees optimal system operation and can separate refrigerant from the water flow in case of heat exchanger failure.
The refrigerant circuit compartment (on models 006-008) has a leak detection and ventilation system. If a refrigerant leak is detected, the unit stops immediately, and the fan ensures its safe dispersion. Models 006/008 has a ductable relief valves on the high- and low-pressure sides to protect the refrigeration circuit.

13. TESTING

Before shipment, all units are tested in proper testing rooms.
In particular, the main checks performed are the following: correct installation of the components, absence of refrigerant leaks, seal control of the hydraulic circuit and electrical safety tests.

14. OPTIONS MOUNTED ON-BOARD

Circulation pump

Integrated inverter circulation pump, suitable for heat pumps operating with A3 refrigerant. The pump speed is fixed for cooling and heating operation (two distinct values). The working point can be changed by parameter.

Electric heater on the basement

Cable type electrical heater installed on the condensate collection tray, under the outdoor heat exchanger.

Electric heater on the BPHE

Optional antifreeze heater is available to protect the water side exchanger to prevent ice from forming if the water temperature drops below the pre-set value.

Coil protection grill

Robust and effective in protecting the air side coils during transportation, installation and extreme weather conditions.

Pre-painted outdoor heat exchanger

Copper pipes and aluminum fins, collectors and bends treated with an epoxy primer and a polyurethane-based paint (RAL 7001grey).