# NHE-RTU INVERTER

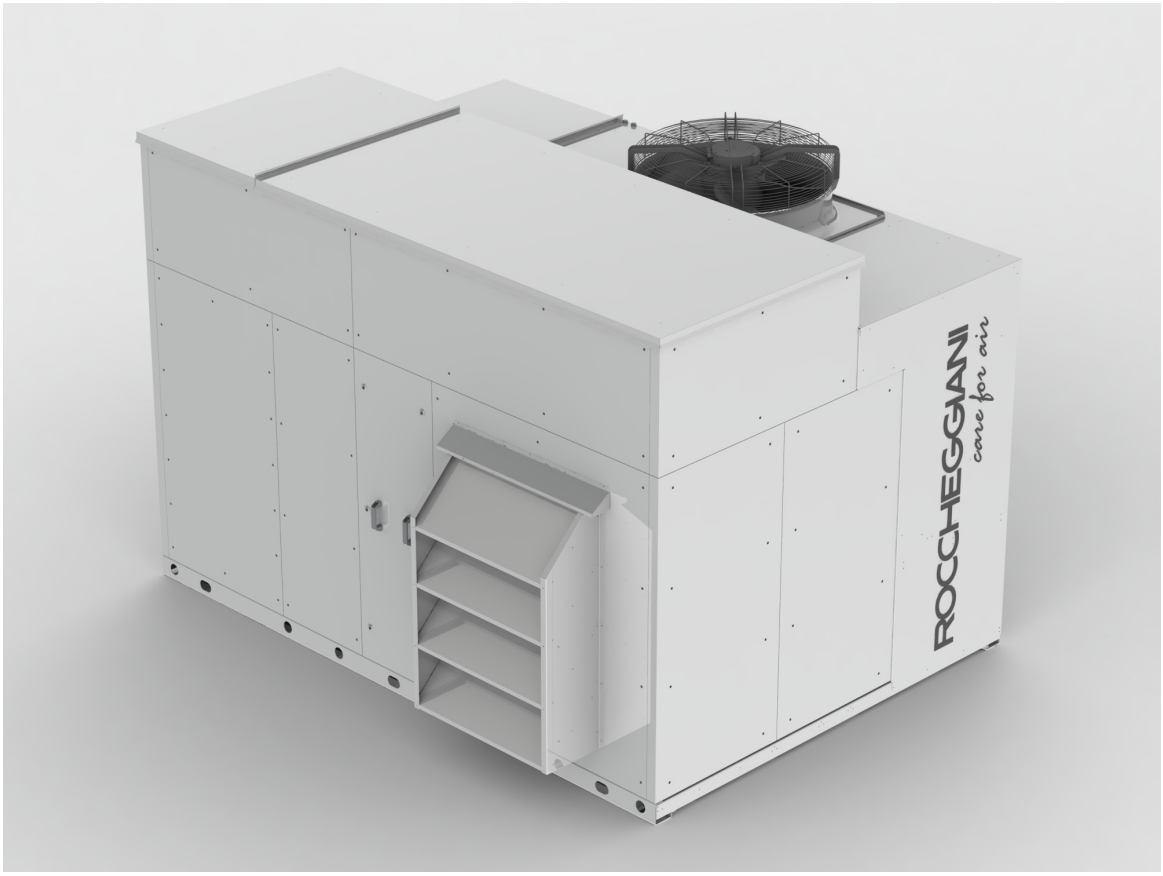
## HIGH-EFFICIENCY ROOF TOP UNITS

BIM READY

ErP 2021 COMPLIANT

R410A

- Air-to-Air type heat pump
- Nominal air flows from 9.000 to 20.000 $m^3/h$
- Cooling capacities from 50 to 114 kW
- Heating capacities from 52 to 120 kW




The high efficiency Roof Top Inverter units in the NHE-RTU range by Roccheggiani are designed (based on their chosen configuration and accessories) to guarantee the handling, renewal and purification of air inside buildings, especially in small and medium service applications, where an air system is likely to be the best solution for quick installation and commissioning and engineering simplicity.
New energy regulations pose a variety of challenges to air conditioning systems used over an annual cycle, that are increasingly based on the use of heat pumps, and may provide opportunities for improved comfort while reducing running costs, thanks to the use of variable speed technologies. These come in addition to an increasingly pressing approach focusing on reduced energy consumption as a component in new, more efficient small service facilities.
Compared to the use of non-inverter Roof Top units, the NHE-RTU Inverter units make it much easier to satisfy current energy standards and also provide numerous other advantages for both the owner and the user of the system.
The NHE-RTU Inverter units by Roccheggiani offer benefits such as precision in the generation and use of heating and cooling power, low energy use when they are switched on and general energy efficiency. These units are also fitted with specifically-designed features for small service applications, offering a high quality solution which enables ample exploitation of renewable energy heat pump technology and the intelligent use of free cooling, a standard feature on all NHE-RTU Inverter units equipped with air discharge and renewal sections.
These characteristics make the high-efficiency Roof Top units in the NHE-RTU range by Roccheggiani an efficient and “cost effective” solution in terms of the system's service life.

Publication: Sales technical information sheet for high efficiency Roof Top units (NHE-RTU Inverter)

## Regulatory Compliance

All the High-Efficiency Roof Top Units in the NHE-RTU Inverter range are assembled, tested under pressure, dehydrated, loaded and tested at a running test standard level before shipment. The Company's Quality System has been certified UNI EN ISO 9001 since 1996. In 2014 the Company was awarded UNI EN ISO 14001 Environmental Management certification. Over the years numerous certifications have been obtained for the various Roccheggiani product ranges from the most important European bodies (TÜV, Istituto Giordano, VKF-AEAI, GOST, AchillesJQS, etc.). Specifically, the High-Efficiency Roof Top Units in the NHE-RTU Inverter range are designed and manufactured in accordance with thefollowing regulations:

- Directive 2006/42/EU - Machinery;
- Directive 2014/30/EU Electromagnetic Compatibility (EMC);
- Directive 2014/35/EU Low Voltage Directive (LVD);
- Directive 2014/68/EU - PED;
- Directive 2009/125/EU - EcoDesign;
- Regulation (EU) No. 2016/2281 (ErP).

## Presentation of the scope of Application

The High-Efficiency Roof Top Units in the Roccheggiani NHE-RTU range are designed for annual-cycle air conditioning in places with different levels of occupation, where the use of air carriers offers advantages in terms of energy and monetary savings (at a TLC level) compared to conventional centralised or decentralised hydronic technologies.

The units respond to a wide spectrum of applications. They are particularly suitable for the following applications:


Industrial


Tertiary


Restaurants


Sports facilities


Wellness centres


Supermarkets


Shops


Medium-to-large sized shopping centres

# Presentation of the High Efficiency Roof Top Product in the NHE-RTU Inverter range

The High-Efficiency Roof Top Units from the Roccheggiani NHE-RTU Inverter range are low power packaged Air-to-Air type Heat Pumps designed to guarantee air handling, renewal and purification inside buildings with low, medium and high level occupation and can be used to advantage in medium and small facilities.

The NHE-RTU Inverter range covers air flow rates from 15,000 to 20,000 $m^3/h$, cooling capacities from 89 to 121 kW and heating capacities from 88 to 121 kW and, since they do not involve intermediate exchanges with fluid water or glycol-water, they have levels of overall efficiency greater than traditional hydronic systems based on the production, distribution and issue of heating and cooling energy with water as the carrier fluid (typical of conventional centralised hydronic systems consisting of Chillers, Boilers, AHUs, etc.).

The range includes the following variants:

| SIZES | 50 | 65 | 80 | 112 |
|---|---|---|---|---|
| 2 Construction Frames | | | | |
| Frame 1 | 50 | 65 | | |
| Frame 2 | | | 80 | 112 |

| 3 versions | |
|---|---|
| RO | Full recirculation version |
| RF | Version with mixing box fitted with 2 dampers and fresh air intake for 50% of the nominal flow rate |
| RFE/RTA | Version with mixing box fitted with 3 dampers and fresh air intake/active thermodynamic recovery for 100% of the nominal flow rate |

| Free Cooling | |
|---|---|
| RO | Not included |
| RF | Fitted with sensitive and enthalpy types, up to a maximum of 50% of nominal capacity |
| RFE/RTA | Fitted with sensitive and enthalpy types, up to 100% of nominal flow rate |

The High-Efficiency Roof Top Units from the NHE-RTU Inverter range are Packaged units, designed to be positioned outdoors (typically on the roof) and use heat pump technology, which enables the units to be extremely compact and efficient.

By exploiting the heat pump principle, Roof Top Units can use the heat contained in the air, which is a certified renewable energy source under European Directive 2009/28/EC (the RES - RENEWABLE ENERGY SOURCE Directive), resulting in significant savings in primary energy consumption compared to conventional systems that use boilers for heating in winter. Furthermore, if combined with a photovoltaic system for electricity generation with adequate capacity and operating logics, the units in the NHE-RTU Inverter range can become air-conditioning systems that use solely renewable energy.

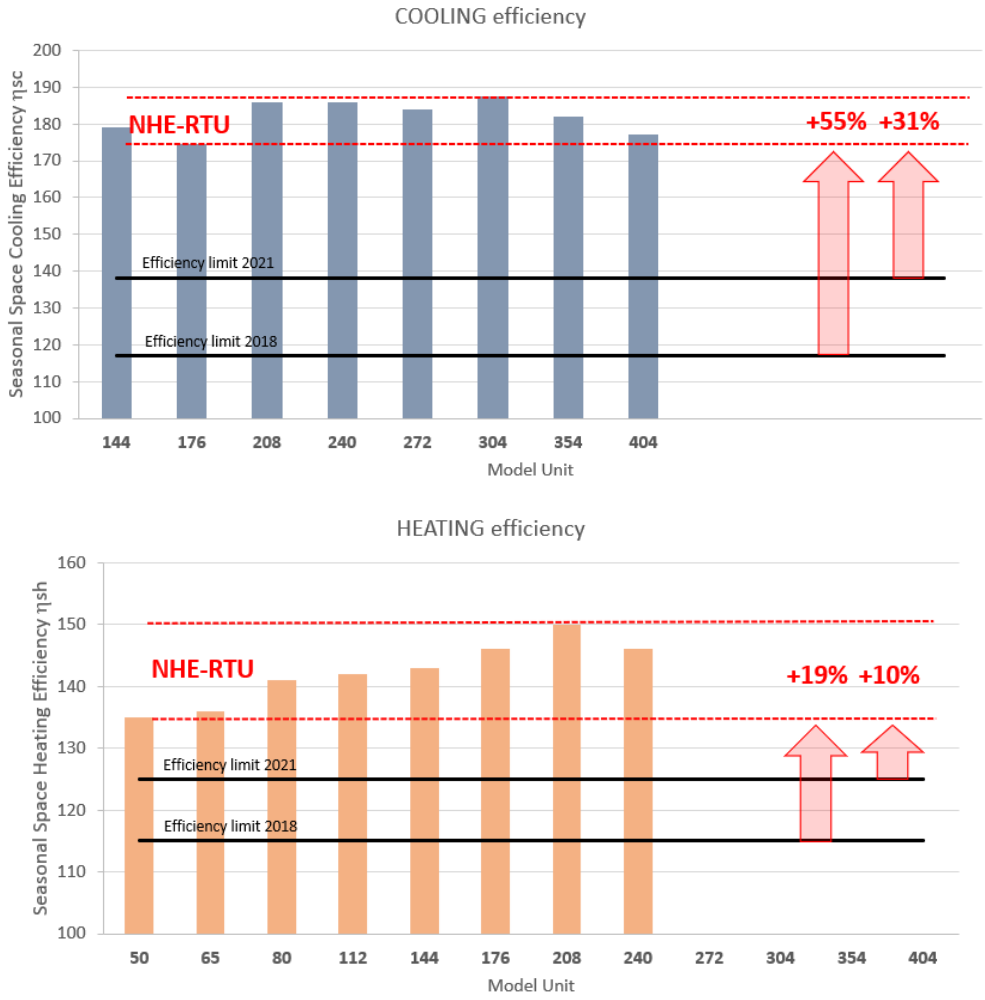
In addition to these substantial advantages, in order to minimise the consumption of primary energy from “non-renewable” sources, the NHE-RTU Inverter range has been designed to exploit the highly advantageous Free Cooling (also available, according to the versions, for 100% of the handled air flow) and heat recovery through two separate technologies: active thermodynamic heat recovery and sensitive and latent heat recovery through a high efficiency enthalpy wheel.

The High-Efficiency Roof Top Units from the NHE-RTU Inverter range are manufactured, in compliance with the UNI EN 12100 Standard and the CE mark directives, according to an ISO 9001-certified quality assurance system and use Gas R410A as a refrigerant, in line with the applicable legislation.

## NHE-RTU Inverter: the range was developed, already in line with the rigorous ERP 2021 standards

The high-efficiency Roof Top units in the NHE-RTU Inverter range are units designed (based on the chosen configuration and accessories) to guarantee the handling, renewal and purification of air inside buildings and stand apart from a large number of similar products on the market due to their particularly high energy-efficiency levels.

The range was in fact designed with a particular focus on energy efficiency and its values for Minimum Energy Performance Standards under the ECODESIGN Regulation (EU) No. 2016/2281 - ENER LOT 21, not only meet the TIER 1 performance requirements of 01/01/2018, but also the more stringent levels established by TIER 2, which will come into force on 01/01/2021.




Values for Minimum Seasonal Energy Performance Standards under the ECODESIGN Regulation (EU) No. 2016/2281 - ENER LOT 21 for the Roof Top category and ranking of the RO version in the NHE-RTU Inverter range.

Right from the initial conception phase, the focus on energy efficiency was the guiding force behind the overall design of the unit and the selection of components: highly-efficient fans, generous sizing of heat exchange surfaces, maximum exploitation of heat pump technology, thermodynamic and enthalpy recovery systems and free cooling.

All these elements ensured the creation of a range with seasonal energy efficiency values well above the standards required by ErP 2021.

This aspect is undoubtedly crucially important for designers whose main aim is to offer their customers solutions that look ahead to meet the future higher standards and that surpass today's ErP 2018 solutions by an average of +24% to +56% in terms of obtainable energy efficiency.

# Description of the Units and main components

## Casing

The housing is made to allow the units to be installed outside, ensure a high degree of isolation of the handled air, protect all the internal components and ensure proper structural rigidity during transportation and installation.
The units are equipped with rain-proof grilles on the fresh air intakes and on the exhaust air outlets, while the evaporating/condensing section may have (as an accessory) wire protection meshes.

## Base

All sections are firmly secured to a suitably reinforced perimeter base with a standard height of 150 mm, made in thick press-formed, coated metal sheet, which provides adequate rigidity to the unit. The base is provided with holes to allow the unit to be lifted and also positioned, normally on the roof of the building, or wherever it is to be installed.

## Air handling section panels

The housing of the High Efficiency Roof Top Units in the NHE-RTU Inverter range, in the air handling section, is characterised by a load-bearing structure made from coated steel profiles coupled to the sandwich panels.
The panels have a thickness of 50 mm and are insulated with polyurethane foam (density approx. 45 kg/m$^3$). The inside of the panel is in galvanised sheet metal and the outside is in pre-coated galvanised sheet metal. The panelling can be easily removed ensuring efficient access to the internal components for routine and major maintenance.
The sandwich type panels (sheet metal/polyurethane/sheet metal) were tested by the Istituto Giordano SpA according to the UNI 9177:1987 standard with the following results:
- category 1 with the test method according to the UNI 8457 and UNI 8457/A1 standards;
- category 1 with the test method according to the UNI 9174 and UNI 9174/A1 standards.

## Heating and Cooling energy generation section panels

The Heating and Cooling energy generation section is equipped with a self-supporting structure and non-insulated closing panels made of thick, coated, galvanised steel sheet.

# Air handling section components

The air handling section manages filtration, heating and cooling and summer reheating with hot gas (or alternatively reheating with water), air intake from the rooms, the fresh air intake, the air discharge outlet and ventilation.

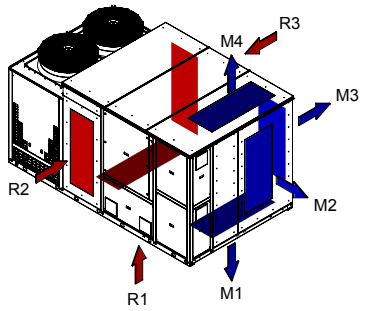
While the part for heating, cooling, summer reheating with hot gas (or alternatively reheating with water) and supply ventilation are more or less the same in all 5 versions (RO – RF – RFE/RTA), the sections for air intake from the rooms, fresh air intake and air discharge outlets can have significantly different configurations according to the various versions described below.

## RO Version

(Only recirculation)

### Air intake in air-conditioned space (RA1 - RA2)

The air handling section includes an air return inlet that recaptures the air from the air-conditioned rooms via suitable connections with the air ducts.
The RO version features total recirculation and so it is fitted with only one air intake hole on the side (RA1) or at the bottom (RA2).
The units are fitted with variable-speed fans for calibrating the air flow from the air-conditioned rooms, so no damper is needed. If one was required, it can be supplied as an accessory.




## RF Version

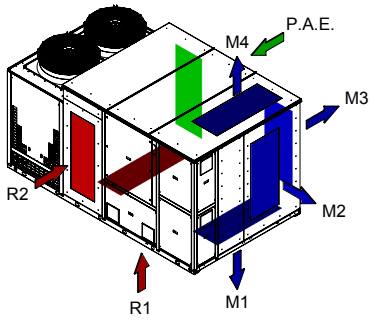
(Mixing box fitted with 2 dampers - free cooling max 50%)

### Air intake in air-conditioned space (RA2)

The air handling section includes a return section that recaptures the air from the air-conditioned rooms through suitable air ducting connections, via the bottom part of the unit (RA2).
There is no need for a damper for the calibration of the air flow from the air-conditioned rooms, as the units are provided with variable-speed fans. If one was required, it can be supplied as an accessory.

### Fresh air intake (PAE1)

This section has a fresh air intake (PAE1), fitted with an aluminium damper and a large-pitch rain-proof grille, which allows the unit to suck in up to 50% of the nominal air flow from the outside.
The fresh air intake damper is equipped with a servo-motor to control the air flow and, in combination with the fan control, can provide free cooling to up to 50% of the total supply air flow.




## RFE / RTA Version

(Return fans, mixing box fitted with 3 dampers, active thermodynamic recovery - free cooling max 100%)

### Air intake in air-conditioned space (RA1)

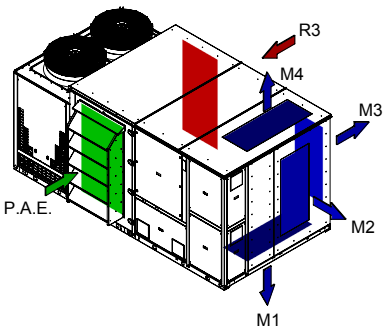
The air handling section includes a return section that recaptures the air from the air-conditioned rooms through suitable air ducting connections, via the side part of the unit (RA1).
There is no need for a damper for the calibration of the air flow from the air-conditioned space, as the units are provided with variable-speed fans, also in the air discharge fan section. If one was required, it can be supplied as an accessory.

### Fresh air intake (PAE2)

This air intake section has a fresh air intake (PAE2), fitted with an aluminium damper and large-pitch rain-proof grille, which allows up to 100% of the nominal air flow to be sucked in from the outside.
The fresh air intake damper is equipped with a servo-motor to control the air flow and, in combination with the fan control, can provide free cooling to up to 100% of the total supply air flow.

### Air discharge (EXP1)

The discharge of waste air from the rooms (EXP1) is fitted with an aluminium damper and enables the air, up to 100% of the nominal air flow, to be discharged outside the unit near the external (condensing – evaporating) heating and cooling generator section so as to take advantage of the energy content in the waste air, through the active thermodynamic recovery system.




### Undulated synthetic filters

In standard configurations, units use pleated synthetic-fibre filters with regenerative cells, 48 mm thick with self-extinguishing filtering media bound with chlorine-vinyl resin, complete with galvanised sheet metal frame with U-profile th.8/10, with double-welded galvanised metal mesh. Filtering class: G4 according to standard EN 779.

### Rigid bag filters F7 – F9 (Optional)

In addition to the standard-supplied G4 filter, the units can also be fitted with compact filters with F7 or F9 efficiency rating.
Filtering class: F7 – F9 according to standard EN 779.

### Optional summer hot-gas reheating coil with 1 row

Under specific external conditions in summer mode, when you need to dehumidify, there is often a risk of the air supply temperature being too low. The (optional) hot gas coil, after the air handling coil, allows you to increase the supply temperature, using the free heat coming from the condensing part of the unit.
It has two advantages: improving comfort in the room being served and improvement in the unit's efficiency. This reduces the thermal load to the external condenser, improving the efficiency of the cooling cycle of the unit.
In relation to the cooling circuit, the coil is located immediately after the compressor and is crossed by all the gas flow, providing maximum thermal output in reduced dimensions (only 1 row), which ensures very low pressure drops and optimised unit efficiency.

### Supplementary electric heating coil (optional)

In particularly harsh climates and where it is necessary to use electricity for preheating the fresh air, you can (optionally) include a supplementary electric heating coil.

### Electronic filters H11 (Optional)

The electrostatic/electronic filter consists of electrostatically-charged active aluminium plates.
It is a purification system which separates and removes solid contaminants (dust) and liquid contaminants (oily vapours) from the intake air flow.
By means of a difference in potentials generated between the input and output electrodes, the system ionises and separates the contaminants from the air that flows between the electrodes.

When the filter is saturated, it only needs to be washed with water and detergent to remove the dirt and allow regeneration. This improves the length of useful life and significantly reduces running costs compared to units fitted with high-efficiency mechanical filters.
The main features are:
- completely sealed, integrated electronic circuit;
- multi-polar connections for mains supply (230V - 50/60 Hz) and for connection in series;
- self-centring system capable of compensating construction imperfections up to 3 mm of error;
- filter status displayed on the incorporated LED on the filter (accessory)

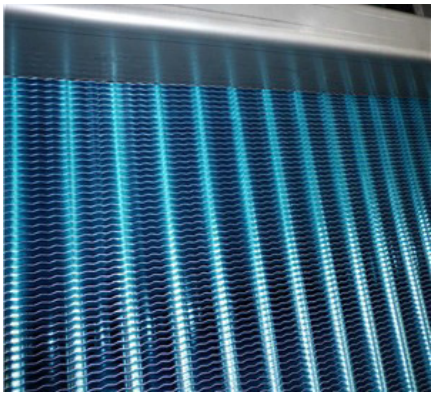
Performance
- high filtration efficiency on particles of 0.3-0.4 microns, comparable to E10, E11 class under the UNI 1822:2009 standard and comparable to the F7, F8, F9 class under the EN 779:2012 standard;
- excellent solution against outdoor pollution from PM10, PM2.5 and PM1;
- significant reduction of air bacterial load;
- excellent protection of the heat-exchange coils and air distribution ducts.

Compared to conventional filtration, the electronic filter provides:
- significant energy savings due to low pressure losses;
- constant filtration efficiency up to a load of 600 g of fine particulates;
- reduced maintenance costs.

Furthermore, electronic filters have high antibacterial power due to high efficiency with sub-micron particles and to the electric field action.
Electrostatic filters only cause minimal pressure drop increases compared to the initial pressure as a result of accumulated soiling of the filter itself. This feature, combined with a high, pollutant accumulation capacity, allows filters to be used for longer periods between one maintenance cycle and the next.

## Handling section (heating/cooling)

Downstream of the filtering section there are one or more refrigerant/air heat exchangers dedicated to handling the supply air for the rooms to be air-conditioned, with copper pipes and aluminium fins.
The excellent heat exchange capacity of the coil is guaranteed by the mechanical expansion of the copper pipes inside the aluminium fin pack so as to ensure adequate heat transfer between the primary and secondary exchange surfaces.
Each heat exchanger coil is designed for maximum heat exchange performance with low aerodynamic losses at the same time. The diameter of the pipes and the space between the fins, ensures a very high heat exchange levels between refrigerant and air flow. The coil is in hydrophilic aluminium allowing condensation water to slide-off quickly.
The heat exchanger coil is equipped with a condensation collection tray made of AISI 304 stainless steel, with condensation-proof insulation and is fitted with a drain hose.



## Supply Fan Section

The fans used for the supply section are of the plug-fan type with reverse blades and high energy efficiency. The fans are directly coupled to the motors, resulting in intrinsic reliability and efficiency as there are no belts, no related energy dissipations and no need to perform maintenance or adjustments on belts.
Electronic speed control, typically from 10% to 100% , allows ample margins for adjustment to the characteristics of the plant and ensures comfort during operation of the unit, compensating for flow variations due to progressive fouling of the filters or ducts. This type of fan thus provides extreme flexibility and efficiency.

## Optional supplementary, 2-row heating coil using hot water (provided by an external generator)

In particularly harsh climates and where it is necessary to preheat the fresh air you can (optionally) include a supplementary heating coil that uses hot water.
The heating coil that uses hot water acts to integrate the heating capacity of the heat pump and extend the operating limits of the unit. The coil can be used for partial or total integration depending on requirements.
The coil is designed to maximise heat exchange and at the same time reduce air pressure drops as much as possible, on the air side.
The water-based heating coil can be combined with a servo-controlled three-way valve. It is handled by the 0-10V control signal and allows fully automatic adjustment of the water coil.

## Supplementary heating module with gas combustion Hot air Generator (Optional)

This accessory consists of an additional structure consisting of a combustion chamber and condensation burner with modulating regulation.
The module is made of steel and aluminium and is available with different capacities to further heat the supply air. It can be chosen with partial or total integration in the unit.
The pre-mixing and modulation technologies allow condensation to be achieved with efficiencies of up to 109%, calculated on the basis of the net calorific value (Hi).
The module produces low polluting emissions (NOx lower than 45mg/kWh) and during installation it must be connected to the unit.
The gas module is compatible only with the horizontal room air supply format.

## Waste air fan section: RF/RTA, RFE/RTA and RFE/RTA/RRE versions

The fans used for the waste air section are of the EC plug-fan type with reverse blades and high energy efficiency. The fans are directly coupled to the motors, resulting in intrinsic reliability and efficiency as there are no belts, no related energy dissipations and no need to perform maintenance or adjustments on belts.
Electronic speed control, typically from 10% to 100% , allows ample margins for adjustment to the characteristics of the plant and ensures comfort during operation of the unit, compensating for flow variations due to progressive fouling of the filters or ducts. This type of fan thus provides extreme flexibility and efficiency.

# Heating and cooling energy generation section components

## Cooling section

All NHE-RTU Inverter units have bi-circuit cooling sections with 1 Inverter compressor per circuit, which provides continuous power modulation from 30% to 100%. The cooling section consists of the following components:

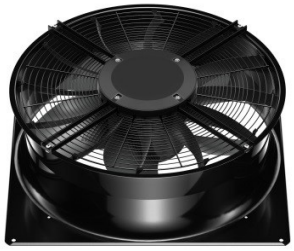
- Hermetic Scroll Inverter compressors with orbiting spiral complete with motor protection against overheating, power surges and excessive temperatures in the supply gas. The compressors are mounted on rubber anti-vibration grommets and come complete with oil charge. The automatic oil heater prevents oil being diluted by the coolant when the compressor is shut down.
- 4-way cycle reversing valve, electronic expansion valve, check valve, high pressure safety valve, liquid indicator, filter drier, liquid receiver, liquid separator, high pressure safety pressure switch, low pressure safety pressure switch and coolant charge.

## External condenser/evaporator fan section

The High-Efficiency Roof Top Units in the NHE-RTU Inverter range are equipped with an evaporator/condenser section with double circuit fitted with heat exchanger coils with copper tubes and aluminium fins and high efficiency axial fans with profiled blades in high-strength polymer, with IP54 internal overheating protection. The fans are equipped with high-efficiency blades allowing greater air flow with a reduction in the level of noise emitted.

External coils are arranged in a V. The angle of the coils and the careful selection of the internal circuits, provide even heat exchange over the entire surface, thus avoiding areas of lower heat exchange. At the base of the coils there is a "sub-cooler". This add-in allows you to avoid or restrict ice formation during heat pump operation with the result of reducing the number of defrosts per day, all providing a significant increase in seasonal efficiency in heating mode. The finned coils have a hydrophilic aluminium exchange pack that, in heat pump mode, allows the need for defrosting to be delayed and also reduces the time required for it, favouring an increase in seasonal efficiency in heating mode.

The fans are of the axial type with EC type Brushless motor. These are the main components and their characteristics:
- high-efficiency electric motor with high power density;
- inverter directly coupled to the motor, suitable for 50 and 60 Hz. Automatic protection against overheating;
- plastic polymer blades with low drag wing profile, aerodynamically constructed to reduce noise. Maximum resistance to UV rays and corrosion;
- dual-angle flow nozzle to recover part of the dynamic static pressure and minimise losses in outflow;
- rectification grille, essential for further recovering static pressure and minimising aerodynamic turbulence to reduce noise levels;
- protection grille according to DIN EN ISO 13857, designed to reduce the pressure drops and double-coated for maximum resistance to weathering.



## Electric power and control section

The Electric power and control section varies according to the chosen configuration of the unit and is generally characterised by the following elements.

The power section includes:
- door-locking main isolation switch;
- compressor protection circuit breaker;
- compressor remote control switch;
- fan motor thermal protection on the internal section and external section;
- circuit breaker on auxiliary circuit;

The microprocessor control section includes:
- compressor protection and timing;
- clean contacts for remote ON-OFF, cumulative alarm, fire alarm input, fan status, compressor status, cooling/heating mode change;
- phase monitor;
- RJ45 connector placed on the external surface of the unit for inspection and maintenance operations;

Remote control with user interface:
- switching the unit ON and OFF;
- daily/weekly programming for switching the unit, or just the fan, ON or OFF;
- manual change of operating mode (hot or cold) and/or of the temperature set-point;
- display of alarms and machine status;
- management of the main operating parameters (password protected);
- selective key locking with password-protected release;
- Power section with dedicated electric panel;
- Microprocessor control section;
- Control and user interface.
-

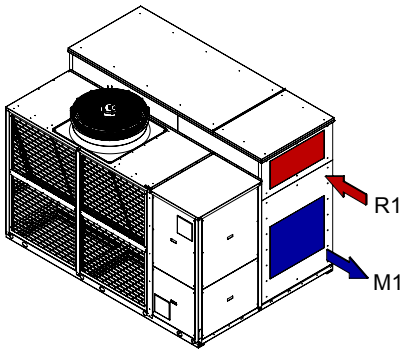
The integrated automatic control of the unit controls and monitors operations and set-points. The control system is based on a programmable microprocessor control for HVAC/R systems.

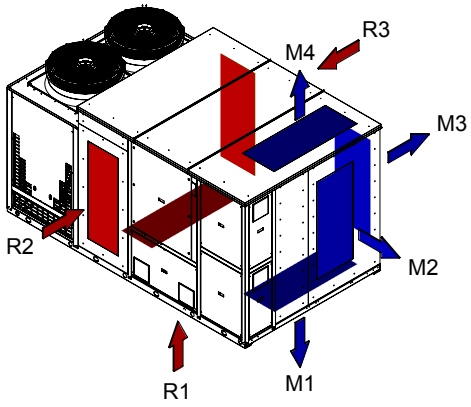
# Possible directions and positions of the air distribution connections according to the various versions

The use of Plug-Fan type fans affords great flexibility in the choice of the position of the supply inlet grille on the unit, which can be on the side, at the front or at the bottom on all versions.

## RO Version

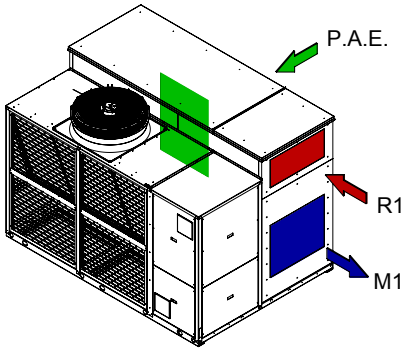
(Only recirculation)

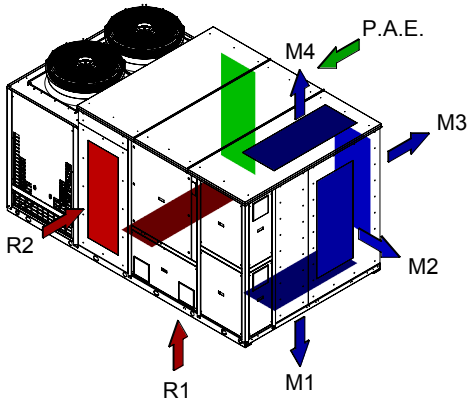



## RF Version

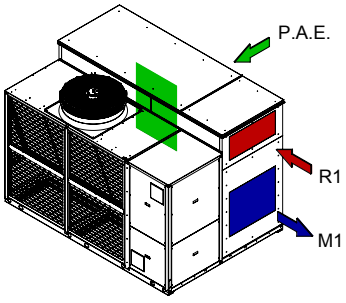
(Mixing box fitted with 2 dampers - free cooling max 50%)

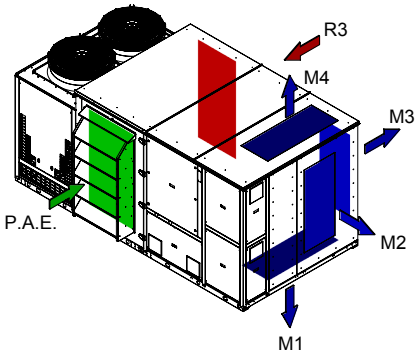



## RFE / RTA Version

(Return fans, mixing box fitted with 3 dampers, active thermodynamic recovery - free cooling max 100%)




SUPPLY RETURN FRESH AIR

# General technical data

## RO Version (solely recirculation)

| **Model NHE-RTU Inverter** | | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|---|
| Version | | | RO | RO | RO | RO |
| Free Cooling | | | - | - | - | - |
| Active Thermodynamic Heat Recovery (RTA) | | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **Performance** | | | | | | |
| Total Cooling Capacity | (1) (2) | kW | 50.1 | 63.6 | 84.2 | 113.9 |
| Sensible Cooling Capacity | (1) (2) | kW | 37.5 | 46.9 | 63.8 | 85.2 |
| Absorbed power | (1) (2) | kW | 12.0 | 16.9 | 18.5 | 30.6 |
| EER Compressors only | (1) (2) (3) | | 4.17 | 3.75 | 4.55 | 3.72 |
| SEER Seasonal Energy Efficiency Ratio | (4) | | 4.63 | 4.64 | 4.53 | 4.59 |
| ηs,c Seasonal Space Cooling Efficiency | (5) | % | 182 | 183 | 178 | 181 |
| Energy Efficiency Class | (6) | | A | A | A | A |
| Total Heating Capacity | (7) (8) | kW | 51.8 | 66.2 | 84.9 | 119.7 |
| Absorbed power | (7) (8) | kW | 11.1 | 14.3 | 17.4 | 27.7 |
| COP Compressor only | (7) (8) (9) | | 4.65 | 4.63 | 4.89 | 4.32 |
| SCOP Seasonal Coefficient of Performance | (4) | | 3.46 | 3.53 | 3.46 | 3.61 |
| ηs,h Seasonal Space Heating Efficiency | (5) | % | 135 | 138 | 135 | 141 |
| Bivalent Temperature | (5) | ° C | -7.0 | -7.0 | -7.0 | -7.0 |
| Energy Efficiency Class | (6) | | A+ | A+ | A+ | A+ |
| **Reheating** | | | | | | |
| Total Heating Capacity | (10) | kW | 19.9 | 25.0 | 32.8 | 43.7 |
| **Supply fan section (High static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 560 | 560 | 450 | 560 |
| Airflow | | m³/h | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | m³/h | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 5.0 | 5.0 | 4.5 | 5.0 |
| Supply Fan Nominal Current | | A | 7.7 | 7.7 | 6.8 | 7.7 |
| External Static Pressure | (11) | Pa | 660 | 490 | 740 | 570 |
| **Supply fan section (Low static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 500 | 560 | 450 | 500 |
| Airflow | | m³/h | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | m³/h | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 3.5 | 4.4 | 2.9 | 4.2 |
| Supply Fan Nominal Current | | A | 5.3 | 6.6 | 4.5 | 6.4 |
| External Static Pressure | (11) | Pa | 350 | 300 | 320 | 370 |
| **Fresh air intake** | | | | | | |
| Airflow | | m³/h | - | - | - | - |

Notes:
(1) Internal Air Temperature 27°C B.S./19°C B.U. Fresh Air Temperature 35°C B.S./24°C B.U. (According to EN14511 - Table 4 - Cooling Mode)
(2) Performance with Air in full recirculation 27°C B.S./19°C B.U.
(3) EER refers only to cooling compressors
(4) According to EN 14825:2016
(5) According to Regulation ECODESIGN (EU) No. 2016/2281 – ENER LOT 21 (ERP)
(6) According to Certification Program (RT) rated up to 200 kW in cooling capacity/n.a. = not applicable
(7) Internal Air Temperature 20°C B.S./12°C B.U. Fresh Air Temperature 7°C B.S./6°C B.U. (According to EN14511 - Table 3 - Heating Mode)
(8) Performance with Air in full recirculation 20°C B.S./12°C B.U.
(9) COP refers only to cooling compressors
(10) Heating power in hot gas reheating operation in summer conditions, referred to inlet air temperature at the reheating coil of 14°C and fresh air temperature of 35°C
(11) External static pressure (maximum available) overall for return air intake from the rooms and for supply, with clean standard G4 filter

# General technical data

## RO Version (solely recirculation)

| Model NHE-RTU Inverter | | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|---|
| Version | | | RO | RO | RO | RO |
| Free Cooling | | | - | - | - | - |
| Active Thermodynamic Heat Recovery (RTA) | | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **External Fan Section (Condensing- Evaporating)** | | | | | | |
| Fan Type | | | Axial EC | Axial EC | Axial EC | Axial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 800 | 800 | 800 | 800 |
| Airflow | | $m^3/h$ | 22825 | 22825 | 48000 | 48000 |
| Single fan Airflow | | $m^3/h$ | 22825 | 22825 | 24000 | 24000 |
| Supply Fan Motor Rating | | kW | 2.56 | 2.56 | 2.56 | 2.56 |
| Supply Fan Nominal Current | | A | 3.9 | 3.9 | 3.9 | 3.9 |
| **Compressors** | | | | | | |
| Compressor | | | BLDC Scroll | BLDC Scroll | BLDC Scroll | BLDC Scroll |
| Total Compressor Number | | no. | 1 | 1 | 2 | 2 |
| Modulation Control | | | Inverter | Inverter | Inverter | Inverter |
| Number of Refrigeration Circuit | | no. | 1 | 1 | 2 | 2 |
| Number of Compressor per Circuit | | no. | 1 | 1 | 1 | 1 |
| Capacity step | | no. | 30-100% | 30-100% | 30-100% | 30-100% |
| Refrigerant | | | R410A | R410A | R410A | R410A |

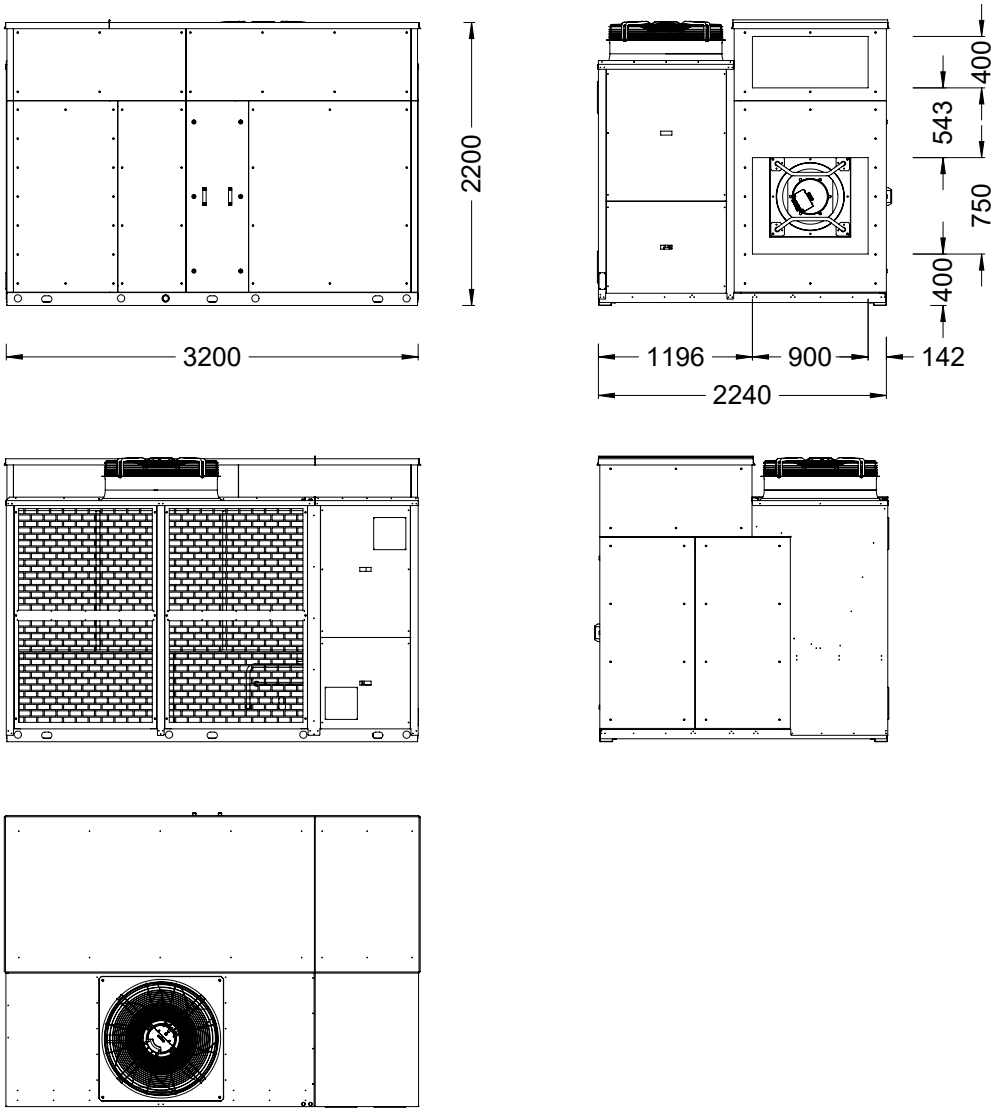
# General Dimensions and Weights

## RO Version (solely recirculation)

| Model NHE-RTU Inverter | | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|---|
| Version | | | RO | RO | RO | RO |
| Free Cooling | | | - | - | - | - |
| Active Thermodynamic Heat Recovery (RTA) | | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **Dimensions** | | | | | | |
| Length | (L) | mm | 3200 | 3200 | 3950 | 3950 |
| Height | (H) | mm | 2200 | 2200 | 2100 | 2100 |
| Width | (B) | mm | 2240 | 2240 | 2240 | 2240 |
| Transport and operating weight of standard unit | | kg | 1700 | 1700 | 1950 | 1950 |

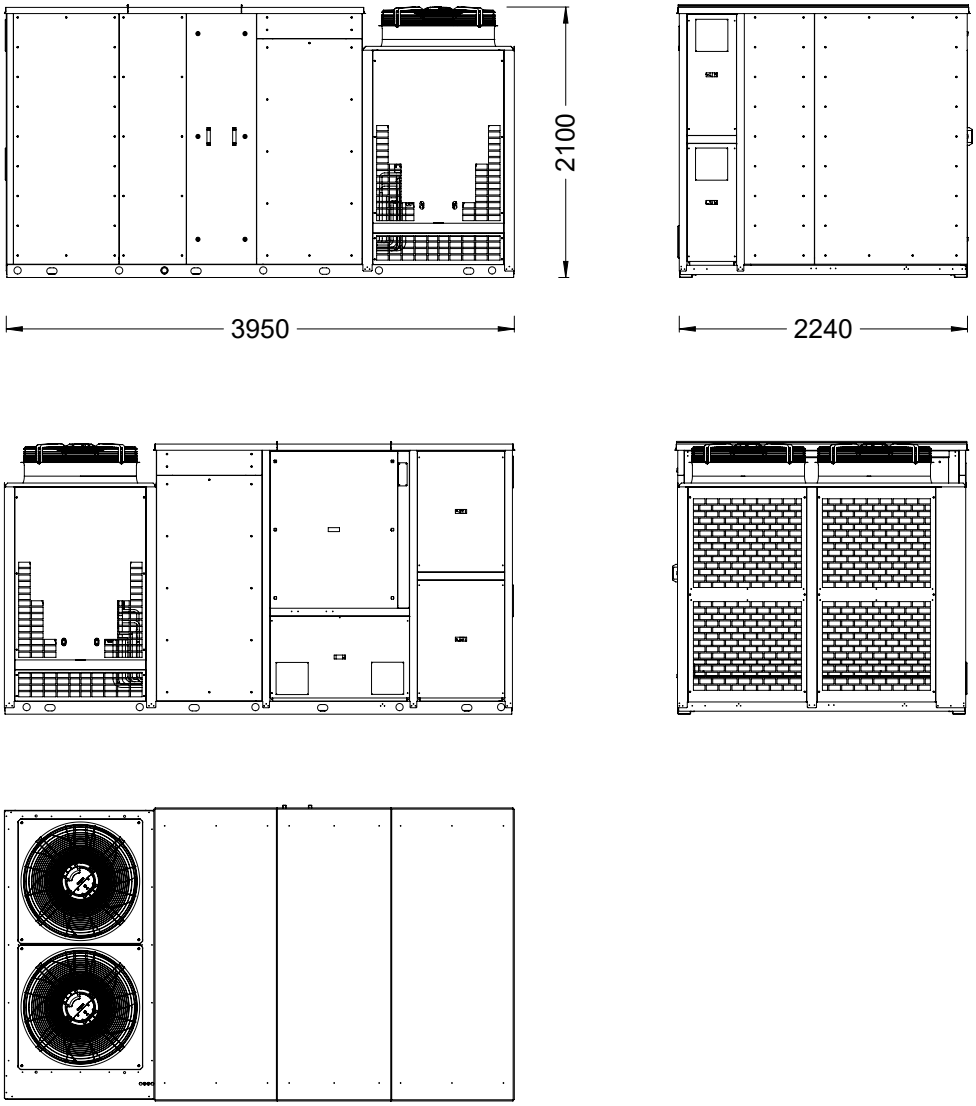
## General Dimensions and Construction Form

- **Frame 1**
- **Models NHE-RTU Inverter 50 RO and NHE-RTU Inverter 65 RO**



## General Dimensions and Construction Form

- **Frame 2**
- **Models NHE-RTU Inverter 80 RO and NHE-RTU Inverter 112 RO**



# Electrical Data

## RO Version (solely recirculation)

### Supply fans with HIGH static pressure

| Model NHE-RTU Inverter | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|
| Version | | RO | RO | RO | RO |
| Free Cooling | | - | - | - | - |
| Active Thermodynamic Heat Recovery (RTA) | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 7.7 | 7.7 | 6.8 | 7.7 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 42.6 | 48.2 | 63.4 | 96.4 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 5 | 5 | 4.5 | 5 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 23.4 | 29.3 | 40.1 | 58.5 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 30.2 | 33.6 | 55 | 81.8 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

### Supply fans with LOW static pressure

| Model NHE-RTU Inverter | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|
| Version | | RO | RO | RO | RO |
| Free Cooling | | - | - | - | - |
| Active Thermodynamic Heat Recovery (RTA) | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 5.3 | 6.6 | 4.5 | 6.4 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 40.2 | 47.1 | 58.8 | 93.8 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 3.45 | 4.4 | 2.9 | 4.2 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 21.8 | 28.7 | 36.9 | 56.9 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 27.8 | 32.5 | 50.4 | 79.2 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

# Noise levels

## RO Version (solely recirculation)

**Sound powers**

| NHE RTU 50 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 66 | 74 | 74 | 72 | 70 | 71 | 77 | 61 | 80 |
| Return | 67 | 65 | 67 | 62 | 57 | 57 | 57 | 43 | 65.2 |
| Axial (total) | 85 | 75 | 70 | 71 | 68 | 65 | 64 | 62 | 73.7 |
| Unit external radiation | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 77.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 64.1 | 68.2 | 63.7 | 58.5 | 56.5 | 58.6 | 63.8 | 55.6 | 67.3 |
| Axial (AxiBlade) | 77 | 68 | 65 | 71 | 71 | 67 | 63 | 60 | 74.4 |

| NHE RTU 65 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 75 | 75 | 73 | 77 | 74 | 72 | 76 | 61 | 81 |
| Return | 70 | 65 | 65 | 57 | 56 | 54 | 58 | 42 | 63.5 |
| Axial (total) | 85 | 75 | 70 | 71 | 68 | 65 | 64 | 62 | 73.7 |
| Unit external radiation | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 77.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 73.1 | 69.2 | 62.7 | 63.5 | 60.5 | 59.6 | 62.8 | 55.6 | 68.1 |
| Axial (AxiBlade) | 77 | 68 | 65 | 71 | 71 | 67 | 63 | 60 | 74.4 |

| NHE RTU 80 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 69 | 77 | 77 | 75 | 73 | 74 | 80 | 64 | 83 |
| Return | 70 | 68 | 70 | 65 | 60 | 60 | 60 | 46 | 68.2 |
| Axial (total) | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 76.7 |
| Unit external radiation | 91 | 81 | 76 | 77 | 74 | 71 | 70 | 68 | 80.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 67.1 | 71.2 | 66.7 | 61.5 | 59.5 | 61.6 | 66.8 | 58.6 | 70.3 |
| Axial (AxiBlade) | 80 | 71 | 68 | 74 | 74 | 70 | 66 | 63 | 77.4 |

| NHE RTU 112 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 78 | 78 | 76 | 80 | 77 | 75 | 79 | 64 | 84 |
| Return | 73 | 68 | 68 | 60 | 59 | 57 | 61 | 45 | 66.5 |
| Axial (total) | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 76.7 |
| Unit external radiation | 91 | 81 | 76 | 77 | 74 | 71 | 70 | 68 | 80.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 76.1 | 72.2 | 65.7 | 66.5 | 63.5 | 62.6 | 65.8 | 58.6 | 71.1 |
| Axial (AxiBlade) | 80 | 71 | 68 | 74 | 74 | 70 | 66 | 63 | 77.4 |

Notes:
The sound levels refer to the individual fan sections for the unit under full load in nominal test conditions with useful static pressure of 50 Pa. The total of the units includes some corrective factors resulting from some typical application solutions. If the unit is installed under conditions other than the nominal test conditions, the sound levels are subject to change, including substantial changes. Tolerance +/-4dB

# General technical data

## RF Version (Mixing box fitted with 2 dampers - free cooling max 50%)

| **Model NHE-RTU Inverter** | | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|---|
| Version | | | RF | RF | RF | RF |
| Free Cooling | | | 50% | 50% | 50% | 50% |
| Active Thermodynamic Heat Recovery (RTA) | | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **Performance** | | | | | | |
| Total Cooling Capacity | (1) (2) | kW | 52.8 | 66.9 | 88.6 | 119.8 |
| Sensible Cooling Capacity | (1) (2) | kW | 39.7 | 49.7 | 67.5 | 90.1 |
| Absorbed power | (1) (2) | kW | 12.1 | 17.2 | 18.6 | 31.0 |
| EER Compressors only | (1) (2) (3) | | 4.35 | 3.90 | 4.77 | 3.86 |
| SEER Seasonal Energy Efficiency Ratio | (4) | | 4.63 | 4.64 | 4.53 | 4.59 |
| ηs,c Seasonal Space Cooling Efficiency | (5) | % | 182 | 183 | 178 | 181 |
| Energy Efficiency Class | (6) | | A | A | A | A |
| Total Heating Capacity | (7) (8) | kW | 52.5 | 66.9 | 86.0 | 121.1 |
| Absorbed power | (7) (8) | kW | 10.4 | 13.2 | 16.1 | 25.8 |
| COP Compressor only | (7) (8) (9) | | 5.07 | 5.05 | 5.34 | 4.70 |
| SCOP Seasonal Coefficient of Performance | (4) | | 3.46 | 3.53 | 3.46 | 3.61 |
| ηs,h Seasonal Space Heating Efficiency | (5) | % | 135 | 138 | 135 | 141 |
| Bivalent Temperature | (5) | ° C | -7.0 | -7.0 | -7.0 | -7.0 |
| Energy Efficiency Class | (6) | | A+ | A+ | A+ | A+ |
| **Reheating** | | | | | | |
| Total Heating Capacity | (10) | kW | 19.9 | 25.0 | 32.8 | 43.7 |
| **Supply fan section (High static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 560 | 560 | 450 | 560 |
| Airflow | | m³/h | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | m³/h | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 5.0 | 5.0 | 4.5 | 5.0 |
| Return Fan Nominal Current | | A | 7.7 | 7.7 | 6.8 | 7.7 |
| External Static Pressure | (11) | Pa | 660 | 490 | 740 | 570 |
| **Supply fan section (Low static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 500 | 560 | 450 | 500 |
| Airflow | | m³/h | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | m³/h | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 3.5 | 4.4 | 2.9 | 4.2 |
| Return Fan Nominal Current | | A | 5.3 | 6.6 | 4.5 | 6.4 |
| External Static Pressure | (11) | Pa | 350 | 300 | 320 | 370 |
| **Fresh air intake** | | | | | | |
| Airflow | | m³/h | 4500 | 6000 | 7500 | 10000 |

Notes:
(1) Internal Air Temperature 27°C B.S./19°C B.U. Fresh Air Temperature 35°C B.S./24°C B.U. (According to EN14511 - Table 4 - Cooling Mode);
(2) Performance with Air in full recirculation 27°C B.S./19°C B.U.;
(3) EER refers only to cooling compressors;
(4) According to EN 14825:2016;
(5) According to Regulation ECODESIGN (EU) No. 2016/2281 – ENER LOT 21 (ERP);
(6) According to Certification Program (RT) rated up to 200 kW in cooling capacity/n.a. = not applicable;
(7) Internal Air Temperature 20°C B.S./12°C B.U. Fresh Air Temperature 7°C B.S./6°C B.U. (According to EN14511 - Table 3 - Heating Mode);
(8) Performance with Air in full recirculation 20°C B.S./12°C B.U.;
(9) COP refers only to cooling compressors;
(10) Heating power in hot gas reheating operation in summer conditions, referred to inlet air temperature at the reheating coil of 14°C and fresh air temperature of 35°C;
(11) External static pressure (maximum available) overall for the return air intake from the rooms and for supply, with clean standard G4 filter;

# General technical data

## RF Version (Mixing box fitted with 2 dampers - free cooling max 50%)

| **Model NHE-RTU Inverter** | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|
| Version | | RF | RF | RF | RF |
| Free Cooling | | 50% | 50% | 50% | 50% |
| Active Thermodynamic Heat Recovery (RTA) | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **External Fan Section (Condensing- Evaporating)** | | | | | |
| Fan Type | | Axial EC | Axial EC | Axial EC | Axial EC |
| Fan Quantity | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | mm | 800 | 800 | 800 | 800 |
| Airflow | $m^3/h$ | 22825 | 22825 | 48000 | 48000 |
| Single fan Airflow | $m^3/h$ | 22825 | 22825 | 24000 | 24000 |
| Supply Fan Motor Rating | kW | 2.56 | 2.56 | 2.56 | 2.56 |
| Return Fan Nominal Current | A | 3.9 | 3.9 | 3.9 | 3.9 |
| **Compressors** | | | | | |
| Compressor | | BLDC Scroll | BLDC Scroll | BLDC Scroll | BLDC Scroll |
| Total Compressor Number | no. | 1 | 1 | 2 | 2 |
| Modulation Control | | Inverter | Inverter | Inverter | Inverter |
| Number of Refrigeration Circuit | no. | 1 | 1 | 2 | 2 |
| Number of Compressor per Circuit | no. | 1 | 1 | 1 | 1 |
| Capacity step | no. | 30-100% | 30-100% | 30-100% | 30-100% |
| Refrigerant | | R410A | R410A | R410A | R410A |

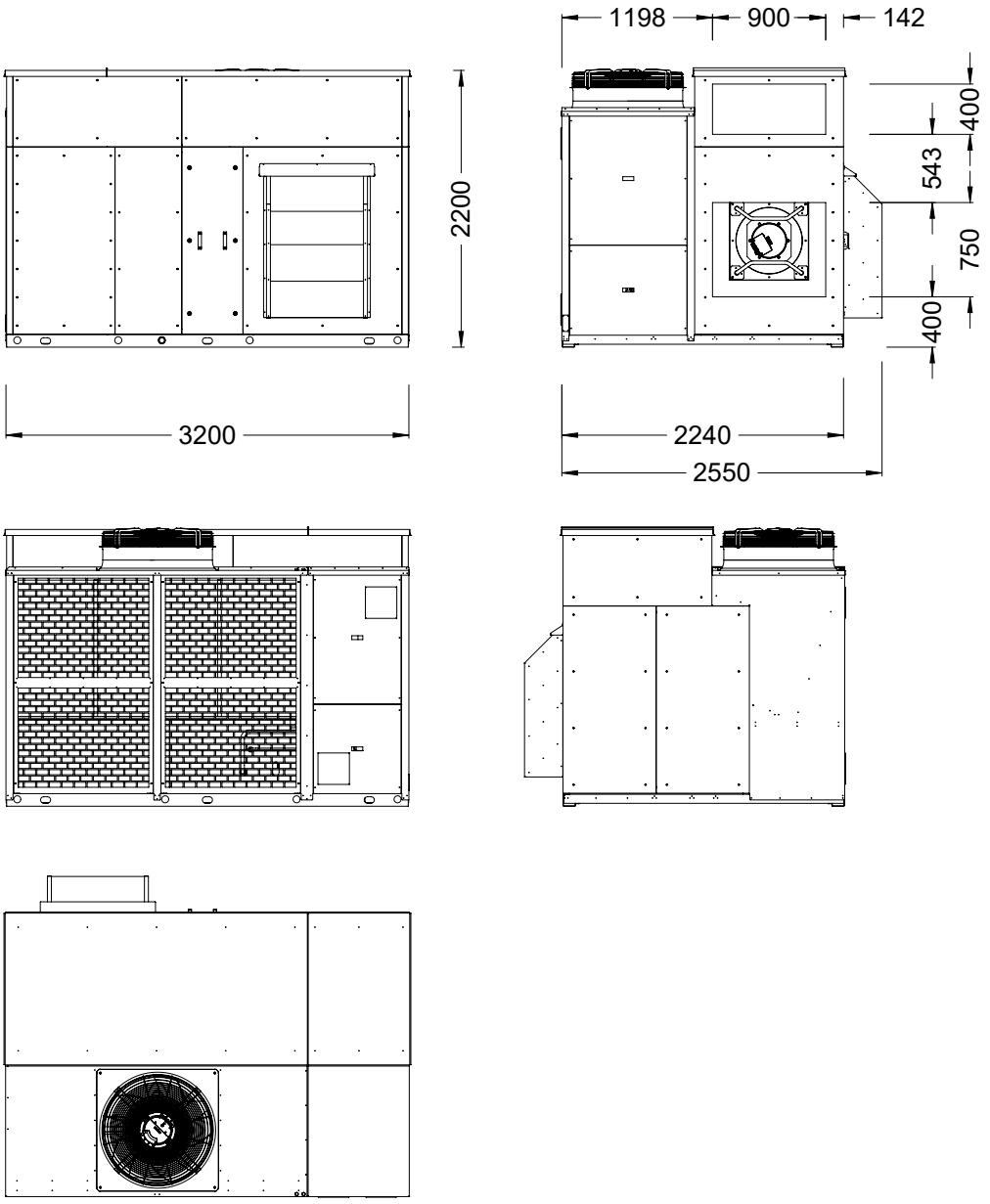
# General Dimensions and Weights

## RF Version (Mixing box fitted with 2 dampers - free cooling max 50%)

| **Model NHE-RTU Inverter** | | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|---|
| Version | | | RF | RF | RF | RF |
| Free Cooling | | | 50% | 50% | 50% | 50% |
| Active Thermodynamic Heat Recovery (RTA) | | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **Dimensions** | | | | | | |
| Length | (L) | mm | 3200 | 3200 | 3950 | 3950 |
| Height | (H) | mm | 2200 | 2200 | 2100 | 2100 |
| Width | (B) | mm | 2240 | 2240 | 2238 | 2238 |
| Transport and operating weight of standard unit | | kg | 1700 | 1700 | 1975 | 1975 |

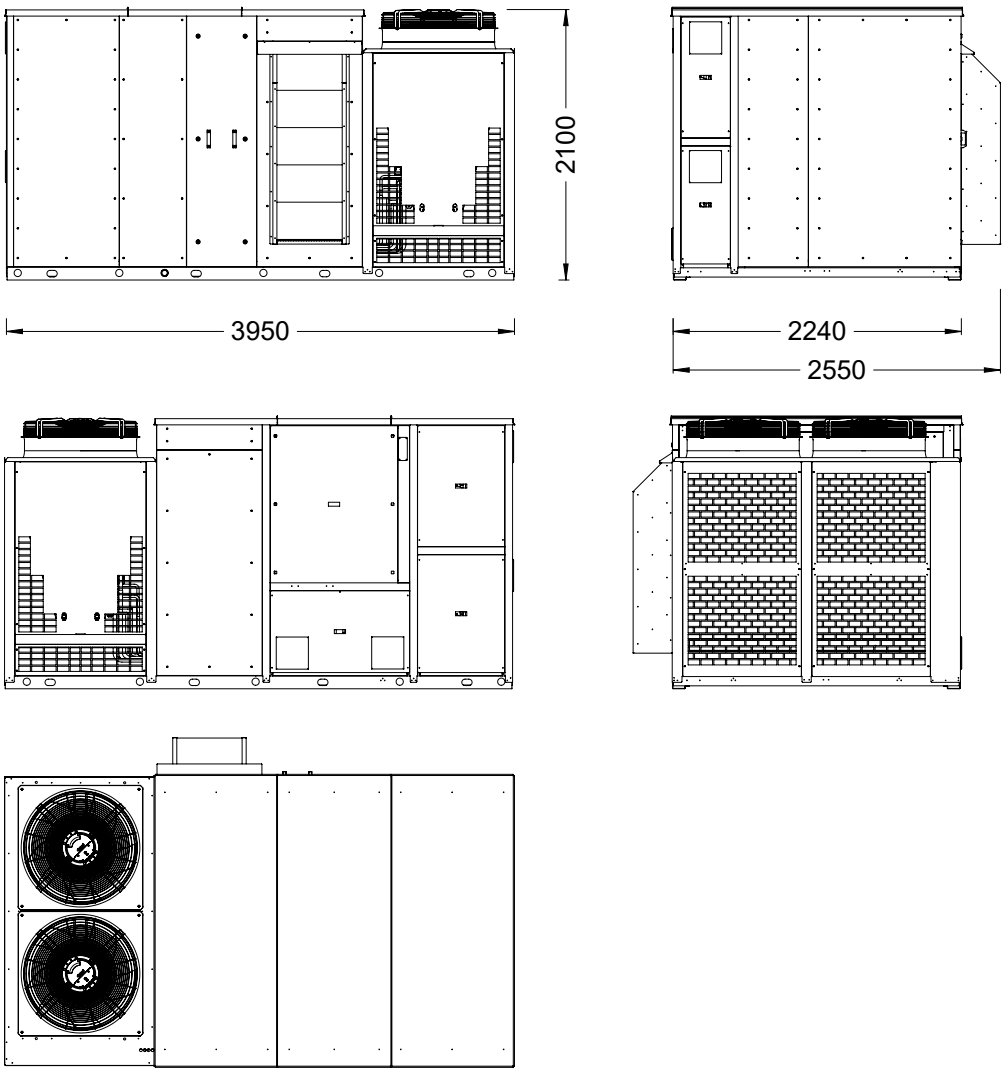
## General Dimensions and Construction Form

- **Frame 1**
- **Models NHE-RTU Inverter 50 RF and NHE-RTU Inverter 65 RF**



## General Dimensions and Construction Form

- **Frame 2**
- **Models NHE-RTU Inverter 80 RF and NHE-RTU Inverter 112 RF**



# Electrical Data

## RF Version (Mixing box fitted with 2 dampers - free cooling max 50%)

### Supply fans with HIGH static pressure

| **Model NHE-RTU Inverter** | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|
| Version | | RF | RF | RF | RF |
| Free Cooling | | 50% | 50% | 50% | 50% |
| Active Thermodynamic Heat Recovery (RTA) | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 7.7 | 7.7 | 6.8 | 7.7 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 42.6 | 48.2 | 63.4 | 96.4 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 5 | 5 | 4.5 | 5 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 23.4 | 29.3 | 40.1 | 58.5 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 30.2 | 33.6 | 55 | 81.8 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

### Supply fans with LOW static pressure

| **Model NHE-RTU Inverter** | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|
| Version | | RF | RF | RF | RF |
| Free Cooling | | 50% | 50% | 50% | 50% |
| Active Thermodynamic Heat Recovery (RTA) | | - | - | - | - |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 5.3 | 6.6 | 4.5 | 6.4 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 40.2 | 47.1 | 58.8 | 93.8 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 3.45 | 4.4 | 2.9 | 4.2 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 21.8 | 28.7 | 36.9 | 56.9 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 27.8 | 32.5 | 50.4 | 79.2 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

# Noise levels

## RF Version (Mixing box fitted with 2 dampers - free cooling max 50%)

| NHE RTU 50 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 66 | 74 | 74 | 72 | 70 | 71 | 77 | 61 | 80 |
| Return | 67 | 65 | 67 | 62 | 57 | 57 | 57 | 43 | 65.2 |
| Axial (total) | 85 | 75 | 70 | 71 | 68 | 65 | 64 | 62 | 73.7 |
| Unit external radiation | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 77.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 64.1 | 68.2 | 63.7 | 58.5 | 56.5 | 58.6 | 63.8 | 55.6 | 67.3 |
| Axial (AxiBlade) | 77 | 68 | 65 | 71 | 71 | 67 | 63 | 60 | 74.4 |

| NHE RTU 65 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 75 | 75 | 73 | 77 | 74 | 72 | 76 | 61 | 81 |
| Return | 70 | 65 | 65 | 57 | 56 | 54 | 58 | 42 | 63.5 |
| Axial (total) | 85 | 75 | 70 | 71 | 68 | 65 | 64 | 62 | 73.7 |
| Unit external radiation | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 77.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 73.1 | 69.2 | 62.7 | 63.5 | 60.5 | 59.6 | 62.8 | 55.6 | 68.1 |
| Axial (AxiBlade) | 77 | 68 | 65 | 71 | 71 | 67 | 63 | 60 | 74.4 |

| NHE RTU 80 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 69 | 77 | 77 | 75 | 73 | 74 | 80 | 64 | 83 |
| Return | 70 | 68 | 70 | 65 | 60 | 60 | 60 | 46 | 68.2 |
| Axial (total) | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 76.7 |
| Unit external radiation | 91 | 81 | 76 | 77 | 74 | 71 | 70 | 68 | 80.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 67.1 | 71.2 | 66.7 | 61.5 | 59.5 | 61.6 | 66.8 | 58.6 | 70.3 |
| Axial (AxiBlade) | 80 | 71 | 68 | 74 | 74 | 70 | 66 | 63 | 77.4 |

| NHE RTU 112 - RO/RF | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 78 | 78 | 76 | 80 | 77 | 75 | 79 | 64 | 84 |
| Return | 73 | 68 | 68 | 60 | 59 | 57 | 61 | 45 | 66.5 |
| Axial (total) | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 76.7 |
| Unit external radiation | 91 | 81 | 76 | 77 | 74 | 71 | 70 | 68 | 80.7 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 76.1 | 72.2 | 65.7 | 66.5 | 63.5 | 62.6 | 65.8 | 58.6 | 77.1 |
| Axial (AxiBlade) | 80 | 71 | 68 | 74 | 74 | 70 | 66 | 63 | 77.4 |

Notes:
The sound levels refer to the individual fan sections for the unit under full load in nominal test conditions with useful static pressure of 50 Pa. The total of the units includes some corrective factors resulting from some typical application solutions. If the unit is installed under conditions other than the nominal test conditions, the sound levels are subject to change, including substantial changes. Tolerance +/-4dB

# General technical data

## RFE/RTA Version (with mixing box with 3 dampers, free cooling up to 100% of nominal flow rate and active thermodynamic heat recovery)

| **Model NHE-RTU Inverter** | | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|---|
| Version | | | RFE/RTA | RFE/RTA | RFE/RTA | RFE/RTA |
| Free Cooling | | | 100% | 100% | 100% | 100% |
| Active Thermodynamic Heat Recovery (RTA) | | | Included | Included | Included | Included |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **Performance** | | | | | | |
| Total Cooling Capacity | (1) (2) | kW | 53.1 | 67.4 | 89.2 | 120.8 |
| Sensible Cooling Capacity | (1) (2) | kW | 39.8 | 49.8 | 67.7 | 90.4 |
| Absorbed power | (1) (2) | kW | 11.9 | 16.9 | 18.3 | 30.5 |
| EER Compressors only | (1) (2) (3) | | 4.45 | 4 | 4.87 | 3.97 |
| SEER Seasonal Energy Efficiency Ratio | (4) | | 4.63 | 4.64 | 4.53 | 4.59 |
| ηs,c Seasonal Space Cooling Efficiency | (5) | % | 182 | 183 | 178 | 181 |
| Energy Efficiency Class | (6) | | A | A | A | A |
| Total Heating Capacity | (7) (8) | kW | 53.4 | 68.2 | 87.5 | 123.9 |
| Absorbed power | (7) (8) | kW | 10.4 | 13.4 | 16.2 | 26.1 |
| COP Compressor only | (7) (8) (9) | | 5.12 | 5.1 | 5.4 | 4.75 |
| SCOP Seasonal Coefficient of Performance | (4) | | 3.46 | 3.53 | 3.46 | 3.61 |
| ηs,h Seasonal Space Heating Efficiency | (5) | % | 135 | 138 | 135 | 141 |
| Bivalent Temperature | (5) | ° C | -7 | -7 | -7 | -7 |
| Energy Efficiency Class | (6) | | A+ | A+ | A+ | A+ |
| **Reheating** | | | | | | |
| Total Heating Capacity | (10) | kW | 19.9 | 25 | 32.8 | 43.7 |
| **Supply fan section (High static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 560 | 560 | 450 | 560 |
| Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |
| Supply Fan Motor Rating | | kW | 5 | 5 | 4.5 | 5 |
| Supply Fan Nominal Current | | A | 5.3 | 6.6 | 4.5 | 6.4 |
| External Static Pressure | (11) | Pa | 660 | 490 | 740 | 570 |
| **Recovery fan (High static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 560 | 560 | 450 | 560 |
| Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | $m^3/h$ | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 4.4 | 4.4 | 3.3 | 3.3 |
| Supply Fan Nominal Current | | A | 6.6 | 6.6 | 5.1 | 5.1 |
| External Static Pressure | (14) | Pa | 750 | 540 | 580 | 480 |
| **Supply fan section (Low static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 500 | 560 | 450 | 500 |
| Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | $m^3/h$ | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 3.5 | 4.4 | 2.9 | 4.2 |
| Supply Fan Nominal Current | | A | 5.30 | 6.60 | 4.50 | 6.40 |
| External Static Pressure | (11) | Pa | 350 | 300 | 320 | 370 |
| **Recovery fan (Low static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 400 | 560 | 400 | 500 |
| Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | $m^3/h$ | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 3.4 | 3.3 | 2.5 | 3.1 |
| Supply Fan Nominal Current | | A | 5.2 | 5.1 | 3.8 | 4.5 |
| External Static Pressure | (14) | Pa | 390 | 370 | 380 | 370 |
| **Fresh air intake** | | | | | | |
| Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |

NOTES: **(1)** Internal Air Temperature 27°C B.S./19°C B.U. Fresh Air Temperature 35°C B.S./24°C B.U. (According to EN14511 - Table 4 - Cooling Mode); **(2)** Performance with Total recirculation Air 27°C B.S./19°C B.U.; **(3)** EER referring only to cooling compressors; **(4)** According to EN 14825:2016; **(6)** Internal Air Temperature 27°C B.S./19°C B.U. Fresh Air Temperature 35°C B.S./24°C B.U. (According to EN14511 - Table 4 - Cooling Mode); According to ECODESIGN Regulation (EU) no. 2016/2281 – ENER LOT 21 (ERP); **(7)** According to Certification Program (RT)rated up to 200 kW in cooling capacity / n.a. = not applicable; **(8)** Internal Air Temperature 20°C B.S./12°C B.U. Fresh Air Temperature 7°C B.S./6°C B.U. (According to EN14511 - Table 3 - HeatingMode); **(9)** Performance with Total recirculation Air 20°C B.S./12°C B.U.; **(10)** COP referring only to cooling compressors; **(11)** Heating capacity in summer reheating mode with hot gas, referringto temperature of air entering the reheating coil of 14°C and external air temperature of 35°C; **(12)** Total available static pressure (maximum available) for the return of air from the rooms and for supply, with clean standard G4 filter.

# General technical data

## RFE/RTA Version (Return fans, mixing box fitted with 3 dampers, active thermodynamic heat recovery - free cooling max 100%)

| **Model NHE-RTU Inverter** | | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|---|
| Version | | | RFE/RTA | RFE/RTA | RFE/RTA | RFE/RTA |
| Free Cooling | | | 100% | 100% | 100% | 100% |
| Active Thermodynamic Heat Recovery (RTA) | | | Included | Included | Included | Included |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **Recovery fan (High static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 560 | 560 | 450 | 560 |
| Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | $m^3/h$ | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 4.4 | 4.4 | 3.3 | 3.3 |
| Supply Fan Nominal Current | | A | 6.6 | 6.6 | 5.1 | 5.1 |
| External Static Pressure | (14) | Pa | 750 | 540 | 580 | 480 |
| **Recovery fan (Low static pressure)** | | | | | | |
| Fan Type | | | Radial EC | Radial EC | Radial EC | Radial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 400 | 560 | 400 | 500 |
| Airflow | | $m^3/h$ | 9000 | 12000 | 15000 | 20000 |
| Single fan Airflow | | $m^3/h$ | 9000 | 12000 | 7500 | 10000 |
| Supply Fan Motor Rating | | kW | 3.4 | 3.3 | 2.5 | 3.1 |
| Supply Fan Nominal Current | | A | 5.2 | 5.1 | 3.8 | 4.5 |
| External Static Pressure | (14) | Pa | 390 | 370 | 380 | 370 |
| **External Fan Section (Condensing- Evaporating)** | | | | | | |
| Fan Type | | | Axial EC | Axial EC | Axial EC | Axial EC |
| Fan Quantity | | no. | 1 | 1 | 2 | 2 |
| Impeller Diameter | | mm | 800 | 800 | 800 | 800 |
| Airflow | | $m^3/h$ | 22825 | 22825 | 48000 | 48000 |
| Single fan Airflow | | $m^3/h$ | 22825 | 22825 | 24000 | 24000 |
| Supply Fan Motor Rating | | kW | 2.56 | 2.56 | 2.56 | 2.56 |
| Return Fan Nominal Current | | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Axial Fans Total Sound Power Level | | dB (A) | 90 | 91 | 92 | 93 |
| **Compressors** | | | | | | |
| Compressor | | | BLDC Scroll | BLDC Scroll | BLDC Scroll | BLDC Scroll |
| Total Compressor Number | | no. | 1 | 1 | 2 | 2 |
| Modulation Control | | | Inverter | Inverter | Inverter | Inverter |
| Number of Refrigeration Circuit | | no. | 1 | 1 | 2 | 2 |
| Number of Compressor per Circuit | | no. | 1 | 1 | 1 | 1 |
| Capacity step | | no. | 30-100% | 30-100% | 30-100% | 30-100% |
| Refrigerant | | | R410A | R410A | R410A | R410A |

Notes:
(14) External static pressure (maximum available) overall for the return with clean standard G4 filter, which can be fitted on the air intake grilles from the rooms.

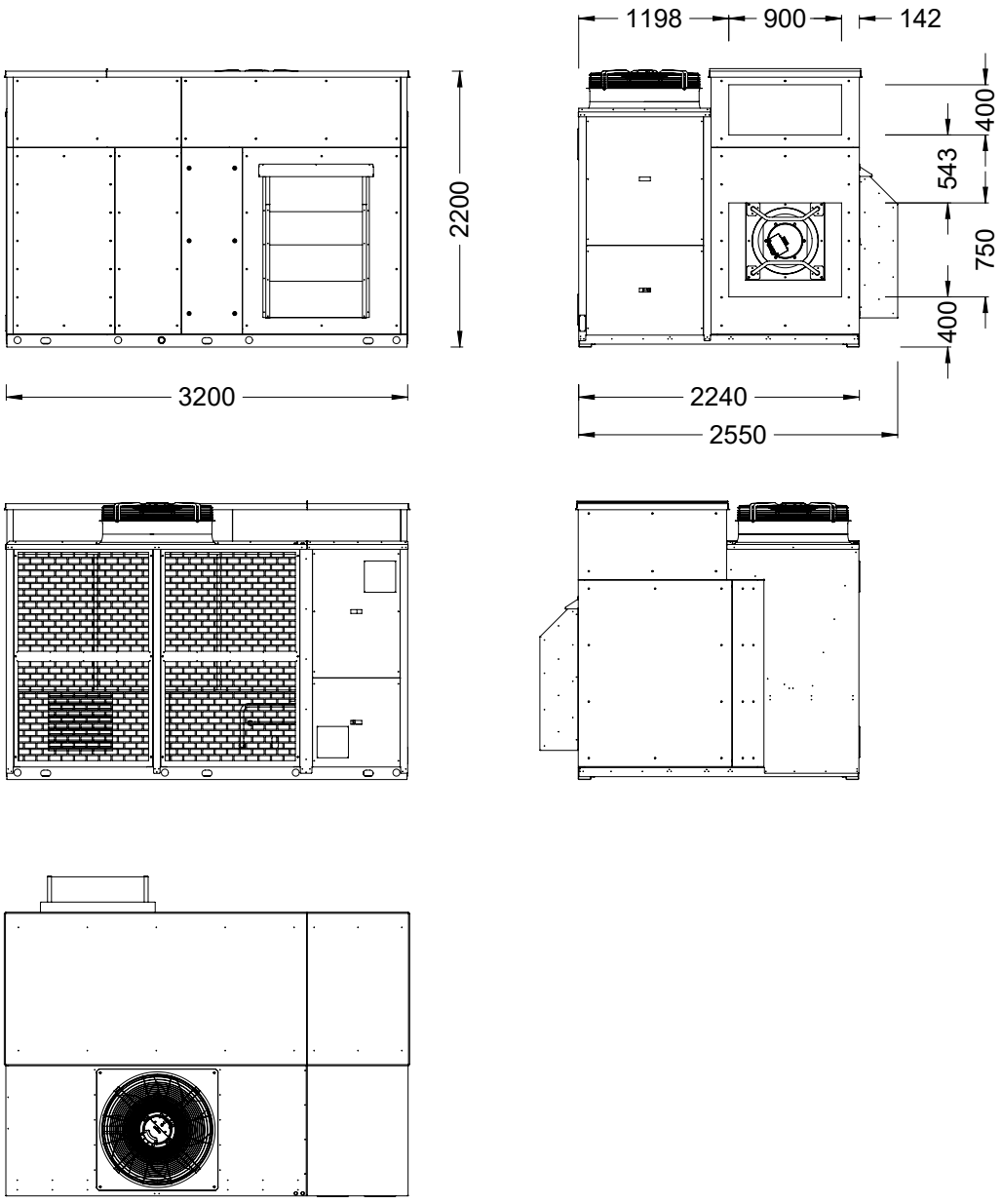
# General Dimensions and Weights

## RFE/RTA Version (with mixing box with 3 dampers, free cooling up to 100% of nominal flow rate and active thermodynamic heat recovery)

| **Model NHE-RTU Inverter** | | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|---|
| Version | | | RFE/RTA | RFE/RTA | RFE/RTA | RFE/RTA |
| Free Cooling | | | 100% | 100% | 100% | 100% |
| Active Thermodynamic Heat Recovery (RTA) | | | Included | Included | Included | Included |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **Dimensions** | | | | | | |
| Length | (L) | mm | 3200 | 3200 | 4450 | 4450 |
| Height | (H) | mm | 2200 | 2200 | 2100 | 2100 |
| Width | (B) | mm | 2240 | 2240 | 2240 | 2240 |
| Transport and operating weight of standard unit | | kg | 1800 | 1800 | 2158 | 2158 |

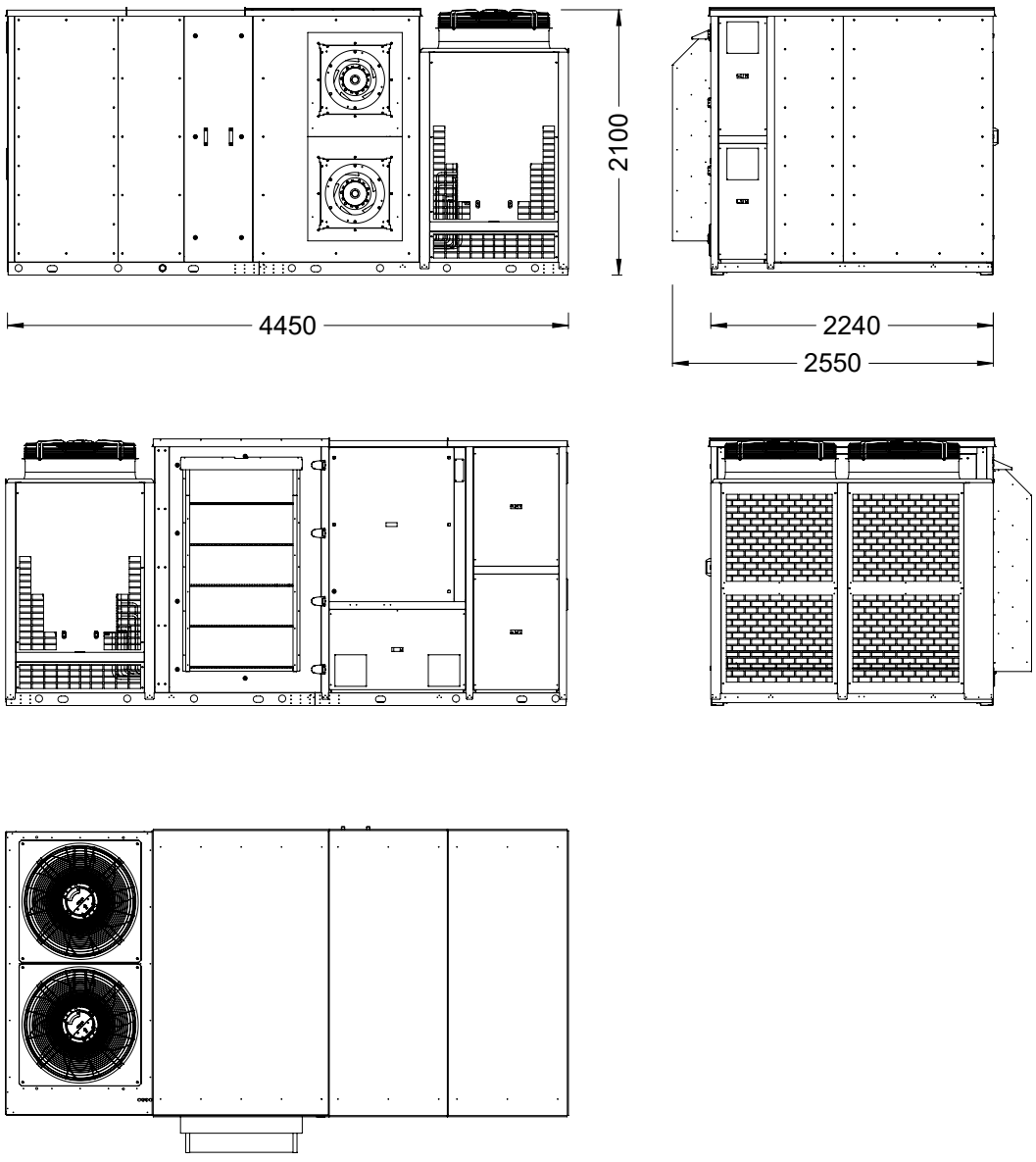
## General Dimensions and Construction Form

- **Frame 1**
- **Models NHE-RTU Inverter 50 RFE/RTA and NHE-RTU Inverter 65 RFE/RTA**



## General Dimensions and Construction Form

- **Frame 2**
- **Models NHE-RTU Inverter 80 RFE/RTA and NHE-RTU Inverter 112 RFE/RTA**



# Electrical Data

## RFE/RTA Version (with mixing box with 3 dampers, free cooling up to 100% of nominal flow rate and active thermodynamic heat recovery)

### Supply fans with HIGH static pressure
### Return fans with LOW static pressure

| **Model NHE-RTU Inverter** | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|
| Version | | RFE/RTA | RFE/RTA | RFE/RTA | RFE/RTA |
| Free Cooling | | 100% | 100% | 100% | 100% |
| Active Thermodynamic Heat Recovery (RTA) | | Included | Included | Included | Included |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 7.7 | 7.7 | 6.8 | 7.7 |
| Single fan return | A | 6.6 | 6.6 | 5.1 | 5.1 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 49.2 | 54.8 | 73.6 | 106.6 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 5 | 5 | 4.5 | 5 |
| Single fan return | kW | 4.4 | 4.4 | 3.3 | 3.3 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 27.8 | 33.7 | 46.7 | 65.1 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 36.8 | 40.2 | 65.2 | 92 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

### Supply fans with HIGH static pressure
### Return fans with HIGH static pressure

| **Model NHE-RTU Inverter** | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|
| Version | | RFE/RTA | RFE/RTA | RFE/RTA | RFE/RTA |
| Free Cooling | | 100% | 100% | 100% | 100% |
| Active Thermodynamic Heat Recovery (RTA) | | Included | Included | Included | Included |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 7.7 | 7.7 | 6.8 | 7.7 |
| Single fan return | A | 6.6 | 6.6 | 5.1 | 5.1 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 49.2 | 54.8 | 73.6 | 106.6 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 5 | 5 | 4.5 | 5 |
| Single fan return | kW | 4.4 | 4.4 | 3.3 | 3.3 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 27.8 | 33.7 | 46.7 | 65.1 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 36.8 | 40.2 | 65.2 | 92 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

# Electrical Data

## RFE/RTA Version (with mixing box with 3 dampers, free cooling up to 100% of nominal flow rate and active thermodynamic heat recovery)

### Supply fans with LOW static pressure
### Return fans with HIGH static pressure

| Model NHE-RTU Inverter | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|
| Version | | RFE/RTA | RFE/RTA | RFE/RTA | RFE/RTA |
| Free Cooling | | 100% | 100% | 100% | 100% |
| Active Thermodynamic Heat Recovery (RTA) | | Included | Included | Included | Included |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 7.7 | 7.7 | 6.8 | 7.7 |
| Single fan return | A | 6.6 | 6.6 | 5.1 | 5.1 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 49.2 | 54.8 | 73.6 | 106.6 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 5 | 5 | 4.5 | 5 |
| Single fan return | kW | 4.4 | 4.4 | 3.3 | 3.3 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 27.8 | 33.7 | 46.7 | 65.1 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 36.8 | 40.2 | 65.2 | 92 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

### Supply fans with LOW static pressure
### Return fans with LOW static pressure

| Model NHE-RTU Inverter | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|
| Version | | RFE/RTA | RFE/RTA | RFE/RTA | RFE/RTA |
| Free Cooling | | 100% | 100% | 100% | 100% |
| Active Thermodynamic Heat Recovery (RTA) | | Included | Included | Included | Included |
| Compliance with Reg. EU 2016/2281 - ENER LOT 21 - TIER 2 | | ERP 2021 | ERP 2021 | ERP 2021 | ERP 2021 |
| **FLA Maximum current allowable** | | | | | |
| Compressor 1 | A | 31 | 36.6 | 21 | 36.6 |
| Compressor 2 | A | - | - | 21 | 36.6 |
| User single fan | A | 5.3 | 6.6 | 4.5 | 6.4 |
| Single fan return | A | 5.2 | 5.1 | 3.8 | 4.5 |
| External single fan | A | 3.9 | 3.9 | 3.9 | 3.9 |
| Total FLA | A | 45.4 | 52.2 | 66.4 | 102.8 |
| **LRA Inrush current** | | | | | |
| Compressor 1 | A | 18.6 | 22 | 12.6 | 22 |
| Compressor 2 | A | - | - | 12.6 | 22 |
| **FLI maximum power absorption** | | | | | |
| Compressor 1 | kW | 15.8 | 21.7 | 13 | 21.7 |
| Compressor 2 | kW | - | - | 13 | 21.7 |
| User single fan | kW | 3.5 | 4.4 | 2.9 | 4.2 |
| Single fan return | kW | 3.4 | 3.3 | 2.5 | 3.1 |
| External single fan | kW | 2.6 | 2.6 | 2.6 | 2.6 |
| Total FLI | kW | 25.3 | 32 | 42 | 63.2 |
| **MIC Maximum inrush current** | | | | | |
| Value | A | 33 | 37.6 | 58 | 88.2 |
| **Power Supply** | | | | | |
| Power supply | | 400 V / 3 Phases / 50Hz | | | |

# Noise levels

## RFE/RTA Version (with mixing box with 3 dampers, free cooling up to 100% of nominal flow rate and active thermodynamic heat recovery)

| NHE RTU 50 - RFE/RTA | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 66 | 74 | 74 | 72 | 70 | 71 | 77 | 61 | 80 |
| Return | 67 | 70 | 70 | 73 | 73 | 72 | 77 | 56 | 80.5 |
| Axial (total) | 85 | 75 | 70 | 71 | 68 | 65 | 64 | 62 | 73.7 |
| Unit external radiation | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 90 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 64.1 | 68.2 | 63.7 | 58.5 | 56.5 | 58.6 | 63.8 | 55.6 | 67.3 |
| Axial (AxiBlade) | 77 | 68 | 65 | 71 | 71 | 67 | 63 | 60 | 74.4 |

| NHE RTU 65 - RFE/RTA | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 75 | 75 | 73 | 77 | 74 | 72 | 76 | 61 | 81 |
| Return | 69 | 68 | 70 | 72 | 72 | 79 | 69 | 56 | 80.8 |
| Axial (total) | 85 | 75 | 70 | 71 | 68 | 65 | 64 | 62 | 73.7 |
| Unit external radiation | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 91 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 73.1 | 69.2 | 62.7 | 63.5 | 60.5 | 59.6 | 62.8 | 55.6 | 68.1 |
| Axial (AxiBlade) | 77 | 68 | 65 | 71 | 71 | 67 | 63 | 60 | 74.4 |

| NHE RTU 80 - RFE/RTA | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 69 | 77 | 77 | 75 | 73 | 74 | 80 | 64 | 83 |
| Return | 70 | 73 | 73 | 76 | 76 | 75 | 80 | 59 | 83.5 |
| Axial (total) | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 76.7 |
| Unit external radiation | 91 | 81 | 76 | 77 | 74 | 71 | 70 | 68 | 92 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 67.1 | 71.2 | 66.7 | 61.5 | 59.5 | 61.6 | 66.8 | 58.6 | 70.3 |
| Axial (AxiBlade) | 80 | 71 | 68 | 74 | 74 | 70 | 66 | 63 | 77.4 |

| NHE RTU 112 - RFE/RTA | 63 Hz | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | dB (A) |
|---|---|---|---|---|---|---|---|---|---|
| Supply | 78 | 78 | 76 | 80 | 77 | 75 | 79 | 64 | 84 |
| Return | 72 | 71 | 73 | 75 | 75 | 82 | 72 | 59 | 83.8 |
| Axial (total) | 88 | 78 | 73 | 74 | 71 | 68 | 67 | 65 | 76.7 |
| Unit external radiation | 91 | 81 | 76 | 77 | 74 | 71 | 70 | 68 | 93 |
| Optional | | | | | | | | | |
| Supply with structural silencer | 76.1 | 72.2 | 65.7 | 66.5 | 63.5 | 62.6 | 65.8 | 58.6 | 71.1 |
| Axial (AxiBlade) | 80 | 71 | 68 | 74 | 74 | 70 | 66 | 63 | 77.4 |

Notes:
The sound levels refer to the individual fan sections for the unit under full load in nominal test conditions with useful static pressure of 50 Pa. The total of the units includes some corrective factors resulting from some typical application solutions. If the unit is installed under conditions other than the nominal test conditions, the sound levels are subject to change, including substantial changes. Tolerance +/-4dB

## Operating Limits

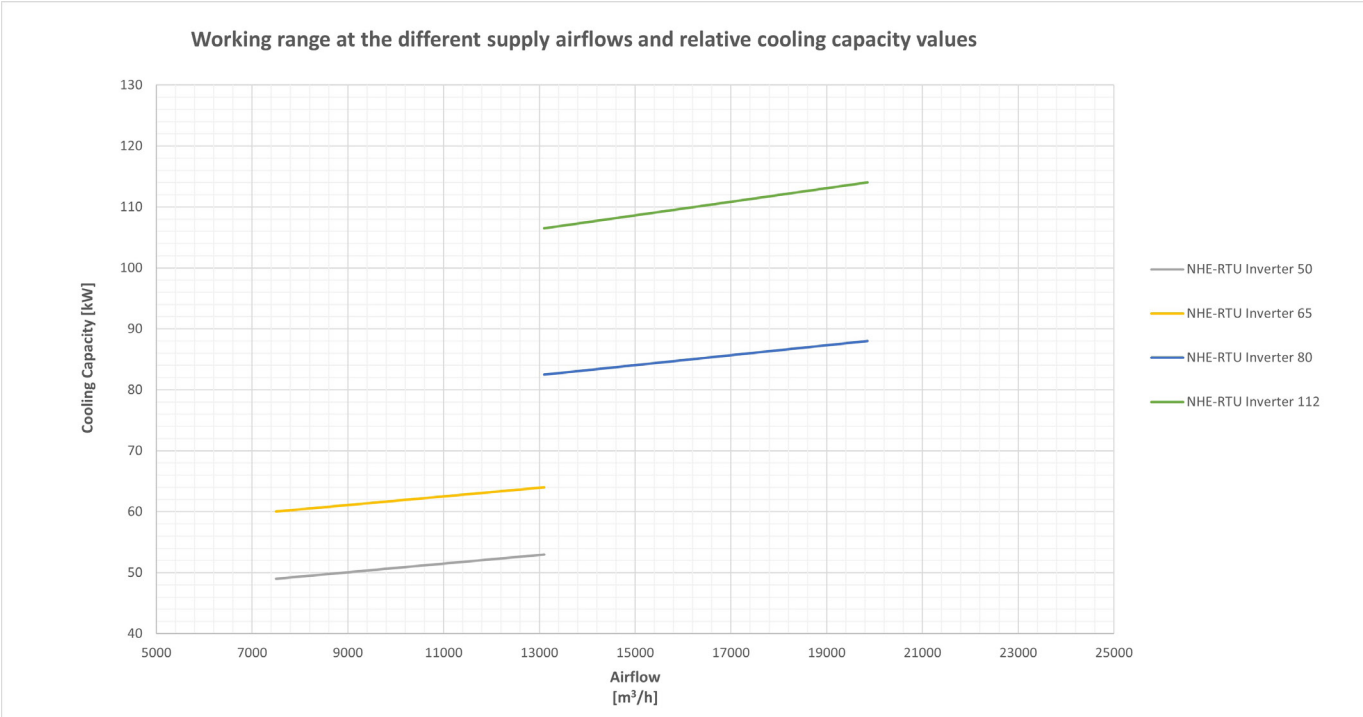
| Model NHE-RTU Inverter | | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|---|
| Summer | | | | | | |
| Temp. Minimum fresh air | (16) (17) | °C | 15 | 15 | 15 | 15 |
| Temp. Maximum fresh air | (16) (17) | °C | 44 | 44 | 44 | 44 |
| Tem. Minimum handling coil inlet air | (16) (17) | °C | 13 | 13 | 13 | 13 |
| Tem. Maximum handling coil inlet air | (16) (17) | °C | 26 | 26 | 26 | 26 |
| Winter | | | | | | |
| Temp. Minimum fresh air | (16) (17) | °C | -10 | -10 | -10 | -10 |
| Temp. Maximum fresh air | (16) (17) | °C | 18 | 18 | 18 | 18 |
| Tem. Minimum handling coil inlet air | (16) (17) | °C | 5 | 5 | 5 | 5 |
| Tem. Maximum handling coil inlet air | (16) (17) | °C | 24 | 24 | 24 | 24 |

Notes:
(16) Valid limits for nominal air flow, correct use and installation of the unit and full load operation.
(17) Values expressed taking account of renewal through fresh air and activation of recovery.

## Operating range

| Model NHE-RTU Inverter | | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|---|
| Supply Airflow Rate | | | | | | |
| Minimum | | m3/h | 8100 | 8100 | 13500 | 13500 |
| Nominal | | m3/h | 9000 | 9000 | 15000 | 20000 |
| Maximum | | m3/h | 13200 | 13200 | 20500 | 20500 |
| Expulsion Air Flow | | | | | | |
| Minimum | | m3/h | 8100 | 8100 | 13500 | 13500 |
| Nominal | | m3/h | 9000 | 9000 | 15000 | 20000 |
| Maximum | | m3/h | 13200 | 13200 | 20500 | 20500 |

Notes:
(18) Standard configuration unit, full recirculation version, without accessories. Limit air flows to ensure a maximum speed across the coils of 2.4 m/s



## Performance under diverse SUMMER conditions, indoors and outdoors
## HIGH AMBIENT TEMPERATURE (SPECIAL EXECUTION)

| Model | Ta | W.B. | Fresh air temperature [°C] | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [°C] | [°C] | 20 | | | | 25 | | | | 30 | | | | 35 | | | |
| | | | kWf | kWs | kWe | EER | kWf | kWs | kWe | EER | kWf | kWs | kWe | EER | kWf | kWs | kWe | EER |
| 50 | 20 | 15 | 54,99 | 35,87 | 10,56 | 5,21 | 52,61 | 34,75 | 11,70 | 4,50 | 50,36 | 33,75 | 12,95 | 3,89 | 48,22 | 32,82 | 14,30 | 3,37 |
| | 22 | 16 | 56,48 | 37,90 | 10,63 | 5,31 | 54,39 | 37,01 | 11,79 | 4,61 | 52,25 | 36,09 | 13,05 | 4,00 | 50,05 | 35,15 | 14,41 | 3,47 |
| | 24 | 17 | 58,46 | 40,34 | 10,72 | 5,45 | 56,33 | 39,44 | 11,89 | 4,74 | 54,14 | 38,50 | 13,15 | 4,12 | 51,80 | 37,49 | 14,50 | 3,57 |
| | 26 | 18 | 60,43 | 42,87 | 10,81 | 5,59 | 58,18 | 41,91 | 11,98 | 4,86 | 55,87 | 40,92 | 13,24 | 4,22 | 53,18 | 39,77 | 14,58 | 3,65 |
| | 27 | 19 | 62,19 | 42,30 | 10,89 | 5,71 | 59,89 | 41,49 | 12,06 | 4,97 | 57,41 | 40,56 | 13,32 | 4,31 | 54,48 | 39,36 | 14,65 | 3,72 |
| | 28 | 19 | 62,19 | 44,81 | 10,89 | 5,71 | 59,89 | 43,99 | 12,06 | 4,97 | 57,33 | 43,01 | 13,32 | 4,31 | 54,52 | 41,87 | 14,65 | 3,72 |
| | 30 | 22 | 67,52 | 42,34 | 11,13 | 6,07 | 65,09 | 41,48 | 12,31 | 5,29 | 62,61 | 40,59 | 13,59 | 4,61 | 59,99 | 39,64 | 14,95 | 4,01 |
| 65 | 20 | 15 | 64,38 | 41,81 | 12,63 | 5,10 | 62,00 | 40,83 | 13,99 | 4,43 | 59,56 | 39,83 | 15,42 | 3,86 | 57,06 | 38,81 | 16,92 | 3,37 |
| | 22 | 16 | 66,72 | 44,72 | 12,78 | 5,22 | 64,28 | 43,73 | 14,14 | 4,55 | 61,79 | 42,71 | 15,58 | 3,97 | 59,20 | 41,65 | 17,08 | 3,47 |
| | 24 | 17 | 69,05 | 47,73 | 12,92 | 5,34 | 66,52 | 46,70 | 14,29 | 4,66 | 63,82 | 45,59 | 15,72 | 4,06 | 60,80 | 44,38 | 17,20 | 3,54 |
| | 26 | 18 | 70,79 | 50,65 | 13,03 | 5,43 | 68,18 | 49,75 | 14,40 | 4,74 | 65,51 | 48,83 | 15,83 | 4,14 | 62,20 | 47,51 | 17,30 | 3,60 |
| | 27 | 19 | 72,65 | 50,23 | 13,15 | 5,53 | 69,75 | 49,17 | 14,50 | 4,81 | 67,05 | 48,25 | 15,94 | 4,21 | 64,30 | 47,31 | 17,45 | 3,69 |
| | 28 | 19 | 72,53 | 53,34 | 13,14 | 5,52 | 69,76 | 52,38 | 14,50 | 4,81 | 67,06 | 51,45 | 15,94 | 4,21 | 64,31 | 50,51 | 17,45 | 3,69 |
| | 30 | 22 | 79,35 | 50,25 | 13,56 | 5,85 | 76,60 | 49,33 | 14,94 | 5,13 | 73,18 | 48,09 | 16,35 | 4,47 | 70,09 | 47,18 | 17,86 | 3,93 |
| 80 | 20 | 15 | 95,33 | 62,26 | 17,32 | 5,50 | 91,33 | 60,39 | 19,38 | 4,71 | 87,89 | 58,89 | 21,62 | 4,06 | 84,30 | 57,32 | 24,01 | 3,51 |
| | 22 | 16 | 98,28 | 66,04 | 17,42 | 5,64 | 94,79 | 64,52 | 19,50 | 4,86 | 91,21 | 62,96 | 21,75 | 4,19 | 87,54 | 61,36 | 24,14 | 3,63 |
| | 24 | 17 | 101,75 | 70,27 | 17,53 | 5,80 | 98,18 | 68,73 | 19,62 | 5,00 | 94,44 | 67,09 | 21,86 | 4,32 | 90,54 | 65,37 | 24,26 | 3,73 |
| | 26 | 18 | 105,11 | 74,60 | 17,64 | 5,96 | 101,32 | 72,93 | 19,73 | 5,14 | 97,43 | 71,23 | 21,97 | 4,43 | 93,25 | 69,40 | 24,36 | 3,83 |
| | 27 | 19 | 108,38 | 73,69 | 17,74 | 6,11 | 104,40 | 72,22 | 19,83 | 5,26 | 99,69 | 70,24 | 22,05 | 4,52 | 95,56 | 68,67 | 24,45 | 3,91 |
| | 28 | 19 | 108,41 | 78,05 | 17,74 | 6,11 | 104,31 | 76,42 | 19,83 | 5,26 | 99,55 | 74,42 | 22,05 | 4,52 | 95,57 | 72,95 | 24,45 | 3,91 |
| | 30 | 22 | 117,71 | 73,77 | 18,02 | 6,53 | 113,71 | 72,30 | 20,13 | 5,65 | 109,56 | 70,79 | 22,39 | 4,89 | 105,18 | 69,17 | 24,80 | 4,24 |
| 112 | 20 | 15 | 120,09 | 79,76 | 25,04 | 4,80 | 114,77 | 77,21 | 27,69 | 4,14 | 110,36 | 75,32 | 30,57 | 3,61 | 105,78 | 73,34 | 33,58 | 3,15 |
| | 22 | 16 | 123,49 | 84,37 | 25,26 | 4,89 | 119,01 | 82,46 | 27,99 | 4,25 | 114,43 | 80,49 | 30,87 | 3,71 | 109,75 | 78,47 | 33,88 | 3,24 |
| | 24 | 17 | 127,77 | 89,74 | 25,54 | 5,00 | 123,19 | 87,79 | 28,28 | 4,36 | 118,51 | 85,79 | 31,16 | 3,80 | 113,60 | 83,67 | 34,18 | 3,32 |
| | 26 | 18 | 132,01 | 95,28 | 25,82 | 5,11 | 127,26 | 93,25 | 28,56 | 4,46 | 122,32 | 91,12 | 31,44 | 3,89 | 116,55 | 88,54 | 34,40 | 3,39 |
| | 27 | 19 | 135,59 | 93,92 | 26,05 | 5,20 | 130,78 | 92,26 | 28,80 | 4,54 | 124,91 | 89,84 | 31,62 | 3,95 | 119,51 | 87,77 | 34,62 | 3,45 |
| | 28 | 19 | 135,60 | 99,45 | 26,05 | 5,20 | 130,83 | 97,78 | 28,80 | 4,54 | 124,72 | 95,21 | 31,61 | 3,95 | 119,54 | 93,29 | 34,63 | 3,45 |
| | 30 | 22 | 147,14 | 94,01 | 26,79 | 5,49 | 141,98 | 92,17 | 29,55 | 4,80 | 136,71 | 90,28 | 32,46 | 4,21 | 131,26 | 88,32 | 35,49 | 3,70 |

Notes:
kWf = Cooling capacity in kW
kWe = Electrical power absorbed by the compressors in kW
kWs = Sensitive cooling capacity in kW
kWt = Heating capacity provided (kW)
The cooling and heating performances do not take account of the heat dissipated by the motors and fans.
Ta = Room air temperature D.B./W.B.
D.B. = Dry bulb
W.B. = Wet bulb
EER referred only to compressors
COP referred only to compressors

# HIGH AMBIENT TEMPERATURE (SPECIAL EXECUTION)

| Model | Ta | W.B. | Fresh air temperature [°C] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [°C] | [°C] | 40 | | | | 45 | | | | 46 | | | |
| | | | kWf | kWs | kWe | EER | kWf | kWs | kWe | EER | kWf | kWs | kWe | EER |
| 50 | 20 | 15 | 46,01 | 31,87 | 15,75 | 2,92 | 43,79 | 30,85 | 17,28 | 2,53 | 43,34 | 30,64 | 17,60 | 2,46 |
| | 22 | 16 | 47,79 | 34,17 | 15,85 | 3,01 | 45,42 | 33,07 | 17,38 | 2,61 | 44,94 | 32,85 | 17,70 | 2,54 |
| | 24 | 17 | 49,40 | 36,44 | 15,95 | 3,10 | 46,89 | 35,30 | 17,47 | 2,68 | 46,35 | 35,06 | 17,78 | 2,61 |
| | 26 | 18 | 50,82 | 38,91 | 16,03 | 3,17 | 47,91 | 37,66 | 17,53 | 2,73 | 47,33 | 37,40 | 17,84 | 2,65 |
| | 27 | 19 | 52,10 | 38,51 | 16,10 | 3,24 | 49,63 | 37,56 | 17,64 | 2,81 | 49,14 | 37,37 | 17,95 | 2,74 |
| | 28 | 19 | 52,10 | 41,00 | 16,10 | 3,24 | 49,64 | 40,05 | 17,64 | 2,81 | 49,14 | 39,86 | 17,95 | 2,74 |
| | 30 | 22 | 57,29 | 38,66 | 16,40 | 3,49 | 54,33 | 37,50 | 17,92 | 3,03 | 53,73 | 37,28 | 18,23 | 2,95 |
| 65 | 20 | 15 | 54,51 | 37,77 | 18,50 | 2,95 | 51,93 | 36,63 | 20,13 | 2,58 | 51,39 | 36,39 | 20,47 | 2,51 |
| | 22 | 16 | 56,49 | 40,53 | 18,65 | 3,03 | 53,80 | 39,38 | 20,28 | 2,65 | 53,19 | 39,09 | 20,61 | 2,58 |
| | 24 | 17 | 58,10 | 43,44 | 18,77 | 3,10 | 55,15 | 42,31 | 20,39 | 2,70 | 54,50 | 42,04 | 20,71 | 2,63 |
| | 26 | 18 | 59,37 | 46,51 | 18,87 | 3,15 | 56,60 | 45,52 | 20,50 | 2,76 | 56,04 | 45,32 | 20,84 | 2,69 |
| | 27 | 19 | 61,49 | 46,34 | 19,02 | 3,23 | 58,69 | 45,30 | 20,66 | 2,84 | 58,12 | 45,10 | 21,00 | 2,77 |
| | 28 | 19 | 61,51 | 49,54 | 19,02 | 3,23 | 58,70 | 48,50 | 20,67 | 2,84 | 58,13 | 48,30 | 21,00 | 2,77 |
| | 30 | 22 | 67,04 | 46,30 | 19,43 | 3,45 | 63,72 | 45,23 | 21,05 | 3,03 | 62,99 | 44,97 | 21,38 | 2,95 |
| 80 | 20 | 15 | 80,63 | 55,71 | 26,56 | 3,04 | 76,93 | 54,02 | 29,25 | 2,63 | 76,19 | 53,67 | 29,80 | 2,56 |
| | 22 | 16 | 83,70 | 59,67 | 26,68 | 3,14 | 79,77 | 57,85 | 29,37 | 2,72 | 78,97 | 57,49 | 29,92 | 2,64 |
| | 24 | 17 | 86,57 | 63,62 | 26,80 | 3,23 | 82,60 | 61,81 | 29,49 | 2,80 | 81,75 | 61,43 | 30,04 | 2,72 |
| | 26 | 18 | 88,79 | 67,55 | 26,89 | 3,30 | 84,25 | 65,64 | 29,55 | 2,85 | 83,47 | 65,36 | 30,11 | 2,77 |
| | 27 | 19 | 91,51 | 67,18 | 27,00 | 3,39 | 87,45 | 65,60 | 29,69 | 2,95 | 86,63 | 65,29 | 30,24 | 2,86 |
| | 28 | 19 | 91,53 | 71,46 | 27,00 | 3,39 | 87,46 | 69,89 | 29,69 | 2,95 | 86,64 | 69,57 | 30,24 | 2,87 |
| | 30 | 22 | 100,73 | 67,52 | 27,35 | 3,68 | 96,22 | 65,79 | 30,03 | 3,20 | 95,19 | 65,39 | 30,58 | 3,11 |
| 112 | 20 | 15 | 101,09 | 71,31 | 36,73 | 2,75 | 96,39 | 69,14 | 40,01 | 2,41 | 95,44 | 68,71 | 40,68 | 2,35 |
| | 22 | 16 | 104,95 | 76,41 | 37,04 | 2,83 | 100,00 | 74,10 | 40,31 | 2,48 | 98,99 | 73,63 | 40,98 | 2,42 |
| | 24 | 17 | 108,51 | 81,45 | 37,32 | 2,91 | 103,37 | 79,14 | 40,59 | 2,55 | 102,18 | 78,52 | 41,25 | 2,48 |
| | 26 | 18 | 111,18 | 86,50 | 37,53 | 2,96 | 105,29 | 83,95 | 40,75 | 2,58 | 104,31 | 83,62 | 41,42 | 2,52 |
| | 27 | 19 | 114,32 | 85,89 | 37,78 | 3,03 | 109,12 | 83,88 | 41,06 | 2,66 | 108,08 | 83,47 | 41,73 | 2,59 |
| | 28 | 19 | 114,36 | 91,41 | 37,78 | 3,03 | 109,17 | 89,39 | 41,07 | 2,66 | 108,12 | 88,98 | 41,74 | 2,59 |
| | 30 | 22 | 125,54 | 86,23 | 38,64 | 3,25 | 119,4 | 83,82 | 41,89 | 2,85 | 118,06 | 83,26 | 42,54 | 2,78 |

Notes:
kWf = Cooling capacity in kW
kWe = Electrical power absorbed by the compressors in kW
kWs = Sensitive cooling capacity in kW
kWt = Heating capacity provided (kW)
The cooling and heating performances do not take account of the heat dissipated by the motors and fans.
Ta = Room air temperature D.B./W.B.
D.B. = Dry bulb
W.B. = Wet bulb
EER referred only to compressors
COP referred only to compressors

## Performance under diverse WINTER conditions, indoors and outdoors

| Model | Ta | W.B. | Indoors air temperature [°C] | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [°C] | [°C] | 10 | | | 12 | | | 15 | | | 18 | | | 20 | | | 22 | | |
| | | | kWt | kWe | COP | kWt | kWe | COP | kWt | kWe | COP | kWt | kWe | COP | kWt | kWe | COP | kWt | kWe | COP |
| 50 | -10 | -11 | 38,06 | 9,20 | 4,14 | 38,05 | 9,62 | 3,96 | 38,06 | 10,29 | 3,70 | 38,10 | 11,00 | 3,46 | 38,06 | 11,49 | 3,31 | 38,12 | 12,00 | 3,18 |
| | -7 | -8 | 41,46 | 9,53 | 4,35 | 41,37 | 9,96 | 4,15 | 41,26 | 10,64 | 3,88 | 41,17 | 11,35 | 3,63 | 41,13 | 11,85 | 3,47 | 41,10 | 12,36 | 3,33 |
| | -5 | -6 | 43,87 | 9,77 | 4,49 | 43,74 | 10,21 | 4,29 | 43,55 | 10,88 | 4,00 | 43,37 | 11,60 | 3,74 | 43,27 | 12,10 | 3,58 | 43,19 | 12,61 | 3,42 |
| | -2 | -3 | 47,70 | 10,16 | 4,70 | 47,49 | 10,59 | 4,48 | 47,20 | 11,28 | 4,18 | 46,93 | 12,00 | 3,91 | 46,76 | 12,51 | 3,74 | 46,61 | 13,02 | 3,58 |
| | 0 | -1 | 50,36 | 10,42 | 4,83 | 50,11 | 10,87 | 4,61 | 49,75 | 11,56 | 4,30 | 49,42 | 12,29 | 4,02 | 49,19 | 12,79 | 3,85 | 48,95 | 13,31 | 3,68 |
| | 2 | 1 | 53,01 | 10,69 | 4,96 | 52,73 | 11,14 | 4,73 | 52,31 | 11,84 | 4,42 | 51,92 | 12,57 | 4,13 | 51,67 | 13,08 | 3,95 | 51,42 | 13,60 | 3,78 |
| | 5 | 6 | 57,18 | 11,12 | 5,14 | 56,82 | 11,57 | 4,91 | 56,29 | 12,28 | 4,58 | 55,79 | 13,02 | 4,28 | 55,46 | 13,53 | 4,10 | 55,15 | 14,06 | 3,92 |
| | 7 | 6 | 60,08 | 11,42 | 5,26 | 59,68 | 11,88 | 5,02 | 59,10 | 12,60 | 4,69 | 58,54 | 13,34 | 4,39 | 58,17 | 13,86 | 4,20 | 57,82 | 14,38 | 4,02 |
| | 8 | 7 | 61,65 | 11,59 | 5,32 | 61,22 | 12,05 | 5,08 | 60,60 | 12,77 | 4,75 | 59,99 | 13,51 | 4,44 | 59,59 | 14,03 | 4,25 | 59,21 | 14,55 | 4,07 |
| | 10 | 9 | 64,67 | 11,91 | 5,43 | 64,20 | 12,37 | 5,19 | 63,51 | 13,10 | 4,85 | 62,85 | 13,85 | 4,54 | 62,41 | 14,37 | 4,34 | 61,99 | 14,90 | 4,16 |
| | 12 | 11 | 67,74 | 12,24 | 5,54 | 67,24 | 12,71 | 5,29 | 66,51 | 13,44 | 4,95 | 65,79 | 14,20 | 4,63 | 65,32 | 14,72 | 4,44 | 64,86 | 15,25 | 4,25 |
| 65 | -10 | -11 | 43,91 | 9,52 | 4,61 | 43,90 | 10,01 | 4,39 | 43,92 | 10,77 | 4,08 | 43,96 | 11,54 | 3,81 | 44,01 | 12,08 | 3,64 | 44,06 | 12,63 | 3,49 |
| | -7 | -8 | 47,81 | 9,94 | 4,81 | 47,73 | 10,43 | 4,58 | 47,63 | 11,18 | 4,26 | 47,56 | 11,97 | 3,97 | 47,52 | 12,50 | 3,80 | 47,49 | 13,05 | 3,64 |
| | -5 | -6 | 50,53 | 10,22 | 4,94 | 50,41 | 10,71 | 4,71 | 50,24 | 11,47 | 4,38 | 50,09 | 12,26 | 4,09 | 50,01 | 12,80 | 3,91 | 49,93 | 13,35 | 3,74 |
| | -2 | -3 | 54,92 | 10,67 | 5,15 | 54,74 | 11,17 | 4,90 | 54,46 | 11,93 | 4,56 | 54,20 | 12,72 | 4,26 | 54,03 | 13,26 | 4,07 | 53,87 | 13,81 | 3,90 |
| | 0 | -1 | 57,97 | 10,99 | 5,28 | 57,73 | 11,48 | 5,03 | 57,38 | 12,25 | 4,69 | 57,05 | 13,04 | 4,38 | 56,84 | 13,58 | 4,19 | 56,64 | 14,13 | 4,01 |
| | 2 | 1 | 60,95 | 11,29 | 5,40 | 60,71 | 11,79 | 5,15 | 60,30 | 12,56 | 4,80 | 59,92 | 13,35 | 4,49 | 59,67 | 13,90 | 4,29 | 59,42 | 14,45 | 4,11 |
| | 5 | 6 | 65,91 | 11,79 | 5,59 | 65,55 | 12,29 | 5,34 | 65,02 | 13,06 | 4,98 | 64,51 | 13,86 | 4,66 | 64,17 | 14,40 | 4,46 | 63,85 | 14,96 | 4,27 |
| | 7 | 6 | 69,41 | 12,14 | 5,72 | 68,96 | 12,63 | 5,46 | 68,30 | 13,40 | 5,10 | 67,66 | 14,20 | 4,77 | 67,30 | 14,75 | 4,56 | 66,94 | 15,31 | 4,37 |
| | 8 | 7 | 71,05 | 12,30 | 5,78 | 70,63 | 12,80 | 5,52 | 70,01 | 13,58 | 5,15 | 69,41 | 14,39 | 4,82 | 69,01 | 14,94 | 4,62 | 68,62 | 15,49 | 4,43 |
| | 10 | 9 | 74,66 | 12,66 | 5,90 | 74,18 | 13,17 | 5,63 | 73,48 | 13,95 | 5,27 | 72,79 | 14,75 | 4,93 | 72,34 | 15,30 | 4,73 | 71,89 | 15,86 | 4,53 |
| | 12 | 11 | 78,56 | 13,05 | 6,02 | 78,04 | 13,56 | 5,76 | 77,15 | 14,33 | 5,38 | 76,27 | 15,13 | 5,04 | 75,70 | 15,67 | 4,83 | 75,20 | 16,23 | 4,63 |
| 85 | -10 | -11 | 67,91 | 15,77 | 4,31 | 67,83 | 16,56 | 4,10 | 67,75 | 17,79 | 3,81 | 67,73 | 19,08 | 3,55 | 67,74 | 19,98 | 3,39 | 67,78 | 20,90 | 3,24 |
| | -7 | -8 | 73,36 | 16,36 | 4,48 | 73,15 | 17,15 | 4,27 | 72,89 | 18,38 | 3,97 | 72,67 | 19,67 | 3,69 | 72,56 | 20,57 | 3,53 | 72,47 | 21,49 | 3,37 |
| | -5 | -6 | 77,12 | 16,75 | 4,60 | 76,80 | 17,54 | 4,38 | 76,36 | 18,77 | 4,07 | 75,98 | 20,06 | 3,79 | 75,82 | 20,96 | 3,62 | 75,67 | 21,89 | 3,46 |
| | -2 | -3 | 83,43 | 17,41 | 4,79 | 83,06 | 18,21 | 4,56 | 82,53 | 19,46 | 4,24 | 82,05 | 20,77 | 3,95 | 81,75 | 21,67 | 3,77 | 81,48 | 22,60 | 3,61 |
| | 0 | -1 | 87,77 | 17,86 | 4,92 | 87,34 | 18,66 | 4,68 | 86,70 | 19,92 | 4,35 | 85,96 | 21,21 | 4,05 | 85,51 | 22,11 | 3,87 | 85,17 | 23,04 | 3,70 |
| | 2 | 1 | 92,33 | 18,32 | 5,04 | 91,82 | 19,13 | 4,80 | 91,08 | 20,40 | 4,47 | 90,39 | 21,72 | 4,16 | 89,94 | 22,63 | 3,97 | 89,52 | 23,56 | 3,80 |
| | 5 | 6 | 99,22 | 19,02 | 5,22 | 98,60 | 19,84 | 4,97 | 97,73 | 21,12 | 4,63 | 96,92 | 22,46 | 4,32 | 96,34 | 23,37 | 4,12 | 95,78 | 24,30 | 3,94 |
| | 7 | 6 | 104,34 | 19,55 | 5,34 | 103,67 | 20,37 | 5,09 | 102,69 | 21,66 | 4,74 | 101,74 | 23,00 | 4,42 | 101,13 | 23,92 | 4,23 | 100,54 | 24,86 | 4,04 |
| | 8 | 7 | 106,90 | 19,81 | 5,40 | 106,20 | 20,64 | 5,15 | 105,18 | 21,93 | 4,80 | 104,20 | 23,28 | 4,48 | 103,56 | 24,20 | 4,28 | 102,93 | 25,15 | 4,09 |
| | 10 | 9 | 112,02 | 20,33 | 5,51 | 111,23 | 21,17 | 5,25 | 110,09 | 22,47 | 4,90 | 109,05 | 23,82 | 4,58 | 108,40 | 24,76 | 4,38 | 107,65 | 25,70 | 4,19 |
| | 12 | 11 | 117,66 | 20,91 | 5,63 | 116,83 | 21,76 | 5,37 | 115,61 | 23,07 | 5,01 | 114,41 | 24,43 | 4,68 | 113,63 | 25,36 | 4,48 | 112,87 | 26,31 | 4,29 |
| 112 | -10 | -11 | 84,38 | 20,29 | 4,16 | 84,38 | 21,30 | 3,96 | 84,42 | 22,87 | 3,69 | 84,50 | 24,49 | 3,45 | 84,57 | 25,60 | 3,30 | 84,67 | 26,74 | 3,17 |
| | -7 | -8 | 91,75 | 21,23 | 4,32 | 91,61 | 22,25 | 4,12 | 91,43 | 23,81 | 3,84 | 91,29 | 25,44 | 3,59 | 91,22 | 26,55 | 3,44 | 91,16 | 27,70 | 3,29 |
| | -5 | -6 | 96,91 | 21,87 | 4,43 | 96,68 | 22,90 | 4,22 | 96,37 | 24,47 | 3,94 | 96,09 | 26,10 | 3,68 | 95,93 | 27,22 | 3,52 | 95,79 | 28,36 | 3,38 |
| | -2 | -3 | 105,22 | 22,91 | 4,59 | 104,84 | 23,93 | 4,38 | 104,31 | 25,52 | 4,09 | 103,81 | 27,15 | 3,82 | 103,49 | 28,27 | 3,66 | 103,19 | 29,42 | 3,51 |
| | 0 | -1 | 110,96 | 23,62 | 4,70 | 110,50 | 24,65 | 4,48 | 109,84 | 26,24 | 4,19 | 109,21 | 27,88 | 3,92 | 108,81 | 29,00 | 3,75 | 108,42 | 30,15 | 3,60 |
| | 2 | 1 | 116,68 | 24,32 | 4,80 | 116,15 | 25,36 | 4,58 | 115,39 | 26,96 | 4,28 | 114,65 | 28,61 | 4,01 | 114,17 | 29,74 | 3,84 | 113,70 | 30,89 | 3,68 |
| | 5 | 6 | 125,85 | 25,45 | 4,94 | 125,16 | 26,49 | 4,72 | 124,16 | 28,10 | 4,42 | 123,19 | 29,75 | 4,14 | 122,55 | 30,88 | 3,97 | 121,93 | 32,03 | 3,81 |
| | 7 | 6 | 132,14 | 26,22 | 5,04 | 131,35 | 27,27 | 4,82 | 130,27 | 28,89 | 4,51 | 129,19 | 30,55 | 4,23 | 128,48 | 31,68 | 4,06 | 127,78 | 32,84 | 3,89 |
| | 8 | 7 | 135,55 | 26,64 | 5,09 | 134,76 | 27,70 | 4,87 | 133,59 | 29,32 | 4,56 | 132,44 | 30,98 | 4,27 | 131,68 | 32,12 | 4,10 | 130,91 | 33,27 | 3,94 |
| | 10 | 9 | 142,22 | 27,47 | 5,18 | 141,33 | 28,52 | 4,96 | 140,00 | 30,15 | 4,64 | 138,69 | 31,81 | 4,36 | 137,84 | 32,95 | 4,18 | 136,99 | 34,11 | 4,02 |
| | 12 | 11 | 149,13 | 28,32 | 5,27 | 148,02 | 29,37 | 5,04 | 146,48 | 30,99 | 4,73 | 145,14 | 32,67 | 4,44 | 144,21 | 33,82 | 4,26 | 143,30 | 34,98 | 4,10 |

Notes:
kWf = Cooling capacity in kW
kWe = Electrical power absorbed by the compressors in kW
kWs = Sensitive cooling capacity in kW
kWt = Heating capacity provided (kW)
The cooling and heating performances do not take account of the heat dissipated by the motors and fans.
Ta = Room air temperature D.B./W.B.
D.B. = Dry bulb
W.B. = Wet bulb
EER referred only to compressors
COP referred only to compressors

# Technical Performance of the Accessories (optionals) to be declared when ordering

## Summer hot-gas reheating coil with 1 row

| Model NHE-RTU Inverter | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|
| Performance of coil for reheating with hot gas | | | | | |
| Nominal Heating Capacity | kWt | 19,9 | 25,0 | 32,8 | 43,7 |
| Nominal air flow | m3 / h | 9000 | 12000 | 15000 | 20000 |
| Temperature difference on the air side with nominal flow | ° C | 6,6 | 6,2 | 6,6 | 6,6 |

Notes:
kWt = heating capacity provided (kW) to the flow of supply air;
Temp. Internal air 27°C/19°C W.B. Fresh Air Temperature 35°C D.B./24°C W.B.;
Performance with full recirculation and constant flow rate;
Standard coils are with 1 row;
The coils are housed downstream of the direct expansion coil and their installation is an alternative to the hot-water auxiliary coil;
The use is solely for summer reheating;
The reheating coil is fed by hot gas.

## Supplementary hot-water heating coil with 2 rows (provided by external generator)

| Model NHE-RTU Inverter | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|
| Performance of water-based reheating coil | | | | | |
| Nominal Heating Capacity | kW | 77 | 93 | 139 | 168 |
| Flow Rate | m3 / h | 9000 | 12000 | 15000 | 20000 |
| Air pressure drop on the air side | Pa | 16 | 26 | 20 | 33 |
| Nominal Water Flow Rate | m3 / h | 3,4 | 4,1 | 6 | 7 |
| Water pressure drop | kPa | 17 | 24 | 14 | 20 |

Notes:
Nominal heating power calculated with air entering the coil at 20°C, with the indicated water flow rate and with IN/OUT temperature of 80/60°C;
Standard coils are with 2 rows;
Heating performance referred to maximum potential of the water coil. The heat regulator chokes the three-way modulating valve restricting the air inlet temperature to the desired values.

## 3-way valve (accessory for optional supplementary hot-water heating coil)

| Model NHE-RTU Inverter | | 50 | 65 | 80 | 112 |
|---|---|---|---|---|---|
| 3-way valve performance (Accessory for the optional water heating coil) | | | | | |
| Nominal Water Flow Rate | m3 / h | 3,4 | 4,1 | 6,1 | 7,4 |
| Valve DN | DN | 25 | 25 | 40 | 40 |
| Valve KV | KV | 10 | 10 | 16 | 16 |
| Water pressure drop | kPa | 12 | 17 | 16 | 23 |
| Actuator type | | 0-10V proportional control | | | |
| Type of valve connections | | Threaded connections | | | |

Notes:
To be used in conjunction with the hot-water coil (optional). It is controlled by the on-board microprocessor through a 0-10V signal and allows fully automatic regulation of the water coil;
0-10V proportional control not included and to be provided for separately;
Threaded Connections.

## Optional protection for the heat exchange coils

All heat exchanger coils in standard execution are with copper tubes and aluminium fins. On request, the coils can be supplied with the following surface treatments against corrosion:

- Aiax Coatings AA Aqua Aero®;
- EneryGuard DCC Fluxcoat®;
- Blygold PoluAluXT®;
- P-413CHeresite®.

### Optional supplementary electric heating coil

The inclusion of this accessory is normally provided where electricity is available and other conventional supplementary solutions (water coil and/or hot air generator with natural gas) are not applicable.

The option consists of inserting an electric coil before the air handling coil. Its function is to preheat the air that enters the standard coil (supplementary heating energy function) to allow rapid achievement of heating comfort and to extend the operating limits of the unit. This accessory is normally used to cover peak heat demands in the building, if the external conditions become critical. The coils are made of aluminium and sized to reduce the pressure drops on the air side. There are various available capacities depending on the unit and external conditions.
The following sizes are available:

- 6 kW / steps with power of 2 kW and 4 kW
- 12 kW / steps with power of 4 kW and 8 kW
- 18 kW / steps with power of 6 kW and 12 kW
- 36 kW / steps with power of 12 kW and 24 kW
- 60 kW / steps with power of 8.6 kW, 17.2 kW and 34.2 kW

Notes:
Power supply 400V / 3 phases / 50Hz

### Optional supplementary heating module with gas combustion hot-air generator

| **Section of gas heating module** | | **65 kW** | | **82 kW** | | **100 kW** | | **130 kW** | |
|---|---|---|---|---|---|---|---|---|---|
| Performance of gas heating modules | | min | max | min | max | min | max | min | max |
| Quantity | | | | | | | | | |
| Nominal Heating Capacity | kW | 12,4 | 65,0 | 16,4 | 82,0 | 18,0 | 100,0 | 12,4 | 130,0 |
| Hi performance (P.C.I.) | % | 108,1 | 96,8 | 108,4 | 97,6 | 109,1 | 97,2 | 108,1 | 96,8 |
| Hs performance (p.C.S.) | % | 97,4 | 87,2 | 97,6 | 87,9 | 98,3 | 87,5 | 97,4 | 87,2 |
| Maximum condensation produced | l/h | 2,1 | | 3,3 | | 2,7 | | 4,2 | |
| Absorbed power | W | 15 | 97 | 40 | 123 | 20 | 130 | 30 | 194 |
| Carbon monoxide C0 (0% of O2) | ppm | <5 | | <5 | | <5 | | <5 | |
| Nitrogen oxide - NOx - (0% of O2) | mg/kWh | 40 | | 34 | | 45 | | 40 | |
| Pressure available at the chimney | Pa | 120 | | 120 | | 120 | | 120 | |
| Gas connection Ø | GAS | UNI/ISO 7/1-3/4" | | UNI/ISO 7/1-3/4" | | UNI/ISO 7/1-3/4" | | UNI/ISO 7/1-3/4" | |
| Drainage pipes Ø | mm | 80/80 | | 80/80 | | 80/80 | | 2 x 80/80 | |

| **Table of Combinations** | **50** | **65** | **80** | **112** |
|---|---|---|---|---|
| Module Size | | | | |
| 65 | • | • | • | • |
| 82 | • | • | • | • |
| 100 | | | • | • |
| 130 | | | | • |

Notes:
Refer to the table of pressure drops due to the inclusion of the heating module;
The module requires a gas supply (gas supply connection to be arranged by the Customer);
The location of the machine and the combustion gas discharge procedures must comply with the applicable laws and regulations in the country where it is installed;
The chimney kit must be fitted by the Customer during the installation works;
Check with the manufacturer for the various combinations of accessories.

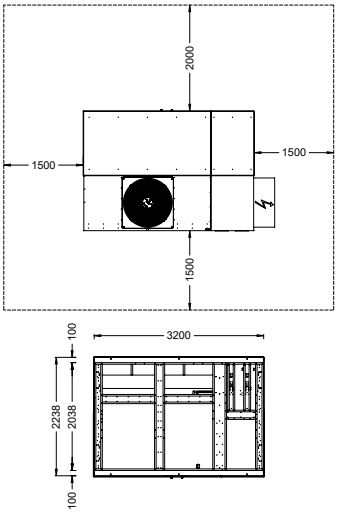
## Air pressure drops on the air side of Accessories (optionals) to be declared when ordering

| **Model NHE-RTU Inverter** | | **50** | **65** | **80** | **112** |
|---|---|---|---|---|---|
| Pressure drops of accessories | | | | | |
| Eff. Filters F7 (optional) | Pa | 142 | 240 | 141 | 250 |
| Electronic filters (optional) | Pa | 29 | 54 | 31 | 55 |
| Coil for Reheating with hot gas (optional) | Pa | 8 | 12 | 10 | 17 |
| Supplementary water-based heating coil (optional) | Pa | 17 | 24 | 16 | 26 |
| Supplementary electric heating coil (optional) | Pa | 15 | 15 | 20 | 20 |
| Gas combustion Hot air Generator module (optional) | Pa | 100 | 100 | 100 | 100 |

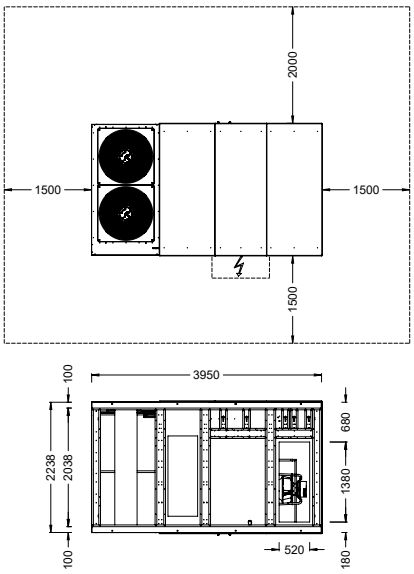
Notes:
If accessories are introduced, the value of the maximum effective available external static pressure of the air handling section (including accessories) is obtained by subtracting the pressure drop of each (optional) accessory from the “External static pressure” figure (stated in the pages related to general technical data).

## Clearances and lower view

- **Frame 1**
- **Models NHE-RTU Inverter 50 RO and NHE-RTU Inverter 65 RO**

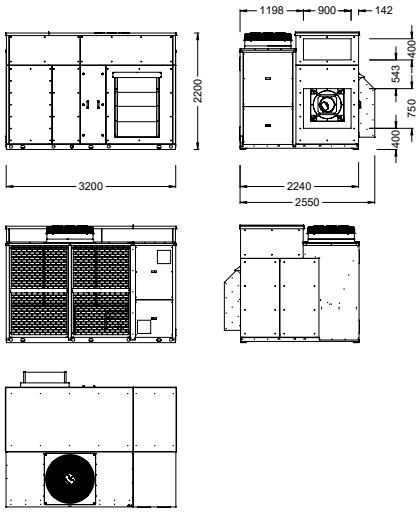



- **Frame 2**
- **Models NHE-RTU Inverter 80 RO and NHE-RTU Inverter 112 RO**

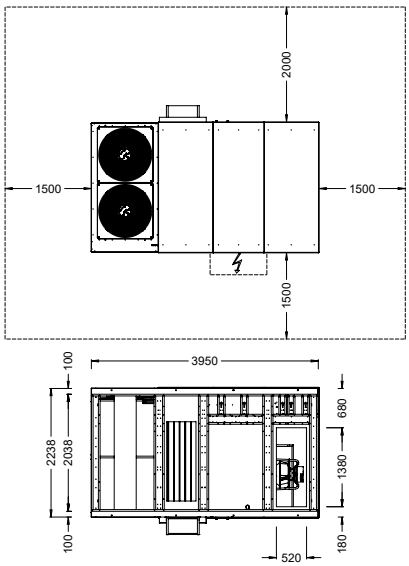


## Clearances and lower view

- **Frame 1**
- **Models NHE-RTU Inverter 50 RF and NHE-RTU Inverter 65 RF**

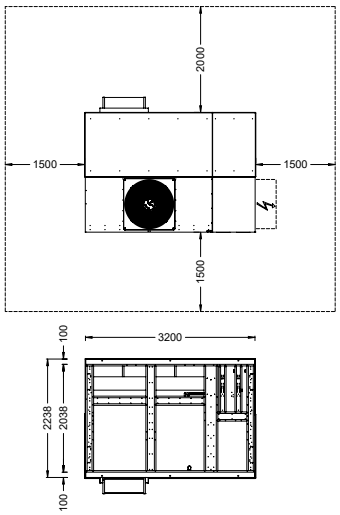



- **Frame 2**
- **Models NHE-RTU Inverter 80 RF and NHE-RTU Inverter 112 RF**

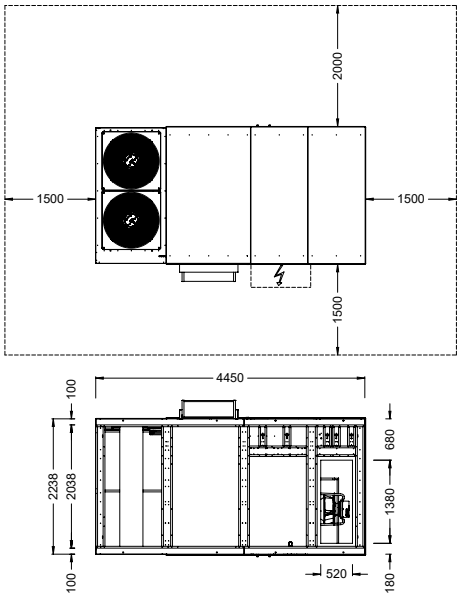


## Clearances and lower view

- **Frame 1**
- **Models NHE-RTU Inverter 50 RFE/RTA and NHE-RTU Inverter 65 RFE/RTA**




- **Frame 2**
- **Models NHE-RTU Inverter 80 RFE/RTA and NHE-RTU Inverter 112 RFE/RTA**



**Roccheggiani S.p.a.**
Via 1° Maggio, 10 - 60021 Camerano (An) Italy
Tel +39 071 730 00 23
Fax +39 071 730 40 05
info@roccheggiani.it

www.roccheggiani.it

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