61AQ

AIR SOURCE HEAT PUMP HIGH TEMPERATURE 75°C HEAT PUMPS WITH GREENSPEED® INTELLIGENCE

AQUASNAP® greenspeed®

Cooling capacity
30 - 120 kW
Heating capacity
40 - 140 kW

NATURAL REFRIGERANT
FULL INVERTER LOW ENVIRONMENTAL IMPACT
HIGH TEMPERATURE 75°C
HIGH FULL AND PART LOAD EFFICIENCY
COMPACT AND SIMPLE TO INSTALL
LOW REFRIGERANT CHARGE
SUPERIOR RELIABILITY
MODULAR CAPABILITY UP TO 4 UNITS (560 KW)
SUPPORTS DECARBONISATION

AquaSnap® heat pumps are the best solution for heating applications where installers, engineering and design departments, and building owners require reduced installation costs, optimal performances and maximum quality in new and refurbished buildings.

- AquaSnap® 61AQ is a compact all-in-one package optimised for applications which require reduced investment and installation costs (low CapEx).
- The large options panel allows for configurations that suit user requirements.
- Variable-speed fans and pumps with Carrier Greenspeed® intelligence control logic make this a product which is optimised for part load applications where a high SCOP, SEER, or IPLV value is required.

In this configuration, AquaSnap® provides premium part load efficiency to reduce maintenance costs over the lifespan of the chiller. In addition, the sound levels achieved under the part load conditions are particularly low. Besides operating efficiently and quietly, the AquaSnap® range with Greenspeed® intelligence operates from -25°C up to +46°C as standard.

R-290 Natural

ECO DESIGN READY

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

CARRIER participates in the ECP programme for LCP-HP. Check ongoing validity of certificate: www.eurovent-certification.com

* The availability of sizes and options depends on the country. Please contact your local commercial dealer for more information.

Original document

R-290: THE BEST SOLUTION FOR HIGH TEMPERATURE SCROLL HEAT PUMPS

Carrier develops innovative products that help customers reduce greenhouse gas emissions and achieve their sustainability goals. We understand the challenges of climate change and are committed to providing customers with increasingly more holistic sustainability solutions. Our innovative products help customers meet their energy and carbon reduction goals, while we shift to more renewable energy sources through electrification and new refrigerants with lower global warming potential.

Carrier was the first to introduce the R-1234ze HFO with ultra-low GWP in screw chillers, as far back as early 2016. Today, having examined its main properties, Carrier has chosen R-290 refrigerant to replace high-GWP refrigerant and proposing an alternative to R-32 refrigerant in its scroll heat pumps, for its lower environmental impact, high energy efficiency, High temperature good availability and ease of use. R-290 is currently the ideal refrigeration solution.

By using R-290 refrigerants, Carrier has reduced the carbon footprint of its AquaSnap® range of heat pumps by 99%. This is the result of a much lower GWP and a significant reduction in the system's charge compared to the previous generation. R-290 is also the right choice economically, reducing the locally imposed tax burden on HFCs based on the CO_2 impact.

Overall, the AquaSnap® 61AQ has been specifically designed around the choice of using the R-290 refrigerant.

By providing sustainable solutions, we are advancing toward our goal of reducing our customers' carbon footprint by more than 1 gigaton by 2030.

CO_2 FOOTPRINT
REDUCED BY UP TO 99%

Lower environmental impact

- R-290 has zero ozone depletion potential (ODP)
- As natural refrigerant the Global Warming Potential (GWP) of R-290 is only 0,02 (following AR6), compare to 1774 for R-407C or 2088 for R-410A

SCOP up to +18%
SEER up to +5%

High energy efficiency

Thanks to the properties of R-290 and the specific new design, the seasonal efficiency of AquaSnap® 61AQ is higher than that of the previous 61AF version.

SAFETY

R-290 is an A3 classified refrigerant due to its high flammability

- Low refrigerant charge in each circuit, in addition to hermetically sealed refrigerant circuit help to minimize the potential for leaks
- **No specific safety requirements** for transporting chillers by road or for outdoor installation
- The service tools must be **certified** for **A3** refrigerants in accordance with standard ISO 817 or EN378
- Service technicians **must be qualified for brazing components** on PED 1 fluid units

AQUASNAP® 61AQ- CUSTOMER BENEFITS

Outstanding performance

Equipped with variable-speed compressors (INVERTER), variable-speed fans (EC) and optional variable-speed pumps, Carrier's AquaSnap® 61AQ range with Greenspeed® intelligence automatically adjusts the heating or cooling capacity and water flow to perfectly adapt to the building's requirements or load variations. The result is optimum operation at both full load and part load. The 61AQ offers energy efficiency up to 10% higher than the previous range with the same or a smaller footprint.

The range is already fully compliant with current Ecodesign regulations.

$SCOP_{35}$ up to 4,32
$SCOP_{55}$ up to 3,41
SEER up to 4,47

Extensive field of application

The AquaSnap® range is suitable for a very wide range of applications from tertiary, healthcare, hospitality, collective dwelling, sport center. The range can operate at outdoor temperatures from -25°C to +50°C and deliver water temperatures up to 75°C. From high-end office buildings and hotels to healthcare facilities, collective dwelling, sport center data centers and industrial projects, AquaSnap® 61AQ units meets the most demanding expectations in terms of energy efficiency and savings, whatever the climate or application.

Up to
75°C

Easy installation & exploitation cost reduction

Thanks to the variable-speed pumps, automatic adjustment of the nominal water flow rate via electronic control and automatic measurement of the unit's energy performance under real conditions, pumping energy consumption is reduced by almost two thirds. These new features guarantee peace of mind for installers and maintenance companies and lower energy bills for users.

Pumping energy
reduced
by up to 66%

AQUASNAP® 61AQ- CUSTOMER BENEFITS

Customer benefit

AquaSnap® 61AQ heat pumps are designed to meet current and future Ecodesign and F-Gas European regulation requirements in terms of energy efficiency and reduced CO_2 emissions. They use the best technologies available today:

- Reduced refrigerant charge of non-ozone depleting R-290 refrigerant with low GWP(0,02)
- Inverter scroll compressors
- Greenspeed® variable-speed fans
- The fans are driven by an EC motor, also known as brushless DC, with dedicated electronics to manage commutation. This offers high precision for fans that require higher efficiency and variable speed
- The 61AQ unit uses latest generation of fan technology, engineered for maximum efficiency, super low noise, and a wide operating range
- Brazed-plate heat exchangers with reduced pressure drops
- Self-regulating microprocessor control with Greenspeed® intelligence
- Colour touch screen with web connectivity capability

AquaSnap®can be equipped with a built-in hydraulic module, limiting the installation to conventional operations such as connection of the power supply and the supply and return piping (plug & play).

Recommended by Carrier, the AquaSnap® can be equipped with one Greenspeed® variable-speed pumps to significantly reduce energy costs linked to pumping (reduction of more than two-thirds), ensure optimum water flow rate control, and improve overall system reliability.

Very economical operation

- High unit full- and part-load energy efficiency and efficient design of the water side:
  - $SCOP_{35\,°C}$ up to 4,32
  - $SCOP_{55\,°C}$ up to 3,41
  - $SEER_{12/7°C}$ up to 4,47 in line with the Ecodesign 2016/2281 regulation
  - Scroll compressors equipped with a high-efficiency inverter motor which can exactly match the cooling capacity to the load required
  - Electronic expansion valve enabling operation at a lower condensing pressure and improved use of the evaporator heat transfer area (superheat control)
  - Coils with high-efficiency energy transfert and Greenspeed® variable-speed fans
  - Low pressure drop brazed plate heat exchangers (< 45 kPa under Eurovent conditions)
- Specific control functions to reduce energy use during occupied and unoccupied periods:
  - Internal timer: switches the chiller on/off and controls operation at a second setpoint
  - Setpoint automatically offset based on the outdoor air temperature (via an option)
  - Floating high pressure (HP) management,
  - Variable-speed fan control
  - Capacity demand limitation

Refer to the control chapter for more information.

- Greenspeed® variable-speed pump to reduce pumping energy consumption by up to two-thirds (option recommended by Carrier):
  - Eliminate energy losses through the water flow rate control valve by electronically setting the nominal water flow rate
  - Save energy during stand-by periods or part-load operation by automatically reducing the water pump speed. The energy consumption of the pump motor varies according to the cube of the speed, so that a reduction in speed of just 40% can reduce energy consumption by 80%
  - Improved unit part-load performance (increased SCOP/SEER value with variable water flow according to standard EN14825)
- Reduced maintenance costs:
  - Fast diagnosis of possible incidents and their history via the control
  - Programmable maintenance alert
  - Programmable leak detection monitoring alert

AQUASNAP® 61AQ- CUSTOMER BENEFITS

Low noise level

- Condenser with Greenspeed® variable-speed fans for quieter operation:
  - Fan setting at low speed
  - Exceptional acoustic signature during part-load operation through smooth fan speed variation
- Compressor inverter for quiter operations:
  - Compressor insulate from air flow
  - Casing with noise absorber material
  - Inverter ensure smoth noise variation and improve acoustic signature
- Specific control functions or features to reduce noise level during the night or unoccupied periods:
  - Night-time sound control with cooling capacity and fan speed limitation
  - Low-noise scroll compressors with low vibration level,
  - The compressor assembly is installed on an independent chassis and supported by flexible anti-vibration mountings
  - Dynamic suction and discharge piping support, minimising vibration transmission
  - Acoustic compressor enclosure, reducing radiated noise emissions

Quick and easy installation

- Compact design:
  - AquaSnap® units are designed with compact dimensions for easy installation.
- Integrated hydraulic module (option):
  - High-pressure water pump
  - Built-in variable-speed pumps with automatic nominal water flow adjustment via electronic control on the user display
  - Water filter protects the water pump against circulating debris
  - Pressure sensors for direct numerical display of the water flow rate and water pressures
  - Thermal insulation and frost protection down to -25°C, using a heater
  - 8 liters membrane expansion tank
- Built-in hydraulic module with Greenspeed® variable-speed pump:
  - Quick and easy electronic setting of the nominal water flow rate when the unit is commissioned, thus eliminating the need to adjust the water flow rate control valve
  - Automatic control of the pump speed based on constant speed, constant pressure difference or constant temperature difference
- Simplified electrical connections:
  - A single power supply point without neutral
  - Main disconnect switch with high trip capacity
  - 24 V control circuit using an integrated transformer
- Simplified hydraulic connections:
  - Screw type couplings on the exchanger
  - Clearly identified and practical reference marks for entering and leaving water connections
- Fast unit commissioning:
  - Systematic factory test before shipment
  - Quick-test function for step-by-step verification of the sensors, electrical components and motors
  - Quick menu to configurate unit and system according installation scheme

Reduced installation costs

- Optional Greenspeed® variable-speed pump with hydraulic module (option recommended by Carrier):
  - Cut costs relating to the water flow control valve
  - The design of the water system with variable primary flow (VPF) can provide significant installation cost savings compared with traditional constant primary systems with variable secondary circuits; elimination of the secondary distribution pump, etc
  - Water system design with fan coils fitted with 2-way valves instead of 3-way valves
  - Minimum water loop volume reduced

Environmentally responsible

AquaSnap® with Greenspeed® intelligence (with optional variable-speed pumps) are a boost for green cities and contribute to a sustainable future. Combining a low refrigerant charge, with R-290 natural refrigerant with a GWP 99% lower than that of the previous version, and exceptional energy efficiency, this chiller significantly reduces energy consumption while reducing carbon dioxide emissions throughout its life cycle.

- Pumping energy consumption can be reduced by up to 2/3 using Greenspeed® variable-speed pumps
- Sealed refrigerant circuits:
  - Leaks are eliminated thanks to the absence of capillary tubes and the use of flare connections
  - Verification of pressure transducers and temperature sensors without transferring refrigerant charge
  - Discharge line shut-off valve and liquid line service valve for simplified maintenance
  - Qualified Carrier maintenance personnel to provide refrigerant servicing
  - ISO 9001 production plant

AQUASNAP® 61AQ- CUSTOMER BENEFITS

Superior reliability

- State-of-the-art concept:
  - Two self-contained refrigerant circuits; the second one automatically takes over if the first one develops a fault, maintaining partial capacity in all circumstances
  - All compressor components are easily accessible on site, minimising downtime
- Self-regulating control:
  - The control algorithm prevents excessive compressor cycling and reduces the quantity of water in the water loop
  - Automatic compressor unloading in case of abnormally high condensing pressure
  - Automatic fan speed adjustment in case of coil fouling,
  - Smooth fan start to increase unit lifetime
- Exceptional endurance tests:
  - To design critical components and sub-assemblies to minimise the risk of failure on site, Carrier uses specialised laboratories and advanced dynamic simulation tools
  - To ensure that the units reach customer sites in the same condition as they are when tested in the factory, Carrier tests the machine behaviour during transportation over 250 km. The road test is based on a military standard and is the equivalent to 5000 km by truck on a normal road
  - To guarantee the coil corrosion resistance, salt spray corrosion resistance tests are performed in the group's laboratory
  - In addition, to maintain the unit's performance throughout its operating life whilst minimising maintenance costs, end users can access the "Connected Services" remote monitoring service

Designed to support Green Building Design

A green building is a building that is environmentally sustainable and is designed, constructed and operated to minimise the total impact on the environment.

The resulting building will be economical to operate, offer increased comfort and create a healthier environment for the people who live and work there, increasing productivity.

The air conditioning system can use between 30 and 40% of the annual building energy consumption. Choosing the right air conditioning system is one of the main considerations when designing a green building. For buildings with a load that varies throughout the year, the AquaSnap® 61AQ unit offers a solution to this important challenge.

A number of green building certification programmes exist in the market and offer third-party assessment of green building measures for a wide variety of building types.

Designed to support Boiler replacment

The AquaSnap® 61AQ has been specifically designed to simplify and enhance boiler replacement projects. These units have been designed with compact dimensions in mind, allowing them to be installed in places where heat pumps were not planned as replacements for old boilers, taking up minimal space.

Acoustic being a key factor when talking about the replacement of boilers, the AquaSnap® 61AQ is fitted with variable speed fans, improving its acoustic signature and allowing low speed of the fans in all configurations. The compressor, is isolated from air flow and benefits from an insulated casing with foam and heavy mass avoiding noise diffusion and can therefore be use for renovation application where installers seek for quieter solution as building in renovation.

High temperature is needed in the renovation application where fossil boilers are removed. The AquaSnap® 61AQ can produce hot water up to 75°C at its maximum and 70°C down to -10°C OAT.

It includes standard boiler management, ensuring seamless integration with existing systems. Additionally, external heater management is available as an option, providing further flexibility. The domestic hot water (DHW) management, supplying a 3-way valve (optional), allows an easy management of Domestic Hot Water, directing the hot water produced by the heat pump to the heating circuit or the domestic hot water tank, with specific set point and time schedule. Another key advantage is the built-in Legionella prevention management, to ensure health and safety compliance. Moreover, the system can efficiently manage up to two heating zones, offering precise control over temperature distribution across the property. This design not only optimizes functionality but also ensures a smooth transition during boiler replacements, enhancing overall system performance.

AQUASNAP® 61AQ- CUSTOMER BENEFITS

Energy saving certificate

The AquaSnap® 61AQ unit is eligible for energy saving certificates in France (CEE) in comfort, industrial and agriculture applications:

- Floating high pressure control (by modulating the air flow through fan activation and speed)
- Floating low pressure control
- Variable speed on asynchronous compressors motor
- Variable speed on asynchronous pump motor (optional)

For more details about financial incentives in France, please refer to the "CEE product sheet".

An Energy Valuable Solution

The purpose of the Ecodesign Directive (EU) 811/2013. and the Energy Labelling Regulation (EU) 2017/1369 is to enhance the energy efficiency of products, minimize their environmental impact, facilitate the free movement of energy-related products within the EU, and provide consumers with information to help them choose more energy-efficient options.

The Energy Labelling Regulation is an EU instrument designed help consumers make informed decisions and encourage the selection of higher-quality products. It complements the EU Ecodesign standards by enforcing mandatory labeling requirements. Given the increased efficiency of heat pumps over time, the European Commission has proposed a rescaling of their labels.

As heat pump technologies are already in the top categories of the energy label for heating, cooling, and domestic hot water, the industry benefits indirectly from this enhanced communication.

This Regulation sets out ecodesign requirements for the market introduction and/or commissioning of space heaters and combination heaters with a rated heat output of ≤ 400 kW. This includes those incorporated in packages containing a space heater, temperature control, and solar device, or in packages with a combination heater, temperature control, and solar device, as defined in Article 2 of Commission Delegated Regulation (EU) 811/2013.

Modular Approach

The AquaSnap® 61AQ bring a modular concept. It has been thought to fit all kind of configuration of buildings (doors, elevators...), The modular design of a heat pump offers several key advantages:

Scalability: Modular heat pumps allow for easy capacity expansion by adding or removing modules as needed. This enables HVAC systems to adapt to changing building sizes or demand over time without requiring a complete overhaul.

Energy Efficiency: By adjusting the number of active modules based on real-time heating or cooling needs, modular systems avoid unnecessary energy consumption, reducing operational costs and enhancing overall efficiency.

Redundancy and Reliability: In a modular system, if one module fails, the others can continue to operate, ensuring minimal downtime and uninterrupted service. This redundancy enhances system reliability.

Easy installation and Maintenance: Since each module operates independently, individual units can be serviced or replaced without taking the entire system offline, reducing maintenance time and disruption.

Phased Installation: Modular heat pumps allow for phased installations, which can be particularly useful for projects with budget constraints. Additional modules can be added as needed, spreading out the investment over time.

Space Optimization: Modular systems can be configured to fit into a variety of spaces. Their compact design allows for flexibility in placement, particularly in buildings with limited space.

Customized Performance: Modular systems can be tailored to specific needs by combining modules with different capacities or features, ensuring a customized solution for varying climate zones or building sections.

These benefits make modular heat pumps a versatile, energy-efficient, and cost-effective solution for a wide range of HVAC applications.

61AQ TECHNICAL OVERVIEW

SmartVu™ CONTROL

- 6 languages available
- 7" user-friendly touch screen
- Very easy online monitoring
- Easy and secure access to unit parameters
- Bacnet, J-Bus communication interfaces as standard

INVERTER

EC VARIABLE SPEED FANS

- Fan blade design inspired by nature
- High efficiency version with EC variable speed motor technology
- Night mode operation

INVERTER SCROLL COMPRESSORS

INVERTER

GAS SEPARATOR

REDUCED REFRIGERANT CHARGE

R-290 Natural

INVERTER

VARIABLE-SPEED PUMP

- Water flow electronic control and reading
- Automatic protection of the pump against low pressure
- Antifrezze protection
- Multiple control options:
  - Constant flow with low speed mode on standby
  - Variable flow based on pressure difference or constant temperature

HIGH-EFFICIENCY BRAZED PLATE HEAT EXCHANGER

- Low pressure drop
- Antifreeze protection by heater
- Antifreeze reliefe valve
- Water filter

TECHNICAL INSIGHTS

SmartVu™ control

The SmartVu™ control combines intelligence with operating simplicity. The control constantly monitors all machine parameters and precisely manages the operation of compressors, expansion devices, fans and the evaporator water pump for optimum energy efficiency.

The SmartVu™ control features advanced communication technology over Ethernet (IP) and a user-friendly and intuitive user interface with 7 inch colour touch screen.

- Heating system management
  AquaSnap® 61AQ is dedicated for integration in an heating system in order to replace or be a complement of a boiler.
  The SmartVu™ can manage all the heating components:
  - An external boiler (O/1)
  - Up to 3 external heaters
  - Up to 2 heating zone
  - Domestic Hot Water (DHW) production with specific DHW set point and time schedule
  - Legionnela prevention with specific set point and time schedule
- Energy management configuration:
  - Internal timer: Controls heat pump on/off times and operation at a second setpoint
  - Setpoint offset based on the outdoor air temperature
  - Lead/Lag control of four units operating in parallel with runtime balancing and automatic changeover in case of a unit fault
  - For further energy savings, the AquaSnap® can be monitored remotely by Carrier experts for energy consumption diagnosis and optimisation
- Integrated features:
  - Night mode: Capacity and fan speed limitation for reduced noise level
  - With hydraulic module: Water pressure display and water flow rate calculation
- Advanced communication features:
  - Easy, high-speed communication technology over Ethernet (IP) to a centralised building management system
  - Access to multiple unit parameters
  - Modbus & Bacnet protocol as standard
- Maintenance functions:
  - Refrigerant leak check reminder alert
  - Maintenance alert can be configured to days, months or hours of operation
  - Storage of maintenance manual, wiring diagram and spare parts list
  - Display of trend curves for the main values
  - Management of a fault memory allowing a log of the last 50 incidents to be accessed, with operating readings taken when the fault occurs
  - Blackbox memory
- 7" SmartVu™ user interface:

  - Intuitive and user-friendly 7 inch touch screen interface,
  - Concise and clear information is available in local languages
  - Complete menu, customised for different users (end user, service personnel or Carrier engineers)

SGR Ready

Heat pump 61AQ are SGR ready certified, standardized and secured label for integration on the smart electrical networks.

TECHNICAL INSIGHTS

Remote management (standard)

Units with SmartVu™ control can be easily accessed from the internet, using a PC with an Ethernet connection. This makes remote control quick and easy and offers significant advantages for service operations.

The AquaSnap® is equipped with an RS485 serial port that offers multiple remote control, monitoring and diagnostic possibilities. Carrier offers a vast choice of control products, specially designed to control, manage and supervise the operation of an air conditioning system. Please consult your Carrier representative for more information.

The AquaSnap® also communicates with other centralised building management systems via communication gateways (Modbus or Bacnet protocol).

A connection terminal allows the AquaSnap® unit to be remotely controlled by wire:

- Start/stop: Opening of this contact will shut down the unit
- Dual setpoint: closing of this contact activates a second setpoint (e.g.: unoccupied mode)
- Demand limit: Closing of this contact limits the maximum unit capacity to a predefined value
- Operation indication: This volt-free contact indicates that the unit is operating
- Defrost indication : This free-voltage contact indicates that the units is on defrost mod
- Alarm indication: this volt-free contact indicates the presence of a major fault that has led to the shut-down of one or several refrigerant circuits
- Setpoint adjustable via 4-20 mA signal
- Customer variable speed pump manage via 0/10V signal
- Boiler management (0/1)
- Up to 3 external heaters management
- Output for Domestic Hot water 3 ways valve
- Output for 2 heating zone management (pumps & 3 ways valves)

RANGE DESCRIPTION

Combinaison

Monobloc unit		Base unit							
AquaSnap® 61AQ	Sizes	040P	050P	060P	070P	080P	100P	120P	140P

Modular system		Modular / 2 units						Modular / 3 units					Modular / 4 units				
AquaSnap® 61AQ Base unit	Sizes	160P	180P	200P	240P	260P	280P	300P	320P	350P	380P	420P	440P	470P	490P	520P	560P
060P		1	1	1				1	1				1				
070P										1				1	1		
100P		1															
120P			1		2	1		2	1		2		2	1		2	
140P				1		1	2		1	2	1	3	1	2	3	2	4

61AQ
040P to 70P

61AQ
080P to 140P

61AQ
160P to 560P

OPTIONS & ACCESSORIES

Options	No.	Description	Advantages	AquaSnap® 61AQ
Corrosion protection, traditional coils	3A	Fins made of pre-treated aluminum by chemical conversion	Improved corrosion resistance, recommended for moderate marine and urban environments	040P-560P
Sensor for Lead / Lag operation (Accessory)	58	Unit equipped with supplementary water outlet temperature sensor kit (to be field installed) allowing Lead / Lag operation of four units connected in parallel	Optimized operation of four units connected in parallel operation with operating time equalization	040P-560P
Remote electrical connection (Accessory)	81B	Remote electrical junction box	Remote electrical connection box easily allows the connection of different types of electrical cables (Ex/ aluminum cable)	040P-560P
HP VSD single-pump (variable speed)	116V	Single high-pressure water pump with variable speed drive (VSD), electronic water flow control, pressure transducers. Multiple possibilities of water flow control. (expansion tank included)	Easy and fast installation (plug & play), significant pumping energy cost savings (up to two-thirds), tighter water flow control, improved system reliability	040P-560P
System Management Module (SMM) (Accessory)	156D	Electrical box to place on the technical room to connect heating accessories (DHW & Heating zones 3WV, boiler,...) Connected to the Heat Pump via a single bus, need 230V Suply.	Easy connection of the accessories of the Heating system	040P-560P
Refrigerant leak detector (Accessory)	159C	Unit equipped with refrigerant leak detector	Quick notification to the customer of refrigerant losses to the atmosphere, allowing timely corrective actions.	040P-560P
System Management Sequencer 4 units (SMS) (Accessory)	275ABC	User Interface (10'' display panel) for remote installation up to 2/3/4 units with SMM (System Management Module) included.	Remote control and sequencer for up to 2/3/4 units s as well as easy management of the heating system accessories	040P-560P
EMC class. C1, as per EN 61000-6-3 (Accessory)	282C	Additional RFI filters on the unit power line	Reduces electromagnetic interferences for compliance with emission level category C1 in order to allow the units to operate in the first environment (so called, residential environment)	040P-560P
EMC class. C1, as per EN 61600-6-3 + Energy meter (Accessory)	282D	Additional RFI filters on the unit power line + Electric energy metering	Reduces electromagnetic interferences for compliance with emission level category C1 in order to allow the units to operate in the first environment (so called, residential environment) Permits the acquisition, (remote) monitoring of energy used.	040P-560P
Electric energy meter (Accessory)	294	Display of energy consumption, instantaneous (U, V, I) and cumulated (kWh) on the unit user interface datas available on communication bus	Permits the acquisition, (remote) monitoring of energy used.	040P-560P
ABOUND HVAC Performance (CS Box Accessory)	298C	Box included : 4G modem + antenna system with GPS location to transmit the machine's (up to 5) operating data in real time	Enable ABOUND HVAC Performance service offer	040P-560P
Water buffer tank module (Accessory)	307	Integrate water buffer tank	Avoid short cycle on compressors and ensure a stable water in the loop	040P-140P
Water buffer tank module with heaters (Accessory)	307D/E	Integrate water buffer tank with electrical heater of D=12 kW (2 stages 2x6kW) / E= 18 kW (3 stages 3x6kW)	The water tank avoid short cycle on compressors and ensure a stable water in the loop. The electric heaters ensures a complement or a security in heating mode.	040P-140P

Refer to the selection tool to find out which options are not compatible.

OPTIONS & ACCESSORIES

Options	No.	Description	Advantages	AquaSnap® 61AQ
Anti-vibration mounts (Accessory)	308	Elastomer antivibratils mounts to be place under the unit(Material classified B2 fire class according to DIN 4102).	Isolate unit from the building, avoid transmission of vibration and associate noise to the buiding. Must be associate with flexible connection on water side	040P-560P
Anti-vibration mounts (Accessory)	308	Elastomer antivibratils mounts to be place under the unit(Material classified B2 fire class according to DIN 4102).	Isolate unit from the building, avoid transmission of vibration and associate noise to the buiding. Must be associate with flexible connection on water side	040P-560P
Exchangers flexibles connection (Accessory)	309A	Flexibles connections on the exchanger water side	Easy installation. Limit transmission of vibrations on the water network	040P-560P
External temperature sensor (Accessory)	312	Remote External temperature sensor	Better value of the external temperature according to the site configuration	040P-560P
Domestic Hot Water sensor (Accessory)	312A	Temperature sensor designed to measure and control the temperature of the Domestic Hot Water tank	Optimization of the production of domestic hot water	040P-560P
Domestic Hot Water 3WV & Management (Accessory)	347A	3WV furniture & management for domestic hot water production (3WV supplied)	Easy management of Domestic Hot Water. Directing the hot water produced by the Heat Pump to the heating circuit or the domestic hot water tank.	040P-140P

Refer to the selection tool to find out which options are not compatible.

PERFORMANCE DATA, SIZES 040P TO 140P

AquaSnap® 61AQ				MONOBLOC UNIT							
				040P	050P	060P	070P	080P	100P	120P	140P
Heating											
Standard unit Full load performances*	HA1	Nominal capacity	kW	38,0	48,0	57,5		76,0	96,0	115,0	
		COP	kW/kW	3,84	3,60	4,04		3,88	3,62	4,08	
	HA2	Nominal capacity	kW	38,0	48,0	57,5		76,0	96,0	115,0	
		COP	kW/kW	3,22	3,03	3,26		3,25	3,05	3,28	
	HA3	Nominal capacity	kW	38,0	48,0	57,5		76,0	96,0	115,0	
		COP	kW/kW	2,81	2,66	2,78		2,83	2,68	2,80	
	HA4	Nominal capacity	kW	38,0	48,0	57,5		76,0	96,0	115,0	
		COP	kW/kW	2,43	2,32	2,33		2,44	2,33	2,34	
Seasonal energy efficiency**	HA1	**$SCOP_{30/35°C}$**	**kWh/kWh**	**4,06**	**4,10**	**4,32**		**4,18**	**4,17**	**4,28**	
		$\eta s\ heat_{30/35°C}$	**%**	**159**	**161**	**170**		**164**	**164**	**168**	
		P_{rated}	kW	38,0	48,0	57,5		76,0	96,0	115,0	
		Energy label		A++	A++	A++		-	-	-	
	HA3	**$SCOP_{47/55°C}$**	**kWh/kWh**	**3,31**	**3,34**	**3,41**		**3,41**	**3,41**	**3,37**	
		$\eta s\ heat_{47/55°C}$	**%**	**129**	**131**	**133**		**133**	**134**	**132**	
		P_{rated}	kW	38,0	48,0	57,5		76,0	96,0	115,0	
		Energy label		A++	A++	A++		-	-	-	
Cooling											
Standard unit Full load performances*	CA1	Nominal capacity	kW	32,0	38,3	52,5		64,0	76,6	105,0	
		EER	kW/kW	2,38	2,21	2,25		2,40	2,22	2,27	
Standard unit Full load performances*	CA2	Nominal capacity	kW	32,0	41,0	52,5		64,0	41,0	105,0	
		EER	kW/kW	3,66	3,30	3,34		3,70	3,32	3,37	
Seasonal energy efficiency**		**$SEER_{12/7°C}$ Comfort low temp.**	**kWh/kWh**	**4,29**	**4,13**	**4,18**		**4,47**	**4,28**	**4,29**	
		$SEER_{23/18°C}$ Comfort medium temp.	**kWh/kWh**	**5,41**	**5,15**	**5,15**		**5,7**	**5,36**	**5,32**	
		$SEPR_{12/7°C}$ Process high temp.	**kWh/kWh**	**5,90**	**5,80**	**5,75**		**6,18**	**6,02**	**5,92**	
Integrated Part Load Value		IPLV.SI	kW/kW	4,673	4,592	4,534		4,805	4,708	4,604	

* In accordance with standard EN14511-3:2022.

** In accordance with standard EN14825:2022, average climate

HA1 Heating mode conditions: Water heat exchanger water entering/leaving temperature 30°C/35°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fooling factor 0 m².K/W

HA2 Heating mode conditions: Water heat exchanger water entering/leaving temperature 40°C/45°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fooling factor 0 m².K/W

HA3 Heating mode conditions: Water heat exchanger water entering/leaving temperature 47°C/55°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fooling factor 0 m².K/W

HA4 Heating mode conditions: Water heat exchanger water entering/leaving temperature 55°C/65°C, outside air temperature tdb/twb = 7°C db/6°C wb, evaporator fooling factor 0 m².K/W

CA1 Cooling mode conditions: Evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator fooling factor 0 m².K/W

CA2 Cooling mode conditions: Evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator fooling factor 0 m².K/W

$\eta s\ heat_{30/35°C}$ & $SCOP_{30/35°C}$ **Bold values compliant to Ecodesign regulation: (EU) No 813/2013 for Heat Pump application**

$\eta s\ heat_{47/55°C}$ & $SCOP_{47/55°C}$ **Bold values compliant to Ecodesign regulation: (EU) No 813/2013 for Heat Pump application**

$SEER_{12/7°C}$ & $SEPR_{12/7°C}$ **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for COMFORT application**

$SEER_{23/18°C}$ **Bold values compliant to Ecodesign regulation: (EU) No 2016/2281 for COMFORT application**

IPLV.SI Calculations according to standard performances AHRI 551-591.

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

Eurovent certified values

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PHYSICAL DATA, SIZES 040P TO 140P

AquaSnap® 61AQ		MONOBLOC UNIT							
		040P	050P	060P	070P	080P	100P	120P	140P
Sound levels - Standard unit									
Sound power in heating mode(1)	dB(A)	75,0	77,0	78,0	0,0	78,0	80,0	81,0	0,0
Sound pressure in heating mode at 10 m(2)	dB(A)	43,0	45,5	46,5	0,0	46,0	48,5	49,5	0,0
Ecodesign Sound power SCOP C conditions	dB(A)	60,0	61,5	62,5	0,0	63,0	64,5	65,5	0,0
Dimensions - Standard unit									
Length	mm	1815	1815	1815	1815	1815	1815	1815	1815
Width	mm	1145	1145	1145	1145	2267	2267	2267	2267
Height	mm	2045	2045	2045	2045	2045	2045	2045	2045
Operating weight(3)									
Standard Unit	kg	527	536	580	596	1001	1020	1107	1138
Unit + option variable-speed single high pressure pump	kg	555	564	608	623	1059	1078	1165	1196
Compressors		Scroll inverter							
Circuit A		1	1	1	1	1	1	1	1
Circuit B		-	-	-	-	1	1	1	1
System PED Category		III	III	III	III	III	III	III	III
Refrigerant(3)		R-290 Natural / A3 / GWP=0,02 following AR6							
Circuit A	kg	3,0	3,0	3,9	3,9	3,0	3,0	3,9	3,9
	$teqCO_2$	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001	0,0001
Circuit B	kg	-	-	-	-	3,0	3,0	3,9	3,9
	$teqCO_2$	-	-	-	-	0,0001	0,0001	0,0001	0,0001
Oil		Oil type							
Circuit A	l	3,3	3,3	3,3	4,4	3,3	3,3	3,3	4,4
Circuit B	l	-	-	-	-	3,3	3,3	3,3	4,4
Capacity control		Smart Vu™							
Number of control stages		Continuous control / Inverter							
Minimum capacity	%	21	21	21	21	21	21	21	21
Air heat exchanger		Grooved copper tubes and aluminium fins							

(1) In dB ref=10^{-12} W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measured in accordance with ISO 9614-1 (HA1 full load running conditions).

(2) In dB ref 20µPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). For information, calculated from the sound power Lw(A).

(3) Values are guidelines only. Refer to the unit name plate.

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Eurovent certified values

PHYSICAL DATA, SIZES 040P TO 140P

AquaSnap® 61AQ		MONOBLOC UNIT							
		040P	050P	060P	070P	080P	100P	120P	140P
Fans		Axial fan with rotating impeller							
Standard unit									
Quantity		1	1	1	1	2	2	2	2
Maximum total air flow	l/s	5600	5600	5600	5600	11200	11200	11200	11200
Maximum rotation speed	rpm	950	950	950	950	950	950	950	950
Available static pressure	Pa	100	100	100	-	100	100	100	-
Water heat exchanger		Direct-expansion welded plate heat exchanger							
Quantity		1	1	1	1	2	2	2	2
Water volume	l	5,33	5,33	8,13	8,13	10,66	10,66	16,26	16,26
Max. water-side operating pressure without hydraulic module	kPa	400	400	400	400	400	400	400	400
Module hydraulique (option)		Pump, cleanable screen filter, relief valve, water and air drain valve, pressure sensors, expansion vessel.							
Pompe		Centrifugal variable speed pump, monocell,high pressure.							
Expansion vessel volume	l	8	8	8	8	8	8	8	8
Buffer tank volume (Accessory)	l	400	400	400	400	400	400	400	400
Max. water-side operating pressure with hydraulic module	kPa	400	400	400	400	400	400	400	400
Water connections with or without hydraulic module		Screw type connections							
Connections	pouces	2	2	2	2	2"1/2	2"1/2	2"1/2	2"1/2
External diameter	mm	60,3	60,3	60,3	60,3	76,1	76,1	76,1	76,1
Casing paint		Colour code RAL 7035							

ELECTRICAL SPECIFICATIONS

AquaSnap® 61AQ		040P	050P	060P	070P	080P	100P	120P	140P
Power circuit supply									
Nominal voltage	V-ph-Hz	400-3-50							
Voltage range	V	360-440							
Control circuit supply		24 V via internal transformer							
Maximum operating input power(1) or (2)									
Standard unit	kW	23	29	34		43	56	68	
Unit + option variable-speed single high pressure pump	kW	25	31	37		47	60	71	
Power factor at maximum power(1) or (2)									
Cosine phi		0,93	0,93	0,93		0,93	0,93	0,93	
Total harmonic distortion	%	35	35	35		35	35	35	
Nominal operating current draw(4)									
Standard unit	A	15	21	24		30	41	47	
Unit + option variable-speed single high pressure pump	A	16	22	26		32	44	52	
Maximum operating current draw (Un)(1) or (2)									
Standard unit	A	34	44	52	72	66	85	103	141
Unit + option variable-speed single high pressure pump	A	37	47	56	75	72	92	109	147
Maximum current (Un-10%)(1) or (2)									
Standard unit	A	37,4	48,4	57,2		72,6	93,5	113,3	
Unit + option variable-speed single high pressure pump	A	40,7	51,7	61,6		79,2	101,2	119,9	
Maximum start-up current(Un)(2) + (3)									
Standard unit	A	38,63	48,63	58,63		74,53	94,53	114,53	
Unit + option variable-speed single high pressure pump	A	42,05	51,78	61,78		80,83	100,83	120,83	

(1) Values obtained at unit continuous maximum operating conditions (data given on the unit nameplate)
(2) Values obtained at operation with maximum operating power input (data given on the unit nameplate)
(3) Operating current of the compressor(s) + fan current + locked rotor current or reduced start-up current of the compressor.
(4) Standardised EUROVENT conditions, water-cooled exchanger water inlet/outlet = 12°C/7°C, outdoor air temperature = 35°C.
For modular size 61AQ 160P to 560P apply value of above table on each module.

Short-circuit withstand current (TN system)(1)

AquaSnap® 61AQ		040P	050P	060P	070P	080P	100P	120P	140P
Rated short-circuit withstand currents									
Rated short time (1s) current – Icw	kA eff	8	8	8		8	8	8	
Rated peak current - Ipk	kA pk	30	30	30		30	30	30	
Value with upstream electrical protection(1)									
Rated conditional short circuit current - Icc	kA eff	25	25	25		25	25	25	
Associated protection - type / supplier		Fuse (gL/gG) / ABB							
Associated protection - rating / part number		315	315	315		315	315	315	

(1) If another current limitation protection device is used, its time-current and thermal constraint (I^2t) trip characteristics must be at least equivalent to those of the recommended protection.
Note: The short-circuit current resistance values given above are established for the TN diagram.
For modular size 61AQ 160P to 560P apply value of above table on each module.

OPERATING LIMITS

Unit operating limits

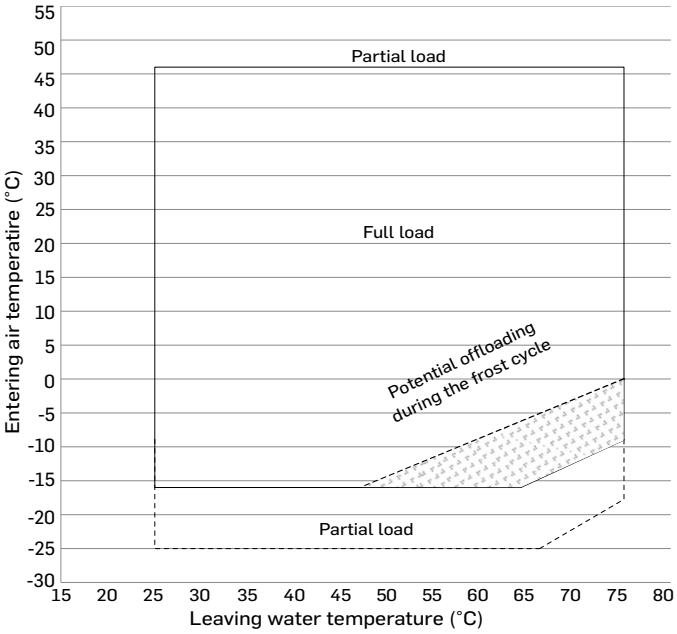
61AQ 040P-140P (Up to 560P in modular installation) units

		Heating mode		Cooling mode	
Water heat exchanger		**Minimum**	**Maximum**	**Minimum**	**Maximum**
Entering temperature at start-up	°C	8(1)	50	8(1)	40
Leaving temperature during operation	°C	20	75	6,5(2)	20(3)
Air heat exchanger		**Minimum**	**Maximum**	**Minimum**	**Maximum**
Outdoor ambient operating temperature					
Outdoor ambient temperature at start-up	°C	-25(4)(5)	50	0/-20(4)	46(5)
Available static pressure					
Standard units	Pa	0			

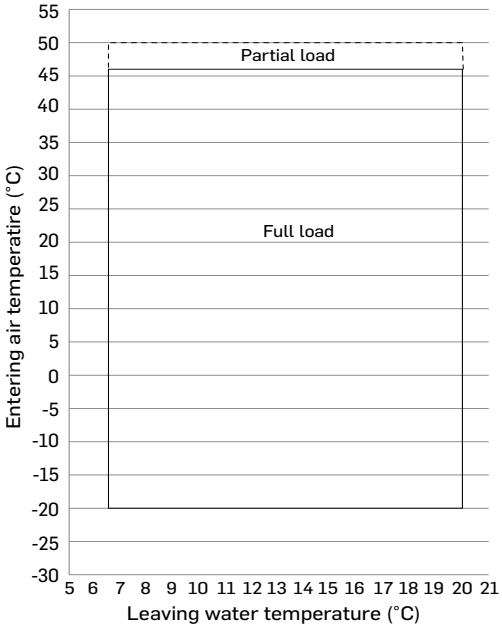
(1) For an application requiring start-up at less than 8°C, contact your representative to select a unit using the electronic catalog.
(2) The use of anti-freeze protection is required if the water outlet temperature is below 6.5°C
(3) For application requiring operation above a water outlet temperature of 20°C, contact your representative to select a unit using the electronic catalog.
(4) Units are equipped by default by heaters protecting the unit internal hydraulic circuit for operation at an ambient temperature below 0°C. It is mandatory for the installer to protect the rest of the installation with additonal heater or using an anti-freeze solution.
(5) Partial load operation authorized under -17°C and above 46°C.
Contact your representative to select a unit using the electronic catalog.

Temperatures in case of non-operating unit (storage and transport) : minimum and maximum ambient temperatures to respect are -20°C and +51°C. These temperature limits shall be considered in case of container shipment.

Operating map - heating mode
Standard unit 61AQ



Operating map - cooling mode
Standard unit 61AQ



Notes:
1. Water heat exchanger ΔT = 5K.
4. Operating ranges are guidelines only. The operating range must be checked with the selection software.

Key:

Operating range at full load
Potential offloading during the frost cycle, depending on the humidity conditions. Refer to the selection software.
Operating range at partial load

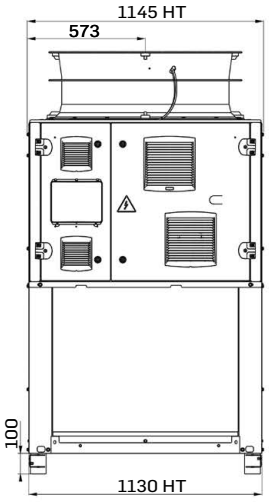
NOTE:

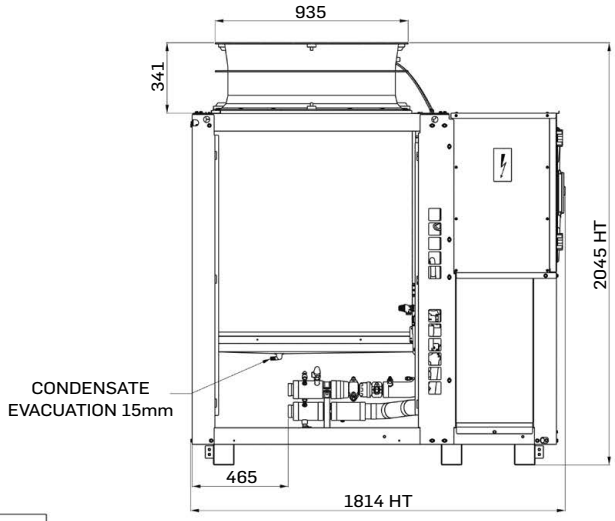
Units equipped with speed regulators (61AQ option 116V, 116W).

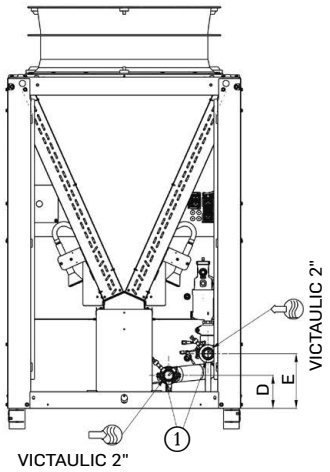
If the air temperature is below -10°C and the unit has been de-energised for more than 4 hours, it is necessary to wait two hours after the unit has been switched on again to allow the regulator to warm up.

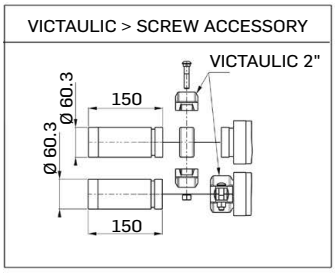
DIMENSIONS/CLEARANCES

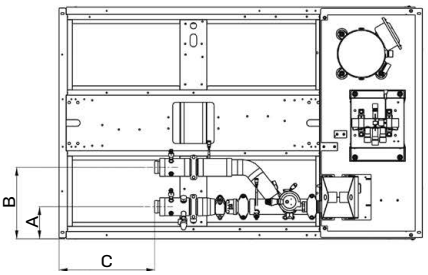
61AQ 040P-070P, units without water buffer tank module











UNITS	A	B	C	D	E
Standard	155	346	462	160	264
Pump 116V	155	303	462	160	264

Key:
All dimensions are given in mm.

① Unit water inlet and outlet

Inlet water

Outlet water

Electrical supply entry

NOTE: Non-contractual drawings.

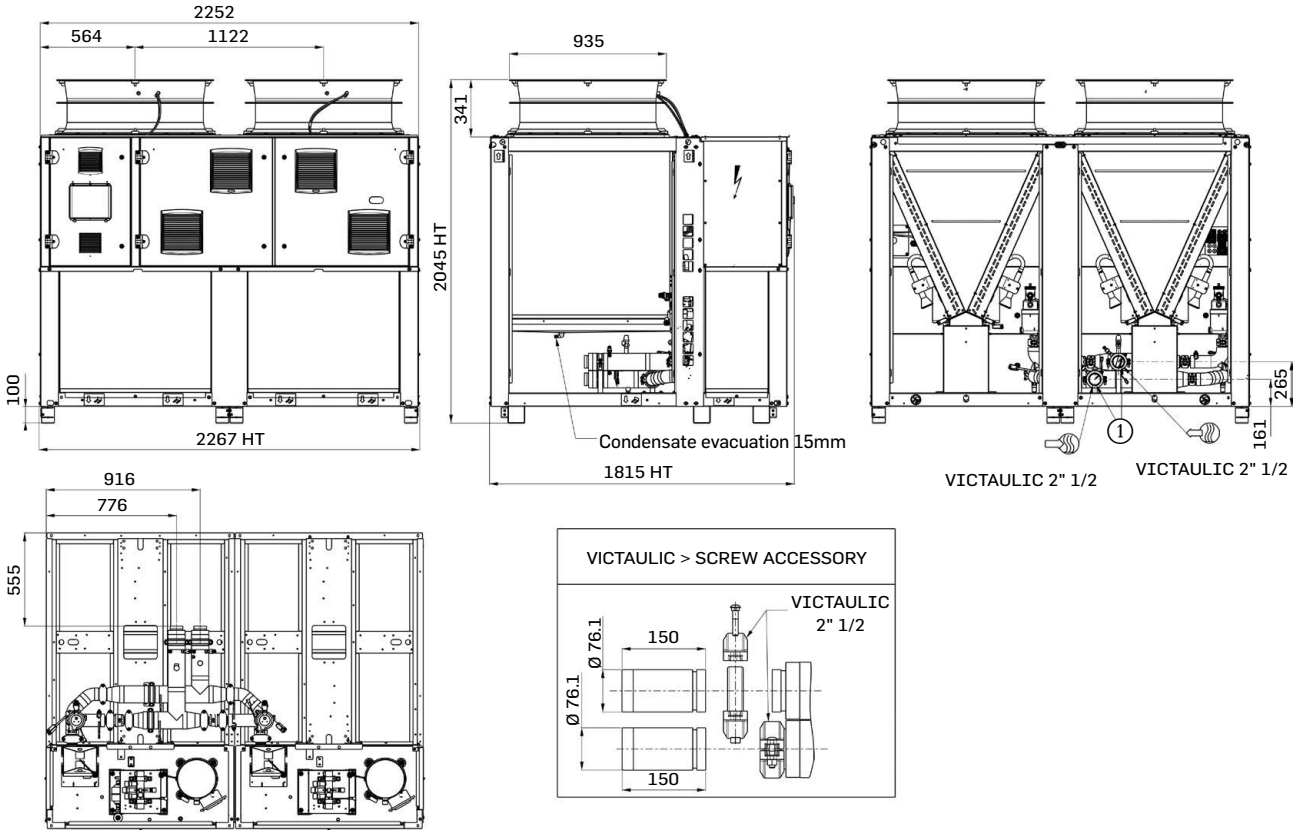
When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

Refer to the certified dimensional drawings for:

- **The location of the fixing points,**
- **The weight distribution,**
- **The coordinates of the centre of gravity, hydraulic and electrical connections,**

DIMENSIONS/CLEARANCES

61AQ 080P-140P, units without water buffer tank module



Key:
All dimensions are given in mm.

① Unit water inlet and outlet

Inlet water

Outlet water

Electrical supply entry

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- **The location of the fixing points,**
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