



AQUACIAT^{POWER} ILD

Heat pump



Energy excellence

Compact and silent

Scroll compressors

High-efficiency brazed plate heat exchangers

Self-adjusting electronic control

Cooling capacity: 156 to 511 kW

Cooling capacity: 173 to 537 kW



Cooling and heating



Hydraulic module



Heat recovery



USE

The new generation of **AQUACIAT^{POWER}** high efficiency air-to-water heat pumps offers an optimal solution for all heating and cooling applications used for the Office, Healthcare, Industry, Administration, Shopping Centres and Collective housing sectors.

These units are designed for outdoor installation and require no special protection against adverse weather conditions.

AQUACIAT^{POWER} is optimised to use ozone-friendly HFC R410A refrigerant.

This range guarantees compliance with the most demanding requirements for increased seasonal energy efficiency (ESEER and SCOP) and CO₂ reduction to comply with the various applicable European directives and regulations.

RANGE

AQUACIAT^{POWER} ILD ST series

Standard reversible heat pump version

The product is optimised to meet the most demanding technical and economic requirements.

AQUACIAT^{POWER} ILD HE series



High seasonal efficiency heat pump version.

The product is optimised for part load applications for which an optimum SEER and SCOP value is required. In this case, the machine is equipped as standard with variable-speed fans, allowing for optimisation of the partial load efficiency throughout the year.

DESCRIPTION

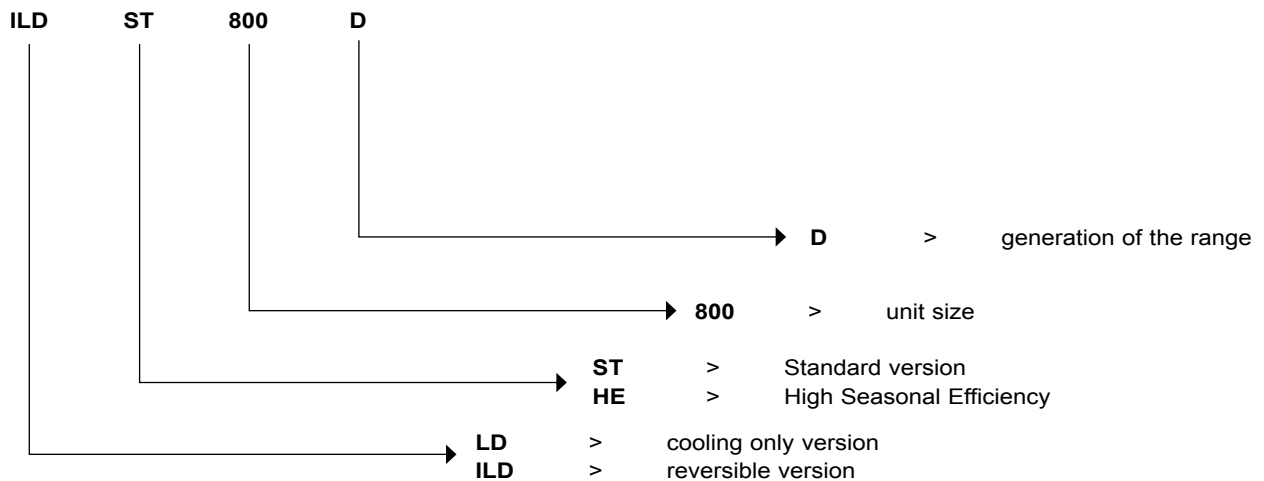
AQUACIAT^{POWER} units are packaged machines supplied as standard with the following components:

- Hermetic SCROLL compressors
- Brazed plate condenser or evaporator water type heat exchanger
- Condenser or evaporator air-cooled exchanger, copper tube coil with aluminium fins and axial fan motor assembly
- Electrical power and remote control cabinet:
 - 400V-3ph-50Hz (+/-10%) general power supply + Earth
 - transformer fitted as standard on the machine for supplying the remote control circuit with 24V
- Connect Touch electronic control module
- Casing for outdoor installation

The entire AQUACIAT^{POWER} range complies with the following EC directives and standards:

- Machinery directive 2006/42/EC.
- Electromagnetic compatibility directive 2014/30/EU.
- EMC immunity and emissions EN 61800-3 'C3'
- Low Voltage directive 2014/35/EU.
- RoHS 2011/65/EU
- Pressure equipment directive (PED) 2014/68/EU
- Machinery directive EN 60-204 -1
- Refrigeration systems and heat pumps EN 378-2
- Commission Regulation (EU) No. 813/2013 implementing directive 2009/125/EC setting the ecodesign requirements

DESCRIPTION



CONFIGURATION

ST	Standard	HE	High Seasonal Efficiency
ST LN option	Standard Low Noise	HE LN option	High Seasonal Efficiency Low Noise
		HE XLN Option	High Seasonal Efficiency Xtra Low Noise
		HE SLN Option	High Seasonal Efficiency Super Low Noise

DESCRIPTION OF THE MAIN COMPONENTS

■ Compressors

- Hermetic SCROLL type
- Electronic motor overheating protection
- Crankcase heater
- Mounted on anti-vibration mounts

■ Water type heat exchanger

- Asymmetrical brazed plate heat exchanger
- Plate patterns optimised for high efficiency
- 19 mm armaflex thermal insulation

■ Air-cooled exchanger

- Air-cooled exchanger, copper tube coil, aluminium fins
- Axial fans with composite blades offering an optimised profile, fixed speed (ST version) or variable speed (HE version)
- Motors – IP 54, class F

■ Refrigerant accessories

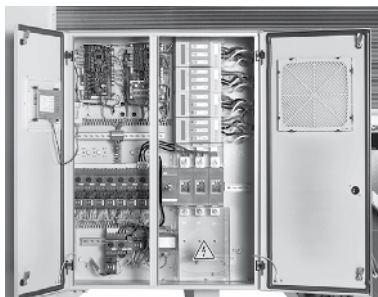
- Dehumidifier filters with rechargeable cartridges
- Hygroscopic sight glasses
- Electronic expansion valves
- Service valves on the liquid line
- 4-way cycle inversion valve in cooling/heating mode

■ Regulation and safety instruments

- Low and high pressure sensors
- Safety valves on the refrigerant circuit
- Water temperature control sensors
- Evaporator antifreeze protection sensor
- Factory-fitted evaporator water flow controller

■ Electrical cabinet

- Electrical cabinet with IP54 protection rating (IP44 for the entire unit)
- A connection point without neutral
- Front-mounted main safety switch with handle
- Control circuit transformer
- 24V control circuit
- Fan and compressor motor circuit breaker
- Fan and compressor motor contactors
- Connect Touch microprocessor-controlled electronic control module
- Wire numbering
- Marking of the main electrical components



■ Casing

Frame made from RAL 7035 light grey & RAL 7024 graphite grey painted panels

■ Connect Touch control module

- User interface with 4.3 inch touch screen
- Intuitive, user-friendly navigation using icons
- Clear text display of information available in 8 languages (F-GB-D-NL-E-I-P+Chinese)



The electronic control module performs the following main functions:

- Regulation of the chilled water temperature (at the return or at the outlet)
- Regulation of the water temperature based on the outdoor temperature (water law)
- Regulation for low temperature energy storage
- Second setpoint management
- Complete management of compressors with start-up sequence, timer and runtime balancing
- Self-regulating and proactive functions with adjustment of the control based on parameter drift
- In-series staged power control system on the compressors according to the thermal requirements
- Management of compressor short-cycle protection
- Frost protection (exchanger heater option)
- Phase reversal protection
- Optimised defrosting with free defrost function to optimise performance at partial load and the SCOP
- Management of occupied/unoccupied modes (according to the time schedule)
- Compressor and pump runtime balancing
- Management of the machine operation limit according to the outdoor temperature
- Sound level reduction device (night mode according to the user programme) with limitation of compressor capacity and fan speed
- Diagnosis of fault and operating statuses
- 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
- Master/slave management of the two machines in parallel with runtime balancing and automatic changeover if a fault occurs on one machine
- Weekly and hourly time schedule for the machine, including 16 periods of absence
- Pump standby based on demand (energy saving)
- Calculation of the water flow rate and operating pressure (hydraulic module version)
- Electronic adjustment of the water pump speed and water flow rate (variable speed pump option)
- Display of all machine parameters (3 access levels, User/Maintenance/Factory, password-protected): temperature, setpoints, pressures, water flow rate (hydraulic version), runtime.
- Display of trend curves for the main values
- Storage of maintenance manual, wiring diagram and spare parts list.
- Innovative smart energy monitoring, providing users with smart data such as real-time electric energy consumption and heating and cooling capacity, and instantaneous and average energy efficiency rates.

■ Remote management

Connect Touch is equipped as standard with an RS485 port and an ETHERNET (IP) connection, offering a range of options for remote management, monitoring and diagnostics.

Using the integrated Webserver, a simple internet connection uses the unit's IP address to access the Connect Touch interface on the PC, facilitating everyday management tasks and maintenance operations.

A range of communication protocols are available: MODBUS/JBUS RTU (RS485) or TC/IP as standard, LONWORKS – BACNET IP as an option, enabling most CMS/BMS to be integrated

Several contacts are available as standard, enabling the machine to be controlled remotely by wired link:

- Automatic operation control: when this contact is open, the machine stops
- Heating/cooling mode selection
- Setpoint 1/setpoint 2 selector: when this contact is closed, a second cooling setpoint is activated (energy storage or unoccupied mode, for example)
- Power limitation: closing the contact concerned allows the power or refrigerating consumption of the machine to be limited by stopping one or more compressors (this limit can be set with a parameter)
- Fault reporting: this contact indicates the presence of a major fault which has caused one or both refrigerant circuits to stop
- Operational status reporting indicates that the unit is in production mode.
- Activation control for partial energy heat recovery unit using the desuperheater.
- Switch control for the customer pump, external to the machine (on/off).

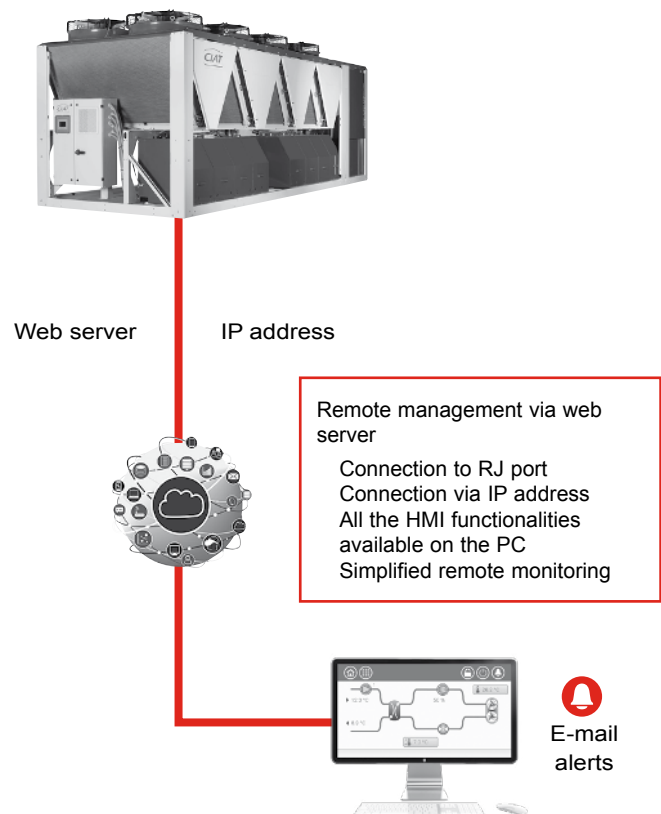
Contacts available as an option:

- Setpoint adjustable via 4-20 mA signal: this input is used to adjust the setpoint in COOLING mode
- On/off control for a boiler
- 4-stage on/off management for additional heaters
- Power limitation adjustable by 4-20 mA signal
- Second power limitation level
- Power indication: analogue output (0-10 V) providing an indication of the unit's load rate.
- User fault reporting enables integration of a fault in the water loop
- General fault reporting: this contact indicates that the unit has stopped completely
- Alert reporting: this contact indicates the presence of a minor fault which did not cause the refrigerant circuit in question to stop.
- End of storage signal: enables return to the second setpoint at the end of the storage cycle
- Schedule override: closing this contact cancels the time schedule.
- Desuperheater activation control
- Desuperheater pump On/Off control

■ Maintenance

Connect Touch has two maintenance reminder functions as standard, making users aware of the need to regularly perform maintenance operations and to guarantee the service life and performance of the unit. These two functions can be activated independently.

A reminder message appears on the unit's HMI screen, and stays there until it is acknowledged by the maintenance operator. The information and alert relating to these functions are available on the communication bus to be used on the CMS/BMS.



- The scheduled maintenance reminder: when activated, this function enables the period between two maintenance inspections to be set. This period may be set by the operator in either days, months or hours of operation, depending on the application.
- The compulsory F-GAS sealing test maintenance reminder: when activated, this function, which is the default factory setting, enables the period between two sealing tests to be selected, according to the refrigerant charge, in compliance with the F-GAS regulations.

■ CIATM2M, the CIAT supervision solution

CIATM2M is a remote supervision solution dedicated to monitoring and controlling several CIAT machines in real time.

Advantages

- Access to the operating trend curves for analysis
- Improved energy performance
- Improved availability rate for the machines

Functions

CIATM2M will send data in real time to the supervision website, www.ciatm2m.com.

The machine operating data can be accessed from any PC, smartphone or tablet.

Any event can be configured to trigger a mail alert.

Parameters monitored:

- Overview
- Control panel for the controllers
- Events
- Temperature curves

Monthly and annual reports are available to analyse:

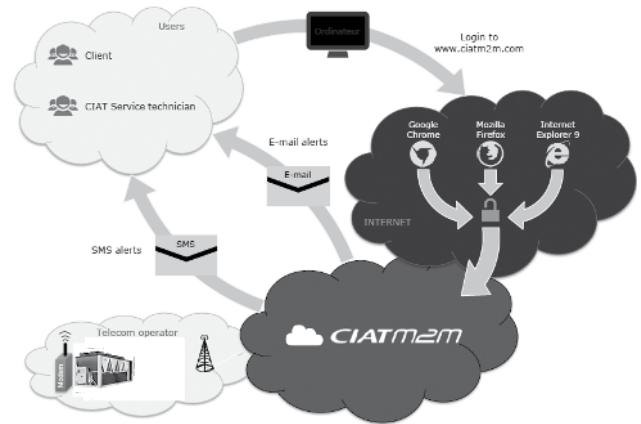
- The performance and operation of the machine
Example: operating curves and time, number of compressor start-ups, events, preventive maintenance actions to be performed, etc.

Incidents such as a drift in the measurements on a temperature sensor, incorrectly set control parameters, or even incorrect settings between one compressor stage and the other are immediately detected, and the corrective actions put in place.

Equipment

This kit can be used on both machines which are already in use (existing inventory), and on new machines which do not have sufficient space in their electrical cabinets.

- 1 transportable cabinet
- 1 wall-mounted antenna

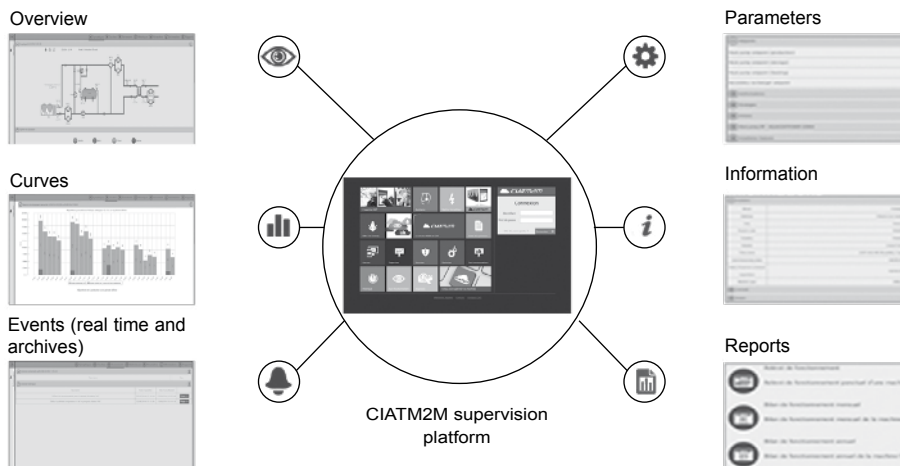


CIATM2M kit contents

- 1 GPRS / 3G modem
- 1 SIM card
- One 24 VDC power supply
- 1 power protection device
- 1 GSM antenna
- Rail mounting
- Enclosed casing to protect the equipment during transport
- Packing box for cable routing (bus, power supply, Ethernet)

Compatibility

Up to three machines per CIATM2M kit



AVAILABLE OPTIONS

Options	Description	Advantages	ILD ST / HE
Corrosion protection, traditional coils	Fins made of pre-treated aluminium (polyurethane and epoxy)	Improved corrosion resistance, recommended for moderate marine and urban environments	●
Low-temperature brine solution	Low temperature chilled water production down to -8°C with ethylene or propylene glycol	Covers specific applications such as ice storage and industrial processes	ILD HE 650-900-1000-1150
Low Noise	Aesthetic and sound absorbing compressor enclosure	Noise level reduction	●
Xtra Low Noise	Acoustic compressor enclosure and low-speed fans	Noise emission reduction at reduced fan speed	HE version, all sizes
Super Low Noise	Acoustic compressor enclosure, low-speed fans and enhanced sound insulation of main noise sources	Noise level reduction for sensitive sites	HE version, all sizes
XtraFan	Unit equipped with specific variable speed fans: XtraFan (see the dedicated chapter to find out the maximum static operating pressure for each size). Each fan is equipped with a connection flange and flexible sleeves enabling connection to the duct system.	Ducted fan discharge, optimised control of the condensing temperature (or evaporating temperature on the heat pump version), based on the operating conditions and system characteristics	HE version, all sizes
IP54 control box	Increased leak tightness of the unit	Protects the inside of the electrical box from dust, water and sand. In general, this option is recommended for installations in polluted environments	●
Protection grilles	Metal grilles on the 4 unit sides.	Improves protection against intrusion to the unit interior, coil and piping protection against impacts.	●
Soft Starter	Electronic starter on each compressor	Reduced start-up current	●
Winter operation down to -20 °C	Fan speed control	Stable operation of the unit when the air temperature is between 0 °C and -20 °C.	ST version, all sizes
Water exchanger frost protection	Electric heater on the water type heat exchanger and the water piping	Water type heat exchanger module frost protection between outdoor air temperatures of 0 °C and -20 °C	●
Water type heat exchanger and hydraulic module frost protection	Electrical heaters on the water type heat exchanger, water pipes, hydraulic module and expansion tank	Water type heat exchanger and hydraulic module frost protection down to an outdoor air temperature of -20 °C	●
Water type heat exchanger and hydraulic module frost protection	Electrical heaters on the water type heat exchanger, water pipes, hydraulic module, expansion tank and water buffer tank module	Water type heat exchanger and hydraulic module frost protection down to an outdoor air temperature of -20 °C	●
Partial heat recovery	Unit equipped with one desuperheater on each refrigerant circuit	Production of free high-temperature hot-water simultaneously with chilled water production (or hot water for Heat pump)	●
Master/slave operation	Unit equipped with supplementary water outlet temperature sensor kit (to be field installed) allowing master/slave operation of two units connected in parallel	Optimised operation of two units connected in parallel operation with operating time equalisation	●
Compressor discharge valves	Shut-off valves on the compressor discharge piping	Simplified maintenance. Possibility to store the refrigerant charge in the condenser side during servicing	●
HP single-pump hydraulic module	Single high pressure water pump, water filter, variable water flow control, pressure sensors. For more details, refer to the dedicated chapter (expansion tank not included. Option with built-in hydraulic safety components available).	Quick, easy installation (plug & play)	●
HP dual-pump hydraulic module	Dual high pressure water pump, water filter, water flow electronic control, pressure sensors. For more details, refer to the dedicated chapter (expansion tank not included. Option with built-in hydraulic safety components available).	Quick, easy installation (plug & play)	●
LP single-pump hydraulic module	Single low pressure water pump, water filter, water flow electronic control, pressure sensors. For more details, refer to the dedicated chapter (expansion tank not included. Option with built-in hydraulic safety components available).	Quick, easy installation (plug & play)	●
LP dual-pump hydraulic module	Dual low pressure water pump, water filter, water flow electronic control, pressure sensors. For more details, refer to the dedicated chapter (expansion tank not included. Option with built-in hydraulic safety components available).	Quick, easy installation (plug & play)	●

● ALL MODELS

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

AVAILABLE OPTIONS

Options	Description	Advantages	ILD ST / HE
HP variable speed single-pump hydraulic module	Single high pressure water pump with variable speed drive, water filter, water flow electronic control, pressure sensors. Multiple water flow control options. For more details, refer to the dedicated chapter (expansion tank not included. Option with built-in hydraulic safety components available).	Quick, easy installation (plug & play), significant reduction in energy consumption for pump use (more than two-thirds), tighter water flow control, improved system reliability	●
HP variable speed dual-pump hydraulic module	Dual high pressure water pump with variable speed drive, water filter, variable water flow control, pressure sensors. Multiple water flow control options. For more details, refer to the dedicated chapter (expansion tank not included. Option with built-in hydraulic safety components available).	Quick, easy installation (plug & play), significant reduction in energy consumption for pump use (more than two-thirds), tighter water flow control, improved system reliability	●
Lon gateway	Bi-directional communication board complying with Lon Talk protocol	Connects the unit by communication bus to a building management system	●
Bacnet over IP	Bi-directional high-speed communication using BACnet protocol over Ethernet network (IP)	Easy and high-speed connection by Ethernet line to a BMS. Allows access to multiple unit parameters	●
Energy Management Module	Control board with additional inputs/outputs. See Contacts available in option on control description.	Extended remote control capabilities (setpoint reset by 0-20 mA input, ice storage end, demand limits, boiler on/off command...)	●
Contact for refrigerant leak detection	0-10 V signal to report any refrigerant leakage in the unit directly on the controller (the leak detector itself must be supplied by the customer)	Immediate customer notification of refrigerant losses to the atmosphere, allowing timely corrective actions	●
Compliance with Russian regulations	EAC certification	Compliance with Russian regulations	●
Power factor correction	Capacitors for automatic regulation of power factor (cos phi) value to 0.95.	Reduction of the apparent electrical power, compliance with minimum power factor limit set by utilities	●
Coil defrost resistance heaters	Electric heaters under the coils and the condensate pans heaters	Prevents frost formation on the coils; compulsory in the heating mode, if the outdoor is below 0°C	●
230V electrical plug	230V AC power supply source provided with plug socket and transformer (180 VA, 0,8 Amps)	Permits connection of a laptop or an electrical device during unit commissioning or servicing	●
Expansion tank	6 bar expansion tank integrated in the hydraulic module	Easy and fast installation (plug & play), & protection of closed water systems from excessive pressure	● with pump
Connection sleeve to be screwed onto the desuperheater	Desuperheater connections with screwed joints	Easy to install. Allows unit connection to a screw connector	●
Desuperheater flexible couplings	Flexible connections on the desuperheater water side	Easy to install. Limit transmission of vibrations on the water network	●
Water buffer tank module	Integrates a water buffer tank module	Avoid short cycle on compressors and ensure a stable water in the loop	● with pump
Anti-vibration mounts	Elastomer anti-vibration mounts to be fitted underneath the unit	Isolate the unit from the building, prevent the transmission of vibrations and associated noise to the building. Must be used in conjunction with a flexible connection on the water side	●
Flexible connection couplings for the exchanger	Flexible connections for the water type heat exchanger	Easy to install. Limits the transmission of vibrations to the water network	●
Desuperheater flexible couplings	Flexible connections on the desuperheater water side	Easy to install. Limit transmission of vibrations on the water network	●
Water filter on the evaporator	Water filter	Prevents fouling in the water network	● no pump
Setpoint adjustable via a 4-20 mA signal	Connections enabling a 4-20 mA signal input	Simplified energy management, enabling the setpoint to be set by a 4-20 mA external signal	●

- ALL MODELS

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

AVAILABLE OPTIONS

Options	Description	Advantages	ILD ST / HE
Evap. single pump power/control circuit	Unit equipped with an electrical power and control circuit for one pump evaporator side	Quick and easy to install: the control for the fixed speed pumps is embedded in the control unit	•
Evap. dual pumps power/control circuit	Unit equipped with an electrical power and control circuit for two pumps evaporator side	Quick and easy to install: the control for the fixed speed pumps is embedded in the control unit	•
M2M supervision (accessory)	Monitoring solution which allows customers to track and monitor their equipment remotely in real time	Real-time expert technical support to increase equipment availability and improve performance.	•

- ALL MODELS

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

SEASONAL PERFORMANCE, COOLING MODE

Most central air conditioning systems installed in the tertiary sector in Europe use water chillers to provide refrigeration. Analyses of installed systems show that the heat load varies from season to season and that a water chiller operates at reduced capacity for the majority of the time.

The efficiency under partial load is therefore essential when choosing a water chiller. It is with this in mind that the new AQUACIAT^{POWER} range was designed. In particular, the entire range uses R410A refrigerant which, thanks to its thermodynamic performance, makes it possible to obtain much higher levels of seasonal performance.

As its compressors are connected in parallel on a single refrigerant circuit, the AQUACIAT^{POWER} easily and efficiently adjusts the cooling capacity to the system's needs. The self-adjusting Connect Touch control anticipates variations in load and starts only the number of compressors needed. This ensures optimum operation of the compressors and guarantees energy efficiency for the majority of the system's life.

The high seasonal energy efficiency AQUACIAT^{POWER} HE series has EC-type variable-speed fan motor assemblies as standard. This technology enables the machine's part-load performance to be improved, along with its seasonal performance (SEER and SEPR).

The **(Seasonal Energy Performance Ratio) (SEPR)** measures the seasonal energy efficiency of liquid chillers for **process applications** by calculating the ratio between the annual process cooling demand and the chiller's annual energy demand. It takes into account the energy efficiency at each outdoor temperature for the average European climate weighted by the number of hours observed for each of these temperatures.

The **SEPR** is a new way of measuring the energy efficiency of liquid chillers for **process applications** over an entire year. The new indicator provides a more realistic overview of the cooling system's energy efficiency and its actual impact on the environment (Ecodesign regulation 2015/1095 and 2016/2281).

The **Seasonal Energy Efficiency Ratio (SEER)** measures the seasonal energy efficiency of liquid chillers for **comfort applications** by calculating the ratio between the annual cooling demand of the building and the chiller's annual energy demand. It takes into account the energy efficiency for each outdoor temperature weighted by the number of hours observed for each of these temperatures, using actual climate data.

The **SEER** is a new way of measuring the energy efficiency of liquid chillers for **comfort applications** over an entire year. The new indicator provides a more realistic overview of the cooling system's energy efficiency and its actual impact on the environment (Ecodesign regulation 2016/2281).

SEASONAL PERFORMANCE, HEATING MODE

The European "Ecodesign" directive takes into account the product's environmental impact throughout its life cycle. It defines the mandatory energy efficiency requirements for water chillers and heat pumps.

Products that do not meet the energy efficiency requirements set by the new directive will gradually be phased out of the market, forcing manufacturers to develop and offer more efficient products.

Like the ESEER relating to water chillers, the new seasonal coefficient of performance (SCOP) resulting from this new European directive is used to evaluate the energy efficiency of heat pumps. Until now, only the COP has been used to measure energy efficiency in heating mode.

The COP was exclusively calculated using a single measuring point, and only took into account operation at full load, which did not represent the efficiency of the heat pump over an entire heating season.

The purpose of the SCOP is to characterise the seasonal efficiency of the heat pump by taking into account the efficiency at partial load and full load established for several outdoor temperatures. The SCOP is the ratio between the building's annual heating demand and the annual electricity consumption of the heating system. It is measured in accordance with the EN14825 standard based on an average reference climate that takes into account several reference temperatures between -10°C and +16°C

■ Primary energy evaluation

In order to compare the energy efficiency of products using different energy sources, the Ecodesign directive introduced a new seasonal energy efficiency calculation known as η_s (Greek letter eta followed by the letter "s" for seasonal) and expressed as a percentage. For heat pumps, the SCOP (final energy) value is transposed to η_s (primary energy) by taking into account a conversion coefficient of 2.5 which corresponds to the average efficiency of the electrical production and various corrections for the responsiveness of the regulation system ($i = 3$ for air-to-water heat pumps).

$$\eta_s (\%) = \frac{\text{SCOP(kW/kW)} \times 100}{2,5} - \sum_i \text{ i corrections}$$

The minimum seasonal efficiency requirements to be met by low temperature heat pumps, set by the standard, are as follows:

$\eta_s = 125\%$, which is a minimum SCOP of 3.2 valid from September 2017.

AQUACIAT^{POWER} ST and HE series models comply with the Ecodesign regulation 813/2013.

LD HYDRAULIC MODULE



■ The "ALL IN ONE" solution

The PLUG & COOL solution offered by AQUACIATPOWER

The hydraulic module contains all the water circuit components needed for the system to operate correctly:

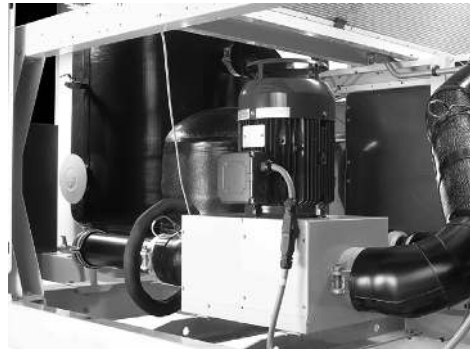
- Buffer tank with 19mm insulation, 550-litre capacity (option).
- Expansion tank (option):
 - . 50 litres for models 602 to 900.
 - . 80 litres for models 902 to 2000.
- Wide choice of pumps:
 - . Single or dual pumps with runtime balancing and backup.
 - . High or low pressure pumps.
 - . Fixed-speed or variable-speed pumps.
- Water temperature and pressure sensors.
- Water filter.
- Relief valve.
- Drain circuit.

- Air bleed valve.
- Frost protection (option).

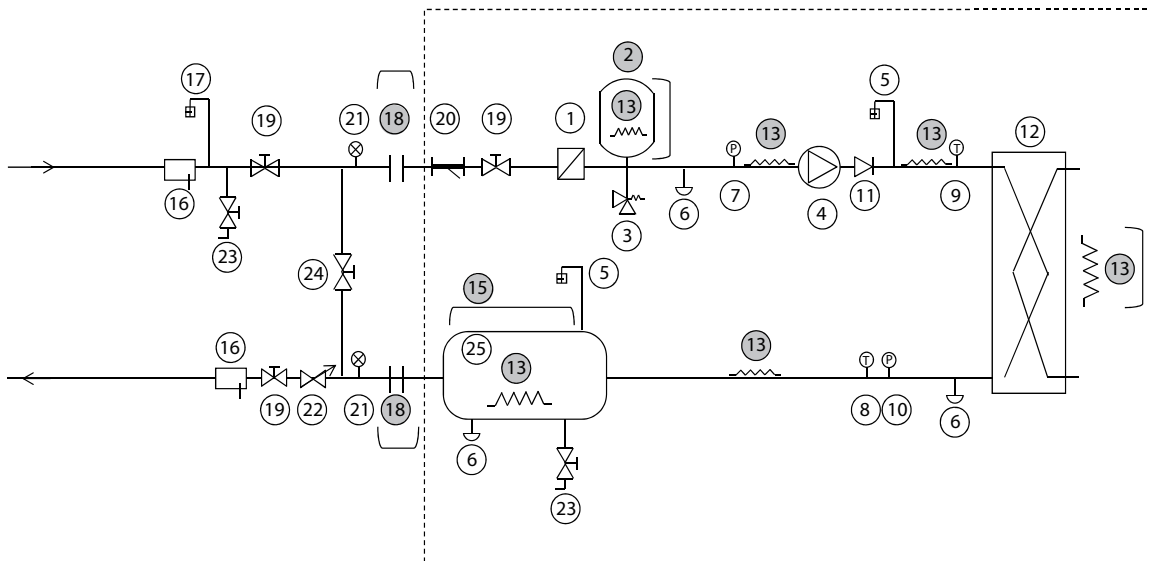
The components in the hydraulic system are carefully selected and factory assembled and tested to make the installation of the units simple and economical.

This ensures conditioning times, implementation times and space requirements are kept to a minimum.

■ Hydraulic module



AQUACIATPOWER hydraulic module diagram



Components of the unit and hydraulic module

- 1 Screen filter (particle size of 1.2 mm)
- 2 Expansion tank
- 3 Relief valve
- 4 Circulating pump (single or dual)
- 5 Air vent
- 6 Water drain tap
- 7 Pressure sensor
Note: Provides information on the pump inlet pressure
- 8 Temperature sensor
Note: Provides information on the water type heat exchanger outlet temperature
- 9 Temperature sensor
Note: Provides information on the water type heat exchanger inlet temperature
- 10 Pressure sensor
Note: Provides information on the water type heat exchanger outlet pressure
- 11 Internal check valve (for dual pump only)
- 12 Plate heat exchanger
- 13 Heater or heat trace cable for frost protection
- 14 Water type heat exchanger flow rate sensor
- 15 Water buffer tank module
Option

System components

- 16 Pocket
- 17 Air vent
- 18 Flexible connection
- 19 Shut-off valve
- 20 800 µm screen filter (Option - mandatory in the case of a unit without hydraulic module/included on hydraulic version)
- 22 Pressure gauge
- 22 Water flow control valve
Note: not required if hydraulic module with variable speed pump
- 23 Charging valve
- 24 Bypass valve for frost protection (if shut-off valves (item 19) are closed during winter)
- 25 Buffer tank (if required)

----- Hydraulic module (unit with hydraulic module option)

Notes:

- The system must be protected against frost.
- The unit's hydraulic module and the water type heat exchanger may be protected against freezing (factory-fitted option) using electric heaters and heat trace cables (13)
- The pressure sensors are fitted on connections without Schraeder. Depressurise and drain the system before any work.
- For units installed in parallel, additional devices may be required. See the section "Operation of 2 master/slave units" in the IOM.

VARIABLE FLOW PUMP

■ Description

The AQUACIAT^{POWER} may be equipped with one or two variable speed pumps which save you energy by adjusting the electrical consumption of one pump to the actual requirements of a hydraulic system, in particular for oversized installations.

■ Simple to use

The "variable-speed pump" is fully integrated on the machine, with full protection, and, as it is installed outdoors, there is no need for any work in the machine room.

The assembly is factory-fitted and pre-set on the unit; it is therefore quick to install and reduces the cost of work, in particular because there is no water flow control valve on the unit's outlet.

The ability to adjust the water flow to your requirements means that the pump pressure can be adapted precisely to the actual pressure drop on the system when it is started up on-site.

■ Operating principle

- Operation at full load

A regulator, with a direct display of the flow rate and pressure on the Connect Touch screen, enables one pump (pump A in the example below) to be adapted, by lowering its pressure P1 to the requirements of system P2, to obtain the optimal water flow rate setpoint. Electricity bills relating to the pump's consumption are reduced proportionately; this means you will see a return on investment (ROI) in only a few years, compared with the same fixed-speed pump equipped with a simple flow control valve.



- Operation at part load

There are three operating modes for part load:

1 - Fixed speed

The control ensures the pump continuously runs at a constant speed, based on the capacity of the compressor(s). When the compressor is powered off, the Connect Touch "standby" function manages the electrical power consumed by the pump by reducing its speed to the minimum.

This provides energy savings of around 33%.

2 - Variable flow rate: Constant regulation of the pressure difference

The control continuously acts on the pump speed to ensure a constant pressure difference. This solution is suitable for installations with two-way valves. This control mode is used to ensure a uniform supply in each hydraulic circuit to make sure that each terminal unit operates at a satisfactory pressure

3 - Variable flow rate: Constant regulation of the temperature difference

The regulation maintains a constant temperature difference whatever the load rate of the unit by reducing the flow rate to the minimum acceptable limit. This control mode is suitable for most comfort applications.

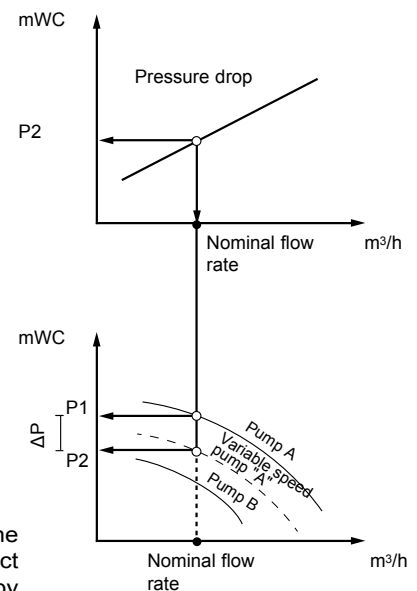
This provides energy savings of around 66% for the pump in each of these last two operating modes

■ SOFT START

A SOFT START function prevents any current peaks when the pump is started up to protect the electrical system, thereby limiting the building's electricity use at peak times and ensuring the smooth operation of the pipework

■ STANDBY function

Lowering the speed when the compressors are on standby reduces the water flow rate to ensure the water loop is perfectly homogenised and the control temperature sensors are well irrigated. This reduces the pump's electricity consumption by around 80% during standby periods, which represents a significant proportion of the machine's normal operating time, in particular for air conditioning applications.



ENVIRONMENTAL RESPONSIBILITY

The AQUACIAT^{POWER} contributes to sustainable development via an environmentally responsible approach, aimed at balancing ecological and economic concerns. This enables it to meet the requirements of future European thermal regulations and to protect our environment for future generations.

The highly efficient performance it offers enables energy consumption to be greatly reduced, thereby reducing the unit's carbon footprint throughout its service life.

This performance is the result of the high quality components used, which have all been rigorously selected:

- The latest generation Scroll compressors
- Highly efficient R410A refrigerant, which has a low environmental impact: zero ODP (Ozone Depletion Potential), low GWP (Global Warning Potential).

- Asymmetrical brazed plate heat exchangers (BPHE)

- Reduction in the refrigerant charge compared with a tubular heat exchanger solution
- The asymmetrical technology enables a reduction in pressure drops on the water side, and an associated drop in electricity consumption.

AQUACIAT ^{POWER}	602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Refrigerant load kg	38	45	46	48	62	63	79	86	95	106	108	112
Environmental impact tCO₂e	78	94	96	100	129	132	164	180	198	221	226	234

Only 20% of a unit's impact on the ozone layer comes from the refrigerant (direct effect), with 80% coming from the CO₂ released into the atmosphere when the electricity required to power the unit is produced (indirect effect). With AQUACIAT^{POWER}, it's a win-win situation: its low refrigerant charge minimises the risk of emissions, and its low energy consumption limits its indirect impact.

The choice of technology used in the AQUACIAT^{POWER} range means that the TEWI, which covers the unit's environmental impact (both direct and indirect) throughout its service life, is greatly reduced.

TECHNICAL CHARACTERISTICS


AQUACIATPOWER ILD ST				602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000	
Heating																
Standard unit Full load performances *	HA1	Nominal capacity	kW	181	198	240	216	272	294	342	359	415	474	457	436	
		COP	kW/kW	3,75	3,79	3,81	3,56	3,86	3,75	3,74	3,82	3,72	3,72	3,62	3,57	
	HA2	Nominal capacity	kW	174	191	232	245	262	282	329	345	399	456	498	537	
		COP	kW/kW	2,99	3,05	3,04	2,91	3,11	2,96	2,98	3,04	2,95	2,97	2,95	2,94	
Standard unit Seasonal energy efficiency **	HA1	SCOP 30/35°C	kW/kW	3,20	3,21	3,23	3,21	3,20	3,22	3,21	3,20	3,30	3,35	3,34	3,32	
		ηs heat 30/35°C	%	125	125	126	125	125	126	125	125	125	129	131	131	130
		P _{rated}	kW	121	134	159	169	159	194	211	231	268	305	339	356	
		Cooling														
Standard unit Full load performances *	CA1	Nominal capacity	kW	154	168	201	225	232	264	297	322	372	424	458	510	
		EER	kW/kW	2,76	2,87	2,73	2,74	2,89	2,86	2,86	2,87	2,87	2,90	2,75	2,74	
		Eurovent class		C	C	C	C	C	C	C	C	C	B	C	C	
Standard unit Seasonal energy efficiency **		SEER 12/7 °C Comfort low temp.	kWh/kWh	3,89	3,89	3,93	3,99	3,95	4,03	4,06	4,00	4,04	4,11	4,09	4,04	
		SEPR 12/7 °C Process high temp.	kWh/kWh	4,40	4,31	4,41	4,12	4,64	4,77	4,72	5,09	5,03	4,86	4,78	4,58	
Part Load integrated values		IPLV.SI	kW/kW	4,320	4,350	4,380	4,370	4,280	4,470	4,410	4,490	4,560	4,610	4,610	4,580	
Sound levels																
Standard unit																
Sound power ⁽¹⁾		dB(A)		90	91	91	91	92	92	93	93	94	94	94	94	
Sound pressure at 10 m ⁽²⁾		dB(A)		58	59	59	59	60	60	61	61	62	62	62	62	
Unit + Low Noise option																
Sound power ⁽¹⁾		dB(A)		89	90	90	90	91	91	91	92	92	93	93	93	
Sound pressure at 10 m ⁽²⁾		dB(A)		57	58	58	58	59	59	59	60	60	61	61	61	
Dimensions																
Length		mm		2410			3604			4797						
Width		mm		2253			2253			2253						
Height		mm		2324			2324			2324						
Unit + Buffer tank module option		mm		3604			4798			5991						
Operating weight ⁽³⁾																
Standard unit		kg		1443	1518	1646	1669	2090	2257	2382	2613	3094	3344	3356	3396	
Unit + Low Noise option		kg		1514	1585	1739	1762	2179	2383	2508	2757	3256	3524	3536	3576	
Unit + Low Noise option + HP dual-pump hydraulic module		kg		1704	1748	1913	1936	2398	2630	2763	2998	3538	3806	3855	3894	
Unit + Low Noise option + HP dual-pump hydraulic module + Buffer tank module		kg		2652	2692	2857	2880	3338	3589	3722	3957	4497	4765	4814	4853	
Compressors				Hermetic Scroll 48.3 r/s												
Circuit A				1	1	2	2	2	2	2	3	4	4	4	4	
Circuit B				2	2	2	2	2	3	3	4	4	4	4	4	
No. of power stages				3	3	4	4	4	5	5	6	7	8	8	8	
Refrigerant ⁽³⁾				R410A												
Circuit A		kg		14,5	22,0	23,0	24,0	27,0	27,0	30,0	33,0	42,0	53,0	54,0	56,0	
		tCO _{2e}		30,3	45,9	48,0	50,1	56,4	56,4	62,6	68,9	87,7	110,7	112,8	116,9	
Circuit B		kg		23,0	23,0	23,0	24,0	35,0	36,0	48,5	53,0	53,0	53,0	54,0	56,0	
		tCO _{2e}		48,0	48,0	48,0	50,1	73,1	75,2	101,3	110,7	110,7	110,7	112,8	116,9	

* In accordance with standard EN14511-3:2013.
 ** In accordance with standard EN14825:2016, average climate conditions.
 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 fouling factor 0 m². kW
 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 fouling factor 0 m². kW
 CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². kW
ηs heat 30/35°C & SCOP 30/35°C Values in bold comply with Ecodesign Regulation (EU) No. 813/2013 for Heating applications
SEER 12/7°C & SEPR 12/7°C Values calculated according to EN14825:2016
IPLV.SI Calculated as per AHRI standard 551-591 (SI).



Eurovent certified values

TECHNICAL CHARACTERISTICS


AQUACIAT ^{POWER} ILD ST		602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Oil charge													
Circuit A	l	6,9	6,9	13,8	13,8	13,8	13,8	13,8	13,8	20,7	27,6	27,6	27,6
Circuit B	l	13,8	13,8	13,8	13,8	13,8	20,7	20,7	27,6	27,6	27,6	27,6	27,6
Control													
Connect Touch Control													
Minimum capacity	%	33%	33%	25%	25%	25%	20%	20%	17%	14%	13%	13%	13%
Air-cooled exchanger													
Grooved copper tubes and aluminium fins (RTPF)													
Fans - Standard unit													
Quantity		3	4	4	4	5	5	6	6	7	8	8	8
Maximum total air flow	l/s	13542	18056	18056	18056	22569	22569	27083	27083	31597	36111	36111	36111
Maximum rotation speed	r/s	16	16	16	16	16	16	16	16	16	16	16	16
Water type heat exchanger													
Dual-circuit plate heat exchanger													
Water volume	l	15	15	15	19	27	27	35	44	44	44	47	53
Max. water-side operating pressure without hydraulic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Hydraulic module (option)													
Pump, Victaulic screen filter, relief valve, water and air vent valve, pressure sensors													
Pump		Centrifugal pump, monocell, 48,3 r/s, low- or high-pressure (as required), single or dual (as required)											
Expansion tank volume (option)	l	50	50	50	50	80	80	80	80	80	80	80	80
Water buffer tank module volume (option)	l	550	550	550	550	550	550	550	550	550	550	550	550
Max. water-side operating pressure with hydraulic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water connections with / without hydraulic module													
Victaulic® type													
Diameter	inch	3	3	3	3	4	4	4	4	4	4	4	4
External diameter	mm	88,9	88,9	88,9	88,9	114,3	114,3	114,3	114,3	114,3	114,3	114,3	114,3
Casing paint													
Colour code RAL 7035/RAL 7024													

TECHNICAL CHARACTERISTICS


AQUACIAT ^{POWER} ILD HE			602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000		
Heating																
Standard unit Full load performances *	HA1	Nominal capacity	kW		181	198	240	216	272	294	342	359	415	474	457	436
		COP	kW/kW		3,75	3,79	3,81	3,56	3,86	3,75	3,74	3,82	3,72	3,72	3,62	3,57
	HA2	Nominal capacity	kW		174	191	232	245	262	282	329	345	399	456	498	537
		COP	kW/kW		2,99	3,05	3,04	2,91	3,11	2,96	2,98	3,04	2,95	2,97	2,95	2,94
Standard unit Seasonal energy efficiency **	HA1	SCOP_{30/35 °C}	kW/kW		3,38	3,38	3,39	3,39	3,38	3,39	3,41	3,40	3,43	3,46	3,47	3,41
		η_s heat_{30/35 °C}	%		132	132	133	133	132	132	133	133	134	135	136	134
		P _{rated}	kW		121	134	159	169	159	194	211	231	268	305	339	356
Cooling																
Standard unit Full load performances *	CA1	Nominal capacity	kW		154	168	201	225	232	264	297	322	372	424	458	510
		EER	kW/kW		2,76	2,87	2,73	2,74	2,89	2,86	2,86	2,87	2,87	2,90	2,75	2,74
		Eurovent class	C		C	C	C	C	C	C	C	C	C	B	C	C
Standard unit Seasonal energy efficiency **		SEER _{12/7 °C} Comfort low temp.	kWh/kWh		4,07	4,08	4,09	4,13	4,16	4,21	4,16	4,23	4,32	4,33	4,30	4,22
		SEPR _{12/7 °C} Process high temp.	kWh/kWh		5,24	5,29	5,29	5,16	5,13	5,39	5,52	5,45	5,56	5,64	5,40	5,18
Unit + low temperature brine solution option Seasonal energy efficiency **		SEPR_{-2/-8 °C} Process medium temp. ***	kWh/kWh		NA	3,55	NA	3,47	NA	3,36	3,67	NA	NA	NA	NA	NA
Part Load integrated values		IPLV.SI	kW/kW		4,560	4,630	4,670	4,660	4,620	4,670	4,840	4,690	4,780	4,880	4,850	4,740
Sound levels																
Standard unit																
Sound power ⁽¹⁾			dB(A)		90	91	91	91	92	92	93	93	94	94	94	94
Sound pressure at 10 m ⁽²⁾			dB(A)		58	59	59	59	60	60	61	61	62	62	62	62
Unit + Low Noise option																
Sound power ⁽¹⁾			dB(A)		89	90	90	90	91	91	91	92	92	93	93	93
Sound pressure at 10 m ⁽²⁾			dB(A)		57	58	58	58	59	59	59	60	60	61	61	61
Unit + Xtra Low Noise option																
Sound power ⁽¹⁾			dB(A)		84	85	86	86	86	87	87	87	88	89	89	89
Sound pressure at 10 m ⁽²⁾			dB(A)		52	53	54	54	54	55	55	55	56	57	57	57
Unit + Super Low Noise option																
Sound power ⁽¹⁾			dB(A)		82	83	84	84	84	85	85	86	86	87	87	87
Sound pressure at 10 m ⁽²⁾			dB(A)		50	51	52	52	52	53	53	54	54	55	55	55
Dimensions																
Length			mm		2410			3604			4797					
Width			mm		2253			2253			2253					
Height			mm		2324			2324			2324					
Unit + Buffer tank module option			mm		3604			4798			5991					
Operating weight ⁽³⁾																
Standard unit			kg		1479	1554	1683	1705	2127	2274	2396	2626	3104	3370	3382	3432
Unit + Low Noise option			kg		1550	1622	1775	1798	2215	2400	2499	2747	3239	3520	3532	3612
Unit + Low Noise option + HP dual-pump hydraulic module			kg		1717	1785	1950	2003	2395	2648	2731	3012	3494	3771	3820	3929
Unit + Low Noise option + HP dual-pump hydraulic module + Buffer tank module			kg		2664	2728	2894	2946	3335	3588	3667	3948	4426	4699	4748	4858

* In accordance with standard EN14511-3:2013.
 ** In accordance with standard EN14825:2016, average climate conditions.
 *** 30 % brine solution
 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 fouling 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 fouling factor 0 m². k/W
 CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m². k/W
η_s heat_{30/35 °C} & SCOP_{30/35 °C} Values in bold comply with Ecodesign Regulation (EU) No. 813/2013 for Heating applications
SEER_{12/7 °C} & SEPR_{12/7 °C} Values calculated according to EN14825:2016
SEPR_{-2/-8 °C} Values in bold comply with Ecodesign Regulation (EU) No. 2015/1095 for Process application
 NA Not authorised for the specific application for the EEC market
 IPLV.SI Calculated as per AHRI standard 551-591 (SI).



Eurovent certified values

TECHNICAL CHARACTERISTICS



AQUACIAT ^{POWER} ILD HE	602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000	
Compressors	Hermetic Scroll 48,3 r/s												
Circuit A	1	1	2	2	2	2	2	2	3	4	4	4	
Circuit B	2	2	2	2	2	3	3	4	4	4	4	4	
No. of power stages	3	3	4	4	4	5	5	6	7	8	8	8	
Refrigerant ⁽³⁾	R410A												
Circuit A	kg	14,5	22	23	24	27	27	30	33	42	53	54	56
Circuit B	tCO ₂ e	30,3	45,9	48	50,1	56,4	56,4	62,6	68,9	87,7	110,7	112,8	116,9
Circuit B	kg	23	23	23	24	35	36	48,5	53	53	53	54	56
No. of power stages	tCO ₂ e	48	48	48	50,1	73,1	75,2	101,3	110,7	110,7	110,7	112,8	116,9
Oil charge													
Circuit A	l	6,9	6,9	13,8	13,8	13,8	13,8	13,8	20,7	27,6	27,6	27,6	
Circuit B	l	13,8	13,8	13,8	13,8	13,8	20,7	20,7	27,6	27,6	27,6	27,6	
Control	Connect Touch Control												
Minimum capacity	%	33%	33%	25%	25%	25%	20%	20%	17%	14%	13%	13%	13%
Air-cooled exchanger	Grooved copper tubes and aluminium fins (RTPF)												
Fans													
Quantity		3	4	4	4	5	5	6	6	7	8	8	8
Maximum total air flow	l/s	13542	18056	18056	18056	22569	22569	27083	27083	31597	36111	36111	36111
Maximum rotation speed	r/s	16	16	16	16	16	16	16	16	16	16	16	16
Water type heat exchanger	Dual-circuit plate heat exchanger												
Water volume	l	15	15	15	19	27	27	35	44	44	44	47	53
Max. water-side operating pressure without hydraulic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Hydraulic module (option)	Pump, Victaulic screen filter, relief valve, water and air vent valve, pressure sensors												
Pump	Centrifugal pump, monocell, 48,3 r/s, low or high pressure (as required), single or dual (as required)												
Expansion tank volume (option)	l	50	50	50	50	80	80	80	80	80	80	80	80
Water buffer tank module volume (option)	l	550	550	550	550	550	550	550	550	550	550	550	550
Max. water-side operating pressure with hydraulic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water connections with / without hydraulic module	Victaulic® type												
Diameter	inch	3	3	3	3	4	4	4	4	4	4	4	4
External diameter	mm	88,9	88,9	88,9	88,9	114,3	114,3	114,3	114,3	114,3	114,3	114,3	114,3
Casing paint	Colour code RAL 7035/RAL 7024												

ELECTRICAL DATA

Basic unit (excluding pump)

AQUACIATPOWER ILD ST		602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Power circuit													
Nominal voltage	V-ph-Hz	400 - 3 -50											
Voltage range	V	360 - 440											
Control circuit supply		24 V, via internal transformer											
Nominal unit current draw⁽¹⁾													
Circuit A&B	A	100	110	133	147	151	166	191	199	233	266	294	322
Max. operating input power⁽²⁾													
Circuit A&B	kW	80	88	107	118	120	134	152	161	188	215	236	258
Cosine Phi unit at maximum power ⁽²⁾													
		0,88	0,87	0,87	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88
Maximum unit current draw (Un-10%)⁽³⁾													
Circuit A&B	A	144	158	192	211	215	241	273	289	337	385	422	460
Maximum unit current draw (Un)⁽⁴⁾													
Circuit A&B - Standard unit	A	133	146	177	195	199	222	252	266	310	354	390	425
Circuit A&B - Unit + Power factor corrector option	A	100	110	133	148	151	166	192	200	233	266	296	326
Maximum start-up current, standard unit (Un)⁽⁵⁾													
Circuit A&B	A	307	356	352	406	409	396	462	440	485	529	600	636
Maximum start-up current, unit with soft starter (Un)⁽⁵⁾													
Circuit A&B	A	261	283	305	332	336	350	389	394	438	482	527	562

- (1) Conditions equivalent to the standardised Eurovent conditions (water type heat exchanger water input/output temperature = 12 °C/7 °C, outdoor air temperature = 35 °C).
- (2) Power input, compressors + fans, at the unit operating limits (saturated suction temperature: 15 °C, saturated condensation temperature 68.3 °C) and nominal voltage of 400 V (data given on the unit's nameplate).
- (3) Maximum unit operating current at maximum unit power input and 360 V.
- (4) Maximum unit operating current at maximum unit input power and 400 V (data given on the unit's name plate).
- (5) Maximum instantaneous starting current at the operating limits (maximum operating current of the smallest compressor(s) + current of the fan(s) + locked rotor current of the largest compressor).
Fan motor electrical data at Eurovent equivalent conditions and motor ambient air temperature of 50 °C at 400 V: current 3.8 A, starting current 20 A, input power: 1.75 kW.

AQUACIATPOWER ILD HE 		602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Power circuit													
Nominal voltage	V-ph-Hz	400 - 3 -50											
Voltage range	V	360 - 440											
Control circuit supply		24 V, via internal transformer											
Nominal unit current draw⁽¹⁾													
Circuit A&B	A	97	107	130	144	147	162	186	195	227	260	288	316
Max. operating input power⁽²⁾													
Circuit A&B	kW	81	88	108	118	120	134	153	161	188	215	237	259
Cosine Phi unit at maximum power ⁽²⁾													
		0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88
Maximum unit current draw (Un-10%)⁽³⁾													
Circuit A&B	A	142	154	189	208	211	237	268	284	331	378	416	454
Maximum unit current draw (Un)⁽⁴⁾													
Circuit A&B - Standard unit	A	131	142	174	192	195	218	247	261	305	348	383	419
Circuit A&B - Unit + Power factor correction option	A	98	108	131	146	148	164	188	197	230	262	291	321
Maximum start-up current, standard unit (Un)⁽⁵⁾													
Circuit A&B	A	305	353	349	402	405	392	458	436	479	523	594	629
Maximum start-up current, unit with soft starter (Un)⁽⁵⁾													
Circuit A&B	A	259	279	302	329	332	346	384	389	433	476	520	556

- (1) Conditions equivalent to the standardised Eurovent conditions (water type heat exchanger water input/output temperature = 12 °C/7 °C, outdoor air temperature = 35 °C).
- (2) Power input, compressors + fans, at the unit operating limits (saturated suction temperature: 15 °C, saturated condensation temperature: 68.3 °C) and nominal voltage of 400 V (data given on the unit's name plate).
- (3) Maximum unit operating current at maximum unit power input and 360 V.
- (4) Maximum unit operating current at maximum unit input power and 400 V (data given on the unit's name plate).
- (5) Maximum instantaneous starting current at the operating limits (maximum operating current of the smallest compressor(s) + current of the fan(s) + locked rotor current of the largest compressor).
Fan motor electrical data reported upstream of the variable drive at Eurovent equivalent conditions and motor ambient air temperature of 50 °C at 400 V: Current 3.0 A; Starting current 20 A; Power input: 1.75 kW.

ELECTRICAL DATA

Short circuit withstand capability (TN system⁽¹⁾)

AQUACIATPOWER ILD ST / HE	602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Value without upstream protection												
Short time (1s) assigned current - I _{cw} - kA eff	8	8	8	8	8	8	15	15	15	15	20	20
Allowable peak assigned current - I _{pk} - kA pk	30	30	30	30	30	30	65	65	65	65	80	80
Value with upstream protection												
Protection type: Fuse												
Rated conditional short circuit current I _{cc} or I _{cf} - kA eff	50	50	50	50	50	50	50	50	50	50	50	50
Assigned gL/gG fuses	200	200	200	250	250	250	315	315	400	400	630	630

(1) Type of system earthing

PARTIAL RECOVERY WITH DESUPERHEATER



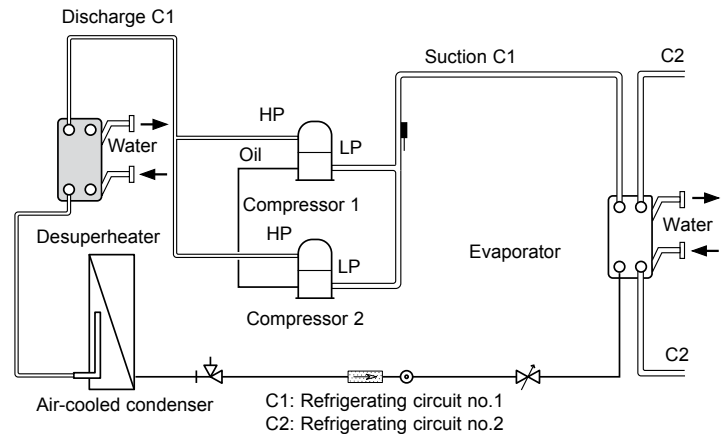
The AQUACIAT^{POWER} range may be equipped as an option with an energy recovery function using a desuperheater

Heat from gases released by the compressors is recovered directly by a type of heat exchanger called a desuperheater located on the unit to produce free, additional hot water.

This optional configuration requires assembly in our factories and is by order only.

■ Refrigerant circuit schematic diagram

This refrigeration diagram illustrates a unit with a desuperheater on each refrigerating circuit. For heat recovery to be possible, the unit must be operating. For the same cooling capacity, the desuperheater provides a source of free hot water and lowers the unit's electrical power consumption.



■ Hydraulic connections: configuration and precautions

The hydraulic supply for each desuperheater is delivered in parallel. In order to ensure that the unit can start and operate under the correct conditions, the desuperheater circuit water loop must be as short as possible and be able to increase quickly in temperature. The minimum desuperheater water inlet temperature must be 25°C. It may require the use of a three-way valve with its controller and a sensor controlling the minimum water inlet temperature.

Note:

The water loop for the desuperheater circuit must include an expansion tank and a valve. Special attention should be paid when selecting the expansion tank as the recovery water circuit can reach 120°C if the pump is turned off or if no hot water is consumed

■ Operating limits

Operating mode	COOLING		HEATING		
	Minimum	Maximum	Minimum	Maximum	
Desuperheater					
Water inlet temperature at start-up	°C	25	60	25	60
Water outlet temperature during operation	°C	30	80	30	80
Air-cooled exchanger					
Outdoor air temperature during operation	°C	0(*)	46	-10	35

(*) -20°C with the option of all-season operation for the ST version
 -20°C as standard for the HE version

PARTIAL RECOVERY WITH DESUPERHEATER

■ Technical characteristics

AQUACIAT ^{POWER} ILD ST / HE	602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000	
Partial heat recovery on the A/B circuits	Plate heat exchanger												
Water volume circuits A/B	2/3,75	2/3,75	3,75/3,75	3,75/3,75	3,75/3,75	3,75/5,5	3,75/5,5	3,75/7,5	5,5/7,5	7,5/7,5	7,5/7,5	7,5/7,5	
Maximum operating pressure, water-side	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	
Refrigerant	R410A												
Circuit A(1)	kg	16,0	22,2	23,7	25,5	29,2	29,2	34,6	36,8	46,2	55,2	56,7	59,2
	tCO ₂ e	33,3	46,3	49,4	53,2	60,9	60,9	72,2	76,9	96,5	115,3	118,3	123,6
Circuit B(1)	kg	23,7	23,7	23,7	25,5	37,1	38,5	49,7	55,2	55,2	55,2	56,7	59,2
	tCO ₂ e	49,4	49,4	49,4	53,2	77,4	80,5	103,8	115,3	115,3	115,3	118,3	123,6
Water connections	Victaulic®												
Connection	inch	2	2	2	2	2	2	2	2	2	2	2	
External diameter	mm	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	

AQUACIAT^{POWER}ILD ST

Operating weight(1)

Unit + Partial heat recovery option	kg	1472	1537	1681	1704	2112	2270	2390	2625	3099	3350	3362	3402
Unit with Low Noise + Partial heat recovery option	kg	1555	1620	1789	1812	2220	2396	2516	2769	3261	3530	3542	3582
Unit + Low Noise + HP dual-pump hydraulic module + Partial heat recovery option	kg	1695	1760	1941	1963	2381	2605	2734	2974	3506	3775	3824	3864

AQUACIAT^{POWER}ILD HE

Operating weight(1)

Unit + Partial heat recovery option	kg	1508	1574	1717	1740	2149	2307	2426	2662	3135	3407	3419	3468
Unit with Low Noise + Partial heat recovery option	kg	1591	1657	1825	1848	2257	2432	2552	2806	3297	3587	3599	3648
Unit + Low Noise + HP dual-pump hydraulic module + Partial heat recovery option	kg	1731	1797	1977	1999	2417	2641	2770	3011	3543	3833	3881	3930

(1) Weights are guidelines only. Refer to the unit name plate

PARTIAL RECOVERY WITH DESUPERHEATER

■ Performance levels
Cooling mode

AQUACIAT ^{POWER} ILD ST / HE		602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Total heating capacity	kW	209	226	274	307	313	356	401	434	502	570	625	697
Recovery capacity (45-55)	kW	54,5	58,7	70,7	76,1	80,7	89,9	90,3	114	133,1	158,1	169,1	196,8
% recovery	%	26%	26%	26%	25%	26%	25%	23%	26%	27%	28%	27%	28%
Water flow rate	l/s	1,3	1,4	1,7	1,8	2,0	2,2	2,2	2,8	3,2	3,8	4,1	4,8
Pressure drops, water	kPa	5,4	6,2	8,7	10	11,1	7,8	7,9	6,3	8,4	11,7	13,3	17,7
Recovery capacity (50-60)	kW	44	47,4	57	61,5	65,2	72,5	74,9	79,5	92,6	110	117,8	138,2
% recovery	%	21%	21%	21%	20%	21%	20%	19%	18%	18%	19%	19%	20%
Water flow rate	l/s	1,1	1,2	1,4	1,5	1,6	1,8	1,8	1,9	2,2	2,7	2,9	3,4
Pressure drops, water	kPa	3,6	4,1	5,8	6,6	7,4	5,2	5,5	3,1	4,2	5,8	6,6	8,9
Recovery capacity (55-65)	kW	34,6	37,3	44,8	48,3	51,2	57,0	59,2	56,3	65,4	78	83,2	98,2
% recovery	%	17%	16%	16%	16%	16%	16%	15%	13%	13%	14%	13%	14%
Water flow rate	l/s	0,8	0,9	1,1	1,2	1,2	1,4	1,4	1,4	1,6	1,9	2	2,4
Pressure drops, water	kPa	2,3	2,6	3,7	4,2	4,7	3,3	3,5	1,6	2,1	3	3,4	4,6

Performance for chilled water mode = 12 °C/7 °C and outdoor air temperature = 35 °C

Heating mode

AQUACIAT ^{POWER} ILD ST / HE		602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Total heating capacity	kW	174	191	232	245	262	282	329	345	399	456	498	537
Recovery capacity (45-55)	kW	69,2	75,8	91,7	96,3	104,0	116,2	131,9	131,2	157,5	175,8	181,5	197,3
% recovery	%	40%	40%	40%	39%	40%	41%	40%	38%	39%	39%	36%	37%
Water flow rate	l/s	1,7	1,8	2,2	2,3	2,5	2,8	3,2	3,2	3,8	4,3	4,4	4,8
Pressure drops, water	kPa	8,4	9,9	14,1	15,4	17,7	12,5	15,8	8,2	11,6	14,3	15,2	17,8
Recovery capacity (50-60)	kW	52	57	69,5	72,6	82,1	94,6	100	104,5	115	124,8	131,1	131,1
% recovery	%	30%	30%	30%	30%	31%	34%	30%	30%	29%	27%	26%	24%
Water flow rate	l/s	1,3	1,4	1,7	1,8	2	2,3	2,4	2,5	2,8	3	3,2	3,2
Pressure drops, water	kPa	4,9	5,8	8,3	9,0	11,3	8,4	9,3	5,3	6,3	7,3	8,1	8,1
Recovery capacity (55-65)	kW	32,0	37,3	42,9	48,1	50,9	58,8	61,6	64,5	76,1	85,4	92,1	98,5
% recovery	%	18%	20%	19%	20%	19%	21%	19%	19%	19%	19%	18%	18%
Water flow rate	l/s	0,8	0,9	1	1,2	1,2	1,4	1,5	1,6	1,9	2,1	2,2	2,4
Pressure drops, water	kPa	2	2,6	3,4	4,1	4,6	3,5	3,8	2,1	2,8	3,5	4,1	4,6

Performance for hot water temperature = 40°C/45°C and outdoor air temperature = 7°C

XTRA FAN OPERATING PRESSURE VENTILATION

The AQUACIAT^{POWER} range, HE version, can be equipped as an option with the XTRAFAN operating pressure ventilation.

■ Features

The XTRAFAN offers a wide range of functions, making a whole host of flexible installation conditions possible, such as:

- The option of installation in a confined space, for example on a terrace surrounded by walls, where only an air supply with static pressure of between 100 and 200 pascals within a duct enables use without recycling or mixing of air at the condenser intake,
- Installation in an urban area in which noise is a particular issue, where operation is only possible by adapting a sound trap to the supply air,
- A self-adjusting variable speed function which allows "all-season" cooling, fully secured for industrial processes, including during harsh winter conditions with an external temperature of -20°C,
- The freedom to precisely adjust the fan speed on-site to what is "strictly necessary" to obtain the optimum air supply pressure, or the maximum acceptable sound limit for the site on which the unit is located,
- An improvement in the EER and electrical consumption for the unit, in direct proportion to the load required by the installation.

The various performances (cooling capacity, heating capacity, input power, energy efficiency) depend on the rotation speed of the fans, and therefore on the desired operating pressure in the duct:

- At an operating pressure of between 0 and 100 Pa, the machine performances are barely affected
- At an operating pressure of between 100 and 200 Pa, the machine performances may be significantly affected, particularly according to the air and water temperature conditions.

The sound level at the duct outlet and the level radiated around the machine depends on the operating pressure.

Refer to the selection tool to evaluate the estimated impact of the ducting system on the machine's operating conditions.

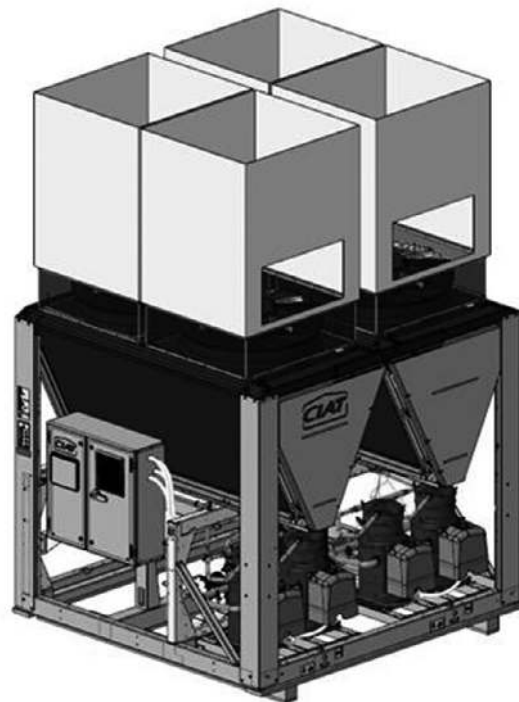
■ Precautions for installation

On-site installation of a packaged reversible air-to-water unit requires some safety measures to be taken, particularly if it is installed in a machine room. For example, the evacuation of condensates specific to these units, including at very low outdoor temperatures.

During defrosting cycles, reversible units are liable to discharge a large amount of water onto the ground, which must be drained, as well as steam from the fan discharge which can damage the air discharge ducts. The ground supporting the unit must be perfectly watertight and capable of collecting and draining the defrosted water, including during freezing periods. It is recommended that the unit is raised by approximately 300 mm.

If an air discharge duct is installed on site, its weight must not be supported by the roof of the unit. Each fan must be connected independently.

The duct must be connected to the unit using a flexible supply air sleeve, included in the option



INTELLIGENTLY-DESIGNED ACOUSTICS

To comply with the various restrictions on integration, the AQUACIAT^{POWER} has four sound finish levels enabling it to be easily integrated into a number of zones without causing disruption to users or their neighbours.

■ Basic version

The distinguishing feature of the AQUACIAT^{POWER} range is its rigorous design incorporating "noiseless" assembly techniques to reduce vibrations and sources of noise:

- New generation scroll compressors with a continuous scrolling motion to lessen vibrations
- Compressor structure separated from the unit by anti-vibration mounts
- Pipes separated from the unit structure
- Fans made from a synthetic material, with aerodynamic blades offering an optimised profile. Optimised air coil-fan pairing which is the result of many hours of thermal and acoustic studies in our Research and Innovation Centre.
- The Connect Touch controller automatically adjusts the fan air flow rate according to the outdoor air temperature and the unit's load rate which enables the sound level to be significantly reduced, particularly at night, mid-season, morning and evening, which totals more than 75% of the time the unit is used.

■ Low Noise option

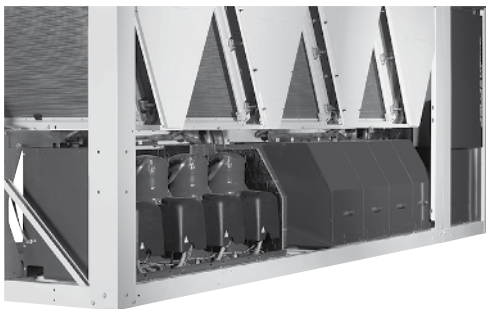
In this version, in addition to the basic equipment, the compressors are fitted inside soundproofed boxes lined with absorbent material to limit the sound level emitted by the machine.

■ Xtra Low Noise option

In this version, the compressors are housed in soundproof boxes identical to those in the Low Noise version and the fan rotation speed is reduced whilst ensuring the output and thermal performance remain optimised.

■ Super Low Noise option

In this version, available on the HE series, the compressors are housed in soundproof boxes identical to those in the Xtra Low Noise version, the fan rotation speed is reduced and improved sound insulation is added to shield the main sources of noise emitted by the machine.

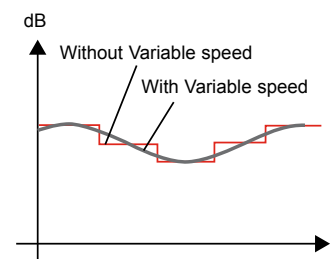
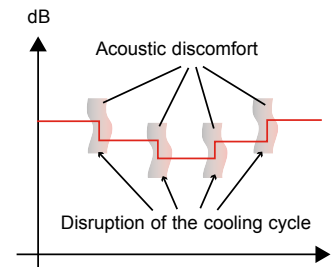


■ Night mode

The AQUACIAT^{POWER} has a Night Mode enabling the sound level to be limited at night or when the building is unoccupied (according to the user programming) by controlling the output and the fan rotation speed.

■ Acoustic signature

As important as the sound power level, the acoustic signature reflects the noise disturbance generated by the unit.



The AQUACIAT^{POWER} HE series has variable speed motors fitted as standard to all of the fan motor assemblies.

AQUACIAT^{POWER} ST series units equipped as an option with variable speed motors (all-season operation) have one variable speed fan motor per refrigerant circuit.

The variable speed control can be used to soft start the fans. It avoids the increases in noise linked to the on/off sequences, thereby improving the unit's acoustic signature.

Similarly, the installation of a variable-speed pump enables the sound level of the pump function to be reduced by adjusting the pump speed to what is strictly necessary. The soft start improves the signature and reduces nuisance noise.

With all these benefits and its four acoustic finish levels (Standard, Low Noise, Xtra Low Noise and Super Low Noise), the AQUACIAT^{POWER} can be integrated into any site, ensuring any constraints in terms of the sound environment can be met.

SOUND LEVELS

Standard ST - High Efficiency HE versions

■ Sound power levels ref 10^{-12} W \pm 3 dB (L_w)

At nominal EN 14511-3: 2013 operating conditions – Cooling mode

AQUACIAT ^{POWER} ILD ST / HE	SOUND POWER LEVEL SPECTRUM (dB)						Overall power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	91	88	88	86	83	76	90
650	92	88	88	87	83	76	91
800	92	88	89	87	84	77	91
900	92	88	89	87	84	77	91
902	93	89	89	88	84	77	92
1000	93	90	90	88	85	78	92
1150	94	90	91	89	85	78	93
1200	94	91	91	89	86	79	93
1400	95	92	92	90	87	80	94
1600	95	92	92	90	87	80	94
1800	95	92	92	90	87	80	94
2000	95	92	92	90	87	80	94

■ Sound pressure levels ref 2×10^{-5} Pa \pm 3 dB (L_p)

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

AQUACIAT ^{POWER} ILD ST / HE	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	59	55	56	54	51	44	58
650	60	56	56	54	51	44	59
800	60	56	57	55	52	45	59
900	60	56	57	55	52	45	59
902	61	57	57	56	52	45	60
1000	61	57	58	56	53	46	60
1150	62	58	58	57	53	46	61
1200	62	58	59	57	54	47	61
1400	63	59	60	58	54	47	62
1600	63	59	60	58	54	47	62
1800	63	59	60	58	54	47	62
2000	63	59	60	58	54	47	62

NB: Sound pressure levels depend on the installation conditions of each system. As such, the levels listed here are given for information only. Only the sound power levels are comparable and certified.

SOUND LEVELS

Standard ST - High Efficiency HE LOW NOISE option versions

■ Sound power levels ref 10^{-12} W ± 3 dB (L_w)

At nominal EN 14511-3: 2013 operating conditions – Cooling mode

AQUACIAT ^{POWER} ILD ST / HE	SOUND POWER LEVEL SPECTRUM (dB)						Overall power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	91	87	87	85	81	74	89
650	92	88	88	86	81	75	90
800	92	88	88	86	82	75	90
900	92	88	88	86	82	75	90
902	93	89	89	87	82	76	91
1000	93	89	89	87	83	76	91
1150	94	90	89	87	83	76	91
1200	94	90	90	88	84	77	92
1400	95	90	90	88	84	77	92
1600	95	91	91	89	85	78	93
1800	95	91	91	89	85	78	93
2000	95	91	91	89	85	78	93

■ Sound pressure levels ref 2×10^{-5} Pa ± 3 dB (L_p)

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

AQUACIAT ^{POWER} ILD ST / HE	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	59	55	55	53	49	42	57
650	60	56	56	54	49	43	58
800	60	56	56	54	50	43	58
900	60	56	56	54	50	43	58
902	61	57	57	55	50	44	59
1000	61	57	57	55	50	44	59
1150	62	57	57	55	51	44	59
1200	62	58	58	56	51	45	60
1400	62	58	58	56	51	45	60
1600	63	59	59	57	52	46	61
1800	63	59	59	57	52	46	61
2000	63	59	59	57	53	47	61

NB: Sound pressure levels depend on the installation conditions of each system. As such, the levels listed here are given for information only. Only the sound power levels are comparable and certified.

SOUND LEVELS

High Efficiency HE version with XTRA LOW NOISE option

■ Sound power levels ref 10^{-12} W ± 3 dB (L_w)

At nominal EN 14511-3: 2013 operating conditions – Cooling mode

AQUACIAT ^{POWER} ILD HE	SOUND POWER LEVEL SPECTRUM (dB)						Overall power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	83	82	84	78	75	69	84
650	84	83	85	79	76	70	85
800	85	84	86	80	77	71	86
900	85	84	86	80	77	71	86
902	85	84	86	80	77	71	86
1000	86	85	87	81	78	72	87
1150	86	85	87	81	78	72	87
1200	86	85	87	81	78	72	87
1400	87	86	88	82	79	73	88
1600	88	87	89	83	80	74	89
1800	88	87	89	83	80	74	89
2000	88	87	89	83	80	74	89

■ Sound pressure levels ref 2×10^{-5} Pa ± 3 dB (L_p)

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

AQUACIAT ^{POWER} ILD HE	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	51	50	52	46	43	37	52
650	52	51	53	47	44	38	53
800	53	52	54	48	45	39	54
900	53	52	54	48	45	39	54
902	53	52	54	48	45	39	54
1000	54	53	55	49	46	40	55
1150	54	53	55	49	46	40	55
1200	54	53	55	49	46	40	55
1400	55	54	56	50	47	41	56
1600	56	55	57	51	48	42	57
1800	56	55	57	51	48	42	57
2000	56	55	57	51	48	42	57

NB: Sound pressure levels depend on the installation conditions of each system. As such, the levels listed here are given for information only. Only the sound power levels are comparable and certified.

SOUND LEVELS

High Efficiency HE version with SUPER LOW NOISE option

■ Sound power levels ref 10^{-12} W ± 3 dB (L_w)

At rated EN 14511-3:2013 operating conditions - Cooling mode

AQUACIAT ^{POWER} ILD HE	SOUND POWER LEVEL SPECTRUM (dB)						Overall power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	79	82	81	76	73	68	82
650	80	82	82	77	74	68	83
800	81	84	83	78	75	70	84
900	81	84	83	78	75	70	84
902	81	83	83	78	75	70	84
1000	82	85	84	79	76	71	85
1150	82	84	84	79	76	71	85
1200	83	86	85	80	77	72	86
1400	83	86	85	80	77	72	86
1600	84	87	86	81	78	73	87
1800	84	87	86	81	78	73	87
2000	84	87	86	81	78	73	87

■ Sound pressure level ref 2×10^{-5} Pa ± 3 dB (L_p)

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

AQUACIAT ^{POWER} ILD HE	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
602	47	50	49	44	41	36	50
650	47	50	50	45	42	36	51
800	49	52	51	46	43	38	52
900	49	52	51	46	43	38	52
902	48	51	51	46	43	37	52
1000	50	53	52	47	44	39	53
1150	50	52	52	47	44	39	53
1200	51	54	53	48	45	40	54
1400	51	54	53	48	45	40	54
1600	52	55	54	49	46	41	55
1800	52	55	54	49	46	41	55
2000	52	55	54	49	46	41	55

NOTE: The sound pressure levels depend on the installation conditions of each system. As such, the levels listed here are given for information only. Only the sound power levels are comparable and certified.

SYSTEM WATER VOLUME - EVAPORATOR WATER FLOW RATE

The Connect Touch controller is equipped with anticipation logic making it highly flexible in adjusting operation to parameter drift, particularly on hydraulic systems with low water volumes. By adjusting compressor running times, it prevents short-cycle protection cycles from starting and, in most cases, eliminates the need for a buffer tank.

Note The minimum volumes of chilled water are calculated for EUROVENT rated conditions:

Cooling mode

- Chilled water temperature = 12°C/7°C
- Outdoor air temperature = 35°C

Heating mode

- Hot water temperature = 40°C/45°C
- Outdoor air temperature = 7°C

This value is applicable for most air conditioning applications (unit with fan coil units).

Note:

For installations running with a low volume of water (assembly with air handling unit) or for industrial processes, the buffer tank is a required component.

AQUACIAT ^{POWER} ILD ST / HE	602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000	
Minimum system water volume air conditioning cooling application (litres)	420	451	494	539	654	750	827	914	993	1076	1159	1306	
Minimum system water volume air conditioning - heating application (litres)	1386	1513	1374	1457	1523	1362	1553	1374	1382	1362	1478	1618	
Minimum system water volume, industrial process application (litres)	1091	1173	1283	1401	1699	1949	2150	2375	2582	2796	3014	3396	
Min(1)/max(2) water type heat exchanger flow rate without hydraulic module (l/s)	2,7 / 17,5	3 / 17,5	3,6 / 17,5	4 / 21,8	4,1 / 29,8	4,7 / 29,8	5,3 / 35,2	5,7 / 40,4	6,6 / 40,4	7,6 / 40,4	8,2 / 41,6	9,0 / 43,4	
Water type heat exchanger flow rate with low pressure module (l/s)	Single min(3) / max	2,8 / 12,2	2,8 / 12,2	3,6 / 14,3	4 / 14,3	3,3 / 20,3	3,7 / 20,3	4,1 / 20,3	9,5 / 25	9,5 / 25	9,5 / 25	6,6 / 28,6	6,9 / 28,6
	Dual min(3) / max	3,2 / 10,3	2,5 / 12,2	2,5 / 14	2,9 / 14	3,7 / 20,2	3,7 / 20,2	4,1 / 20,2	8,0 / 25	8,0 / 25	8,0 / 25	5,8 / 26,5	6,6 / 26,5
Water type heat exchanger flow rate with high pressure hydraulic module (l/s)	Single min(3) / max	2,5 / 11,7	2,5 / 11,7	4,6 / 16,1	5,2 / 16,1	6,5 / 16,1	3,6 / 26,5	4,1 / 26,5	4,4 / 26,5	4,9 / 26,5	5,3 / 26,7	7 / 30	
	Dual min(3) / max	2,6 / 10,8	2,6 / 10,8	2,6 / 15,5	2,9 / 15,5	3,5 / 15,5	3,6 / 26,5	4,1 / 26,5	4,4 / 26,5	4,9 / 29,2	5,3 / 29,2	5,8 / 30	6,6 / 30

- (1) Minimum flow rate for maximum permitted water temperature difference conditions (10°C)
- (2) Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger
- (3) Factory-set minimum flow rate based on the type of pump

NOTE: For the Buffer Tank Module option, the volume of the tank must be taken into account (550 litres)

OPERATING RANGE

AQUACIAT^{POWER} devices have a broad field of application, enabling them to meet a range of heating and cooling requirements in the most varied of climates.

Multi-climate:

Cooling mode from -20°C to +48°C

The AQUACIAT^{POWER} HE series is equipped as standard with all the management devices and algorithms to enable all-season operation in all climates. The AQUACIAT^{POWER} HE series is therefore able to operate in conditions ranging from the heat of the Mediterranean basin to the chill of Scandinavia, the humid Atlantic coast to the dry climate of Central Europe.

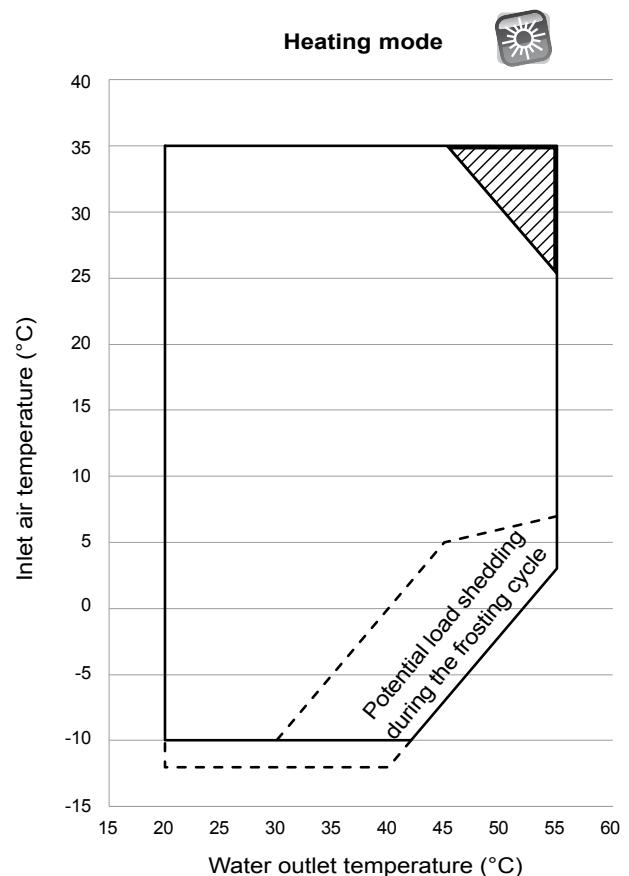
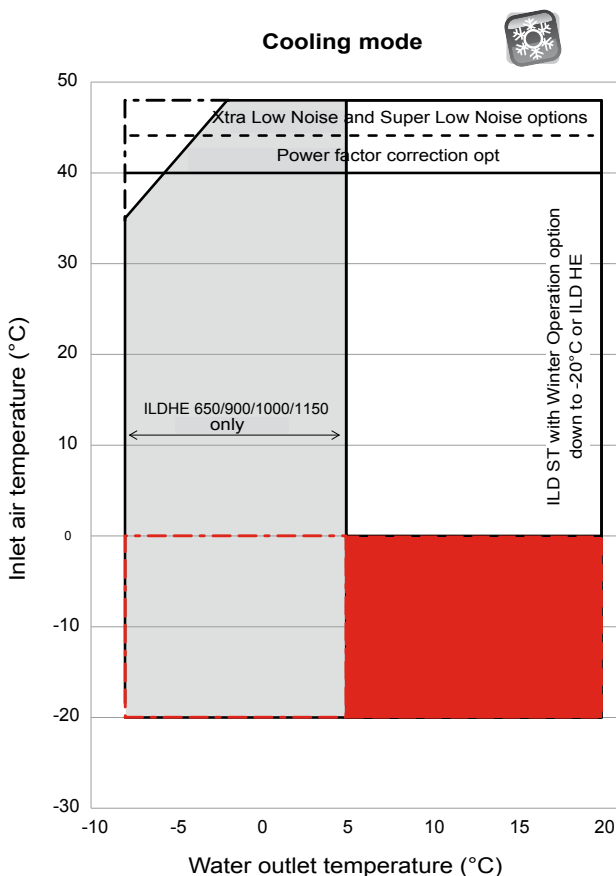
In the ST series, all-season operation down to -20°C is optional.

Heating mode from -10°C to +35°C

The design of the AQUACIAT^{POWER} makes it suitable for the majority of heating and air conditioning applications, regardless of the climate. Water heated to +40°C is guaranteed, even for outdoor temperatures of -10°C.

Multi-application: air conditioning, industrial processes

The AQUACIAT^{POWER} can be used for all traditional air conditioning applications in sectors as varied as collective housing, hotels, shopping centres and offices.



- ILD ST/HE full load
- ST version winter operation option (standard HE version)
- ILD ST / HE 1150 part load operation. Other sizes operate at full load.
- Partial load operation. Potential load shedding during the frosting cycle depending on the humidity conditions.
- Low temperature brine solution option
- Part load for low temperature brine solution option

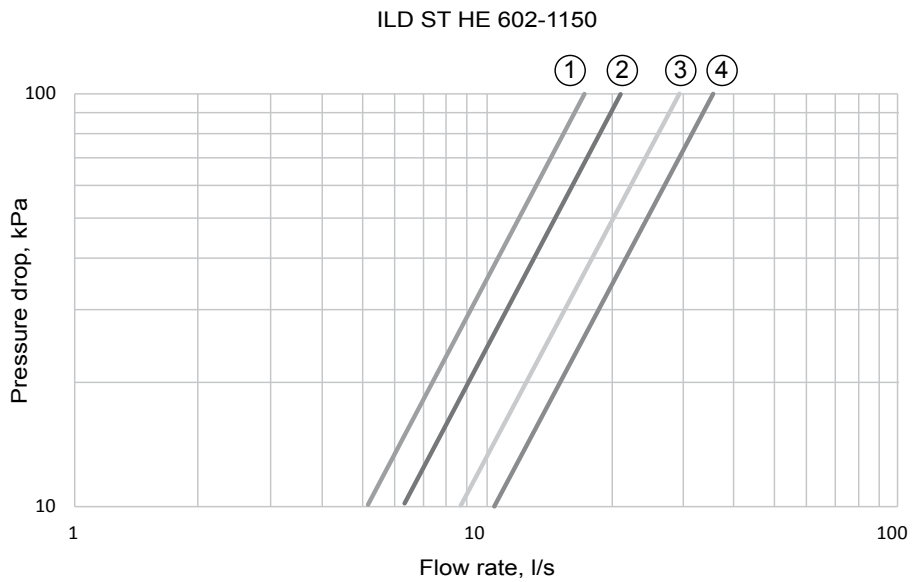
Power factor correction option available for an inlet air temperature up to +40°C

For operation in pure water at an inlet air temperature below 0°C, the frost protection option must be provided

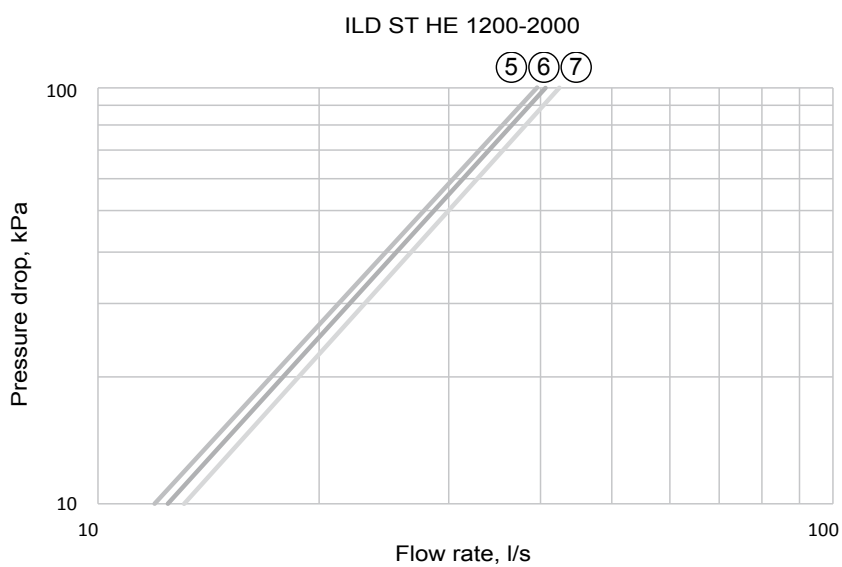
HYDRAULIC SPECIFICATIONS

■ Water pressure drop in the evaporator

Data applicable for pure water at 20°C.



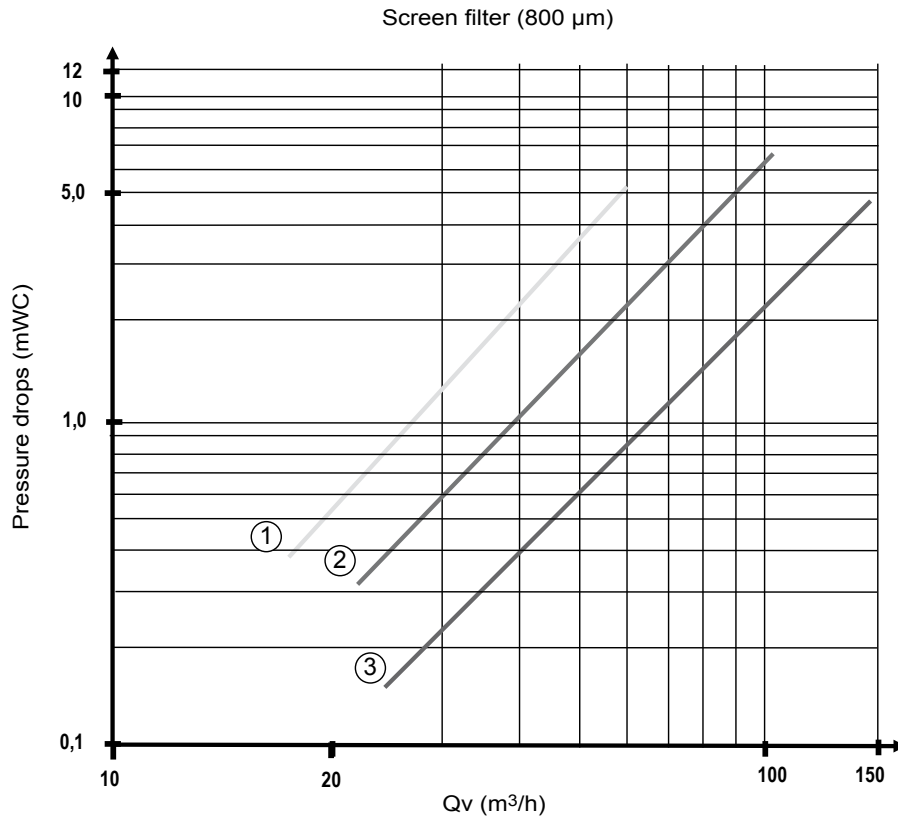
- ① ILD 602-650-800
- ② ILD 900
- ③ ILD 902-1000
- ④ ILD 1150



- ⑤ ILD 1200-1400-1600
- ⑥ ILD 1800
- ⑦ ILD 2000

HYDRAULIC SPECIFICATIONS

■ Water pressure drop in the filter



- ① ILD 602 - 650
- ② ILD 800 - 1150
- ③ ILD 1200 - 2000

HYDRAULIC SPECIFICATIONS

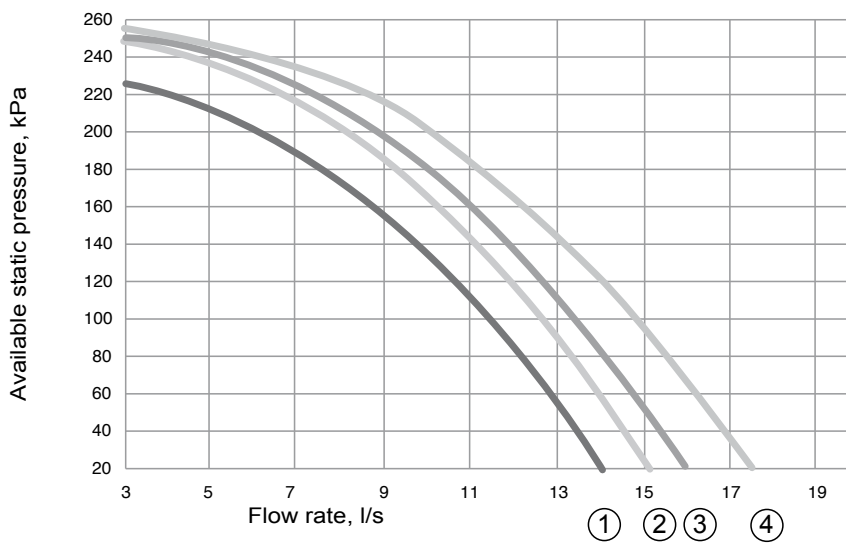
■ Available static system pressure

Data applicable for:

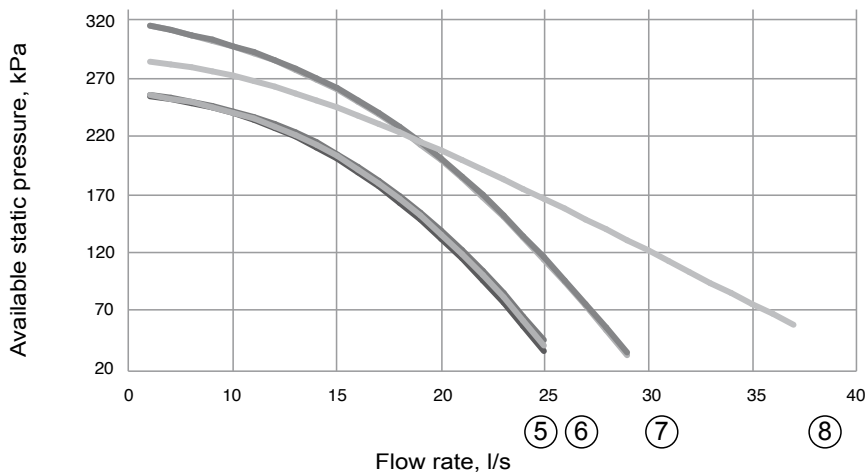
- Pure water at 20°C
- Refer to the section "Evaporator water flow rate" for the minimum and maximum water flow rate values
- If a glycol/water mix is used, the maximum water flow rate is reduced

■ ILD ST / HE high pressure pumps (fixed or variable speed at 50 Hz)

Single pumps



- ① ILD 602 - 650
- ② ILD 800
- ③ ILD 900
- ④ ILD 902

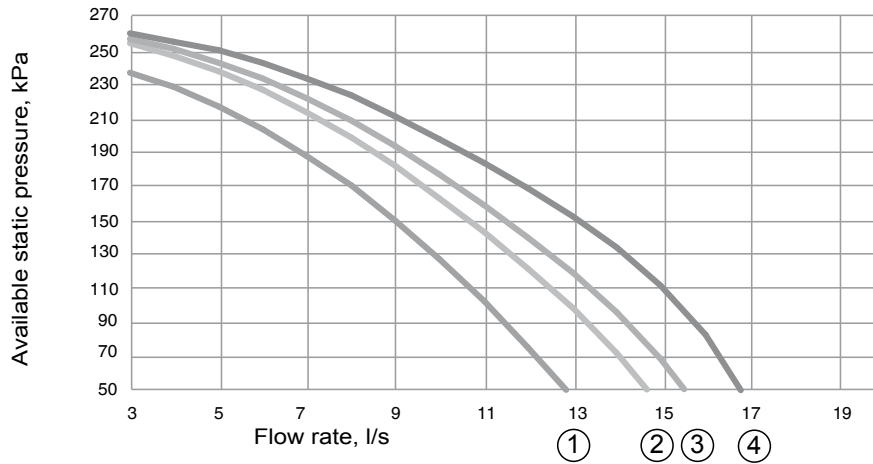


- ⑤ ILD 1000-1150
- ⑥ ILD 1200-1400
- ⑦ ILD 1600-1800
- ⑧ ILD 2000

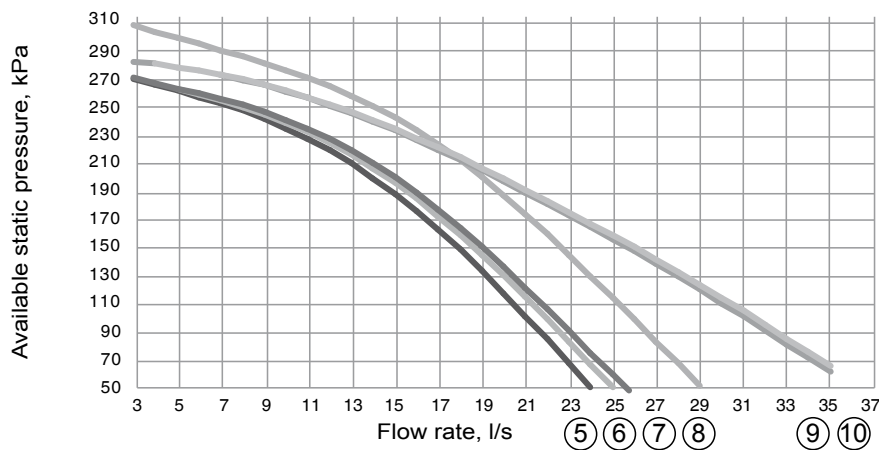
HYDRAULIC SPECIFICATIONS

■ ILD ST / HE high pressure pumps (fixed or variable speed at 50 Hz)

Dual pumps



- ① ILD 602-650
- ② ILD 800
- ③ ILD 900
- ④ ILD 902



- ⑤ ILD 1000
- ⑥ ILD 1150
- ⑦ ILD 1200
- ⑧ ILD 1400-1600
- ⑨ ILD 1800
- ⑩ ILD 2000

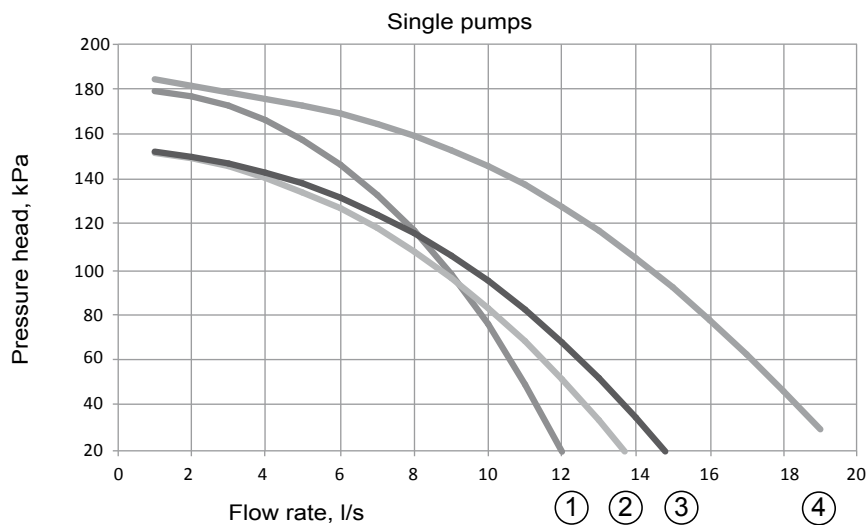
HYDRAULIC SPECIFICATIONS

■ Available static system pressure

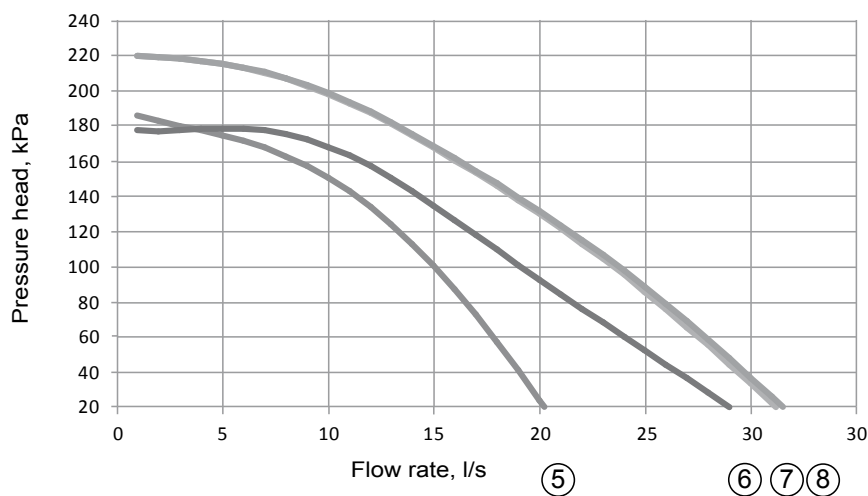
Data applicable for:

- Pure water at 20°C
- Refer to the section "Evaporator water flow rate" for the minimum and maximum water flow rate values
- If a glycol/water mix is used, the maximum water flow rate is reduced

■ ILD ST/HE low pressure pumps (fixed speed)



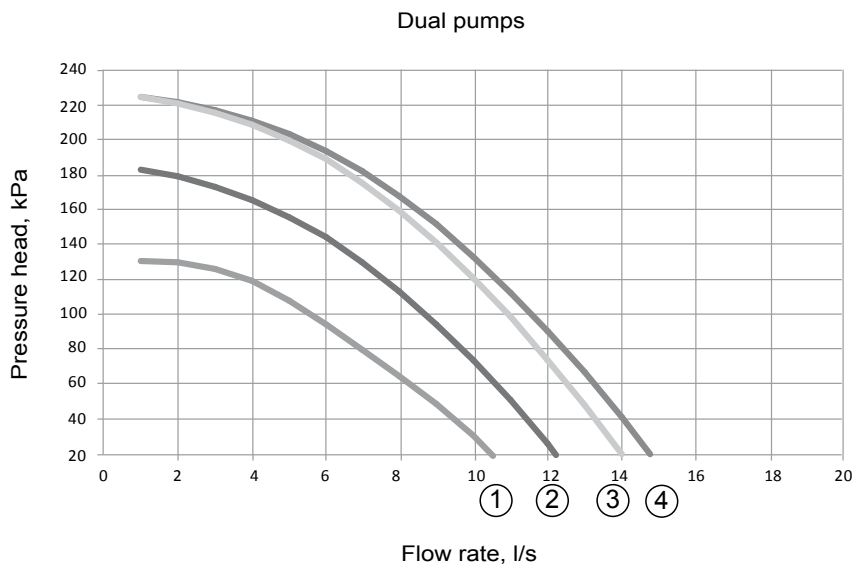
- ① ILD 602-650
- ② ILD 800
- ③ ILD 900
- ④ ILD 902-1000



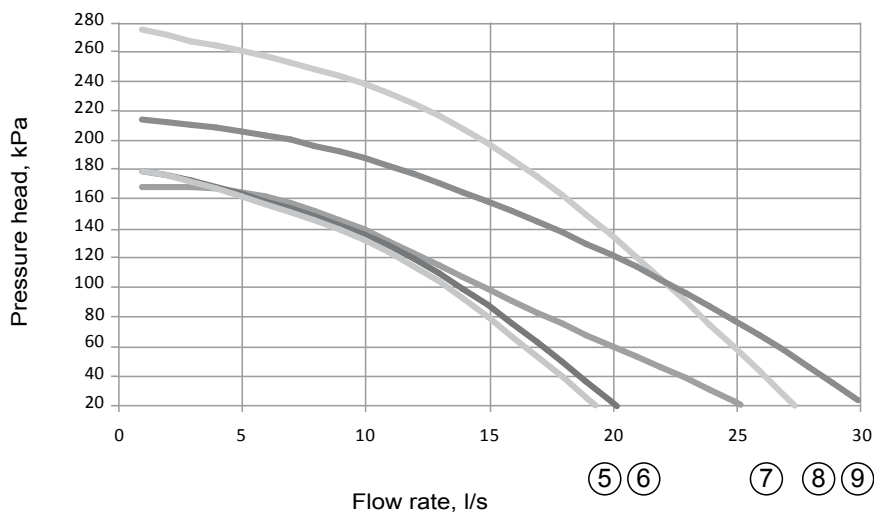
- ⑤ ILD 1150
- ⑥ ILD 1200-1400-1600
- ⑦ ILD 1800
- ⑧ ILD 2000

HYDRAULIC SPECIFICATIONS

■ ILD ST/HE low pressure pumps (fixed speed)



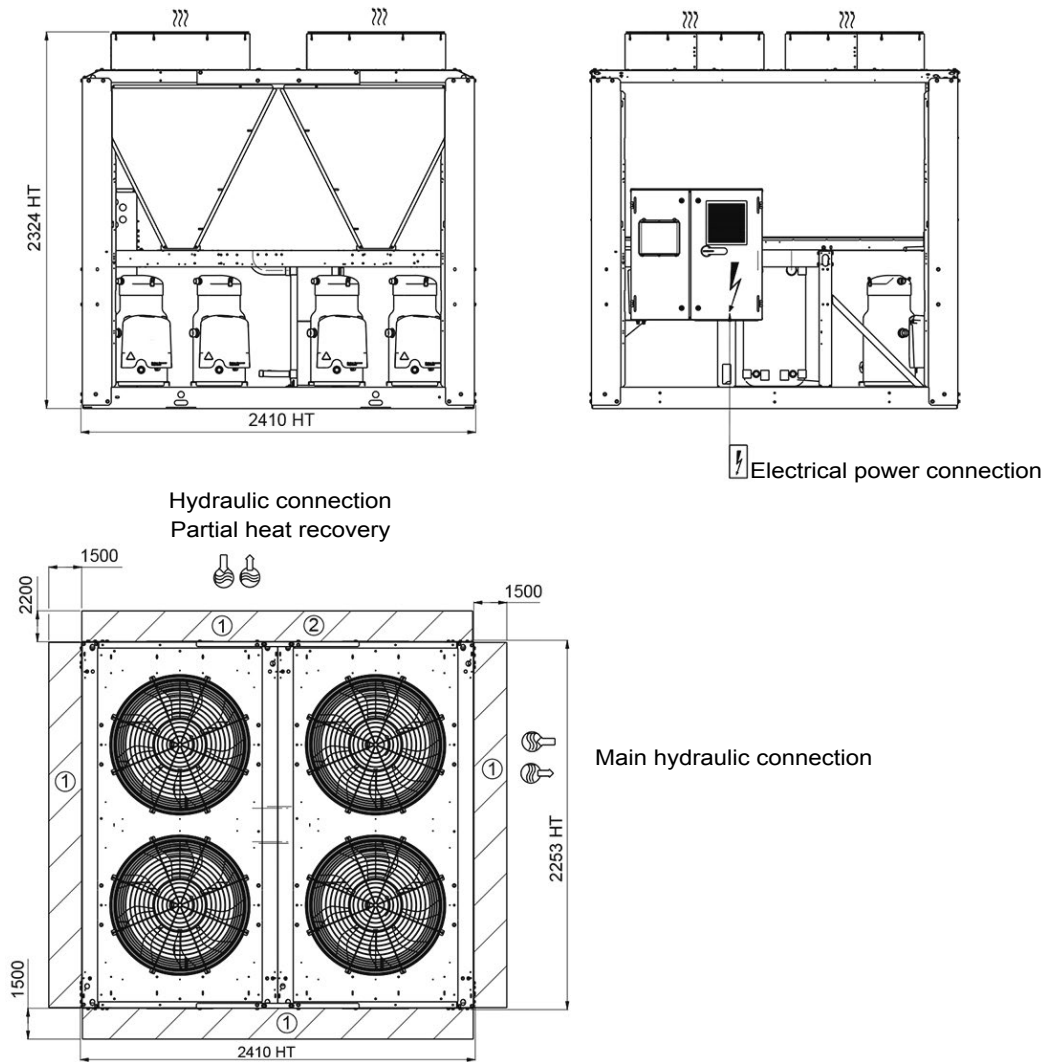
- ① ILD 602
- ② ILD 650
- ③ ILD 800
- ④ ILD 900



- ⑤ ILD 902-1000
- ⑥ ILD 1150
- ⑦ ILD 1200-1400-1600
- ⑧ ILD 1800
- ⑨ ILD 2000

DIMENSIONS

■ AQUACIAT^{POWER} ILD ST-HE 602 to 900 Without buffer tank



Key

All dimensions in mm

- ① Clearance required for maintenance and air flow
- ② Clearances recommended for removal of the coils
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Electrical cabinet

Notes:

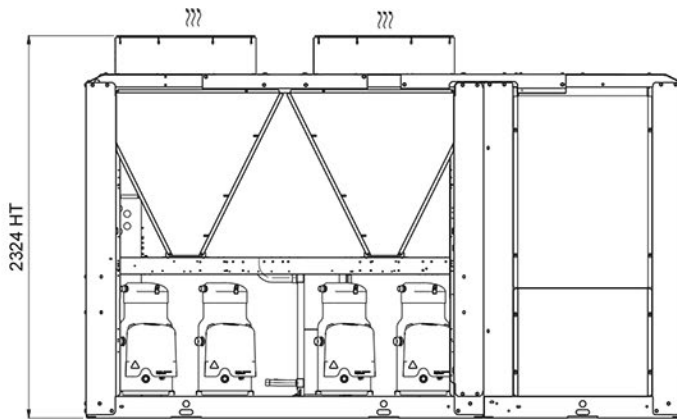
Non-contractual drawings.

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

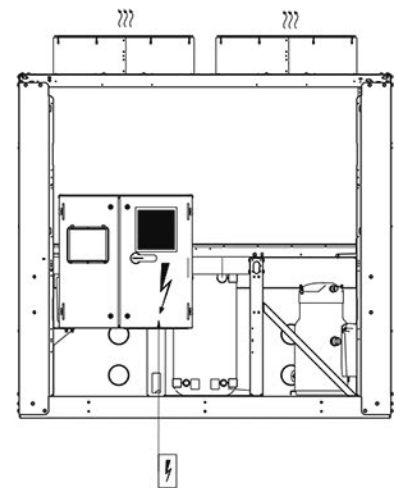
Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

DIMENSIONS

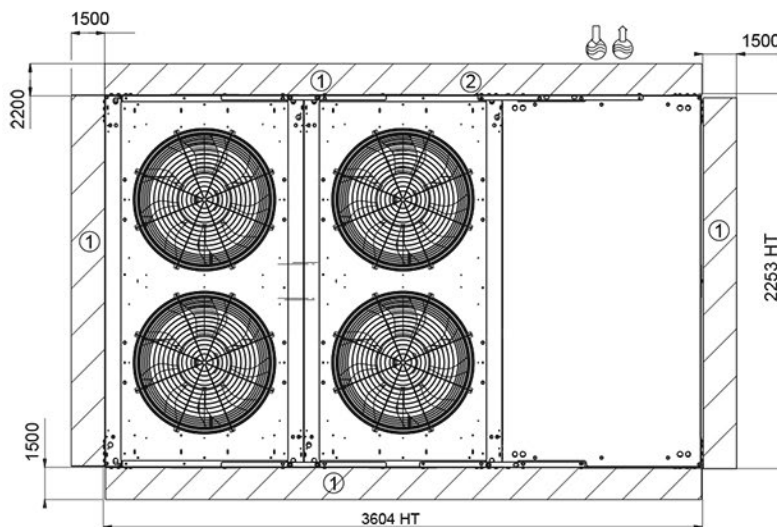
■ AQUACIAT^{POWER} ILD ST-HE 602 to 900 With buffer tank



Main hydraulic connection



Electrical power connection



Key

All dimensions in mm

- ① Clearance required for maintenance and air flow
- ② Clearances recommended for removal of the coils
- Water inlet
- Water outlet
- Air outlet, do not obstruct

- Electrical cabinet

Notes:

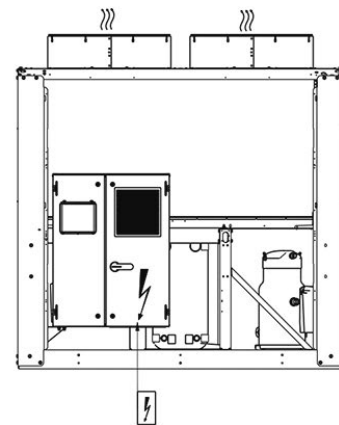
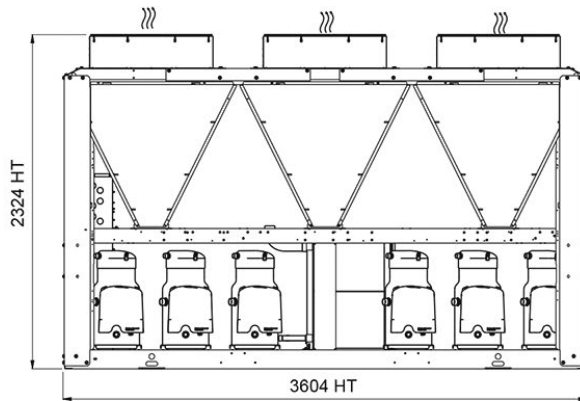
Non-contractual drawings.

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

Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

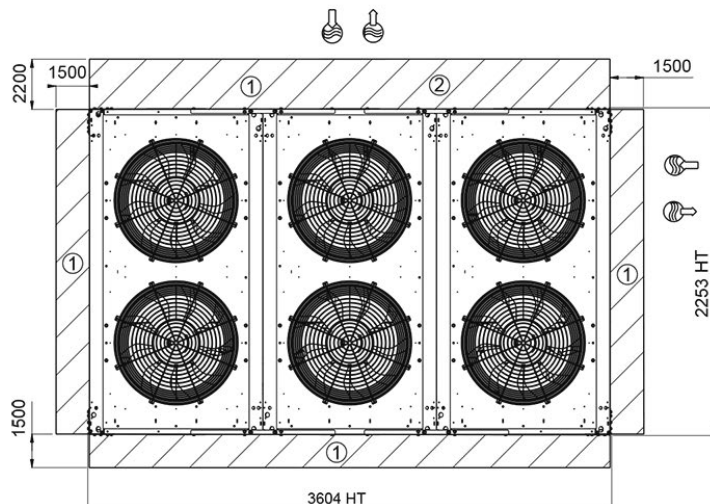
DIMENSIONS

■ AQUACIAT^{POWER} ILD ST-HE 902 to 1200 Without buffer tank



Electrical power connection

Hydraulic connection
Partial heat recovery



Main hydraulic connection

Key

All dimensions in mm

- ① Clearance required for maintenance and air flow
- ② Clearances recommended for removal of the coils
- Water inlet
- Water outlet
- Air outlet, do not obstruct

Electrical cabinet

Notes:

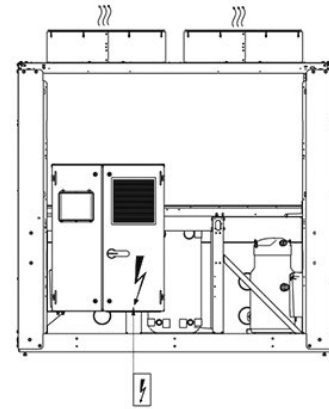
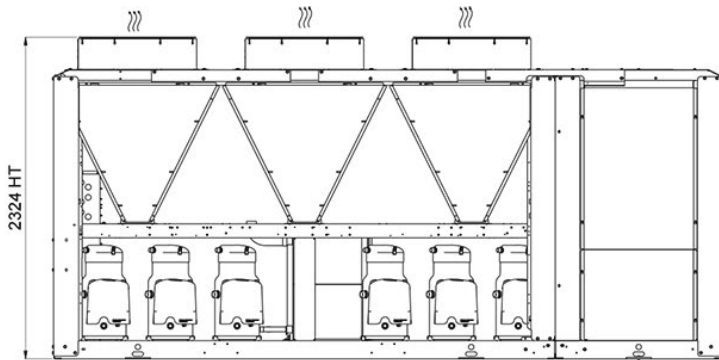
Non-contractual drawings.

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

Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

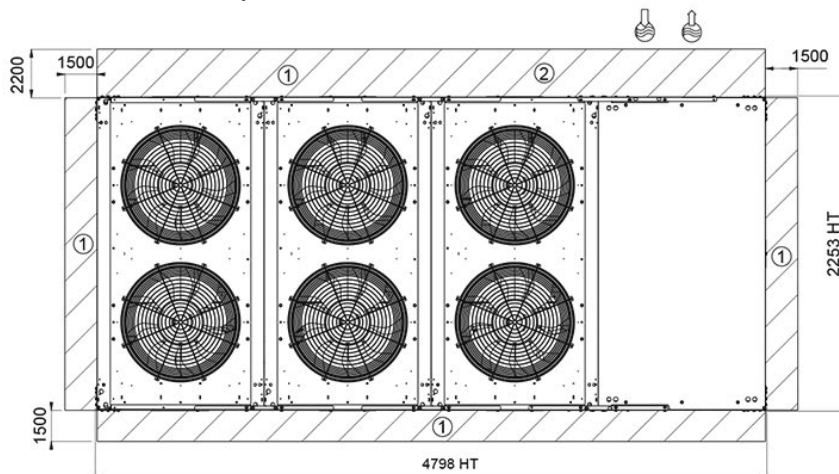
DIMENSIONS

■ AQUACIAT^{POWER} ILD ST-HE 902 to 1200 With buffer tank



Electrical power connection

Main hydraulic connection



Key

All dimensions in mm

- ① Clearance required for maintenance and air flow
- ② Clearances recommended for removal of the coils
- Water inlet
- Water outlet
- Air outlet, do not obstruct

- Electrical cabinet

Notes:

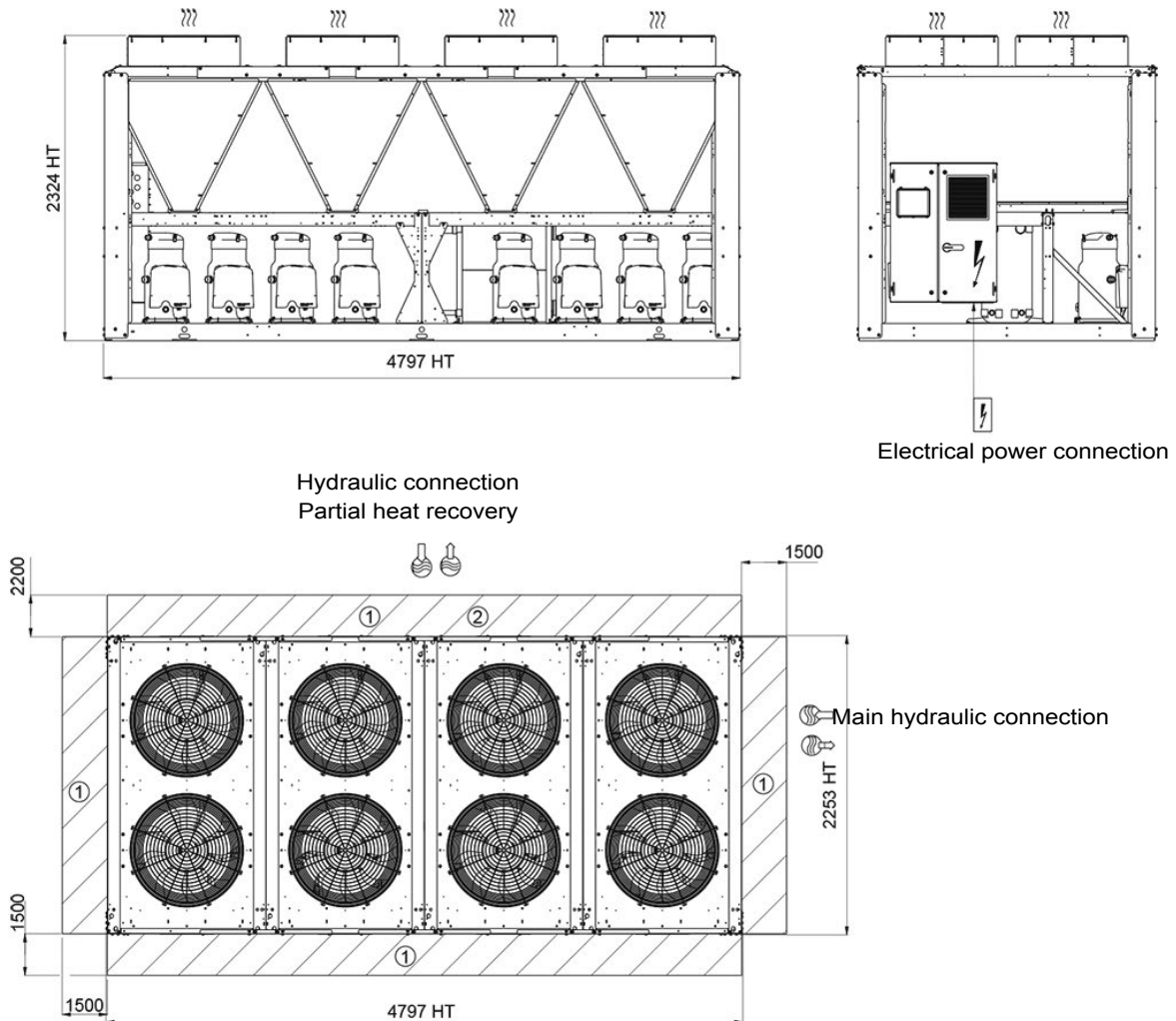
Non-contractual drawings.

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

Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

DIMENSIONS

■ AQUACIATPOWER ILD ST-HE 1400 to 2000 Without buffer tank



Hydraulic connection
Partial heat recovery

Electrical power connection

Main hydraulic connection

Key

All dimensions in mm

- ① Clearance required for maintenance and air flow
- ② Clearances recommended for removal of the coils
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Electrical cabinet

Notes:

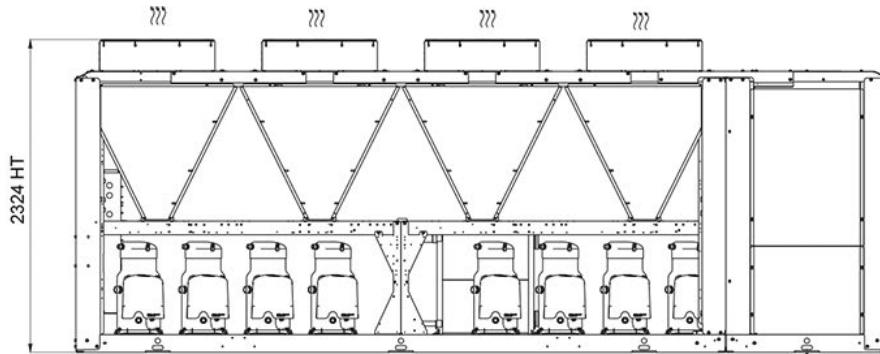
Non-contractual drawings.

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

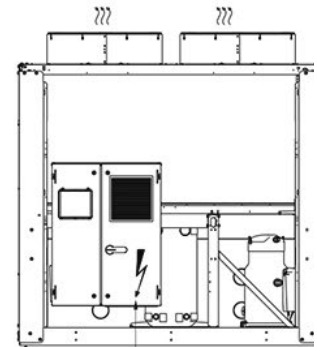
Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

DIMENSIONS

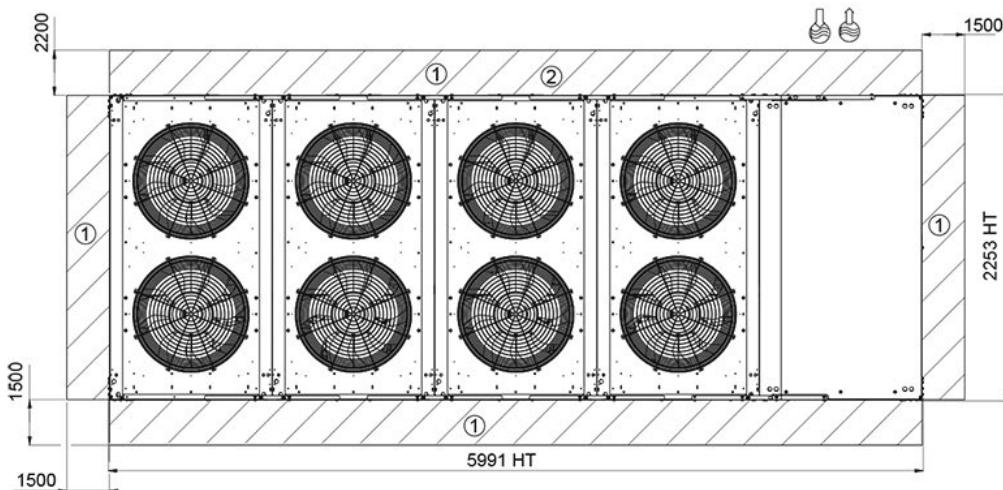
■ AQUACIAT^{POWER} ILD ST-HE 1400 to 2000 With buffer tank



Main hydraulic connection



Electrical power connection



Key

All dimensions in mm

- ① Clearance required for maintenance and air flow
- ② Clearances recommended for removal of the coils
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Electrical cabinet

Notes:

Non-contractual drawings.

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

Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

INSTALLATION RECOMMENDATIONS

■ Water quality criteria to be respected

Warning: It is essential that an 800-micron water filter be placed on the unit's water inlet during installation. The quality of the water used has a direct impact on the correct and compliant operation of the machine and its service life. This is particularly true if the water used clogs or corrodes components or promotes the growth of algae or micro-organisms. The water must be tested to determine whether it is suitable for the unit. It is also tested to determine whether chemical treatment is necessary and will suffice to make it of acceptable quality. This analysis should confirm whether or not the various machine components are compatible with the water they come into contact with on-site.

Warning: failure to follow these instructions will result in the immediate voiding of the unit's warranty.

■ Lifting and handling

The utmost safety precautions must be taken when lifting and handling the unit.

Always follow the lifting diagram on the unit and in the instruction manual.

Before attempting to lift the unit, make sure the path leading to its intended location is free from obstacles. Always keep the unit vertical when moving it. Never tip it or lie it on its side.

■ Choosing a location for the unit

AQUACIAT^{POWER} units are designed for outdoor installation. Precautions should be taken to protect it from freezing temperatures. Special attention should be paid to ensure sufficient free space (including at the top) to allow maintenance. The unit must be placed on a perfectly level, fireproof surface strong enough to support it when ready for operation. Noise pollution from auxiliary equipment such as pumps should be studied thoroughly.

Potential noise transmission routes should be studied, with assistance from an acoustical engineer if necessary, before installing the unit. It is strongly recommended that flexible couplings are placed over pipes and anti-vibration mounts are fitted underneath the unit (equipment available as an option) to reduce vibrations, and the noise this causes, as much as possible.

■ Fitting accessories supplied separately

A number of optional accessories may be delivered separately and installed on the unit on site.

You must follow the instructions in the manual.

■ Electrical connections

You must follow the instructions in the manual. All information concerning electrical connections is stated on the wiring diagrams provided with the unit. Always follow this information to the letter.

Electrical connections must be made in accordance with best current practices and applicable standards and regulations. Electrical cable connections to be made on-site:

- electrical power supply to unit
- contacts available as standard enabling the machine to be controlled remotely (optional)

It should be noted that the unit's electrical system is not protected against lightning strikes.

Therefore devices to protect against transient voltage surges must be installed on the system and inside the power supply unit.

■ Pipe connections

You must follow the instructions in the manual. All pipes must be correctly aligned and slope toward the system's drain valve. Pipes must be installed and connected to allow sufficient access to the panels and fitted with heat insulation.

Pipe fixings and brackets must be separate to avoid vibrations and ensure no pressure is placed on the unit. Water flow shut-off and control valves must be fitted when the unit is installed.

Pipe connections to be made on site:

- water supply with pressure-reducing valve
 - evaporator, condenser and drain
- Accessories essential to any hydraulic circuit must also be installed, such as:
- water expansion tank
 - drain nozzles at pipe low points
 - exchanger shut-off valves equipped with filters
 - air vents at pipe high points
 - check the system's water capacity (install a buffer water tank if necessary)
 - flexible couplings on exchanger inlets and outlets

Warning:

- Pressure in the water circuits below 4 bar for units equipped with the hydraulic module.
- Place the expansion tank upstream of the pump.
- Do not place any valves on the expansion tank.
- Make sure the water circulation pumps are placed directly at the exchanger inlets.
- Make sure the pressure of the water drawn in by the circulation pumps is greater than or equal to the required minimum NPSH, particularly if the water circuits are "open".
- Test the water quality in accordance with the relevant technical requirements.
- Take the necessary precautions to protect the unit and hydraulic system from freezing temperatures (e.g. allow for the possibility of draining the unit). If glycol is added to prevent freezing, check its type and concentration before system start-up.
- Before making any final hydraulic connections, flush the pipes with clean water to remove any debris in the network.

INSTALLATION RECOMMENDATIONS

■ **System start-up**

System start-up for these machines must be performed by CIAT or a CIAT-authorized firm.

You must follow the instructions in the manual.

List of system start-up checks (non-exhaustive):

- Correct positioning of unit
- Power supply protections
- Phases and direction of rotation
- Wiring connections on unit
- Direction of water circulation in unit
- Cleanliness of water circuit
- Water flow rate at specified value
- Pressure in the refrigerating circuit
- Direction of rotation of compressors
- Water pressure drops and flow rates
- Operating readings

■ **Maintenance operations**

Specific preventive maintenance operations are required at regular intervals and should be performed by CIAT-approved contractors.

The operating parameters are read and noted on a "CHECK LIST" form to be returned to CIAT.

To do this, you must refer to and comply with the instruction manual.

You must take out a maintenance contract with a CIAT-approved refrigeration equipment specialist. Such a contract is required even during the warranty period.

CONTROL

USER-FRIENDLY INTERFACE CONSOLE

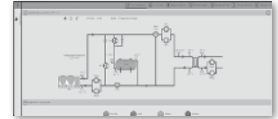
- User-friendly 4.3 inch touch screen.
- Information displayed in a choice of languages.
- Temperature and pressure readings.
- Operating and fault status diagnostics.
- Master/slave control of two machines in parallel.
- Fault memory management.
- Pump management.
- Time schedule.
- IP web server
- Programmable maintenance
- Preventive maintenance
- FGAS maintenance.
- E-mail alert



REMOTE M2M MACHINE SUPERVISION

Two years of Full Serenity with:

- Monitoring of machine operation (operation overviews and curves, alarm logs).
- E-mail alerts for alarms (optional SMS alerts).
- Remote update of the M2M.
- Access to a log of machine operation data.
- Remote advice for using M2M.
- System start-up and operating readings.



PRODUCT FUNCTIONALITY

POTENTIAL-FREE (DRY) CONTACTS AVAILABLE AS STANDARD

- Inputs:**
- Automatic operation control
 - Heating/cooling mode selection
 - Selection of setpoints 1 / 2
 - Power limitation.
- Outputs:**
- General fault reporting
 - Operational status reporting
- Additional inputs available as options:**
- Setpoint adjustable by 4-20 mA signal
 - Power limitation adjustable by 4-20 mA signal
 - Second power limitation level
 - End of storage signal
 - User fault reporting
 - Contact for refrigerant leak detection
- Additional outputs available as options:**
- Indication of the power level by 0-10 V signal
 - Minor alert reporting
 - Unit shut down general fault reporting
 - Desuperheater pump On/Off control
 - On/off control for a boiler
 - 4-stage on/off management for additional heaters

AVAILABLE OUTPUTS

- MODBUS-JBUS RTU (RS485) or TC/IP (standard) open protocol
- LONWORKS protocol (option)
- BACNET IP protocol (option)

CIAT SYSTEM FUNCTIONALITY

Communication with CIAT Energy pool controlled by Power'Control.

Integrated Power'Control:

- Energy optimisation of refrigeration and heating using several generators,
- Manages free cooling capacity
- Uses heat recovery to supply domestic hot water.



Via dry contact

Customer
CMSCOMMUNICATION

Via BUS
communication



Order No: NA20.748A. Supersedes order No: NA19.748A.

Manufacturer reserves the right to change any product specifications without notice.

The illustrations in this document are for illustrative purposes only and not part of any offer for sale or contract. The manufacturer reserves the right to change the design at any time without notice.

Manufacturer: Carrier SCS, Montluel, France.