



“Energy excellence

- Compact and silent*
- Scroll compressors*
- High efficiency brazed plate heat exchangers*
- Self-adjusting electronic control*

Cooling capacity: 156 to 511 kW
 Heating 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 partial-load applications for which an optimum ESEER 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

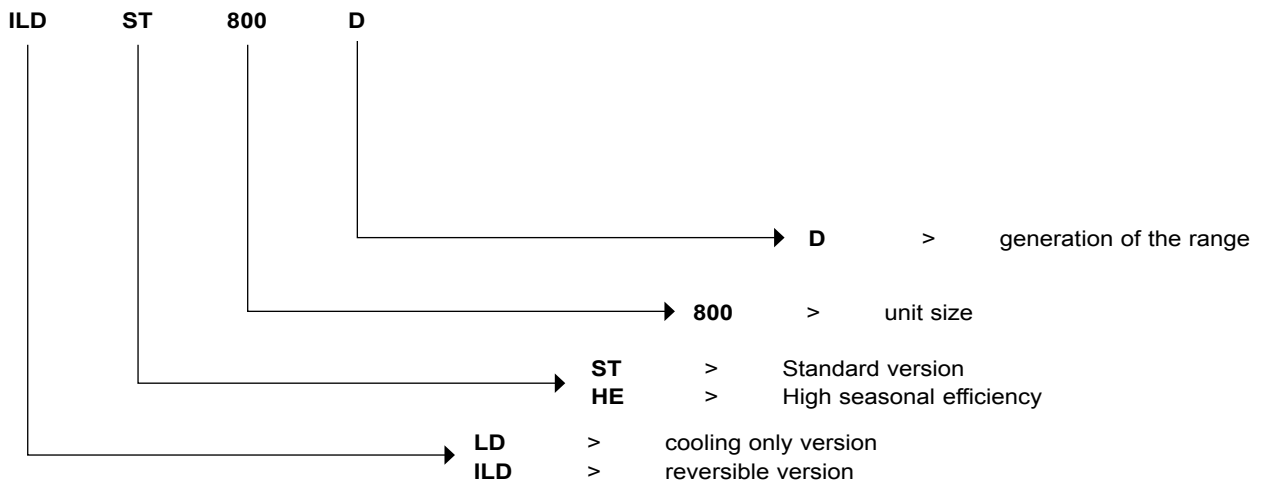
AQUACIAT^{POWER} units are packaged machines supplied as standard with the following components:

- 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
- Refrigerating systems and heat pumps EN 378-2

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

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

■ Refrigerating accessories

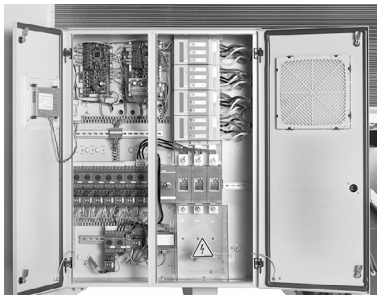
- Dehumidifier filters with rechargeable cartridges
- Hygroscopic sight glasses
- Electronic expansion valves
- Service valves on the liquid line
- 4-way cycle inversion valve in cooling/heating mode

■ Control and safety instruments

- Low and high pressure sensors
- Safety valves on the refrigerating 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



■ Frame

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

■ Connect Touch control module

- User interface with 5 inch touchscreen
- 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-adjusting and proactive functions with adjustment of settings on drift control
- 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 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.

■ Remote control

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 refrigerating 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).

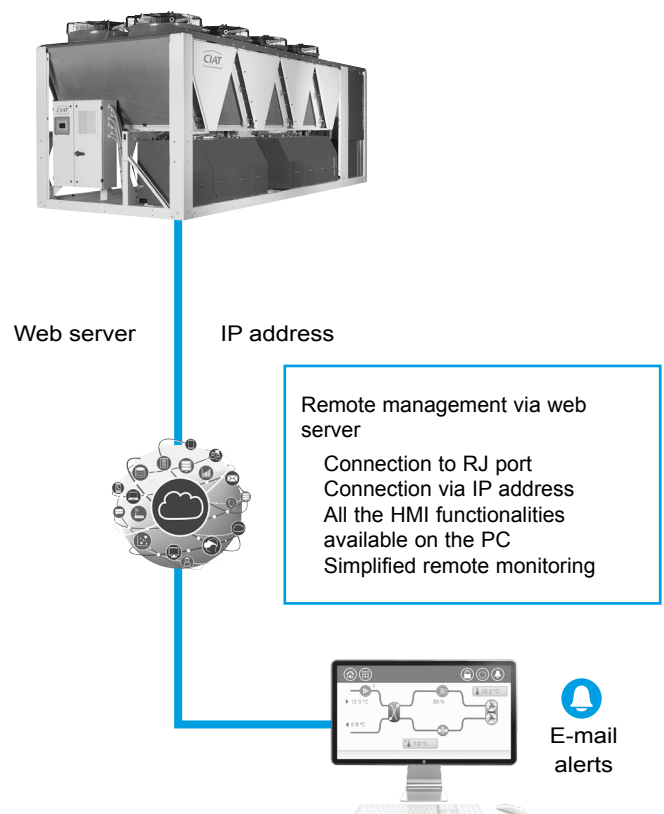
Contacts available as an option:

- 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 refrigerating 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 operating hours, 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:

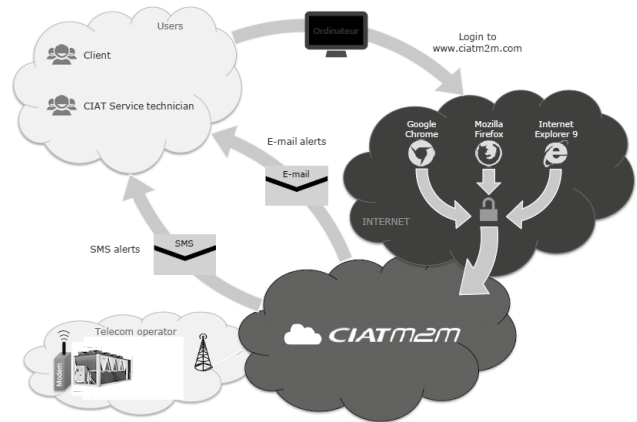
- The performance and operation of the machine
 Example: operating curves and time, number of compressor start-ups, events, preventive maintenance actions to be performed, etc.

- The electricity consumed (if the energy meter option is present)
 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

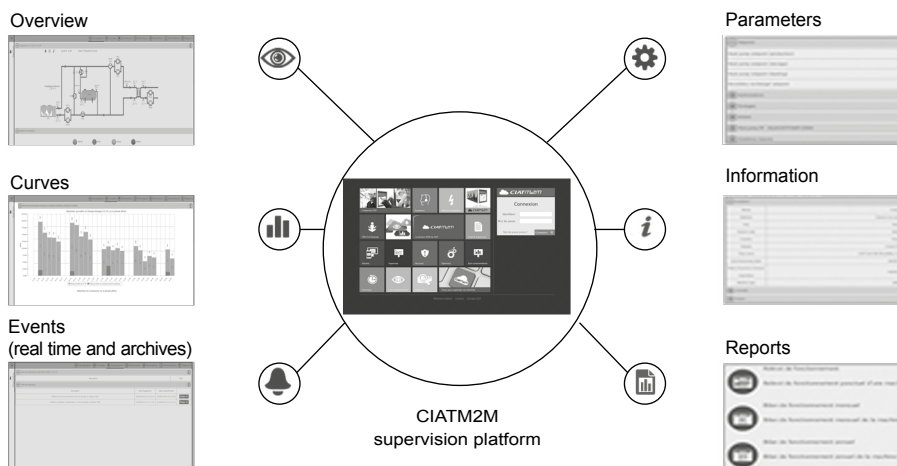


CIATM2M kit contents

- 1 GPRS / 3G modem
- 1 SIM card
- 1 24VDC 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 3 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 by 1 to 2 dB(A)	●
Xtra Low Noise	Acoustic compressor enclosure and low-speed fans	Noise level reduction by 5 to 6 dB(A)	All HE version
XtraFan	Unit equipped with specific variable-speed fans : XtraFans (See specific chapter for maximum available static pressure according to size), each fan equipped with a connection flange & sleeves allowing the connection to the ducting system.	Ducted fan discharge, optimised condensing (or evaporating on Heat pump version) temperature control, based on the operating conditions and system characteristics	All HE version
IP54 electrical cabinet	Increased leak tightness of the unit	Protects the inside of the electricals box from dust, water and sand. In general this option is recommended for installations in polluted environments	●
Protective grilles	Metal grilles on the 4 unit sides.	Improved protection against intrusion into the unit, protection of coils and piping against impacts	●
Electronic starter	Electronic starter on each compressor	Reduces the in-rush current at start-up	●
Winter operation (down to -20°C)	Controls the fan speed	Stable operation of the unit when the air temperature is between 0°C and -20°C.	All ST version
Water type heat exchanger frost protection	Electric heater on the water type heat exchanger and the water piping	Water type heat exchanger module frost protection for outdoor temperatures between 0°C and -20°C	●
Water type heat exchanger and hydraulic module frost protection	Electrical heaters on the water type heat exchanger hydraulic module and optional expansion vessel	Frost protection of the water type heat exchanger and hydraulic module 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 vessel and buffer tank module	Frost protection of the water type heat exchanger and hydraulic module down to an outdoor air temperature of -20°C	●
Partial heat recovery	Unit equipped with a desuperheater on each refrigerating circuit	Simultaneous free production of hot water (high temperature) and production of chilled water (or hot water for the heat pump)	●
Master/slave operation	Unit equipped with an additional water outlet temperature sensor, to be installed on site, enabling Master/Slave operation of 2 units connected in parallel	Optimised operation of two units connected in parallel with run 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, electronic water flow control, pressure sensors. For more details, refer to the dedicated section (expansion tank not included. Option with integrated hydraulic safety components available.)	Quick, easy installation (plug & play)	●
HP dual-pump hydraulic module	Dual high-pressure water pump, water filter, electronic water flow control, pressure sensors. For more details, refer to the dedicated section (expansion tank not included. Option with integrated hydraulic safety components available.)	Quick, easy installation (plug & play)	●
LP single-pump hydraulic module	Single low-pressure water pump, water filter, electronic water flow control, pressure sensors. For more details, refer to the dedicated section (expansion tank not included. Option with integrated hydraulic safety components available.)	Quick, easy installation (plug & play)	●
LP dual-pump hydraulic module	Dual low-pressure water pump, water filter, electronic water flow control, pressure sensors. For more details, refer to the dedicated section (expansion tank not included. Option with integrated hydraulic safety components available.)	Quick, easy installation (plug & play)	●
HP variable speed single-pump hydraulic module	Single high pressure water pump with speed regulator, water filter, electronic water flow rate control, pressure sensors. Multiple water flow control options. For more details, refer to the dedicated section (expansion tank not included. Option with integrated 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	●

● 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 dual-pump hydraulic module	Dual high pressure water pump with speed regulator, water filter, electronic water flow rate control, pressure sensors. Multiple water flow control options. For more details, refer to the dedicated section (expansion tank not included. Option with integrated 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 communication gateway	Two-directional communication board complying with Lon Talk protocol	Connects the unit by communication bus to a building management system	•
BACnet/IP	Two-directional high-speed communication using BACnet protocol over Ethernet network (IP)	Easy and high-speed connection by Ethernet line to a building management system. Allows access to multiple unit parameters	•
Energy Management Module	Control board with additional inputs/outputs. See the list of contacts available as an option in the control description.	Extended remote control capabilities (setpoint reset by 0-20 mA input, ice storage end, demand limits, boiler start-up/shut-down command, etc.)	•
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 input, compliance with minimum power factor limit set by electricity suppliers	•
Coil defrost resistance heaters	Electric heaters under the coils and the condensate pans	Prevents frost formation underneath the coils; compulsory in heating mode if the outdoor temperature is below 0°C	•
230V electrical plug	230V AC power source provided with plug socket and transformer (180 VA, 0.8 Amps)	Enables connection of a laptop or an electrical device during unit start-up or servicing	•
Expansion vessel	6-bar expansion vessel integrated into the hydraulic module	Easy, quick installation (ready to use), and closed circuit protection of hydraulic systems to counter excessive pressure	• with pump
Screwed desuperheater water connection kit	Desuperheater connections with screwed joints	Easy to install. Used to connect the unit to a screw connector	•
Desuperheater flexible connection sleeves	Flexible connections on the desuperheater water side	Easy to install. Limits the transmission of vibrations to the water network	•
Buffer tank module	Integrated buffer tank module	Prevents compressor short cycling and provides stability of the water in the loop	• with pump
Anti-vibration mounts	Elastomer anti-vibration mounts to be fitted underneath the unit	Isolates the unit from the building, preventing vibrations and noise from being transmitted 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 flexibles connection (kit)	Flexibles connections on the desuperheater water side	Easy installation. Limit transmission of vibrations on the water network	•
Water filter on the evaporator	Water filter	Prevents fouling in the water network	• without 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	•
Evap. single pump power/control circuit	Unit equipped with an electrical power and control circuit for one pump evaporator side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	•
Evap. dual pumps power/control circuit	Unit equipped with an electrical power and control circuit for two pumps evaporator side	Quick and easy installation: the control of fixed speed pumps is embedded in the unit control	•
M2M supervision (accessory)	Monitoring solution which allows customers to track and monitor their equipment remotely in real time	Real-time expert technical support to improve equipment availability and reports at customer hand to monitor and optimize operating equipment.	•

• ALL MODELS

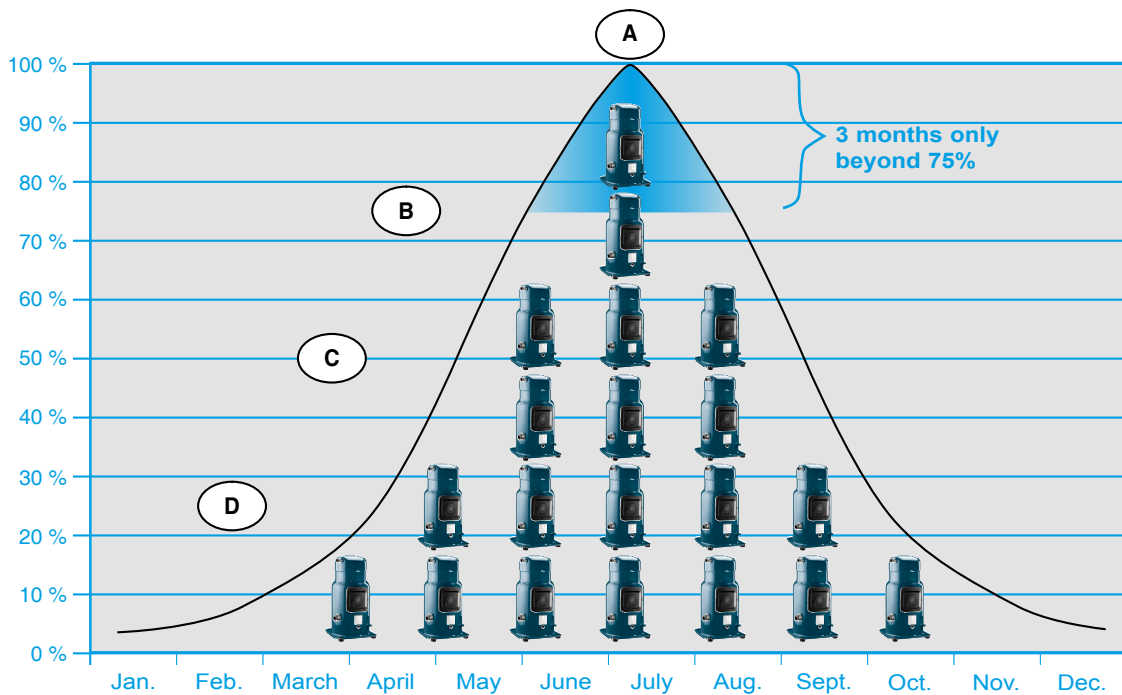
Refer to the selection tool to find out which options are not compatible.

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 European Seasonal Energy Efficiency Ratio (ESEER) measures the seasonal efficiency of water chillers by taking into account their efficiency under partial load using formulas created by the European certification body Eurovent.

■ Seasonal heat load variations



$$\text{ESEER} = A \times \text{EER}_{100\%} + B \times \text{EER}_{75\%} + C \times \text{EER}_{50\%} + D \times \text{EER}_{25\%}$$

A, B, C and D are weighting coefficients pertaining to a unit's running time based on its load. The ESEER design conditions for air-cooled water chillers are as follows:

Load (%)	Air temperature (°C)	Chilled water (°C)	Energy efficiency	Weighting coefficient
100	35	12 / 7	EER _{100%}	A = 0.03
75	30	- / 7 (*)	EER _{75%}	B = 0.33
50	25	- / 7 (*)	EER _{50%}	C = 0.41
25	20	- / 7 (*)	EER _{25%}	D = 0.23

(*) Water flow rate = Water flow rate at 100%

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 ESEER ratings.

As its compressors are connected in parallel on the refrigerating 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 performance at partial loads to be improved, along with its ESEER.

SEASONAL PERFORMANCES IN 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).

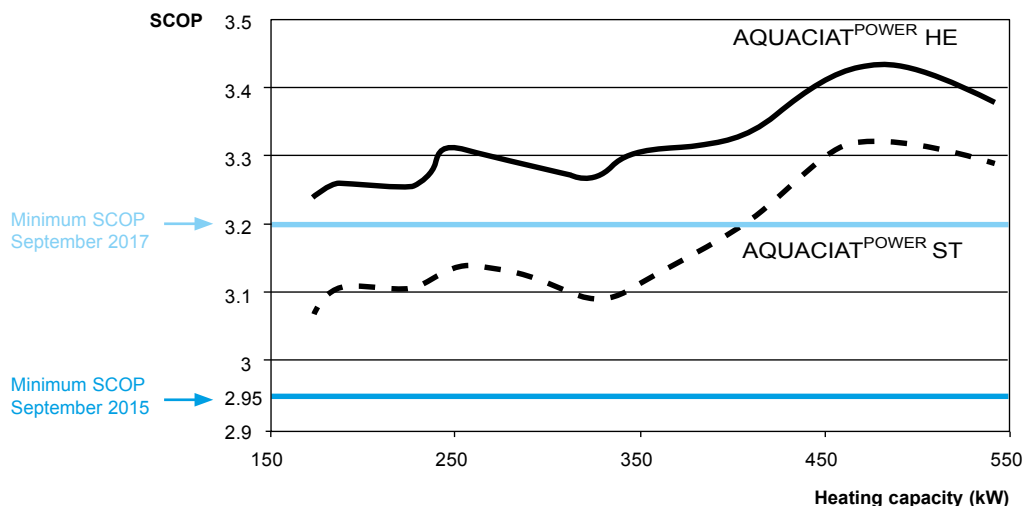
$$\eta_s (\%) = \frac{\text{SCOP}(\text{kW/kW}) \times 100}{2,5} - \sum^i \text{corrections}$$

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

$\eta_s = 115\%$, which is a minimum SCOP of 2.95 valid from September 2015.

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

The AQUACIAT^{POWER} ST series complies with the European Ecodesign 2015 directive. The AQUACIAT^{POWER} HE series already meets the more stringent 2017 directive.



LD HYDRAULIC MODULE



■ **The "ALL-IN-ONE" solution**

The PLUG & COOL solution offered by AQUACIAT^{POWER}

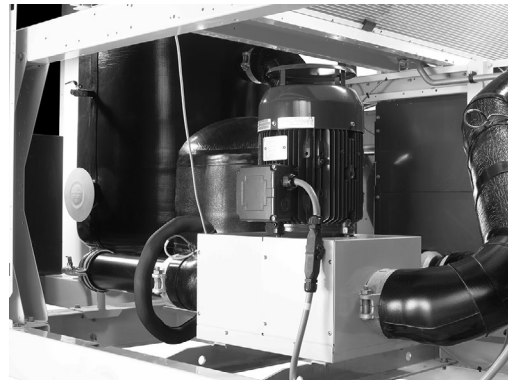
The hydraulic module contains all the water circuit components needed for the system to operate correctly:

- Buffer tank with 19mm insulation, 550-litre capacity (option).
- Expansion vessel (option):
 - . 50 litres for 602 to 1000 models
 - . 80 litres for 1150 to 2000 models
- Wide selection 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).

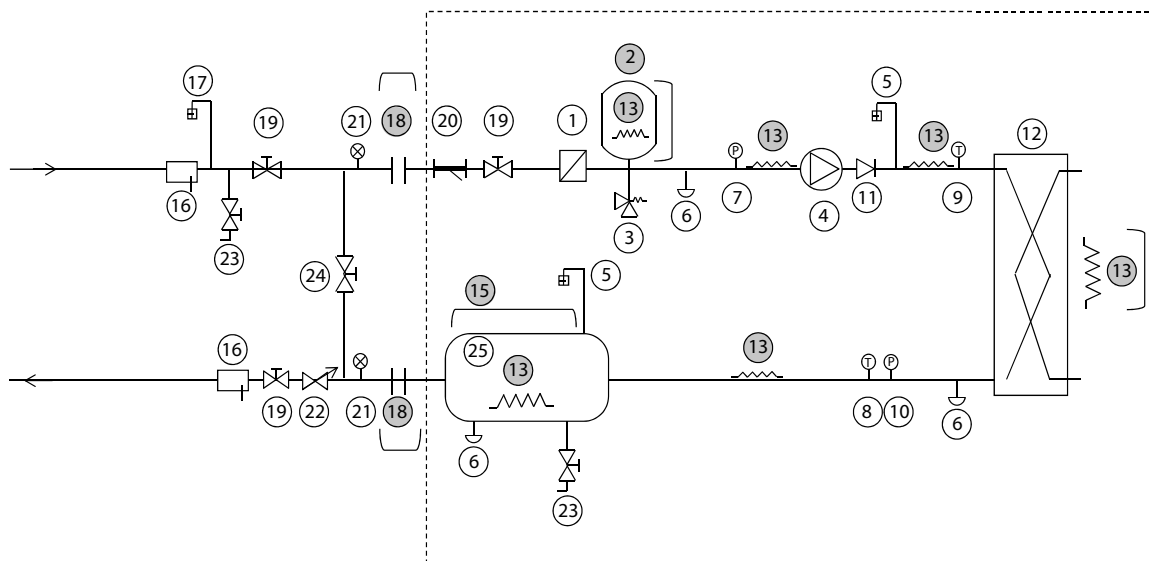
The components in the hydraulic system are carefully selected and factory assembled and tested to make the installation of the units simple and economical.

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

■ **Hydraulic module**



AQUACIAT^{POWER} hydraulic module diagram



Components of the unit and hydraulic module

- 1 Screen filter (particle size of 1.2 mm)
- 2 Expansion vessel
- 3 Relief valve
- 4 Circulating pump (single or dual)
- 5 Air bleed
- 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 Check valve (if dual pump)
- 12 Plate heat exchanger
- 13 Heater or heat trace cable for antifreeze protection
- 14 Water type heat exchanger flow rate sensor
- 15 Buffer tank module
Option

System components

- 16 Pocket
 - 17 Air bleed
 - 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)
 - 21 Pressure gauge
 - 22 Water flow control valve
Note: not required if hydraulic module with variable speed pump
 - 23 Charge valve
 - 24 Bypass valve for frost protection (if shut-off valves are closed (item 19) 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 empty the system before any work.

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.

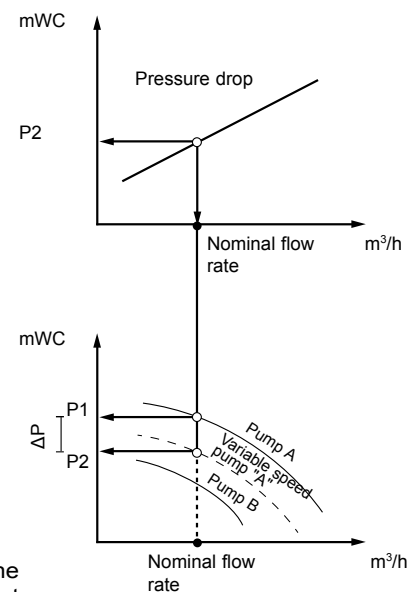
The assembly is factory-fitted and pre-set on the unit; it is therefore quick to install and reduces the cost of work, in particular because there is no water flow control valve on the unit's outlet.

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 partial load

There are three operating modes for partial 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 (delta P). 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



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 PBHE brazed plate heat exchangers

- 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	tCO ₂ e	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



AQUACIAT ^{POWER} ILD ST				602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Cooling															
Standard unit	C1	Nominal capacity	kW	154	168	201	225	232	264	297	322	372	424	458	510
Full load performances ^(*)	C1	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
Seasonal efficiency ^(**)		ESEER	kW/kW	3.79	3.82	3.84	3.90	3.84	3.91	3.95	3.96	4.00	4.06	4.05	4.02
Heating															
Standard unit	H1	Nominal capacity	kW	181	198	240	216	272	294	342	359	415	474	457	436
Full load performances ^(*)	H1	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
	H2	Nominal capacity	kW	174	191	232	245	262	282	329	345	399	456	498	537
Seasonal efficiency ^(**)	H2	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
	H1	SCOP	kW/kW	3.20	3.21	3.23	3.21	3.20	3.22	3.20	3.20	3.30	3.35	3.34	3.31
	H1	ηs heating	%	125	125	126	125	125	126	125	125	129	131	131	130
	H1	Prated	kW	121	134	159	169	159	194	211	231	268	305	339	356
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	2297			2297			2297					
Unit + Buffer tank module option			mm	3604			4798			5991					
Operating weight(3)															
Standard unit			kg	1454	1533	1662	1684	2109	2257	2382	2613	3094	3344	3356	3396
Unit + Low Noise option			kg	1537	1616	1770	1792	2217	2383	2508	2757	3256	3524	3536	3576
Unit + Low Noise + HP dual pump option			kg	1716	1794	1960	1982	2417	2630	2763	2998	3538	3806	3855	3894
Unit + Low Noise + HP dual pump + Buffer tank module option			kg	2675	2753	2919	2941	3376	3589	3722	3957	4497	4765	4814	4853
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	22.0	23.0	24.0	27.0	27.0	30.0	33.0	42.0	53.0	54.0	56.0
			teqCO ₂	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
			teqCO ₂	48.0	48.0	48.0	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	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 content			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 drain valve, pressure sensors															
Pump				Centrifugal pump, monocoil, 48.3 r/s, low or high pressure (as required), single or dual (as required)											
Expansion vessel volume (option)			l	50	50	50	50	80	80	80	80	80	80	80	80
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 or 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															

(*) In accordance with EN14511-3:2013.

(**) In accordance with EN14825:2013, average climate conditions.

C1 Conditions in cooling mode: Evaporator water inlet/outlet temperature 12°C/7°C, outdoor air temperature 35°C. Evaporator fouling factor 0m². kW

H1 Conditions in heating mode: Exchanger water inlet/outlet temperature 30°C/35°C, fouling factor 0 m²/kW, outdoor air temperature DB 7°C/WB 6°C.

H2 Conditions in heating mode: Exchanger water inlet/outlet temperature 40°C/45°C, fouling factor 0 m²/kW, outdoor air temperature DB 7°C/WB 6°C.

IPLV Calculated as per standard AHRI 550-590

(1)

In dB ref=10⁻¹² W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measurements according to ISO 9614-1 under nominal operating conditions EN14511 - cooling mode.

(2)

In dB ref 20μPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). For information, calculated from the sound power Lw(A). Values are guidelines only. Refer to the unit name plate.

(3)



Eurovent certified values

TECHNICAL CHARACTERISTICS



AQUACIAT ^{POWER} ILD HE				602	650	800	900	902	1000	1150	1200	1400	1600	1800	2000
Cooling															
Standard unit	C1	Nominal capacity	kW	154	168	201	225	232	264	297	322	372	424	458	510
Full load performances(*)	C1	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
Seasonal efficiency(*)		ESEER	kW/kW	3.98	4.03	4.04	4.07	4.08	4.08	4.15	4.13	4.22	4.28	4.26	4.20
Heating															
Standard unit	H1	Nominal capacity	kW	181	198	240	216	272	294	342	359	415	474	457	436
	H1	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
Full load performances(*)	H2	Nominal capacity	kW	174	191	232	245	262	282	329	345	399	456	498	537
	H2	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
Seasonal efficiency(**)	H1	SCOP	kW/kW	3.38	3.38	3.39	3.39	3.38	3.38	3.40	3.40	3.43	3.46	3.46	3.41
	H1	ηs heating	%	132	132	133	133	132	132	133	133	134	135	135	133
	H1	Prated	kW	121	134	159	169	159	194	211	231	268	305	339	356
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	2297			2297			2297					
Unit + Buffer tank module option			mm	3604			4798			5991					
Operating weight(3)															
Standard unit			kg	1490	1570	1698	1721	2146	2294	2419	2649	3131	3401	3413	3462
Unit + Low Noise / Xtra Low Noise option			kg	1573	1653	1806	1829	2254	2419	2545	2793	3293	3581	3593	3643
Unit + Low Noise / Xtra Low Noise + HP dual pump option			kg	1751	1831	1996	2018	2453	2667	2800	3035	3575	3863	3912	3960
Unit + Low Noise / Xtra Low Noise + HP dual pump + Buffer tank module option			kg	2710	2790	2955	2977	3412	3626	3759	3994	4534	4822	4871	4919
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
			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
			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	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															
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 content			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 drain valve, pressure sensors															
Pump				Centrifugal pump, monocell, 48.3 r/s, low or high pressure (as required), single or dual (as required)											
Expansion vessel volume (option)			l	50	50	50	50	80	80	80	80	80	80	80	80
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 or 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															

(*) In accordance with EN14511-3:2013.
 (**) In accordance with EN14825:2013, average climate conditions.
 C1 Conditions in cooling mode: Evaporator water inlet/outlet temperature 12°C/7°C, outdoor air temperature 35°C. Evaporator fouling factor 0m². kW
 H1 Conditions in heating mode: Exchanger water inlet/outlet temperature 30°C/35°C, fouling factor 0 m²/kW, outdoor air temperature DB 7°C/WB 6°C.
 H2 Conditions in heating mode: Exchanger water inlet/outlet temperature 40°C/45°C, fouling factor 0 m²/kW, outdoor air temperature DB 7°C/WB 6°C.
 IPLV Calculated as per standard AHRI 550-590

(1) In dB ref=10⁻¹² W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). Measurements according to ISO 9614-1 under nominal operating conditions EN14511 - cooling mode.
 (2) In dB ref 20μPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 with an associated uncertainty of +/-3dB(A). For information, calculated from the sound power Lw(A).
 (3) Values are guidelines only. Refer to the unit name plate.



Eurovent certified values

ELECTRICAL SPECIFICATIONS

■ Basic unit (excluding pump)

AQUACIAT ^{POWER} 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	124	133	161	180	201	221	242	261	282	322
Maximum unit power input(2)													
Circuit A&B	kW	80	88	99	107	129	145	161	177	194	210	226	258
Unit Cosine Phi 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	176	192	230	259	288	317	345	374	403	460
Maximum unit current draw (Un)(4)													
Circuit A&B - Standard unit	A	133	146	163	177	212	239	266	292	319	345	372	425
Circuit A&B - Unit + Power factor corrector option	A	100	110	125	133	163	181	204	222	244	262	285	326
Maximum start-up current, standard unit (Un)(5)													
Circuit A&B	A	307	356	374	352	423	450	476	503	529	556	583	636
Maximum start-up current, unit with soft starter (Un)(5)													
Circuit A&B	A	261	283	300	305	349	376	403	429	456	482	509	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 and fans, at the unit operating limits (saturated intake temperature 15°C, saturated condensing temperature 68.3°C) and nominal voltage of 400 V (data given on the unit name plate).
- (3) Maximum unit operating current at maximum unit power input and 360 V.
- (4) Maximum unit operating current at maximum unit power input and 400 V (values given on the unit name plate).
- (5) Maximum instantaneous starting current at operating limits (maximum operating current of the smallest compressor(s) + fan current + 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, power input 1.75 kW

AQUACIAT ^{POWER} 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	121	130	158	176	197	216	237	255	276	316
Maximum unit power input(2)													
Circuit A&B	kW	81	88	99	108	129	145	162	178	194	210	226	259
Unit Cosine Phi 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	173	189	227	255	284	312	340	369	397	454
Maximum unit current draw (Un)(4)													
Circuit A&B - Standard unit	A	131	142	160	174	209	235	262	287	314	340	366	419
Circuit A&B - Unit + Power factor correction option	A	98	108	123	131	161	178	201	219	241	259	281	321
Maximum start-up current, standard unit (Un)(5)													
Circuit A&B	A	305	353	371	349	420	446	472	498	525	550	577	629
Maximum start-up current, unit with soft starter (Un)(5)													
Circuit A&B	A	259	279	297	302	346	372	399	424	451	477	503	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 and fans, at the unit operating limits (saturated intake temperature 15°C, saturated condensing temperature 68.3°C) and nominal voltage of 400 V (data given on the unit name plate).
- (3) Maximum unit operating current at maximum unit power input and 360 V.
- (4) Maximum unit operating current at maximum unit power input and 400 V (values given on the unit name plate).
- (5) Maximum instantaneous starting current at operating limits (maximum operating current of the smallest compressor(s) + fan current + locked rotor current of the largest compressor).
Fan motor electrical data reported upstream of the variable speed 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 SPECIFICATIONS

■ Short circuit current withstand capability (TN system⁽¹⁾)

AQUACIAT ^{POWER} 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												
Conditional short circuit assigned 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



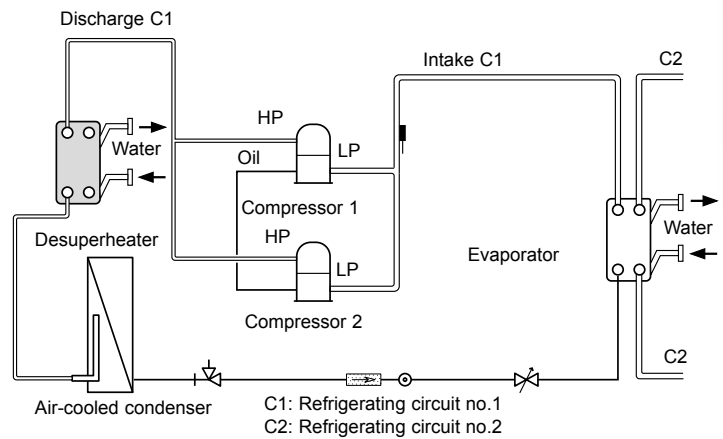
The AQUACIAT^{POWER} range may be equipped as an option with an energy recovery function using a desuperheater

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.

■ Refrigerating circuit 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 vessel and a valve. Special attention should be paid when selecting the expansion vessel 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
	teqCO ₂	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
	teqCO ₂	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	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	60.3
AQUACIAT^{POWER}ILD ST													
Operating weight ⁽¹⁾													
Unit + Partial heat recovery option	kg	1484	1553	1696	1719	2131	2289	2413	2648	3126	3380	3392	3433
Unit with Low Noise + Partial heat recovery option	kg	1567	1636	1804	1827	2239	2415	2539	2792	3288	3561	3573	3613
Unit + Low Noise + HP dual pump hydraulic module + Partial heat recovery option	kg	1707	1776	1956	1978	2400	2624	2757	2997	3533	3806	3855	3894
AQUACIAT^{POWER}ILD HE													
Operating weight ⁽¹⁾													
Unit + Partial heat recovery option	kg	1520	1589	1733	1755	2168	2326	2449	2685	3162	3438	3450	3499
Unit with Low Noise + Partial heat recovery option	kg	1603	1672	1841	1863	2276	2452	2575	2829	3324	3618	3630	3679
Unit + Low Noise + HP dual pump hydraulic module + Partial heat recovery option	kg	1742	1812	1992	2015	2437	2660	2793	3034	3570	3863	3912	3960

(1) The weight data is purely indicative. Refer to the unit name plate.

PARTIAL RECOVERY WITH DESUPERHEATER



■ Performance

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	114.0	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 drop, 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 drop, 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	78.0	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	2.0	2.4
Pressure drop, 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 drop, 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	2.0	2.3	2.4	2.5	2.8	3.0	3.2	3.2
Pressure drop, 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	1.0	1.2	1.2	1.4	1.5	1.6	1.9	2.1	2.2	2.4
Pressure drop, 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} HE version range can be equipped as an option with XTRAFAN operating pressure ventilation.

■ Functions

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 recirculation 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 ventilation speed on-site to what is «strictly necessary» to obtain the optimum air supply pressure, or the maximum acceptable noise level 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 noise level at the duct outlet and that radiated around the machine depend on the operating pressure.

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

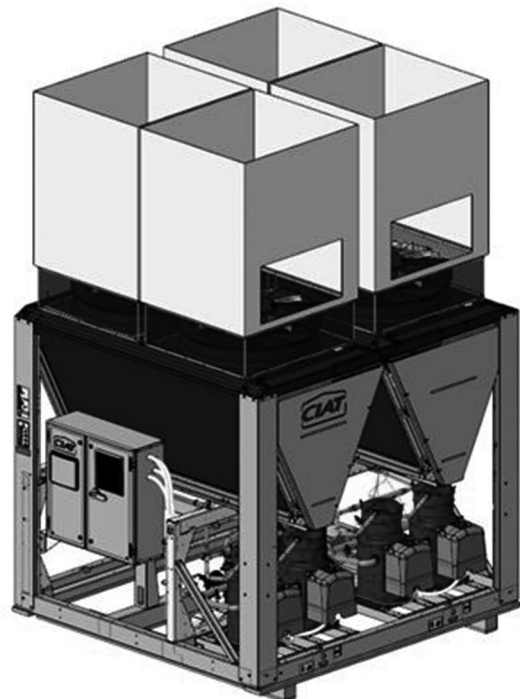
■ Precautions for installation

On-site installation of a reversible air-to-water packaged unit requires some safety measures to be taken, particularly if it is installed in a machine room. For example, the condensate draining must be specific to these units, particularly for when outdoor temperatures are very low.

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 supply air 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 also 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 two 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:

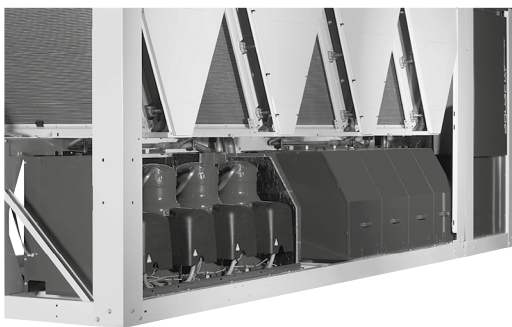
- New generation scroll compressors with a continuous scrolling motion to lessen vibrations
- Compressor structure separated from the unit by anti-vibration mounts
- Pipes separated from the unit structure
- Fans made from a synthetic material, with aerodynamic blades offering an optimised profile. Optimised air coil-fan pairing which is the result of many hours of thermal and acoustic studies in our Research and Innovation Centre. Each fan is equipped with an air current rectifier deflector which ensures a linear flow of air with no turbulence, whilst reducing recirculation and keeping the acoustic spectrum within a pleasant range.
- 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 casing lined with absorbent material to limit the sound level emitted by the machine.

■ Xtra Low Noise option

In this version available from the HE series, the compressors are housed in sound 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.

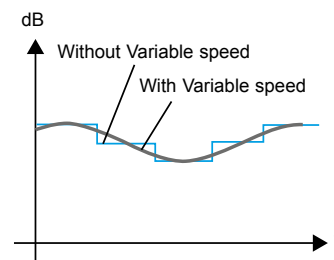
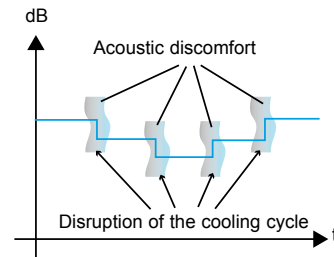


■ Night mode

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 refrigerating 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 three acoustic finish levels (Standard, Low Noise and Xtra 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 ± 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 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 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 versions, 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 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 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 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, 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 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	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.

SYSTEM WATER VOLUME - EVAPORATOR WATER FLOW RATE

The Connect Touch control 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 runtimes, 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	5.8 / 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.

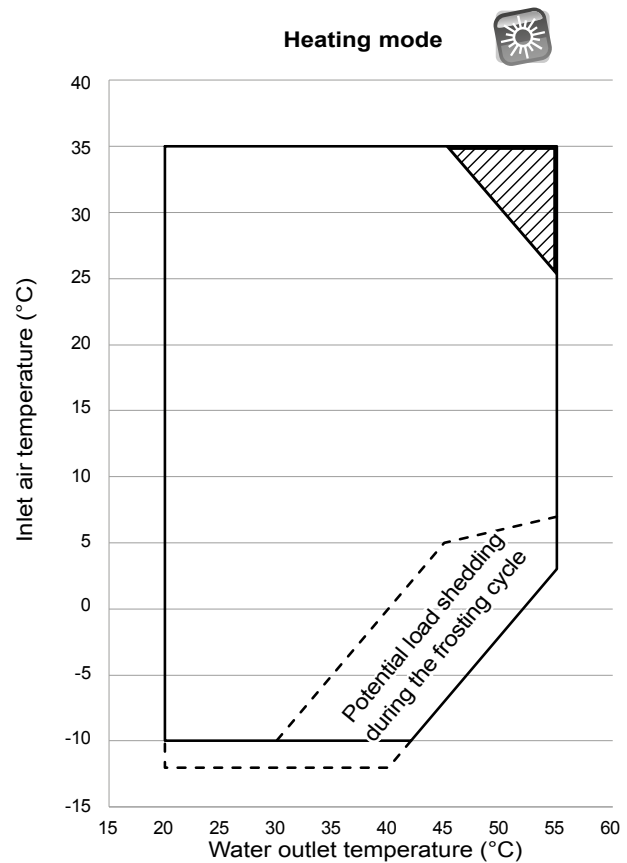
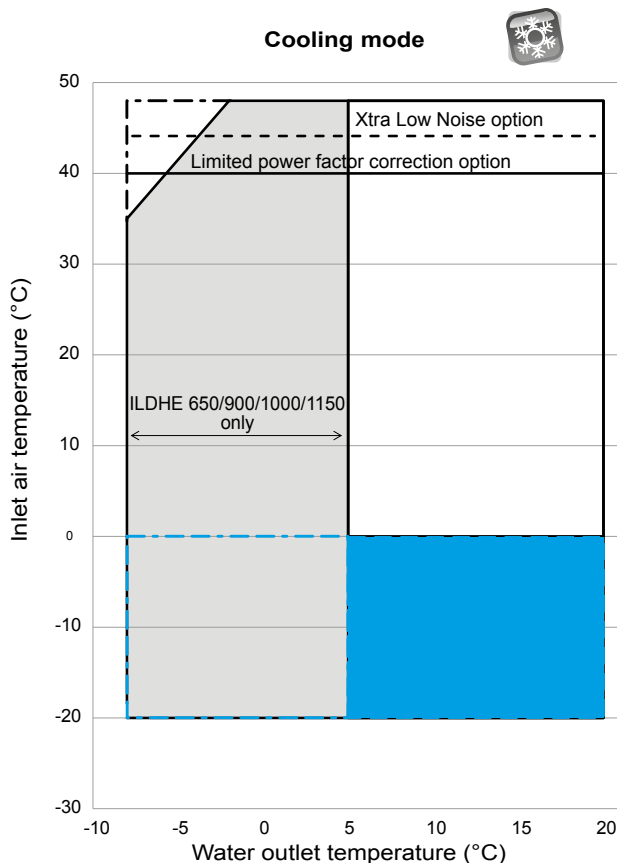
In the ST series, all-season operation down to -20°C is optional.

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 partial 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
- Partial charge for low-temperature brine solution option

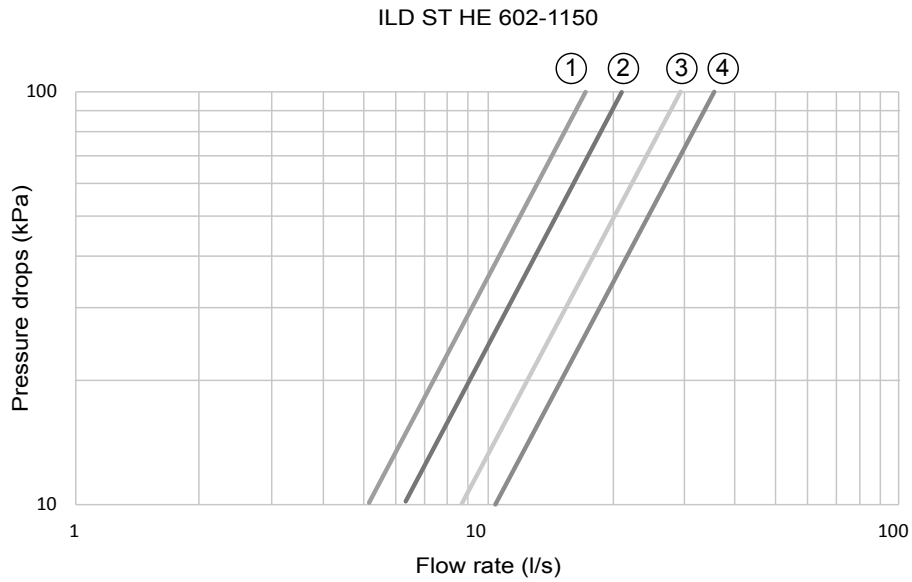
Power factor correction option available for an inlet air temperature up to +40°C

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

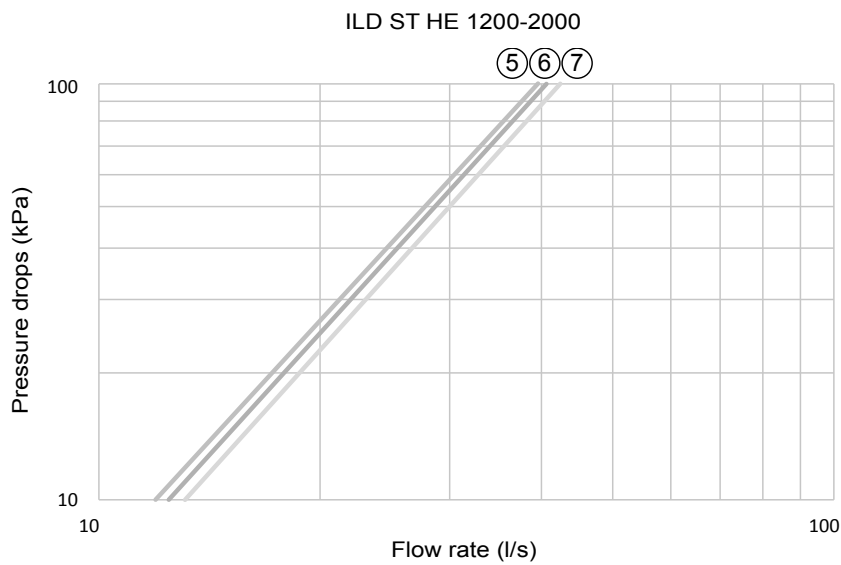
HYDRAULIC SPECIFICATIONS

■ Water pressure drop in the evaporator

Data applicable for pure water at 20°C.

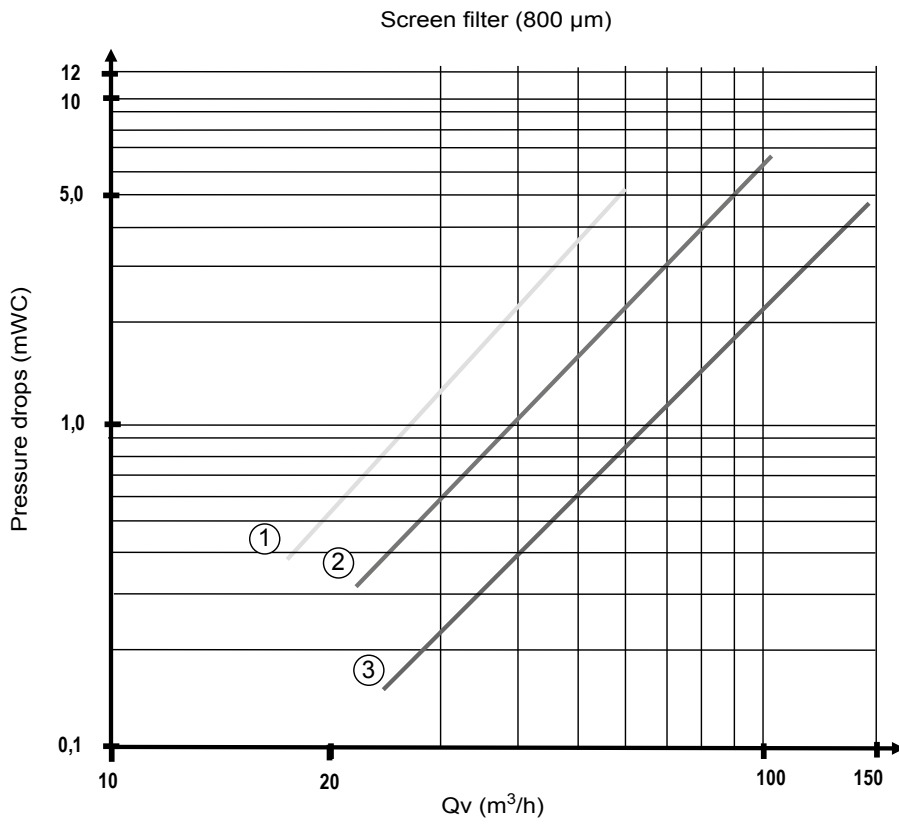


- ① ILD 602-650-800
- ② ILD 900
- ③ ILD 902-1000
- ④ ILD 1150



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

■ Water pressure drop in the filter



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

HYDRAULIC SPECIFICATIONS

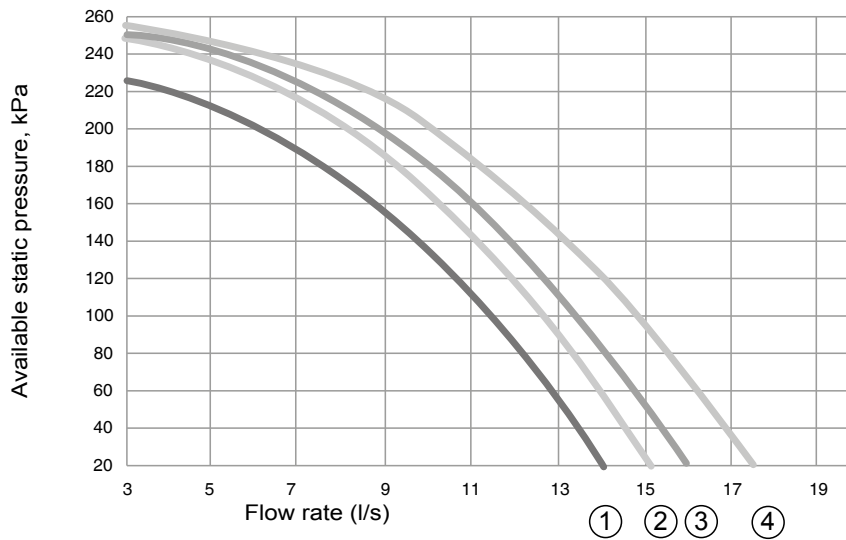
■ Available static pressure for the system

Data applicable for:

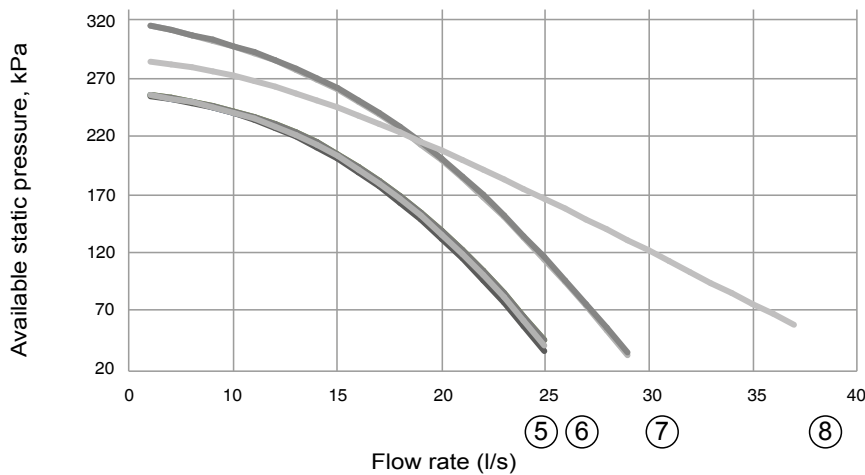
- Pure water at 20°C
- Refer to the section "Evaporator water flow rate" for the minimum and maximum water flow rate values
- If a glycol/water mix is used, the maximum water flow rate is reduced

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

Single pumps



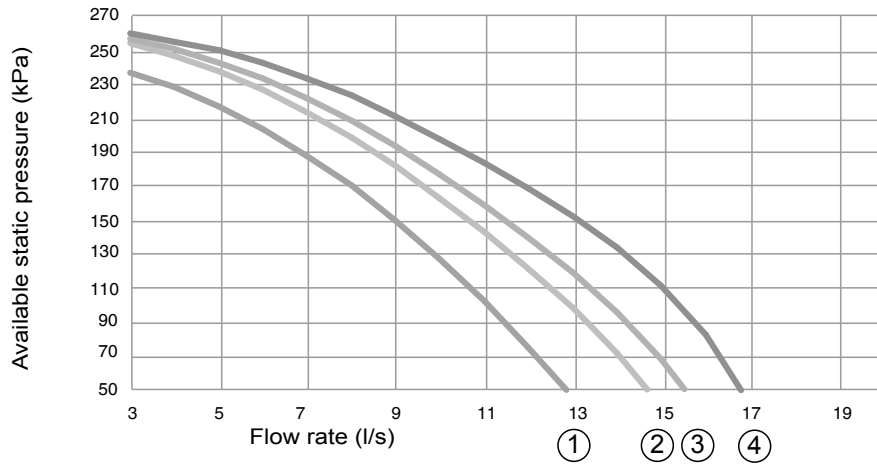
- ① ILD 602 - 650
- ② ILD 800
- ③ ILD 900
- ④ ILD 902



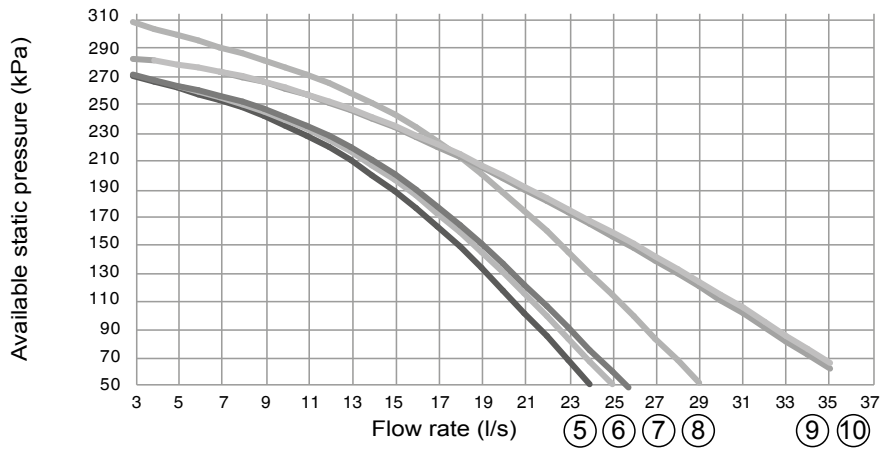
- ⑤ ILD 1000-1150
- ⑥ ILD 1200-1400
- ⑦ ILD 1600-1800
- ⑧ ILD 2000

■ **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

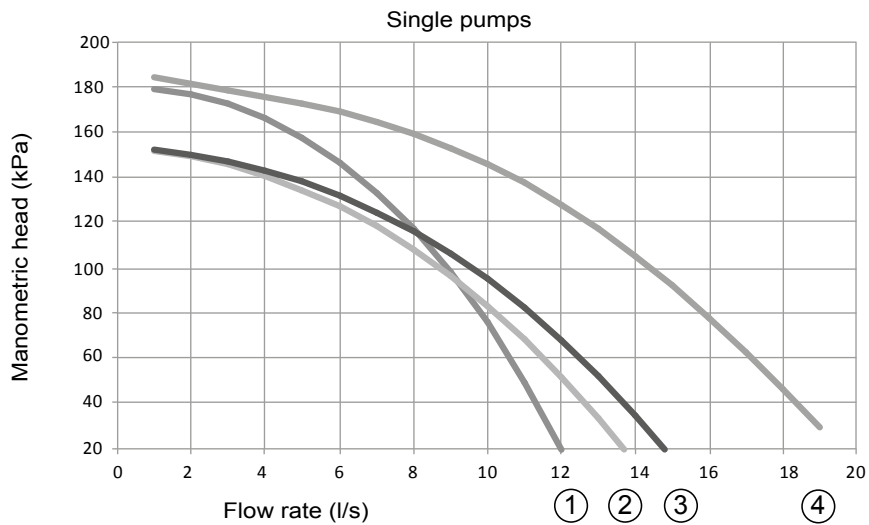
HYDRAULIC SPECIFICATIONS

■ Available static pressure for the system

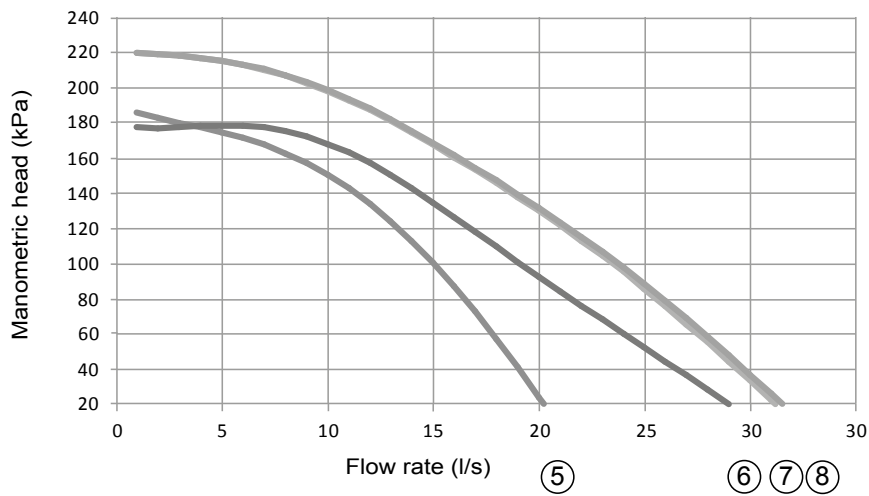
Data applicable for:

- 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)



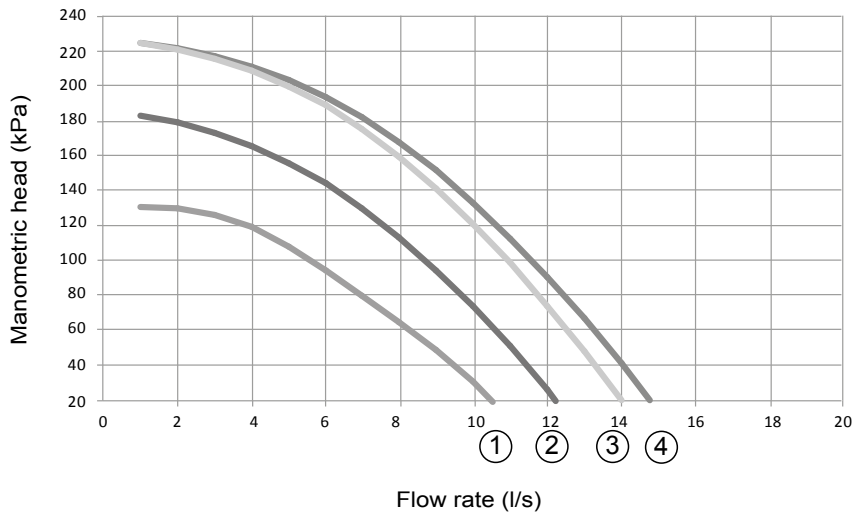
- ① ILD 602-650
- ② ILD 800
- ③ ILD 900
- ④ ILD 902-1000



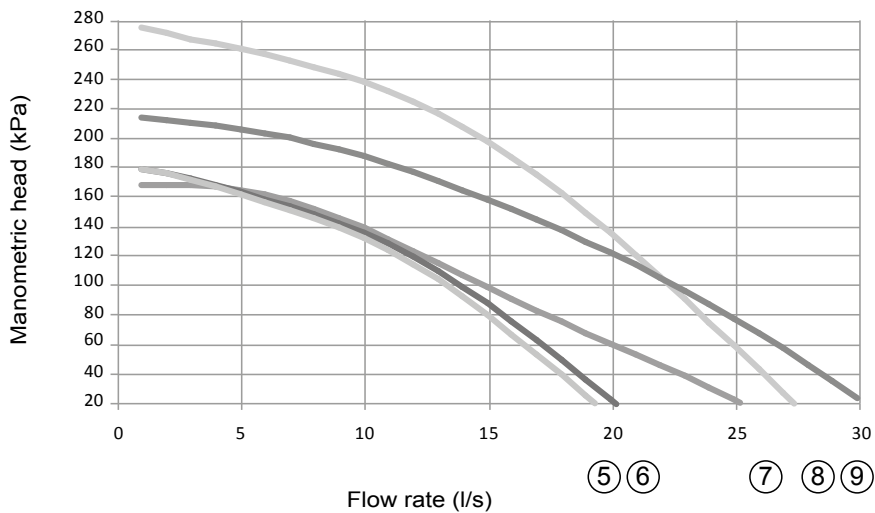
- ⑤ ILD 1150
- ⑥ ILD 1200-1400-1600
- ⑦ ILD 1800
- ⑧ ILD 2000

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

Dual pumps



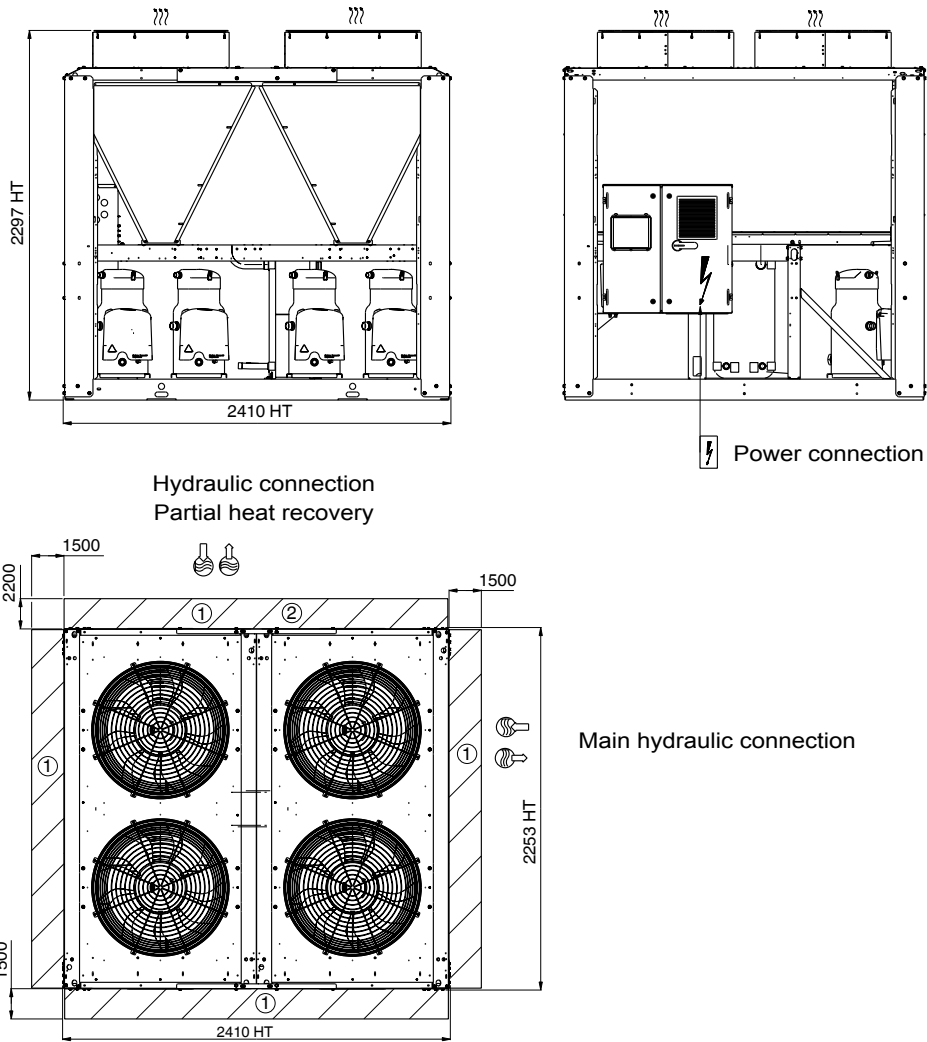
- ① ILD 602
- ② ILD 650
- ③ ILD 800
- ④ ILD 900



- 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 Clearance recommended for coil removal
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Electrical cabinet

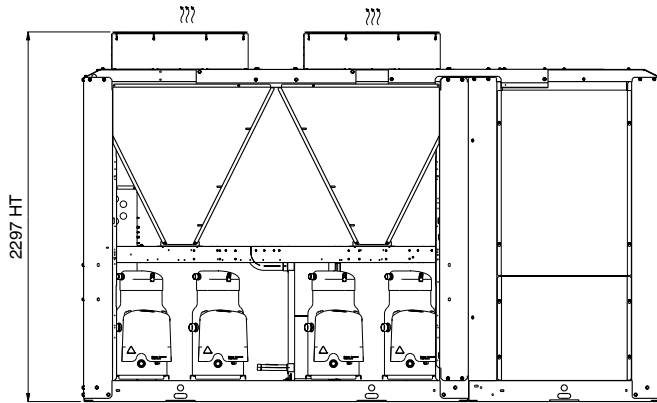
Notes:
Non-contractual drawings.

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

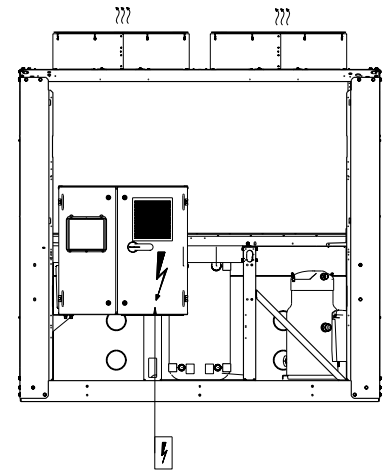
Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

DIMENSIONS

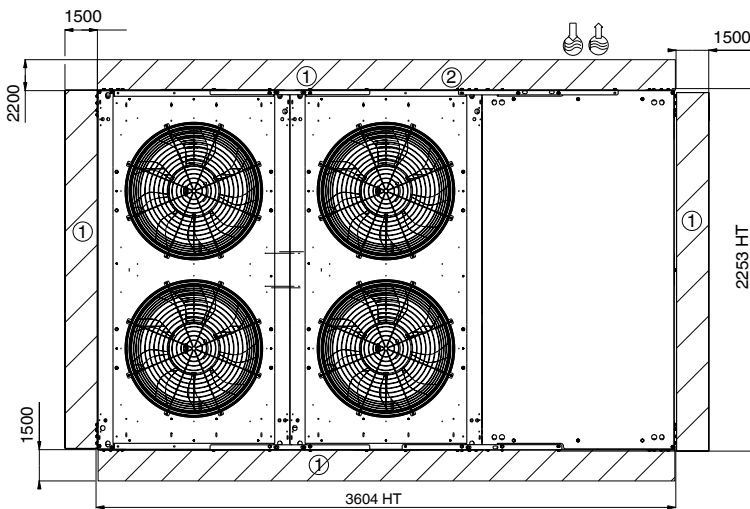
■ AQUACIAT^{POWER}ILD ST-HE 602 to 900 With buffer tank



Main hydraulic connection



Power connection



Key
All dimensions in mm

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

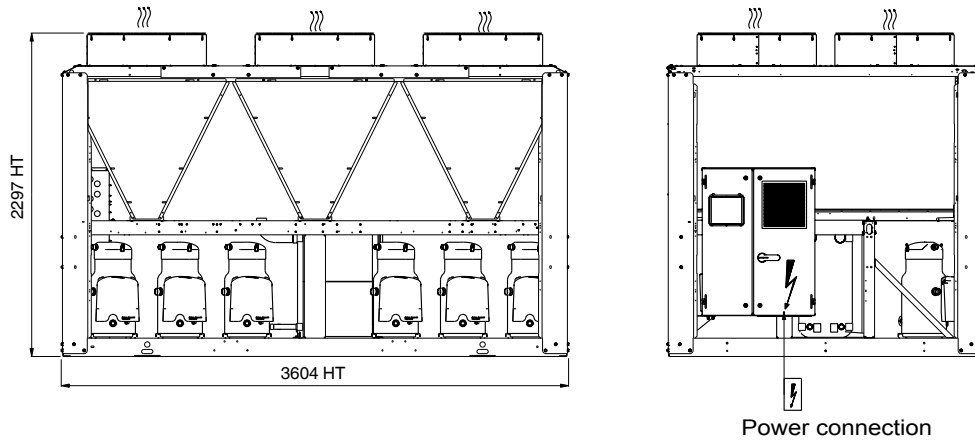
Notes:
Non-contractual drawings.

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

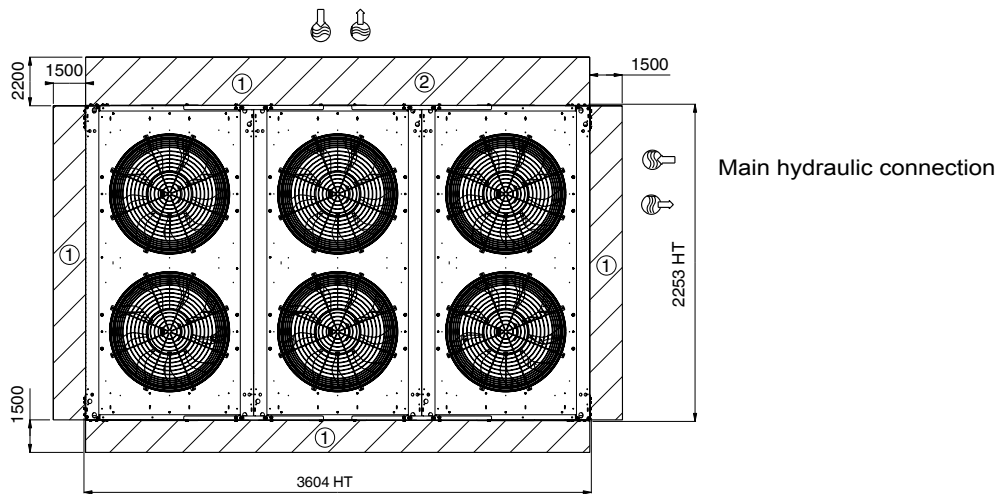
Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

DIMENSIONS

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



Hydraulic connection
Partial heat recovery



Key
All dimensions in mm

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

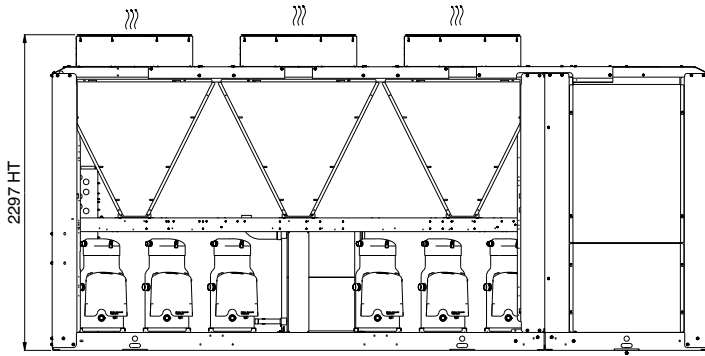
Notes:
Non-contractual drawings.

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

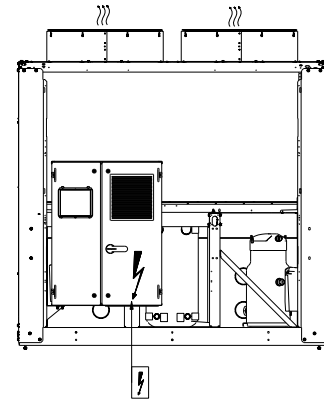
Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.

DIMENSIONS

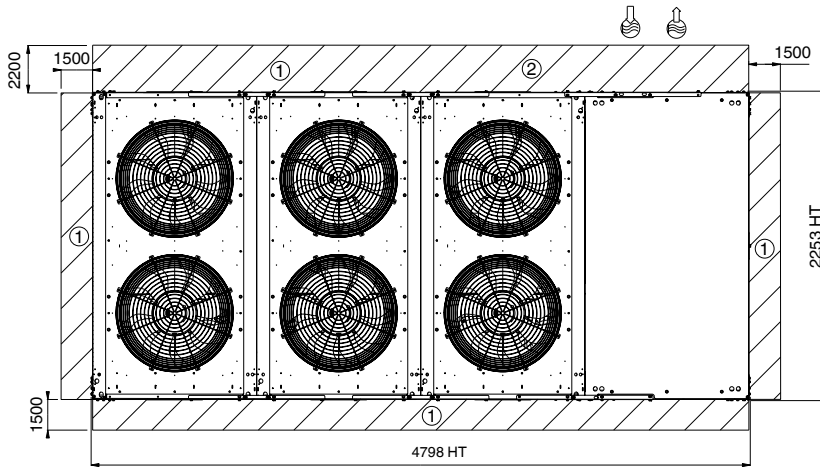
■ AQUACIAT^{POWER}ILD ST-HE 902 to 1200 With buffer tank



Main hydraulic connection



Power connection



Key
All dimensions in mm

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

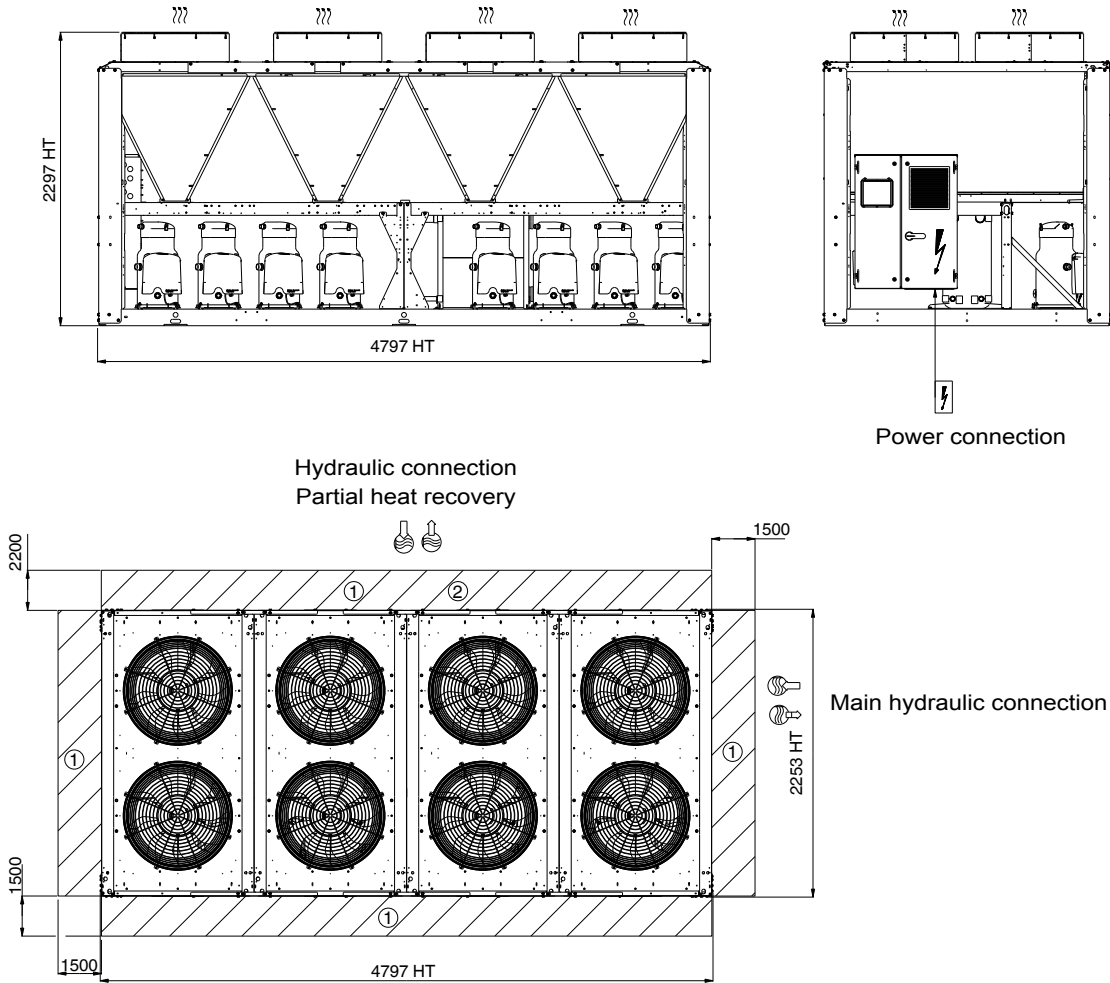
Notes:
Non-contractual drawings.

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 Without buffer tank



Key

All dimensions in mm

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

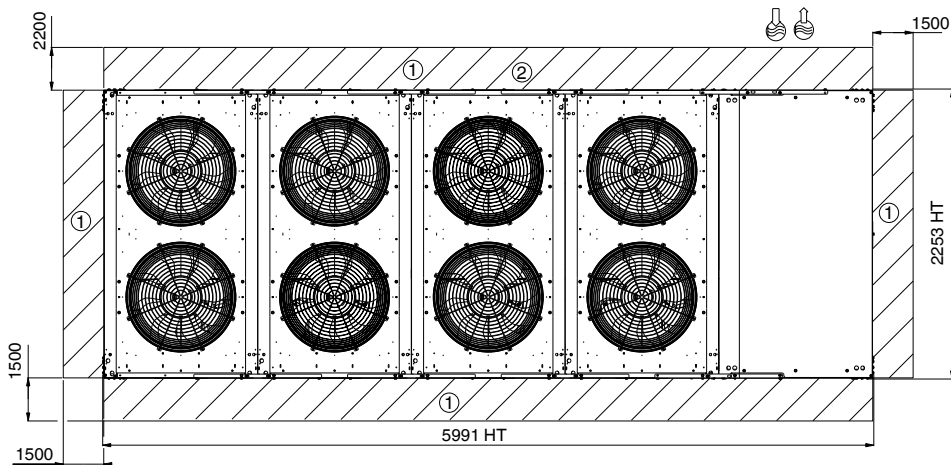
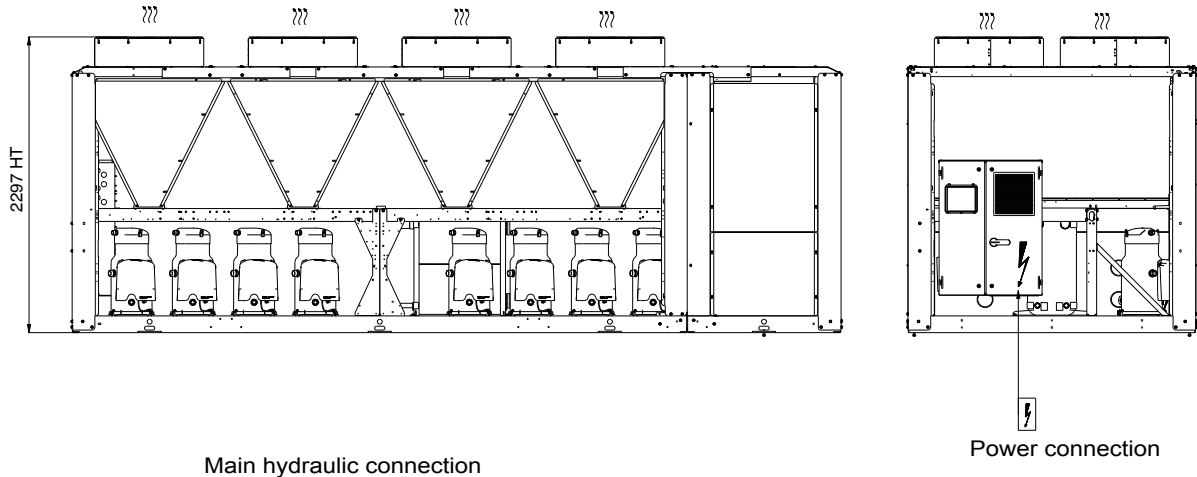
Notes:
Non-contractual drawings.

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



Key
All dimensions in mm

- ① Clearance required for maintenance and air flow
- ② Clearance recommended for coil removal
- 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 them 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 to allow sufficient access to the panels and fitted with heat insulation.

Pipe mountings and clamps must be separate to avoid vibrations and pressure 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

The following are a few examples of accessories essential to any hydraulic circuit, which must also be installed:

- water expansion vessel
- 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 vessel upstream of the pump.
- Do not place any valves on the expansion vessel.
- 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 pressure (NPSH), particularly if the water circuits are "open".
- Test the water quality in accordance with the relevant technical specifications.
- 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.



■ System start-up

CIAT or a CIAT-approved firm must perform system start-up on the units.

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

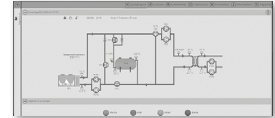
- User-friendly 5 inch touch screen.
- Information displayed in a choice of languages.
- Temperature and pressure readings.
- Operating and fault status diagnostics.
- Master/slave control of two machines in parallel.
- Fault memory management.
- Pump management.
- Time schedule.
- IP web server
- Programmable 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



Via potential-free (dry) contact

Customer CMS COMMUNICATION

Via BUS communication

CIAT SYSTEM 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
 - Time schedule override
- 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)

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.



This document is non-contractual. As part of its policy of continual product improvement, CIAT reserves the right to make any technical modification it feels appropriate without prior notification.

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