



→ Water chillers  
Heat pump



**Compact and silent**

*High energy efficiency*

*Scroll compressors*

*High-efficiency brazed-plate heat exchangers*

*Self-adjusting electronic control*



Cooling capacity: 25 to 190 kW

Heating capacity: 29 to 230 kW



Cooling



Heating



Hydraulic  
module



**USE**

The latest generation of **DYNACIAT** water chillers and heat pumps are the perfect solution for all cooling and heating applications in the Offices, Healthcare, Industry, Administration, Shopping Centres and Collective Housing markets.

These units are designed to be installed in machine rooms that are protected against freezing temperatures and inclement weather.

When producing chilled water, these units can be connected to a drycooler or a water cooling tower. This range is also available in a "split system" version without a condenser (LGN series).

Connected to an underfloor heating-cooling system, comfort units or an air handling unit, DYNACIAT can heat or cool buildings by reversing the cycle on hydraulic circuits using a set of valves (hydraulic valves not supplied).

For quick and easy installation, a range of hydronic modules is available as an option on the evaporator side (for chilled water production) and the condenser side (for hot water production).

DYNACIAT is optimised to use ozone-friendly HFC R410A refrigerant.

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

**RANGE**

**DYNACIAT LG series**

Cooling or heating version.

**DYNACIAT LGN series**

Split system cooling only version without condenser.



## DESCRIPTION

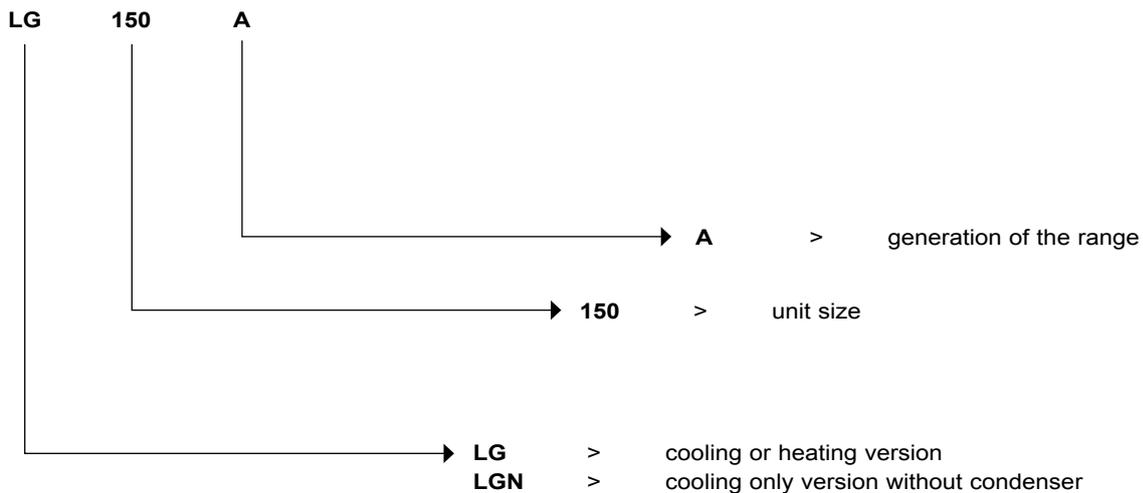
DYNACIAT units are packaged machines supplied as standard with the following components:

- Hermetic SCROLL compressors
- Chilled-water evaporator with brazed plates
- Hot water condenser, with brazed plates
- 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 indoor installation

The entire DYNACIAT range complies with the following EC directives and standards:

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

## DESCRIPTION



## CONFIGURATION

|                  |                    |
|------------------|--------------------|
| LG-LGN           | Standard           |
| LG-LGN LN option | Standard Low Noise |

## DESCRIPTION OF THE MAIN COMPONENTS

### ■ Compressors

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

### ■ Evaporator

- Brazed-plate exchanger
- Plate patterns optimised for high efficiency
- 19 mm armafex thermal insulation

### ■ Condenser

- Brazed-plate exchanger
- Plate patterns optimised for high-efficiency
- 19 mm armafex thermal insulation (optional)

### ■ Refrigerating accessories

- Dehumidifier filters
- Hygroscopic sight glasses
- Electronic expansion valves
- Service valves on the liquid line

### ■ Regulation and safety instruments

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

### ■ Electrical cabinet

- Electrical cabinet with IP 23 protection rating
- A connection point without neutral
- Main safety switch with handle on front
- Control circuit transformer
- 24V control circuit
- Compressor motor circuit breaker
- Compressor motor contactors
- Connect Touch microprocessor-controlled electronic control module
- Wire numbering
- Marking of the main electrical components

### ■ Casing

Frame made from RAL7035 light grey & RAL 7024 graphite grey painted panels.

### ■ Connect Touch control module

- User interface with 4.3-inch touch screen
- Intuitive, user-friendly navigation using icons
- Clear text display of information available in 6 languages (F-GB-D-E-I-NL)



The electronic control module performs the following main functions:

- Regulation of the water temperature (at the return or at the outlet)
- Regulation of the water temperature based on the outdoor temperature (water law)
- Regulation for low-temperature energy storage
- Second setpoint management
- Complete management of compressors with start-up sequence, timer and runtime balancing
- Self-regulating and proactive functions with adjustment of the control based on parameter drift
- In-series staged power control system on the compressors according to the thermal requirements
- Management of compressor short-cycle protection
- Phase reversal protection
- 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
- 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
- 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.

■ **Remote management**

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

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

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

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

- Automatic operation control: when this contact is open, the machine stops
- Heating/cooling operating 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.
- Switch control for the customer pump, external to the machine (on/off).

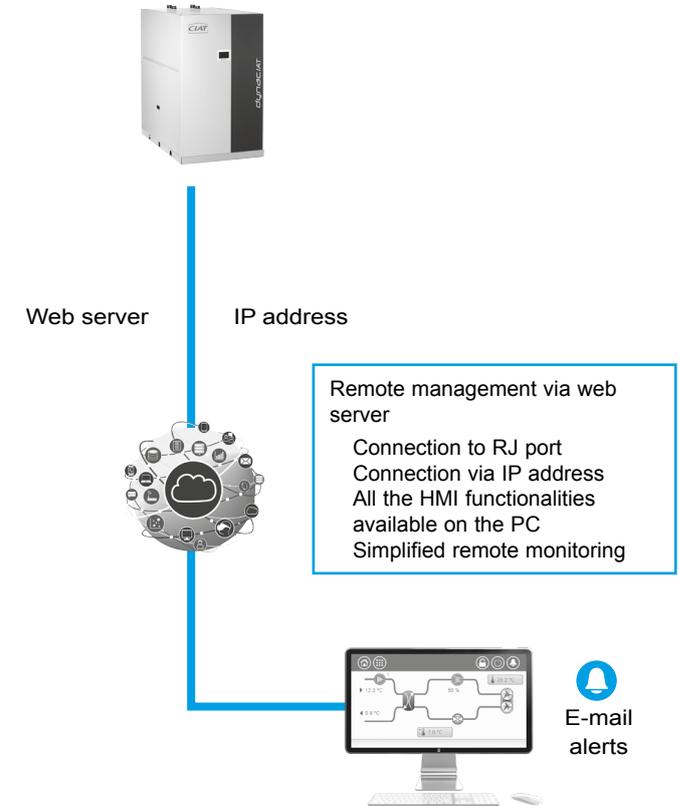
Contacts available as an option:

- Setpoint adjustable via 4-20 mA signal: this input is used to adjust the setpoint in COOLING mode.

■ **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



## → Water chillers Heat pump

### ■ 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

#### Features

CIATM2M will send data in real time to the supervision website, [www.ciatm2m.com](http://www.ciatm2m.com).

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

Any event can be configured to trigger a mail alert.

Parameters monitored:

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

Monthly and annual reports are available to analyse:

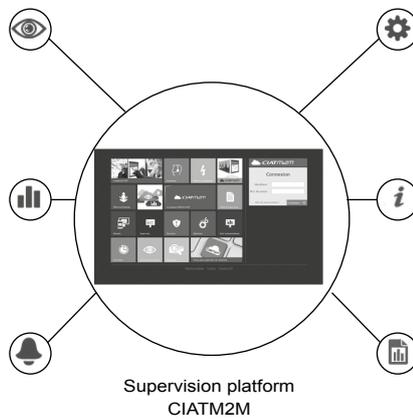
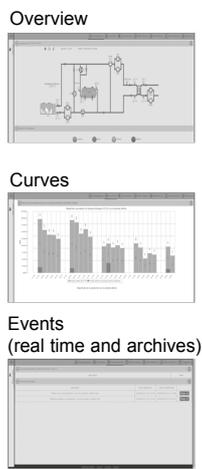
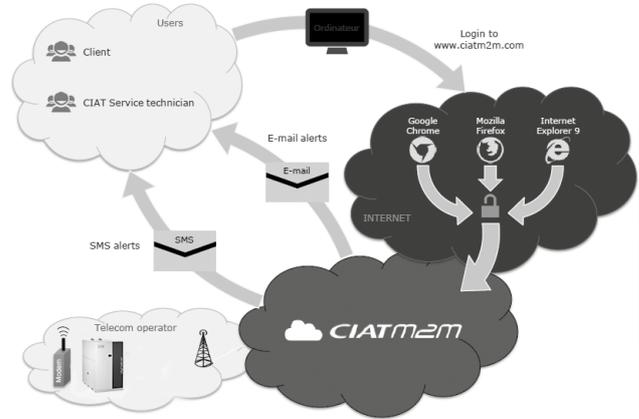
- The performance and operation of the machine  
Example: operating curves and time, number of compressor start-ups, events, preventive maintenance actions to be performed, etc.

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

#### Equipment

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

- 1 transportable cabinet
- 1 wall-mounted antenna



## AVAILABLE OPTIONS

| Options                                   | Description   | Advantages   | LG               |
|---|---|--|------------------|
| Low-temperature brine solution            | Low temperature glycol solution production down to -12°C with ethylene glycol   | Covers specific applications such as ice storage and industrial processes  | ●                |
| Soft Starter                              | Electronic starter on each compressor   | Reduced start-up current   | ●                |
| Master/slave operation                    | Unit equipped with supplementary water outlet temperature sensor kit (to be field installed) allowing master/slave operation of two units connected in parallel   | Optimised operation of two units connected in parallel operation with operating time equalisation  | ●                |
| 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  | Sizes 360 to 600 |
| Cond. single pump power/control circuit   | Unit equipped with an electrical power and control circuit for one pump condenser side  | Quick and easy installation: the control of fixed speed pumps is embedded in the unit control  | Sizes 360 to 600 |
| Condenser insulation                      | Thermal condenser insulation  | Minimizes thermal dispersions condenser side (key option for heat pump or heat recovery applications)  | ●                |
| HP single-pump hydraulic module           | Single high-pressure water pump, water filter, electronic water flow control, pressure transducers. For more details, refer to the dedicated chapter (expansion tank not included). Option with built-in safety hydraulic components available.)                              | Easy and fast installation (plug & play)   | Sizes 360 to 600 |
| LP evap. single-pump                      | Evaporator hydraulic module equipped with low pressure fixed-speed pump, drain valve, air vent and pressure sensors. For more details, refer to the dedicated chapter (expansion tank not included). Option with built-in safety hydraulic components available)              | Easy and fast installation (plug & play)   | ●                |
| HP evap. variable-speed single-pump       | Evaporator hydraulic module equipped with high-pressure variable-speed pump, drain valve, air vent and pressure sensors. For more details, refer to the dedicated chapter (expansion tank not included). Option with built-in safety hydraulic components available)          | Easy and fast installation (plug & play), significant pumping energy cost savings (more than two-thirds), tighter water flow control, improved sytem reliability | ●                |
| HP VSD dual-pump hydraulic mod.           | Dual high-pressure water pump with variable speed drive (VSD), pressure transducers. Multiple possibilities of water flow control. For more details, refer to the dedicated chapter (expansion tank not included; option with built-in hydraulic safety components available) | Easy and fast installation (plug & play), significant pumping energy cost savings (more than two-thirds), tighter water flow control, improved sytem reliability | Sizes 360 to 600 |
| LP VSD single-pump                        | Evaporator hydraulic module equipped with low -pressure variable-speed pump, drain valve, air vent and pressure sensors. For more details, refer to the dedicated chapter (expansion tank not included). Option with built-in safety hydraulic components available.)         | Easy and fast installation (plug & play), significant pumping energy cost savings (more than two-thirds), tighter water flow control, improved sytem reliability | Sizes 360 to 600 |
| Lon gateway                               | Bi-directional communication board complying with Lon Talk protocol   | Connects the unit by communication bus to a building management system   | ●                |
| Bacnet over IP                            | Bi-directional high-speed communication using BACnet protocol over Ethernet network (IP)  | Easy and high-speed connection by Ethernet line to a building management system. Allows access to multiple unit parameters                                       | ●                |
| Specific dry cooler control               | Control box for communication with the drycooler via a bus. For OPERA drycooler need to select the cabinet with option control cabinet manage by the chiller ConnectTouch control   | Permits the use of an energy-efficient plug-and-play system  | ●                |
| External boiler management                | Control board factory-installed on the unit to control a boiler   | Extended remote control capabilities to a boiler on/off command. Permits easy control of a basic heating system  | ●                |
| Electric heaters management               | Control board factory-installed on the unit with additional inputs/outputs in order to manage up to 4 external heating stages (electric heaters, etc.)  | Extended remote control capabilities to up to 4 electric heaters. Permits easy control of a basic heating system   | ●                |
| Compliance with Russian regulations       | EAC certification   | Compliance with Russian regulations  | ●                |
| Insulation of the evap. in/out ref. lines | Thermal insulation of the evaporator entering/leaving refrigerant lines with flexible, UV resistant insulation  | Prevents condensation on the evaporator entering/leaving refrigerant lines   | ●                |
| Low noise level                           | Compressor sound enclosure  | Reduced sound emissions  | ●                |

● ALL MODELS

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



## → Water chillers Heat pump

| Options                                   | Description   | Advantages   | LG                       |
|---|---|--|--------------------------|
| Evaporator screw connection sleeves (kit) | Evaporator inlet/outlet screw connection sleeves  | Allows unit connection to a screw connector  | ●                        |
| Condenser screw connection sleeves kit    | Condenser inlet/outlet screw connection sleeves   | Allows unit connection to a screw connector  | ●                        |
| HP single-pump, condenser side            | Condenser hydraulic module equipped with high pressure fixed-speed pump, drain valve, air vent and pressure sensors. Built-in safety hydraulic components available in option.                                  | Easy and fast installation (plug & play)   | Sizes 360 to 600         |
| LP single-pump, cond. side                | Condenser hydraulic module equipped with low pressure variable-speed pump, drain valve, air vent and pressure sensors. Built-in safety hydraulic components available in option.                                | Easy and fast installation (plug & play)   | ●                        |
| HP cond. variable-speed single-pump       | Condenser hydraulic module equipped with high-pressure variable-speed pump, drain valve, air vent and pressure sensors. (expansion tank not included). Built-in safety hydraulic components available in option | Easy and fast installation (plug & play), reduced power consumption of the water circulation pump  | ●                        |
| HP cond. variable-speed dual-pump         | Condenser hydraulic module equipped with dual high-pressure variable-speed pump, drain valve, air vent and pressure sensors. (expansion tank not included) Optional hydraulic safety components available       | Easy and fast installation (plug & play), reduced power consumption of the water circulation pump  | Sizes 360 to 600         |
| LP cond. variable-speed single-pump       | Condenser hydraulic module equipped with low-pressure variable-speed pump, drain valve, air vent and pressure sensors. (expansion tank not included) Optional hydraulic safety components available             | Easy and fast installation (plug & play), reduced power consumption of the water circulation pump  | Sizes 360 to 600         |
| Safety hydraulic components, evap. side   | Screen filter, expansion tank and relief valve integrated in the evaporator hydraulic module  | Easy and fast installation (plug & play), operating safety   | ●                        |
| Safety hydraulic components, cond. side   | Screen filter, expansion tank and relief valve integrated in the condenser hydraulic module   | Easy and fast installation (plug & play), operating safety   | ●                        |
| 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.                               | ●                        |
| Anti-vibration mounts (kit)               | Elastomer antivibratils mounts to be place under the unit (Material classified B2 fire class according to DIN 4102 ).   | Isolate unit from the building, avoid transmission of vibration and associate noise to the buiding. Must be used in conjunction with a flexible connection on the water side | ●                        |
| Exchangers flexibles connection (kit)     | Flexible connections on the exchanger water side  | Easy installation. Limit transmission of vibrations on the water network   | ●                        |
| Exchangers water filter (kit)             | Water filter  | Eliminate dust in the water network  | ●<br>Without pump option |
| Condenser water filter (kit)              | Water filter  | Eliminate dust in the water network  | ●<br>Without pump option |
| Set point adjustment by 4-20mA signal     | Connections to allow a 4-20 mA signal input   | Simplified energy management, enabling the setpoint to be set by a 4-20 mA external signal   | ●                        |
| External temperature sensor               | External temperature sensor control for using weather compensation  | Allow to adjust set point using weather compensation and define autorisation operation mode to external temperature  | ●                        |
| Free Cooling dry cooler management        | Control & connections to a Free Cooling Drycooler Opera or Vextra fitted with option FC control box   | Easy system management, Extended control capabilities to a dryccoler used in Free Cooling mode   | ●                        |
| Desuperheater flexibles connection (kit)  | Flexibles connections on the desuperheaterr water side  | Easy installation. Limit transmission of vibrations on the water network   | Sizes 360 to 600         |

● ALL MODELS

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

## SEASONAL PERFORMANCE, COOLING MODE

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Most central air conditioning systems installed in the tertiary sector in Europe use water chillers to provide refrigeration.

Analyses of installed systems show that the heat load varies from season to season and that a water chiller operates at reduced capacity for the majority of the time.

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

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

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

As its compressors are connected in parallel on the same refrigerating circuit, the DYNACIAT 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 **(Seasonal Energy Performance Ratio) (SEPR)** measures the seasonal energy efficiency of liquid chillers for process applications by calculating the ratio between the annual process cooling demand and the chiller's annual energy demand. It takes into account the energy efficiency at each outdoor temperature for the average European climate weighted by the number of hours observed for each of these temperatures.

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

## SEASONAL PERFORMANCE, HEATING MODE

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

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

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

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

The purpose of the SCOP is to characterise the seasonal efficiency of the heat pump by taking into account the full-load and part-load performances established for several outdoor temperature values. 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

The DYNACIAT complies with the European Ecodesign 2017 directive, offering SCOP values greater than 3.33 across the entire range.

### ■ 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  $\eta_s$  (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  $\eta_s$  (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 ( $i = 8$  for water-to-water heat pumps).

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

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

**$\eta_s = 125\%$ , which is a minimum SCOP of 3.33 valid from September 2017.**

**HYDRAULIC MODULE**



■ **The "ALL-IN-ONE" solution**

**The PLUG & COOL solution offered by DYNACIAT**

The entire DYNACIAT LG range can be equipped with a hydraulic module on both the evaporator and condenser side, with all the components required to ensure the smooth running of the installation:

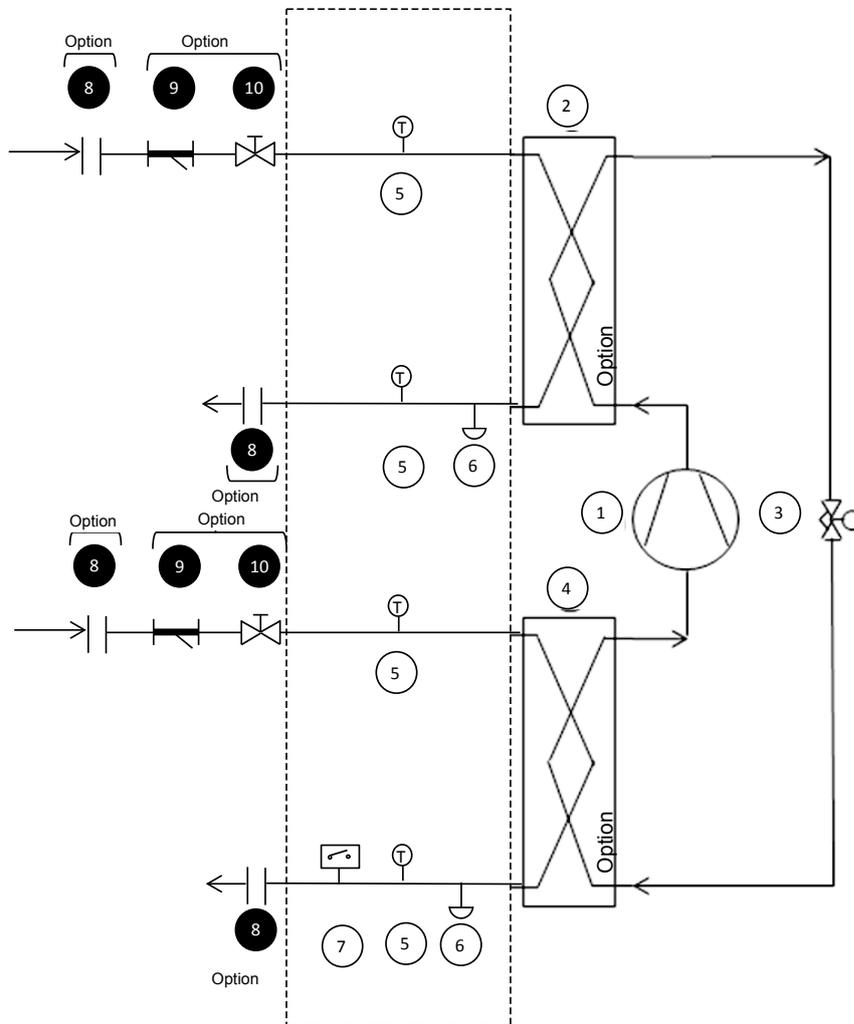
- Expansion vessel (option):
  - 8 litres, 12 litres, 25 litres or 35 litres, depending on the model
- Wide choice of pumps:
  - High or low pressure single pumps.
  - Fixed-speed or variable-speed pumps.
- Water temperature and pressure sensors.

- Water filter
- Relief valve (option)
- Drain circuit
- Air bleed valve

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.

■ **Diagram without hydraulic module**



**Unit and hydraulic module elements**

- 1 Compressor
- 2 Condenser
- 3 Expansion valve
- 4 Evaporator
- 5 Temperature sensor inlet/outlet
- 6 Water drain valve
- 7 Flow rate controller
- 8 Flexible connection coupling (Option)
- 9/10 800 µm screen filter and valve (Compulsory with a pump option and optional without)

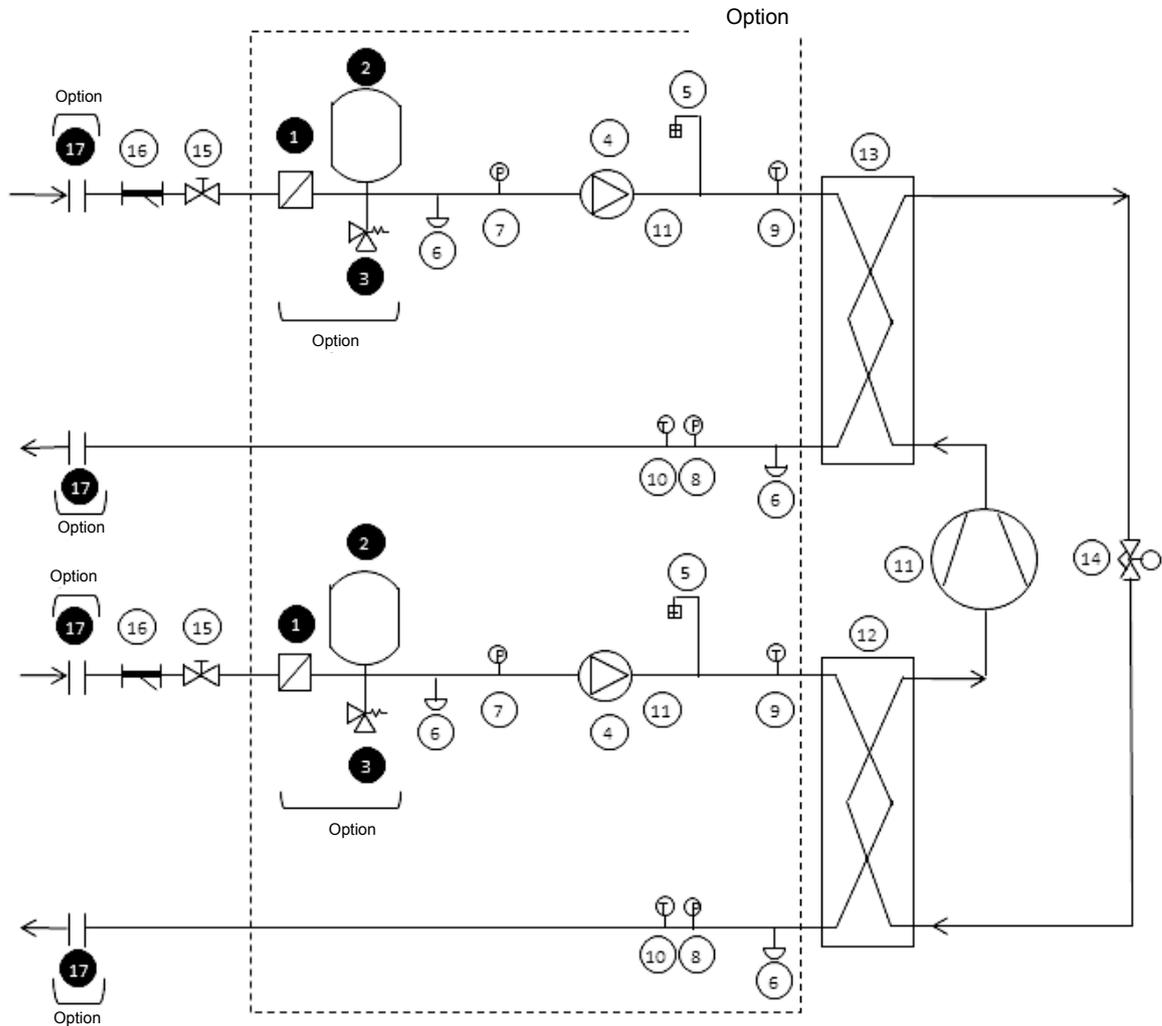
**NOTE:**

- Units without hydraulic module include a flow rate controller.

## HYDRAULIC MODULE



### ■ Diagram with hydraulic module



#### Unit and hydraulic module elements

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1 Victaulic screen filter</li> <li>2 Expansion tank (Optional Hydraulic safety components on evaporator side and condenser side)</li> <li>3 Relief valve (Optional Hydraulic safety components on evaporator side and condenser side)</li> <li>4 Water pump</li> <li>5 Air bleed valve</li> <li>6 Water drain valve</li> <li>7/8 Pressure sensor inlet/outlet</li> </ul> | <ul style="list-style-type: none"> <li>9/10 Temperature sensor inlet/outlet</li> <li>11 Compressor</li> <li>12 Evaporator</li> <li>13 Condenser</li> <li>14 Expansion valve</li> <li>15/16 800 µm screen filter and valve (Compulsory with a pump option and optional without)</li> <li>17 Flexible connection coupling (Option)</li> <li>--- Hydraulic module (unit with hydraulic module option)</li> </ul> |
|---|---|

#### NOTE:

- Units without hydraulic module include a flow rate controller.

## VARIABLE FLOW PUMP

### ■ Description

The DYNACIAT may be equipped with one or two variable-speed pumps on the evaporator and condenser side which save you energy by adjusting the electrical consumption of one pump to the actual requirements of a hydraulic system, in particular for oversized installations.

### ■ Simple to use

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

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

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

### ■ Operating principle

- Operation at full load

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

- Operation at part load

There are three operating modes for part load:

#### ● Fixed speed

The control ensures the pump continuously runs at a constant speed, based on the capacity of the compressor(s). When the compressors are 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%**

#### ● Variable flow rate: Constant regulation of the pressure difference

The control continuously acts on the pump speed to ensure a constant  $\Delta P$ . 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

#### ● Variable flow rate: Constant regulation of the temperature difference

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

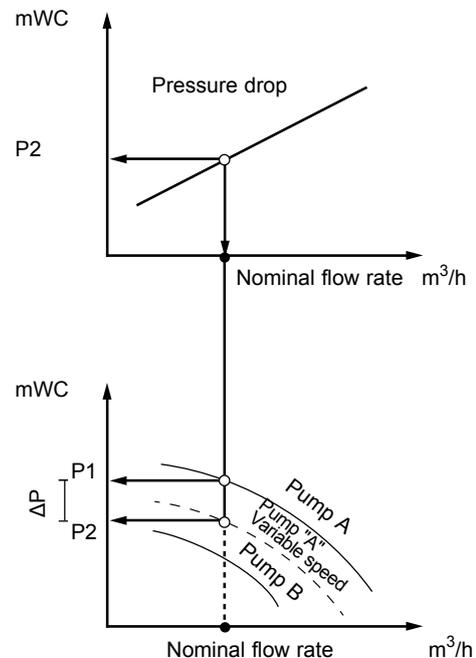
**This provides energy savings of around 66% for the pump in each of these last two operating modes**

### ■ SOFT START

A SOFT START function prevents any current peaks when the pump is started up to protect the electrical system, thereby limiting the building's electricity use at peak times and preventing any hammering in the pipework.

### ■ STANDBY function

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



## TECHNICAL CHARACTERISTICS



| DYNACIAT LG  |   |                                   |                | 080         | 090         | 100         | 120         | 130         | 150         | 180         | 200         | 240         | 260         | 300         |
|--|---|-----------------------------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Heating</b>   |   |                                   |                |             |             |             |             |             |             |             |             |             |             |             |
| <b>Standard unit</b><br>Full load performances*  | HW1   | Nominal capacity                  | kW             | 30          | 35          | 38          | 44          | 51          | 56          | 70          | 77          | 89          | 101         | 114         |
|  |   | COP                               | kW/kW          | 5,48        | 5,48        | 5,44        | 5,47        | 5,43        | 5,45        | 5,49        | 5,40        | 5,46        | 5,42        | 5,47        |
|  | HW2   | Nominal capacity                  | kW             | 29          | 33          | 36          | 43          | 49          | 54          | 68          | 74          | 85          | 97          | 108         |
|  |   | COP                               | kW/kW          | 4,31        | 4,33        | 4,32        | 4,33        | 4,37        | 4,31        | 4,35        | 4,30        | 4,27        | 4,36        | 4,29        |
|  | HW3   | Nominal capacity                  | kW             | 28          | 33          | 35          | 41          | 47          | 52          | 65          | 73          | 81          | 93          | 103         |
|  |   | COP                               | kW/kW          | 3,57        | 3,61        | 3,59        | 3,58        | 3,65        | 3,59        | 3,55        | 3,60        | 3,51        | 3,68        | 3,54        |
| <b>Standard unit</b><br>Seasonal energy efficiency**                                   | HW1   | SCOP <sub>30/35°C</sub>           | kWh/kWh        | 5,35        | 5,33        | 5,24        | 5,28        | 5,23        | 5,26        | 5,95        | 5,9         | 5,93        | 6,01        | 6,03        |
|  |   | η <sub>s heat 30/35°C</sub>       | %              | 206         | 205         | 202         | 203         | 201         | 202         | 230         | 228         | 229         | 232         | 233         |
|  | HW3   | <b>SCOP<sub>47/55°C</sub></b>     | <b>kWh/kWh</b> | <b>4,31</b> | <b>4,31</b> | <b>4,29</b> | <b>4,31</b> | <b>4,33</b> | <b>4,28</b> | <b>4,79</b> | <b>4,83</b> | <b>4,74</b> | <b>4,96</b> | <b>4,81</b> |
|  |   | <b>η<sub>s heat 47/55°C</sub></b> | <b>%</b>       | <b>164</b>  | <b>164</b>  | <b>163</b>  | <b>164</b>  | <b>165</b>  | <b>163</b>  | <b>184</b>  | <b>185</b>  | <b>181</b>  | <b>191</b>  | <b>184</b>  |
|  |   | P <sub>rated</sub>                | kW             | 32          | 37          | 40          | 47          | 54          | 59          | 75          | 83          | 93          | 106         | 118         |
|  |   | Energy labelling                  | kW/kW          | A++         | A++         | A++         | A++         | A++         | A++         | -           | -           | -           | -           | -           |
| <b>Cooling</b>   |   |                                   |                |             |             |             |             |             |             |             |             |             |             |             |
| <b>Standard unit</b><br>Full load performances*  | CW1   | Nominal capacity                  | kW             | 25          | 29          | 32          | 37          | 42          | 47          | 58          | 63          | 74          | 84          | 94          |
|  |   | EER                               | kW/kW          | 4,68        | 4,68        | 4,65        | 4,68        | 4,65        | 4,67        | 4,65        | 4,57        | 4,62        | 4,58        | 4,62        |
|  |   | Eurovent class                    |                | B           | B           | B           | B           | B           | B           | B           | C           | C           | C           | C           |
|  | CW2   | Nominal capacity                  | kW             | 34          | 39          | 43          | 50          | 57          | 66          | 78          | 86          | 102         | 113         | 129         |
|  |   | EER                               | kW/kW          | 6,35        | 6,04        | 5,96        | 5,98        | 5,83        | 5,99        | 6,02        | 5,83        | 6,10        | 5,86        | 6,08        |
|  |   | Eurovent class                    |                | A           | A           | A           | A           | A           | A           | A           | A           | A           | A           | A           |
| <b>Standard unit</b><br>Seasonal energy efficiency**                                   | SEER <sub>12/7°C</sub> Comfort low temp.        |                                   | kWh/kWh        | 4,79        | 4,78        | 4,69        | 4,72        | 4,69        | 4,72        | 5,41        | 5,34        | 5,31        | 5,45        | 5,41        |
|  | SEPR <sub>12/7°C</sub> Process high temp.       |                                   | kWh/kWh        | 6,33        | 6,34        | 6,17        | 6,12        | 6,16        | 6,20        | 6,47        | 6,33        | 6,33        | 6,43        | 6,47        |
| <b>Unit with Low-temperature brine solution option</b><br>Seasonal energy efficiency** | SEPR <sub>-2/-8°C</sub> Process medium temp.*** |                                   | kWh/kWh        | 3,88        | 4,22        | 4,38        | 4,29        | 4,41        | 3,96        | 4,10        | 4,63        | 4,46        | 4,67        | 4,65        |
| Part Load integrated values  | IPLV.SI   |                                   | kW/kW          | 5,840       | 5,850       | 5,760       | 5,780       | 5,770       | 5,820       | 6,580       | 6,680       | 6,560       | 6,810       | 6,720       |
| <b>Sound levels</b>  |   |                                   |                |             |             |             |             |             |             |             |             |             |             |             |
| <b>Standard unit</b>   |   |                                   |                |             |             |             |             |             |             |             |             |             |             |             |
| Sound power <sup>(1)</sup>   |   |                                   | dB(A)          | 67          | 69          | 69          | 69          | 70          | 70          | 72          | 72          | 72          | 73          | 73          |
| Sound pressure at 10 m <sup>(2)</sup>  |   |                                   | dB(A)          | 36          | 37          | 38          | 38          | 39          | 39          | 40          | 41          | 41          | 42          | 42          |
| <b>Unit with Low Noise option</b>  |   |                                   |                |             |             |             |             |             |             |             |             |             |             |             |
| Sound power <sup>(1)</sup>   |   |                                   | dB(A)          | 65          | 66          | 66          | 67          | 68          | 68          | 68          | 69          | 69          | 69          | 70          |
| Sound pressure at 10 m <sup>(2)</sup>  |   |                                   | dB(A)          | 34          | 35          | 35          | 35          | 37          | 37          | 37          | 37          | 38          | 38          | 39          |
| <b>Dimensions</b>  |   |                                   |                |             |             |             |             |             |             |             |             |             |             |             |
| Length   |   |                                   | mm             | 600         | 600         | 600         | 600         | 600         | 600         | 880         | 880         | 880         | 880         | 880         |
| Width  |   |                                   | mm             | 1044        | 1044        | 1044        | 1044        | 1044        | 1044        | 1474        | 1474        | 1474        | 1474        | 1474        |
| Height   |   |                                   | mm             | 901         | 901         | 901         | 901         | 901         | 901         | 901         | 901         | 901         | 901         | 901         |

\* In accordance with standard EN14511-3:2013.  
 \*\* In accordance with standard EN14825:2016, average climate  
 \*\*\* With EG 30%  
 HW1 Heating mode conditions: Evaporator water inlet/outlet temperature 10 °C/7 °C, condenser water inlet/outlet temperature 30 °C/35 °C, evaporator fouling factor 0 m<sup>2</sup>. kW/W  
 HW2 Heating mode conditions: Evaporator water inlet/outlet temperature 10 °C/7 °C, condenser water inlet/outlet temperature 40 °C/45 °C, evaporator fouling factor 0 m<sup>2</sup>. kW/W  
 HW3 Heating mode conditions: Evaporator water inlet/outlet temperature 10 °C/7 °C, condenser water inlet/outlet temperature 47 °C/55 °C, evaporator fouling factor 0 m<sup>2</sup>. kW/W  
 CW1 Cooling mode conditions: Evaporator water inlet/outlet temperature 12 °C/7 °C, condenser water inlet/outlet temperature 30 °C/35 °C, evaporator fouling factor 0 m<sup>2</sup>. kW/W  
 CW2 Cooling mode conditions: Evaporator water inlet/outlet temperature 23 °C/18 °C, condenser water inlet/outlet temperature 30 °C/35 °C, evaporator fouling factor 0 m<sup>2</sup>. kW/W  
 η<sub>s heat 30/35°C</sub> & SCOP<sub>30/35°C</sub> Values calculated in accordance with EN14825:2016  
 η<sub>s heat 47/55°C</sub> & SCOP<sub>47/55°C</sub> **Bold values compliant to Ecodesign regulation: (EU) No 813/2013 for Heat Pump application**  
 SEER<sub>12/7°C</sub> & SEPR<sub>12/7°C</sub> Values calculated in accordance with EN14825:2016  
 SEPR<sub>-2/-8°C</sub> Values calculated in accordance with EN14825:2016  
 IPLV.SI Calculated as per AHRI standard 551-591(SI).  
 - Not applicable  
 (1) In dB ref=10-12 W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.  
 (2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).



Eurovent certified values

TECHNICAL CHARACTERISTICS



| DYNACIAT LG  |                    | 080  | 090  | 100  | 120  | 130  | 150  | 180  | 200  | 240  | 260  | 300  |
|--|--------------------|------|------|------|------|------|------|------|------|------|------|------|
| <b>Operating Weight <sup>(3)</sup></b>   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Standard unit  | kg                 | 191  | 200  | 200  | 207  | 212  | 220  | 386  | 392  | 403  | 413  | 441  |
| Unit with evaporator with single LP pump   | kg                 | 250  | 258  | 258  | 263  | 266  | 271  | 431  | 435  | 442  | 449  | 465  |
| Unit with condenser with single LP pump  | kg                 | 250  | 258  | 258  | 263  | 266  | 271  | 431  | 435  | 442  | 449  | 465  |
| Unit with evaporator with single variable-speed HP pump + condenser with single variable-speed HP pump | kg                 | 305  | 313  | 313  | 321  | 327  | 334  | 513  | 521  | 533  | 544  | 574  |
| <b>Compressors</b>   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Hermetic Scroll 48.3 r/s   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Circuit A  | Qty                | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    |
| Number of power stages   | Qty                | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 2    | 2    | 2    | 2    |
| <b>Refrigerant <sup>(3)</sup></b>  |                    |      |      |      |      |      |      |      |      |      |      |      |
| R410A  |                    |      |      |      |      |      |      |      |      |      |      |      |
| Circuit A  | kg                 | 3,5  | 3,5  | 3,6  | 3,7  | 4    | 4,6  | 7,6  | 7,8  | 7,9  | 8,7  | 11,5 |
|  | tCO <sub>2</sub> e | 7,3  | 7,3  | 7,5  | 7,7  | 8,4  | 9,6  | 15,9 | 16,3 | 16,5 | 18,2 | 24   |
| <b>Oil charge</b>  |                    |      |      |      |      |      |      |      |      |      |      |      |
| TYPE: 160SZ  |                    |      |      |      |      |      |      |      |      |      |      |      |
| Circuit A  | l                  | 3    | 3,3  | 3,3  | 3,3  | 3,3  | 3,6  | 3,3  | 3,3  | 3,3  | 3,3  | 3,6  |
| <b>Power control</b>   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Connect Touch Control  |                    |      |      |      |      |      |      |      |      |      |      |      |
| Minimum capacity   | %                  | 100  | 100  | 100  | 100  | 100  | 100  | 50   | 50   | 50   | 50   | 50   |
| <b>Water type heat exchanger</b>   |                    |      |      |      |      |      |      |      |      |      |      |      |
| <b>Evaporator</b>  |                    |      |      |      |      |      |      |      |      |      |      |      |
| Plate heat exchanger with direct expansion   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Water volume   | l                  | 3,3  | 3,6  | 3,6  | 4,2  | 4,6  | 5    | 8,4  | 9,2  | 9,6  | 10,4 | 12,5 |
| Max. water-side operating pressure without hydraulic module  | kPa                | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| <b>Condenser</b>   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Plate heat exchanger   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Water volume   | l                  | 3,3  | 3,6  | 3,6  | 4,2  | 4,6  | 5    | 8,4  | 9,2  | 9,6  | 10,4 | 12,5 |
| Max. water-side operating pressure without hydraulic module  | kPa                | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| <b>Hydronic module (optional)</b>  |                    |      |      |      |      |      |      |      |      |      |      |      |
| Single pump  |                    |      |      |      |      |      |      |      |      |      |      |      |
| Pump, Victaulic screen filter, drain valves (water and air), pressure sensors                          |                    |      |      |      |      |      |      |      |      |      |      |      |
| Expansion tank volume (optional)   | l                  | 8    | 8    | 8    | 8    | 8    | 8    | 12   | 12   | 12   | 12   | 12   |
| Expansion vessel pressure <sup>(4)</sup>   | bar                | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |
| Max. water-side operating pressure with hydraulic module   | kPa                | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  |
| <b>Water connections with or without hydronic module</b>   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Victaulic®   |                    |      |      |      |      |      |      |      |      |      |      |      |
| Connections  | inch               | 1,5  | 1,5  | 1,5  | 1,5  | 1,5  | 1,5  | 2    | 2    | 2    | 2    | 2    |
| External diameter  | mm                 | 48,3 | 48,3 | 48,3 | 48,3 | 48,3 | 48,3 | 60,3 | 60,3 | 60,3 | 60,3 | 60,3 |
| <b>Casing paint</b>  |                    |      |      |      |      |      |      |      |      |      |      |      |
| Colour code: RAL 7035 / RAL 7024   |                    |      |      |      |      |      |      |      |      |      |      |      |

(3) Values shown are a guideline only. Please refer to the unit nameplate

(4) On delivery, the vessels are preinflated to a standard value, which may not be the optimum one for the installation. To enable the water volume to be varied as desired, adapt the inflation pressure to a value close to that which corresponds to the static height of the installation. Fill the installation with water (bleeding out any air) at a pressure more than 10 to 20 kPa higher than the vessel pressure.

## TECHNICAL CHARACTERISTICS



| DYNACIAT LG  |     |   |                | 360         | 390         | 450         | 480         | 520         | 600         |
|--|-----|---|----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <b>Heating</b>   |     |   |                |             |             |             |             |             |             |
| <b>Standard unit</b><br>Full load performances*  | HW1 | Nominal capacity                                | kW             | 137         | 156         | 172         | 183         | 206         | 230         |
|  |     | COP   | kW/kW          | 5,60        | 5,57        | 5,49        | 5,64        | 5,59        | 5,56        |
|  | HW2 | Nominal capacity                                | kW             | 131         | 148         | 163         | 174         | 197         | 218         |
|  |     | COP   | kW/kW          | 4,42        | 4,43        | 4,37        | 4,40        | 4,48        | 4,36        |
|  | HW3 | Nominal capacity                                | kW             | 125         | 140         | 155         | 166         | 189         | 209         |
|  |     | COP   | kW/kW          | 3,58        | 3,62        | 3,56        | 3,60        | 3,76        | 3,59        |
| <b>Standard unit</b><br>Seasonal energy efficiency**                                   | HW1 | SCOP <sub>30/35°C</sub>                         | kWh/kWh        | 6,24        | 6,28        | 6,18        | 6,24        | 6,24        | 6,08        |
|  |     | η <sub>s heat 30/35°C</sub>                     | %              | 242         | 243         | 239         | 242         | 241         | 235         |
|  | HW3 | <b>SCOP<sub>47/55°C</sub></b>                   | <b>kWh/kWh</b> | <b>5,02</b> | <b>5,05</b> | <b>5,01</b> | <b>4,99</b> | <b>5,14</b> | <b>4,92</b> |
| η <sub>s heat 47/55°C</sub>  |     | %   | <b>193</b>     | <b>194</b>  | <b>192</b>  | <b>192</b>  | <b>198</b>  | <b>189</b>  |             |
|  |     | P <sub>rated</sub>                              | kW             | 143         | 161         | 178         | 191         | 216         | 239         |
| <b>Cooling</b>   |     |   |                |             |             |             |             |             |             |
| Full load performances *   | CW1 | Nominal capacity                                | kW             | 115         | 130         | 144         | 153         | 172         | 192         |
|  |     | EER   | kW/kW          | 4,78        | 4,75        | 4,68        | 4,81        | 4,76        | 4,77        |
|  |     | Eurovent class                                  |                | B           | B           | B           | B           | B           | B           |
|  | CW2 | Nominal capacity                                | kW             | 155         | 176         | 196         | 207         | 230         | 262         |
|  |     | EER   | kW/kW          | 6,17        | 6,07        | 5,98        | 6,20        | 5,94        | 6,09        |
|  |     | Eurovent class                                  |                | A           | A           | A           | A           | A           | A           |
| <b>Standard unit</b><br>Seasonal energy efficiency**                                   |     | SEER <sub>12/7°C</sub> Comfort low temp.        | kWh/kWh        | 6,05        | 6,16        | 6,07        | 5,91        | 5,97        | 5,87        |
|  |     | SEPR <sub>12/7°C</sub> Process high temp.       | kWh/kWh        | 6,92        | 7,05        | 6,90        | 6,69        | 6,69        | 6,69        |
| <b>Unit with Low-temperature brine solution option</b><br>Seasonal energy efficiency** |     | SEPR <sub>-2/-8°C</sub> Process medium temp.*** | kWh/kWh        | 4,30        | 4,45        | 4,42        | 4,66        | 4,72        | 4,68        |
| Part Load integrated values  |     | IPLV.SI   | kW/kW          | 6,860       | 6,980       | 6,900       | 6,820       | 6,890       | 6,820       |
| <b>Sound levels</b>  |     |   |                |             |             |             |             |             |             |
| <b>Standard unit</b>   |     |   |                |             |             |             |             |             |             |
| Sound power <sup>(1)</sup>   |     |   | dB(A)          | 76          | 77          | 78          | 76          | 77          | 78          |
| Sound pressure at 10 m <sup>(2)</sup>  |     |   | dB(A)          | 44          | 45          | 46          | 44          | 45          | 47          |
| <b>Unit with Low Noise option</b>  |     |   |                |             |             |             |             |             |             |
| Sound power <sup>(1)</sup>   |     |   | dB(A)          | 73          | 74          | 75          | 73          | 74          | 75          |
| Sound pressure at 10 m <sup>(2)</sup>  |     |   | dB(A)          | 41          | 42          | 43          | 41          | 42          | 44          |
| <b>Dimensions</b>  |     |   |                |             |             |             |             |             |             |
| Length   |     |   | mm             | 880         | 880         | 880         | 880         | 880         | 880         |
| Width  |     |   | mm             | 1583        | 1583        | 1583        | 1583        | 1583        | 1583        |
| Height   |     |   | mm             | 1574        | 1574        | 1574        | 1574        | 1574        | 1574        |

\* In accordance with standard EN14511-3:2013.  
 \*\* In accordance with standard EN14825:2016, average climate  
 \*\*\* With EG 30%  
 HW1 Heating mode conditions: Evaporator water inlet/outlet temperature 10 °C/7 °C, condenser water inlet/outlet temperature 30 °C/35 °C, evaporator fouling factor 0 m<sup>2</sup>. k/W  
 HW2 Heating mode conditions: Evaporator water inlet/outlet temperature 10 °C/7 °C, condenser water inlet/outlet temperature 40 °C/45 °C, evaporator fouling factor 0 m<sup>2</sup>. k/W  
 HW3 Heating mode conditions: Evaporator water inlet/outlet temperature 10 °C/7 °C, condenser water inlet/outlet temperature 47 °C/55 °C, evaporator fouling factor 0 m<sup>2</sup>. k/W  
 CW1 Cooling mode conditions: Evaporator water inlet/outlet temperature 12 °C/7 °C, condenser water inlet/outlet temperature 30 °C/35 °C, evaporator fouling factor 0 m<sup>2</sup>. k/W  
 CW2 Cooling mode conditions: Evaporator water inlet/outlet temperature 23 °C/18 °C, condenser water inlet/outlet temperature 30 °C/35 °C, evaporator fouling factor 0 m<sup>2</sup>. k/W  
 η<sub>s heat 30/35°C</sub> & SCOP<sub>30/35°C</sub> Values calculated in accordance with EN14825:2016  
 η<sub>s heat 47/55°C</sub> & SCOP<sub>47/55°C</sub> **Bold values compliant to Ecodesign regulation: (EU) No 813/2013 for Heat Pump application**  
 SEER<sub>12/7°C</sub> & SEPR<sub>12/7°C</sub> Values calculated in accordance with EN14825:2016  
 SEPR<sub>-2/-8°C</sub> Values calculated in accordance with EN14825:2016  
 IPLV.SI Calculated as per AHRI standard 551-591(SI).  
 (1) In dB ref=10-12 W, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by Eurovent.  
 (2) In dB ref 20μPa, (A) weighting. Declared dualnumber noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). For information, calculated from the sound power level Lw(A).



Eurovent certified values

TECHNICAL CHARACTERISTICS



| DYNACIAT LG  |                    | 360   | 390  | 450  | 480  | 520   | 600   |
|--|--------------------|---|------|------|------|-------|-------|
| <b>Operating Weight <sup>(3)</sup></b>   |                    |   |      |      |      |       |       |
| Standard unit  | kg                 | 721   | 742  | 765  | 844  | 872   | 899   |
| Unit with evaporator with single LP pump   | kg                 | 996   | 1022 | 1048 | 1158 | 1230  | 1261  |
| Unit with condenser with single LP pump  | kg                 | 1016  | 1042 | 1068 | 1178 | 1230  | 1261  |
| Unit with evaporator with single variable-speed HP pump + condenser with single variable-speed HP pump | kg                 | 1056  | 1082 | 1108 | 1218 | 1270  | 1301  |
| <b>Compressors</b>   |                    | Hermetic Scroll 48.3 r/s  |      |      |      |       |       |
| Circuit A  | Qty                | 3   | 3    | 3    | 2    | 2     | 2     |
| Circuit B  | Qty                | -   | -    | -    | 2    | 2     | 2     |
| Number of power stages   | Qty                | 3   | 3    | 3    | 4    | 4     | 4     |
| <b>Refrigerant <sup>(3)</sup></b>  |                    | R410A   |      |      |      |       |       |
| Circuit A  | kg                 | 13,3  | 14,7 | 15,3 | 10,5 | 11,5  | 12,1  |
|  | tCO <sub>2</sub> e | 27,8  | 30,7 | 31,9 | 21,9 | 23,9  | 25,05 |
| Circuit B  | kg                 | -   | -    | -    | 10,5 | 11,25 | 12    |
|  | tCO <sub>2</sub> e | -   | -    | -    | 21,9 | 23,9  | 25,05 |
| <b>Oil charge</b>  |                    | TYPE: 160SZ   |      |      |      |       |       |
| Circuit A  | l                  | 3,3   | 3,3  | 3,6  | 3,3  | 3,3   | 3,6   |
| Circuit B  | l                  | -   | -    | -    | 3,3  | 3,3   | 3,6   |
| <b>Power control</b>   |                    | Connect Touch Control   |      |      |      |       |       |
| Minimum capacity   | %                  | 33  | 33   | 33   | 25   | 25    | 25    |
| <b>Water type heat exchanger</b>   |                    |   |      |      |      |       |       |
| <b>Evaporator</b>  |                    | Plate heat exchanger with direct expansion                                    |      |      |      |       |       |
| Water volume   | l                  | 15  | 17   | 19   | 23   | 26    | 29    |
| Max. water-side operating pressure without hydraulic module  | kPa                | 1000  | 1000 | 1000 | 1000 | 1000  | 1000  |
| <b>Condenser</b>   |                    | Plate heat exchanger  |      |      |      |       |       |
| Water volume   | l                  | 15  | 17   | 19   | 23   | 26    | 29    |
| Max. water-side operating pressure without hydraulic module  | kPa                | 1000  | 1000 | 1000 | 1000 | 1000  | 1000  |
| <b>Hydronic module (optional)</b>  |                    |   |      |      |      |       |       |
| Single pump  |                    | Pump, Victaulic screen filter, drain valves (water and air), pressure sensors |      |      |      |       |       |
| Expansion tank volume (optional)   | l                  | 25  | 25   | 25   | 35   | 35    | 35    |
| Expansion vessel pressure <sup>(4)</sup>   | bar                | 4   | 4    | 4    | 4    | 4     | 4     |
| Max. water-side operating pressure with hydraulic module   | kPa                | 400   | 400  | 400  | 400  | 400   | 400   |
| <b>Water connections with or without hydronic module</b>   |                    | Victaulic®  |      |      |      |       |       |
| Connections  | inch               | 2,5   | 2,5  | 2,5  | 3    | 3     | 3     |
| External diameter  | mm                 | 73  | 73   | 73   | 88,9 | 88,9  | 88,9  |
| <b>Casing paint</b>  |                    | Colour code: RAL 7035 / RAL 7024  |      |      |      |       |       |

(3) Values shown are a guideline only. Please refer to the unit nameplate

(4) On delivery, the vessels are preinflated to a standard value, which may not be the optimum one for the installation. To enable the water volume to be varied as desired, adapt the inflation pressure to a value close to that which corresponds to the static height of the installation. Fill the installation with water (bleeding out any air) at a pressure more than 10 to 20 kPa higher than the vessel pressure.

## ELECTRICAL SPECIFICATIONS

| DYNACIAT LG - Standard unit (without hydraulic module)                   |         | 080                           | 090  | 100  | 120  | 130  | 150   | 180  | 200  | 240   | 260   | 300   | 360   | 390   | 450   | 480   | 520   | 600   |  |
|--|---------|-------------------------------|------|------|------|------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| <b>Power circuit</b>   |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Nominal voltage  | V-ph-Hz | 400-3-50                      |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Voltage range  | V       | 360-440                       |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| <b>Control circuit supply</b>  |         | 24 V via internal transformer |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| <b>Nominal unit current draw<sup>(3)</sup></b>                           |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Circuit A&B  | A       | 10,5                          | 13,2 | 13,8 | 15,6 | 16,2 | 20,2  | 26,4 | 27,6 | 31,2  | 32,4  | 40,4  | 46,8  | 48,6  | 60,6  | 62,4  | 64,8  | 80,8  |  |
| <b>Maximum unit power input<sup>(2)</sup></b>                            |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Circuit A&B  | kW      | 9,2                           | 10,8 | 11,7 | 13,7 | 15,1 | 17,1  | 21,5 | 23,3 | 27,3  | 30,3  | 34,2  | 41    | 44,9  | 51,2  | 54,6  | 59,8  | 68,3  |  |
| <b>Unit power factor at maximum capacity<sup>(2)</sup></b>               |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Circuit A&B  |         | 0,85                          | 0,83 | 0,85 | 0,85 | 0,86 | 0,85  | 0,83 | 0,85 | 0,85  | 0,86  | 0,85  | 0,85  | 0,85  | 0,85  | 0,85  | 0,85  | 0,85  |  |
| <b>Maximum unit current draw (Un-10%)<sup>(5)</sup></b>                  |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Circuit A&B  | A       | 17,3                          | 20,8 | 22   | 25,8 | 28,2 | 32,2  | 41,6 | 44   | 51,6  | 56,4  | 64,4  | 77,3  | 84,7  | 96,7  | 103,1 | 112,9 | 128,9 |  |
| <b>Maximum current draw (Un)<sup>(4)</sup></b>                           |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Circuit A&B - Standard unit  | A       | 15,6                          | 18,7 | 19,8 | 23,2 | 25,4 | 29    | 37,4 | 39,6 | 46,4  | 50,8  | 58    | 69,6  | 76,2  | 87    | 92,8  | 101,6 | 116   |  |
| <b>Maximum start-up current, standard unit (Un)<sup>(1)</sup></b>        |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Circuit A&B  | A       | 98                            | 142  | 142  | 147  | 158  | 197   | 161  | 162  | 170   | 183   | 226   | 193,4 | 208,8 | 255   | 216,6 | 234,2 | 284   |  |
| <b>Maximum start-up current, unit with soft start (Un)<sup>(1)</sup></b> |         |                               |      |      |      |      |       |      |      |       |       |       |       |       |       |       |       |       |  |
| Circuit A&B  | A       | 53,9                          | 78,1 | 78,1 | 80,9 | 86,9 | 108,4 | 96,8 | 97,9 | 104,1 | 112,3 | 137,4 | 127,3 | 137,7 | 166,4 | 150,5 | 163,1 | 195,4 |  |

- (1) Maximum instantaneous starting current (maximum operating current of the smallest compressor(s) + locked rotor current of the largest compressor).
- (2) Power input, at the unit's permanent operating limits (indication given on the unit's name plate).
- (3) Standardised EUROVENT conditions, water type heat exchanger input/output = 12°C/7°C, outdoor air temperature = 35°C.
- (4) Maximum unit current at 400V, during non-permanent operation (indication given on the unit's name plate)
- (5) Maximum unit current at 360V, during non-permanent operation

### ■ Short circuit current withstand capability (TN system<sup>(1)</sup>)

| DYNACIAT LG  |        | 080      | 090 | 100 | 120 | 130 | 150 | 180 | 200 | 240 | 260 | 300 | 360 | 390 | 450 | 480 | 520 | 600 |  |
|--|--------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| <b>Value without upstream protection</b>                                 |        |          |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| Short time assigned current (1s) - I <sub>cw</sub>                       | kA eff | 3        | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 3   | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 | 5,5 |  |
| Allowable peak assigned current - I <sub>pk</sub>                        | kA pk  | 6        | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 20  | 20  | 20  | 20  | 20  | 20  |  |
| <b>Value with upstream protection</b>                                    |        |          |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| Conditional short circuit assigned current I <sub>cc</sub>               | kA eff | 40       | 40  | 40  | 40  | 40  | 40  | 40  | 40  | 40  | 40  | 40  | 154 | 154 | 154 | 154 | 154 | 154 |  |
| Associated Schneider circuit breaker - Compact type range <sup>(2)</sup> |        | NSX 100N |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |

- (1) Type of system earthing
- (2) If another current limiting protection device is used, its time-current trip and I<sup>2</sup>t thermal stress characteristics must be at least equivalent to those of the recommended Schneider circuit breaker.  
The short-circuit withstand values given above were determined for the TN system.

## INTELLIGENTLY-DESIGNED ACOUSTICS

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To comply with the various restrictions on integration, the DYNACIAT 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 DYNACIAT 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

### ■ Low Noise option

In this version, the compressors are housed inside noise insulating jackets.

### ■ Acoustic signature

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

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 two acoustic finish levels (Standard and Xtra Low Noise), the DYNACIAT ensures any environmental noise constraints can be met.

## SOUND LEVELS

### Standard version

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

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

| DYNACIAT LG | SOUND POWER LEVEL SPECTRUM (dB) |        |        |         |         |         | Overall power level dB(A) |
|-------------|---------------------------------|--------|--------|---------|---------|---------|---------------------------|
|             | 125 Hz                          | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |                           |
| 080         | 60                              | 53     | 52     | 63      | 61      | 57      | 67                        |
| 090         | 64                              | 56     | 56     | 63      | 60      | 58      | 69                        |
| 100         | 61                              | 59     | 58     | 64      | 63      | 60      | 69                        |
| 120         | 64                              | 59     | 59     | 64      | 61      | 58      | 69                        |
| 130         | 59                              | 60     | 58     | 67      | 64      | 59      | 70                        |
| 150         | 57                              | 56     | 57     | 66      | 65      | 62      | 70                        |
| 180         | 47                              | 60     | 65     | 68      | 66      | 56      | 72                        |
| 200         | 43                              | 61     | 65     | 68      | 67      | 57      | 72                        |
| 240         | 46                              | 61     | 67     | 67      | 66      | 55      | 72                        |
| 260         | 40                              | 61     | 65     | 70      | 68      | 55      | 73                        |
| 300         | 51                              | 64     | 64     | 69      | 69      | 58      | 73                        |
| 360         | 83                              | 73     | 71     | 70      | 68      | 65      | 76                        |
| 390         | 84                              | 74     | 72     | 71      | 69      | 66      | 77                        |
| 450         | 80                              | 75     | 71     | 74      | 72      | 65      | 78                        |
| 480         | 78                              | 74     | 71     | 70      | 71      | 65      | 76                        |
| 520         | 79                              | 75     | 72     | 71      | 72      | 66      | 77                        |
| 600         | 82                              | 76     | 75     | 74      | 71      | 66      | 78                        |

#### ■ Sound pressure levels ref $2 \times 10^{-5}$ Pa $\pm$ 3 dB (Lp)

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

| DYNACIAT LG | SOUND PRESSURE SPECTRUM (dB) |        |        |         |         |         | Overall pressure level dB(A) |
|-------------|------------------------------|--------|--------|---------|---------|---------|------------------------------|
|             | 125 Hz                       | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |                              |
| 080         | 29                           | 22     | 20     | 32      | 30      | 25      | 36                           |
| 090         | 33                           | 25     | 24     | 32      | 29      | 27      | 37                           |
| 100         | 30                           | 28     | 26     | 33      | 31      | 29      | 38                           |
| 120         | 33                           | 28     | 28     | 33      | 30      | 27      | 38                           |
| 130         | 27                           | 28     | 27     | 35      | 32      | 27      | 39                           |
| 150         | 26                           | 25     | 26     | 35      | 34      | 31      | 39                           |
| 180         | 16                           | 28     | 33     | 37      | 34      | 25      | 40                           |
| 200         | 12                           | 30     | 34     | 36      | 36      | 25      | 41                           |
| 240         | 15                           | 30     | 35     | 36      | 35      | 23      | 41                           |
| 260         | 9                            | 30     | 34     | 38      | 36      | 23      | 42                           |
| 300         | 19                           | 33     | 33     | 38      | 38      | 27      | 42                           |
| 360         | 51                           | 42     | 39     | 39      | 36      | 33      | 44                           |
| 390         | 52                           | 43     | 40     | 40      | 37      | 34      | 45                           |
| 450         | 48                           | 44     | 39     | 42      | 40      | 33      | 46                           |
| 480         | 46                           | 43     | 39     | 39      | 39      | 33      | 44                           |
| 520         | 47                           | 44     | 40     | 40      | 40      | 34      | 45                           |
| 600         | 50                           | 45     | 43     | 42      | 39      | 34      | 47                           |

**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 Version LOW NOISE Option

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

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

| DYNACIAT LG | SOUND POWER LEVEL SPECTRUM (dB) |        |        |         |         |         | Overall power level dB(A) |
|-------------|---------------------------------|--------|--------|---------|---------|---------|---------------------------|
|             | 125 Hz                          | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |                           |
| 080         | 59                              | 58     | 50     | 60      | 57      | 51      | 65                        |
| 090         | 58                              | 57     | 55     | 62      | 58      | 54      | 66                        |
| 100         | 58                              | 57     | 56     | 61      | 59      | 54      | 66                        |
| 120         | 58                              | 57     | 59     | 62      | 59      | 54      | 67                        |
| 130         | 64                              | 58     | 56     | 64      | 60      | 53      | 68                        |
| 150         | 58                              | 57     | 56     | 65      | 63      | 58      | 68                        |
| 180         | 48                              | 57     | 61     | 65      | 62      | 51      | 68                        |
| 200         | 43                              | 59     | 61     | 65      | 63      | 51      | 69                        |
| 240         | 47                              | 59     | 63     | 65      | 62      | 49      | 69                        |
| 260         | 39                              | 58     | 61     | 66      | 63      | 48      | 69                        |
| 300         | 50                              | 62     | 60     | 66      | 65      | 52      | 70                        |
| 360         | 80                              | 70     | 68     | 67      | 65      | 62      | 73                        |
| 390         | 81                              | 71     | 69     | 68      | 66      | 63      | 74                        |
| 450         | 77                              | 72     | 68     | 71      | 69      | 62      | 75                        |
| 480         | 75                              | 71     | 68     | 67      | 68      | 62      | 73                        |
| 520         | 76                              | 72     | 69     | 68      | 69      | 63      | 74                        |
| 600         | 79                              | 73     | 72     | 71      | 68      | 63      | 75                        |

#### ■ Sound pressure levels ref $2 \times 10^{-5}$ Pa $\pm 3$ dB (Lp)

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

| DYNACIAT LG | SOUND PRESSURE SPECTRUM (dB) |        |        |         |         |         | Overall pressure level dB(A) |
|-------------|------------------------------|--------|--------|---------|---------|---------|------------------------------|
|             | 125 Hz                       | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz |                              |
| 080         | 27                           | 27     | 19     | 29      | 26      | 20      | 34                           |
| 090         | 27                           | 26     | 24     | 30      | 26      | 23      | 35                           |
| 100         | 27                           | 26     | 24     | 30      | 27      | 23      | 35                           |
| 120         | 27                           | 26     | 27     | 31      | 28      | 23      | 35                           |
| 130         | 33                           | 27     | 25     | 32      | 29      | 22      | 37                           |
| 150         | 27                           | 26     | 25     | 33      | 31      | 27      | 37                           |
| 180         | 16                           | 26     | 30     | 34      | 30      | 19      | 37                           |
| 200         | 12                           | 27     | 30     | 33      | 32      | 20      | 37                           |
| 240         | 15                           | 28     | 32     | 34      | 31      | 18      | 38                           |
| 260         | 8                            | 27     | 30     | 35      | 31      | 17      | 38                           |
| 300         | 19                           | 30     | 28     | 35      | 33      | 21      | 39                           |
| 360         | 48                           | 39     | 36     | 36      | 33      | 30      | 41                           |
| 390         | 49                           | 40     | 37     | 37      | 34      | 31      | 42                           |
| 450         | 45                           | 41     | 36     | 39      | 37      | 30      | 43                           |
| 480         | 43                           | 40     | 36     | 36      | 36      | 30      | 41                           |
| 520         | 44                           | 41     | 37     | 37      | 37      | 31      | 42                           |
| 600         | 47                           | 42     | 40     | 39      | 36      | 31      | 44                           |

**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 - EXCHANGER 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 running times, it prevents short cycle protection cycles from starting and, in most cases, eliminates the need for a buffer tank.

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

Cooling mode (Evaporator)  
- Chilled water temperature = 12°C/7°C  
- Hot water temperature = 30°C/35°C

Heating mode (Condenser)  
- Chilled water temperature = 10°C/7°C  
- Hot water temperature = 30°C/35°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 (unit with air handling unit) or for industrial processes, the buffer tank is essential.

### ■ Minimum system water volume and exchanger water flow rate

| DYNACIAT LG  | 080           | 090       | 100       | 120       | 130     | 150       | 180       | 200       | 240        | 260        | 300        |
|--|---------------|-----------|-----------|-----------|---------|-----------|-----------|-----------|------------|------------|------------|
| <b>Evaporator</b>  |               |           |           |           |         |           |           |           |            |            |            |
| Minimum system water volume, air conditioning application (litres)                   | 61,5          | 71,7      | 78,8      | 91,8      | 104,6   | 116,6     | 145,3     | 158,5     | 184,4      | 209,8      | 236,4      |
| Min/max water type heat exchanger flow rate without hydraulic module (l/s)           | 0.5 / 3.8     | 0.5 / 4.1 | 0.5 / 4.1 | 0.6 / 4.7 | 0.6 / 5 | 0.8 / 5.4 | 0.8 / 9.2 | 1 / 9.9   | 1.1 / 10.3 | 1.3 / 10.9 | 1.5 / 12.5 |
| Maximum water type heat exchanger flow rate with low pressure hydraulic module (l/s) | Low pressure  | 3,5       | 3,8       | 3,8       | 4,1     | 4,3       | 4,5       | 6,1       | 6,2        | 6,3        | 8,1        |
|  | High pressure | 3,7       | 3,9       | 3,9       | 4,3     | 4,5       | 4,8       | 7,9       | 8,1        | 8,3        | 8,8        |
| <b>Condenser</b>   |               |           |           |           |         |           |           |           |            |            |            |
| Minimum system water volume, air conditioning application (litres)                   | 75            | 87,5      | 95        | 110       | 125     | 140       | 175       | 192,5     | 222,5      | 252,5      | 285        |
| Min/max water type heat exchanger flow rate without hydraulic module (l/s)           | 0.3 / 3.8     | 0.3 / 4.1 | 0.3 / 4.1 | 0.4 / 4.7 | 0.4 / 5 | 0.4 / 5.4 | 0.4 / 7   | 0.5 / 7.5 | 0.5 / 7.8  | 0.6 / 8.2  | 0.6 / 9.3  |
| Maximum water type heat exchanger flow rate with low pressure hydraulic module (l/s) | Low pressure  | 3,5       | 3,7       | 3,7       | 4       | 4,2       | 4,4       | 5,4       | 5,6        | 5,7        | 7,4        |
|  | High pressure | 3,6       | 3,9       | 3,9       | 4,2     | 4,4       | 4,6       | 6,9       | 7,1        | 7,3        | 8          |

| DYNACIAT LG  | 360           | 390        | 450       | 480        | 520        | 600      |
|--|---------------|------------|-----------|------------|------------|----------|
| <b>Evaporator</b>  |               |            |           |            |            |          |
| Minimum system water volume, air conditioning application (litres)                   | 287,5         | 325        | 360       | 382,5      | 430        | 480      |
| Min/max water type heat exchanger flow rate without hydraulic module (l/s)           | 0.8 / 14.4    | 0.9 / 16.6 | 1 / 18.3  | 0.8 / 16.1 | 0.9 / 18.3 | 1 / 20.2 |
| Maximum water type heat exchanger flow rate with low pressure hydraulic module (l/s) | Low pressure  | 7,5        | 7,6       | 8,6        | 8,6        | 13,6     |
|  | High pressure | 11,8       | 12,5      | 12,8       | 12,5       | 13,05    |
| <b>Condenser</b>   |               |            |           |            |            |          |
| Minimum system water volume, air conditioning application (litres)                   | 342,5         | 390        | 430       | 457,5      | 515        | 575      |
| Min/max water type heat exchanger flow rate without hydraulic module (l/s)           | 0.5/13,05     | 0.5/15     | 0.6/16,66 | 0.5/16,38  | 0.5/18,8   | 0.6/20,5 |
| Maximum water type heat exchanger flow rate with low pressure hydraulic module (l/s) | Low pressure  | 11,4       | 12,5      | 13,2       | 12,6       | 14       |
|  | High pressure | 11,7       | 12,4      | 12,9       | 13,8       | 14,4     |

- (1) Maximum flow rate for a pressure drop of 100 kPa in the plate heat exchanger  
 (2) Maximum flow rate for a machine operating pressure of 20 kPa (unit with low pressure pump) or 50 kPa (high pressure pump).

## OPERATING RANGE

DYNACIAT units have a broad field of application, enabling them to meet a range of heating and cooling requirements in the most varied of climates.

**Multi-application:** air conditioning, heating, industrial processes

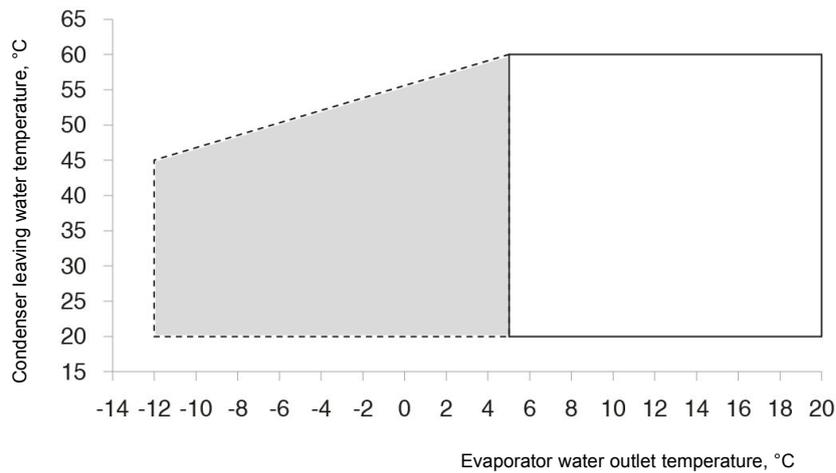
The DYNACIAT can be used for all traditional heating and air conditioning applications in sectors as varied as collective housing, hotels, shopping centres and offices.

### ■ Water chiller operating limits - LG heat pump

**Cooling mode** Production of chilled water from -12°C (with low temperature brine option) to +20°C.

### Heating mode

Hot water production possible up to +60°C.



- Standard unit
- Low temperature brine solution option



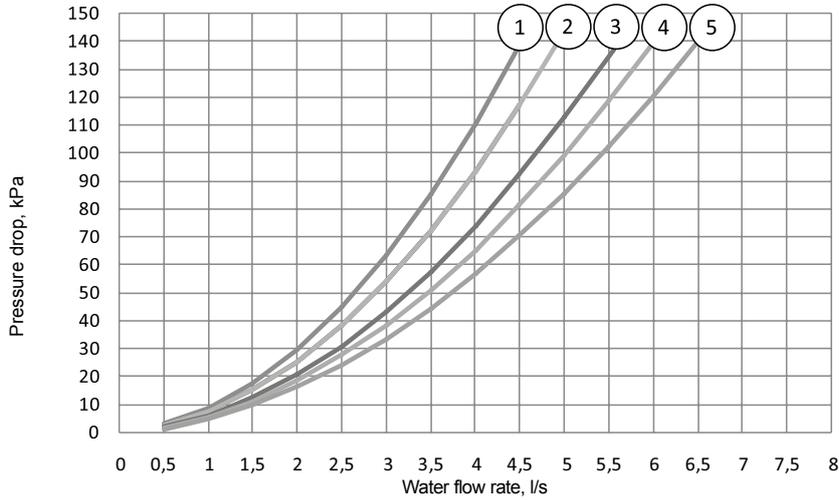
## HYDRAULIC SPECIFICATIONS

### ■ Water pressure drop in the evaporator

Data applicable for pure water at 20°C

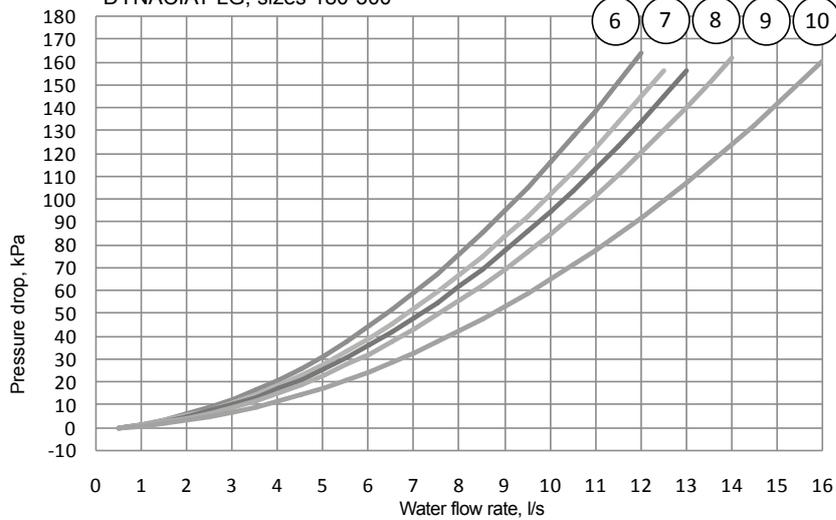
### ■ Evaporator

DYNACIAT LG, sizes 080-150



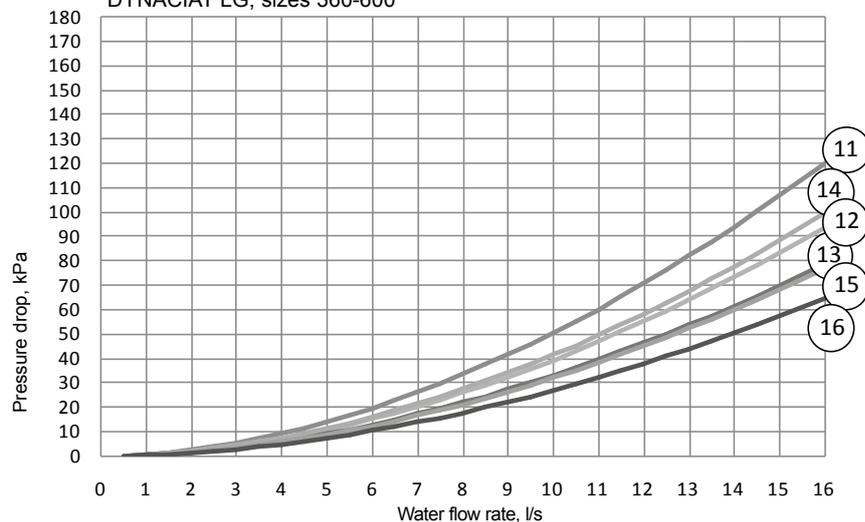
- 1 080
- 2 090 - 100
- 3 120
- 4 130
- 5 150

DYNACIAT LG, sizes 180-300



- 6 180
- 7 200
- 8 240
- 9 260
- 10 300

DYNACIAT LG, sizes 360-600



- 11 360
- 12 390
- 13 450
- 14 480
- 15 520
- 16 600

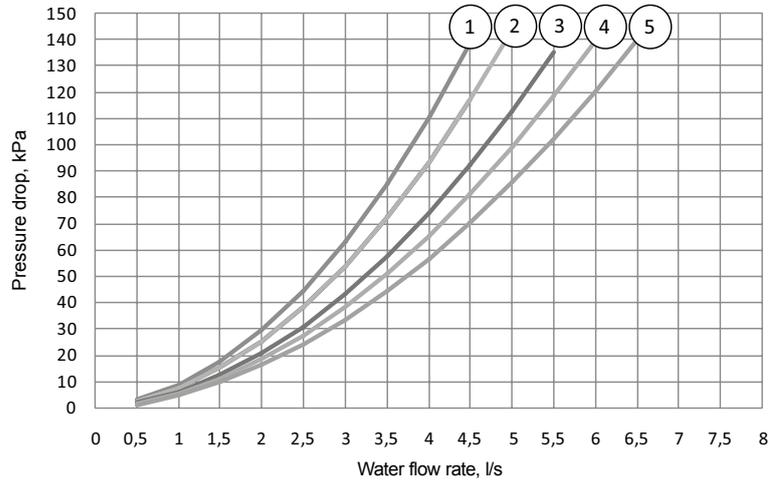
## HYDRAULIC SPECIFICATIONS

### ■ Water pressure drop in the evaporator

Data applicable for pure water at 20°C

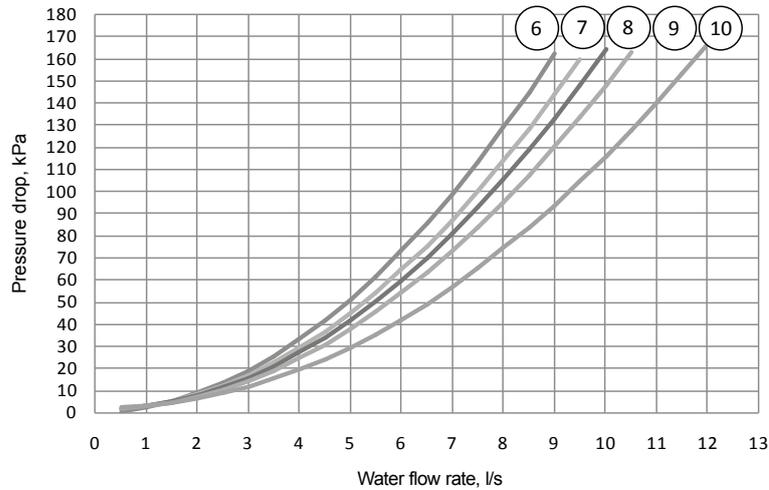
### ■ Condenser

DYNACIAT LG, sizes 080-150



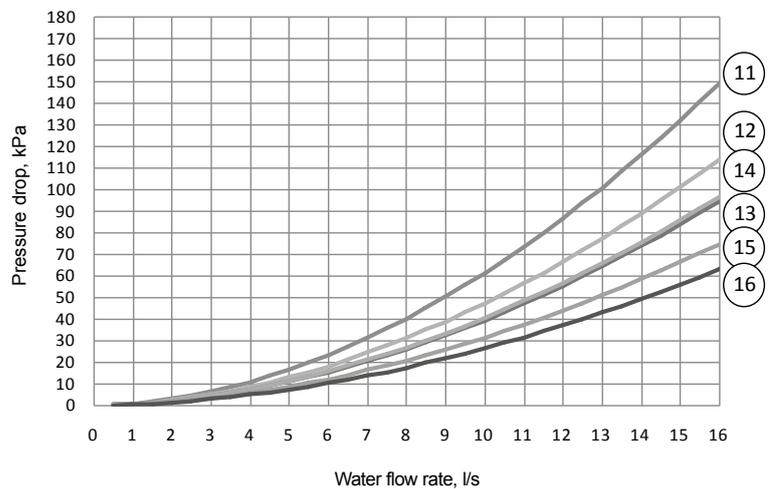
- 1 080
- 2 090 - 100
- 3 120
- 4 130
- 5 150

DYNACIAT LG, sizes 180-300



- 6 180
- 7 200
- 8 240
- 9 260
- 10 300

DYNACIAT LG, sizes 360-600



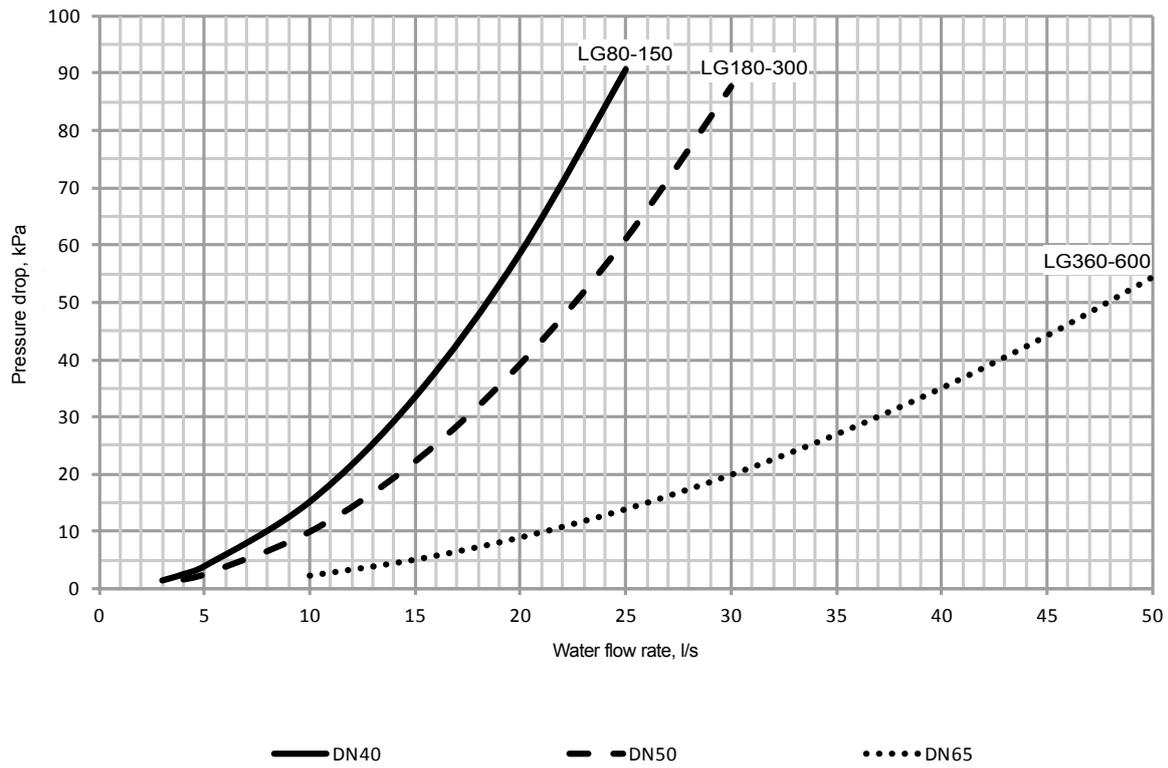
- 11 360
- 12 390
- 13 450
- 14 480
- 15 520
- 16 600



→ Water chillers  
Heat pump

## HYDRAULIC SPECIFICATIONS

### ■ Water pressure drop in the filter



DYNACIAT LG

## HYDRAULIC SPECIFICATIONS

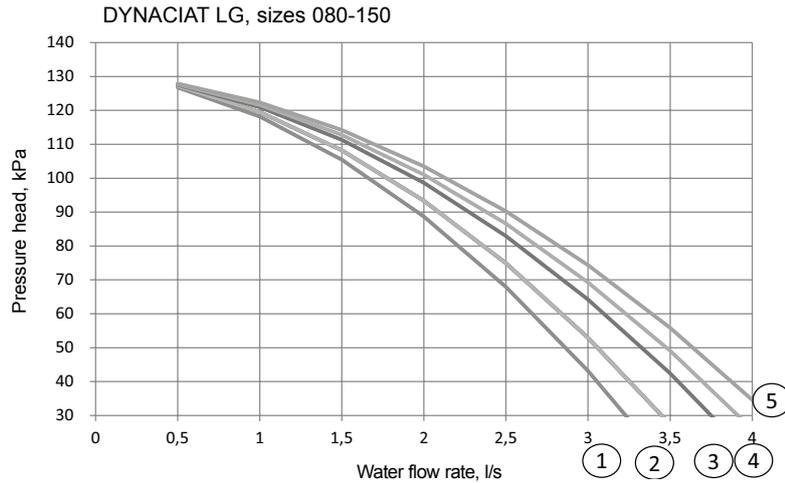
### ■ Available static system pressure

Units with hydraulic module (single variable- and fixed-speed low pressure pump)

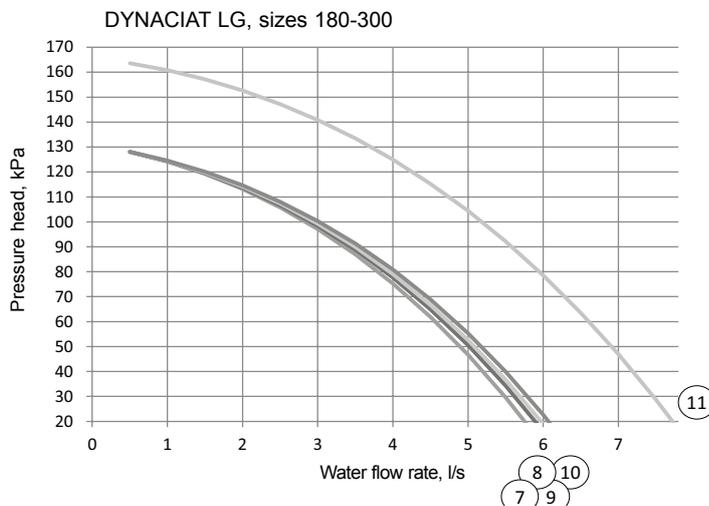
Data applicable for:

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

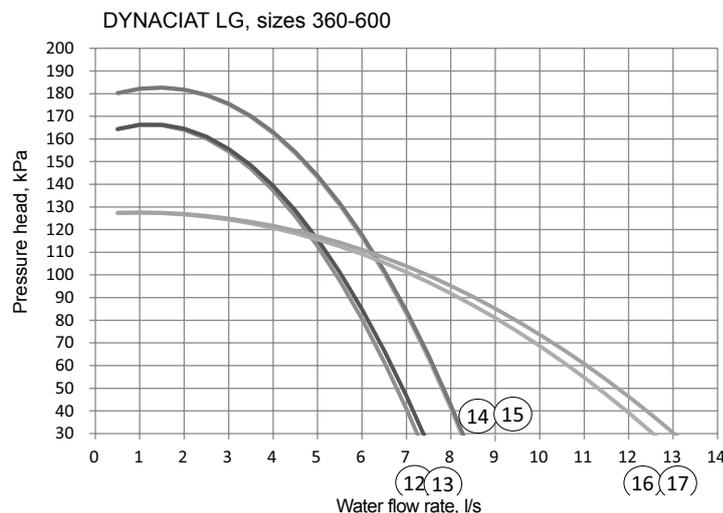
### ■ Evaporator



- 1 LG 080
- 2 LG 090-100
- 3 LG 120
- 4 LG 130
- 5 LG 150



- 7 LG 180
- 8 LG 200
- 9 LG 240
- 10 LG 260
- 11 LG 300



- 12 LG 360
- 13 LG 390
- 14 LG 450
- 15 LG 480
- 16 LG 520
- 17 LG 600

## HYDRAULIC SPECIFICATIONS

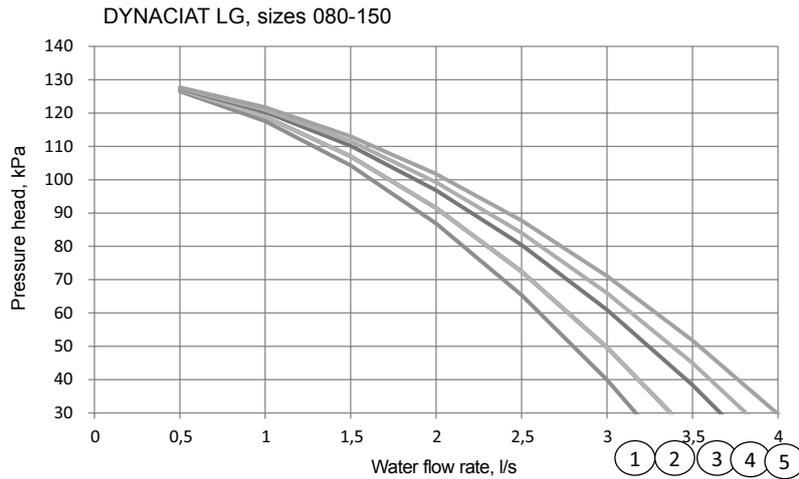
### ■ Available static system pressure

Units with hydraulic module (single variable- and fixed-speed low pressure pump)

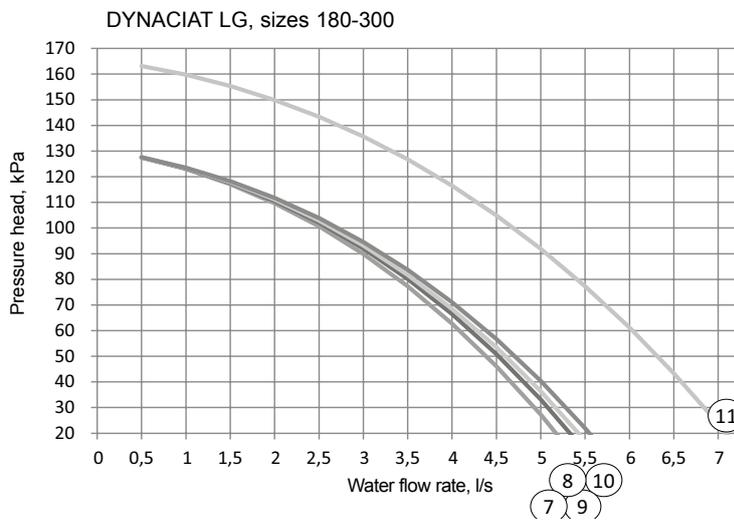
Data applicable for:

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

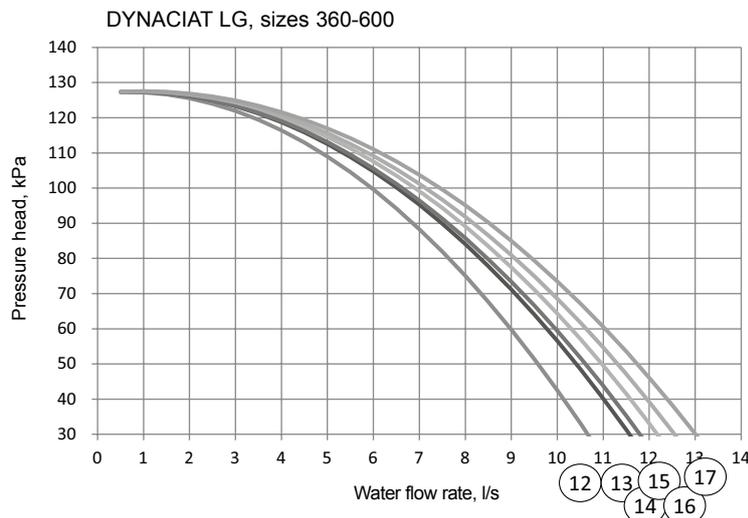
### ■ Condenser



- 1 LG 080
- 2 LG 090-100
- 3 LG 120
- 4 LG 130
- 5 LG 150



- 7 LG 180
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- 9 LG 240
- 10 LG 260
- 11 LG 300



- 12 LG 360
- 13 LG 390
- 14 LG 450
- 15 LG 480
- 16 LG 520
- 17 LG 600

**HYDRAULIC SPECIFICATIONS**

■ **Available static system pressure**

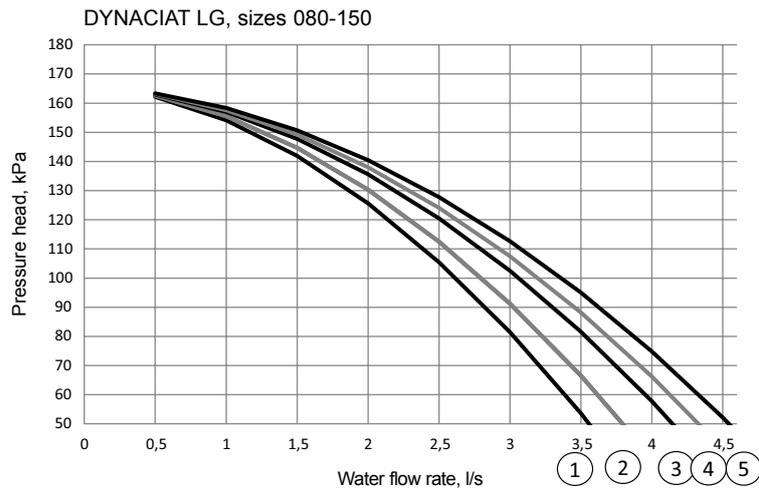
Units with hydraulic module (single variable and fixed-speed (\*) high pressure pump)

Data applicable for:

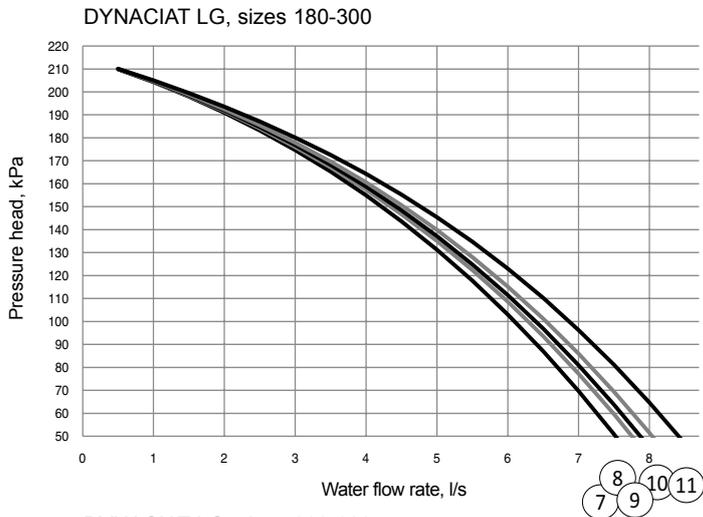
- Pure water at 20°C
- Refer to the section "Evaporator water flow rate" for the water flow rate values

(\*) Sizes 360 to 600 only

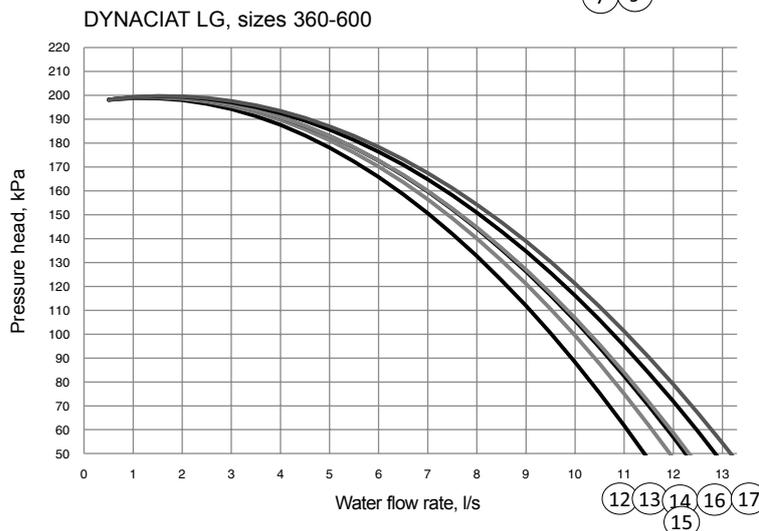
■ **Evaporator**



- 1 LG 080
- 2 LG 090-100
- 3 LG 120
- 4 LG 130
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- 12 LG 360
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- 14 LG 450
- 15 LG 480
- 16 LG 520
- 17 LG 600



## HYDRAULIC SPECIFICATIONS

### ■ Available static system pressure

Units with hydraulic module (single variable and fixed-speed (\*) high pressure pump)

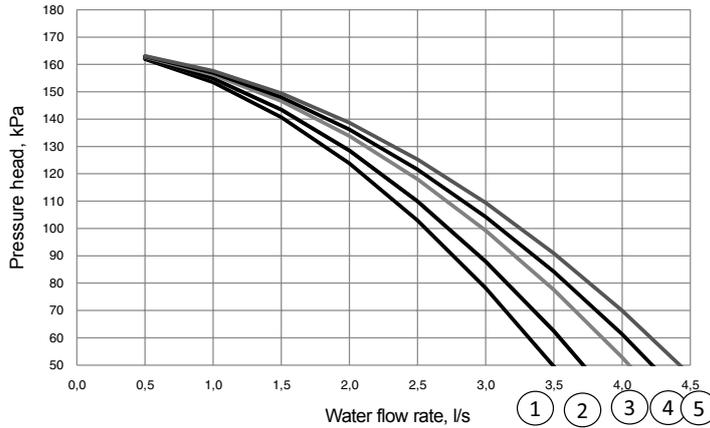
Data applicable for:

- Pure water at 20°C
- Refer to the section "Evaporator water flow rate" for the water flow rate values

(\*) Sizes 360 to 600 only

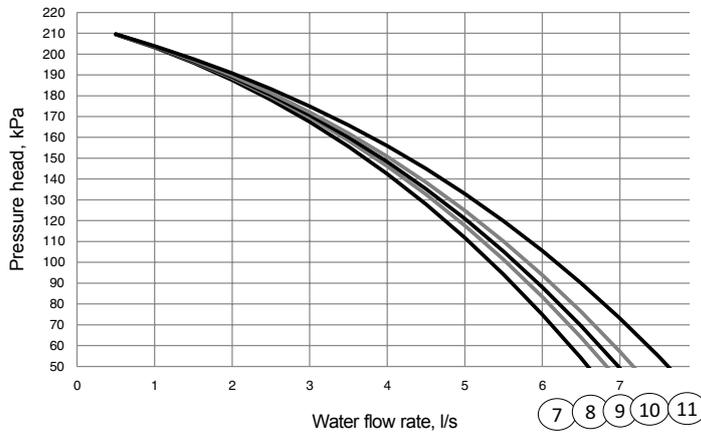
### ■ Condenser

DYNACIAT LG, sizes 080-150



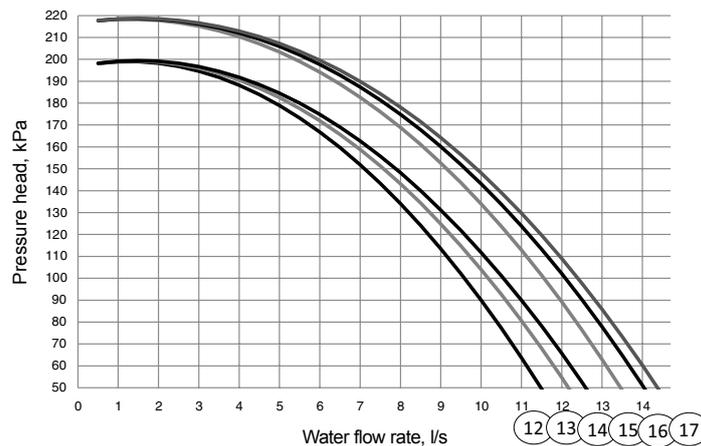
- 1 LG 080
- 2 LG 090-100
- 3 LG 120
- 4 LG 130
- 5 LG 150

DYNACIAT LG, sizes 180-300



- 7 LG 180
- 8 LG 200
- 9 LG 240
- 10 LG 260
- 11 LG 300

DYNACIAT LG, sizes 360-600



- 12 LG 360
- 13 LG 390
- 14 LG 450
- 15 LG 480
- 16 LG 520
- 17 LG 600

## HYDRAULIC SPECIFICATIONS

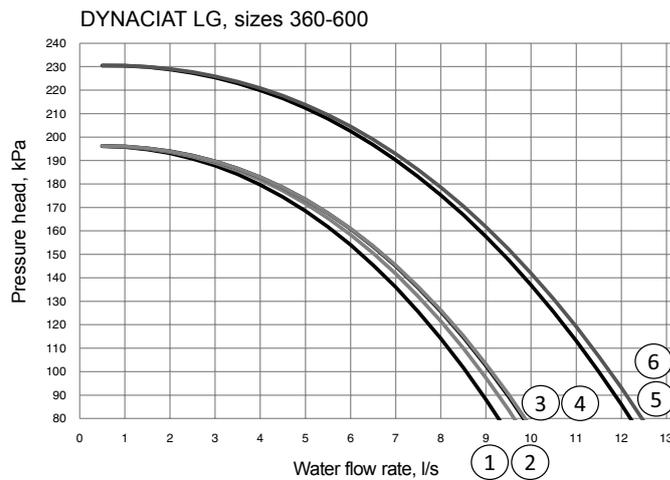
### ■ Available static system pressure

Units with hydraulic module (dual variable-speed high pressure pump)

Data applicable for:

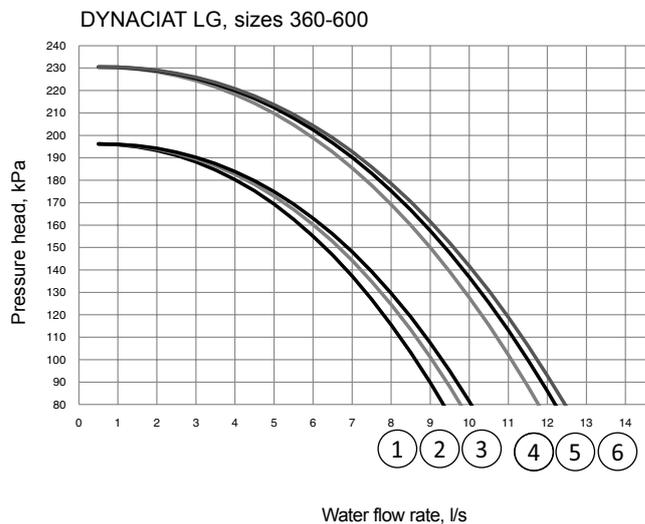
- Pure water at 20°C
- Refer to the section "Evaporator water flow rate" for the minimum and maximum water flow rate values
- If brine is used, the maximum water flow rate is reduced.

### ■ Evaporator



- 1 LG 360
- 2 LG 390
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- 5 LG 520
- 6 LG 600

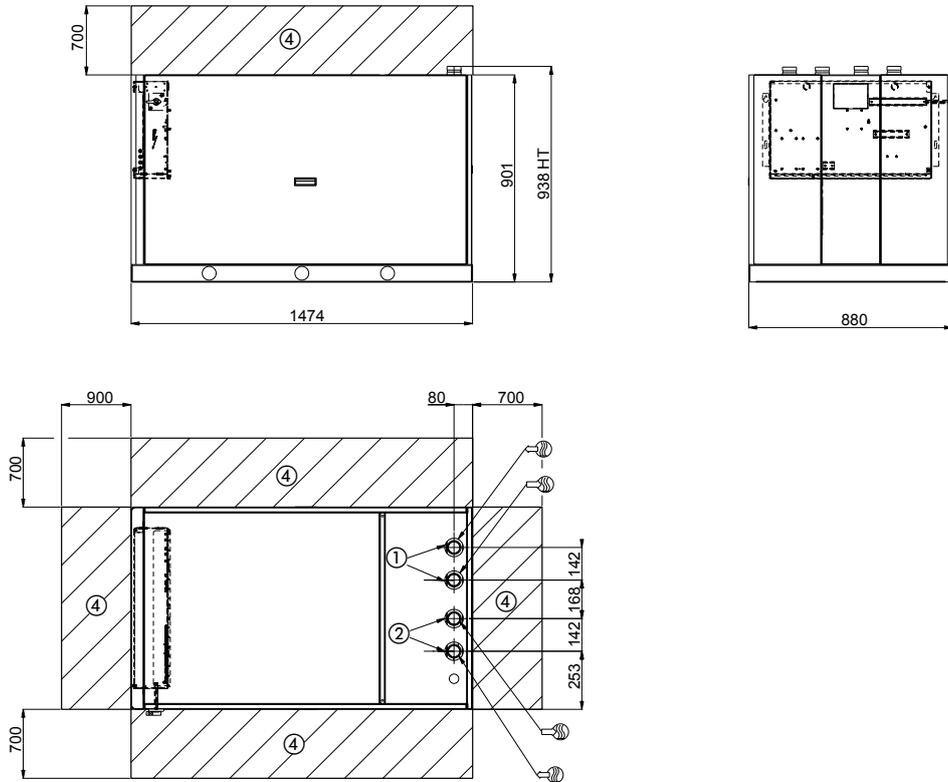
### ■ Condenser



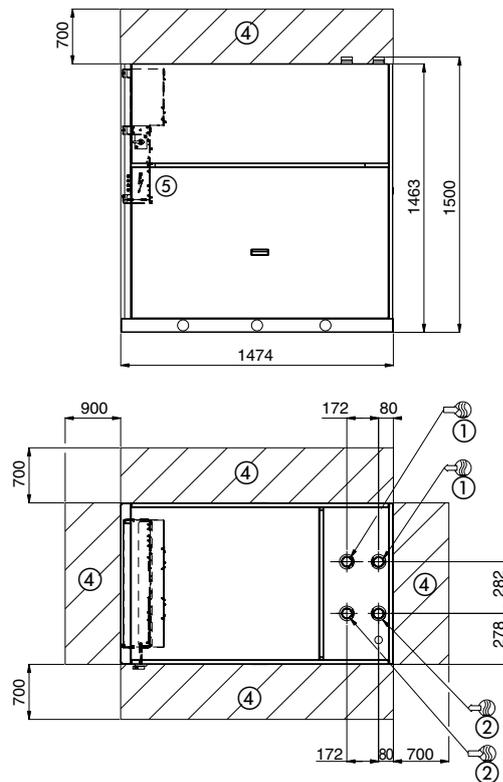
- 1 LG 360
- 2 LG 390
- 3 LG 450
- 4 LG 480
- 5 LG 520
- 6 LG 600

## DIMENSIONS

### ■ DYNACIAT LG 80A to 150 without hydraulic module



### ■ DYNACIAT LG 80A to 150 with hydraulic module



#### Key

All dimensions are given in mm

- ① Evaporator side
- ② Condenser side
- ③ Valve
- ④ Clearances required for maintenance (see Note)
- ⑤ Electrical box
- Water inlet
- Water outlet
- Electrical power connection

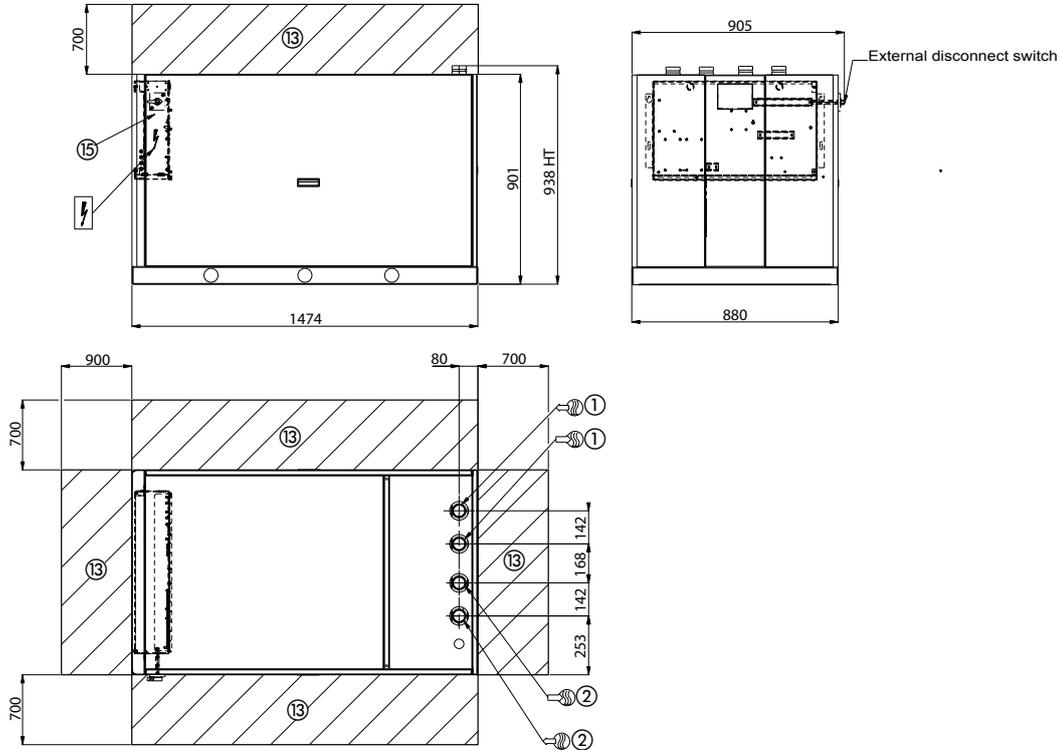
#### Notes:

Non-contractual drawings.

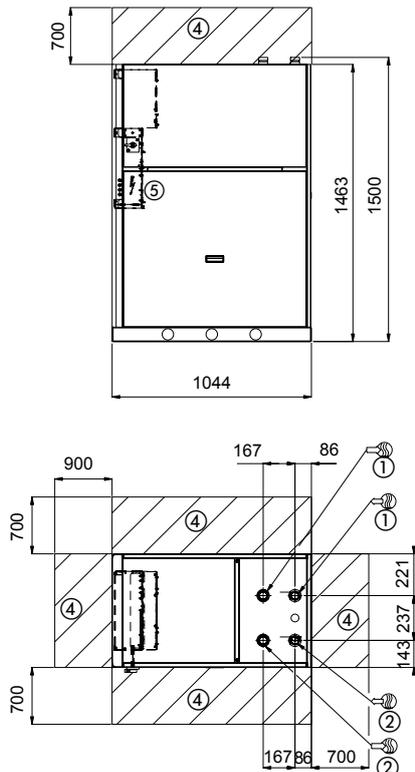
When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

## DIMENSIONS

### ■ DYNACIAT LG 180 to 300 without hydraulic module



### ■ DYNACIAT LG 180 to 300 with hydraulic module



#### Key

All dimensions are given in mm

- ① Evaporator side
- ② Condenser side
- ③ Valve
- ④ Clearances required for maintenance (see Note)
- ⑤ Electrical box
- Water inlet
- Water outlet
- Electrical power connection

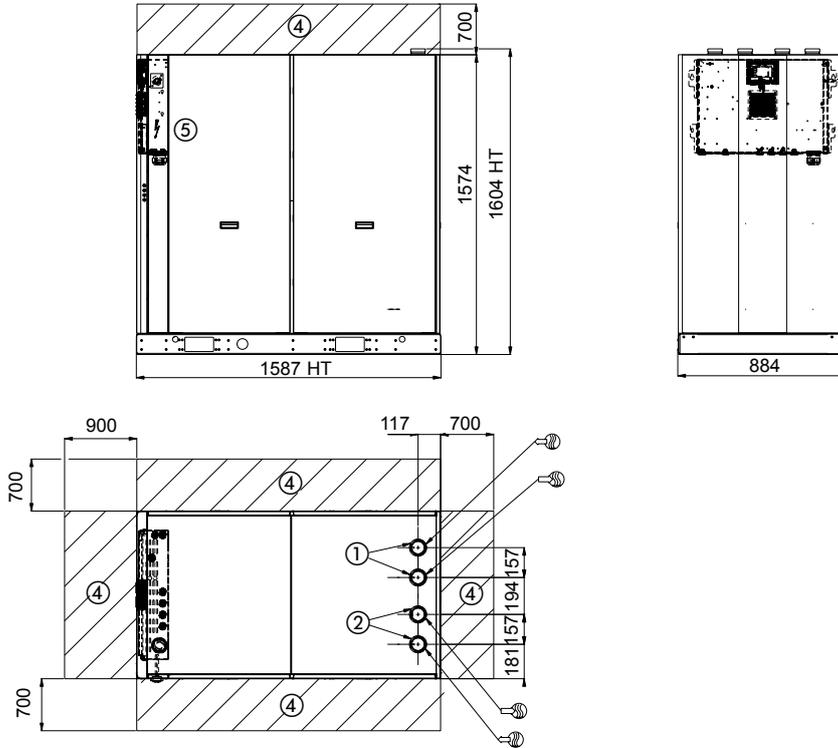
#### Notes:

Non-contractual drawings.

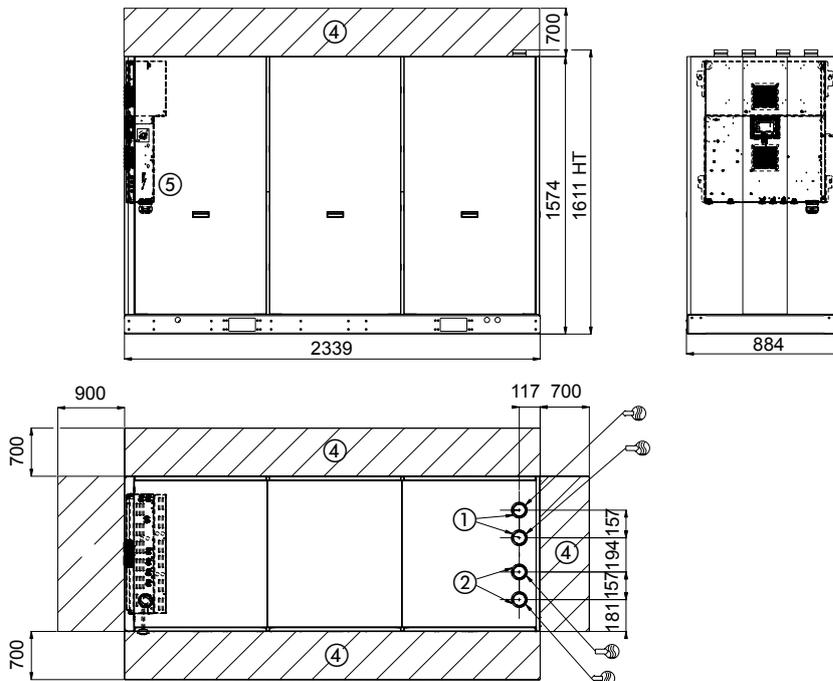
When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

## DIMENSIONS

### ■ DYNACIAT LG 360 to 450 without hydraulic module



### ■ DYNACIAT LG 360 to 450 with hydraulic module



#### Key

All dimensions are given in mm

- ① Evaporator side
- ② Condenser side
- ③ Valve
- ④ Clearances required for maintenance (see Note)
- ⑤ Electrical box
- Water inlet
- Water outlet
- Electrical power connection

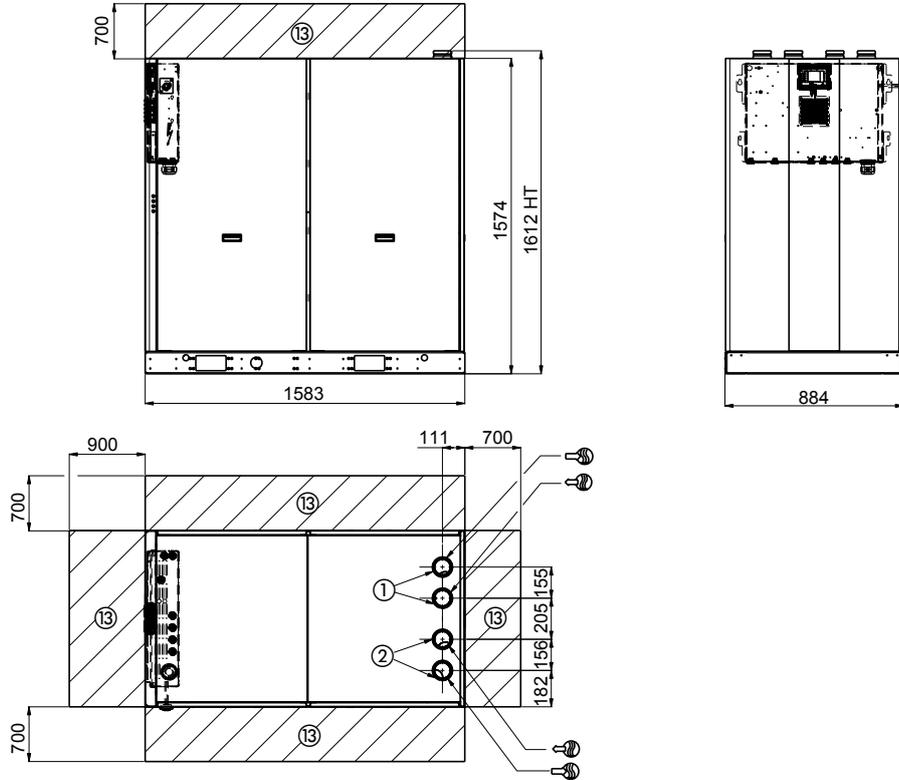
#### Notes:

Non-contractual drawings.

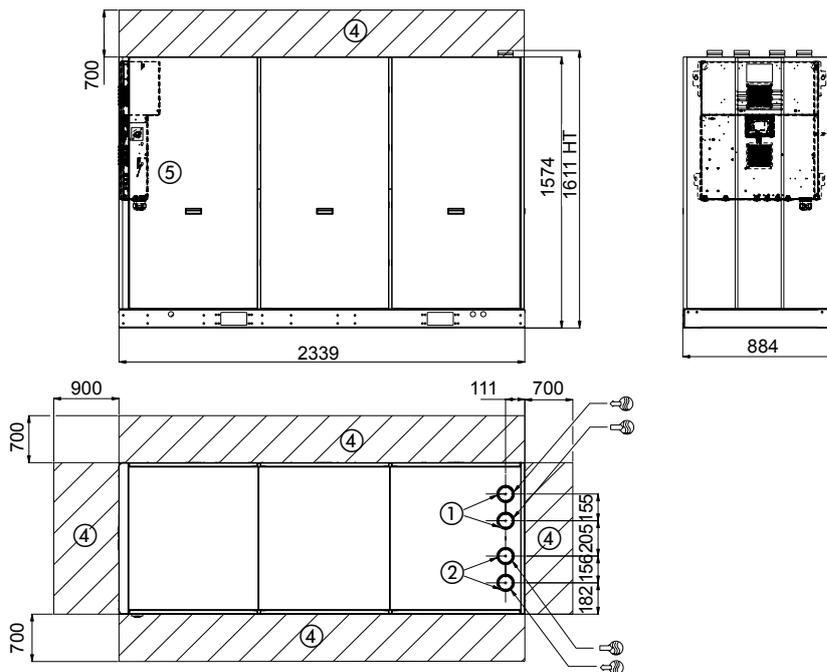
When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

## DIMENSIONS

### ■ DYNACIAT LG 480 to 600 without hydraulic module



### ■ DYNACIAT LG 480 to 600 with hydraulic module



#### Key

All dimensions are given in mm

- ① Evaporator side
- ② Condenser side
- ③ Valve
- ④ Clearances required for maintenance (see Note)
- ⑤ Electrical box
- Water inlet
- Water outlet
- Electrical power connection

#### Notes:

Non-contractual drawings.

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

## 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

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

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

### ■ Machine room ventilation

According to the regulations in force in the place in which the machine is to be installed, the machine room must comply with certain ventilation rules for fresh air to ensure there is no risk of discomfort or hazard in the event of a refrigerant leak.

### ■ 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 installation's drain valve. Pipes must be installed to allow sufficient access to the panels for maintenance, and must be fitted with heat insulation.

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

Pipe connections to be made on site:

- Water supply with pressure-reducing valve
- Evaporator, condenser and drain

Accessories essential to any hydraulic circuit must also be installed, such as:

- Water expansion 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 NPSH, particularly if the water circuits are "open".
- Test the water quality in accordance with the relevant technical requirements.
- Take the necessary precautions to protect the unit and hydraulic system from freezing temperatures (e.g. allow for the possibility of draining the unit). If glycol is added to prevent freezing, check its type and concentration before system start-up.
- Before making any final hydraulic connections, flush the pipes with clean water to remove any debris in the network.

## ■ System start-up

Units must be commissioned by CIAT or a CIAT-authorized firm.

You must follow the instructions in the manual.

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

- Correct siting of unit
- Power supply protections
- Phases and direction of rotation
- Wiring connections on unit
- Direction of water flow in unit
- Cleanliness of water circuit
- Water flow rate at specified value
- Pressure in the refrigerant 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.

## DRYCOOLERS

■ CIAT OPERA series drycoolers are compatible with DYNACIAT LG units with water cooled condensers.

■ Available in a wide range of sizes and with 6 ventilation speeds, OPERA can be adapted to the noise constraints or space restrictions of each site.



## CONTROL

### USER-FRIENDLY INTERFACE CONSOLE

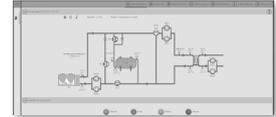
- User-friendly 4.3-inch touch screen.
- Information displayed in a choice of languages.
- Temperature and pressure readings.
- Operating and fault status diagnostics.
- Master/slave control of two machines in parallel.
- Fault memory management.
- Pump management.
- Time schedule.
- IP Web server.
-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



### 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

### Drycooler control

Connect Touch management for a CIAT OPERA Drycooler via a simple bus

- Dry cooler used as**
- Heat rejection
  - Free cooling source



### 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
  - Circuit fault reporting
  - User fault reporting

- Additional inputs available as options:**
- Setpoint adjustable by 4-20 mA signal

- Additional outputs available as options:**
- 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

Customer CMS

Via dry contact

Via BUS communication

## CIAT SYSTEM FUNCTIONALITY

Communication with Hysys system (generator, transmitter, air handling unit), controlled by an Easy CIATcontrol or Smart CIATcontrol touch tablet.

- **Logging** of consumption data and temperatures •
- **Optimal Water®**: optimisation of producer performance based on building requirements
- **Optimal Stop and Start**: optimisation of the building restart time





→ Water chillers  
Heat pump

DYNACIAT LG

This document is not legally binding. As part of its continuous drive to improve its equipment, CIAT reserves the right to make any technical modifications without prior notice.

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#### CIAT Service

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Spare parts: 0 826 96 95 94 (€0.15/min)  
[PDRFrance@ciat.fr](mailto:PDRFrance@ciat.fr) - [PDRGarantie@ciat.fr](mailto:PDRGarantie@ciat.fr)



Compagnie Industrielle d'Applications Thermiques - S.A. with a registered capital of €26,728,480 - Companies and trade registry. Bourg-en-Bresse B 545 620 114

ISO 9001 • ISO 14001  
OHSAS 18001  
Certified  
Management System