



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 (ESEER 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

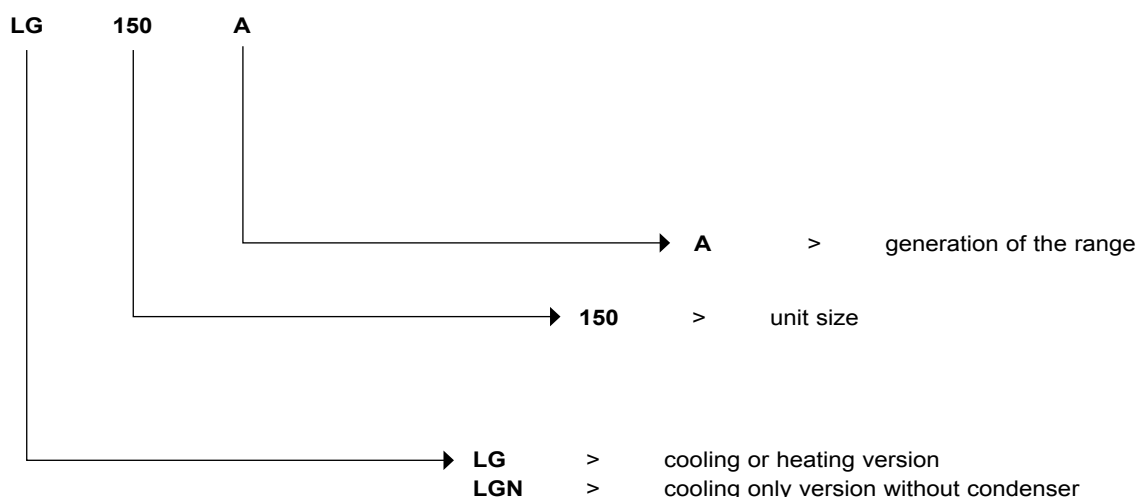
DYNACIAT units are packaged machines supplied as standard with the following components:

- Hermetic SCROLL compressors
- Chilled-water evaporator with brazed plates
- Hot water condenser, with brazed plates
- Electrical power and remote control cabinet:
 - 400 V-3ph-50 Hz (+/-10%) mains power supply + earth
 - transformer fitted as standard on the machine for supplying the remote control circuit with 24 V
- 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
- Refrigerating systems and heat pumps EN 378-2

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 armaflex thermal insulation

■ Condenser

- Brazed-plate exchanger
- Plate patterns optimised for high-efficiency
- 19 mm armaflex 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

■ Frame

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 5 languages (F-GB-D-E-I)



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-adjusting and proactive functions with adjustment of settings on drift control
- In-series staged power control system on the compressors according to the thermal requirements
- Management of compressor short-cycle protection
- 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 selection: when this contact is closed, a second cooling setpoint is activated (energy storage or unoccupied mode, for example)
- Power limitation: closing the contact allows the power and 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 cooling 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).

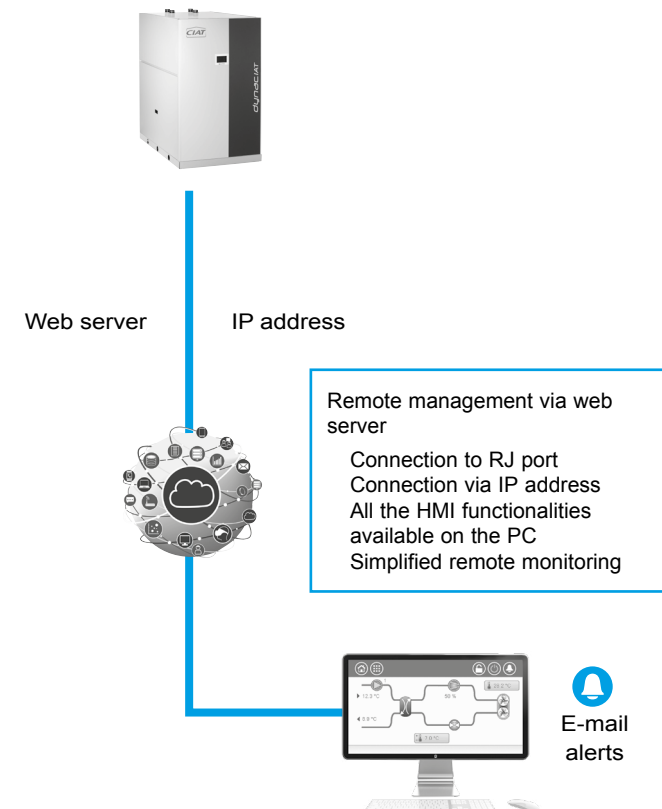
Contacts available as an option:

- Setpoint adjustable by 4-20 mA signal: this input allows the setpoint to be adjusted 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 unit's refrigerant charge, in compliance with the F-GAS regulations

■ CIATM2M, the CIAT supervision solution

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

Advantages

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

Functions

CIATM2M will send data in real time to a supervision website: www.ciatm2m.com.

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

Any event can be configured to trigger a mail alert.

Parameters monitored:

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

Monthly and annual reports are available to analyse:

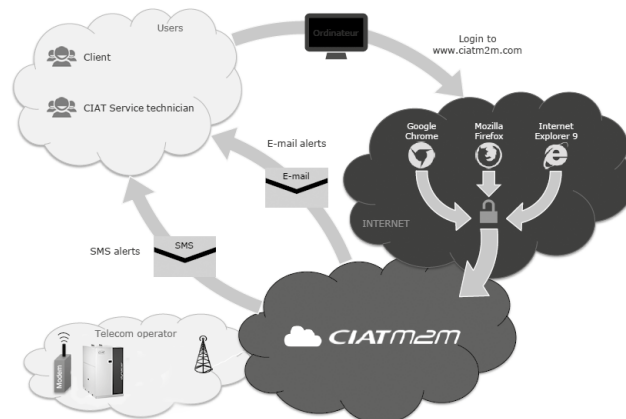
- The performance and operation of the machine
Example: operating curves and time, number of compressor start-ups, events, preventive maintenance actions to be performed, etc.
- The electricity consumed (if the energy meter option is present)

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

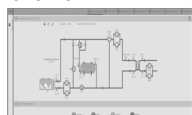
Equipment

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

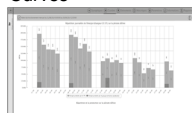
- 1 transportable cabinet
- 1 wall-mounted antenna



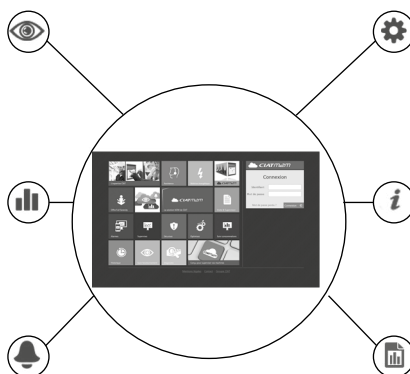
Overview



Curves



Events
(real time and archives)



Supervision platform
CIATM2M

Parameters



Information



Reports



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	Sizes 80A to 300A and 480A to 600A
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 parrallele operation with operating time equalisation	●
Condenser insulation	Thermal condenser insulation	Minimizes thermal dispersions condenser side (key option for heat pump or heat recovery applications) and allows compliancy with special installation criteria (hot parts insulated)	●
HP single-pump hydronic 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 360A to 600A
LP evap. single-pump	Evaporator hydronic 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 hydronic 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 single-pump, cond. side	Condenser hydronic module equipped with high pressure fixed-speed pump, drain valve, air vent and pressure sensors. Option with built-in safety hydraulic components available.)	Easy and fast installation (plug & play)	Sizes 360A to 600A
LP single-pump, cond. side	Condenser hydronic module equipped with low pressure fixed-speed pump, drain valve, air vent and pressure sensors. Option with built-in safety hydraulic components available.)	Easy and fast installation (plug & play)	●
HP cond. variable-speed single-pump	Condenser hydronic module equipped with high-pressure variable-speed pump, drain valve, air vent and pressure sensors. (expansion tank not included). Option with built-in safety hydraulic components available.)	Easy and fast installation (plug & play), reduced power consumption of the water circulation pump	●
Safety hydraulic components, evap. side	Screen filter, expansion tank and relief valve integrated in the evaporator hydronic module	Easy and fast installation (plug & play), operating safety	With pump option ●
Safety hydraulic components, cond. side	Screen filter, expansion tank and relief valve integrated in the condenser hydronic module	Easy and fast installation (plug & play), operating safety	With pump option ●
Lon gateway	Two-directional communication board complying with Lon Talk protocol	Connects the unit by communication bus to a building management system	●
Bacnet over IP	Two-directional high-speed communication using BACnet protocol over Ethernet network (IP)	Easy and high-speed connection by ethernet line to a building management system. Allows access to multiple unit parameters	●
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 externals heating stage (electrical heaters...)	Extended remote control capabilities to up to 4 electrics heaters. Permits easy control of a basic heating system	●
Compliance with Russian regulations	EAC certification	Conformance with Russian regulations	●
Low noise	Compressor sound enclosure	Reduced sound emissions	●
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	●

● ALL MODELS

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

Options	Description	Advantages	LG
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 associate with flexible connection on water side	●
Exchangers flexibles connection (kit)	Flexibles 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	● without pump option
Condenser water filter (kit)	Water filter	Eliminate dust in the water network	● without pump option
Set point adjustment by 4-20mA signal	Connections to allow a 4-20mA signal input	Easy energy managment, allow to adjust set point by a 4-20mA 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 managment, Extended control capabilities to a drycooler used in Free Cooling mode	●
M2M supervision (accessory)	Monitoring solution which allows customers to track and monitor their equipment remotely in real time	Real-time expert technical support to improve equipment availability and reports at customer hand to monitor and optimize operating equipment.	●

- ALL MODELS

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

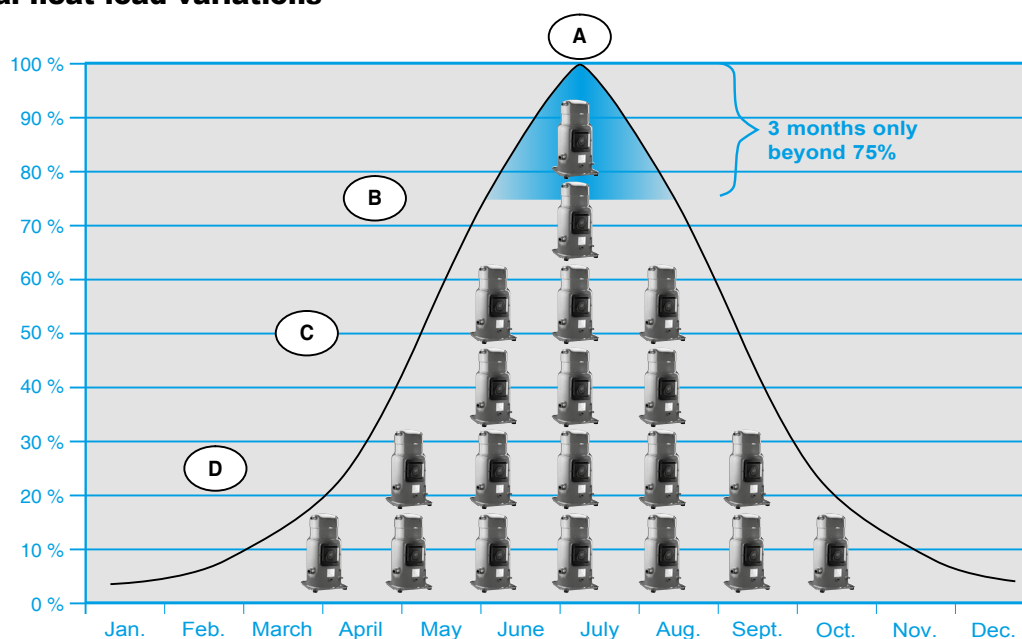
SEASONAL PERFORMANCE, COOLING MODE

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

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

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

■ Seasonal heat load variations



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

A, B, C and D are weighting coefficients pertaining to a unit's running time based on its load

The ESEER design conditions for water-cooled water chillers are as follows:

Load (%)	Hot water (°C)	Chilled water (°C)	Energy efficiency	Weighting coefficient
100	30 / 35 (*)	12 / 7	EER100%	A = 0.03
75	26 / - (*)	- / 7 (*)	EER75%	B = 0.33
50	22 / - (*)	- / 7 (*)	EER50%	C = 0.41
25	18 / - (*)	- / 7 (*)	EER25%	D = 0.23

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

The efficiency under partial load is therefore essential when choosing a water chiller. It is with this in mind that the new 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 ESEER ratings.

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.

As an option, the DYNACIAT can be equipped with variable-speed fan motor assemblies. This technology enables the machine's part-load performance to be improved, along with its ESEER.

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 η_s (Greek letter eta followed by the letter "s" for seasonal) and expressed as a percentage. For heat pumps, the SCOP (final energy) value is transposed to η_s (primary energy) by taking into account a conversion coefficient of 2.5 which corresponds to the average efficiency of the electrical production and various corrections for the responsiveness of the regulation system ($i = 8$ for water-to-water heat pumps).

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

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

$\eta_s = 125\%$, 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:

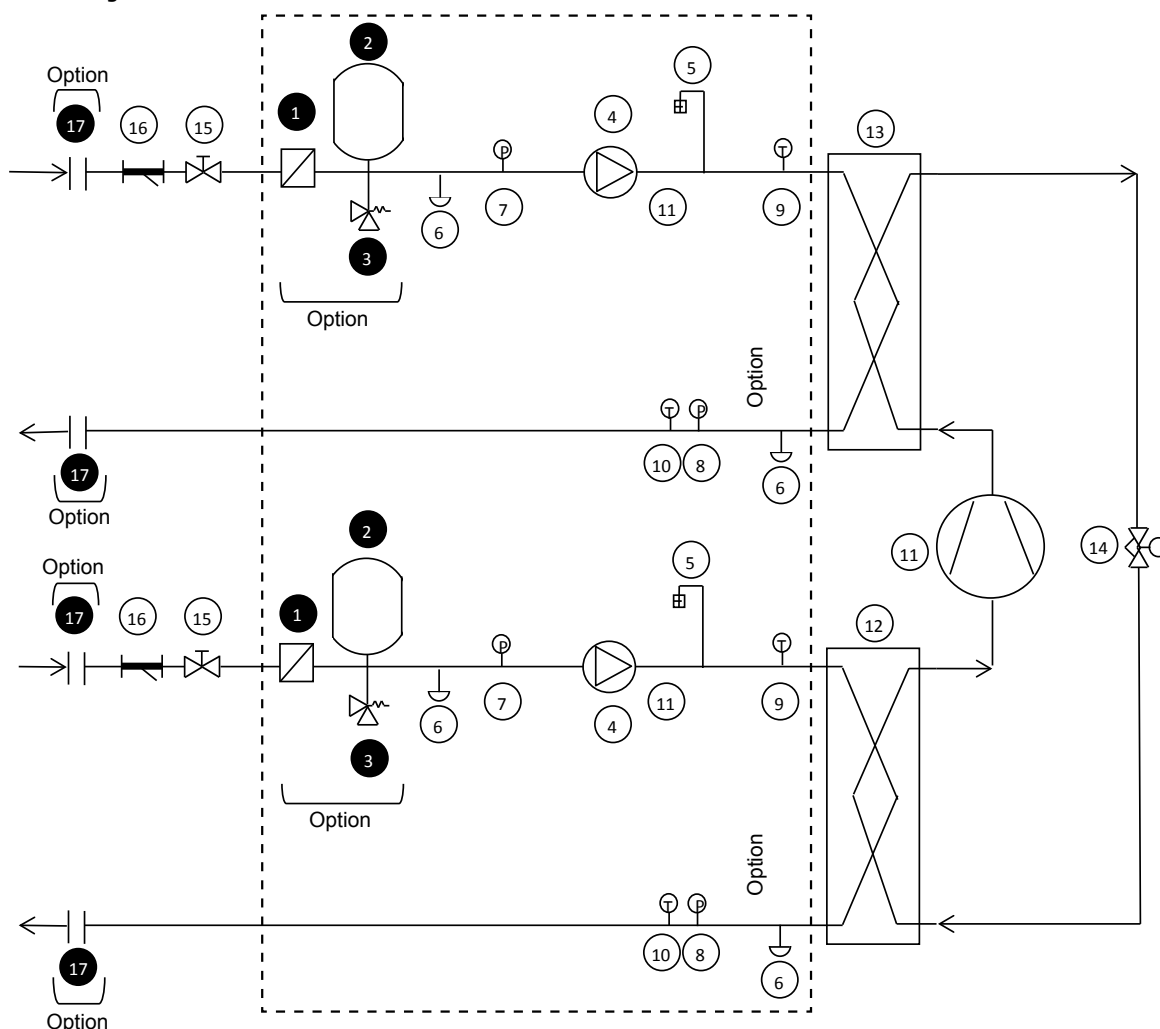
- Expansion vessel (option):
 - 8 litres, 12 litres, 25 litres or 35 litres, depending on the model
- Wide choice of pumps:
 - High or low pressure single pumps.
 - Fixed-speed or variable-speed pumps.
- Water temperature and pressure sensors.

- 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 with hydraulic module



Unit and hydraulic module elements

- 1 Victaulic screen filter
- 2 Expansion tank (Optional Hydraulic safety components on evaporator side and condenser side)
- 3 Relief valve (Optional Hydraulic safety components on evaporator side and condenser side)
- 4 Water pump
- 5 Air bleed valve
- 6 Water drain valve
- 7/8 Pressure sensor inlet/outlet

- 9/10 Temperature sensor inlet/outlet
- 11 Compressor
- 12 Evaporator
- 13 Condenser
- 14 Expansion valve
- 15/16 800 µm screen filter and valve (Compulsory with a pump option and optional without)
- 17 Flexible connection coupling (Option)
- - - Hydraulic module (unit with hydraulic module option)

COMMENT: Units without a hydraulic module have a flow rate sensor.

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: Constant control of the pressure difference

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

● Variable flow: Constant control 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.

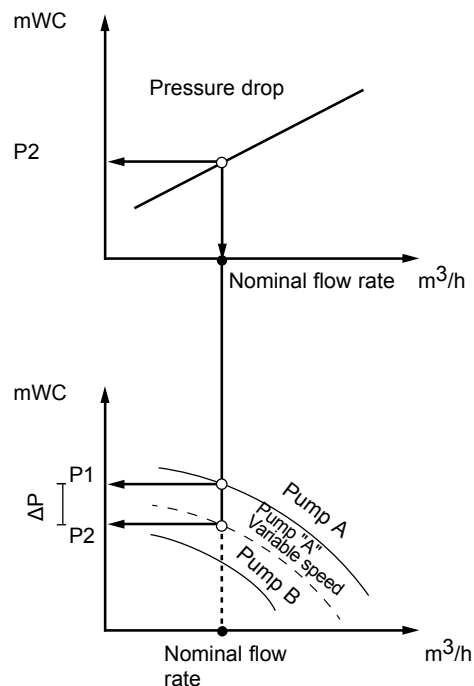
This provides energy savings of around 66% for the pump in each of these last two operating modes

■ 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				080A	090A	100A	120A	130A	150A	180A	200A	240A	260A	300A
Cooling														
Standard unit	C1	Nominal capacity	kW	24,6	28,6	31,5	36,7	41,8	46,6	58	63,3	73,7	83,8	94,4
	C1	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
	C1	Eurovent class cooling		B	B	B	B	B	B	B	C	C	C	B
	C2	Nominal capacity	kW	33,9	39,3	43	50,1	56,6	65,6	78,5	85,8	101,6	113,1	129,3
	C2	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
	C2	Eurovent class cooling		A	A	A	A	A	A	A	A	A	A	A
Seasonal efficiency*	C1	ESEER	kW/kW	5,05	5,04	4,98	4,99	4,98	5,02	5,66	5,69	5,63	5,81	5,76
	C3	SEPR	kW/kW	3,85	4,21	4,39	4,30	4,41	3,96	4,20	4,78	4,60	4,83	4,80
Heating														
Full load performances*	H1	Nominal capacity	kW	29,6	34,5	38	44,2	50,5	56,2	70,1	76,6	89	101,4	114,1
	H1	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
	H2	Nominal capacity	kW	28,6	33,3	36,4	42,6	49,1	53,5	68,1	74,3	84,8	96,7	108,2
	H2	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
	H3	Nominal capacity	kW	27,9	32,5	35	41,3	47,4	52	65,2	72,8	81	92,6	103,2
	H3	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
Seasonal efficiency**	H1	SCOP	kW/kW	5,35	5,33	5,24	5,28	5,23	5,26	5,95	5,90	5,93	6,01	6,03
	H1	η _{js} heat	%	206	205	202	203	201	202	230	228	229	232	233
	H1	Prated	kW	34	39	43	50	57	64	79	87	101	115	129
	H3	SCOP	kW/kW	4,31	4,31	4,29	4,31	4,33	4,28	4,79	4,83	4,74	4,96	4,81
	H3	η _{js} heat	%	164	164	163	164	165	163	184	185	181	191	184
	H3	Prated	kW	32	37	40	47	54	59	75	83	93	106	118
Integrated Part Load Values IPLV.SI				kW/kW	5,84	5,85	5,76	5,78	5,77	5,82	6,58	6,68	6,56	6,81
Sound levels														
Standard unit														
Sound power ⁽¹⁾			dB(A)	67	69	69	69	70	70	72	72	72	73	73
Sound pressure at 10 m ⁽²⁾			dB(A)	36	37	38	38	39	39	40	41	41	42	42
Unit + Low Noise option														
Sound power ⁽¹⁾			dB(A)	65	66	66	67	68	68	68	69	69	69	70
Sound pressure at 10 m ⁽²⁾			dB(A)	34	35	35	35	37	37	37	37	38	38	39
Dimensions														
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
Operating Weight ⁽³⁾														
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
Compressors														
Hermetic Scroll 48.3 r/s														
Circuit A			Qty	1	1	1	1	1	1	2	2	2	2	2
No. of control stages			Qty	1	1	1	1	1	1	2	2	2	2	2
Refrigerant ⁽³⁾														
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 ₂ e	7,3	7,3	7,5	7,7	8,4	9,6	15,9	16,3	16,5	18,2	24
Oil charge														
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

* In accordance with standard EN14511-3:2013.

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

C1 Conditions in cooling mode: Water type heat exchanger inlet/outlet temperature 12°C/7°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

C2 Conditions in cooling mode: Water type heat exchanger inlet/outlet temperature 23°C/18°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

C3 Conditions in cooling mode: Water type heat exchanger inlet/outlet temperature -2°C/-8°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

H1 Conditions in heating mode: Water type heat exchanger inlet/outlet temperature 10°C/7°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

H2 Conditions in heating mode: Water type heat exchanger inlet/outlet temperature 10°C/7°C, outdoor air temperature 40/45°C, evaporator fouling factor 0 m2K/W.

H3 Conditions in heating mode: Water type heat exchanger inlet/outlet temperature 10°C/7°C, outdoor air temperature 47/55°C, evaporator fouling factor 0 m2K/W.

IPLV.SI Calculations based on standard performances (in accordance with AHRI 551-591).

(1) In dB ref=10-12 W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)).

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

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



Eurovent certified values

TECHNICAL CHARACTERISTICS



DYNACIAT LG		080A	090A	100A	120A	130A	150A	180A	200A	240A	260A	300A
Power control		Connect Touch Control										
Minimum output	%	100	100	100	100	100	100	50	50	50	50	50
Water-cooled heat exchanger												
Evaporator		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
Condenser		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
Hydronic module (optional)												
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 ⁽⁴⁾	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
Water connections with or without hydraulic module		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
Casing paint		Colour code: RAL 7035 / RAL 7024										

- (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				360A	390A	450A	480A	520A	600A
Cooling									
Standard unit	C1	Nominal capacity	kW	114,5	129,9	143,5	152,9	171,8	191,8
	C1	EER	kW/kW	4,78	4,75	4,68	4,81	4,76	4,77
	C1	Eurovent class cooling		B	B	B	B	B	B
	C2	Nominal capacity	kW	155	176	196,2	206,8	230,4	261,6
	C2	EER	kW/kW	6,17	6,07	5,98	6,20	5,94	6,09
	C2	Eurovent class cooling		A	A	A	A	A	A
Seasonal efficiency*	C1	ESEER	kW/kW	6,07	6,17	6,08	6,01	6,05	5,96
	C3	SEPR	kW/kW	NA	NA	NA	4,74	4,80	4,76
Heating									
Full load performances*	H1	Nominal capacity	kW	137	155,6	172,4	183,3	206,4	230,2
	H1	COP	kW/kW	5,60	5,57	5,49	5,64	5,59	5,56
	H2	Nominal capacity	kW	130,8	147,6	163,4	174,1	196,8	218,4
	H2	COP	kW/kW	4,42	4,43	4,37	4,40	4,48	4,36
	H3	Nominal capacity	kW	125,1	140,1	155,2	166,5	188,7	208,6
	H3	COP	kW/kW	3,58	3,62	3,56	3,60	3,76	3,59
Seasonal efficiency**	H1	SCOP	kW/kW	6,24	6,28	6,18	6,24	6,24	6,08
	H1	ηs heat	%	242	243	239	242	241	235
	H1	Prated	kW	155	177	196	208	234	261
	H3	SCOP	kW/kW	5,02	5,05	5,01	4,99	5,14	4,92
	H3	ηs heat	%	193	194	192	192	198	189
	H3	Prated	kW	143	161	178	191	216	239
Integrated Part Load Values IPLV.SI				kW/kW	6,86	6,98	6,90	6,82	6,82
Sound levels									
Standard unit									
Sound power ⁽¹⁾			dB(A)	76	77	78	76	77	78
Sound pressure at 10 m ⁽²⁾			dB(A)	44	45	46	44	45	47
Unit + Low Noise option									
Sound power ⁽¹⁾			dB(A)	73	74	75	73	74	75
Sound pressure at 10 m ⁽²⁾			dB(A)	41	42	43	41	42	44
Dimensions									
Length			mm	880	880	880	880	880	880
Width			mm	1583	1583	1583	1583	1583	1583
Height			mm	1574	1574	1574	1574	1574	1574
Operating Weight ⁽³⁾									
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
Compressors				Hermetic Scroll 48.3 r/s					
Circuit A			Qty	3	3	3	2	2	2
Circuit B			Qty	-	-	-	2	2	2
No. of control stages			Qty	3	3	3	4	4	4
Refrigerant ⁽³⁾				R410A					
Circuit A			kg	13,3	14,7	15,3	10,5	11,5	12,1
			tCO ₂ e	27,8	30,7	31,9	21,9	23,9	25,05
Circuit B			kg	-	-	-	10,5	11,25	12
			tCO ₂ e	-	-	-	21,9	23,9	25,05
Oil charge				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

* In accordance with standard EN14511-3:2013.

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

C1 Conditions in cooling mode: Water type heat exchanger inlet/outlet temperature 12°C/7°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

C2 Conditions in cooling mode: Water type heat exchanger inlet/outlet temperature 23°C/18°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

C3 Conditions in cooling mode: Water type heat exchanger inlet/outlet temperature -2°C/-8°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

H1 Conditions in heating mode: Water type heat exchanger inlet/outlet temperature 10°C/7°C, outdoor air temperature 30/35°C, evaporator fouling factor 0 m2K/W.

H2 Conditions in heating mode: Water type heat exchanger inlet/outlet temperature 10°C/7°C, outdoor air temperature 40/45°C, evaporator fouling factor 0 m2K/W.

H3 Conditions in heating mode: Water type heat exchanger inlet/outlet temperature 10°C/7°C, outdoor air temperature 47/55°C, evaporator fouling factor 0 m2K/W.

IPLV.SI Calculations based on standard performances (in accordance with AHRI 551-591).

(1) In dB ref=10-12 W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)).

(2) Measured in accordance with ISO 9614-1.

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

Values are guidelines only. Refer to the unit name plate.



Eurovent certified values

TECHNICAL CHARACTERISTICS



DYNACIAT LG		360A	390A	450A	480A	520A	600A
Power control		Connect Touch Control					
Minimum output	%	33	33	33	25	25	25
Water-cooled heat exchanger							
Evaporator		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
Condenser		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
Hydronic module (optional)							
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 ⁽⁴⁾	bar	4	4	4	4	4	4
Max. water-side operating pressure with hydraulic module	kPa	400	400	400	400	400	400
Water connections with or without hydraulic module		Victaulic®					
Connections	inch	2,5	2,5	2,5	3	3	3
External diameter	mm	73	73	73	88,9	88,9	88,9
Casing paint		Colour code: RAL 7035 / RAL 7024					

- (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)		080A	090A	100A	120A	130A	150A	180A	200A	240A	260A	300A	360A	390A	450A	480A	520A	600A
Power circuit																		
Nominal voltage	V-ph-Hz	400-3-50																
Voltage range	V	360-440																
Control circuit supply		24 V via internal transformer																
Nominal unit current draw⁽³⁾																		
Circuit A&B	A	11,4	13,8	14,7	16,5	18,1	21,2	27,6	29,4	33	36,2	42,4	60,8	66	78,8	60,8	66	78,8
Maximum unit power input⁽²⁾																		
Circuit A&B	kW	9,3	10,9	11,8	13,8	15,4	17,3	21,8	23,6	27,6	30,6	34,5	56	60	68	56	60	68
Unit power factor at maximum capacity⁽²⁾																		
		0,85	0,83	0,85	0,85	0,86	0,85	0,83	0,85	0,85	0,86	0,85	0,87	0,85	0,85	0,87	0,85	0,85
Maximum unit current draw (Un-10%)⁽⁵⁾																		
Circuit A&B	A	17,2	20,6	21,8	25,6	28,0	31,9	41,2	43,6	51,2	56,0	63,8	102,4	112	127,6	102,4	112	127,6
Maximum current draw (Un)⁽⁴⁾																		
Circuit A&B - Standard unit	A	15,6	18,7	19,8	23,2	25,4	29,0	37,5	39,6	46,4	50,8	58,0	92,8	101,6	116	92,8	101,6	116
Maximum start-up current, standard unit (Un)⁽¹⁾																		
Circuit A&B	A	98	142	142	147	158	197	161	163	172	185	227	192,6	207,5	284	192,6	207,5	284
Maximum start-up current, unit with soft start (Un)⁽¹⁾																		
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	126,2	136,4	195,4	126,5	136,4	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⁽¹⁾)

DYNACIAT LG		080A	090A	100A	120A	130A	150A	180A	200A	240A	260A	300A	360A	390A	450A	480A	520A	600A
Value without upstream protection																		
Short time (1s) assigned current - I _{cw}	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 _{pk}	kA pk	6	6	6	6	6	6	6	6	6	6	6	20	20	20	20	20	20
Value with upstream protection																		
Conditional short circuit assigned current I _{cc}	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 ⁽²⁾		NSX 100N																

- (1) Type of system earthing
(2) If another current limiting protection device is used, its time-current trip and I²t thermal stress characteristics must be at least equivalent to those of the recommended Schneider circuit breaker. Contact your manufacturer's representative.
The short-circuit withstand values given above were determined for the TN system.

INTELLIGENTLY-DESIGNED ACOUSTICS

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 (L_w)

At nominal EN 14511-3 operating conditions: 2013 - 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	
080A	60	53	52	63	61	57	67
090A	64	56	56	63	60	58	69
100A	61	59	58	64	63	60	69
120A	64	59	59	64	61	58	69
130A	59	60	58	67	64	59	70
150A	57	56	57	66	65	62	70
180A	47	60	65	68	66	56	72
200A	43	61	65	68	67	57	72
240A	46	61	67	67	66	55	72
260A	40	61	65	70	68	55	73
300A	51	64	64	69	69	58	73
360A	83	73	71	70	68	65	76
390A	84	74	72	71	69	66	77
450A	80	75	71	74	72	65	78
480A	78	74	71	70	71	65	76
520A	79	75	72	71	72	66	77
600A	82	76	75	74	71	66	78

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

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

DYNACIAT LG	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
080A	29	22	20	32	30	25	36
090A	33	25	24	32	29	27	37
100A	30	28	26	33	31	29	38
120A	33	28	28	33	30	27	38
130A	27	28	27	35	32	27	39
150A	26	25	26	35	34	31	39
180A	16	28	33	37	34	25	40
200A	12	30	34	36	36	25	41
240A	15	30	35	36	35	23	41
260A	9	30	34	38	36	23	42
300A	19	33	33	38	38	27	42
360A	51	42	39	39	36	33	44
390A	52	43	40	40	37	34	45
450A	48	44	39	42	40	33	46
480A	46	43	39	39	39	33	44
520A	47	44	40	40	40	34	45
600A	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 ± 3 dB (L_w)

At nominal EN 14511-3 operating conditions: 2013 - 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	
080A	59	58	50	60	57	51	65
090A	58	57	55	62	58	54	66
100A	58	57	56	61	59	54	66
120A	58	57	59	62	59	54	67
130A	64	58	56	64	60	53	68
150A	58	57	56	65	63	58	68
180A	48	57	61	65	62	51	68
200A	43	59	61	65	63	51	69
240A	47	59	63	65	62	49	69
260A	39	58	61	66	63	48	69
300A	50	62	60	66	65	52	70
360A	80	70	68	67	65	62	73
390A	81	71	69	68	66	63	74
450A	77	72	68	71	69	62	75
480A	75	71	68	67	68	62	73
520A	76	72	69	68	69	63	74
600A	79	73	72	71	68	63	75

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

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

DYNACIAT LG	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
080A	27	27	19	29	26	20	34
090A	27	26	24	30	26	23	35
100A	27	26	24	30	27	23	35
120A	27	26	27	31	28	23	35
130A	33	27	25	32	29	22	37
150A	27	26	25	33	31	27	37
180A	16	26	30	34	30	19	37
200A	12	27	30	33	32	20	37
240A	15	28	32	34	31	18	38
260A	8	27	30	35	31	17	38
300A	19	30	28	35	33	21	39
360A	48	39	36	36	33	30	41
390A	49	40	37	37	34	31	42
450A	45	41	36	39	37	30	43
480A	43	40	36	36	36	30	41
520A	44	41	37	37	37	31	42
600A	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 controller is equipped with anticipation logic making it highly flexible in adjusting operation to parameter drift, particularly on hydraulic systems with low water volumes. By adjusting compressor running times, it prevents short-cycle protection cycles from starting and, in most cases, eliminates the need for a buffer tank.

N.B.: 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)

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

■ Minimum system water volume and exchanger water flow rate

DYNACIAT LG		080A	090A	100A	120A	130A	150A	180A	200A	240A	260A	300A	
Evaporator													
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	1.0 / 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	6,4	8,1	
	High pressure	3,7	3,9	3,9	4,3	4,5	4,8	7,9	8,1	8,3	8,4	8,8	
Condenser													
Minimum system water volume, air conditioning application (litres)		75,0	87,5	95,0	110,0	125,0	140,0	175,0	192,5	222,5	252,5	285,0	
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	0.4 / 5.4	0.4 / 7.0	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	5,8	7,4	
	High pressure	3,6	3,9	3,9	4,2	4,4	4,6	6,9	7,1	7,3	7,5	8	
DYNACIAT LG		360A		390A		450A		480A		520A		600A	
Evaporator													
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		14	
	High pressure	11,8		12,5		12,8		12,5		13,05		13,3	
Condenser													
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)		11.4 / 13.05		12.5 / 15		13.2 / 16.66		12.58 / 16.38		13.61 / 18.8		14 / 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		13,6		14,0	
	High pressure	11,7		12,4		12,9		13,8		14,4		14,7	

(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

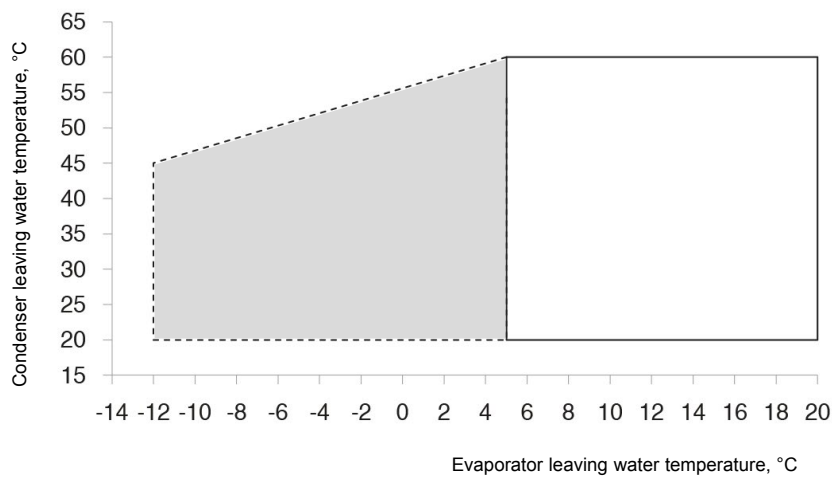
The DYNACIAT can be used for all traditional heating and air conditioning applications in sectors as varied as collective housing, hotels, shopping centres and offices.

■ 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 option (Not available on sizes 360A-390A-450A)

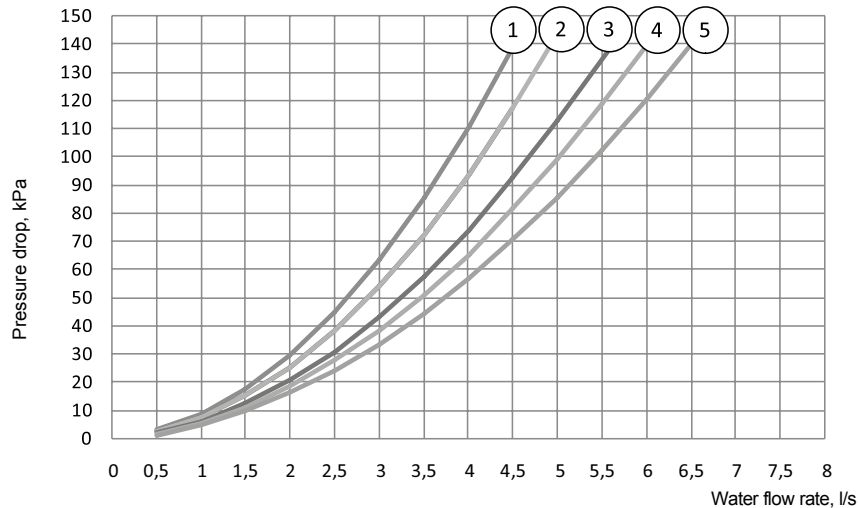
HYDRAULIC SPECIFICATIONS

■ Water pressure drop in the evaporator

Data applicable for pure water at 20°C

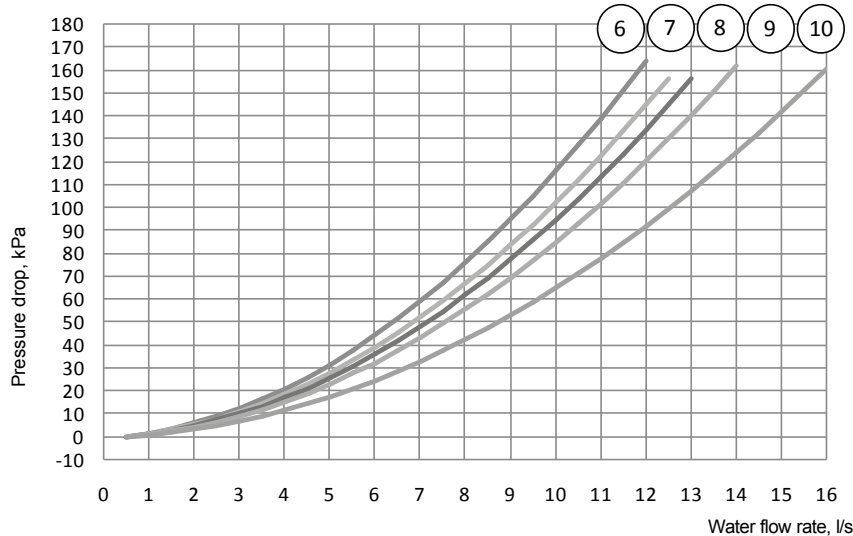
■ Evaporator

DYNACIAT LG sizes 080A-150A



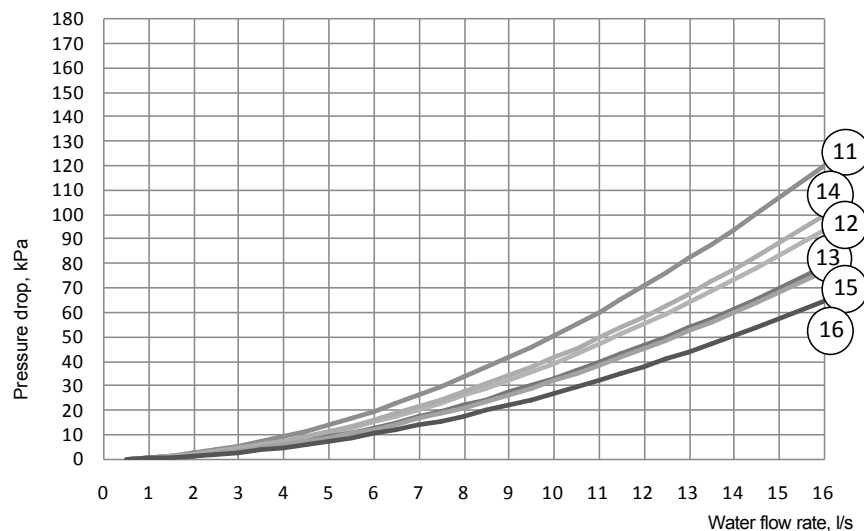
- 1 080A
- 2 090A - 100A
- 3 120A
- 4 130A
- 5 150A

DYNACIAT LG sizes 180A-300A



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

DYNACIAT LG sizes 360A-600A



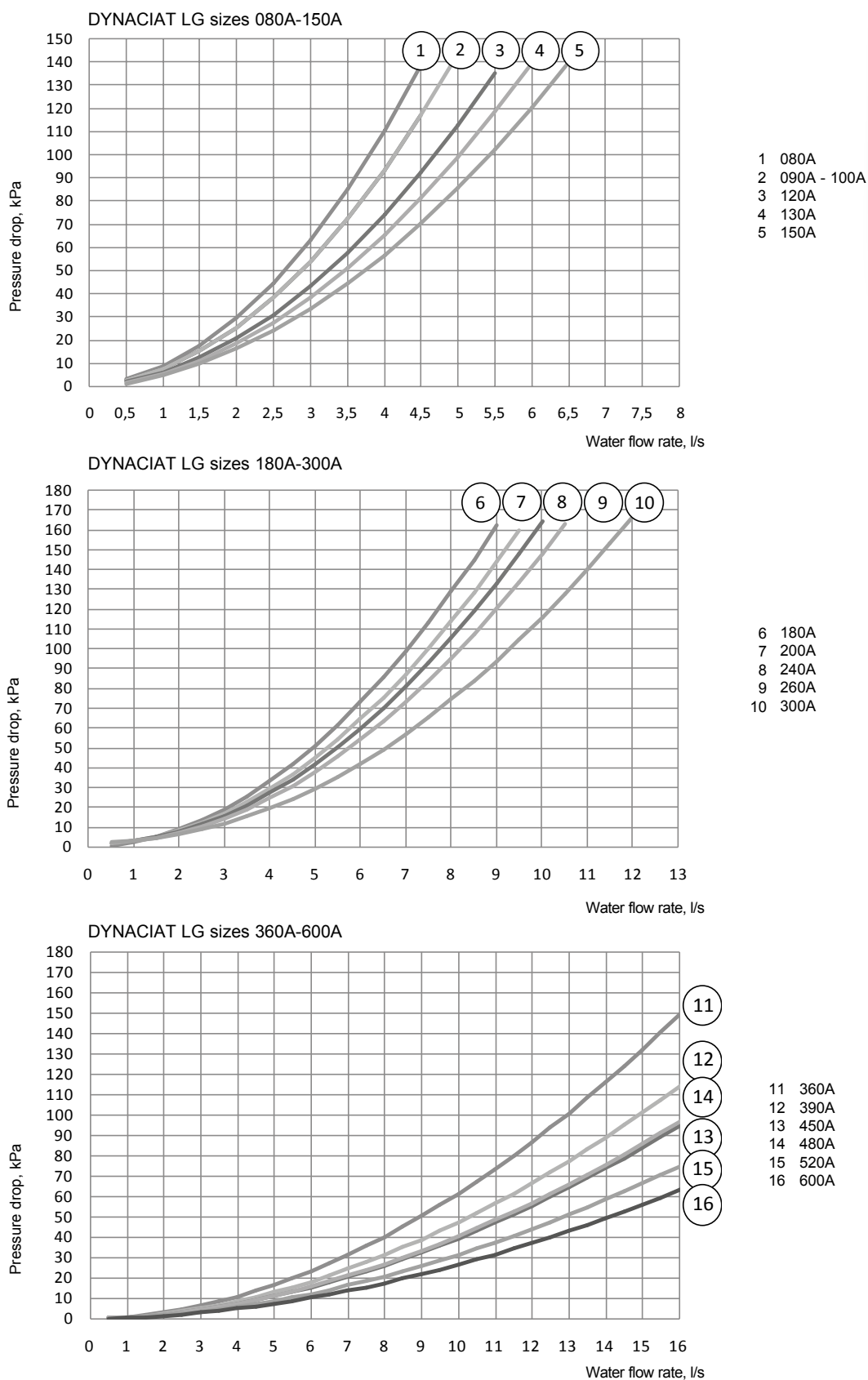
- 11 360A
- 12 390A
- 13 450A
- 14 480A
- 15 520A
- 16 600A

HYDRAULIC SPECIFICATIONS

■ Water pressure drop in the evaporator

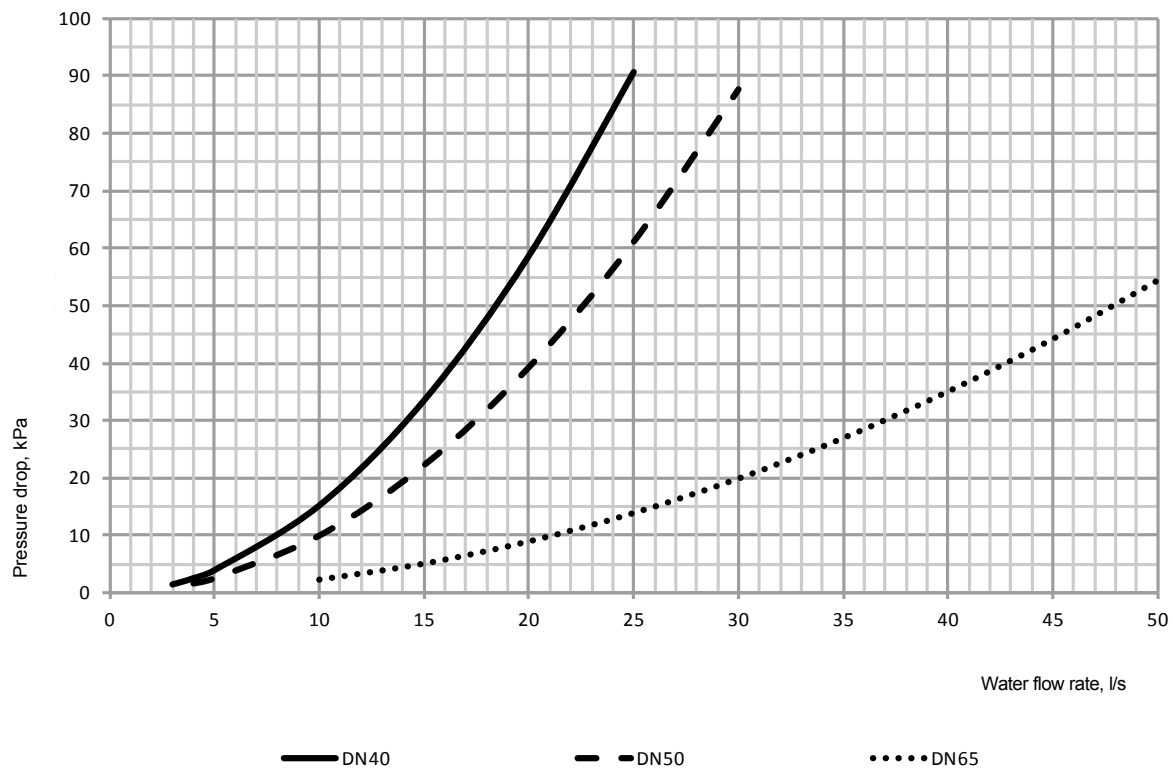
Data applicable for pure water at 20°C

■ Condenser



HYDRAULIC SPECIFICATIONS

■ Water pressure drop in the filter



HYDRAULIC SPECIFICATIONS

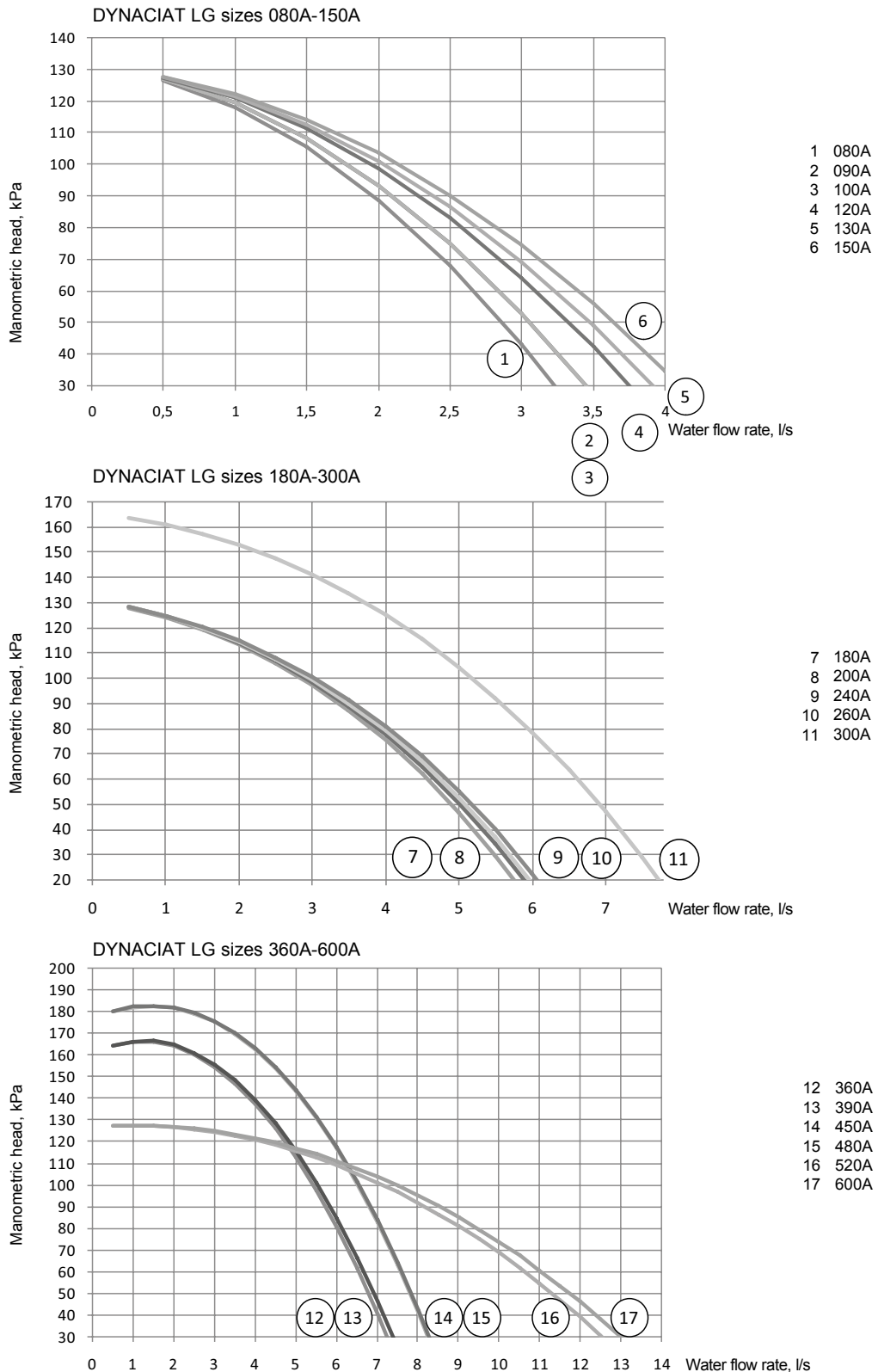
■ Available static system pressure

Units with hydraulic module (single 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



HYDRAULIC SPECIFICATIONS

■ Available static system pressure

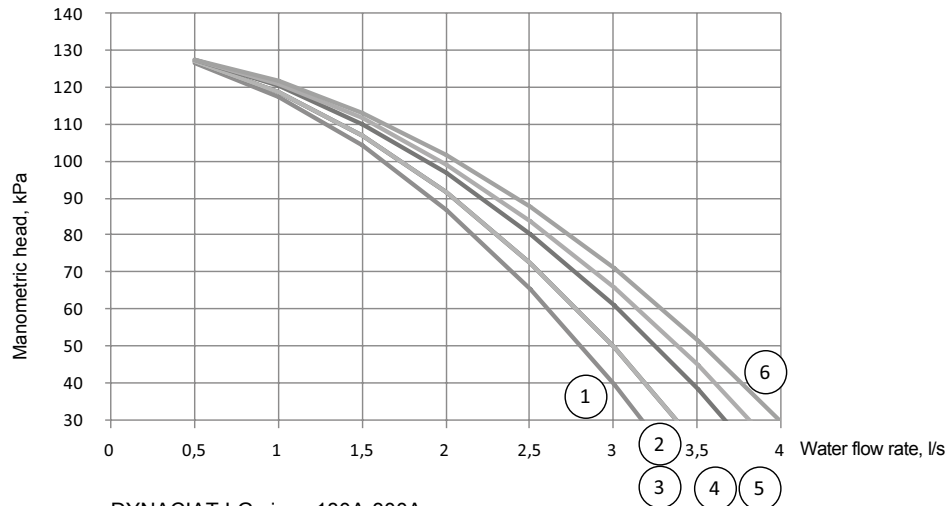
Units with hydraulic module (single fixed-speed low pressure pump)

Data applicable for:

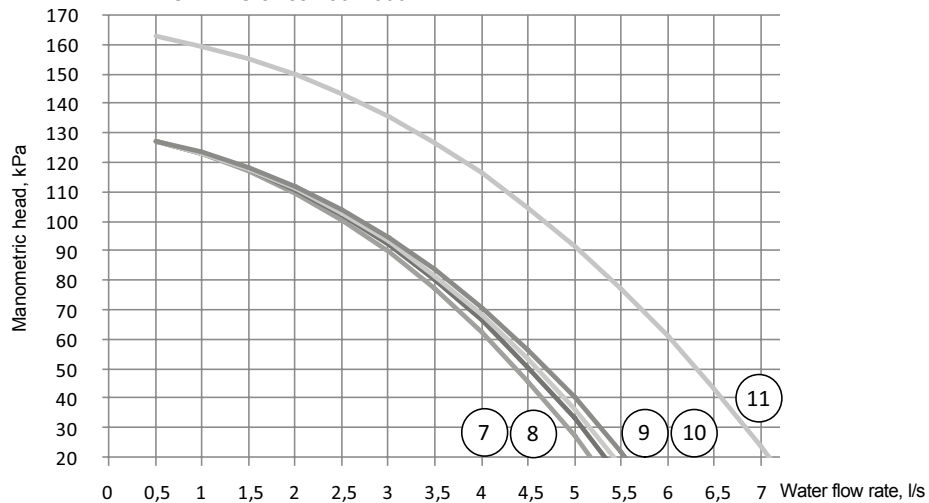
- Pure water at 20°C
- Refer to the section "Evaporator water flow rate" for the minimum and maximum water flow rate values
- If brine is used, the maximum water flow rate is reduced.

■ Condenser

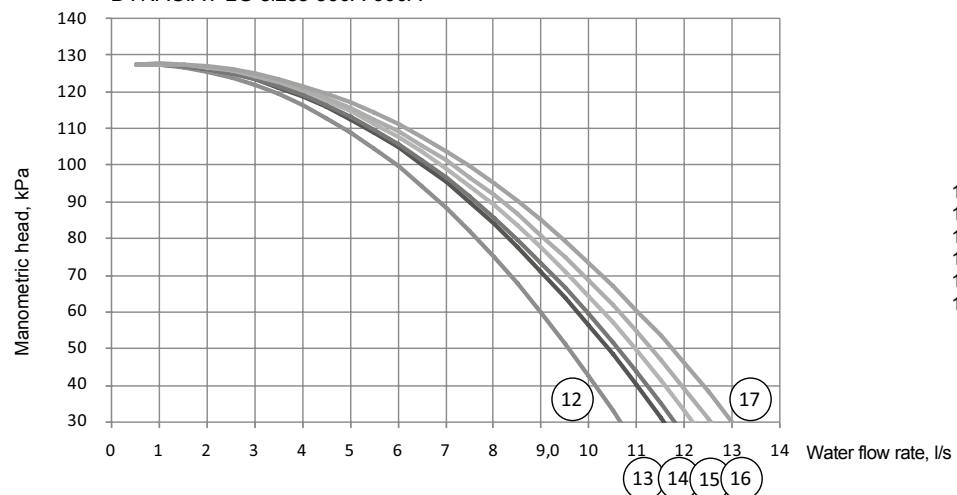
DYNACIAT LG sizes 080A-150A



DYNACIAT LG sizes 180A-300A



DYNACIAT LG sizes 360A-600A



HYDRAULIC SPECIFICATIONS

■ Available static system pressure

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

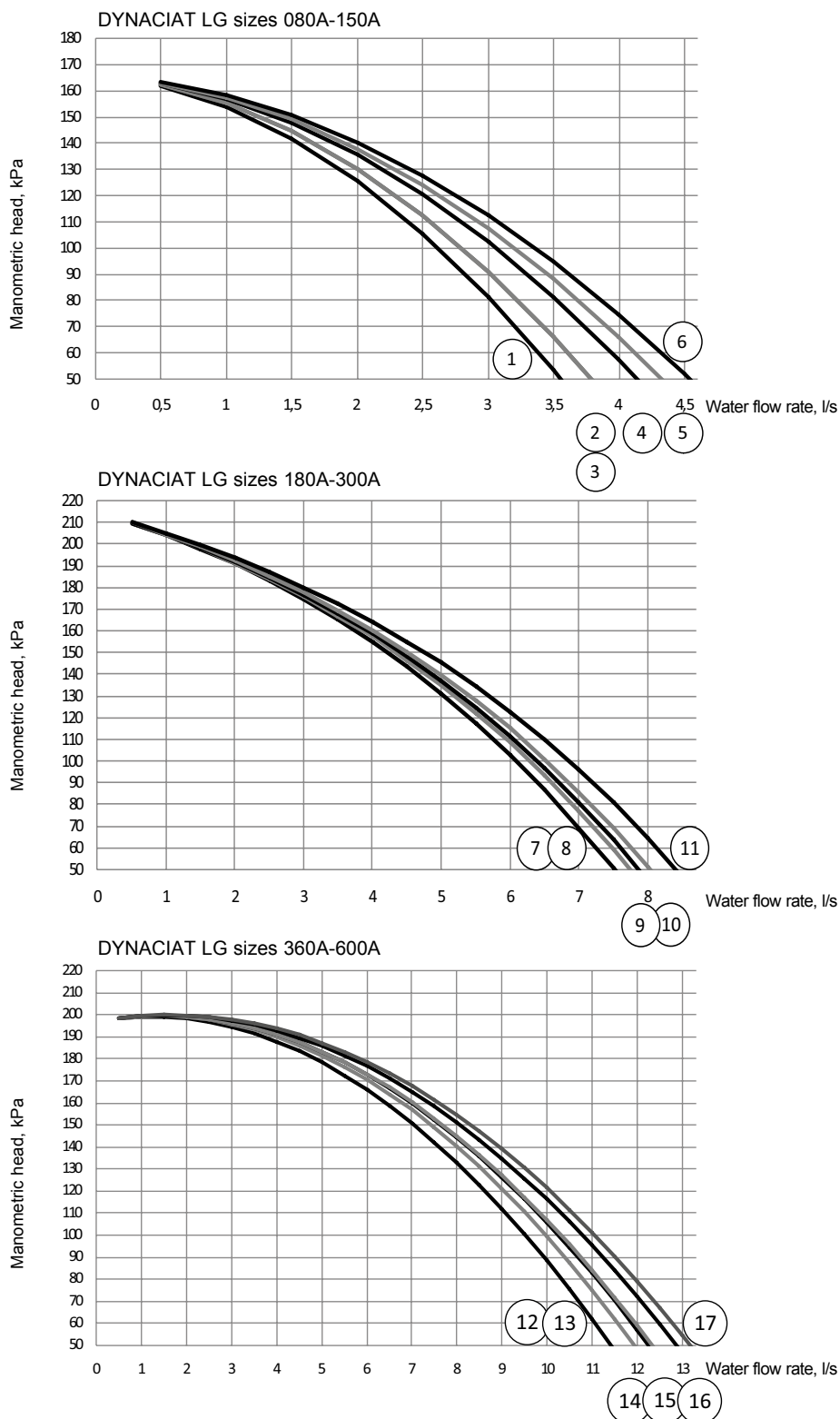
Data applicable for:

- Pure water at 20°C

- Refer to the section "Evaporator water flow rate" for the water flow rate values

(*) Sizes 360A to 600A only

■ Evaporator



HYDRAULIC SPECIFICATIONS

■ Available static system pressure

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

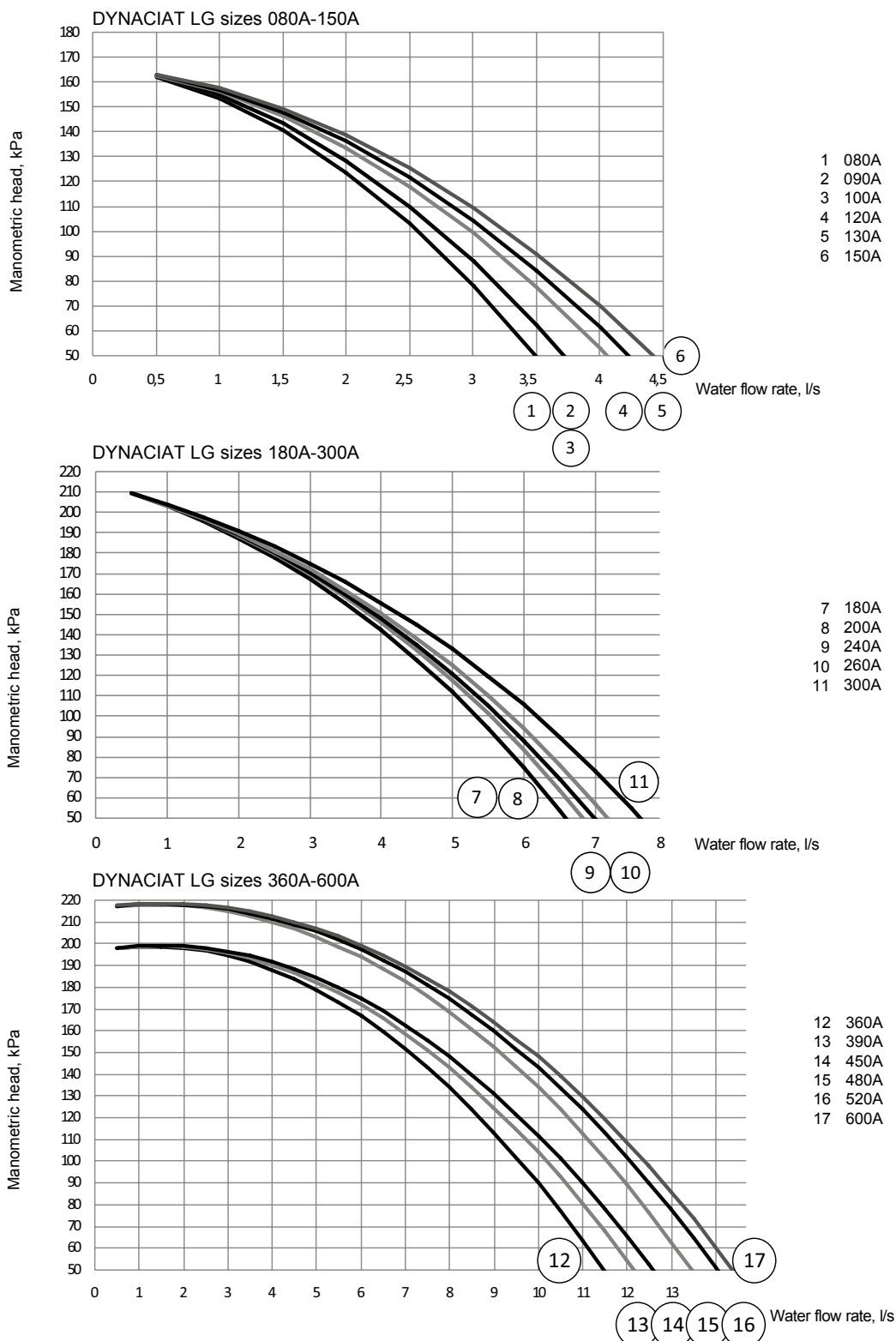
Data applicable for:

- Pure water at 20°C

- Refer to the section "Evaporator water flow rate" for the water flow rate values

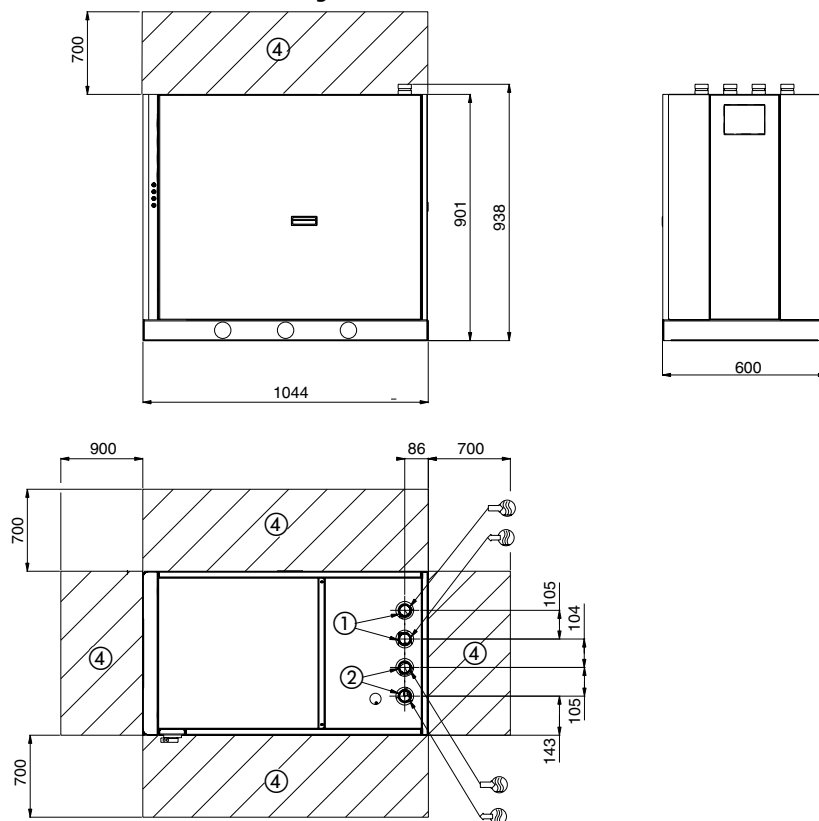
(*) Sizes 360A to 600A only

■ Condenser

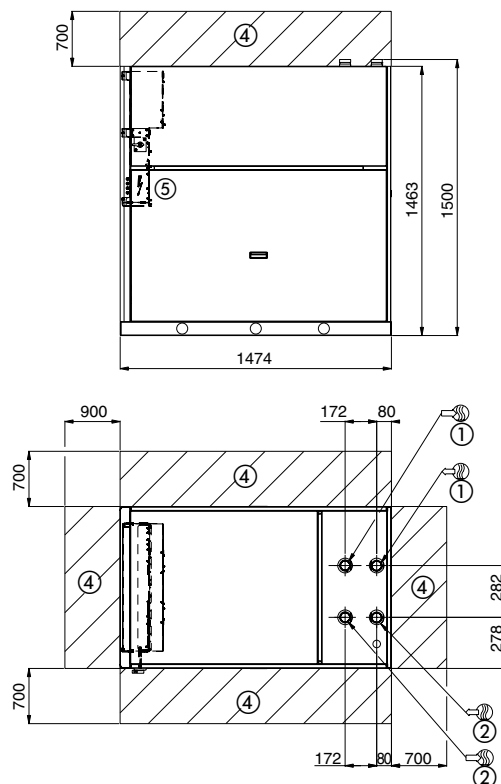


DIMENSIONS

■ DYNACIAT LG 80A to 150A without hydraulic module



■ DYNACIAT LG 80A to 150A with hydraulic module



Key

All dimensions are in mm

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

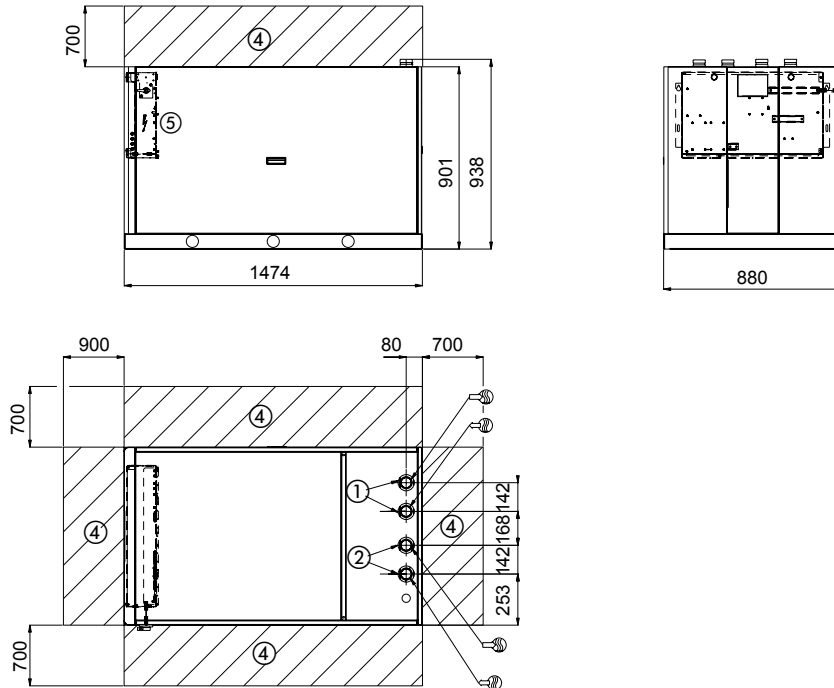
Notes:

Non-contractual drawings.

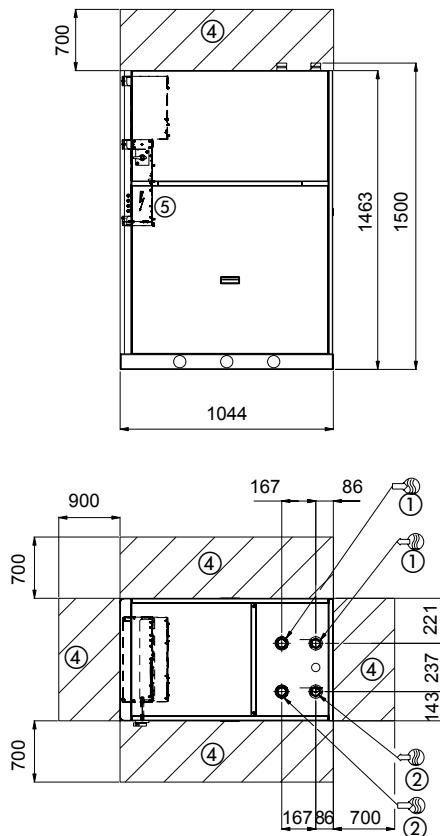
When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

DIMENSIONS

■ DYNACIAT LG 180A to 300A without hydraulic module



■ DYNACIAT LG 180A to 300A with hydraulic module



Key

All dimensions are in mm

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

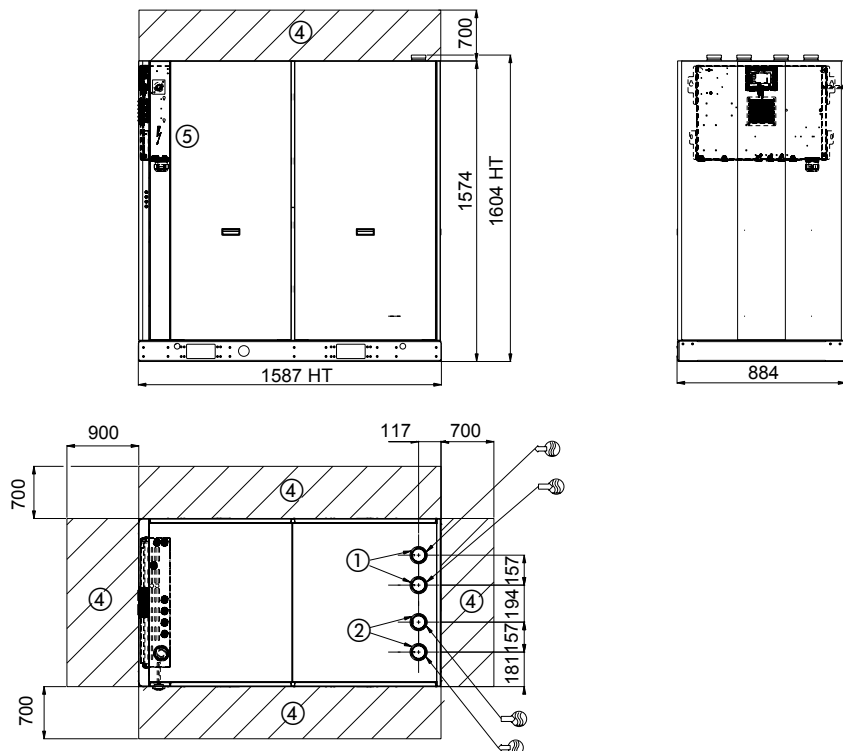
Notes:

Non-contractual drawings.

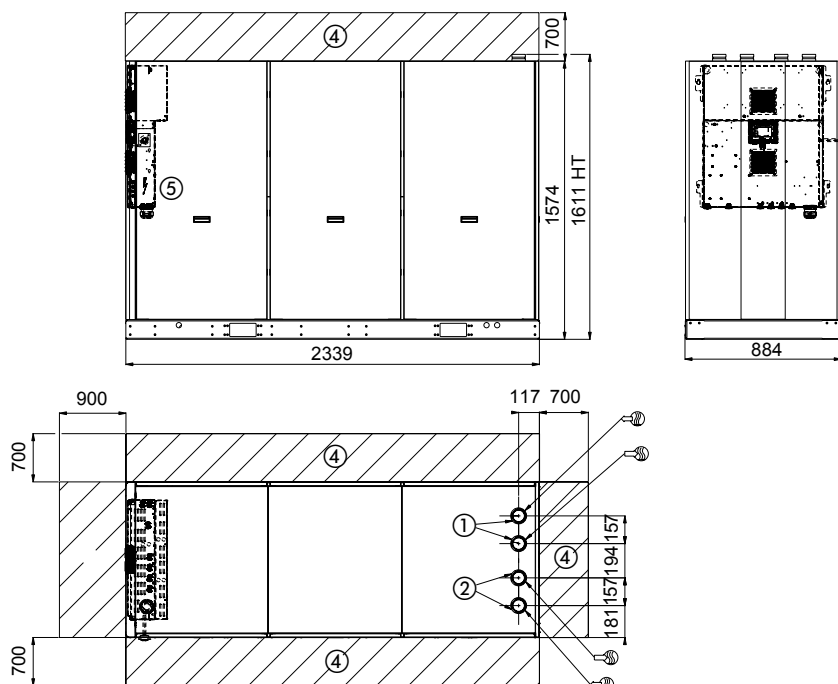
When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

DIMENSIONS

■ DYNACIAT LG 360A to 450A without hydraulic module



■ DYNACIAT LG 360A to 450A with hydraulic module



Key

All dimensions are in mm

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

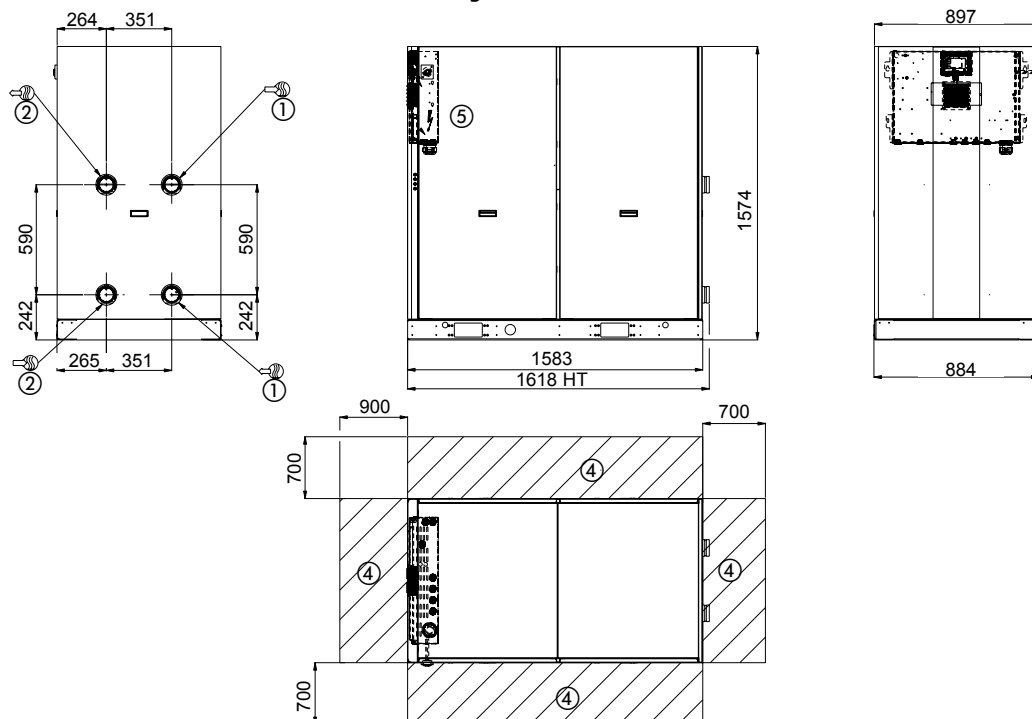
Notes:

Non-contractual drawings.

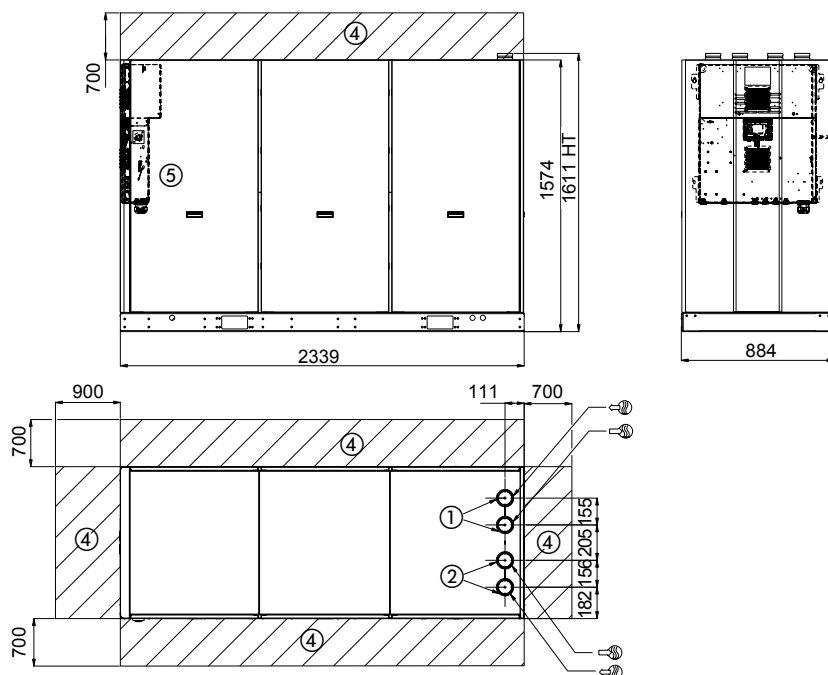
When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

DIMENSIONS

■ DYNACIAT LG 480A to 600A without hydraulic module



■ DYNACIAT LG 480A to 600A with hydraulic module



Key

All dimensions are in mm

- ① Evaporator side
- ② Condenser side
- ③ Valve
- ④ Clearances required for maintenance (see Note)
- ⑤ Electrics 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: The guarantee shall be void if these instructions are not followed.

■ 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 system'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 before 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-approved 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 refrigerating circuit
- Direction of rotation of compressors
- Water pressure drops and flow rates
- Operating readings

■ Maintenance operations

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

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

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

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

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

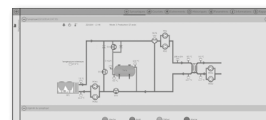
- User-friendly 4.3-inch touch screen.
- Information displayed in a choice of languages.
- Temperature and pressure readings.
- Operating and fault status diagnostics.
- Master/slave control of two machines in parallel.
- Fault memory management.
- Pump management.
- Time schedule.
- IP Web server.
- 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 potential-free
(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
- **OptimalWater®**: optimisation of producer performance based on building requirements
- **Optimal Stop and Start**: optimisation of the restart time for the building





→ Water chillers
Heat pump

DYNACIAT LG

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

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Compagnie Industrielle d'Applications Thermiques - S.A. with a registered capital of 26 728 480 € - R.C.S. Bourg-en-Bresse B 545 620 114