

Application guide NEOSYS

- Providing indoor climate comfort



NEOSYS™

APPLICATION GUIDE

Ref : NEOSYS-AGU-0409-E

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Our company is member of the Eurovent Certification Programme, The NEOSYS™ Lennox chillers are tested and rated in accordance with Eurovent certification program.



Our products comply with the European standards.



Product designed and manufactured under a quality management system certified ISO 9001.



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EXAMPLE : NAC 200D N M1 M

N	NEOSYS
A	Air cooled
C	C = Cooling mode H = Heat pump mode
200	Cooling capacity in kW
D	Number of circuits : S = 1 circuit D = 2 circuits T = 3 circuits F = 4 circuits
N	Non ducted
M	R410 A refrigerant
2	Revision number
M	400V/3/50 Hz

**Air-cooled Liquid Chiller for outdoor installation (NAC)
Air-to-water Heat Pump for outdoor installation (NAH)**

Nominal cooling capacity:
200 to 1000 kW (NAC)
200 to 300 kW (NAH)

Nominal heating capacity:
200 to 300 kW (NAH)



Sustainable Performance

- **Extended qualification tests** (vibration tests, run tests, field tests) to ensure superior reliability.
- **High efficiency aluminium micro channel heat exchanger** (MCHX) with improved corrosion resistance for moderate marine or urban applications (Cooling only version). **3-year warranty***.
- **Specific MCHX coil design** with high mechanical fin resistance that offers easy cleaning with high pressure air or water washers for extended life cycle.
- **V-coil design**, compressor and hydraulic enclosure to protect the unit against climatic conditions (e.g. sun rays, UV light, hail).
- **Exclusive Compliant Scroll® compressor design** with both axial and radial compliance to increase compressor operation tolerance of liquid refrigerant or debris, substantially improving durability and reliability. **3-year warranty***.
- **Exclusive fan design with SKF hybrid Ceramic bearings** to double (treble in some cases) the service life of the motors and to reduce noise level. With these sealed hybrid ceramic bearings, our customer can expect little or no maintenance of the motor throughout its life. **3-year warranty***.

Quiet performance

- **Unique design** with compressor, pump(s) and fan acoustic enclosure to reduce radiated noise emissions.
- **Inverter fans** using external rotor technology associated with high performance aluminium fan blades of the latest generation (Owlet™ design).
- **Elimination of intrusive fan start/stop noise** that is irritating to the human ear.
- **Active Acoustic Attenuation System™** to meet changing building load requirements while automatically adjusting the air flow to meet night and day sound level constraints (Time schedule with 4 time zones per day).

Quick performance and service

- **Complete hydraulic module** with single or twin, low or high pressure pump (options) that includes all necessary equipment for quick connection: pump(s), regulating valve, expansion tank vessel with pressure gauge, pressure tapping points, water filter, air vent, pressure relief valve and Victaulic connections.
- 400V, 50 Hz, 3 phase power supply (without neutral) with a single point of power connection. Main on/off switch included in as standard.
- **Air spring powered Butterfly Electrical Panel™** with jacks top opening providing protection to service engineers

against rain or snow during commissioning and maintenance operations.

Energy performance

- **High Energy Performance** (ESEER above 4; EER up to 2.9 ; COP up to 3,2) for improved energy consumption all around the year.
- **Aluminium micro channel heat exchanger** that offers +10% outstanding system efficiency (cooling only version).
- **R410A refrigerant** for optimized system performance.
- **Energy savings** due to lower system minimum water content reducing the time to reach setpoint. This can also eliminate the need for a buffer tank.

Architectural integration

- **State of the art design** with hidden compressors, fans and pump for perfect architectural integration.
- **Flat top, aesthetic grilles, very low unit height** (< 2m) for discrete installation on a roof reducing the requirement of costly cladding solutions around the unit.

* This warranty covers parts only. The above warranty is liable if the start-up and periodic maintenance agreement is contracted by a LENNOX company or any company accredited by LENNOX. Refer to LENNOX 3 year warranty conditions.

Flat top and low profile for best architectural integration



The NEOSYS design is minded to be perfectly integrated into urban or residential environments. The state of the art design of NEOSYS includes a painted casing with rounded side panels, a flat top that hides the fans, aesthetic protection grilles.

The very low unit height less than two meters makes easier for architects and design engineers to integrate the unit on a roof. Many interviewed customers confirm that the state of the art design of NEOSYS will replace any requirement of costly cladding solutions around the unit.

Smarts acoustics with inverter fans

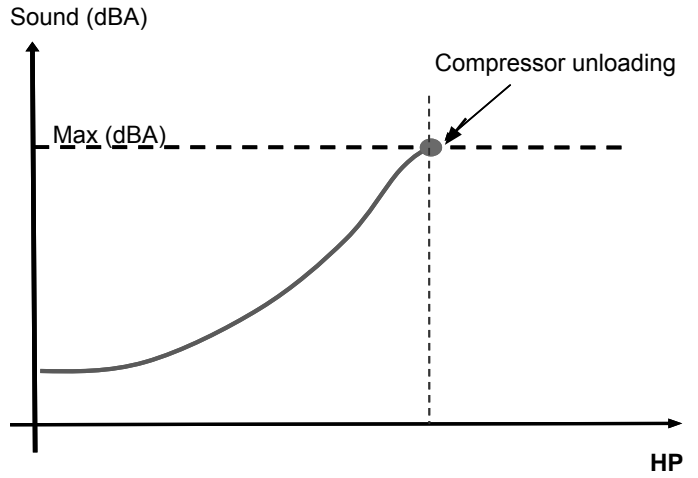


No more need to make a choice between a high efficiency version, a low noise or an ultra low noise version. NEOSYS can adapt all situations with only one version. NEOSYS is fitted in standard with the Active Acoustic Attenuation System™ that is using an electronic control associated with inverter fans. NEOSYS can change automatically the speed of all the fans – from 0% to 100% of the nominal air flow – to meet the building load requirements while respecting maximum authorised noise level in the time zone. NEOSYS is surely achieving the best acoustic signature of the market thanks to the latest generation of owlet™ high performance aluminium fan blades and noiseless ceramic bearings.

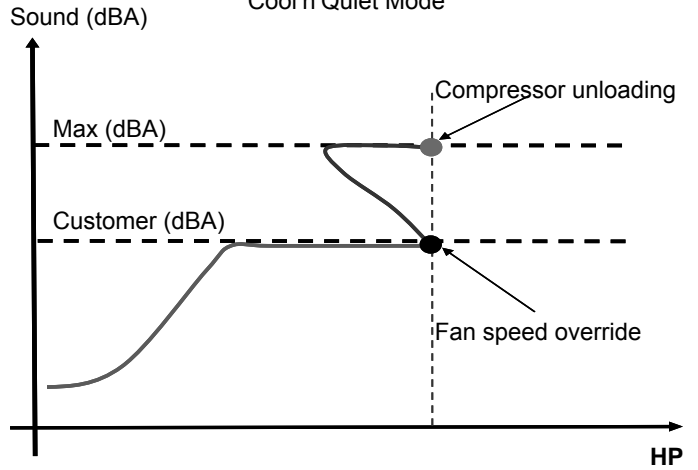
ACTIVE ACOUSTIC ATTENUATION SYSTEM™

SELECT YOU MODE PER TIME ZONE

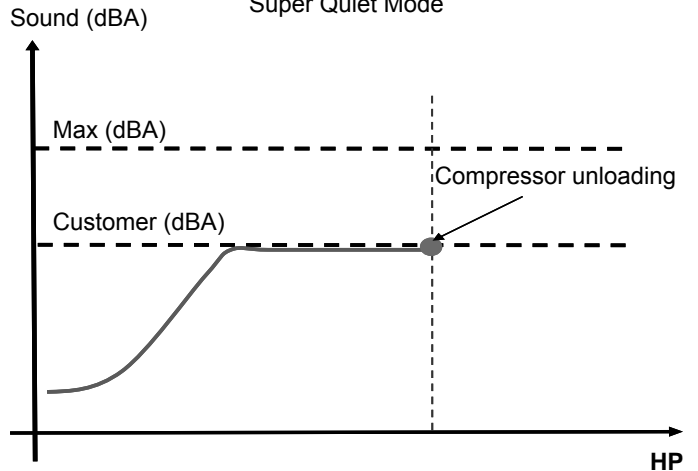
Performance Mode



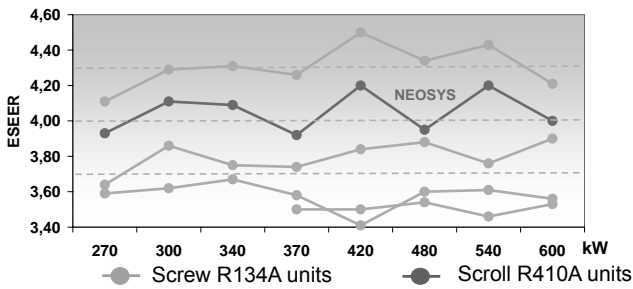
Cool'n'Quiet Mode



Super Quiet Mode



A high energy performance



By using R410A refrigerant associated with high efficiency micro channel coils and variable speed fans NEOSYS is contributing to a very low energy consumption all year around with an average energy efficiency ratio (ESEER)* in cooling mode above 4.0. NEOSYS Heat-pumps are also achieving very high performances in cooling and heating mode (COP* up to 3.2).

Furthermore NEOSYS advanced control allows energy savings all year around by using smart control functions:

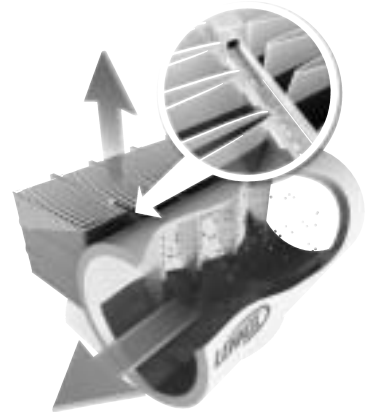
- Low water system quantity to reduce the time to reach the set-point.
- Dynamic defrost (patented) to limit the number of defrost cycles.
- Set-point reset based on outside air temperature to relax the chilled water set-point.

*ESEER : European Seasonal Energy Efficiency Ratio in cooling mode. COP : Coefficient of Performance in heating mode.

R410A Micro channel heat exchanger

With the use of fully aluminium coils already used in the automotive industry, NEOSYS™ offers many customer benefits:

- Up to 40% less refrigerant charge that contributes to reduce the total amount of refrigerant used in the system.
- A more efficient system (EER + 10%).
- An air heat exchanger with significantly improved corrosion resistance results (x 2) from the same aluminium alloy (no galvanic action) vs. the traditional copper tube/aluminium fin coils. By using this type of coil, units can be used in light corrosive or seacoast environments without any need for additional, and expensive, pre-treated fins or coil coating.
- High mechanical resistance eases the cleaning with high pressure air or water washers without any risk of damaging the fins.



Available in cooling only version, this technology will surely be enlarged shortly to reversible applications.

GENERAL CHARACTERISTICS OF THE UNIT

The NEOSYS unit is designed to be integrated into urban or residential environments.

As main characteristics the NEOSYS unit offers **state of the art design** to match architectural constraints and **adjustable sound level performances** during day and night to satisfy local environmental constraints.

CASING/CHASSIS

- Casing made of galvanised steel sheet metal painted with a white RAL 9002 powdered polyester paint and a RAL3003 red stripe.
- Fully RAL 7016 grey colour painted chassis protecting against corrosion.
- **State of the art design** with hidden compressors, fans and pump for perfect architectural integration.
- Flat top, aesthetic grilles, **very low unit height (< 2m)** for discrete installation on a roof reducing the requirement of costly cladding solutions around the unit
- **Aesthetic side anti-intrusion grilles** as standard to protect the unit during transportation and against human aggressions.

COMPRESSOR

- Exclusive Compliant Scroll® design with both axial and radial compliance to increase compressor operation tolerance to liquid refrigerant, substantially improving durability and reliability. **3-year warranty***.
- Motor cooled by suction gas.
- Electronic control of the compressor discharge temperature.
- Motor protection device against high temperature or over current situations.
- Discharge non-return valve.
- Low noise scroll compressors mounted in a sound-proofed technical cabinet to reduce noise emissions.
- Compressors assembly installed on an independent chassis supported by anti-vibration mountings.

WATER HEAT EXCHANGER

- True dual circuit plate heat exchanger
- Copper brazed Stainless steel plate heat exchanger.
- 13 mm thermal insulation foam.
- Water heat exchanger located in a technical cabinet protecting the insulation against climatic conditions (UV light, rain).

AIR HEAT EXCHANGER

- High efficiency aluminium Micro Channel heat exchangers (MCHX) with improved corrosion resistance in moderate marine or urban environment (cooling only version). **3-year warranty***.
- Standard copper tubes/aluminium fins heat exchanger (heat pump version).
- V-coil design to protect the unit against climatic conditions (e.g. hail).

FANS

- Inverter fans (0 to 900 rpm operating range).
- **Active Acoustic Attenuation System™** to meet changing building load requirements while automatically adjusting the air flow to respect night and day sound level constraints (adjustable setting over time schedule with 4 time zones per day).
- Elimination of intrusive start/stop noise that is irritating to the human ear.
- Fan-motor assembly using external rotor technology associated with owl high performance aluminium fan blades of the latest generation.
- IP 54 electrical motor, class F protected against high temperature with an internal sensor.
- Exclusive fan design with hybrid Ceramic bearings to extend the service life of motors and to reduce noise level. With these sealed hybrid ceramic bearings, our customer can expect little or no maintenance of the motor throughout its life. **3-year warranty***.
- Extremely rigid fan assembly via the integration of the fans mounted within a pre-formed bell mouth roof panel, thus improving rigidity while reducing vibrations.
- Rounded top acoterion panels to hide the fans and reduce noise emissions for quieter operation.

REFRIGERANT CIRCUIT

NEOSYS is using R410A refrigerant in 2 independent circuits. Each circuit includes:

- **A refrigerant charge reduced by 30%** due to the use of R410A combined with micro channel heat exchanger (NAC/Cooling only version).
- Suction piping with thermal insulation.
- Filter drier with removable cartridge filter.
- Thermostatic or electronic expansion valve (Electronic device only when "winter operation" option selected).
- Temperature sensors and pressure transducers.
- Four-way valve and liquid receiver (heat pump units only).
- Leak-tight refrigerant circuit with brazing carried out under nitrogen by certified engineers.
- Each refrigerant circuit is pressure and leak tested with a Hydrogen/Nitrogen mixture, and vacuumed before being charged with refrigerant. All units are then subjected to a complete functional and operational run test to guarantee perfect sealing before leaving the factory.

* Warranty under conditions - See page 2

ELECTRICAL BOX

- Unit electrical cabinet, components and wiring in compliance with EN 60204-1 electrical directive.
- 400V, 50 Hz, 3 phase power supply (without neutral) with a single point of power connection.
- Bottom entry (through the base) for electrical power.
- IP54 protection class.
- **Air spring powered Butterfly Electrical Panel™** with top opening providing protection to the service engineers against rain or snow during commissioning and maintenance operations.
- Recognized brand electrical components (Schneider) for ease of maintenance.
- Main on/off switch mounted on the front panel.
- DC50™ user interface mounted on the front panel.
- Main disconnect switch with high trip capacity allowing optimized sizing of the customer power supply.
- 400/24 V transformer to supply the control circuit.
- Numbered electrical wires to facilitate maintenance and diagnostic.
- Variable Frequency Drives (VFD) to control the fan speed.

CONTROL

CLIMATIC™ microprocessor based control is providing the following functions:

- 4 scheduling time zones per day over 7 days to allow energy consumption and sound level management according to the building use and environmental constraints.
- PI control of the water temperature with operating time equalisation of the compressors.
- Water set-point offset based on outdoor air temperature.
- **Active variable speed control of all fans** to optimize the unit condensing pressure and energy performances at full- and part-load while meeting authorized maximum noise level in the time zone (Active Acoustic Attenuation System™ control patented).
- Intelligent advanced control algorithm to protect the compressors against excessive short-cycling and to allow **operation of the unit without buffer tank** in most comfort air conditioning applications (e.g. unit with fan-coils). Refer to minimum installation water loop volume recommendations.
- **Dynamic defrost** to limit the number and the duration of the defrost cycles in winter for high performance of the unit (Dynamic Defrost patented).
- Automatic compressor unloading in case of excessive condensing pressure allowing the operation of the machine at high outdoor air temperature (operation extended up to 46°C ambient).
- Water pump control with operating time equalization and automatic change-over in case of a pump fault (Twin pump only).
- Master/slave or cascade control of two chillers operating in parallel with operating time equalization and automatic change-over in case of a unit fault.

CLIMATIC™ is pre-factory configured with default settings allowing a fast commissioning on site. The DC50™ user interface with graphical display is easy to use, intuitive. Main customer parameters can be read or modified without main power shut-off (Entering/leaving water temperatures, outdoor air temperature, alarm history, scheduling of the different time zone, water and noise level set-points, high and low pressure reading).

The DS50™ service display (optional) is a “plug and play” controller that allows service people to read and modify all unit parameters (Unit settings, operating time and number of compressor starts, low and high pressure reading, read the history of last 32 faults...).

COMMUNICATION

The control board is equipped with a RS485 serial communication port to allow remote management through communication bus. According to the wished communication protocol, our control board can be fitted with **ModBUS®, LonWorks® or BacNET® communication interface** (options).

The main control board has free dry contacts that allow remote control of the unit by wired cable:

- Remote on/off of the unit.
- Remote alarm reset to re-start the unit.
- Alarm or alert indications.
- Free customer contact.

With the optional extension board BE50™, it is possible to get additional customized digital or analog inputs / outputs for remote control of the unit:

- Fault fans or pumps (dry contact).
- Operation indication at 100% on circuit 1 or 2 (dry contact).
- Dual water set-point management (dry contact).
- Force heating or cooling mode (24V AC input).
- Power limitation by disabling circuit 1 or 2 (24V AC input).
- Force unoccupied mode (24V AC input).
- Water set-point offset based on a 4-20mA signal. Note: non available with heat-pump units.

DIRECTIVES

The unit is built to meet European norms and standards & Eurovent certification performance standards.

- DI 97/23/CE Pressure Equipment Directive.
- DI 98/37/CE Machinery Directive.
- DI 73/23/CE Low Voltage Directive.
- DI 89/336/CE Electro Magnetic Compatibility Directive
- EN 378-2 Safety and Environmental Directive.
- **The European Restriction of the Use of Certain Hazardous Substances (RoHS).**

OPTIONS	DESCRIPTION	ADVANTAGES	MODELS
Low-pressure single-pump hydraulic module	Low-pressure single pump, regulating valve, Victaulic couplings, filter and all necessary hydraulic devices. Refer to specific chapter.	Quick start-up on job site. Available pressure around 150 kPA.	NAC 200 ► 640 NAH 200 ► 300
High-pressure single-pump hydraulic module	High-pressure single pump, regulating valve, Victaulic couplings, filter and all necessary hydraulic devices. Refer to specific chapter.	Quick start-up on job site. Available pressure around 250 kPA.	NAC 200 ► 640 NAH 200 ► 300
Low-pressure twin-pump hydraulic module	Low-pressure twin pumps, regulating valve, Victaulic couplings, filter and all necessary hydraulic devices. Refer to specific chapter.	Quick start-up on job site. Available pressure around 150 kPA.	NAC 200 ► 640 NAH 200 ► 300
High-pressure twin-pump hydraulic module	High-pressure twin pumps, regulating valve, Victaulic couplings, filter and all necessary hydraulic devices. Refer to specific chapter.	Quick start-up on job site. Available pressure around 250 kPA.	NAC 200 ► 640 NAH 200 ► 300
Partial heat recovery	Plate heat exchanger on each compressor circuit allowing recovery of 20% of the rejected heat	Allow free hot water production simultaneously with unit operation	NAC 200 ► 640 NAH 200 ► 300
Free cooling	Additional free cooling coils (one “V” or two “V” depending on needed capacity) with inverter fans and motorised valves.	Allow the chilled water to run through the free-cooling system, which uses less power and utilises the lower ambient air to cool the water.	NAC 200 ► 540
Winter operation (from +6°C down to -20°C) – Cooling only units	Unit fitted with electronic expansion valve and variable frequency driven fans. Select “anti-freeze protection” option if no glycol water	Increased operating range in cooling down to -20°C ambient temperature. (Standard on sizes 540/600/640/1080).	NAC 200 ► 480 NAC 680 ► 960
Brine operation (From +5°C down to -10°C)	Unit fitted with electronic expansion valve, variable frequency driven fans and reinforced evaporator and piping thermal insulation.	Increased operating range in cooling down to -10°C water leaving temperature for thermal storage or process cooling.	NAC 200 ► 1080
Anti-freeze protection (down to -20°C)	Resistance heaters on the evaporator, hydraulic module and partial heat recovery if selected. To be selected if no glycol water.	Evaporator and hydraulic module frost protection down to -20°C ambient temperature	NAC 200 ► 1080 NAH 200 ► 300
Heavy anti-corrosion coil treatment	Application of Thermoguard® treatment on the entire coil surface.	High corrosion resistance for severe industrial and marine environments.	NAC 200 ► 1080 NAH 200 ► 300
Rear protection grille	Metallic grille fitted at the back of the unit	Prevents the rear V-coil against possible damage	NAC 200 ► 640 NAH 200 ► 300
Soft starter	Electronic soft starter fitted into the electrical cabinet	Start-up current reduced by 15 % up to 30 %.	NAC 200 ► 1080* NAH 200 ► 300
Power Factor correction	Capacitors fitted into the unit	Cos phi correction up to 0.95 to reduce current and energy consumption.	NAC 200 ► 1080 NAH 200 ► 300

*except in case of main power connection option

OPTIONS	DESCRIPTION	ADVANTAGES	MODELS
Single main power connection	Electrical cabinet equipped with one single point of connection and power cut-off for the complete unit.	Allow easy electrical connection with one single cable instead of two cables	NAC 680 ► 1080
BE50™ extension board for additional inputs/ outputs	Electronic extension board with additional analog inputs (4), digital inputs (4) and digital outputs (4). See control manual.	Relay card for remote control and alarm report using dry contacts, 24 Vac or 4-20 mA signals.	NAC 200 ► 1080 NAH 200 ► 300
Modbus communication interface	Communication card using ModBus/JBus protocol.	Communication interface with a building management system.	NAC 200 ► 1080 NAH 200 ► 300
LonWorks® communication interface	Communication card using LonTalk® protocol.	Communication interface with a building management system.	NAC 200 ► 1080 NAH 200 ► 300
BACnet® communication interface	Communication card using Bacnet® protocol.	Communication interface with a building management system.	NAC 200 ► 1080 NAH 200 ► 300

ACCESSORIES	DESCRIPTION	ADVANTAGES	MODELS
Water filter	1000 microns water filter delivered with piping and Victaulic connections. Not necessary if 'hydraulic module' option selected.	This protection must be fitted in the customer water supply piping to protect the evaporator from any possible impurities.	NAC 200 ► 1080 NAH 200 ► 300
Flange connection	Two connections sleeves with victaulic groove and flange on opposite side.	Allow easy connection with flanges on customer side.	NAC 200 ► 1080 NAH 200 ► 300
Anti-vibration mounts	Rubber anti-vibration mounts to be mounted under the unit.	Reduction of the transmission of vibration to the ground and the general level.	NAC 200 ► 1080 NAH 200 ► 300
DC50™ remote comfort display	Customer display located at 600 meters maximum from the unit.	Remote customer parameter reading and modification.	NAC 200 ► 1080 NAH 200 ► 300
DS50™ service display	Plug and play display delivered with 1 meter cable and connector for quick connection on Climatic controller.	Display for service technicians only.	NAC 200 ► 1080 NAH 200 ► 300
Adalink™ supervision	Electronic board with RS485 cables, RJ11 phone cable, Ethernet cable and power supply cable.	Remote supervision of the unit via an intuitive web page.	NAC 200 ► 1080 NAH 200 ► 300

COOLING ONLY

NAC

NEOSYS	NAC	200	230	270	300	340	380
Cooling mode							
Cooling capacity ⁽¹⁾	kW	207,8	235,0	273,4	307,3	345,9	387,3
Power input ⁽¹⁾	kW	70,9	85,2	105,4	106,2	123,6	148,4
Full load amps ⁽¹⁾	A	133,3	155,6	184,7	188,5	218,8	257,6
EER ⁽²⁾		2,93	2,76	2,59	2,89	2,80	2,61
ESEER ⁽³⁾		4,24	4,03	3,99	4,04	4,15	3,90
Acoustic Active Acoustic Attenuation System™							
Global sound power level ⁽¹⁾ High performance	dB(A)	89	89	89	91	91	91
Global sound power level ⁽¹⁾ Quiet mode	dB(A)	84	84	85	86	87	87
Global sound power level ⁽¹⁾ Super quiet mode	dB(A)	82	83	84	85	85	86
Compressor Scroll - Hermetic							
Number of compressor	nr	4	4	4	4	5	5
Capacity steps	%	19-38-50- 62-81-100	16-32-50- 68-84-100	22-44-50- 57-78-100	20-47-73- 100	18-41-59- 82-100	20-40-60- 80-100
Oil charge per compressor	l	(3,2+6,8) + (3,2+6,8)	(3,2+6,3) + (3,2+6,3)	(6,8+6,3) + (6,8+6,3)	(6,3x2) + (6,8+6,3)	(6,8x3) + (6,3x2)	(6,3x3) + (6,3x2)
Oil type	type	MOBIL EAL Arctic 22CC or ICI EMKARATE RL32CF					
Refrigerant R410A							
Expansion	type	Thermostatic expansion valve					
Number of circuit	nr	2	2	2	2	2	2
Charge per circuit	kg	17	17	17	25,5	25,5	25,5
Condenser Microchannel Aluminium Tube and fins							
Fan & Motor Variable speed fans							
Number of fan		4	4	4	6	6	6
Diameter	mm	800	800	800	800	800	800
Maximum speed	RPM	Variable speed - 900 rpm maximum					
Nominal air flow (100%)	m ³ /h	87 200	87 200	87 200	130 800	130 800	130 800
Total motor power input (900 rpm)	kW	6,4	6,4	6,4	9,6	9,6	9,6
Evaporator AISI 316 stainless steel plate brazed with copper heat exchanger							
Water flow ⁽¹⁾	m ³ /h	35,8	40,4	47,0	52,9	59,5	66,6
Water volume	l	20	20	23,2	23,2	27,2	34,4
Pressure drop ⁽¹⁾	kPa	30,3	38,7	39,6	49,9	47,9	40,8
Water operating pressure	kPa	600	600	600	600	600	600
Hydraulic connections Victaulic							
Water inlet/outlet	Inches	4"	4"	4"	4"	5"	5"
Electrical data 400V / III / 50 Hz							
Start-up intensity	A	397,7	450,1	478,4	500,0	530,9	574,1
Maximum current	A	170,6	199,4	227,7	249,3	280,2	323,4
Dimensions							
Length	mm	3590	3590	3590	4620	4620	4620
Width	mm	2280	2280	2280	2280	2280	2280
Height	mm	1964	1964	1964	1964	1964	1964
Footprint	m ²	8,2	8,2	8,2	10,5	10,5	10,5
Operating weight	kg	1991	2018	2266	2647	2930	3009
Shipping weight	kg	1962	1989	2234	2615	2889	2962
Construction							
Frame		Cataphoresis and Galvanised - RAL 7016					
Casing		Galvanised steel					
Painting		Polyester - RAL 9002/RAL 7016/RAL 3003					

- (1) All data are at Eurovent condition,
Gross cooling capacity with 12/7°C water temperature and 35°C air ambient.
Gross heating capacity with 7°C air inlet temperature and 40/45°C water temperature.

- (2) EER and COP according to EN14511 Eurovent calculation method
(3) ESEER according to EN14511 Eurovent calculation method.

(NA) Not available.

OPERATING LIMITS on page 19.

NEOSYS™ is part of LCP Eurovent Certification Program (All models are certified up to 600 kW) (www.eurovent-certification.com).

COOLING ONLY

NAC

NEOSYS	NAC	420	480	540	600	640
Cooling mode						
Cooling capacity ⁽¹⁾	kW	432,0	472,9	531,1	605,0	626,9
Power input ⁽¹⁾	kW	150,9	172,0	201,5	219,9	226,1
Full load amps ⁽¹⁾	A	265,7	300,4	349,9	381,9	383,1
EER ⁽²⁾		2,86	2,75	2,64	2,76	2,77
ESEER ⁽³⁾		4,19	4,01	4,0	4,15	4,17
Acoustic		Active Acoustic Attenuation System™				
Global sound power level ⁽¹⁾ High performance	dB(A)	92	92	93	94	94
Global sound power level ⁽¹⁾ Quiet mode	dB(A)	88	88	89	90	90
Global sound power level ⁽¹⁾ Super quiet mode	dB(A)	86	87	88	89	89
Compressor		Scroll - Hermetic				
Number of compressor	nr	6	6	6	6	6
Capacity steps	%	14-33-48-67-81-100	17-33-50-67-83-100	18-33-51-67-85-100	17-33-50-67-83-100	17-33-50-67-83-100
Oil charge per compressor	l	(6,3x3) + (6,8x3)	(6,3x3) + (6,3x3)	(6,3x3) + (6,3x3)	(6,3x3) + (6,3x3)	(6,3x3) + (6,3x3)
Oil type	type	MOBIL EAL Arctic 22CC or ICI EMKARATE RL32CF				
Refrigerant		R410A				
Expansion	type	Thermostatic expansion valve		Electronic expansion valve		
Number of circuit	nr	2	2	2	2	2
Charge per circuit	kg	34	34	34	42,5	42,5
Condenser		Microchannel aluminium tube and fins - Air cooled				
Fan & Motor		Variable speed fans				
Number of fan		8	8	8	10	10
Diameter	mm	800	800	800	800	800
Maximum speed	RPM	Variable speed - 900 rpm maximum				
Nominal air flow (100%)	m ³ /h	174 400	174 400	174 400	218 000	218 000
Total motor power input (900 rpm)	kW	12,8	12,8	12,8	16	16
Evaporator		AISI 316 stainless steel plate brazed with copper heat exchanger				
Water flow ⁽¹⁾	m ³ /h	74,3	81,4	91,4	104,1	107,9
Water volume	l	39,2	39,2	42,7	51,7	56,2
Pressure drop ⁽¹⁾	kPa	41,4	49,5	56,8	59,0	58,4
Water operating pressure	kPa	600	600	600	600	600
Hydraulic connections		Victaulic				
Water inlet/outlet	Inches	5"	5"	6"	6"	6"
Electrical data		400V / III / 50 Hz				
Start-up intensity	A	597,8	641,0	754,0	804,7	804,7
Maximum current	A	347,0	390,3	433,8	484,5	484,5
Dimensions						
Length	mm	5650	5650	5650	6680	6680
Width	mm	2280	2280	2280	2280	2280
Height	mm	1964	1964	1964	1964	1964
Footprint	m ²	12,9	12,9	12,9	15,2	15,2
Operating weight	kg	3482	3583	3596	3941	3983
Shipping weight	kg	3429	3530	3539	3884	3918
Construction						
Frame		Cataphoresis and Galvanised - RAL7016				
Casing		Galvanised steel				
Painting		Polyester - RAL 9002/RAL 7016/RAL 3003				

- (1) All data are at Eurovent condition,
Gross cooling capacity with 12/7°C water temperature and 35°C air ambient.
Gross heating capacity with 7°C air inlet temperature and 40/45°C water temperature.
- (2) EER and COP according to EN14511 Eurovent calculation method
- (3) ESEER according to EN14511 Eurovent calculation method.

(NA) Not available.

OPERATING LIMITS on page 19.

NEOSYS™ is part of LCP Eurovent Certification Program (All models are certified up to 600 kW) (www.eurovent-certification.com).

COOLING ONLY

NAC

NEOSYS	NAC	680	760	840	960	1080
Cooling mode						
Cooling capacity ⁽¹⁾	kW	691,8	774,6	863,9	945,8	1062,3
Power input ⁽¹⁾	kW	247,1	296,8	301,9	344,0	403,0
Full load amps ⁽¹⁾	A	437,6	515,1	531,4	600,8	699,8
EER ⁽²⁾		2,80	2,61	2,86	2,75	2,64
ESEER ⁽³⁾		4,15	3,91	4,21	4,01	4,0
Acoustic		Active Acoustic Attenuation System™				
Global sound power level ⁽¹⁾ High performance	dB(A)	94	94	95	95	96
Global sound power level ⁽¹⁾ Quiet mode	dB(A)	90	90	91	91	92
Global sound power level ⁽¹⁾ Super quiet mode	dB(A)	88	89	89	90	91
Compressor		Scroll - Hermetic				
Number of compressor	nr	10	10	12	12	12
Capacity steps	%	9-18-30-41-50-59-70-82-91-100	10-20-30-40-50-60-70-80-90-100	8-15-24-33-41-48-58-67-74-82-91-100	8-17-25-33-42-50-58-67-75-83-92-100	8-15-24-33-41-48-58-67-74-82-91-100
Oil charge per compressor	l	[(6,8x3) + (6,3x2)] x 2	[(6,3x3) + (6,3x2)] x 2	[(6,3x3) + (6,8x3)] x 2	[(6,3x3) + (6,3x3)] x 2	
Oil type	type	MOBIL EAL Arctic 22CC or ICI EMKARATE RL32CF				
Refrigerant		R410A				
Expansion	type	Thermostatic expansion valve				Electronic expansion valve
Number of circuit	nr	4	4	4	4	4
Charge per circuit	kg	25,5	25,5	34	34	34
Condenser		Microchannel aluminium tube and fins				
Fan & Motor		Variable speed fans				
Number of fan		12	12	16	16	16
Diameter	mm	800	800	800	800	800
Maximum speed	RPM	Variable speed - 900 rpm maximum				
Nominal air flow (100%)	m ³ /h	261 600	261 600	348 800	348 800	348 800
Total motor power input (900 rpm)	kW	19,2	19,2	25,6	25,6	25,6
Evaporator		AISI 316 stainless steel plate brazed with copper heat exchanger				
Water flow ⁽¹⁾	m ³ /h	119,0	133,3	148,6	162,7	182,8
Water volume	l	275	290	300	335	345
Pressure drop ⁽¹⁾	kPa	57,0	51,3	56,0	66,0	71,0
Water operating pressure	kPa	600	600	600	600	600
Hydraulic connections		Victaulic				
Water inlet/outlet	Inches	8"				
Electrical data		400V / III / 50 Hz				
Start-up intensity	A	811,0	897,5	944,8	1031,2	1187,7
Maximum current	A	560,3	646,8	694,1	780,5	867,5
Dimensions						
Length	mm	9040	9040	11100	11100	11100
Width	mm	2280	2280	2280	2280	2280
Height	mm	1964	1964	1964	1964	1964
Footprint	m ²	21,1	21,1	25,8	25,8	25,8
Operating weight	kg	6720	6860	8000	8160	8160
Shipping weight	kg	6445	6570	7700	7825	7815
Construction						
Frame		Cataphoresis and Galvanised - RAL 7016				
Casing		Galvanised steel				
Painting		Polyester - RAL 9002/RAL 7016/RAL 3003				

- (1) All data are at Eurovent condition,
Gross cooling capacity with 12/7°C water temperature and 35°C air ambient.
Gross heating capacity with 7°C air inlet temperature and 40/45°C water temperature.
- (2) EER and COP according to EN14511 Eurovent calculation method
- (3) ESEER according to EN14511 Eurovent calculation method.

(NA) Not available.

OPERATING LIMITS on page 19.
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(www.eurovent-certification.com).

HEAT PUMP

NAH

NEOSYS	NAH	200	230	270	300
Cooling mode					
Cooling capacity ⁽¹⁾	kW	191	215	271	295
Power input ⁽¹⁾	kW	69,5	84,8	96,9	111,5
Full load amps ⁽¹⁾	A	128,5	152,1	171,9	194,5
EER ⁽¹⁾		2,75	2,54	2,79	2,65
ESEER ⁽²⁾		4,00	3,76	3,99	3,94
Heating mode					
Heating capacity ⁽¹⁾	kW	219	252	313	346
Power input ⁽¹⁾	kW	68,1	80,4	97,7	110,7
Full load amps ⁽¹⁾	A	125,9	145,3	172,8	192,5
COP ⁽³⁾		3,21	3,13	3,20	3,12
Acoustic					
Active Acoustic Attenuation System™					
Global sound power level ⁽¹⁾ High performance	dB(A)	89	89	91	91
Global sound power level ⁽¹⁾ Quiet mode	dB(A)	84	84	86	86
Global sound power level ⁽¹⁾ Super quiet mode	dB(A)	82	83	85	85
Compressor					
Scroll - Hermetic					
Number of compressor	nr	4	4	4	4
Capacity steps	%	19 - 38 - 50 - 62 - 81 - 100	16 - 32 - 50 - 68 - 84 - 100	22 - 43 - 50 - 57 - 78 - 100	25 - 50 - 75 - 100
Oil charge per compressor	l	(3,2+6,8) + (3,2+6,8)	(3,2+6,3) + (3,2+6,3)	(6,8+6,3) + (6,8+6,3)	(6,3x2) + (6,3x2)
Oil type	type	MOBIL EAL Arctic 22CC or ICI EMKARATE RL32CF			
Refrigerant					
R410A					
Expansion	type	Thermostatic expansion valve			
Number of circuit	nr	2	2	2	2
Charge per circuit	kg	29	29	43,5	43,5
Condenser					
Copper tube - Aluminium fin - Air-cooled					
Fan & Motor					
Variable speed fans					
Number of fan		4	4	6	6
Diameter	mm	800	800	800	800
Maximum speed	RPM	Variable speed - 900 rpm maximum			
Nominal air flow (100%)	m ³ /h	76 000	76 000	114 000	114 000
Total motor power input	kW	6,4	6,4	9,6	9,6
Evaporator					
AISI 316 stainless steel plate brazed with copper heat exchanger					
Water flow ⁽¹⁾	m ³ /h	32,9	37,0	46,6	50,8
Water volume		20	20	23,2	23,2
Pressure drop ⁽¹⁾	kPa	25,7	32,5	38,8	46,2
Water operating pressure	kPa	600	600	600	600
Hydraulic connections					
Victaulic					
Water inlet/outlet	Inches	4"			
Electrical data					
400V / III / 50 Hz					
Start-up intensity	A	397,7	450,1	485,6	514,4
Maximum current	A	170,6	199,4	234,9	263,7
Dimensions					
Length	mm	3590	3590	4620	4620
Width	mm	2280	2280	2280	2280
Height	mm	1964	1964	1964	1964
Footprint	m ²	8,2	8,2	10,5	10,5
Operating weight	kg	2137	2163	2835	2861
Shipping weight	kg	2088	2114	2769	2795
Construction					
Frame		Cataphoresis and Galvanised - RAL 7016			
Casing		Galvanised steel			
Painting		Polyester - RAL 9002/RAL 7016/RAL 3003			

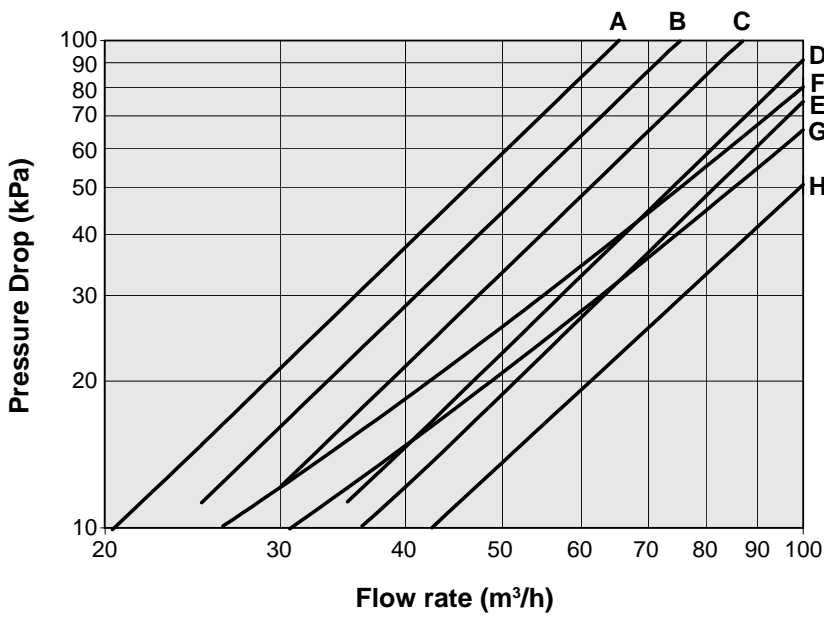
- (1) All data are at Eurovent condition,
Gross cooling capacity with 12/7°C water temperature and 35°C air ambient.
Gross heating capacity with 7°C air inlet temperature and 40/45°C water temperature.
- (2) EER and COP according to EN14511 Eurovent calculation method
- (3) ESEER according to EN14511 Eurovent calculation method.

(NA) Not available.

OPERATING LIMITS on page 19.

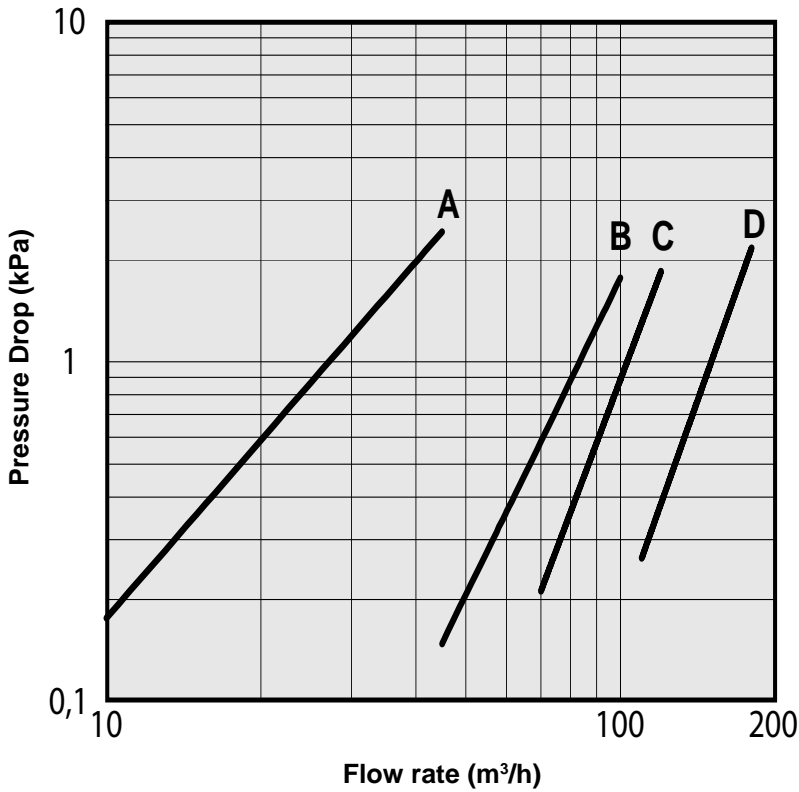
NEOSYS™ is part of LCP Eurovent Certification Program (All models are certified up to 600 kW) (www.eurovent-certification.com).

EVAPORATORS CURVE



NAC	NAH	Curve
200		A
230		
270		B
300		
340	-	C
380	-	D
420	-	E
480	-	
540	-	F
600	-	G
640	-	H

FILTER CURVE



NAC	NAH	Curve
200		A
230		
270		
300		
340	-	B
380	-	
420	-	
480	-	
540	-	C
600	-	
640	-	
680	-	
760	-	D
840	-	
960	-	
1080	-	

Pressure drops are given for information only, A tolerance of +/- 20kPa must be considered when selecting water pumps,

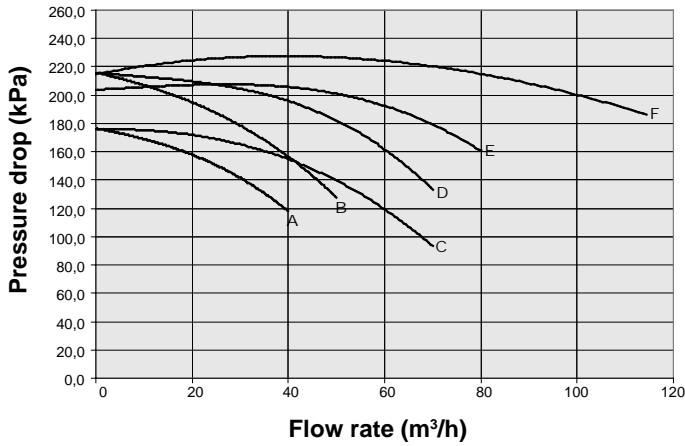
NAC		200	230	270	300	340	380	420	480	540	600	640
NAH						-	-	-	-	-	-	-
Nominal water flow	m ³ /h	34,8	39,3	45,8	51,4	57,9	64,9	72,3	79,2	91,4	102,7	107,7
Single pump												
Available static pressure (1)	kPa	110	119	107	117	121	147	132	114	142	132	126
Double pump												
Available static pressure (1)	kPa	105	109	102	112	111	137	127	109	120	108	108
Single pump HP												
Available static pressure (1)	kPa	208	236	215	200	205	206	225	207	227	215	211
Double pump HP												
Available static pressure (1)	kPa	198	226	215	200	205	201	215	192	206	193	188
Expansion vessel												
Volume	l	50										
Maximum pressure	kPa	400										
Gross Weight	kg	12,2										

(1) : Pump external static pressure - Evaporator pressure drop

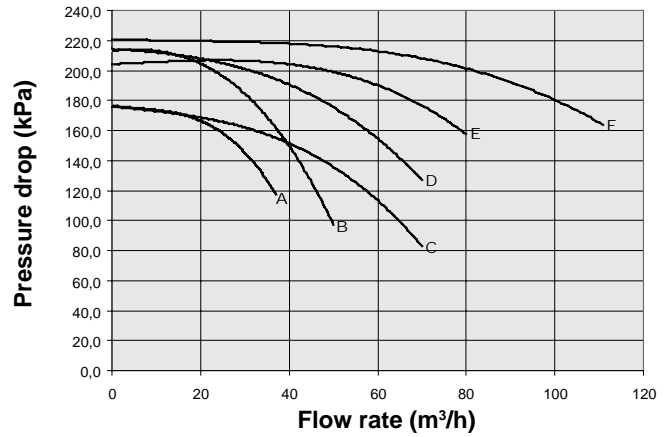
PUMP PRESSURE CURVES

Low pressure

Single pump



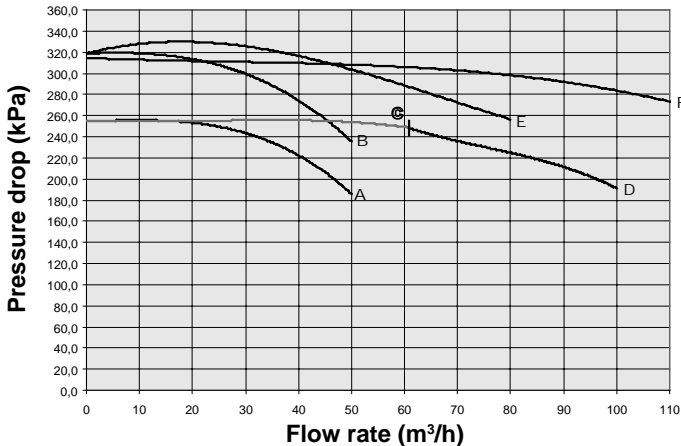
Double pump



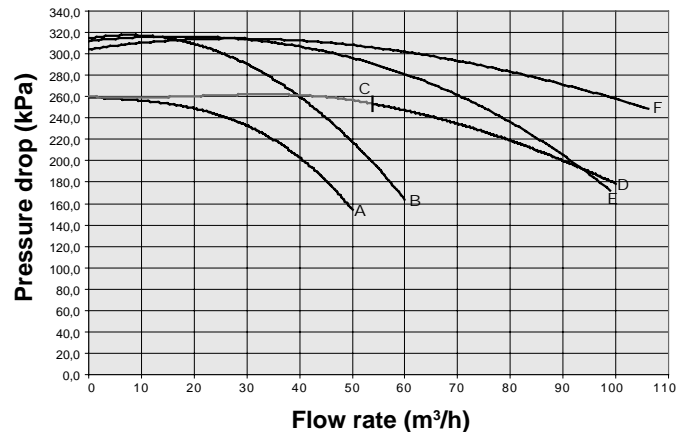
A	NAC/NAH 200	D	NAC/NAH 300	E	NAC 380/420/480
B	NAC/NAH 230		NAC 340	F	NAC 540/600/640
C	NAC/NAH 270				

High pressure

Single pump

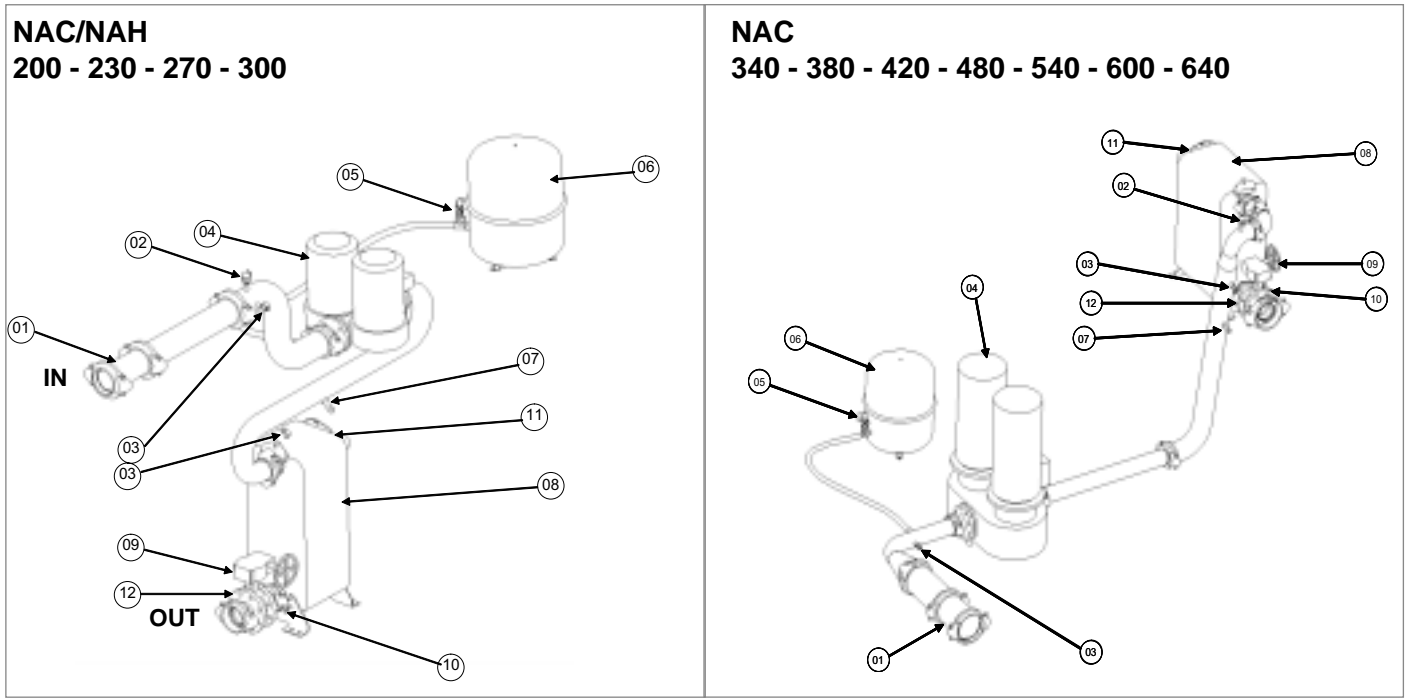


Double pump



A	NAC/NAH 200	D	NAC/NAH 300	E	NAC 420/480
B	NAC/NAH 230		NAC 340/380	F	NAC 540/600/640
C	NAC/NAH 270				

UNIT WITH HYDRAULIC MODULE



01	Water filter (item supplied loose)	07	Electronic flow switch
02	Air purge	08	Plate heat exchanger
03	Pressure tap	09	Setting valve
04	Pump	10	Pressure tap and drain valve
05	Safety valve with manometer	11	Return temperature sensor
06	Expansion vessel	12	Supply temperature sensor

MINIMUM WATER CONTENT OF AN INSTALLATION

Thanks to multi step capacity control and smart anti-short compressor cycling, NEOSYS can work with minimum water loop volume as defined here below. This can eliminate the need for a buffer tank in most of air-conditioning applications (e.g. NEOSYS application with fan-coil units). :

$$V_{mini} = 86 \times Q / (N_{stage} \times Dt)$$

Where :	V	Minimum water content of the installation
	Q	Cooling capacity of the chiller
	Nstage	Number of control steps available in the unit
	Dt	Maximum acceptable temperature rise (Dt = 6°c for an air conditioning application)

Important note: In case NEOSYS is used in air-conditioning applications with a short water system (e.g. NEOSYS application with air handling units) or in case NEOSYS is used for industrial process cooling, it is mandatory to use a buffer tank.

MINIMUM WATER CONTENT OF AN INSTALLATION (con't)

Unit Size	Number of stages	Mini water volume (L)
NAC		
200	6	478
230	6	549
270	6	645
300	4	1075
340	5	975
380	5	1089
420	6	1003
480	6	1147
540	6	1290
600	6	1433
640	6	1529
680	10	975
760	10	1089
840	12	1003
960	12	1147
1080	12	1290

Unit Size	Number of stages	Mini water volume (L)
NAH		
200	6	478
230	6	549
270	6	645
300	4	1075

MAXIMUM WATER CONTENT OF AN INSTALLATION

The maximum water content of the installation is determined by the capacity of the expansion vessel.
 On units fitted with a standard Hydraulic Module it is possible to determine the maximum water content of the installation.

Unit Size	Expansion vessel volume	Pressure in the expansion vessel	Max. volume clear water (L)		Max. volume Glycol water (L)	
			Static pressure		Static pressure	
			5 m	10 m	5 m	10 m
200-230-270 300-340-380 420-480 540 600-640	50 L	1,5 bar	5 230 L	4 180 L	4 020 L	3 210 L

GLYCOL CORRECTION FACTOR

Minimum ambient temperature or water outlet temperature	Ethylene glycol	Pressure drop	Water flow	CAPACITIES	
				Cooling	Heating
+ 5°C ► 0°C	10%	1,05	1,02	0,99	0,994
0°C ► -5°C	20%	1,10	1,05	0,98	0,993
- 5°C ► -10°C	30%	1,15	1,08	0,97	0,99
- 10°C ► -15°C	35%	1,18	1,10	0,96	0,987

Example : 10% glycol
 Minimum flow : 1,19 m³/h x 1,02
 Pressure drop x 1,07
 System capacity x 0,99

IMPORTANT NOTE : Thanks to variable speed fans, maximum sound level can be reduced.
NEOSYS maximum air flow can be adjusted between 70 % and 100 % of the nominal airflow to meet maximum sound level requirements.

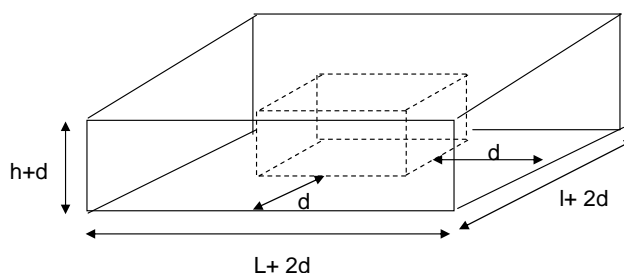
Please contact LENNOX for noise level calculations at reduced airflow.

Spectrum per octave band (dBa)								Maximum global sound power	Maximum sound pressure at 10 meters envelopping surface
NAC	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	EUROVENT Lw dB(A)	(1) Lp dB(A)
200	68	79	83	85	82	75	68	89	58
230	68	80	84	85	82	76	68	89	58
270	68	80	84	85	83	76	68	89	58
300	70	82	85	87	84	78	70	91	60
340	70	82	85	87	84	78	70	91	60
380	70	82	86	87	84	78	70	91	60
420	71	83	87	88	85	79	71	92	61
480	71	83	87	88	86	79	71	92	61
540	71	83	87	89	87	80	71	93	62
600	72	83	88	90	88	81	72	94	63
640	72	83	88	90	88	81	72	94	63
680	73	85	88	90	87	81	73	94	63
760	73	85	89	90	88	81	73	94	63
840	74	86	90	91	88	82	74	95	64
960	74	86	90	91	89	82	74	95	64
1080	74	86	90	92	90	83	74	96	65

Spectrum per octave band (dBa)								Maximum global sound power	Maximum sound pressure at 10 meters envelopping surface
NAH	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	EUROVENT Lw dB(A)	(1) Lp dB(A)
200	68	79	83	85	82	75	68	89	58
230	68	80	84	85	82	76	68	89	58
270	70	82	85	87	84	78	70	91	60
300	70	82	85	87	84	78	70	91	60

(1) : For information only. Data calculated by envelopping surface method in free open field

Enveloping Surface



$$A = 2(L+2d)(h+d) + 2(l+2d)(h+d) + (L+2d)(l+2d)$$

NAC

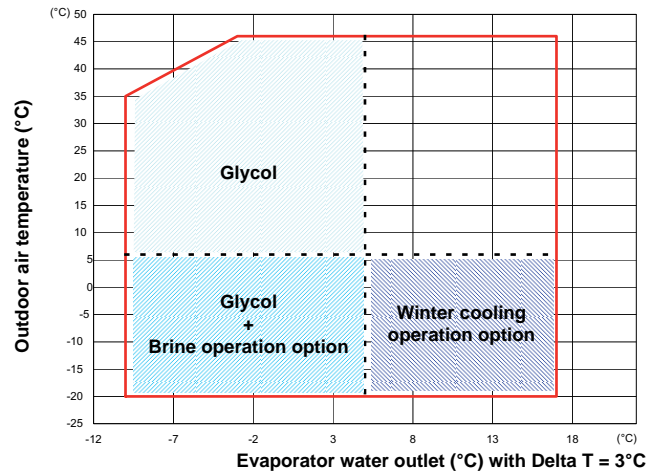
NAC		200 > 340	380	420 - 480	540	600 > 960	1080
Min. outlet water temperature	°C	5					
Min. outlet water temperature with brine operation option	°C	- 10					
Max. inlet water temperature	°C	20					
Min. difference water inlet/outlet	°C	3					
Max. difference water inlet/outlet	°C	8					
Min. outside air temperature	°C	6					
Min. outside air temperature Winter operation option	°C	- 20					
Maximum outside air temperature : Full capacity operation	°C	46	43	46	43	46	43

NAH

Cooling mode	NAH	200 > 300
Min. outlet water temperature	°C	5
Max. inlet water temperature	°C	20
Min. difference water inlet/outlet	°C	3
Max. difference water inlet/outlet	°C	8
Min. outside air temperature	°C	6
Min. outside air temperature Winter operation option	°C	- 20
Maximum outside air temperature : Full capacity operation	°C	46

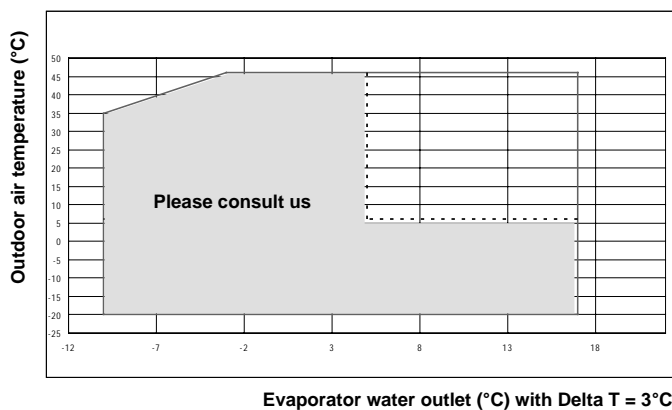
Heating mode	NAH	200 > 300
Min. condenser outlet water temperature	°C	24
Max. condenser outlet water temperature	°C	50
Min. difference water inlet/outlet	°C	3
Max. difference water inlet/outlet	°C	8
Min. outside air temperature (Water outlet temp. : 37°C)	°C	- 12
Max. outside air temperature	°C	30

NAC
Operating envelope
Cooling mode

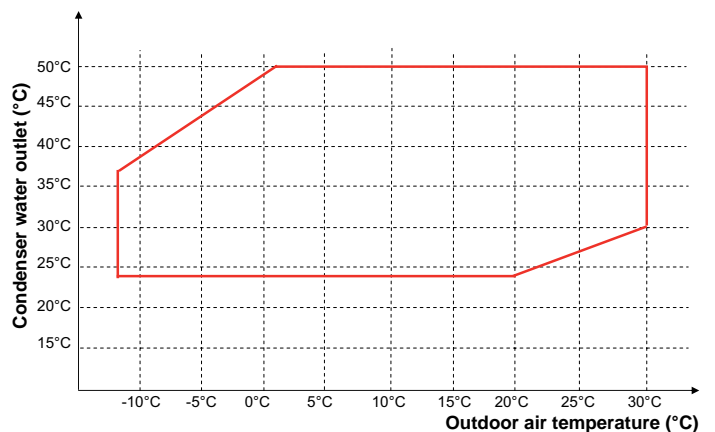


Maximum outdoor air temperature = 43°C on NAC 380 / NAC 540 and NAC 1080

NAH
Operating envelope
Cooling mode



NAH
Operating envelope
Heating mode



UNITS

NAC

NEOSYS		200	230	270	300	340	380	420	480	540	600	640
Minimum and maximum voltage	V	380 V / 420 V										
Maximum power	kW	96,1	113,7	134,5	146,5	165,1	191,5	204,6	231,0	262,8	297,8	297,8
Maximum current	A	170,6	199,4	227,7	249,3	280,2	323,4	347,0	390,3	433,8	484,5	484,5
Maximum current (with cos phi 0,95 option)	A	152,9	179,7	211,3	231,8	260,3	300,4	322,7	362,8	411,2	466,7	466,7
Start-up intensity	A	397,7	450,1	478,4	500,0	530,9	574,1	597,8	641,0	754,0	804,7	804,7
Start-up intensity (with sofstarter option)	A	288,9	326,1	354,4	376,0	406,9	450,1	473,8	517,0	596,3	647,0	647,0
Start-up intensity (with cos phi 0,95 option)	A	274,6	310,8	342,4	363,0	391,5	431,6	453,9	494,0	576,6	632,1	632,1
Maximum connectable power section	mm ²	185	185	185	300	300	300	300	300	300	300	300

UNITS (dual connection point)

NEOSYS		680	760	840	960	1080
Minimum and maximum voltage		380 V / 420 V				
Maximum power per box	kW	164,9	191,3	204,4	230,8	262,6
Maximum current per box	A	279,2	322,4	346,0	389,3	432,8
Maximum current per box (with cos phi 0,95 option)	A	260,0	300,1	322,4	362,5	410,9
Start-up intensity per box	A	529,9	573,1	596,8	640,0	753,0
Start-up intensity per box (with sofstarter option)	A	405,9	449,1	472,8	516,0	595,3
Start-up intensity per box (with cos phi 0,95 option)	A	391,2	431,3	453,6	493,7	576,3

UNITS (single main power connection as an option)

NEOSYS		680	760	840	960	1080
Minimum and maximum voltage	V	380 V / 420 V				
Maximum power	kW	330,2	383,0	409,1	461,9	525,5
Maximum current	A	560,3	646,8	694,1	780,5	867,5
Maximum current (with cos phi 0,95 option)	A	520,6	600,8	645,5	725,7	822,3
Start-up intensity	A	811,0	897,5	944,8	1031,2	1187,7
Start-up intensity (with sofstarter option)	A	687,0	773,4	820,8	907,2	1030,1
Start-up intensity (with cos phi 0,95 option)	A	651,8	732,0	776,6	856,8	987,8

OPTIONS

NAC

NEOSYS			200	230	270	300	340	380	420	480	540	600	640
Low pressure	Single pump	kW	2,20	3,00	3,00	4,00	4,00	5,50	5,50	5,50	7,50	7,50	7,50
	Double pump		2,20	3,00	3,00	4,00	4,00	5,50	5,50	5,50	7,50	7,50	7,50
High pressure	Single pump - Double pump	A	4,90	6,10	6,10	7,50	7,50	10,50	10,50	10,50	13,80	13,80	13,80
	Maximum current		4,90	6,10	6,10	7,50	7,50	10,50	10,50	10,50	13,80	13,80	13,80
Evaporator anti-freeze heater *		kW	0,13										
Evaporator anti-freeze heater		A	0,32										
Maximum current		A	0,32										
Hydraulic anti-freeze heater		kW	0,23	0,23	0,23	0,23	0,24	0,24	0,24	0,24	0,24	0,24	0,24
Hydraulic anti-freeze heater		A	0,56	0,56	0,56	0,56	0,60	0,60	0,60	0,60	0,60	0,60	0,60
Maximum current		A	0,56	0,56	0,56	0,56	0,60	0,60	0,60	0,60	0,60	0,60	0,60

* : Value x 2 if desuperheater

OPTIONS (dual connection point)

NEOSYS		680	760	840	960	1080
Evaporator anti-freeze heater power per box	kW	0,13				
Evaporator anti-freeze heater	A	0,32				
Maximum current per box	A	0,32				
Hydraulic anti-freeze heater power per box	kW	0,24				
Hydraulic anti-freeze heater	A	0,60				
Maximum current per box	A	0,60				

OPTIONS (single main power connection as an option)

NEOSYS		680	760	840	960	1080
Evaporator anti-freeze heater power	kW	0,26				
Evaporator anti-freeze heater	A	0,65				
Maximum current	A	0,65				
Hydraulic anti-freeze heater power	kW	0,96				
Hydraulic anti-freeze heater	A	2,40				
Maximum current	A	2,40				

NAC		Outdoor air temperature																	
		28				30				32				35					
		Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp		
		kW	kW	m³/h	kPa	kW	kW	m³/h	kPa	kW	kW	m³/h	kPa	kW	kW	m³/h	kPa		
Water outlet temperature	5 °C	200	210,1	62,2	36,1	30,9	205,8	64,2	35,4	29,7	201,5	66,4	34,7	28,5	194,5	69,9	33,5	26,6	
		230	236,5	74,5	40,7	39,2	232,2	76,9	39,9	37,8	227,6	79,6	39,1	36,3	220,0	83,9	37,9	33,9	
		270	280,0	92,4	48,2	41,5	274,2	95,3	47,2	39,8	268,1	98,5	46,1	38,1	258,2	103,8	44,4	35,3	
		300	310,1	93,8	53,3	50,8	304,5	96,7	52,4	49,1	298,6	99,8	51,4	47,2	289,0	104,9	49,7	44,2	
		340	352,7	108,9	60,7	49,8	345,8	112,3	59,5	47,9	338,5	115,9	58,2	45,9	326,8	122,0	56,2	42,8	
		380	395,8	129,9	68,1	42,6	388,2	134,0	66,8	41,0	380,0	138,6	65,4	39,2	366,4	146,3	63,0	36,5	
		420	438,8	133,0	75,5	42,7	430,4	137,1	74,1	41,1	421,5	141,6	72,5	39,4	407,2	149,0	70,1	36,8	
		480	479,1	151,1	82,4	50,8	470,5	155,8	81,0	49,0	461,3	161,0	79,4	47,1	446,0	169,7	76,7	44,1	
		540	539,5	176,6	92,8	58,5	530,1	181,9	91,2	56,6	519,8	187,9	89,4	54,5	503,1	198,2	86,6	51,3	
		600	614,3	193,4	105,7	60,8	603,3	198,8	103,8	58,7	591,6	205,1	101,8	56,6	572,9	216,0	98,6	53,2	
		640	636,8	199,5	109,5	60,2	625,2	205,1	107,6	58,1	613,0	211,6	105,5	56,0	593,5	222,8	102,1	52,7	
		680	705,4	217,8	121,4	59,2	691,5	224,5	119,0	56,9	676,9	231,8	116,5	54,5	653,5	243,9	112,4	50,9	
		760	791,6	259,7	136,2	52,8	776,4	268,1	133,6	50,8	760,0	277,2	130,7	48,7	732,9	292,5	126,1	45,4	
		840	877,6	265,9	151,0	57,7	860,9	274,2	148,1	55,6	843,1	283,1	145,0	53,3	814,5	298,0	140,1	49,8	
		960	958,1	302,2	164,8	68,7	941,1	311,7	161,9	66,3	922,6	322,1	158,7	63,7	892,1	339,4	153,5	59,6	
		1080	1079,1	353,3	185,6	80,0	1060,1	363,8	182,4	77,3	1039,7	375,8	178,9	74,5	1006,3	396,5	173,1	70,1	
		6 °C	200	217,3	62,7	37,4	33,1	212,9	64,7	36,6	31,8	208,4	66,9	35,8	30,4	201,2	70,4	34,6	28,4
			230	244,8	75,1	42,1	41,9	240,2	77,6	41,3	40,4	235,4	80,2	40,5	38,8	227,5	84,5	39,1	36,3
	270		288,3	93,2	49,6	44,0	282,4	96,1	48,6	42,2	276,0	99,3	47,5	40,3	265,8	104,6	45,7	37,4	
	300		320,1	94,4	55,1	54,2	314,3	97,3	54,1	52,2	308,1	100,4	53,0	50,2	298,1	105,6	51,3	47,0	
	340		363,1	109,6	62,5	52,8	355,9	113,0	61,2	50,7	348,3	116,7	59,9	48,6	336,3	122,7	57,8	45,3	
	380		407,3	130,9	70,1	45,1	399,4	135,1	68,7	43,3	390,8	139,7	67,2	41,5	376,8	147,3	64,8	38,6	
	420		452,3	133,9	77,8	45,3	443,6	138,0	76,3	43,6	434,3	142,5	74,7	41,8	419,5	149,9	72,2	39,1	
	480		493,8	152,3	85,0	54,0	484,9	157,0	83,4	52,1	475,3	162,2	81,8	50,0	459,4	170,8	79,0	46,8	
	540		554,7	177,9	95,4	61,6	544,9	183,3	93,7	59,6	534,4	189,4	91,9	57,4	517,2	199,9	89,0	54,0	
	600		631,5	194,6	108,7	64,0	620,2	200,1	106,7	61,9	608,2	206,5	104,6	59,6	589,0	217,5	101,3	56,1	
	640		654,6	200,6	112,6	63,4	642,7	206,4	110,6	61,3	630,2	213,0	108,4	59,0	610,2	224,5	105,0	55,5	
	680		726,3	219,2	124,9	62,7	711,9	226,0	122,5	60,3	696,7	233,3	119,9	57,7	672,5	245,5	115,7	53,8	
	760		814,7	261,8	140,2	55,8	798,8	270,2	137,4	53,7	781,7	279,4	134,5	51,5	753,6	294,6	129,6	47,9	
	840		904,6	267,8	155,6	61,3	887,2	276,0	152,6	59,0	868,7	285,0	149,5	56,6	839,1	299,9	144,4	52,8	
	960		987,7	304,5	169,9	72,9	969,8	314,0	166,9	70,3	950,5	324,3	163,5	67,6	918,8	341,7	158,1	63,2	
	1080		1109,4	355,9	190,9	84,3	1089,8	366,6	187,5	81,5	1068,7	378,8	183,9	78,5	1034,3	399,7	177,9	73,8	
	7 °C		200	224,5	63,1	38,6	35,3	220,0	65,1	37,8	33,9	215,2	67,3	37,0	32,5	207,8	70,9	35,8	30,3
			230	253,0	75,7	43,5	44,8	248,2	78,2	42,7	43,1	243,2	80,8	41,8	41,4	235,0	85,2	40,4	38,7
		270	296,7	94,0	51,1	46,6	290,6	96,9	50,0	44,7	284,0	100,1	48,9	42,7	273,4	105,4	47,0	39,6	
		300	330,1	95,1	56,8	57,6	324,1	97,9	55,8	55,5	317,6	101,1	54,6	53,3	307,3	106,2	52,9	49,9	
340		373,7	110,4	64,3	55,9	366,2	113,8	63,0	53,7	358,4	117,5	61,7	51,4	345,9	123,6	59,5	47,9		
380		419,0	132,0	72,1	47,7	410,7	136,2	70,7	45,8	401,8	140,8	69,1	43,9	387,3	148,4	66,6	40,8		
420		465,9	134,8	80,2	48,1	456,9	139,0	78,6	46,3	447,3	143,5	77,0	44,3	432,0	150,9	74,3	41,4		
480		508,7	153,4	87,5	57,3	499,4	158,1	85,9	55,2	489,3	163,3	84,2	53,0	472,9	172,0	81,4	49,5		
540		569,9	179,2	98,1	64,8	559,8	184,7	96,3	62,6	548,9	190,9	94,4	60,4	531,1	201,5	91,4	56,8		
600		648,7	195,7	111,6	67,4	637,0	201,4	109,6	65,1	624,7	207,9	107,5	62,7	605,0	219,1	104,1	59,0		
640		672,4	201,8	115,7	66,7	660,2	207,7	113,6	64,5	647,4	214,4	111,4	62,1	626,9	226,1	107,9	58,4		
680		747,4	220,8	128,6	66,4	732,5	227,5	126,0	63,8	716,8	234,9	123,3	61,1	691,8	247,1	119,0	56,9		
760		838,0	264,0	144,2	59,0	821,4	272,4	141,3	56,8	803,7	281,5	138,3	54,4	774,6	296,8	133,3	50,6		
840		931,9	269,7	160,3	65,0	913,7	277,9	157,2	62,5	894,6	286,9	153,9	60,0	863,9	301,9	148,6	56,0		
960		1017,5	306,8	175,1	77,3	998,8	316,3	171,8	74,5	978,7	326,7	168,4	71,6	945,8	344,0	162,7	66,9		
1080		1139,8	358,5	196,1	88,7	1119,5	369,4	192,6	85,7	1097,7	381,8	188,9	82,6	1062,3	403,0	182,8	77,6		

Ph : Net heating capacity in kW	Pe : Effective absorbed power in heating mode	Wf : Water flow in m³ per hour	Dp : Water pressure drop in KPa
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COOLING MODE

NAH		Outdoor air temperature																
		28°C				30°C				32°C				35°C				
		Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	
		kW	kW	m³/h	kPa	kW	kW	m³/h	kPa	kW	kW	m³/h	kPa	kW	kW	m³/h	kPa	
Water outlet temperature	5°C	200	194,5	60,2	33,5	26,6	190,2	62,4	32,7	25,4	185,8	64,8	32,0	24,2	179,0	68,4	30,8	22,5
		230	218,2	73,2	37,5	33,4	213,7	75,9	36,8	32,0	208,9	78,8	35,9	30,6	201,5	83,3	34,7	28,5
		270	275,3	84,6	47,4	40,1	269,7	87,5	46,4	38,5	263,8	90,6	45,4	36,8	254,5	95,6	43,8	34,3
		300	299,6	96,9	51,5	47,5	293,7	100,3	50,5	45,6	287,6	104,0	49,5	43,8	277,6	109,9	47,8	40,8
	6°C	200	201,0	60,8	34,6	28,4	196,6	63,0	33,8	27,1	192,1	65,3	33,0	25,9	185,1	68,9	31,8	24,1
		230	225,6	74,0	38,8	35,7	220,9	76,7	38,0	34,2	216,1	79,5	37,2	32,7	208,4	84,0	35,8	30,5
		270	284,0	85,3	48,9	42,7	278,2	88,2	47,9	41,0	272,2	91,3	46,8	39,2	262,7	96,3	45,2	36,5
		300	309,1	97,9	53,2	50,5	303,1	101,2	52,1	48,6	296,7	104,8	51,0	46,6	286,5	110,7	49,3	43,4
	7°C	200	207,6	61,3	35,7	30,2	203,0	63,5	34,9	28,9	198,4	65,8	34,1	27,6	191,2	69,5	32,9	25,7
		230	232,9	74,8	40,1	38,0	228,1	77,5	39,3	36,5	223,1	80,3	38,4	34,9	215,3	84,8	37,0	32,5
		270	292,8	86,1	50,4	45,4	286,9	88,9	49,4	43,5	280,6	92,0	48,3	41,7	270,9	96,9	46,6	38,8
		300	318,6	98,8	54,8	53,7	312,4	102,1	53,8	51,6	305,9	105,7	52,6	49,5	295,4	111,5	50,8	46,2

Ph : Net heating capacity in kW	Pe : Effective absorbed power in heating mode	Wf : Water flow in m³ per hour	Dp : Water pressure drop in KPa
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HEATING MODE

NAH		Water outlet temperature																
		30°C				35°C				40°C				45°C				
		Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	Pf	Pe	Wf	Dp	
		kW	kW	m ³ /h	kPa	kW	kW	m ³ /h	kPa	kW	kW	m ³ /h	kPa	kW	kW	m ³ /h	kPa	
Outdoor air temperature	20°C	200	323,0	53,3	55,6	72,8	316,1	58,3	54,4	69,7	309,2	64,1	53,2	66,8	302,5	70,7	52,1	63,9
		230	366,0	63,0	63,0	93,3	359,9	68,7	61,9	90,3	353,7	75,5	60,8	87,2	347,1	83,3	59,7	84,0
		270	461,5	78,8	79,4	112,3	451,1	85,1	77,6	107,3	440,8	92,8	75,8	102,5	430,6	101,9	74,1	97,8
		300	505,5	88,7	87,0	134,6	496,0	95,7	85,3	129,7	486,3	104,4	83,7	124,6	476,1	114,7	81,9	119,5
	15°C	200	285,1	52,8	49,1	56,8	279,1	57,6	48,0	54,5	273,3	63,3	47,0	52,2	267,6	69,7	46,0	50,1
		230	323,4	62,2	55,6	73,0	318,3	67,8	54,8	70,7	313,0	74,5	53,9	68,4	307,5	82,2	52,9	66,0
		270	407,2	77,2	70,1	87,5	398,4	83,6	68,5	83,8	389,7	91,3	67,0	80,2	381,0	100,3	65,6	76,7
		300	446,5	86,8	76,8	105,2	438,6	94,0	75,5	101,5	430,4	102,7	74,0	97,7	421,8	113,1	72,6	93,9
	10°C	200	250,7	52,2	43,1	44,0	245,7	56,9	42,3	42,3	240,8	62,4	41,4	40,6	236,1	68,7	40,6	39,0
		230	284,6	61,5	49,0	56,6	280,5	66,9	48,3	55,0	276,2	73,5	47,5	53,3	271,6	81,1	46,7	51,6
		270	357,9	75,8	61,6	67,6	350,6	82,2	60,3	64,9	343,4	89,9	59,1	62,3	336,3	99,0	57,9	59,8
		300	392,8	85,2	67,6	81,4	386,4	92,4	66,5	78,8	379,7	101,2	65,3	76,1	372,6	111,6	64,1	73,3
	7°C	200	231,7	51,8	39,9	37,6	227,3	56,5	39,1	36,2	223,0	61,9	38,4	34,9	218,9	68,1	37,7	33,6
		230	263,2	61,0	45,3	48,5	259,7	66,4	44,7	47,2	255,9	72,8	44,0	45,8	251,9	80,4	43,3	44,4
		270	330,6	75,0	56,9	57,8	324,2	81,4	55,8	55,6	318,0	89,1	54,7	53,5	312,5	97,7	53,6	51,4
		300	363,0	84,2	62,4	69,6	357,5	91,5	61,5	67,5	351,8	100,3	60,5	65,4	345,6	110,7	59,5	63,1
	5°C	200	219,8	51,6	37,8	33,9	215,7	56,2	37,1	32,6	211,9	61,5	36,4	31,5	208,1	67,7	35,8	30,4
		230	249,7	60,7	43,0	43,6	246,5	66,0	42,4	42,5	243,2	72,4	41,8	41,4	239,6	79,9	41,2	40,2
		270	313,4	74,5	53,9	51,9	307,6	80,9	52,9	50,1	302,0	88,6	52,0	48,2	296,4	97,7	51,0	46,5
		300	344,2	83,7	59,2	62,6	339,3	90,9	58,4	60,9	334,2	99,8	57,5	59,0	328,7	110,2	56,5	57,1
	0°C	200	192,3	51,0	33,1	26,0	189,3	55,4	32,6	25,2	186,4	60,6	32,1	24,4	183,6	66,6	31,6	23,7
		230	218,5	59,9	37,6	33,5	216,3	65,1	37,2	32,8	214,0	71,4	36,8	32,1	211,3	78,8	36,4	31,3
		270	273,8	73,3	47,1	39,7	269,6	79,7	46,4	38,5	265,5	87,5	45,7	37,3	261,5	96,5	45,0	36,2
		300	300,8	82,3	51,7	47,8	297,5	89,6	51,2	46,8	293,9	98,5	50,6	45,7	289,9	109,0	49,9	44,5
	-2°C	200	182,3	50,7	31,4	23,4	179,7	55,1	30,9	22,7	177,2	60,2	30,5	22,1	174,8	66,2	30,1	21,5
		230	207,1	59,6	35,6	30,1	205,3	64,8	35,3	29,6	203,3	71,0	35,0	29,0	201,1	78,3	34,6	28,4
		270	259,3	72,8	44,6	35,6	255,7	79,3	44,0	34,6	252,3	87,0	43,4	33,7	248,9	96,1	42,8	32,8
		300	284,8	81,8	49,0	42,9	282,2	89,1	48,5	42,1	279,2	98,0	48,0	41,2	275,8	108,6	47,5	40,3
	-4°C	200	172,9	50,5	29,7	21,0	170,6	54,8	29,4	20,5	168,5	59,9	29,0	20,0	166,5	65,7	28,6	19,5
		230	196,3	59,3	33,8	27,1	194,9	64,4	33,5	26,7	193,3	70,6	33,3	26,2	191,5	77,8	32,9	25,7
		270	245,6	72,4	42,3	32,0	242,7	78,8	41,7	31,2	239,8	86,6	41,3	30,5	237,0	95,7	40,8	29,8
		300	269,8	81,3	46,4	38,5	267,7	88,6	46,1	37,9	265,3	97,6	45,6	37,3	262,6	108,2	45,2	36,5
	-6°C	200	164,0	50,2	28,2	18,9	162,2	54,4	27,9	18,5	160,4	59,5	27,6	18,1	158,8	65,3	27,3	17,7
		230	186,2	59,0	32,0	24,3	185,2	64,0	31,9	24,1	183,9	70,2	31,6	23,8	-	-	-	-
		270	232,7	72,0	40,0	28,7	230,4	78,4	39,6	28,1	228,1	86,2	39,2	27,6	226,0	95,3	38,9	27,1
		300	255,5	80,8	44,0	34,6	254,1	88,2	43,7	34,2	252,3	97,2	43,4	33,7	-	-	-	-
	-8°C	200	155,7	49,9	26,8	17,1	154,2	54,1	26,5	16,7	152,9	59,1	26,3	16,5	-	-	-	-
		230	176,6	58,6	30,4	21,9	176,0	63,6	30,3	21,8	175,1	69,7	30,1	21,6	-	-	-	-
		270	220,5	71,6	37,9	25,8	218,8	78,1	37,7	25,4	217,2	85,8	37,4	25,0	-	-	-	-
		300	242,1	80,4	41,6	31,0	241,3	87,8	41,5	30,8	240,1	96,8	41,3	30,5	-	-	-	-
-10°C	200	148,0	49,7	25,5	15,4	146,9	53,8	25,3	15,2	145,9	58,7	25,1	15,0	-	-	-	-	
	230	167,6	58,3	28,8	19,8	167,4	63,3	28,8	19,7	-	-	-	-	-	-	-	-	
	270	209,2	71,2	36,0	23,2	208,1	77,7	35,8	23,0	207,1	85,5	35,6	22,8	-	-	-	-	
	300	229,5	80,0	39,5	27,9	229,3	87,4	39,4	27,9	228,7	96,4	39,4	27,7	-	-	-	-	

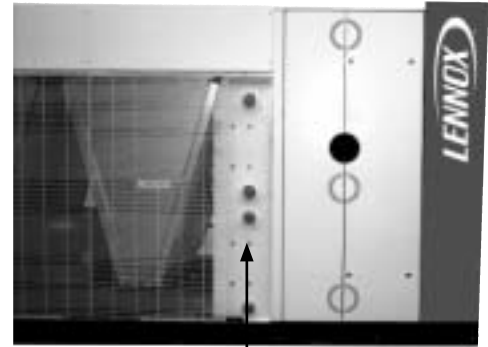
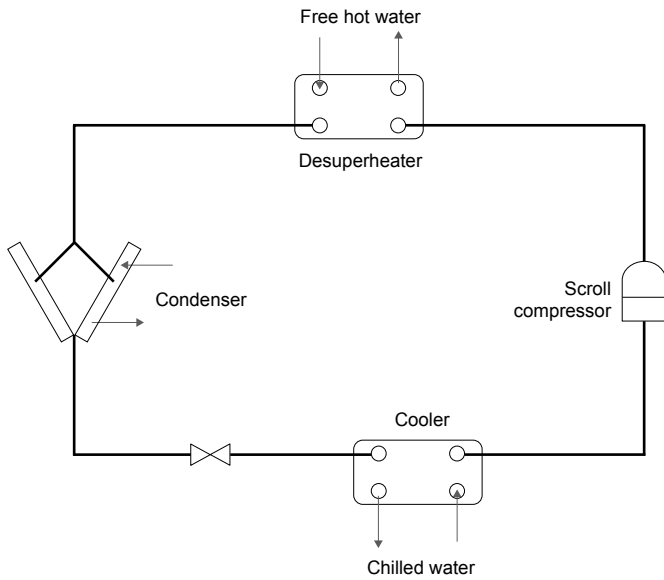
Ph : Net heating capacity in kW - Instantaneous heating capacity (this does not take into account the formation of frost on the coil and the defrost cycles.	Pe : Effective absorbed power in heating mode	Wf : Water flow in m ³ per hour	Dp : Water pressure drop in KPa
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Compared with the basic configuration, this option features an additional refrigerant/water heat exchanger on the compressor discharge line, allowing recovery of 15% of the rejected heat. This heat exchanger is large enough to recover heat for the production of free hot water simultaneously with chilled water production. The heating capacity of the heat recovery circuit is approximately equal to the power input of the compressor.

Typical heat recovery applications can be facilities with high domestic hot water usage, such as health care, hotels, etc.

Notes:

This option is available on cooling only and heat-pump versions. Heat recovery can only occur when the unit is running either in cooling or heating mode.



Partial heat recovery

	Water in/out: 50/55 °C			Water in/out: 55/60 °C			Water in/out: 50/60 °C		
	Recovery (kW)	Wf (m³/h)	Dp (kPa)	Recovery (kW)	Wf (m³/h)	Dp (kPa)	Recovery (kW)	Wf (m³/h)	Dp (kPa)
NAC 200	41	7,18	6,00	32	5,62	4	37	3,26	2
NAC 230	52	9,11	9,00	43	7,55	6	48	4,22	2
NAC 270	56	9,81	7,00	44	7,73	5	50	4,40	2
NAC 300	65	11,39	9,17	52	9,13	6	59	5,19	2
NAC 340	79	13,84	9,80	64	11,24	6	72	6,34	2
NAC 380	101	17,69	14,28	83	14,58	10	93	8,18	3
NAC 420	91	15,94	9,17	73	12,82	6	82	7,22	2
NAC 480	106	18,57	12,00	86	15,11	8	96	8,45	3
NAC 540	143	25,05	15,00	118	20,73	11	129	11,35	4
NAC 600	150	26,28	13,00	122	21,43	9	136	11,97	3
NAC 640	154	27,07	13,33	125	22,07	9	139	12,33	3
NAH 200	41	7,18	6,00	32	5,62	4	37	3,26	2
NAH 230	52	9,11	9,00	43	7,55	6	48	4,22	2
NAH 270	56	9,81	7,00	44	7,73	5	50	4,40	2
NAH 300	65	11,39	9,17	52	9,13	6	59	5,19	2

Wf :
Water flow in m³ per hour

Dp :
Water pressure drop in KPa

Compared with the basic configuration this option features one or two additional V free cooling coils at the back of the unit. The free cooling includes two motorised valves, allowing the chilled water to run through the free-cooling coils, which uses less power and utilises the lower ambient air to cool the water. The cooling capacity of one V free cooling coil at 0°C ambient is approximately 100 kW. NEOSYS™ free cooling system is using the same fans and speed inverters as for the standard unit in order to keep the same acoustic capabilities. The hydraulic module options are compatible with the Free Cooling option but glycol is of course required.

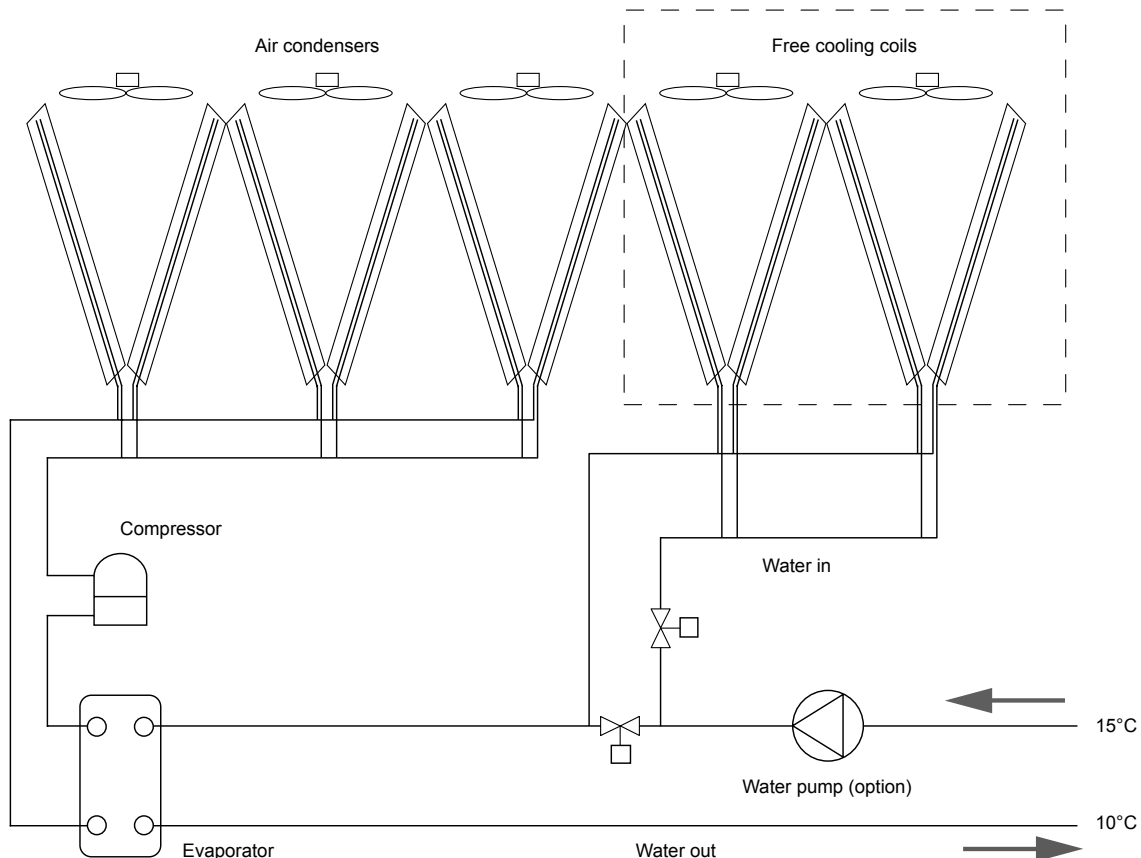
Typical free cooling applications can be facilities with cooling demand all along the year, such as offices with high internal loads like computer rooms, data centers, etc. In the North and North-East part of Europe, the ambient temperature is below 5°C between 20 and 45% of the year that makes this option very attractive.

Control principle

The control principle is the following: if ambient Temperature < return Temperature – 3°C, motorised valves open to by-pass return water flow through the Free Cooling coils. The Free Cooling fans are driven by the Climatic 50 via a specific PID algorithm. The Free cooling operation is considered as a cooling stage that has a priority on the compressor stages: only if the free cooling fan speed has reached the maximum fan speed then the compressors are allowed to run with their own PID.

Advantages of the NEOSYS free cooling system

- Simultaneous compressor cooling capability to reach building needs in any conditions (vs. DX free cooling that can not operate simultaneous compressor and free cooling).
- Design with additional V free cooling coils to eliminate unnecessary air pressure drop when running 100% in compressor cooling mode thus reducing all along the year energy fan consumption (vs. traditional free cooling system with free cooling coils located in series with the condensing coil.)
- Free cooling as soon as the air outside is cold enough (3°C below return water temperature).
- Reduce the running use of the compressors.
- Extend the life expectancy of the compressors.
- EER up to 63 (Water 15/10°C, Air -15°C).
- Reduce power costs.
- Payback could be as little as 12 months



Example of free cooling :

Unit running 100% in free cooling mode:

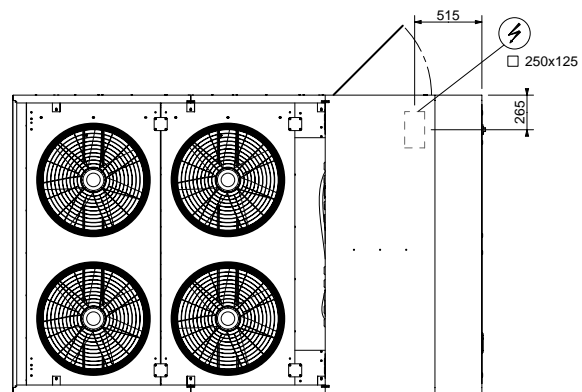
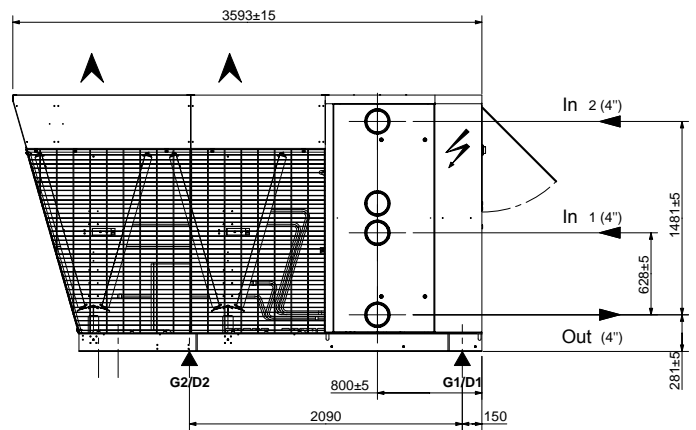
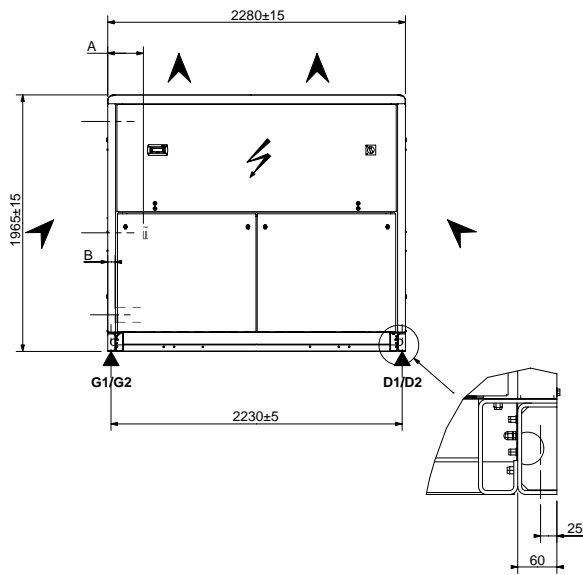
Return water temperature: 12°C (30% glycol)

Number of "V"		1V for NAC 200 to 540					2V for NAC 200 to 540				
Air flow	m ³ /h	38000					76000				
Water flow	m ³ /h	36					72				
Ambient temperature	°C	-15	-10	-5	0	5	-15	-10	-5	0	5
Outlet temperature	°C	6,7	7,7	8,7	9,7	10,7	6,7	7,7	8,7	9,7	10,7
Free cooling capacity	kW	190	153	117	82	47	380	306	234	164	94
Free cooling absorbed power	kW	3,2	3,2	3,2	3,2	3,2	6,4	6,4	6,4	6,4	6,4
EER		59	48	37	26	15	59	48	37	26	15
Free cooling pressure drop to be added to evaporator pressure drop	kPa	57					62				

Return water temperature: 15°C (30% glycol)

Number of "V"		1V for NAC 200 to 540					2V for NAC 200 to 540				
Air flow	m ³ /h	38000					76000				
Water flow	m ³ /h	36					72				
Ambient temperature	°C	-15	-10	-5	0	5	-15	-10	-5	0	5
Outlet temperature	°C	9	10,1	11,1	12,1	13,1	9	10,1	11,1	12,1	13,1
Free cooling capacity	kW	214	177	140	104	69	428	354	280	208	138
Free cooling absorbed power	kW	3,2	3,2	3,2	3,2	3,2	6,4	6,4	6,4	6,4	6,4
EER		67	55	44	33	22	67	55	44	33	22
Free cooling pressure drop to be added to evaporator pressure drop	kPa	57					62				

NAC 200 / 230 / 270
NAH 200 / 230



	A (mm)	B (mm)
In 1	273	-
In 2	62	-
Out	-	56

LEGEND :

IN1 : Water inlet - Unit without hydraulic module

IN2 : Water inlet - Unit with hydraulic module

OUT : Water outlet

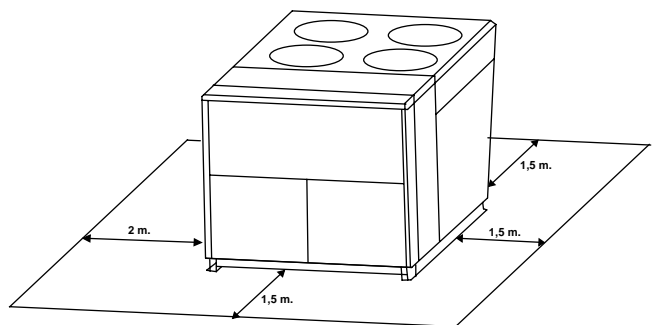
LOAD DISTRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

	G1	G2	D1	D2
NAC 200	563	563	563	563
NAC 230	587	587	587	587
NAC 270	652	652	652	652
NAH 200	597	597	597	597
NAH 230	620	620	620	620

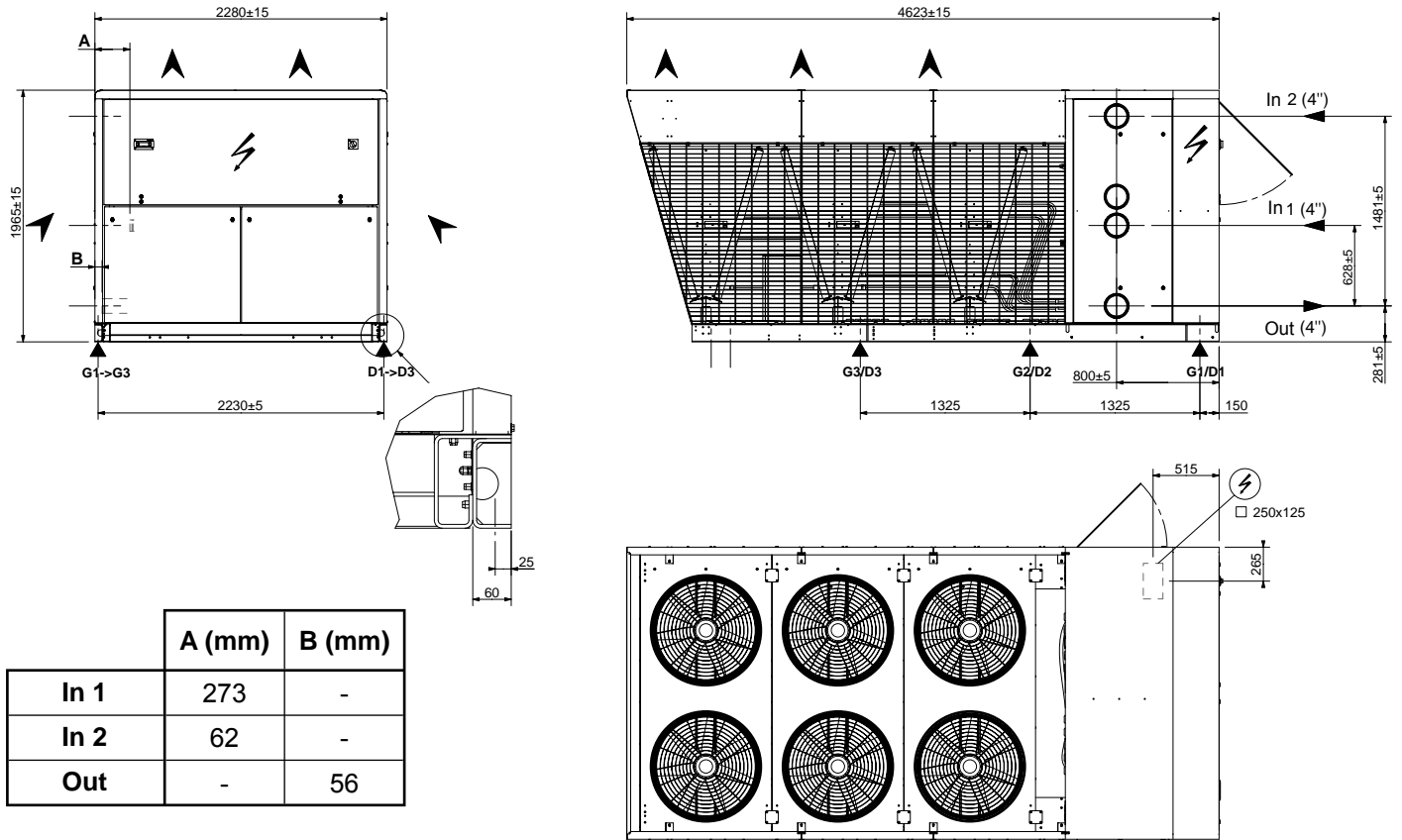
CLEARANCES

Overhead obstructions are not permitted



Lennox recommend load distribution as detailed above,

NAC 300
NAH 270 / 300



LEGEND :

- IN1 :** Water inlet - Unit without hydraulic module
- IN2 :** Water inlet - Unit with hydraulic module
- OUT :** Water outlet

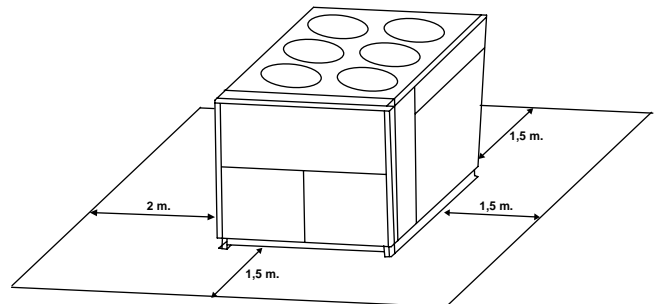
LOAD DITRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

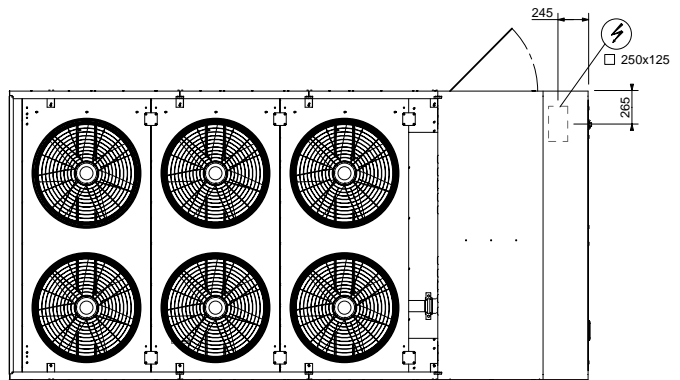
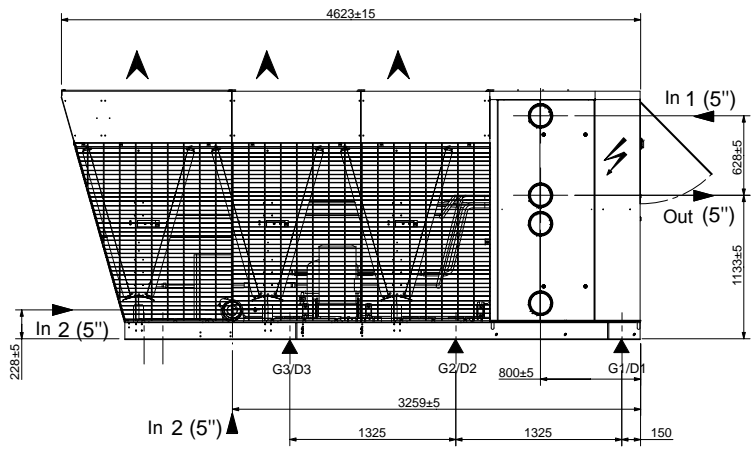
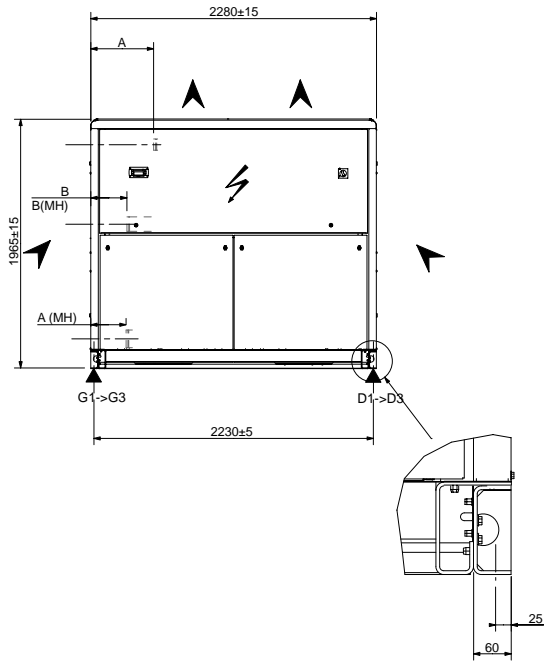
	G1	G2	G3	D1	D2	D3
NAC 300	501	501	501	501	501	501
NAH 270	527	527	527	527	527	527
NAH 300	534	534	534	534	534	534

CLEARANCES

Overhead obstruction are not permitted



NAC 340 / 380



	A (mm)	B (mm)
In 1	266	-
In 2	281	-
Out	-	136
Out (MH)	-	122

LEGEND :

- IN1 :** Water inlet - Unit without hydraulic module
- IN2 :** Water inlet - Unit with hydraulic module
- OUT :** Water outlet
- OUT (MH) :** Water outlet - Unit with hydraulic module

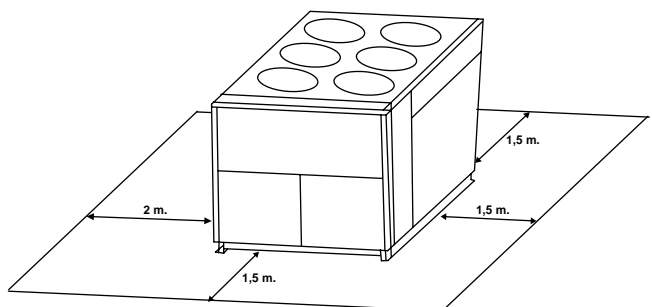
LOAD DISTRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

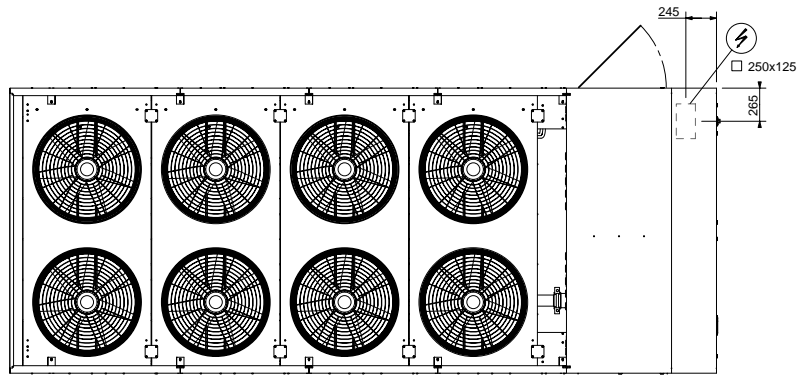
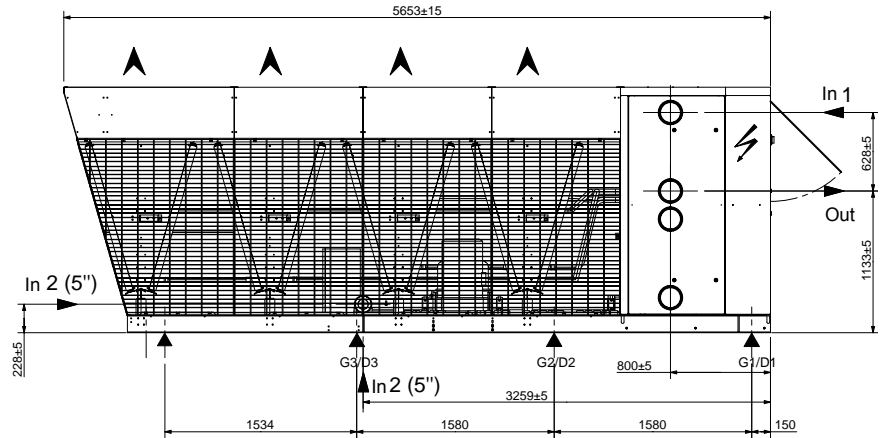
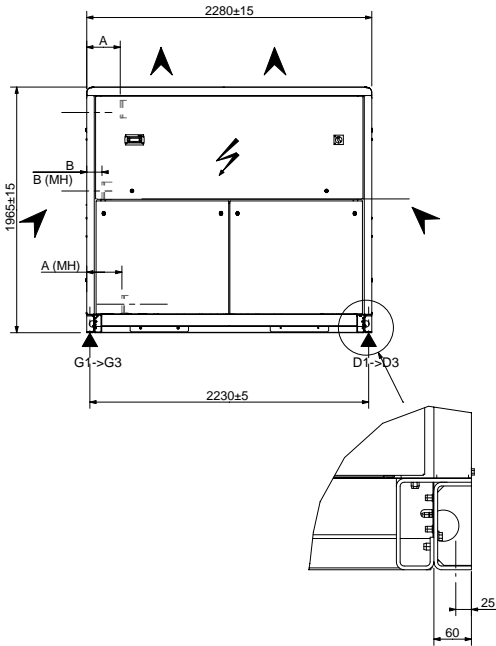
	G1	G2	G3	D1	D2	D3
NAC 340	551	551	551	551	551	551
NAC 380	564	564	564	564	564	564

CLEARANCES

Overhead obstruction are not permitted



NAC 420 / 480



	A (mm)	B (mm)
In 1	266	-
In 2	281	-
Out	-	136
Out (MH)	-	122

LEGEND :

- IN1 :** Water inlet - Unit without hydraulic module
- IN2 :** Water inlet - Unit with hydraulic module
- OUT :** Water outlet
- OUT (MH) :** Water outlet - Unit with hydraulic module

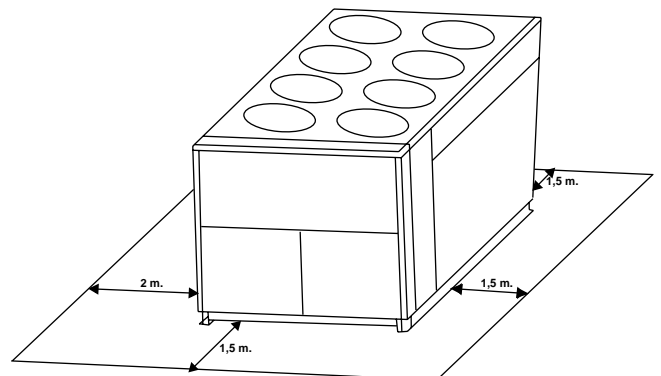
LOAD DITRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

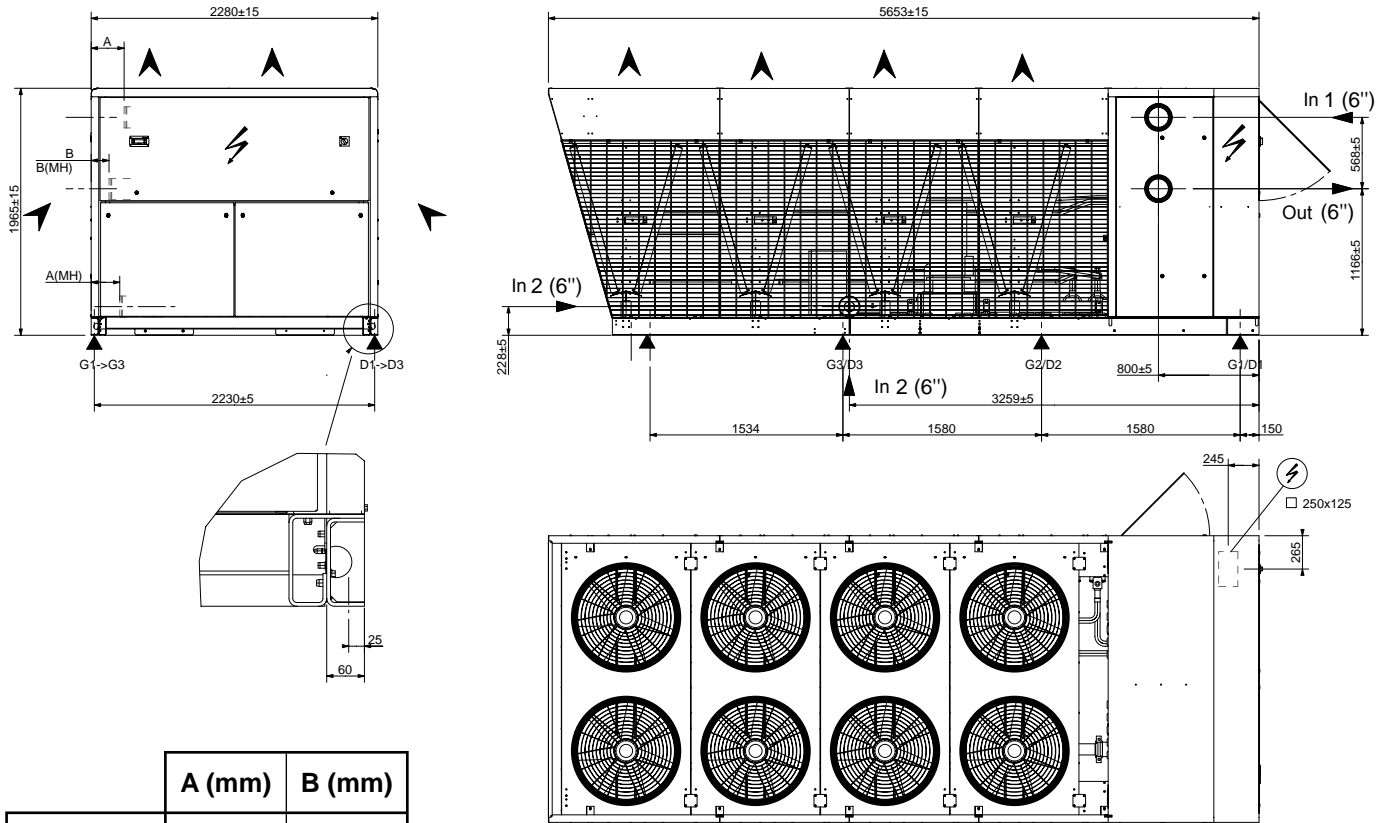
	G1	G2	G3	D1	D2	D3
NAC 420	645	645	645	645	645	645
NAC 480	662	662	662	662	662	662

CLEARANCES

Overhead obstruction are not permitted



NAC 540



	A (mm)	B (mm)
In 1	262	-
In 2	227	-
Out	-	141
Out (MH)	-	273

LEGEND :

- IN1 :** Water inlet - Unit without hydraulic module
- IN2 :** Water inlet - Unit with hydraulic module
- OUT :** Water outlet
- OUT (MH) :** Water outlet - Unit with hydraulic module

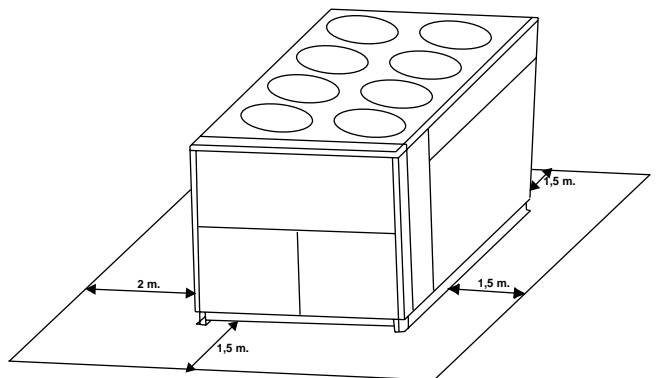
LOAD DITRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

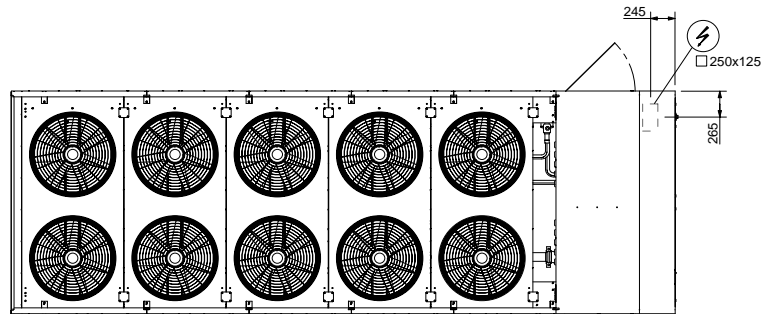
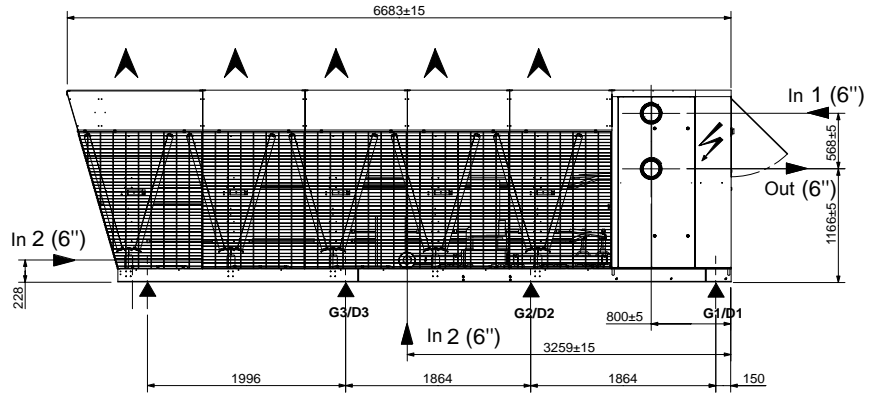
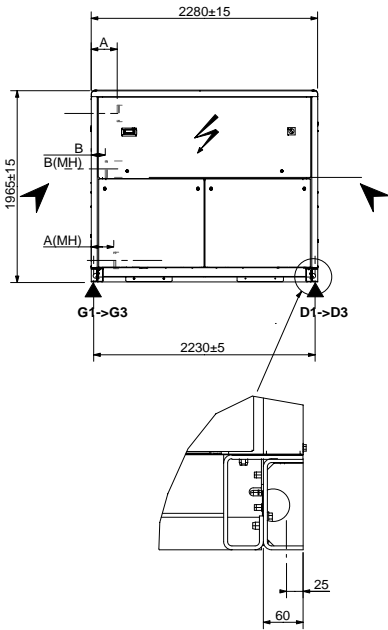
	G1	G2	G3	D1	D2	D3
NAC 540	686	686	686	686	686	686

CLEARANCES

Overhead obstruction are not permitted



NAC 600 / 640



	A (mm)	B (mm)
In 1	262	-
In 2	227	-
Out	-	141
Out (MH)	-	273

LEGEND :

- IN1 :** Water inlet - Unit without hydraulic module
- IN2 :** Water inlet - Unit with hydraulic module
- OUT :** Water outlet
- OUT (MH) :** Water outlet - Unit with hydraulic module

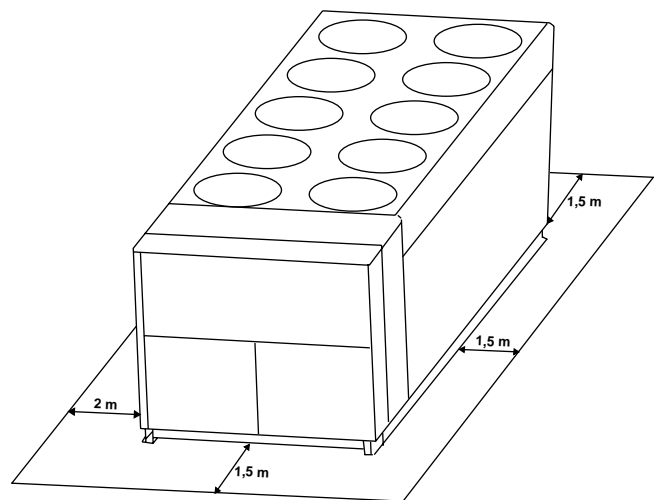
CLEARANCES

Overhead obstruction are not permitted

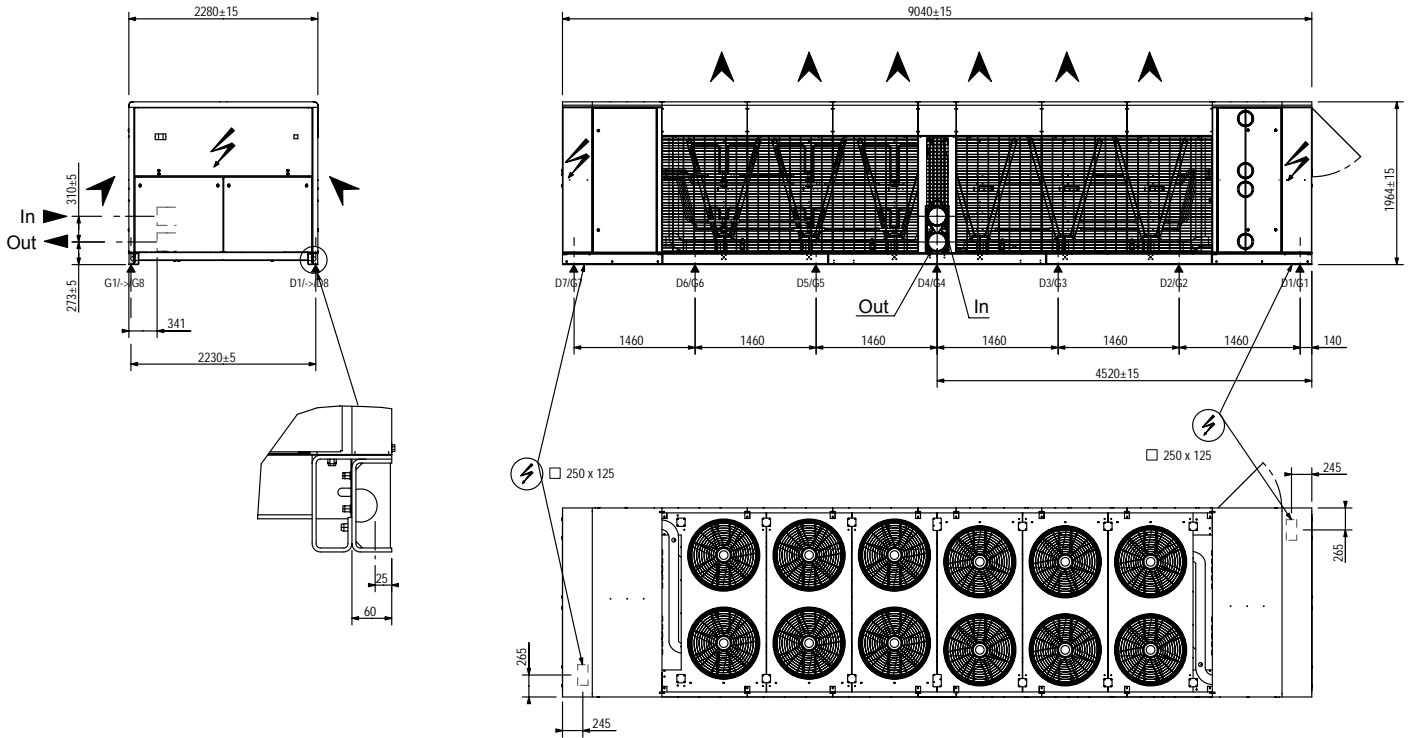
LOAD DITRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

	G1	G2	G3	D1	D2	D3
NAC 600	744	744	744	744	744	744
NAC 640	751	751	751	751	751	751



NAC 680 / 760



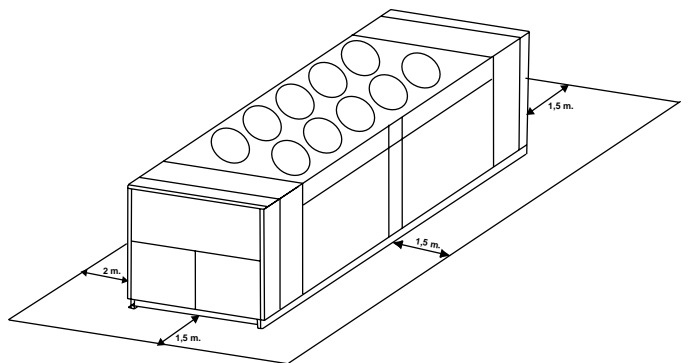
Note: In case of single main power connection (option), main power supply and disconnect switch are located at the right side of the unit.

CLEARANCES

Overhead obstructions are not permitted

LEGEND :

IN: Water inlet
OUT: Water outlet

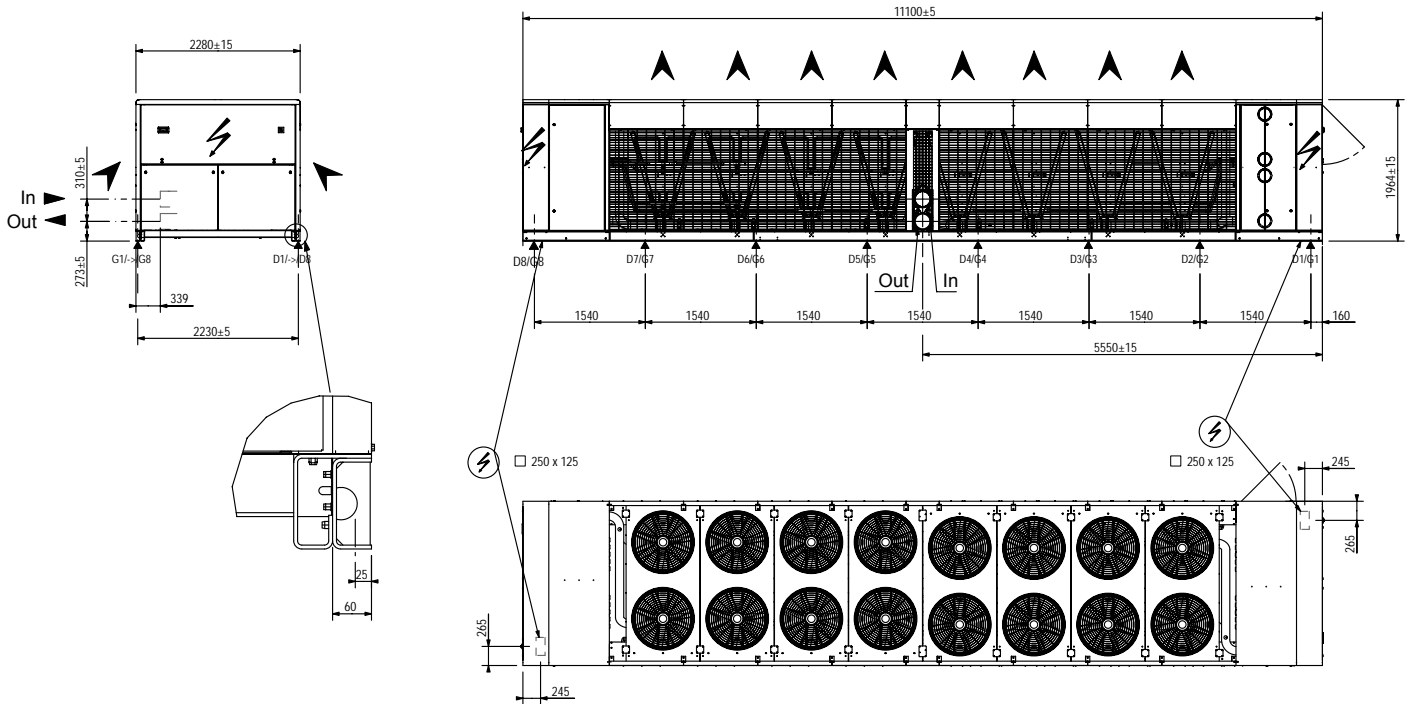


LOAD DITRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

	G1	G2	G3	G4	G5	G6	G7	D1	D2	D3	D4	D5	D6	D7
NAC 680	480	480	480	480	480	480	480	480	480	480	480	480	480	480
MAC 760	490	490	490	490	490	490	490	490	490	490	490	490	490	490

NAC 840 / 960 / 1080



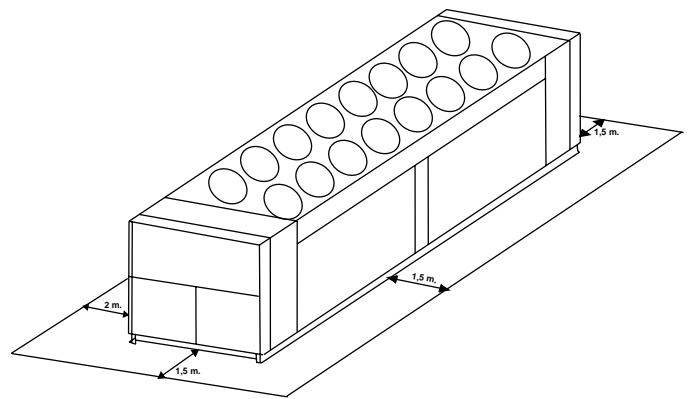
Note: In case of single main power connection (option), main power supply and disconnect switch are located at the right side of the unit.

CLEARANCES

Overhead obstructions are not permitted

LEGEND :

- IN:** Water inlet
- OUT:** Water outlet



LOAD DITRIBUTION

(Kg - Operating weights with dual pump hydraulic module)

	G1	G2	G3	G4	G5	G6	G7	G8	D1	D2	D3	D4	D5	D6	D7	D8
NAC 840	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
NAC 960	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510
NAC 1080	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510	510

NAC

	NAC	200	230	270	300	340	380	420	480
Without hydraulic module									
Operating weight	kg	1991	2018	2266	2647	2930	3009	3482	3583
Shipping weight	kg	1962	1989	2234	2615	2889	2962	3429	3530
With low pressure single pump									
Operating weight	kg	2198	2228	2483	2871	3169	3283	3756	3857
Shipping weight	kg	2157	2187	2439	2826	3110	3218	3685	3786
With low pressure double pump									
Operating weight	kg	2231	2264	2525	2919	3217	3366	3838	3939
Shipping weight	kg	2190	2252	2512	2907	3199	3348	3820	3921
With high pressure single pump									
Operating weight	kg	2208	2271	2525	2915	3213	3292	3767	3868
Shipping weight	kg	2167	2229	2480	2870	3154	3227	3697	3798
With high pressure double pump									
Operating weight	kg	2251	2350	2608	3007	3305	3385	3873	3974
Shipping weight	kg	2209	2309	2564	2963	3247	3319	3802	3903

	NAC	540	600	640	680	760	840	960	1080
Without hydraulic module									
Operating weight	kg	3596	3941	3983	6720	6860	8000	8160	8160
Shipping weight	kg	3539	3884	3918	6445	6570	7700	7825	7815
With low pressure single pump									
Operating weight	kg	3931	4276	4319	NA	NA	NA	NA	NA
Shipping weight	kg	3857	4202	4236	NA	NA	NA	NA	NA
With low pressure double pump									
Operating weight	kg	4038	4383	4426	NA	NA	NA	NA	NA
Shipping weight	kg	4021	4366	4408	NA	NA	NA	NA	NA
With high pressure single pump									
Operating weight	kg	3969	4314	4357	NA	NA	NA	NA	NA
Shipping weight	kg	3895	4240	4274	NA	NA	NA	NA	NA
With high pressure double pump									
Operating weight	kg	4117	4462	4504	NA	NA	NA	NA	NA
Shipping weight	kg	4042	4387	4421	NA	NA	NA	NA	NA

NAH

	NAH	200	230	270	300
Without hydraulic module					
Operating weight	kg	2137	2163	2835	2861
Shipping weight	kg	2088	2114	2769	2795
With single pump					
Operating weight	kg	2340	2369	3045	3077
Shipping weight	kg	2261	2291	2949	2981
With double pump					
Operating weight	kg	2370	2402	3083	3121
Shipping weight	kg	2291	2324	2987	3025
With high pressure single pump					
Operating weight	kg	2349	2408	3083	3117
Shipping weight	kg	2270	2329	2987	3021
With high pressure double pump					
Operating weight	kg	2388	2480	3159	3201
Shipping weight	kg	2309	2401	3063	3105



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Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.

Installation and service must be performed by a qualified installer and servicing agency