FläktGroup

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GLAC(H)-4131-8321

GLAC4131-8321CD2(.SL/.HE), GLAH4131-6181CD2, GLAH4131-8321CD2.LT
TECHNICAL DATA

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FläktGroup Chiller and Heat Pump

G	L	A	C	8	3	2	1	C	D	2	.	H	E

FläktGroup air cooled chiller for outdoor installation
GLAC 4131-8321 CD2
GLAC 4131-8321 CD2.SL
GLAC 4131-8321 CD2.HE

and

FläktGroup air cooled heat pump for outdoor installation
GLAH 4131-6181 CD2
GLAH 4131-8321 CD2.LT

FläktGroup Chiller

GL	Global Large

Condenser

A	Air cooled (outdoor installation)

Operating mode

C	Chiller
H	Heat pump

Number of compressors

4	4 compressors
5	5 compressors
6	6 compressors
8	8 compressors

Capacity stage

131, 141,	4 compressors
161,	4 compressors
171, 201,	5 compressors in chiller
171, 201,	6 compressors in heat pump
181, 211	6 compressors
231,	6 compressors as chiller
241,	6 compressors
241, 261,	8 compressors
281, 301,	8 compressors
321	8 compressors

Series

C	Unit series C

Refrigerant

D	R410A

Supply voltage

2	400 V/3~/50 Hz (+PE)

Design

–	Standard
.SL	SL unit - especially quiet model, applies only to chillers
.HE	HE unit - high efficiency model, applies only to chillers
.LT	LT model: heating up to -12 °C in heat pump mode, only for heat pumps

Chiller

GLAC 4131-8321 CD2

FläktGroup GLAC Chiller 4131-8321 CD2 (.SL/.HE):

- Refrigerant R-410A
- 3 unit configurations
  - Basic configuration
  - SL-model for sound attenuated operation
  - HE model for energy optimized operation => Eurovent class A
- 2 to 4 refrigeration circuits
- 2 to 3 scroll compressors per each refrigeration circuit
- 14 unit sizes with cooling duty from 350 to 885 kW
- Operating range from -15 °C to 46 °C ambient temperature
- SL/HE-units can be can be delivered with an integrated GLHM hydraulic module

Heat pump

Heat pump GLAH 4131-6181CD2 and GLAH4131-8321CD2.LT:

- Refrigerant R-410A
- 2 unit configurations
  - Basic configuration
  - LT model for energy optimized operation and extended operating limits => Eurovent class A
- 2 to 4 refrigeration circuits
- 2 scroll compressors per each refrigeration circuit
- 5 unit sizes (basic units) / 13 units sizes (LT units) with cooling capacity from 340 to 780 kW & heating capacity from 370 kW to 871 kW
- Operating range: cooling -15 °C to 46 °C ambient temperature heating: -12 °C (.LT) to 20 °C ambient temperature
- Unit sizes GLAH4131-6181CD2(.LT) can be delivered with an integrated GLHM hydraulic module

GLAH 4131-8321 CD2

All chillers of GLAC 4131-6211 CD2 (.SL/.HE) series as well as heat pumps of GLAH 4131-6181.CD2 and GLAH 4131-6211 CD2.LT series are certified by the Eurovent.

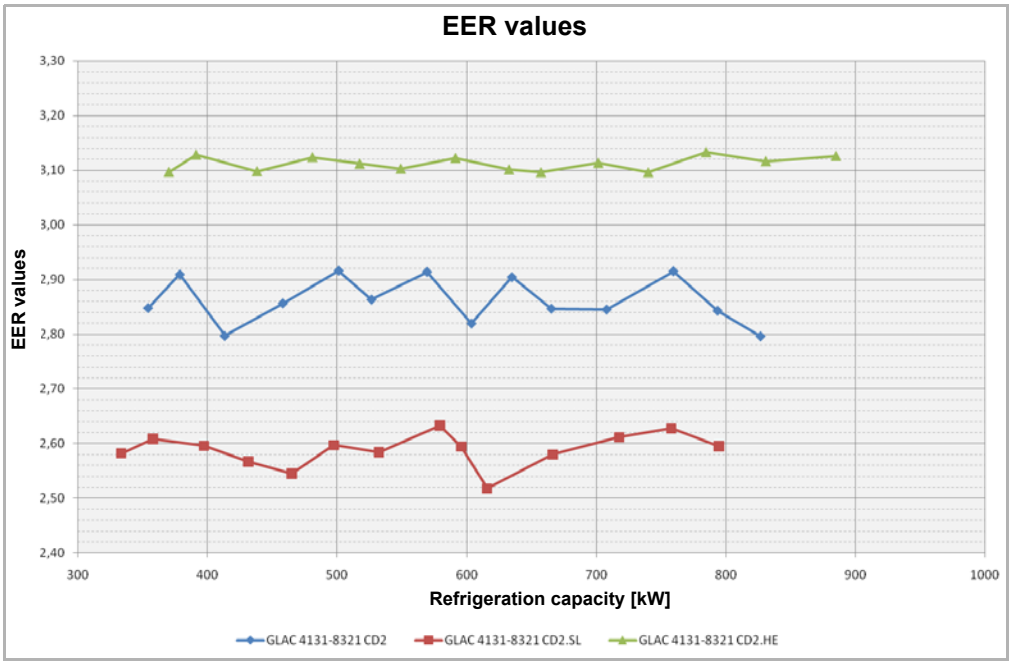
EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

EER value:

The EER value (Energy Efficiency Ratio) of a chiller indicates the relationship between cooling capacity and consumed electrical power with consideration of the following measurement conditions for air cooled units:

– Medium water
– Water inlet temperature 12 °C
– Water outlet temperature 7 °C
– Ambient air temperature 35 °C
– Unit operates under full load

The higher the EER value - the more energy efficient the unit operation at 100% full load. With units that operate at full load most time of the year or the whole year around - special attention should be paid to a possibly high EER value. This is often the case in production facilities or computer and data processing centres.

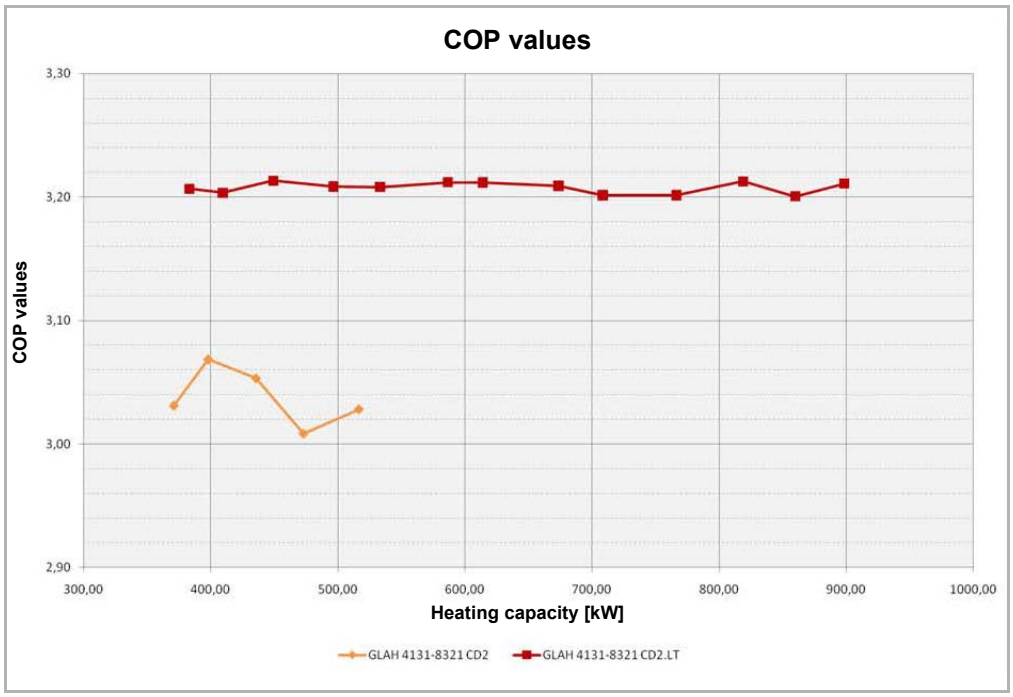


COP value:

The COP value (Coefficient of Performance) of a heat pump indicates the relationship between heating capacity and consumed electrical power with consideration of the following measurement conditions for air cooled units:

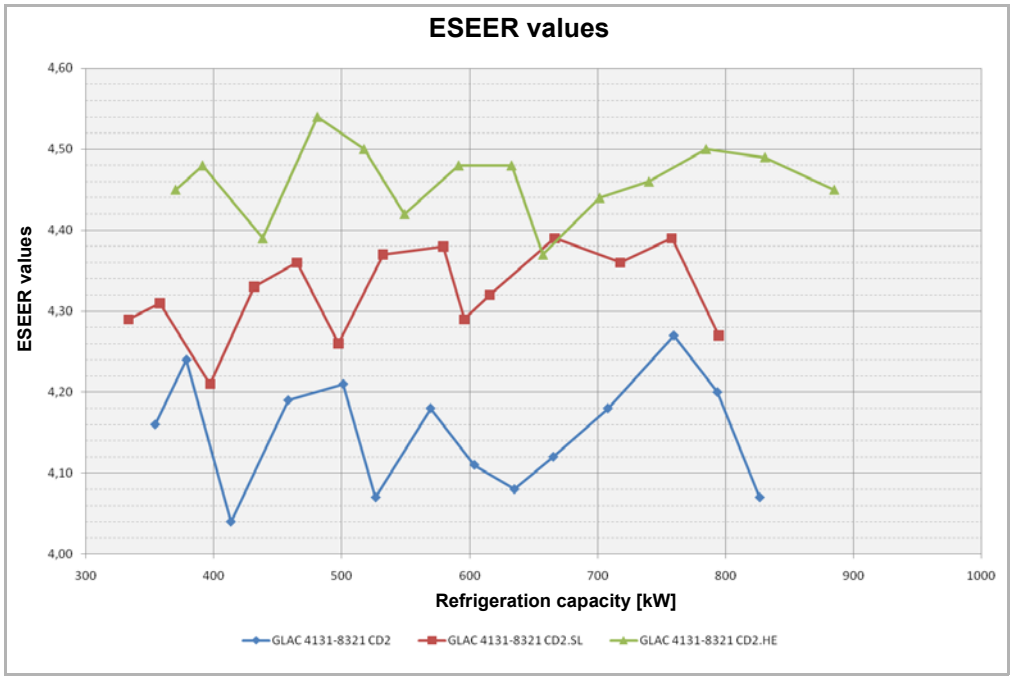
– Medium water
– Water inlet temperature 40 °C
– Water outlet temperature 45 °C
– Ambient air temperature 7 °C
– Unit operates under full load

The higher the COP value - the more energy efficient the unit operation at 100% full load.



ESEER value:

The ESEER value demonstrates the energy efficiency not only in full load conditions but in part load conditions during the entire year as well (refer to section „Energy Indicies IPLV and ESEER“). In comfort air handling the focus should be placed on the ESEER value instead of EER. In this case the same rule applies that the higher the ESEER value - the more energy efficient the annual unit operation.

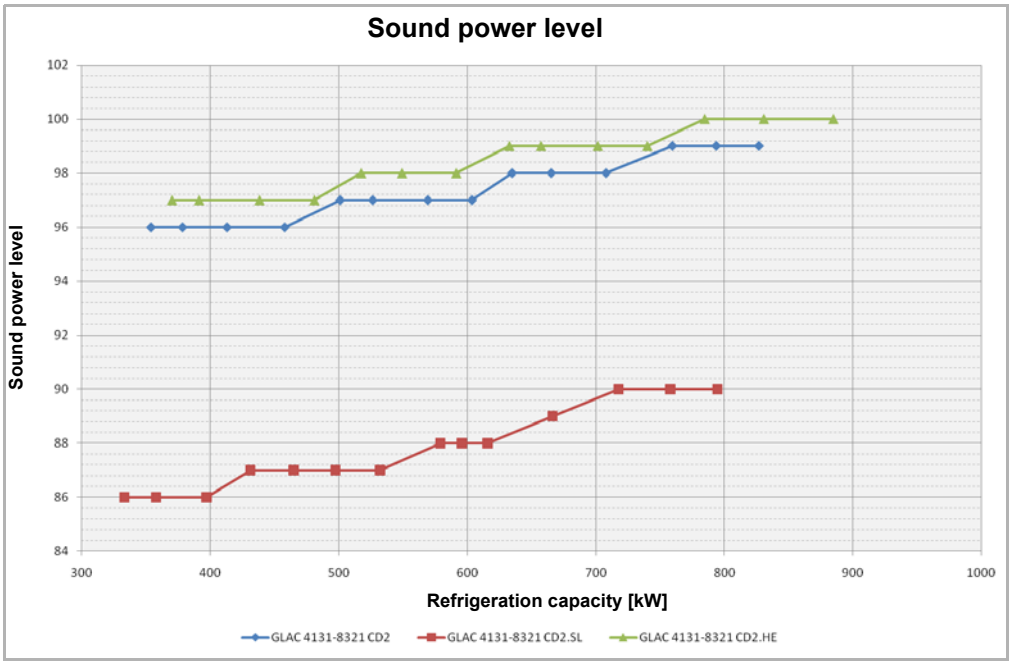


Sound power level:

Depending on the installation location it is important for the units to operate extremely quietly in order to fulfil e.g. legal standards. Therefore the GLAC - CD2 unit is also available as an SL version that enables especially quiet operation.

The sound power level is reduced by the following:

– acoustic insulation of compressor casing
– increased surface of condenser
– Reduction of fan RPM (with extremely high ambient temperatures the fan speed is increased in order to ensure safe unit operation)



In Europe increasing attention is paid to the energy consumption of air conditioning equipment. It is not only the efficiency of air-conditioning equipment under nominal conditions that has been used as a basis in the U.S. for many years. An assessment index is also used, which considers operation of the unit under partial load conditions as well as nominal conditions. In part load operating mode ambient temperature is remains below the nominal value and the refrigerant compressors operate at part load speed. The assessment index used in the USA is known as IPLV (Integrated Part Load Value) and is defined in a guideline issued by the ARI (American Refrigeration Institute).

ARI Norm: $\mathbf{IPLV_{ARI} = (1 \bullet EER_{100\%} + 42 \bullet EER_{75\%} + 45 \bullet EER_{50\%} + 12 \bullet EER_{25\%}) / 100}$

EER100%, EER75%, EER50%, EER25% stand for the chiller efficiency under a number of different part load conditions (100 % - 75 % - 50 % - 25 %), calculated given the ambient temperature conditions listed below. The temperature of the chilled water at the evaporator outlet is assumed to be a constant 6,7 °C under part load conditions, with DT of T of 5 K at full load. The multipliers 1 %, 42 %, 45 % und 12 % are the respective percentage weightings of the efficiency levels for the different part load conditions as specified by the ARI Standard. These were determined by ARI, based on investigations of various building shapes in 29 American cities.

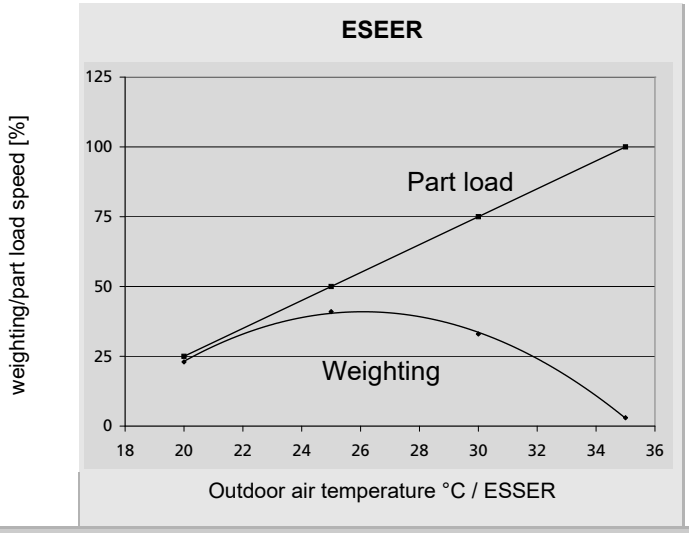
Water at the evaporator outlet:	6.7 °C			
∆T at full load:	5 °C			
Load:	100 %	75 %	50 %	25 %
Outdoor air temperature:	35 °C	26.7 °C	18.3 °C	12.8 °C

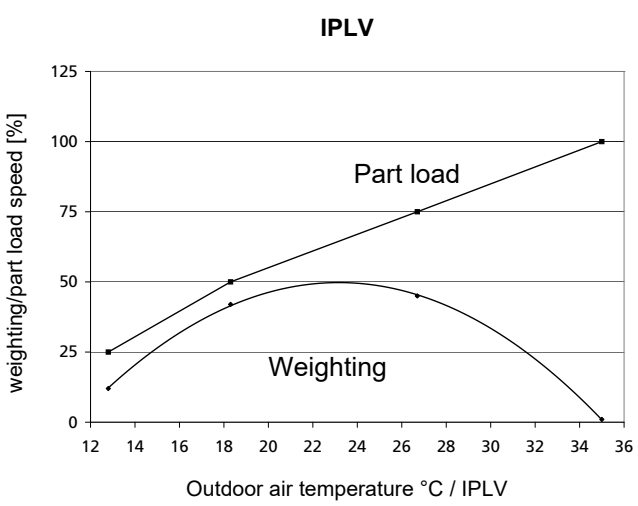
Taking into consideration normal European conditions it is difficult to imagine that a chiller would operate at outdoor air temperatures below 20 °C. Besides, legal codes and regulations (including drafts) tend to enforce obligations on producers with an aim to reduce energy consumption and promote the application of systems that can directly or indirectly make use of outdoor air if ambient conditions allow this.

In Europe the EECCAC (Energy Efficiency and Certification of Central Air Conditioner) study was carried out to adapt the US-related IPLV (Integrated Part Load Value) to European climate conditions. The ESEER (European Seasonal Energy Efficiency Ratio) was developed within the framework of this guideline.

EECCAC suggestion: $\mathbf{ESEER = (3 \bullet EER_{100\%} + 33 \bullet EER_{75\%} + 41 \bullet EER_{50\%} + 23 \bullet EER_{25\%}) / 100}$

Water at the evaporator outlet:	6.7 °C			
∆T at full load:	5 °C			
Load:	100 %	75 %	50 %	25 %
Outdoor air temperature:	35 °C	30 °C	25 °C	20 °C





Load:	Air temperature	Weighting	Air temperature	Weighting
100 %	35 °C	3 %	35 °C	1 %
75 %	30 °C	33 %	26.7 °C	42 %
50 %	25 °C	41 %	18.3 °C	45 %
25 %	20 °C	23 %	12.8 °C	12 %

Using the energy indices

Once the index to be used has been determined and the total energy required by the system in summer has been estimated (cooling energy in kWh), the seasonal electrical consumption (in kWh) can be derived using the formula below:

Energy consumed = required energy/efficiency index

For individual figures regarding the relevant series please refer to the following tables in Technical Data from page 22 and on.

The actual energy can be calculated more precisely in a “dynamic” form by considering the load progression curve in relation to changes of outdoor temperatures, the installation location and the relevant number of operating hours. With this data every system operator or system designer can bring their own considerations into play depending on the type of a building, location, the type of heat load and other factors. The energy index can also be determined by using the method that best corresponds to the system requirements, compares energy aspects of similar or equal systems and uses the same reference unit.

These **FläktGroup units are air cooled chillers or heat pumps, designed for installation outdoors and equipped with axial fans.** In the factory they are filled with refrigerator oil and refrigerant and a test run is performed, so that when the units are installed on site only chilled water and electrical connections have to be established. A functional test must also be carried out.

The FläktGroup unit series are designed only to be used with the refrigerant R410A.

Directives and regulations

Units meet the following directives and regulations:

- Directive on Machinery 2006/42/EC
- Low Voltage Directive 2006/95/EC
- Electromagnetic Compatibility 89/336/ECC + 2004/108/EC
- Pressure Equipment Directive 97/23/EC according to module H1

Components

Chillers with a high EER and heat pumps with a good COP

This new unit generation has a high efficiency ratio (EER and COP) and uses the refrigerant R410A. An optimum result was achieved by carefully designing all internal components so as to fully exploit the performance characteristics of the specific refrigerant. Particular attention was paid to the surfaces of the heat exchangers, as well as the fans and compressors.

The newly designed condensers have larger exchange surface areas, as do the new evaporators, which enable even better and more efficient distribution of the refrigerant in a liquid and gaseous state. The fans are controlled so as to optimise the air volume flow in each condenser section and therefore ensure that noise levels are kept to a minimum in every operational mode.

The intelligent control of the chilled water outlet temperature reduces fluctuations in relation to the specified setpoint and vastly reduces the time the system needs until it is ready for operation. The precision and rapid reaction of the intelligent control system facilitate optimum control in the event of load fluctuations which means that stable operating conditions can be achieved very quickly, even during part load operation. A carefully dimensioned system implemented in these units produces considerable energy savings and vastly reduces operating costs.

State-of-the-art system of the newest generation

The GLAC/GLAH unit series are water cooling systems that are particularly suitable for small and medium-sized air conditioning systems, or for systems designed for low water system content. The main difference when compared to conventional units is the intelligent controller system.

Basic construction

The frame and panels are made of galvanized, plastic-coated sheet steel (RAL 7035). The self-supporting construction offers excellent access to the individual components during maintenance and repair work.

Compressor

Fully hermetic, low-vibration and suction-refrigerant cooled scroll compressor complete with oil heating for safe compressor start-up, electronic overheating protection with manual reset and a two-pole electric motor. These scroll compressors are also highly economical to run and have a sound power level that is some 6 dB(A) lower than piston compressors.

Chillers of model sizes 4131-4161 are fitted with 2 compressors in each of two refrigeration circuits.
Chillers of model sizes 5171 and 5201 are fitted with 5 compressors in a total of two refrigeration circuits.
Chillers of model sizes 6181, 6211 and 6241 are fitted with 3 compressors in a total of two refrigeration circuits.
Chillers of model sizes 6231 are fitted with 2 compressors in a total of three refrigeration circuits. Chillers of model sizes 8241-8321 are fitted with 2 compressors in each of four refrigeration circuits.
Heat pumps of model sizes 4131-4161 are fitted with 2 compressors in each of two refrigeration circuits.
Heat pumps of model sizes 6171-6241 are fitted with 2 compressors in each of three refrigeration circuits.
Heat pumps of model sizes 8241-8321 are fitted with 2 compressors in each of four refrigeration circuits.

Evaporator (chiller mode)

Shell and tube heat exchanger for dry evaporation with asymmetric lines which makes it possible to ensure the correct velocity of the refrigerant in each phase of the evaporation process. The external steel shell is provided with a diffusion-tight and non-eroding thermal insulating material covering the entire surface. The internal tube bundle is made of seamless copper pipes that are expanded into terminal plates. In order to increase the heat exchange surface the copper pipes are finned inside. During operation the evaporator is protected by a differential pressure switch installed between the chilled water inlet and outlet. The unit can also be operated with glycol as standard at outlet temperatures of up to -8°C. If chillers are operated with water outlet temperatures below 0 °C, it is recommended to use enhanced thermal insulation for the evaporator (option .I11).

Condenser

Newly developed, V-form arranged „Micro-Channel" condenser with aluminium pipes and fins is designed to reach high power density and energy efficiency through excellent heat exchange features. Use of aluminium increases resistance against corrosion of heat exchanger which can used in saline and corrosive environments. Refrigerant pipework in the condenser is performed with small cross-section which makes it possible to reduce the required volume of refrigerant to a minimum. Another advantage is that an aluminium heat exchanger is significantly less heavier than conventional Cu/Al heat exchangers.

Condenser (with chilled water operation for GLAH units)

V-form arranged finned tube heat exchangers have copper fins and corrugated aluminium fins. The best possible heat exchanger efficiency is achieved through even spacing of the fins.

Fans

Direct driven axial fans (protection type IP54) provided with deep drawn rotor made of sheet steel and 6-pole motor with overheating protection and maintenance-free ball bearings. Assembled in a streamlined form and fitted with a protective grille. In order to ensure efficiency factor at part load, the fan groups per each refrigeration circuit are separated on the air side.

Electronic expansion valve

An electronic expansion valve enables to reduce the condensing pressure of the unit to a minimum with the purpose to increase unit efficiency especially in part load operation. The next optimisation of capacity is reached through minimum evaporator overheating, which can only be performed with an electronic expansion valve.

4-way valve (only GLAH)

The 4-way valve is installed in the refrigeration circuit after the compressor. Depending on the required operating mode (cooling or heating), the decision is made on whether to direct hot refrigerant gas through an air cooled Cu/Al heat exchanger for heat transfer to outside air or to a shell and tube heat exchanger for heat transfer to water circuit.

In chiller mode hot gas passes to Cu/Al heat exchanger and in heat pump mode - to shell and tube heat exchanger.

Refrigeration circuit

Each refrigeration circuit contains the following components:

- Filter drier
- Sight glass with humidity indicator
- Electronic expansion valve
- Liquid line shut off valve
- Electronic pressure sensor on discharge and suction side
- Safety valve on pressure and suction side
- High and low pressure switch
- Service valves on suction and pressure side, liquid and injection line.

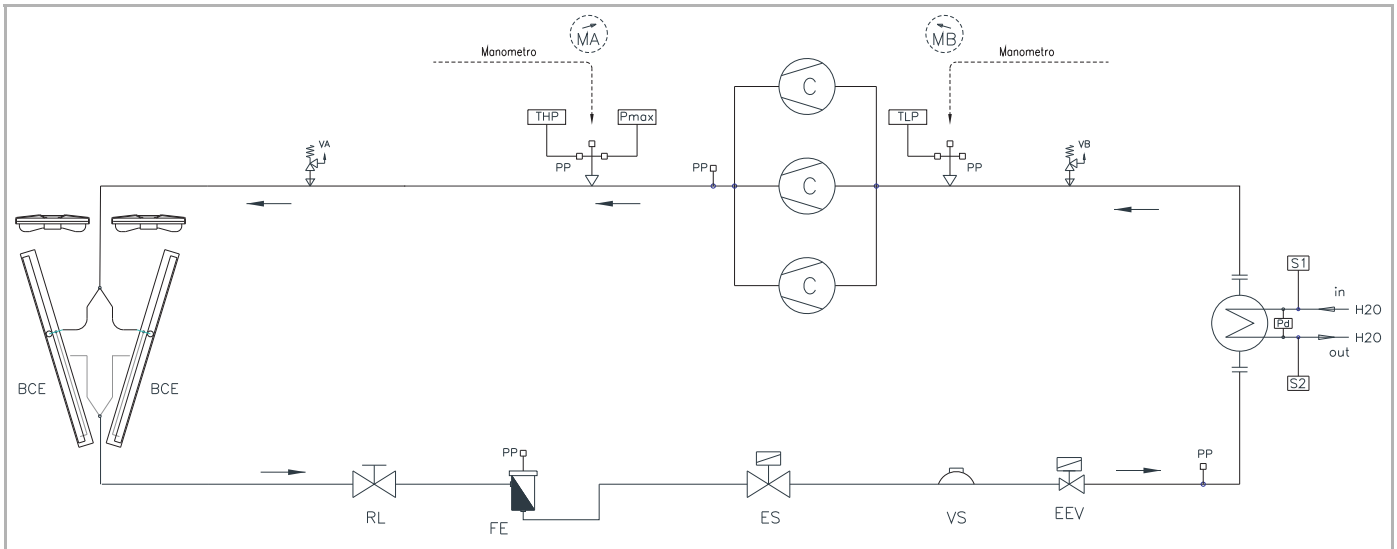


Fig. 1: FE137505-0 - Refrigeration circuit scheme unit series GLAC 4131-8321 CD2(.SL/.HE)

Acronym	Description	Acronym	Description
BCE	Air cooled condenser	PP	Service Schrader valve
C	Scroll compressor	RL	Shut off valve on liquid line (only 0904-1204)
EEV	Electronic expansion valve	S1	Temperature sensor water inlet
EV	Evaporator	S2	Temperature sensor water outlet
FE	Filter drier	THP	High pressure sensor
MA	High-pressure gauge (option .R13)	TLP	Low pressure sensor
MB	Low-pressure gauge (option .R13)	VA	High pressure safety valve
Pmax	High-pressure pressostat	VB	Low-pressure safety valve
Pd	Differential pressure switch (water)	VS	Sight glass with humidity indicator

Chillers of model sizes 4131-4161 are fitted with 2 compressors in each of two refrigeration circuits.
Chillers of model sizes 5171 and 5201 are fitted with 5 compressors in a total of two refrigeration circuits.
Chillers of model sizes 6181, 6211 and 6241 are fitted with 3 compressors in a total of two refrigeration circuits.
Chillers of model sizes 6231 are fitted with 2 compressors in a total of three refrigeration circuits.
Chillers of model size 8241-8321 are fitted with 2 compressors in each of four refrigeration circuits.

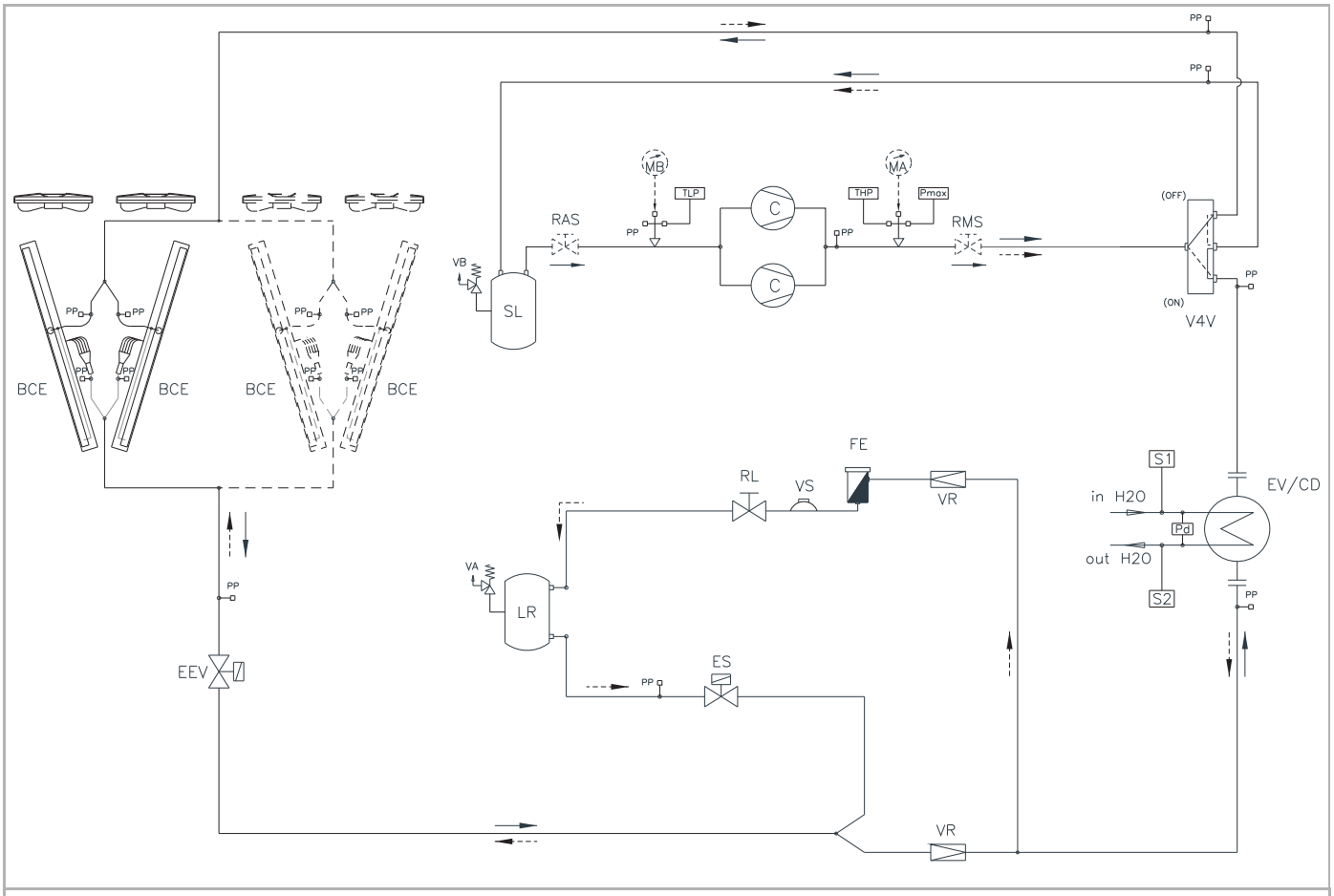


Fig. 2: FE237505-0 - Refrigeration circuit scheme unit series GLAH 4131-6181CD2 and GLAH 4131-8321 CD2.LT

Acronym	Description	Acronym	Description
BCE	Air cooled condenser (cooling mode)/evaporator (heating mode)	RL	Shut off valve on liquid line
C	Scroll compressor	RMS	Shut off on discharge side (optional .R10)
EEV	Electronic expansion valve	S1	Temperature sensor water inlet
ES	Solenoid valve	S2	Temperature sensor water outlet
EV/CD	Evaporator (cooling mode)/condenser (heating mode)	SL	Liquid strainer
FE	Filter drier	THP	High pressure sensor
LR	Refrigerant receiver	TLP	Low pressure sensor
MA	High-pressure gauge (option .R13)	VA	High pressure safety valve
MB	Low-pressure gauge (option .R13)	VB	Low-pressure safety valve
Pmax	High-pressure pressostat	V4V	4-way reversing valve
Pd	Differential pressure switch (water)	VS	Sight glass with humidity indicator
PP	Service Schrader valve	- - - - - -	Heating Operation
RAS	Shut-off valve suction side (optional .R02)	———	Cooling Operation

Heat pumps of model size 4131-4161 are fitted with 2 compressors in each of two refrigeration circuits.
Heat pumps of model size 6171-6241 are fitted with 2 compressors in each of three refrigeration circuits.
Heat pumps of model size 8241-8321 are fitted with 2 compressors in each of four refrigeration circuits.

Switch cabinet

Control cabinet (IP24), divided into power and control module, manufactured according to EN 60204-1, electromagnetic compatibility as of 2004/108/EC and Low Voltage Directive 2006/95/EC, complete with:

- Control cabinet in a separate casing sealed within the unit
- Transformer for generating control voltage
- Door locking main isolator
- Motor protection switch and contactors for compressor and fans
- Terminal strip control voltage
- Automatic circuit breaker for load and control current circuit
- Phase sequence protection for the compressor
- Contact for external remote ON/OFF
- Contact for general error message
- Clip contact for flow switch
- Operation status message from compressor (option.E03)
- Pump relay for controlling chilled water pump by others
- Continuous control of fan motor performed by high pressure or low pressure with GLAH units in heat pump operation
- Switch-over between cooling/heating operation using a potential-free floating contact (only heat pumps)

Electronic control system

Fig. 3: Electronic controller

Electronic controls of the FläktGroup controller - step II features the following:

- Plain text and digit alphanumerical LCD display
- Selection of 7 different languages is possible
- Automatic self-diagnostics of electronics
- Display of all analogue recorded temperature and pressure values
- Display of faults in compressors and refrigeration circuits
- Display of general unit faults
- Optional control of chilled water inlet or outlet temperature
- Safety times for compressor, such as compressor cycle protection, minimum downtime of compressors or maximum start-ups per hour (depending on type of the control system)
- Operating hours counter for compressor and chilled water pump
- Automatic operating hours compensation for compressor
- Notification about maintenance intervals of compressors and pumps (can be adjusted)
- Read out latest 200 alarm messages
- Service possible via PC and system software
- Pump lead and overrun times for switching unit on and off safely
- Setpoint shift via an external 4-20 mA signal (option .E21)

Accessories for controls

Fig. 4: Remote control

– Operation message of compressors (option .E03) floating contacts for status indication of each compressor.
– Second control connection for remote monitoring and regulation. Up to 10 units in the same controller family can be connected to an additional remote control. (option .E19 for remote control up to 200 meters and .E20 for remote control up to 500 meters distance).
– 2nd setpoint via normally open contact by others (option .E22) (applies to model size 4060-4160 only). External changeover between two setpoint values set for unit by closing a field-provided floating contact. Raising the setpoint, e.g. during night mode operation, enables to realize significant savings potential.
– Load shedding switch (option .E23)
Reduction of electrical power consumption by deactivating compressors or their capacity stages (load shedding switch) by opening a potential-free floating contact by others. This function is used, if a full electrical power supply is temporarily unavailable, e.g. during operation via an emergency generator.

Fig. 5: Serial card for connection to a building management system or for master/slave control

– Unit information can be called up via the Internet and LAN.
– Unit connection to the building management system (BMS) using a serial card. The following protocols are used to transmit digital and analogue values:
  – Reading off fault messages
  – Reading off temperature and pressure values provided by the controller
  – Operating status of individual compressors
  – Unit enabling
  – Setpoint shift
  – Changing operating mode between heating and cooling for heat pumps
  – Modbus (Siemens, Johnson Controls, Honeywell) (option .E14 for the unit or option .E24, if the unit should be connected to the building management system using a sequencer)
  – LONWORKS® (option .E15 for the unit or option .E25, if the unit should be connected to the building management system using a sequencer)
  – BACnet via IP (option .E16 for the unit).
  – BacNet via MS/TP RS485 (option .E17 for the unit or option .E27, if the unit should be connected to the building management system using a sequencer)

Fig. 6: Sequencer

– Sequencer (option .E18) Upstream master/slave control. Up to a maximum 5 units of the W3000 controller family can be used in a hydraulic circuit and connected to a sequencer. The sequencer is supplied in a separate switch cabinet with two temperature sensors, that must be installed in a common water inlet and outlet. Depending on the water inlet temperature, individual capacity stages or units are switched on or off. Every unit needs a serial card of type RS485 (option .E14) in order to communicate with the sequencer and own chilled water pump to be regulated by the chiller/heat pump. Units with a scroll compressor are fitted with a pump relay as standard.
– Sequencer (option .E18)
– Sequencer with integration to a BMS via RS485 protocol (option .E24).
– Sequencer with integration to a BMS via LONWORKS® (option .E25).
– Sequencer with integration to a BMS via BACNet protocol (option .E27).

Electrical accessories

– Soft start for compressor drive motors* (option .E06). Soft start for each unit compressor for reduction of starting current to 60 % of rated starting current.

Refrigeration circuit accessories

– Shut off valve on compressor suction side (option .R02). Service shut off valve fitted in suction line for fast and easy maintenance.
– Shut off valve on compressor discharge side (option .R10). Service shut off valve fitted in discharge line for fast and easy maintenance.
– High and low pressure gauge (option .R13). Refrigerant gauge for high and low pressure side for each refrigeration circuit for reading off current values on operating pressure.

**Each compressor motor is operated via a soft start.*
Soft start reduces the starting current of each compressor to 60%.
Example of maximum starting current for GLAC 8321 CD2 unit:
1. Maximum current consumption of a compressor that is already in operation
(73.6 A per compressor, highest current load of a unit with 7 operating compressors with the 8th compressor switching on => 7 73.6 A = 515.2 A)*
2. Maximum current consumption of fans (45.6 A)
*3. Starting current of an operating compressor (394 A * 0.6 = 236.4 A - factor 0.6 because of soft start)*
4. Sum of results from step 1 and 3 (515.2 A + 45.6 A + 236.4 A = 797.2 A)

Installation accessories

- Spring anti-vibration mounts for unit installation (option .I01). Anti-vibration mounts with spring elements for reduction of vibration transfer (enclosed).
- Air cooled Cu/Al heat exchanger with epoxy pre-coated aluminium fins for enhanced weather resistance properties. (Option .I03)
- Protection grille on the condenser outer side (option .I04)
- Flow switch with paddle for installation in hydraulic circuit at chilled water outlet (enclosed) (option .I10).

- Heavy duty thermal insulation of evaporator (option .I11). Double-layer thermal insulation of evaporator to prevent condensate formation in case of very high relative humidity of ambient air. Especially recommended at medium temperature below 0°C.
- Fin Guard Silver coating for Cu/Al heat exchanger (option .I18).
  Air cooled heat exchanger with Fin Guard Silver coating for increased resistance in specific ambient conditions.
- Acoustic box for compressor sound attenuation (option .I47).
  Acoustic box for each compressor group, mounted by the manufacturer. The sound power level is reduced by 2 dB(A).
- Protective cover for condenser deflecting bends (option .I53)
  To prevent damage covers for condenser deflecting bends are fitted for each condenser unit.
- Unit packing in open wooden crate with a nylon film (option .O01). The unit is supplied in open wooden crate for additional protection against shipping damage. The unit is additionally protected with nylon film against weather effects and contamination.

The following options are not available for all types.

Unit accessories

- Hydraulic module (fitted in unit), refer to page 108 and following pages.
- Stand-by-pump for GLHM hydraulic module.
- Anti-freeze heating for GLHM hydraulic module (option .M05). Anti-freeze heater for buffer tank water protection in stand-by mode at ambient temperatures below 3°C. Frost protection of pump, expansion tank and pipework shall be performed by others on site.

Optionally available unit version

For chiller: Basic model, SL model and HE model

For heat pump: Basic model, and LT model

SL unit Extremely quiet model – operation where strict acoustic protection measures apply.

Reduced sound values as compared to basic model:
- Acoustic attenuation of compressor casing
- Reduced fan speed – at especially high ambient temperatures the fan speed is automatically increased over standard RPM speed.
- Increase of heat exchanger surface of condenser.

HE Unit Unit model with high energy efficiency – for special energetic requirements and/or high ambient temperature.

Enhanced capacity rate as compared to a basic model thanks to:
- Increase of heat exchanger surface of condenser
- Increased volume flow
- Energy optimized system design

LT model The LT version makes it possible to operate the unit in heating mode at up to -12 °C ambient temperature.

This document is intended for specially qualified personnel and provides guidance on the selection of a suitable FläktGroup Chiller for the specific application.

NOTE!

For varying temperature differences and/or media also refer to the information on units in the “Performance data” tables on page 40 and following pages. For operating temperatures outside the specified ranges, please get in touch with your FläktGroup sales representative.

To help you select your unit we would like to explain this procedure using the following example:

EXAMPLE

	Input data			→	**Result**
Requirements You must first determine certain input data.	Noise protection requirements	→	No special requirements	→	**Basic unit** Use tables „Performance data basic unit“ on page 40 and following pages.
	Required cooling capacity	→	$\dot{Q}_e$ = 650 kW	→	Input values for tables „Performance data“ on page 40 and on.
	Outdoor air temperature	→	T_a = 35 °C		
	Chilled water outlet temperature	→	T_{eo} = 6 °C		
	Chilled water inlet temperature	→	T_{ei} = 12 °C		
	Frost safety of unit	→	up to -15 °C	→	Input value for table on page 68 and on.
	Available installation location	→	11 x 6.5 m roof of a building in an industrial area	→	**see step 4**
1. Step Determine the unit type, its performance and operating data using the “Performance data” tables on page 40 and following pages.	Determine the preliminary unit type	→	from tables on page 40 and following pages	→	**GLAC 8261 CD2** Q_e = 688.0 kW P = 246.4 kW V_e = 118.2 m³/h Δp_e = 51.7 kPa
2. Step At chilled water temperature difference of $\Delta Te \neq 5$ K it is necessary to determine the chilled water flow and chilled water related pressure drop in the evaporator (for the design of the pumps) using the diagrams on page 64 and following pages.	Is $\Delta T_e \neq 5$ *K?*	→	$\Delta T_e = T_{ei} - T_{eo}$ *Gl. 1* ΔT_e [K] - chilled water temp. difference T_{ei} - chilled water inlet temperature T_{eo} - chilled water outlet temperature		
			$\Delta T_e = 12$ °C - 6 °C	→	ΔT_e = 6 K
	ΔT_e = 6 K $\dot{Q}_e$ = 688.0 kW	→	Chiller water volume flow from diagram D. 1 on page 64	→	$\dot{V}_e$ = 98.7 m³/h
			Chilled water volume flow from diagram D. 2 on page 64	→	Δ_{pe} = 36.0 kPa

	Input data	→	Result
3. Step If water-glycol mixture is used, the refrigeration capacity must be determined and the chilled water flow rate as well as the chilled water related pressure drop in the evaporator must be adjusted accordingly using the conditional equations and diagrams on page 68 and following pages. * Check if the required cooling capacity is attained, otherwise you must select the next larger unit type and repeat the calculation.	Water-glycol rate in cooling medium (water) for frost protection up to -15 °C.	→ (See page 68) → Determine cooling capacity depending on ethylene glycol content (D. 9 on page 68) according to equation Gl. 2 on page 69. $\dot{Q}_{e,G} = 0.972 \cdot 688.0\ kW = \underline{668.7\ kW} > 650\ kW = req\ \dot{Q}_e$ ✓ Determine cool water volume flow depending on ethylene glycol content (D. 9 on page 68) according to the equation Gl. 3 on page 69. $\dot{V}_{e,G} = 1.08 \cdot 98.7\ m^3/h = \underline{106.6\ m^3/h}$ Determine chilled water side pressure drop depending on ethylene glycol content (D. 9 on page 68) according to the equation Gl. 4 on page 69. $\Delta p_{e,G} = 1.38 \cdot 36\ kPa = \underline{49.7\ kPa}$	→ **30 % glycol ratio** → **$\dot{Q}_{e,G}$ = 668.7 kW *** → **$\dot{V}_{e,G}$ = 106.6 m³/h** → **Δp_e = 49.7 kPa**
4. Step Check that the available installation site is large enough for the unit's dimensions, including the necessary clearance for maintenance and air supply (see table on page 25 and following pages).	Total space requirement = 10,430 mm x 6,060 mm (as in tables on page 25 and on)	→ If possible, units for outdoor installation should be operated in sun protected location. Please remember that an air short circuit must be avoided and the unit must be protected against large snow loads. Detailed information is provided in the operation manuals for the units.	→ **Installation possible**

Notes: the values in the example are rounded up or down. You can also perform unit design and layout using our Aid@ software.

Unit Type			4131	4141	4161	5171	6181	5201	6211
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	354.3	378.8	413.4	458.2	501.3	526.6	569.4
Total unit power consumption	P	[kW]	124.4	130.2	147.8	160.4	171.9	183.9	195.4
EER - Energy Efficiency Ratio			2.85	2.91	2.80	2.86	2.92	2.86	2.91
ESEER			4.16	4.24	4.04	4.19	4.21	4.07	4.18
Chilled water volume flow	$\dot{V}_e$	[m³/h]	61.0	65.2	71.2	78.9	86.6	90.5	98.0
Pressure drop (chilled water)	Δp_e	[kPa]	54.0	43.8	52.2	48.5	58.1	39.3	46.1
Controls, regulation system			FläktGroup controller - Step II						
SEER (ERP 2016/2281) [4]			4.11	4.22	4.10	4.17	4.22	4.10	4.23
η_S (ERP 2016/2281) [4]		[%]	162	166	161	164	166	161	166
ERP-compliant 2018 [4]			✓	✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**						
Number of fans		n	6	6	6	7	8	8	9
Total air volume flow		[m³/h]	128,520	122,760	122,760	143,280	163,800	163,800	183,960
Compressor			**Fully hermetic Copeland scroll compressor**						
Number of compressors		n	4	4	4	5	6	5	6
Number of refrigeration circuits		n	2	2	2	2	2	2	2
Capacity stages per unit		n	4	4	4	5	6	5	6
Compressor type 1			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 2			ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 3			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			-	-	-	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 6			-	-	-	-	ZP 385 KCE	-	ZP 485 KCE
Compressor type 7			-	-	-	-	-	-	-
Compressor type 8			-	-	-	-	-	-	-
Oil type			Mobil EAL Arctic 22 CC						
Oil heating		[W]	4 x 150	4 x 150	4 x 150	5 x 150	6 x 150	5 x 150	6 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator			**Shell and tube heat exchanger**						
Minimum chilled water flow rate	$\dot{V}_{e,min}$	[m³/h]	38.1	40.7	44.4	49.2	53.9	56.5	61.2
Maximum chilled water volume	$\dot{V}_{e,max}$	[m³/h]	99.3	96.2	107.7	118.2	127.1	137.8	145.3
Maximum chilled water side operating pressure [2]		[bar]	10	10	10	10	10	10	10
Evaporator inlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Evaporator outlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Filling quantities									
Refrigerant R410A [3]		[kg]	39	45	45	53	58	63	67
Oil		[kg]	25	25	25	32	38	32	38
Minimum chilled water system content		[l]	1020	1090	1190	1320	1440	1510	1630
Water charge of heat exchanger		[l]	78.5	66.8	66.8	82.7	82.7	149.8	149.8
Weight									
Transport weight		[kg]	2730	2770	2800	3400	3650	3690	4200

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off.

2) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar.

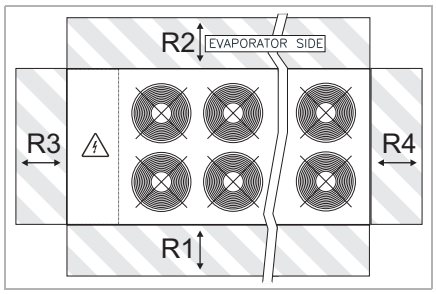
3) For exact refrigerant charge volume - refer to the unit identification plate.

4) Applies to units without pumps.

Tab. 1

Unit type		4131	4141	4161	5171	6181	5201	6211
Sound values								
Sound power level [4]	[dB(A)]	96	96	96	96	97	97	97
Sound pressure level [5]	[dB(A)]	64	64	64	64	65	65	64
Compressor								
Maximum power consumption	[kW]	3x35.8+1x46.5	2x35.8+2x46.5	4x46.5	3x35.8+2x46.5	6x35.8	5x46.5	3x35.8+3x46.5
Maximum current consumption	[A]	3x58.9+1x73.6	2x58.9+2x73.6	4x73.6	3x58.9+2x73.6	6x58.9	5x73.6	3x58.9+3x73.6
Starting current of each compressor	[A]	3x310+1x394	2x310+2x394	4x394	3x310+2x394	6x310	5x394	3x310+3x394
Fans [3]								
Maximum power consumption	[kW]	12	12	12	14	16	16	18
Maximum current consumption	[A]	22.8	22.8	22.8	26.6	30.4	30.4	34.2
Total [1,2,3]								
Maximum power consumption	[kW]	166	177	198	214	231	249	265
Maximum current consumption	[A]	273	288	317	351	384	398	432
Starting current of entire unit	[A]	594	608	638	671	635	719	752
Maximum connectable cable cross-sections [1]								
Rectangular	[mm]	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 32 x 6	2 x 25 x 5	2 x 32 x 6
Round	[mm²]	240	240	240	240	2 x 185	240	2 x 185
Maximum permissible backup fuse ratings (fuse type gLgG) [2]								
Back up fuse	[A]	400	400	400	500	630	500	630
Dimensions								
A (length)	[mm]	3905	3905	3905	5080	5080	5080	6255
B (width)	[mm]	2260	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450	2450
Clearances								
R1	[mm]	1500	1500	1500	1500	1500	1500	1500
R2	[mm]	2300	2300	2300	2300	2300	2300	2300
R3	[mm]	1500	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500	1500

Tab. 2



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 7: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3)Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 75 for further details).

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 75).

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

Unit type			6231	6241	8241	8261	8281	8301	8321
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	603.7	634.9	665.3	707.9	759.4	793.5	826.6
Total unit power consumption	P	[kW]	214.1	218.6	233.7	248.8	260.5	279.1	295.6
EER - Energy Efficiency Ratio			2.82	2.90	2.85	2.85	2.92	2.84	2.80
ESEER			4.11	4.08	4.12	4.18	4.27	4.2	4.07
Chilled water volume flow	$\dot{V}_e$	[m³/h]	103.9	109.3	114.5	121.9	130.7	136.6	142.3
Pressure drop (chilled water)	Δp_e	[kPa]	44.3	49.0	48.5	54.9	42.7	46.7	50.6
Controls, regulation system			FläktGroup controller - step II						
SEER (ERP 2016/2281) [4]			4.15	4.14	4.12	4.17	4.29	4.22	4.10
η_S (ERP 2016/2281) [4]		[%]	163	162	162	164	168	166	161
ERP-compliant 2018 [4]			✓	✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**						
Number of fans		n	9	10	12	12	12	12	12
Total air volume flow		[m³/h]	183,960	204,480	251,640	256,680	245,520	245,520	245,520
Compressor			**Fully hermetic Copeland scroll compressor**						
Number of compressors		n	6	6	8	8	8	8	8
Number of refrigeration circuits		n	3	2	4	4	4	4	4
Capacity stages per unit		n	6	6	8	8	8	8	8
Compressor type 1			ZP 385 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 2			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 3			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 6			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 7			-	-	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 8			-	-	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Oil type			Mobil EAL Arctic 22 CC						
Oil heating		[W]	6 x 150	6 x 150	8 x 150	8 x 150	8 x 150	8 x 150	8 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator			**Shell and tube heat exchanger**						
Minimum chilled water flow rate	$\dot{V}_{e,min}$	[m³/h]	64.9	68.3	71.5	76.1	81.6	85.4	88.9
Maximum chilled water volume	$\dot{V}_{e,max}$	[m³/h]	155.4	161.5	186.2	186.2	204	204	217.3
Maximum chilled water side operating pressure [2]		[bar]	10	10	10	10	10	10	10
Evaporator inlet connection	G	["]	5"	5"	6"	6"	6"	6"	6"
Evaporator outlet connection	G	["]	5"	5"	6"	6"	6"	6"	6"
Filling quantities									
Refrigerant R410A [3]		[kg]	67	76	75	82	93	93	93
Oil		[kg]	38	38	50	50	50	50	50
Minimum chilled water system content		[l]	1730	1820	1910	2030	2180	2270	2370
Water charge of heat exchanger		[l]	134.2	134.2	195.5	195.5	180.2	180.2	180.2
Weight									
Transport weight		[kg]	4220	4350	5260	5300	5370	5400	5430

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off.

2) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar.

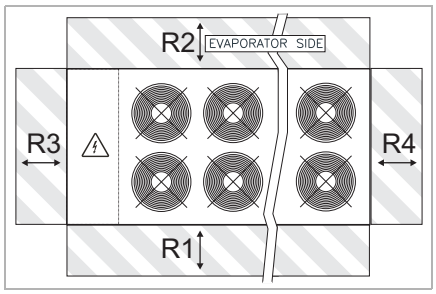
3) For exact refrigerant charge volume - refer to the unit identification plate.

4) Applies to units without pumps.

Tab. 3

Unit type		6231	6241	8241	8261	8281	8301	8321
Sound values								
Sound power level [4]	[dB(A)]	97	98	98	98	99	99	99
Sound pressure level [5]	[dB(A)]	64	65	65	65	66	66	66
Compressor								
Maximum power consumption	[kW]	1x35.8+5x46.5	6x46.5	8x35.8	6x35.8+2x46.5	4x35.8+4x46.5	2x35.8+6x46.5	8x46.5
Maximum current consumption	[A]	1x58.9+5x73.6	6x73.6	8x58.9	6x58.9+2x73.6	4x58.9+4x73.6	2x58.9+6x73.6	8x73.6
Starting current of each compressor	[A]	1x310+5x394	6x394	8x310	6x310+2x394	4x310+4x394	2x310+6x394	8x394
Fans [3]								
Maximum power consumption	[kW]	18	20	24	24	24	24	24
Maximum current consumption	[A]	34.2	38	45.6	45.6	45.6	45.6	45.6
Total [1,2,3]								
Maximum power consumption	[kW]	286	299	310	332	353	375	396
Maximum current consumption	[A]	461	480	517	546	576	605	634
Starting current of entire unit	[A]	782	800	768	867	896	925	955
Maximum connectable cable cross-sections [1]								
Rectangular	[mm]	2 x 32 x 6	2 x 32 x 6	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5
Round	[mm²]	2 x 185	2 x 185	2 x 300	2 x 300	2 x 300	2 x 300	2 x 300
Maximum permissible backup fuse ratings (fuse type gLgG) [2]								
Back up fuse	[A]	630	630	800	800	800	800	800
Dimensions								
A (length)	[mm]	6255	6255	7430	7430	7430	7430	7430
B (width)	[mm]	2260	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450	2450
Clearances								
R1	[mm]	1500	1500	1500	1500	1500	1500	1500
R2	[mm]	2300	2300	2300	2300	2300	2300	2300
R3	[mm]	1500	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500	1500

Tab. 4



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 8: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3)Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 75 for further details).

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 75).

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

Unit type			4131	4141	4161	5171	6181	5201	6211
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	333.6	358.1	397.4	431.5	465	497.6	532.3
Total unit power consumption	P	[kW]	129.2	137.3	153.1	168.1	182.7	191.6	206.0
EER - Energy Efficiency Ratio			2.58	2.61	2.60	2.57	2.55	2.60	2.58
ESEER			4.29	4.31	4.21	4.33	4.36	4.26	4.37
Chilled water volume flow	$\dot{V}_e$	[m³/h]	57.4	61.7	68.4	74.3	80.1	85.7	91.6
Pressure drop (chilled water)	Δp_e	[kPa]	47.8	39.2	48.2	43.0	50.0	35.2	40.3
Controls, regulation system			FläktGroup controller - step II						
SEER (ERP 2016/2281) [4]			4.16	4.25	4.14	4.26	4.19	4.23	4.27
η_S (ERP 2016/2281) [4]		[%]	164	167	163	167	165	166	168
ERP-compliant 2018 [4]			✓	✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**						
Number of fans		n	7	8	8	9	10	10	11
Total air volume flow		[m³/h]	96,876	107,640	103,068	124,524	134,568	128,844	154,296
Compressor			**Fully hermetic Copeland scroll compressor**						
Number of compressors		n	4	4	4	5	6	5	6
Number of refrigeration circuits		n	2	2	2	2	2	2	2
Capacity stages per unit		n	4	4	4	5	6	5	6
Compressor type 1			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 2			ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 3			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			-	-	-	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 6			-	-	-	-	ZP 385 KCE	-	ZP 485 KCE
Compressor type 7			-	-	-	-	-	-	-
Compressor type 8			-	-	-	-	-	-	-
Oil type			Mobil EAL Arctic 22 CC						
Oil heating		[W]	4 x 150	4 x 150	4 x 150	5 x 150	6 x 150	5 x 150	6 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator			**Shell and tube heat exchanger**						
Minimum chilled water flow rate	$\dot{V}_{e,min}$	[m³/h]	38.1	40.7	44.4	49.2	53.9	56.5	61.2
Maximum chilled water volume	$\dot{V}_{e,max}$	[m³/h]	99.3	96.2	107.7	118.2	127.1	137.8	145.3
Maximum chilled water side operating pressure [2]		[bar]	10	10	10	10	10	10	10
Evaporator inlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Evaporator outlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Filling quantities									
Refrigerant R410A [3]		[kg]	42	45	54	57	55	72	71
Oil		[kg]	25	25	25	32	38	32	38
Minimum chilled water system content		[l]	960	1030	1140	1240	1340	1430	1530
Water charge of heat exchanger		[l]	78.5	66.8	66.8	82.7	82.7	149.8	149.8
Weight									
Transport weight		[kg]	3060	3160	3200	3900	4110	4190	4640

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off.

2) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar.

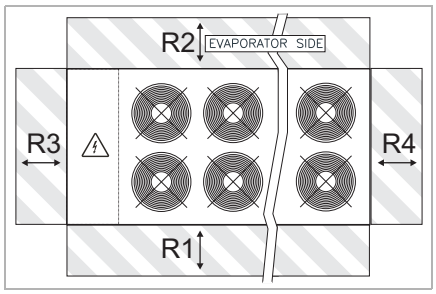
3) For exact refrigerant charge volume - refer to the unit identification plate.

4) Applies to units without pumps.

Tab. 5

Unit type		4131	4141	4161	5171	6181	5201	6211
Sound values								
Sound power level [4]	[dB(A)]	86	86	86	87	87	87	87
Sound pressure level [5]	[dB(A)]	54	54	54	54	54	54	54
Compressor								
Maximum power consumption	[kW]	3x35.8+1x46.5	2x35.8+2x46.5	4x46.5	3x35.8+2x46.5	6x35.8	5x46.5	3x35.8+3x46.5
Maximum current consumption	[A]	3x58.9+1x73.6	2x58.9+2x73.6	4x73.6	3x58.9+2x73.6	6x58.9	5x73.6	3x58.9+3x73.6
Starting current of each compressor	[A]	3x310+1x394	2x310+2x394	4x394	3x310+2x394	6x310	5x394	3x310+3x394
Fans [3]								
Maximum power consumption	[kW]	8.4	9.6	9.6	10.8	12	12	13.2
Maximum current consumption	[A]	15.4	17.6	17.6	19.8	22	22	24.2
Total [1,2,3]								
Maximum power consumption	[kW]	162	174	196	211	227	245	260
Maximum current consumption	[A]	266	283	312	344	375	390	422
Starting current of entire unit	[A]	586	603	632	664	627	710	742
Maximum connectable cable cross-sections [1]								
Rectangular	[mm]	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 32 x 6	2 x 25 x 5	2 x 32 x 6
Round	[mm²]	240	240	240	240	2 x 185	240	2 x 185
Maximum permissible backup fuse ratings (fuse type gLgG) [2]								
Back up fuse	[A]	400	400	400	500	630	500	630
Dimensions								
A (length)	[mm]	5080	5080	5080	6255	6255	6255	7430
B (width)	[mm]	2260	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450	2450
Clearances								
R1	[mm]	1500	1500	1500	1500	1500	1500	1500
R2	[mm]	2300	2300	2300	2300	2300	2300	2300
R3	[mm]	1500	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500	1500

Tab. 6



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 9: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3)Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 76 for further details).

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 76).

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

Unit type			6231	6241	8241	8261	8281	8301	8321
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	579.3	595.9	615.8	666.4	717.7	757.8	794.6
Total unit power consumption	P	[kW]	220.0	229.7	244.6	258.3	274.8	288.4	306.2
EER - Energy Efficiency Ratio			2.63	2.59	2.52	2.58	2.61	2.63	2.60
ESEER			4.38	4.29	4.32	4.39	4.36	4.39	4.27
Chilled water volume flow	$\dot{V}_e$	[m³/h]	99.7	102.6	106.0	114.7	123.6	130.5	136.8
Pressure drop (chilled water)	Δp_e	[kPa]	40.8	43.1	41.6	48.7	38.2	42.6	46.8
Controls, regulation system			FläktGroup controller - step II						
SEER (ERP 2016/2281) [4]			4.28	4.17	4.18	4.17	4.28	4.27	4.21
η_S (ERP 2016/2281) [4]		[%]	168	164	164	164	168	168	166
ERP-compliant 2018 [4]			✓	✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**						
Number of fans		n	12	12	12	14	16	16	16
Total air volume flow		[m³/h]	152,316	154,620	154,620	193,716	215,316	224,460	206,136
Compressor			**Fully hermetic Copeland scroll compressor**						
Number of compressors		n	6	6	8	8	8	8	8
Number of refrigeration circuits		n	3	2	4	4	4	4	4
Capacity stages per unit		n	6	6	8	8	8	8	8
Compressor type 1			ZP 385 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 2			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 3			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 6			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 7			-	-	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 8			-	-	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Oil type			Mobil EAL Arctic 22 CC						
Oil heating		[W]	6 x 150	6 x 150	8 x 150	8 x 150	8 x 150	8 x 150	8 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator									
Minimum chilled water flow rate	$\dot{V}_{e,min}$	[m³/h]	64.9	68.3	71.5	76.1	81.6	85.4	88.9
Maximum chilled water volume	$\dot{V}_{e,max}$	[m³/h]	155.4	161.5	186.2	186.2	204	204	217.3
Maximum chilled water side operating pressure [2]		[bar]	10	10	10	10	10	10	10
Evaporator inlet connection	G	["]	5"	5"	6"	6"	6"	6"	6"
Evaporator outlet connection	G	["]	5"	5"	6"	6"	6"	6"	6"
Filling quantities									
Refrigerant R410A [3]		[kg]	77	86	89	89	93	103	112
Oil		[kg]	38	38	50	50	50	50	50
Minimum chilled water system content		[l]	1660	1710	1770	1910	2060	2170	2280
Water charge of heat exchanger		[l]	134.2	134.2	195.5	195.5	180.2	180.2	180.2
Weight									
Transport weight		[kg]	4730	4790	5410	5810	6160	6200	6250

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off.

2) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar.

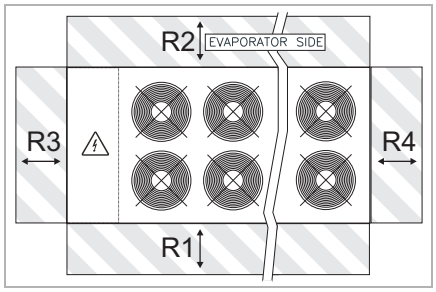
3) For exact refrigerant charge volume - refer to the unit identification plate.

4) Applies to units without pumps.

Tab. 7

Unit type		6231	6241	8241	8261	8281	8301	8321
Sound values								
Sound power level [4]	[dB(A)]	88	88	88	89	90	90	90
Sound pressure level [5]	[dB(A)]	55	55	55	56	57	57	57
Compressor								
Maximum power consumption	[kW]	1x35.8+5x46.5	6x46.5	8x35.8	6x35.8+2x46.5	4x35.8+4x46.5	2x35.8+6x46.5	8x46.5
Maximum current consumption	[A]	1x58.9+5x73.6	6x73.6	8x58.9	6x58.9+2x73.6	4x58.9+4x73.6	2x58.9+6x73.6	8x73.6
Starting current of each compressor	[A]	1x310+5x394	6x394	8x310	6x310+2x394	4x310+4x394	2x310+6x394	8x394
Fans [3]								
Maximum power consumption	[kW]	14.4	14.4	14.4	16.8	19.2	19.2	19.2
Maximum current consumption	[A]	26.4	26.4	26.4	30.8	35.2	35.2	35.2
Total [1,2,3]								
Maximum power consumption	[kW]	283	293	301	325	348	370	391
Maximum current consumption	[A]	453	468	498	531	565	595	624
Starting current of entire unit	[A]	774	788	749	852	886	915	944
Maximum connectable cable cross-sections [1]								
Rectangular	[mm]	2 x 32 x 6	2 x 32 x 6	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5
Round	[mm²]	2 x 185	2 x 185	2 x 300	2 x 300	2 x 300	2 x 300	2 x 300
Maximum permissible backup fuse ratings (fuse type gLgG) [2]								
Back up fuse	[A]	630	630	800	800	800	800	800
Dimensions								
A (length)	[mm]	7430	7430	7430	8605	9780	9780	9780
B (width)	[mm]	2260	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450	2450
Clearances								
R1	[mm]	1500	1500	1500	1500	1500	1500	1500
R2	[mm]	2300	2300	2300	2300	2300	2300	2300
R3	[mm]	1500	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500	1500

Tab. 8



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 10: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3)Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 76 for further details).

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 76).

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

Unit type			4131	4141	4161	5171	6181	5201	6211
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	370.4	391.4	438.4	481.1	517.5	549.2	591.4
Total unit power consumption	P	[kW]	119.6	125.1	141.5	154.0	166.3	177.0	189.4
EER - Energy Efficiency Ratio			3.10	3.13	3.10	3.12	3.11	3.10	3.12
ESEER			4.45	4.48	4.39	4.54	4.50	4.42	4.48
Chilled water volume flow	$\dot{V}_e$	[m³/h]	63.8	67.4	75.5	82.8	89.1	94.5	101.8
Pressure drop (chilled water)	Δp_e	[kPa]	59.0	46.8	58.7	53.5	61.9	42.9	49.8
Controls, regulation system			FläktGroup controller - step II						
SEER (ERP 2016/2281) [4]			4.03	4.12	4.02	4.13	4.13	4.14	4.21
η_S (ERP 2016/2281) [4]		[%]	158	162	158	162	162	163	165
ERP-compliant 2018 [4]			✓	✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**						
Number of fans		n	8	8	8	9	10	10	11
Total air volume flow		[m³/h]	171,180	163,620	163,620	184,068	204,516	204,516	225,000
Compressor			**Fully hermetic Copeland scroll compressor**						
Number of compressors		n	4	4	4	5	6	5	6
Number of refrigeration circuits		n	2	2	2	2	2	2	2
Capacity stages per unit		n	4	4	4	5	6	5	6
Compressor type 1			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 2			ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 3			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 385 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			-	-	-	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 6			-	-	-	-	ZP 385 KCE	-	ZP 485 KCE
Compressor type 7			-	-	-	-	-	-	-
Compressor type 8			-	-	-	-	-	-	-
Oil type			Mobil EAL Arctic 22 CC						
Oil heating		[W]	4 x 150	4 x 150	4 x 150	5 x 150	6 x 150	5 x 150	6 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator			**Shell and tube heat exchanger**						
Minimum chilled water flow rate	$\dot{V}_{e,min}$	[m³/h]	38.1	40.7	44.4	49.2	53.9	56.5	61.2
Maximum chilled water volume	$\dot{V}_{e,max}$	[m³/h]	99.3	96.2	107.7	118.2	127.1	137.8	145.3
Maximum chilled water side operating pressure [2]		[bar]	10	10	10	10	10	10	10
Evaporator inlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Evaporator outlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Filling quantities									
Refrigerant R410A [3]		[kg]	46	54	54	62	67	72	77
Oil		[kg]	25	25	25	32	38	32	38
Minimum chilled water system content		[l]	1060	1120	1260	1380	1490	1580	1700
Water charge of heat exchanger		[l]	78.5	66.8	66.8	82.7	82.7	149.8	149.8
Weight									
Transport weight		[kg]	3060	3100	3130	3800	4050	4090	4540

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off.

2) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar.

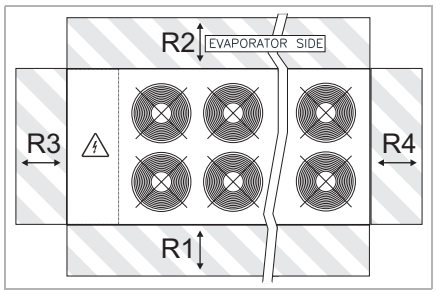
3) For exact refrigerant charge volume - refer to the unit identification plate.

4) Applies to units without pumps.

Tab. 9

Unit type		4131	4141	4161	5171	6181	5201	6211
Sound values								
Sound power level [4)]	[dB(A)]	97	97	97	97	98	98	98
Sound pressure level [5)]	[dB(A)]	65	65	65	64	65	65	65
Compressor								
Maximum power consumption	[kW]	3x35.8+1x46.5	2x35.8+2x46.5	4x46.5	3x35.8+2x46.5	6x35.8	5x46.5	3x35.8+3x46.5
Maximum current consumption	[A]	3x58.9+1x73.6	2x58.9+2x73.6	4x73.6	3x58.9+2x73.6	6x58.9	5x73.6	3x58.9+3x73.6
Starting current of each compressor	[A]	3x310+1x394	2x310+2x394	4x394	3x310+2x394	6x310	5x394	3x310+3x394
Fans [3)]								
Maximum power consumption	[kW]	16	16	16	18	20	20	22
Maximum current consumption	[A]	30.4	30.4	30.4	34.2	38	38	41.8
Total [1,2,3)]								
Maximum power consumption	[kW]	170	181	202	218	235	253	269
Maximum current consumption	[A]	281	295	325	358	391	406	439
Starting current of entire unit	[A]	601	616	645	679	643	726	760
Maximum connectable cable cross-sections [1)]								
Rectangular	[mm]	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 32 x 6	2 x 25 x 5	2 x 32 x 6
Round	[mm²]	240	240	240	240	2 x 185	240	2 x 185
Maximum permissible backup fuse ratings (fuse type gLgG) [2)]								
Back up fuse	[A]	400	400	400	500	630	500	630
Dimensions								
A (length)	[mm]	5080	5080	5080	6255	6255	6255	7430
B (width)	[mm]	2260	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450	2450
Clearances								
R1	[mm]	1500	1500	1500	1500	1500	1500	1500
R2	[mm]	2300	2300	2300	2300	2300	2300	2300
R3	[mm]	1500	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500	1500

Tab. 10



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 11: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3)Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 77 for further details).

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 77).

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

Unit type			6231	6241	8241	8261	8281	8301	8321
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	632.7	657.3	701.5	740	784.6	830.6	884.7
Total unit power consumption	P	[kW]	204.0	212.3	225.3	239.0	250.4	266.5	283
EER - Energy Efficiency Ratio			3.10	3.10	3.11	3.10	3.13	3.12	3.13
ESEER			4.48	4.37	4.44	4.46	4.50	4.49	4.45
Chilled water volume flow	$\dot{V}_e$	[m³/h]	108.9	113.2	120.8	127.4	135.1	143.0	152.3
Pressure drop (chilled water)	Δp_e	[kPa]	48.6	52.5	54.0	60.0	45.6	51.1	58.0
Controls, regulation system			FläktGroup controller - step II						
SEER (ERP 2016/2281) [4]			4.21	4.14	4.11	4.16	4.20	4.21	4.11
η_S (ERP 2016/2281) [4]		[%]	165	163	162	163	165	166	161
ERP-compliant 2018 [4]			✓	✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**						
Number of fans		n	12	12	16	16	16	16	16
Total air volume flow		[m³/h]	245,448	244,448	335,484	342,360	327,240	327,240	327,240
Compressor			**Fully hermetic Copeland scroll compressor**						
Number of compressors		n	6	6	8	8	8	8	8
Number of refrigeration circuits		n	3	2	4	4	4	4	4
Capacity stages per unit		n	6	6	8	8	8	8	8
Compressor type 1			ZP 385 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 2			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 3			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 6			ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 7			-	-	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 8			-	-	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Oil type			Mobil EAL Arctic 22 CC						
Oil heating		[W]	6 x 150	6 x 150	8 x 150	8 x 150	8 x 150	8 x 150	8 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator			**Shell and tube heat exchanger**						
Minimum chilled water flow rate	$\dot{V}_{e,min}$	[m³/h]	61.2	68.3	71.5	76.1	81.6	85.4	88.9
Maximum chilled water volume	$\dot{V}_{e,max}$	[m³/h]	155.4	161.5	186.2	186.2	204	204	217.3
Maximum chilled water side operating pressure [2]		[bar]	10	10	10	10	10	10	10
Evaporator inlet connection	G	["]	5"	5"	6"	6"	6"	6"	6"
Evaporator outlet connection	G	["]	5"	5"	6"	6"	6"	6"	6"
Filling quantities									
Refrigerant R410A [3]		[kg]	81	86	89	99	112	112	112
Oil		[kg]	38	38	50	50	50	50	50
Minimum chilled water system content		[l]	1820	1890	2010	2120	2250	2380	2540
Water charge of heat exchanger		[l]	134.2	134.2	195.5	195.5	180.2	180.2	180.2
Weight									
Transport weight		[kg]	4630	4690	5930	5970	6040	6070	6110

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off.

2) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar.

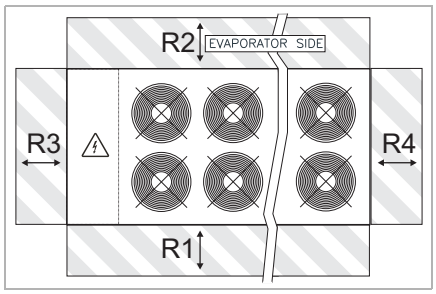
3) For exact refrigerant charge volume - refer to the unit identification plate.

4) Applies to units without pumps.

Tab. 11

Unit type		6231	6241	8241	8261	8281	8301	8321
Sound values								
Sound power level [4)]	[dB(A)]	99	99	99	99	100	100	100
Sound pressure level [5)]	[dB(A)]	66	66	66	66	67	67	67
Compressor								
Maximum power consumption	[kW]	1x35.8+5x46.5	6x46.5	8x35.8	6x35.8+2x46.5	4x35.8+4x46.5	2x35.8+6x46.5	8x46.5
Maximum current consumption	[A]	1x58.9+5x73.6	6x73.6	8x58.9	6x58.9+2x73.6	4x58.9+4x73.6	2x58.9+6x73.6	8x73.6
Starting current of each compressor	[A]	1x310+5x394	6x394	8x310	6x310+2x394	4x310+4x394	2x310+6x394	8x394
Fans [3)]								
Maximum power consumption	[kW]	24	24	32	32	32	32	32
Maximum current consumption	[A]	45.6	45.6	60.8	60.8	60.8	60.8	60.8
Total [1,2,3)]								
Maximum power consumption	[kW]	292	303	318	340	361	383	404
Maximum current consumption	[A]	473	487	532	561	591	620	650
Starting current of entire unit	[A]	793	808	783	882	911	941	970
Maximum connectable cable cross-sections [1)]								
Rectangular	[mm]	2 x 32 x 6	2 x 32 x 6	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5
Round	[mm²]	2 x 185	2 x 185	2 x 300	2 x 300	2 x 300	2 x 300	2 x 300
Maximum permissible backup fuse ratings (fuse type gLgG) [2)]								
Back up fuse	[A]	630	630	800	800	800	800	800
Dimensions								
A (length)	[mm]	7430	7430	9780	9780	9780	9780	9780
B (width)	[mm]	2260	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450	2450
Clearances								
R1	[mm]	1500	1500	1500	1500	1500	1500	1500
R2	[mm]	2300	2300	2300	2300	2300	2300	2300
R3	[mm]	1500	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500	1500

Tab. 12



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 12: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3)Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 77 for further details).

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 77).

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

Unit type			4131	4141	4161	6171	6181
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	339.4	363.4	396.4	434.9	477.8
Total unit power consumption	P	[kW]	126.4	132.0	151.4	164.6	177.8
EER - Energy Efficiency Ratio			2.69	2.75	2.62	2.64	2.69
ESEER			3.80	3.88	3.79	3.88	3.78
Chilled water volume flow	$\dot{V}_e$	[m³/h]	58.4	62.6	68.2	74.9	82.2
Pressure drop (chilled water)	Δp_e	[kPa]	49.5	43.4	51.7	35.3	42.6
Heating capacity [2]	$\dot{Q}_H$	[kW]	371.0	398.0	435.7	472.9	514.6
Total unit power consumption	P	[kW]	122.4	129.7	142.7	157.2	170.6
COP			3.03	3.07	3.05	3.01	3.03
Warm water volume flow	$\dot{V}H$	[m³/h]	64.5	69.2	75.7	82.2	89.4
Pressure drop (warm water side)	Dph	[kPa]	60.3	53.1	63.6	42.5	50.4
Controls, regulation system			FläktGroup controller - step II				
SCOP (EU 813/2013) [5]			3.47	3.54	3.44	3.59	3.49
η_S (EU 813/2013) [5]		[%]	136	139	134	141	137
SEER (ERP 2016/2281) [5]			3.60	3.72	3.62	3.71	3.63
η_S (ERP 2016/2281) [5]		[%]	141	146	142	146	142
ERP-compliant 2018 [5]			✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**				
Number of fans		n	6	6	6	7	9
Total air volume flow rate - cooling		n	129,420	124,524	124,524	142,272	191,052
Total air volume flow rate - heating		n	129,420	124,524	124,524	142,272	191,052
Compressor			**Fully hermetic Copeland scroll compressor**				
Number of compressors			4	4	4	6	6
Number of refrigeration circuits			2	2	2	3	3
Capacity stages per unit			4	4	4	6	6
Compressor type 1			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 295 KCE	ZP 385 KCE
Compressor type 2			ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE
Compressor type 3			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 295 KCE	ZP 385 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE
Compressor type 5			-	-	-	ZP 385 KCE	ZP 385 KCE
Compressor type 6			-	-	-	ZP 385 KCE	ZP 385 KCE
Compressor type 7			-	-	-	-	-
Compressor type 8			-	-	-	-	-
Oil type			Mobil EAL Arctic 22 CC				
Oil heating		[W]	4 x 150	4 x 150	4 x 150	6 x 150	6 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51
Evaporator (in cooling mode)			**Shell and tube heat exchanger**				
Minimum chilled and warm water volume flow	$\dot{V}_{e,min}$	[m³/h]	36.6	39.1	42.6	46.7	51.4
Maximum chilled/warm water volume flow	$\dot{V}_{e,max}$	[m³/h]	95.2	95.8	104.9	130.3	130.3
Maximum chilled water side operating pressure [3]		[bar]	10	10	10	10	10
Evaporator inlet connection	G	["]	4"	4"	4"	5"	5"
Evaporator outlet connection	G	["]	4"	4"	4"	5"	5"
Filling quantities							
Refrigerant R410A [4]		[kg]	78	84	84	96	108
Oil		[kg]	25	25	25	39	38
Minimum chilled water volume flow		[l]	1070	1140	1250	1360	1480
Water charge of heat exchanger		[l]	78.5	66.8	66.8	161.3	161.3

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off

2) Performance data for input parameters: warm water temperatures (inlet/outlet) 40/45°C; ambient temperature 7°C / 87 % r.h.; values partially rounded off

3) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar

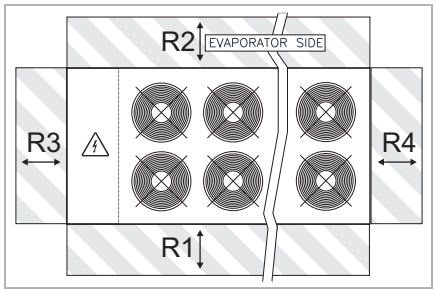
4) For exact refrigerant charge volume - refer to the unit identification plate.

5) Applies to units without pumps.

Tab. 13

Unit type		4131	4141	4161	6171	6181
Weight						
Transport weight	[kg]	3170	3250	3280	4220	4610
Sound values						
Sound power level [4)]	[dB(A)]	96	96	96	96	97
Sound pressure level [5)]	[dB(A)]	64	64	64	64	65
Compressor						
Maximum power consumption	[kW]	3x35.8+1x46.5	2x35.8+2x46.5	4x46.5	4x35.8+2x27.4	6x35.8
Maximum current consumption	[A]	3x58.9+1x73.6	2x58.9+2x73.6	4x73.6	4x58.9+2x45.8	6x58.9
Starting current of each compressor	[A]	3x310+1x394	2x310+2x394	4x394	4x310+2x272	6x310
Fans [3)]						
Maximum power consumption	[kW]	12	12	12	14	18
Maximum current consumption	[A]	22.8	22.8	22.8	26.6	34.2
Total [1,2,3)]						
Maximum power consumption	[kW]	165.9	176.6	198	212	232.8
Maximum current consumption	[A]	273.1	287.8	317.2	353.8	387.6
Starting current of entire unit	[A]	594	608	638	605	639
Maximum connectable cable cross-sections [1)]						
Rectangular	[mm]	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 32 x 6	2 x 32 x 6
Round	[mm²]	240	240	240	2 x 185	2 x 185
Maximum permissible backup fuse ratings (fuse type gLgG) [2)]						
Back up fuse	[A]	400	400	400	630	630
Dimensions						
A (length)	[mm]	3905	3905	3905	4515	5690
B (width)	[mm]	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450
Clearances						
R1	[mm]	1500	1500	1500	1500	1500
R2	[mm]	2000	2000	2000	2000	2000
R3	[mm]	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500

Tab. 14



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 13: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3) Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 78 for further details)

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 78)

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

Unit type			4131	4141	4161	6171	6181	6201	6211
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	351.7	371.8	416.8	453.2	504.4	537.6	559
Total unit power consumption	P	[kW]	121.2	127.8	143.4	155.5	172.6	184.7	191.7
EER - Energy Efficiency Ratio			2.90	2.91	2.91	2.91	2.92	2.91	2.92
ESEER			4.12	4.20	4.07	4.19	4.08	4.18	4.17
Chilled water volume flow	$\dot{V}_e$	[m³/h]	60.6	64.0	71.7	78.0	86.8	92.6	96.2
Pressure drop (chilled water)	Δp_e	[kPa]	53.2	45.5	57.1	38.4	47.5	41.1	44.4
Heating capacity [2]	$\dot{Q}_H$	[kW]	383.2	409.4	449.2	496.7	533.2	586.5	614.1
Total unit power consumption	P	[kW]	119.5	127.8	139.8	154.8	166.2	182.6	191.2
COP			3.2	3.2	3.2	3.2	3.2	3.2	3.2
Warm water volume flow	$\dot{V}H$	[m³/h]	66.6	71.1	78.1	86.3	92.6	101.9	106.7
Pressure drop (warm water side)	Dph	[kPa]	64.3	56.2	67.6	46.9	54.1	49.9	54.7
Controls, regulation system			FläktGroup controller - step II						
SCOP (EU 813/2013) [5]			3.65	3.73	6.63	3.78	3.68	-	-
η_S (EU 813/2013) [5]		[%]	143	146	142	148	144	-	-
SEER (ERP 2016/2281) [5]			4.06	4.14	4.04	4.16	4.07	4.18	4.17
η_S (ERP 2016/2281) [5]		[%]	159	163	159	163	160	164	164
ERP-compliant 2018 [5]			✓	✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**						
Number of fans		n	8	8	8	10	12	12	12
Total air volume flow rate - cooling		n	172,548	166,032	166,032	203,688	254,736	245,448	249,048
Total air volume flow rate - heating		n	138,312	130,716	130,716	159,192	202,392	192,276	196,092
Compressor			**Fully hermetic Copeland scroll compressor**						
Number of compressors			4	4	4	6	6	6	6
Number of refrigeration circuits			2	2	2	3	3	3	3
Capacity stages per unit			4	4	4	6	6	6	6
Compressor type 1			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 295 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE
Compressor type 2			ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 3			ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 295 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE
Compressor type 4			ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			-	-	-	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE
Compressor type 6			-	-	-	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 7			-	-	-	-	-	-	-
Compressor type 8			-	-	-	-	-	-	-
Oil type			Mobil EAL Arctic 22 CC						
Oil heating		[W]	4 x 150	4 x 150	4 x 150	6 x 150	6 x 150	6 x 150	6 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator (in cooling mode)			**Shell and tube heat exchanger**						
Minimum chilled and warm water volume flow	$\dot{V}_{e,min}$	[m³/h]	36.6	39.1	42.6	46.7	51.4	56.3	58.7
Maximum chilled/warm water volume flow	$\dot{V}_{e,max}$	[m³/h]	95.2	95.8	104.9	130.3	130.3	138.3	144
Maximum chilled water side operating pressure [3]		[bar]	10	10	10	10	10	10	10
Evaporator inlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Evaporator outlet connection	G	["]	4"	4"	4"	5"	5"	5"	5"
Filling quantities									
Refrigerant R410A [4]		[kg]	90	96	96	126	126	138	144
Oil		[kg]	25	25	25	39	38	38	38
Minimum chilled water volume flow		[l]	1100	1180	1290	1430	1530	1680	1760
Water charge of heat exchanger		[l]	78.5	66.8	66.8	161.3	161.3	149.8	149.8

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off

2) Performance data for input parameters: warm water temperatures (inlet/outlet) 40/45°C; ambient temperature 7°C / 87 % r.h.; values partially rounded off

3) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar

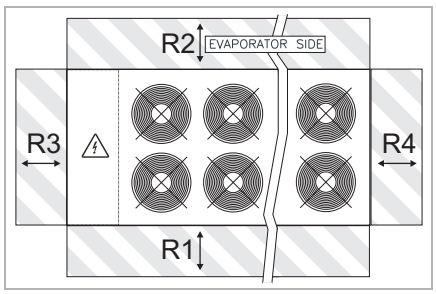
4) For exact refrigerant charge volume - refer to the unit identification plate.

5) Applies to units without pumps.

Tab. 15

Unit type		4131	4141	4161	6171	6181	6201	6211
Weight								
Transport weight	[kg]	3490	3580	3610	4840	5120	5270	5350
Sound values								
Sound power level [4)]	[dB(A)]	97	97	97	97	98	98	98
Sound pressure level [5)]	[dB(A)]	65	65	65	64	65	65	65
Compressor								
Maximum power consumption	[kW]	3x35.8+1x46.5	2x35.8+2x46.5	4x46.5	4x35.8+2x27.4	6x35.8	4x35.8+2x46.5	3x35.8+3x46.5
Maximum current consumption	[A]	3x58.9+1x73.6	2x58.9+2x73.6	4x73.6	4x58.9+2x45.8	6x58.9	4x58.9+2x73.6	3x58.9+3x73.6
Starting current of each compressor	[A]	3x310+1x394	2x310+2x394	4x394	4x310+2x272	6x310	4x310+2x394	3x310+3x394
Fans [3)]								
Maximum power consumption	[kW]	16	16	16	20	24	24	24
Maximum current consumption	[A]	30.4	30.4	30.4	38	45.6	45.6	45.6
Total [1,2,3)]								
Maximum power consumption	[kW]	169.9	180.6	202	218	238.8	260.2	270.9
Maximum current consumption	[A]	280.7	295.4	324.8	365.2	399	428.4	443.1
Starting current of entire unit	[A]	601	616	645	616	650	749	764
Maximum connectable cable cross-sections [1)]								
Rectangular	[mm]	2 x 25 x 5	2 x 25 x 5	2 x 25 x 5	2 x 32 x 6	2 x 32 x 6	2 x 32 x 6	2 x 32 x 6
Round	[mm²]	240	240	240	2 x 185	2 x 185	2 x 185	2 x 185
Maximum permissible backup fuse ratings (fuse type gLgG) [2)]								
Back up fuse	[A]	400	400	400	630	630	630	630
Dimensions								
A (length)	[mm]	5080	5080	5080	6255	7430	7430	7430
B (width)	[mm]	2260	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450	2450
Clearances								
R1	[mm]	1500	1500	1500	1500	1500	1500	1500
R2	[mm]	2000	2000	2000	2000	2000	2000	2000
R3	[mm]	1500	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500	1500

Tab. 16



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 14: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3) Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 79 for further details)

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 79)

NOTE!

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Unit type			6241	8241	8261	8281	8301	8321
Refrigeration capacity [1]	$\dot{Q}_e$	[kW]	624.8	666.7	709.6	745.4	789.3	833.2
Total unit power consumption	P	[kW]	215.0	228.2	242.3	255.7	269.9	286.7
EER - Energy Efficiency Ratio			2.91	2.92	2.93	2.92	2.92	2.91
ESEER			4.09	4.09	4.14	4.18	4.17	4.09
Chilled water volume flow	$\dot{V}_e$	[m³/h]	107.6	114.8	122.2	128.3	135.9	143.4
Pressure drop (chilled water)	Δp_e	[kPa]	47.4	48.7	55.2	41.2	46.2	51.4
Heating capacity [2]	$\dot{Q}_H$	[kW]	673.6	708.5	766.4	818.9	860.0	898.4
Total unit power consumption	P	[kW]	209.9	221.3	239.4	254.9	268.7	279.8
COP			3.21	3.20	3.20	3.21	3.20	3.21
Warm water volume flow	$\dot{V}H$	[m³/h]	117.1	123.1	133.2	142.3	149.4	156.1
Pressure drop (warm water side)	Dph	[kPa]	56.2	56.1	65.6	50.6	55.8	60.9
Controls, regulation system			FläktGroup controller - step II					
SEER (ERP 2016/2281) [5]			4.11	4.10	4.11	4.17	4.18	4.11
η_S (ERP 2016/2281) [5]		[%]	161	161	162	164	164	161
ERP-compliant 2018 [5]			✓	✓	✓	✓	✓	✓
Application			Comfort	Comfort	Comfort	Comfort	Comfort	Comfort
Fans			**Axial fans**					
Number of fans		n	12	16	16	16	16	16
Total air volume flow rate - cooling		n	249,048	339,624	345,132	332,064	332,064	332,064
Total air volume flow rate - heating		n	196,092	269,892	276,624	261,432	261,432	261,432
Compressor			**Fully hermetic Copeland scroll compressor**					
Number of compressors			6	8	8	8	8	8
Number of refrigeration circuits			3	4	4	4	4	4
Capacity stages per unit			6	8	8	8	8	8
Compressor type 1			ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 2			ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 3			ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 4			ZP 485 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 5			ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE
Compressor type 6			ZP 485 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 7			-	ZP 385 KCE	ZP 385 KCE	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE
Compressor type 8			-	ZP 385 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE	ZP 485 KCE
Oil type			Mobil EAL Arctic 22 CC					
Oil heating		[W]	6 x 150	8 x 150	8 x 150	8 x 150	8 x 150	8 x 150
Coil resistance per coil / compressor		[W]	0.51	0.51	0.51	0.51	0.51	0.51
Evaporator (in cooling mode)			**Shell and tube heat exchanger**					
Minimum chilled and warm water volume flow	$\dot{V}_{e,min}$	[m³/h]	63.9	68.5	72.9	78.3	81.8	85.1
Maximum chilled/warm water volume flow	$\dot{V}_{e,max}$	[m³/h]	157.7	186.2	186.2	204	204	210.3
Maximum chilled water side operating pressure [3]		[bar]	10	10	10	10	10	10
Evaporator inlet connection	G	["]	5"	6"	6"	6"	6"	6"
Evaporator outlet connection	G	["]	5"	6"	6"	6"	6"	6"
Filling quantities								
Refrigerant R410A [4]		[kg]	144	168	180	192	192	192
Oil		[kg]	38	50	50	50	50	50
Minimum chilled water volume flow		[l]	1930	2030	2200	2350	2470	2570
Water charge of heat exchanger		[l]	134.2	195.5	195.5	180.2	180.2	180.2
Weight								
Transport weight		[kg]	5400	6610	6760	6940	6970	7000

1) Performance data for input parameters: chilled water temperatures (inlet/outlet) 12/7°C; ambient temperature 35°C; values partially rounded off

2) Performance data for input parameters: warm water temperatures (inlet/outlet) 40/45°C; ambient temperature 7°C / 87 % r.h.; values partially rounded off

3) Only without supplied GLHM hydraulic module, with GLHM hydraulic module: 6 bar

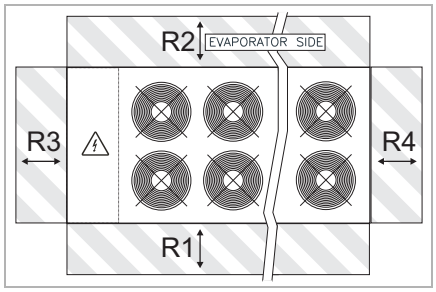
4) For exact refrigerant charge volume - refer to the unit identification plate.

5) Applies to units without pumps.

Tab. 17

Unit type		6241	8241	8261	8281	8301	8321
Sound values							
Sound power level [4]	[dB(A)]	99	99	99	100	100	100
Sound pressure level [5]	[dB(A)]	66	66	66	67	67	67
Compressor							
Maximum power consumption	[kW]	6x46.5	8x35.8	6x35.8+2x46.5	4x35.8+4x46.5	2x35.8+6x46.5	8x46.5
Maximum current consumption	[A]	6x73.6	8x58.9	6x58.9+2x73.6	4x58.9+4x73.6	2x58.9+6x73.6	8x73.6
Starting current of each compressor	[A]	6x394	8x310	6x310+2x394	4x310+4x394	2x310+6x394	8x394
Fans [3]							
Maximum power consumption	[kW]	24	32	32	32	32	32
Maximum current consumption	[A]	45.6	60.8	60.8	60.8	60.8	60.8
Total [1,2,3]							
Maximum power consumption	[kW]	303	318.4	339.8	361.2	382.6	404
Maximum current consumption	[A]	487.2	532.0	561.4	590.8	620.2	649.6
Starting current of entire unit	[A]	808	783	882	911	941	970
Maximum connectable cable cross-sections [1]							
Rectangular	[mm]	2 x 32 x 6	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5	2 x 63 x 5
Round	[mm²]	2 x 185	2 x 300	2 x 300	2 x 300	2 x 300	2 x 300
Maximum permissible backup fuse ratings (fuse type gLgG) [2]							
Back up fuse	[A]	630	800	800	800	800	800
Dimensions							
A (length)	[mm]	7430	9780	9780	9780	9780	9780
B (width)	[mm]	2260	2260	2260	2260	2260	2260
H (height)	[mm]	2450	2450	2450	2450	2450	2450
Clearances							
R1	[mm]	1500	1500	1500	1500	1500	1500
R2	[mm]	2000	2000	2000	2000	2000	2000
R3	[mm]	1500	1500	1500	1500	1500	1500
R4	[mm]	1500	1500	1500	1500	1500	1500

Tab. 18



CLEARANCES FOR AIR SUPPLY!

Unit must freely discharge air to top. Air short-circuiting must be excluded! The necessary clearances near and over the unit may exceed the depicted maintenance clearance by many times.

Fig. 15: Clearances

1) Please observe the regionally applicable safety regulations and constructional conditions relevant to the dimensioning of the supply line.

2) Please observe the regionally applicable standards for cable cross sections and backup fuses.
Voltage tolerance: max. 10%, voltage deviation between phases: max. 3%.

3) Values are based on the total number of fans operating at maximum speed.

4) According to Eurovent (refer to „Acoustics“ on page 79 for further details)

5) In 10 m free-field conditions (also refer to „Acoustics“ on page 79)

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

GLAC 4131 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**377,1**	**356,4**	**347,8**	**334,4**	**311,0**	**301,3**
	P	102,5	111,7	115,7	122,1	133,6	138,6
	V_e	64,8	61,2	59,8	57,5	53,4	51,8
	Δp_e	60,8	54,4	51,8	47,9	41,4	38,8
6	Q_e	**388,3**	**367,1**	**358,2**	**344,4**	**320,3**	**310,2**
	P	103,6	112,8	116,9	123,3	134,9	139,9
	V_e	66,7	63,1	61,5	59,2	55,0	53,3
	Δp_e	64,5	57,7	54,9	50,8	43,9	41,2
7	Q_e	**399,5**	**377,7**	**368,5**	**354,3**	**329,5**	**319,2**
	P	104,6	113,9	118,0	124,4	136,1	141,1
	V_e	68,6	64,9	63,3	60,9	56,6	54,8
	Δp_e	68,3	61,0	58,1	53,7	46,5	43,6
10	Q_e	**432,9**	**409,2**	**399,3**	**384,0**	**357,1**	**345,9**
	P	107,6	117,1	121,3	127,9	139,7	144,8
	V_e	74,4	70,4	68,7	66,0	61,4	59,5
	Δp_e	80,3	71,8	68,4	63,2	54,7	51,3
12	Q_e	**454,9**	**430,0**	**419,6**	**403,5**	**375,3**	**363,6**
	P	109,5	119,2	123,4	130,0	142,0	147,1
	V_e	78,3	74,0	72,2	69,5	64,6	62,6
	Δp_e	88,9	79,4	75,6	69,9	60,5	56,8
15	Q_e	**487,6**	**461,0**	**449,9**	**432,6**	**402,5**	**389,9**
	P	112,2	122,1	126,3	133,1	145,2	150,4
	V_e	84,0	79,4	77,5	74,5	69,4	67,2
	Δp_e	102,4	91,5	87,1	80,6	69,7	65,5

GLAC 4141 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**402,5**	**380,8**	**371,8**	**357,7**	**333,1**	**322,8**
	P	107,5	116,9	121,1	127,7	140,0	145,3
	V_e	69,2	65,4	63,9	61,5	57,2	55,5
	Δp_e	49,3	44,1	42,0	38,9	33,7	31,7
6	Q_e	**414,4**	**392,1**	**382,8**	**368,3**	**342,9**	**332,4**
	P	108,5	118,0	122,2	129,0	141,3	146,6
	V_e	71,2	67,4	65,8	63,3	58,9	57,1
	Δp_e	52,2	46,7	44,5	41,2	35,8	33,6
7	Q_e	**426,2**	**403,3**	**393,7**	**378,8**	**352,8**	**341,9**
	P	109,5	119,2	123,4	130,2	142,6	148,0
	V_e	73,2	69,3	67,6	65,1	60,6	58,7
	Δp_e	55,2	49,4	47,1	43,6	37,8	35,5
10	Q_e	**461,5**	**436,7**	**426,4**	**410,3**	**382,2**	**370,5**
	P	112,4	122,3	126,7	133,6	146,3	151,8
	V_e	79,4	75,1	73,3	70,6	65,7	63,7
	Δp_e	64,9	58,1	55,4	51,3	44,5	41,8
12	Q_e	**484,8**	**458,8**	**448,0**	**431,1**	**401,6**	**389,4**
	P	114,3	124,3	128,7	135,8	148,7	154,2
	V_e	83,4	79,0	77,1	74,2	69,1	67,0
	Δp_e	71,7	64,2	61,2	56,7	49,2	46,3
15	Q_e	**519,4**	**491,7**	**480,1**	**462,1**	**430,6**	**417,5**
	P	116,8	127,1	131,7	138,8	151,9	157,5
	V_e	89,5	84,7	82,7	79,6	74,2	71,9
	Δp_e	82,5	73,9	70,5	65,3	56,7	53,3

GLAC 4161 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**442,1**	**417,4**	**407,1**	**391,1**	**363,2**	**351,6**
	P	121,8	132,4	137,2	144,9	159,2	165,4
	V_e	75,9	71,7	69,9	67,2	62,4	60,4
	Δp_e	59,4	53,0	50,4	46,5	40,1	37,6
6	Q_e	**454,6**	**429,3**	**418,7**	**402,3**	**373,6**	**361,7**
	P	123,0	133,8	138,6	146,4	160,8	167,1
	V_e	78,1	73,8	71,9	69,1	64,2	62,1
	Δp_e	62,8	56,0	53,3	49,2	42,4	39,8
7	Q_e	**467,1**	**441,2**	**430,3**	**413,4**	**384,0**	**371,7**
	P	124,1	135,1	140,0	147,8	162,5	168,8
	V_e	80,3	75,8	73,9	71,0	66,0	63,9
	Δp_e	66,3	59,2	56,3	52,0	44,8	42,0
10	Q_e	**504,3**	**476,3**	**464,6**	**446,5**	**414,9**	**401,7**
	P	127,4	138,8	143,9	152,0	167,1	173,6
	V_e	86,7	81,9	79,9	76,8	71,3	69,1
	Δp_e	77,5	69,1	65,8	60,7	52,4	49,2
12	Q_e	**528,8**	**499,5**	**487,2**	**468,3**	**435,2**	**421,4**
	P	129,5	141,1	146,3	154,7	170,0	176,6
	V_e	91,0	86,0	83,9	80,6	74,9	72,5
	Δp_e	85,3	76,1	72,4	66,9	57,8	54,2
15	Q_e	**565,1**	**533,8**	**520,7**	**500,5**	**465,3**	**-**
	P	132,4	144,5	149,8	158,3	174,0	-
	V_e	97,4	92,0	89,7	86,2	80,2	-
	Δp_e	97,7	87,1	82,9	76,6	66,2	-

GLAC 5171 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**488,0**	**461,3**	**450,1**	**432,7**	**402,4**	**389,7**
	P	132,0	143,8	149,0	157,3	172,4	178,9
	V_e	83,8	79,2	77,3	74,3	69,1	67,0
	Δp_e	54,8	49,0	46,6	43,1	37,3	35,0
6	Q_e	**502,4**	**474,9**	**463,4**	**445,5**	**414,3**	**401,2**
	P	133,3	145,3	150,5	158,8	174,1	180,6
	V_e	86,3	81,6	79,6	76,5	71,2	68,9
	Δp_e	58,1	51,9	49,4	45,7	39,5	37,1
7	Q_e	**516,8**	**488,5**	**476,6**	**458,3**	**426,1**	**412,7**
	P	134,6	146,7	152,0	160,4	175,7	182,3
	V_e	88,8	83,9	81,9	78,7	73,2	70,9
	Δp_e	61,5	54,9	52,3	48,3	41,8	39,2
10	Q_e	**559,5**	**528,9**	**516,1**	**496,2**	**461,5**	**447,0**
	P	138,4	150,8	156,2	164,8	180,4	187,2
	V_e	96,2	91,0	88,7	85,3	79,4	76,9
	Δp_e	72,2	64,5	61,4	56,8	49,1	46,1
12	Q_e	**587,7**	**555,6**	**542,1**	**521,3**	**484,9**	**469,7**
	P	140,8	153,4	158,9	167,6	183,4	190,2
	V_e	101,1	95,6	93,3	89,7	83,4	80,8
	Δp_e	79,8	71,3	67,9	62,8	54,3	51,0
15	Q_e	**629,6**	**595,2**	**580,8**	**558,5**	**519,6**	**503,4**
	P	144,2	157,1	162,7	171,6	187,6	194,5
	V_e	108,5	102,6	100,1	96,2	89,5	86,7
	Δp_e	91,8	82,0	78,1	72,2	62,5	58,7

T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAC 6181 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**532,2**	**503,4**	**491,3**	**472,7**	**440,0**	**426,4**
	P	141,0	154,1	159,7	168,6	184,6	191,4
	V_e	91,4	86,5	84,4	81,2	75,6	73,2
	Δp_e	65,2	58,3	55,6	51,4	44,6	41,8
6	**Q_e**	**548,3**	**518,7**	**506,3**	**487,0**	**453,3**	**439,3**
	P	142,5	155,7	161,3	170,3	186,3	193,1
	V_e	94,2	89,1	87,0	83,7	77,9	75,5
	Δp_e	69,2	61,9	59,0	54,6	47,3	44,4
7	**Q_e**	**564,4**	**533,9**	**521,1**	**501,3**	**466,6**	**452,2**
	P	144,0	157,2	162,9	171,9	188,0	194,8
	V_e	97,0	91,7	89,5	86,1	80,2	77,7
	Δp_e	73,3	65,6	62,5	57,9	50,1	47,1
10	**Q_e**	**612,5**	**579,4**	**565,5**	**544,0**	**506,4**	**490,6**
	P	148,3	161,7	167,5	176,6	192,8	199,7
	V_e	105,3	99,6	97,3	93,6	87,1	84,4
	Δp_e	86,5	77,4	73,8	68,3	59,1	55,5
12	**Q_e**	**644,3**	**609,5**	**594,9**	**572,3**	**532,7**	**516,2**
	P	151,0	164,6	170,4	179,6	195,9	202,8
	V_e	110,9	104,9	102,4	98,5	91,7	88,8
	Δp_e	95,9	85,8	81,8	75,7	65,6	61,6
15	**Q_e**	**691,6**	**654,3**	**638,6**	**614,4**	**571,9**	**554,2**
	P	154,9	168,7	174,6	183,9	200,3	207,3
	V_e	119,2	112,7	110,0	105,9	98,5	95,5
	Δp_e	110,7	99,1	94,4	87,4	75,8	71,1

GLAC 5201 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**560,1**	**529,6**	**516,8**	**497,0**	**462,3**	**447,9**
	P	152,2	165,1	170,9	180,4	198,0	205,7
	V_e	96,2	91,0	88,8	85,4	79,4	76,9
	Δp_e	44,5	39,7	37,8	35,0	30,3	28,4
6	**Q_e**	**576,2**	**544,8**	**531,7**	**511,4**	**475,7**	**460,9**
	P	153,5	166,7	172,6	182,1	200,0	207,7
	V_e	99,0	93,6	91,3	87,8	81,7	79,2
	Δp_e	47,0	42,1	40,1	37,0	32,1	30,1
7	**Q_e**	**592,2**	**560,0**	**546,5**	**525,6**	**489,1**	**473,9**
	P	154,9	168,2	174,2	183,9	201,9	209,7
	V_e	101,7	96,2	93,9	90,3	84,0	81,4
	Δp_e	49,7	44,4	42,3	39,1	33,9	31,8
10	**Q_e**	**639,9**	**605,2**	**590,7**	**568,2**	**528,9**	**512,6**
	P	158,7	172,6	178,8	188,8	207,4	215,5
	V_e	110,0	104,1	101,6	97,7	91,0	88,1
	Δp_e	58,1	52,0	49,5	45,8	39,7	37,3
12	**Q_e**	**671,3**	**635,0**	**619,8**	**596,3**	**555,2**	**538,1**
	P	161,2	175,4	181,7	191,9	210,8	219,0
	V_e	115,5	109,3	106,7	102,6	95,6	92,6
	Δp_e	64,1	57,3	54,6	50,6	43,8	41,2
15	**Q_e**	**718,0**	**679,3**	**663,0**	**638,0**	**594,2**	**576,0**
	P	164,5	179,2	185,7	196,2	215,5	223,9
	V_e	123,7	117,0	114,2	109,9	102,4	99,3
	Δp_e	73,5	65,7	62,6	58,0	50,3	47,3

GLAC 6211 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**605,1**	**572,5**	**558,8**	**537,6**	**500,5**	**485,1**
	P	161,4	175,5	181,7	191,7	210,1	218,0
	V_e	104,0	98,4	96,0	92,4	86,0	83,3
	Δp_e	51,9	46,4	44,2	40,9	35,5	33,3
6	**Q_e**	**623,0**	**589,4**	**575,3**	**553,6**	**515,4**	**499,5**
	P	162,9	177,2	183,5	193,6	212,1	220,1
	V_e	107,0	101,3	98,8	95,1	88,5	85,8
	Δp_e	55,0	49,2	46,9	43,4	37,6	35,3
7	**Q_e**	**640,8**	**606,3**	**591,8**	**569,4**	**530,2**	**513,9**
	P	164,4	178,8	185,2	195,4	214,0	222,1
	V_e	110,1	104,2	101,7	97,8	91,1	88,3
	Δp_e	58,2	52,1	49,6	45,9	39,8	37,4
10	**Q_e**	**693,9**	**656,6**	**641,0**	**616,8**	**574,5**	**556,8**
	P	168,8	183,6	190,2	200,6	219,6	227,8
	V_e	119,3	112,9	110,2	106,1	98,8	95,8
	Δp_e	68,3	61,2	58,3	54,0	46,8	44,0
12	**Q_e**	**729,0**	**689,9**	**673,5**	**648,1**	**603,7**	**585,2**
	P	171,5	186,6	193,3	203,8	223,1	231,4
	V_e	125,5	118,7	115,9	111,5	103,9	100,7
	Δp_e	75,6	67,7	64,5	59,7	51,8	48,7
15	**Q_e**	**781,2**	**739,3**	**721,8**	**694,7**	**647,3**	**627,5**
	P	175,4	190,9	197,6	208,4	228,0	236,5
	V_e	134,6	127,4	124,4	119,7	111,5	108,1
	Δp_e	87,0	77,9	74,2	68,8	59,7	56,1

GLAC 6231 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**644,2**	**608,7**	**593,8**	**570,8**	**530,5**	**513,7**
	P	176,6	192,0	198,9	210,0	230,5	239,4
	V_e	110,7	104,6	102,0	98,1	91,1	88,2
	Δp_e	50,2	44,8	42,7	39,4	34,1	31,9
6	**Q_e**	**662,7**	**626,2**	**610,9**	**587,3**	**545,9**	**528,6**
	P	178,3	193,9	200,9	212,1	232,8	241,8
	V_e	113,9	107,6	105,0	100,9	93,8	90,8
	Δp_e	53,1	47,5	45,2	41,7	36,1	33,8
7	**Q_e**	**681,2**	**643,7**	**628,0**	**603,7**	**561,2**	**543,5**
	P	180,0	195,8	202,8	214,1	235,1	244,2
	V_e	117,0	110,6	107,9	103,7	96,4	93,4
	Δp_e	56,2	50,1	47,7	44,1	38,1	35,7
10	**Q_e**	**736,1**	**695,7**	**678,8**	**652,6**	**606,8**	**587,8**
	P	184,7	201,1	208,4	220,1	241,6	250,9
	V_e	126,6	119,6	116,7	112,2	104,4	101,1
	Δp_e	65,7	58,7	55,9	51,6	44,7	41,9
12	**Q_e**	**772,3**	**730,0**	**712,2**	**684,8**	**636,9**	**617,0**
	P	187,7	204,5	211,9	223,8	245,7	255,1
	V_e	132,9	125,6	122,6	117,9	109,6	106,2
	Δp_e	72,4	64,7	61,6	57,0	49,3	46,2
15	**Q_e**	**826,1**	**780,8**	**761,9**	**732,7**	**681,6**	**660,4**
	P	191,9	209,2	216,8	229,0	251,3	261,0
	V_e	142,3	134,5	131,3	126,2	117,4	113,8
	Δp_e	83,1	74,2	70,7	65,3	56,6	53,1

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAC 6241 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**675,0**	**638,8**	**623,6**	**600,1**	**558,9**	**541,8**
	P	181,4	196,6	203,4	214,6	235,4	244,5
	V_e	116,0	109,7	107,1	103,1	96,0	93,1
	Δp_e	55,1	49,4	47,1	43,6	37,8	35,5
6	Q_e	**694,4**	**657,3**	**641,7**	**617,5**	**575,2**	**557,6**
	P	183,0	198,4	205,4	216,6	237,7	246,9
	V_e	119,3	112,9	110,2	106,1	98,8	95,8
	Δp_e	58,4	52,3	49,8	46,1	40,0	37,6
7	Q_e	**713,8**	**675,6**	**659,7**	**634,9**	**591,5**	**573,4**
	P	184,6	200,2	207,2	218,6	239,9	249,2
	V_e	122,6	116,1	113,3	109,1	101,6	98,5
	Δp_e	61,7	55,2	52,7	48,8	42,3	39,8
10	Q_e	**771,5**	**730,4**	**713,2**	**686,5**	**639,9**	**620,5**
	P	189,0	205,2	212,5	224,3	246,2	255,7
	V_e	132,7	125,6	122,6	118,1	110,0	106,7
	Δp_e	72,2	64,7	61,7	57,2	49,7	46,7
12	Q_e	**809,6**	**766,5**	**748,5**	**720,7**	**671,9**	**651,6**
	P	191,7	208,3	215,8	227,8	250,1	259,8
	V_e	139,3	131,9	128,8	124,0	115,6	112,1
	Δp_e	79,6	71,4	68,0	63,1	54,8	51,6
15	Q_e	**866,2**	**820,3**	**801,1**	**771,4**	**719,5**	**697,9**
	P	195,5	212,7	220,3	232,7	255,5	265,4
	V_e	149,2	141,3	138,0	132,9	124,0	120,2
	Δp_e	91,3	81,9	78,1	72,4	63,0	59,3

GLAC 8241 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**706,9**	**668,4**	**652,3**	**627,4**	**583,7**	**565,5**
	P	192,2	209,8	217,3	229,2	250,5	259,6
	V_e	121,4	114,8	112,1	107,8	100,3	97,2
	Δp_e	54,6	48,8	46,5	43,0	37,2	34,9
6	Q_e	**728,4**	**688,7**	**672,1**	**646,3**	**601,3**	**582,6**
	P	194,3	211,9	219,5	231,5	252,9	262,0
	V_e	125,1	118,3	115,5	111,0	103,3	100,1
	Δp_e	57,9	51,8	49,3	45,6	39,5	37,1
7	Q_e	**749,7**	**708,9**	**691,8**	**665,3**	**618,9**	**599,6**
	P	196,3	214,1	221,7	233,7	255,2	264,3
	V_e	128,8	121,8	118,8	114,3	106,3	103,0
	Δp_e	61,4	54,9	52,3	48,3	41,8	39,3
10	Q_e	**813,3**	**769,0**	**750,4**	**721,7**	**671,4**	**650,4**
	P	202,2	220,2	228,0	240,1	261,8	271,0
	V_e	139,9	132,2	129,1	124,1	115,5	111,8
	Δp_e	72,4	64,7	61,6	57,0	49,3	46,3
12	Q_e	**855,3**	**808,8**	**789,3**	**759,0**	**706,1**	**684,1**
	P	206,0	224,2	232,0	244,2	266,0	275,2
	V_e	147,2	139,2	135,8	130,6	121,5	117,7
	Δp_e	80,2	71,7	68,3	63,1	54,6	51,3
15	Q_e	**917,8**	**867,9**	**847,0**	**814,6**	**757,9**	**734,2**
	P	211,3	229,8	237,7	250,0	272,0	281,3
	V_e	158,1	149,5	145,9	140,4	130,6	126,5
	Δp_e	92,5	82,7	78,8	72,9	63,1	59,2

GLAC 8261 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**753,2**	**712,0**	**694,8**	**668,1**	**621,4**	**601,9**
	P	204,9	223,3	231,3	244,0	267,1	277,0
	V_e	129,4	122,3	119,4	114,8	106,8	103,4
	Δp_e	62,0	55,4	52,7	48,7	42,2	39,6
6	Q_e	**775,6**	**733,3**	**715,5**	**688,0**	**639,9**	**619,9**
	P	207,0	225,6	233,6	246,4	269,7	279,6
	V_e	133,3	126,0	122,9	118,2	109,9	106,5
	Δp_e	65,7	58,7	55,9	51,7	44,7	42,0
7	Q_e	**798,0**	**754,4**	**736,1**	**707,9**	**658,4**	**637,7**
	P	209,1	227,8	235,9	248,8	272,2	282,2
	V_e	137,1	129,6	126,5	121,6	113,1	109,6
	Δp_e	69,5	62,1	59,2	54,7	47,3	44,4
10	Q_e	**864,6**	**817,4**	**797,6**	**767,0**	**713,4**	**691,1**
	P	215,1	234,2	242,5	255,6	279,4	289,5
	V_e	148,7	140,6	137,2	131,9	122,7	118,9
	Δp_e	81,8	73,1	69,6	64,4	55,7	52,3
12	Q_e	**908,6**	**859,0**	**838,2**	**806,1**	**749,8**	**726,4**
	P	218,8	238,2	246,6	259,9	283,9	294,1
	V_e	156,4	147,8	144,3	138,7	129,1	125,0
	Δp_e	90,5	80,9	77,0	71,2	61,6	57,8
15	Q_e	**973,9**	**920,9**	**898,6**	**864,2**	**804,0**	**779,0**
	P	224,2	244,0	252,6	266,0	290,3	300,7
	V_e	167,8	158,7	154,8	148,9	138,5	134,2
	Δp_e	104,2	93,1	88,7	82,0	71,0	66,7

GLAC 8281 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**806,9**	**763,4**	**745,2**	**716,9**	**667,5**	**646,8**
	P	215,2	234,0	242,3	255,6	280,1	290,7
	V_e	138,6	131,2	128,0	123,2	114,7	111,1
	Δp_e	48,0	43,0	41,0	37,9	32,9	30,9
6	Q_e	**830,8**	**786,0**	**767,2**	**738,2**	**687,3**	**666,1**
	P	217,2	236,2	244,6	258,1	282,8	293,4
	V_e	142,7	135,0	131,8	126,8	118,1	114,4
	Δp_e	50,9	45,6	43,4	40,2	34,9	32,7
7	Q_e	**854,5**	**808,5**	**789,2**	**759,4**	**707,1**	**685,3**
	P	219,2	238,5	246,9	260,5	285,4	296,1
	V_e	146,8	138,9	135,6	130,5	121,5	117,7
	Δp_e	53,9	48,2	46,0	42,5	36,9	34,7
10	Q_e	**925,3**	**875,6**	**854,8**	**822,5**	**766,0**	**742,5**
	P	225,1	244,8	253,5	267,4	292,9	303,8
	V_e	159,1	150,6	147,0	141,4	131,7	127,7
	Δp_e	63,3	56,7	54,0	50,0	43,4	40,8
12	Q_e	**972,1**	**920,0**	**898,1**	**864,3**	**805,1**	**780,4**
	P	228,7	248,9	257,7	271,8	297,5	308,6
	V_e	167,3	158,3	154,6	148,7	138,6	134,3
	Δp_e	70,0	62,7	59,7	55,3	48,0	45,1
15	Q_e	**1041,7**	**985,9**	**962,6**	**926,4**	**863,2**	**836,8**
	P	233,9	254,5	263,5	277,9	304,1	315,3
	V_e	179,5	169,9	165,9	159,6	148,7	144,2
	Δp_e	80,5	72,1	68,8	63,7	55,3	52,0

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

Values from example on page 20

GLAC 8301 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**845,8**	**799,4**	**780,0**	**749,9**	**697,3**	**675,4**
	P	230,4	250,4	259,3	273,7	300,3	311,9
	V_e	145,3	137,3	134,0	128,8	119,8	116,0
	Δp_e	52,8	47,2	44,9	41,5	35,9	33,7
6	**Q_e**	**870,3**	**822,6**	**802,7**	**771,8**	**717,7**	**695,1**
	P	232,6	252,9	261,9	276,5	303,3	315,0
	V_e	149,5	141,3	137,9	132,6	123,3	119,4
	Δp_e	55,9	49,9	47,5	43,9	38,0	35,7
7	**Q_e**	**894,7**	**845,7**	**825,2**	**793,5**	**737,9**	**714,8**
	P	234,7	255,3	264,4	279,1	306,3	318,0
	V_e	153,7	145,3	141,8	136,3	126,8	122,8
	Δp_e	59,1	52,8	50,2	46,5	40,2	37,7
10	**Q_e**	**967,3**	**914,5**	**892,3**	**858,1**	**798,3**	**773,4**
	P	240,9	262,2	271,6	286,8	314,6	326,7
	V_e	166,3	157,3	153,5	147,6	137,3	133,0
	Δp_e	69,2	61,8	58,9	54,4	47,1	44,2
12	**Q_e**	**1015,2**	**959,8**	**936,6**	**900,8**	**838,2**	**812,1**
	P	244,8	266,6	276,2	291,6	319,8	332,1
	V_e	174,7	165,2	161,2	155,0	144,3	139,8
	Δp_e	76,3	68,2	65,0	60,1	52,0	48,8
15	**Q_e**	**1086,3**	**1027,2**	**1002,4**	**964,2**	**897,4**	**869,6**
	P	250,3	272,7	282,5	298,3	327,1	339,6
	V_e	187,2	177,0	172,7	166,1	154,6	149,8
	Δp_e	87,6	78,3	74,6	69,0	59,8	56,1

GLAC 8321 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**883,8**	**834,5**	**813,9**	**782,0**	**726,1**	**702,9**
	P	243,6	264,8	274,3	289,7	318,3	330,8
	V_e	151,8	143,4	139,8	134,3	124,7	120,8
	Δp_e	57,6	51,4	48,9	45,1	38,9	36,5
6	**Q_e**	**908,9**	**858,3**	**837,1**	**804,3**	**747,0**	**723,1**
	P	245,9	267,5	277,1	292,7	321,6	334,2
	V_e	156,1	147,5	143,8	138,2	128,3	124,2
	Δp_e	61,0	54,4	51,7	47,7	41,2	38,6
7	**Q_e**	**933,9**	**881,9**	**860,2**	**826,6**	**767,7**	**743,2**
	P	248,2	270,1	279,9	295,7	324,9	337,6
	V_e	160,4	151,5	147,8	142,0	131,9	127,7
	Δp_e	64,4	57,4	54,6	50,4	43,5	40,8
10	**Q_e**	**1008,2**	**952,2**	**928,8**	**892,6**	**829,4**	**803,1**
	P	254,8	277,6	287,7	304,0	334,1	347,2
	V_e	173,4	163,8	159,7	153,5	142,6	138,1
	Δp_e	75,2	67,0	63,8	58,9	50,9	47,7
12	**Q_e**	**1057,1**	**998,5**	**974,0**	**936,2**	**870,0**	**842,5**
	P	258,9	282,2	292,6	309,3	339,9	353,2
	V_e	181,9	171,9	167,6	161,1	149,7	145,0
	Δp_e	82,8	73,8	70,3	64,9	56,1	52,6
15	**Q_e**	**1129,7**	**1067,2**	**1041,0**	**1000,7**	**930,3**	**-**
	P	264,7	288,9	299,5	316,6	348,0	-
	V_e	194,7	183,9	179,4	172,4	160,3	-
	Δp_e	94,7	84,5	80,4	74,3	64,2	-

T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAC 4131 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**360,5**	**338,7**	**329,7**	**315,6**	**307,4**	**297,6**
	P	104,8	115,0	119,4	126,3	131,8	136,8
	V_e	61,9	58,2	56,6	54,2	52,8	51,1
	Δp_e	55,6	49,1	46,5	42,6	40,5	37,9
6	Q_e	**370,9**	**348,5**	**339,1**	**324,6**	**316,5**	**306,4**
	P	106,1	116,4	120,8	127,8	133,1	138,2
	V_e	63,7	59,9	58,3	55,8	54,4	52,6
	Δp_e	58,9	52,0	49,2	45,1	42,9	40,2
7	Q_e	**381,2**	**358,1**	**348,5**	**333,6**	**325,6**	**315,2**
	P	107,4	117,7	122,2	129,2	134,4	139,5
	V_e	65,5	61,5	59,9	57,3	55,9	54,1
	Δp_e	62,2	54,9	52,0	47,6	45,4	42,5
10	Q_e	**411,8**	**386,7**	**376,2**	**360,1**	**352,6**	**341,3**
	P	111,1	121,7	126,2	133,4	138,2	143,3
	V_e	70,8	66,5	64,7	61,9	60,6	58,7
	Δp_e	72,7	64,1	60,7	55,6	53,3	49,9
12	Q_e	**431,8**	**405,5**	**394,5**	**377,5**	**370,4**	**358,5**
	P	113,4	124,2	128,8	136,1	140,5	145,7
	V_e	74,3	69,8	67,9	65,0	63,8	61,7
	Δp_e	80,1	70,6	66,8	61,2	58,9	55,2
15	Q_e	**461,4**	**433,1**	**421,3**	**427,5**	**396,9**	**384,2**
	P	116,9	127,9	132,6	131,5	143,9	149,2
	V_e	79,5	74,6	72,6	73,7	68,4	66,2
	Δp_e	91,6	80,8	76,4	78,7	67,8	63,5

GLAC 4141 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**385,9**	**363,1**	**353,6**	**338,9**	**329,4**	**319,1**
	P	111,7	122,3	126,9	134,3	140,7	146,2
	V_e	66,3	62,4	60,7	58,2	56,6	54,8
	Δp_e	45,3	40,1	38,0	34,9	33,0	31,0
6	Q_e	**396,9**	**373,5**	**363,7**	**348,5**	**339,1**	**328,5**
	P	113,0	123,7	128,4	135,8	142,1	147,6
	V_e	68,2	64,2	62,5	59,9	58,3	56,4
	Δp_e	47,9	42,4	40,2	36,9	35,0	32,8
7	Q_e	**407,9**	**383,8**	**373,7**	**358,1**	**348,8**	**337,9**
	P	114,2	125,1	129,8	137,3	143,5	149,0
	V_e	70,1	65,9	64,2	61,5	59,9	58,0
	Δp_e	50,6	44,8	42,5	39,0	37,0	34,7
10	Q_e	**440,4**	**414,3**	**403,4**	**386,6**	**377,6**	**365,8**
	P	117,9	129,1	133,9	141,6	147,4	153,0
	V_e	75,7	71,3	69,4	66,5	64,9	62,9
	Δp_e	59,1	52,3	49,6	45,5	43,4	40,8
12	Q_e	**461,8**	**434,3**	**422,9**	**405,2**	**396,7**	**384,3**
	P	120,3	131,6	136,6	144,4	149,9	155,6
	V_e	79,5	74,8	72,8	69,7	68,3	66,1
	Δp_e	65,1	57,6	54,6	50,1	48,0	45,1
15	Q_e	**493,3**	**464,0**	**451,7**	**432,8**	**425,0**	**411,8**
	P	123,6	135,3	140,4	148,3	153,3	159,1
	V_e	85,0	79,9	77,8	74,6	73,2	71,0
	Δp_e	74,4	65,8	62,4	57,3	55,2	51,8

GLAC 4161 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**429,7**	**403,9**	**393,2**	**376,5**	**369,6**	**358,0**
	P	124,2	136,0	141,2	149,7	154,9	161,0
	V_e	73,8	69,4	67,5	64,7	63,5	61,5
	Δp_e	56,1	49,6	47,0	43,1	41,5	39,0
6	Q_e	**441,6**	**415,2**	**404,1**	**387,0**	**380,4**	**368,5**
	P	125,6	137,6	142,9	151,4	156,4	162,7
	V_e	75,9	71,3	69,4	66,5	65,3	63,3
	Δp_e	59,3	52,4	49,6	45,5	44,0	41,3
7	Q_e	**453,5**	**426,3**	**415,0**	**397,4**	**391,1**	**378,8**
	P	126,9	139,1	144,5	153,1	158,0	164,3
	V_e	77,9	73,2	71,3	68,3	67,2	65,1
	Δp_e	62,5	55,3	52,4	48,0	46,5	43,6
10	Q_e	**488,7**	**459,4**	**447,2**	**428,3**	**422,9**	**409,8**
	P	130,8	143,5	149,1	158,1	162,3	168,8
	V_e	84,1	79,0	76,9	73,7	72,7	70,5
	Δp_e	72,8	64,3	60,9	55,9	54,5	51,1
12	Q_e	**511,9**	**481,1**	**468,3**	**448,5**	**443,9**	**430,2**
	P	133,3	146,4	152,1	161,2	165,0	171,6
	V_e	88,1	82,8	80,6	77,2	76,4	74,0
	Δp_e	79,9	70,6	66,9	61,4	60,1	56,5
15	Q_e	**546,0**	**513,1**	**499,4**	**510,2**	**475,1**	**460,5**
	P	136,9	150,4	156,3	153,3	168,8	175,5
	V_e	94,1	88,4	86,0	87,9	81,9	79,3
	Δp_e	91,1	80,5	76,3	79,6	69,0	64,8

GLAC 5171 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**466,6**	**438,4**	**426,6**	**408,4**	**398,0**	**385,3**
	P	136,4	149,5	155,3	164,3	171,4	178,0
	V_e	80,2	75,3	73,3	70,2	68,4	66,2
	Δp_e	50,1	44,2	41,9	38,4	36,5	34,2
6	Q_e	**479,9**	**450,9**	**438,7**	**420,0**	**409,7**	**396,6**
	P	138,0	151,3	157,1	166,2	173,1	179,8
	V_e	82,5	77,5	75,4	72,2	70,4	68,1
	Δp_e	53,0	46,8	44,3	40,6	38,6	36,2
7	Q_e	**493,2**	**463,3**	**450,8**	**431,5**	**421,4**	**407,9**
	P	139,6	153,1	158,9	168,1	174,8	181,5
	V_e	84,7	79,6	77,4	74,1	72,4	70,1
	Δp_e	56,0	49,4	46,8	42,9	40,9	38,3
10	Q_e	**532,3**	**499,9**	**486,4**	**465,5**	**456,0**	**441,4**
	P	144,4	158,2	164,2	173,6	179,7	186,6
	V_e	91,5	86,0	83,6	80,1	78,4	75,9
	Δp_e	65,4	57,7	54,6	50,0	48,0	45,0
12	Q_e	**558,0**	**523,9**	**509,7**	**487,8**	**478,9**	**463,6**
	P	147,4	161,5	167,5	177,1	182,8	189,7
	V_e	96,0	90,2	87,7	84,0	82,4	79,8
	Δp_e	71,9	63,4	60,0	55,0	53,0	49,7
15	Q_e	**595,9**	**559,4**	**544,1**	**552,3**	**512,9**	**496,5**
	P	151,8	166,2	172,4	170,9	187,2	194,2
	V_e	102,7	96,4	93,8	95,2	88,4	85,6
	Δp_e	82,2	72,5	68,6	70,6	60,9	57,1

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

Unit does not operate in quiet mode

GLAC 6181 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**503,1**	**472,4**	**459,6**	**439,9**	**428,2**	**414,3**
	P	148,2	162,7	168,9	178,6	186,4	193,4
	V_e	86,4	81,2	79,0	75,6	73,6	71,2
	Δp_e	58,3	51,4	48,6	44,5	42,2	39,5
6	**Q_e**	**517,7**	**486,1**	**472,9**	**452,5**	**440,9**	**426,6**
	P	150,1	164,7	170,9	180,7	188,3	195,3
	V_e	88,9	83,5	81,2	77,7	75,7	73,3
	Δp_e	61,7	54,4	51,5	47,1	44,8	41,9
7	**Q_e**	**532,2**	**499,7**	**486,1**	**465,0**	**453,6**	**438,8**
	P	152,0	166,7	172,9	182,7	190,1	197,1
	V_e	91,4	85,8	83,5	79,9	77,9	75,4
	Δp_e	65,2	57,5	54,4	49,8	47,4	44,3
10	**Q_e**	**575,2**	**539,8**	**525,0**	**502,2**	**491,3**	**475,3**
	P	157,5	172,4	178,7	188,6	195,4	202,5
	V_e	98,9	92,8	90,3	86,4	84,5	81,7
	Δp_e	76,3	67,2	63,6	58,2	55,7	52,1
12	**Q_e**	**603,4**	**566,1**	**550,5**	**526,5**	**516,2**	**499,4**
	P	161,0	176,1	182,5	192,5	198,8	205,9
	V_e	103,9	97,4	94,8	90,6	88,9	86,0
	Δp_e	84,1	74,0	70,0	64,0	61,6	57,6
15	**Q_e**	**645,0**	**604,9**	**588,2**	**596,6**	**553,3**	**535,2**
	P	166,1	181,5	187,9	186,7	203,6	210,8
	V_e	111,1	104,2	101,3	102,8	95,3	92,2
	Δp_e	96,3	84,7	80,1	82,4	70,9	66,3

GLAC 5201 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**538,1**	**505,8**	**492,3**	**471,5**	**462,9**	**448,3**
	P	155,3	170,1	176,7	187,2	193,7	201,4
	V_e	92,5	86,9	84,6	81,0	79,5	77,0
	Δp_e	41,0	36,2	34,3	31,5	30,4	28,5
6	**Q_e**	**553,1**	**519,9**	**506,0**	**484,6**	**476,3**	**461,4**
	P	157,1	172,1	178,7	189,4	195,7	203,5
	V_e	95,0	89,3	86,9	83,3	81,8	79,3
	Δp_e	43,3	38,3	36,3	33,3	32,1	30,2
7	**Q_e**	**568,0**	**533,9**	**519,7**	**497,7**	**489,7**	**474,4**
	P	158,8	174,0	180,7	191,6	197,6	205,5
	V_e	97,6	91,7	89,3	85,5	84,1	81,5
	Δp_e	45,7	40,4	38,3	35,1	34,0	31,9
10	**Q_e**	**612,2**	**575,4**	**560,0**	**536,3**	**529,6**	**513,1**
	P	163,7	179,6	186,6	197,8	203,0	211,2
	V_e	105,3	99,0	96,3	92,2	91,1	88,2
	Δp_e	53,2	47,0	44,5	40,8	39,8	37,4
12	**Q_e**	**641,2**	**602,6**	**586,5**	**561,6**	**555,9**	**538,7**
	P	166,8	183,1	190,3	201,7	206,4	214,7
	V_e	110,3	103,7	100,9	96,7	95,7	92,7
	Δp_e	58,4	51,6	48,9	44,9	43,9	41,3
15	**Q_e**	**683,9**	**642,7**	**625,5**	**639,1**	**595,1**	**576,7**
	P	171,3	188,2	195,5	191,7	211,1	219,6
	V_e	117,8	110,7	107,8	110,1	102,5	99,4
	Δp_e	66,7	58,9	55,8	58,2	50,5	47,4

GLAC 6211 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**575,4**	**540,7**	**526,3**	**503,9**	**490,3**	**474,5**
	P	167,2	183,2	190,3	201,4	210,5	218,7
	V_e	98,9	92,9	90,4	86,6	84,2	81,5
	Δp_e	46,9	41,4	39,2	36,0	34,1	31,9
6	**Q_e**	**591,8**	**556,1**	**541,2**	**518,1**	**504,6**	**488,5**
	P	169,1	185,4	192,5	203,7	212,7	220,9
	V_e	101,7	95,5	93,0	89,0	86,7	83,9
	Δp_e	49,6	43,8	41,5	38,0	36,1	33,8
7	**Q_e**	**608,0**	**571,3**	**556,0**	**532,3**	**518,9**	**502,3**
	P	171,1	187,5	194,7	206,0	214,8	223,1
	V_e	104,5	98,1	95,5	91,4	89,2	86,3
	Δp_e	52,4	46,2	43,8	40,1	38,2	35,7
10	**Q_e**	**656,2**	**616,4**	**599,8**	**574,2**	**561,5**	**543,6**
	P	176,8	193,7	201,1	212,7	220,8	229,3
	V_e	112,8	106,0	103,2	98,8	96,6	93,5
	Δp_e	61,1	53,9	51,1	46,8	44,8	41,9
12	**Q_e**	**687,8**	**646,0**	**628,6**	**601,7**	**589,6**	**570,8**
	P	180,4	197,7	205,2	217,0	224,6	233,2
	V_e	118,4	111,2	108,2	103,6	101,5	98,2
	Δp_e	67,3	59,3	56,2	51,5	49,4	46,3
15	**Q_e**	**734,4**	**689,7**	**671,0**	**679,7**	**631,4**	**611,3**
	P	185,7	203,4	211,1	209,7	230,0	238,7
	V_e	126,5	118,8	115,6	117,1	108,8	105,3
	Δp_e	76,9	67,8	64,2	65,8	56,8	53,3

GLAC 6231 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**625,1**	**588,0**	**572,5**	**548,6**	**535,6**	**518,9**
	P	178,7	195,6	203,1	215,1	224,2	233,0
	V_e	107,4	101,0	98,4	94,2	92,0	89,1
	Δp_e	47,3	41,8	39,7	36,4	34,7	32,6
6	**Q_e**	**642,7**	**604,6**	**588,6**	**564,0**	**551,3**	**534,0**
	P	180,7	197,8	205,4	217,6	226,4	235,4
	V_e	110,4	103,9	101,1	96,9	94,7	91,7
	Δp_e	50,0	44,2	41,9	38,5	36,8	34,5
7	**Q_e**	**660,2**	**621,0**	**604,6**	**579,3**	**566,9**	**549,2**
	P	182,6	200,0	207,7	220,0	228,6	237,6
	V_e	113,4	106,7	103,9	99,5	97,4	94,3
	Δp_e	52,7	46,7	44,2	40,6	38,9	36,5
10	**Q_e**	**712,1**	**669,7**	**652,1**	**624,8**	**613,3**	**594,3**
	P	188,3	206,4	214,3	227,0	234,9	244,1
	V_e	122,5	115,2	112,1	107,4	105,5	102,2
	Δp_e	61,5	54,4	51,6	47,3	45,6	42,8
12	**Q_e**	**746,1**	**701,7**	**683,2**	**654,6**	**644,0**	**624,0**
	P	191,9	210,4	218,5	231,4	238,8	248,2
	V_e	128,4	120,8	117,6	112,7	110,8	107,4
	Δp_e	67,6	59,8	56,7	52,0	50,4	47,3
15	**Q_e**	**796,4**	**748,9**	**729,1**	**740,6**	**689,5**	**668,3**
	P	197,0	216,1	224,5	222,1	244,2	253,8
	V_e	137,2	129,0	125,6	127,6	118,8	115,2
	Δp_e	77,2	68,3	64,7	66,8	57,9	54,4

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C Coolant medium = 100% water*

For other temperature differences and/or media see the note on page 20 and following pages.

Unit does not operate in quiet mode

SL unit

GLAC 6241 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**644,2**	**605,6**	**589,5**	**564,5**	**554,2**	**536,8**
	P	186,2	204,0	211,8	224,5	232,3	241,5
	V_e	110,7	104,0	101,3	97,0	95,2	92,2
	Δp_e	50,2	44,4	42,0	38,6	37,2	34,9
6	Q_e	**662,1**	**622,4**	**605,9**	**580,2**	**570,3**	**552,4**
	P	188,3	206,3	214,3	227,1	234,6	244,0
	V_e	113,7	106,9	104,1	99,7	98,0	94,9
	Δp_e	53,0	46,9	44,4	40,7	39,4	36,9
7	Q_e	**679,9**	**639,2**	**622,2**	**595,9**	**586,3**	**568,0**
	P	190,3	208,6	216,7	229,7	236,9	246,4
	V_e	116,8	109,8	106,9	102,4	100,7	97,6
	Δp_e	55,9	49,4	46,8	43,0	41,6	39,0
10	Q_e	**732,7**	**688,8**	**670,4**	**642,1**	**634,0**	**614,3**
	P	196,2	215,3	223,7	237,1	243,5	253,2
	V_e	126,0	118,4	115,3	110,4	109,0	105,6
	Δp_e	65,1	57,5	54,5	50,0	48,7	45,8
12	Q_e	**767,3**	**721,3**	**702,0**	**672,4**	**665,5**	**644,9**
	P	200,0	219,5	228,1	241,8	247,5	257,4
	V_e	132,1	124,1	120,8	115,7	114,5	111,0
	Δp_e	71,5	63,2	59,9	54,9	53,8	50,5
15	Q_e	**818,4**	**769,2**	**748,7**	**764,9**	**712,3**	**690,4**
	P	205,3	225,5	234,4	229,8	253,1	263,2
	V_e	141,0	132,5	129,0	131,8	122,7	119,0
	Δp_e	81,5	72,0	68,2	71,2	61,8	58,0

GLAC 8241 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**668,3**	**626,8**	**609,5**	**582,7**	**572,9**	**554,3**
	P	197,8	217,5	225,9	239,0	246,3	255,6
	V_e	114,8	107,7	104,7	100,1	98,4	95,2
	Δp_e	48,8	42,9	40,6	37,1	35,8	33,6
6	Q_e	**687,6**	**644,8**	**627,0**	**599,3**	**590,0**	**570,8**
	P	200,4	220,2	228,6	241,8	248,7	258,1
	V_e	118,1	110,8	107,7	103,0	101,4	98,1
	Δp_e	51,6	45,4	42,9	39,2	38,0	35,6
7	Q_e	**706,9**	**662,7**	**644,3**	**615,9**	**607,0**	**587,2**
	P	202,9	222,9	231,3	244,6	251,2	260,5
	V_e	121,4	113,9	110,7	105,8	104,3	100,9
	Δp_e	54,6	48,0	45,3	41,4	40,2	37,7
10	Q_e	**763,7**	**715,7**	**695,7**	**664,7**	**657,6**	**636,2**
	P	210,4	230,6	239,2	252,7	258,2	267,6
	V_e	131,3	123,1	119,6	114,3	113,1	109,4
	Δp_e	63,8	56,1	53,0	48,4	47,3	44,3
12	Q_e	**801,0**	**750,4**	**729,3**	**745,3**	**691,1**	**668,5**
	P	215,2	235,7	244,4	240,2	262,7	272,2
	V_e	137,9	129,2	125,5	128,3	118,9	115,1
	Δp_e	70,3	61,7	58,3	60,9	52,3	49,0
15	Q_e	**855,9**	**801,5**	**778,8**	**799,0**	**740,8**	**716,6**
	P	222,2	243,0	251,8	246,4	269,1	278,7
	V_e	147,5	138,1	134,2	137,7	127,6	123,5
	Δp_e	80,5	70,6	66,6	70,1	60,3	56,4

GLAC 8261 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**720,2**	**676,8**	**658,6**	**630,6**	**614,3**	**594,6**
	P	209,5	229,9	238,7	252,5	263,5	273,6
	V_e	123,7	116,3	113,1	108,3	105,5	102,2
	Δp_e	56,6	50,0	47,4	43,4	41,2	38,6
6	Q_e	**741,0**	**696,2**	**677,5**	**648,6**	**632,4**	**612,2**
	P	212,1	232,6	241,5	255,4	266,2	276,3
	V_e	127,3	119,6	116,4	111,4	108,7	105,2
	Δp_e	60,0	52,9	50,1	45,9	43,7	40,9
7	Q_e	**761,5**	**715,5**	**696,2**	**666,4**	**650,5**	**629,7**
	P	214,6	235,3	244,2	258,3	268,8	278,9
	V_e	130,8	122,9	119,6	114,5	111,8	108,2
	Δp_e	63,3	55,9	52,9	48,5	46,2	43,3
10	Q_e	**822,6**	**772,5**	**751,7**	**719,4**	**704,4**	**681,8**
	P	222,0	243,2	252,3	266,6	276,2	286,5
	V_e	141,5	132,9	129,3	123,7	121,1	117,3
	Δp_e	74,0	65,3	61,8	56,6	54,3	50,9
12	Q_e	**862,6**	**810,0**	**788,0**	**754,1**	**740,0**	**716,3**
	P	226,7	248,3	257,5	272,0	281,0	291,4
	V_e	148,5	139,4	135,6	129,8	127,4	123,3
	Δp_e	81,5	71,9	68,1	62,3	60,0	56,2
15	Q_e	**921,6**	**865,2**	**841,7**	**853,9**	**792,9**	**767,5**
	P	233,6	255,6	265,0	263,0	287,7	298,2
	V_e	158,8	149,1	145,0	147,1	136,6	132,3
	Δp_e	93,3	82,2	77,8	80,1	69,1	64,7

GLAC 8281 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**773,5**	**727,7**	**708,6**	**679,1**	**660,2**	**639,4**
	P	223,5	244,8	254,0	268,8	281,6	292,5
	V_e	132,9	125,0	121,7	116,7	113,4	109,8
	Δp_e	44,1	39,1	37,1	34,0	32,2	30,2
6	Q_e	**795,6**	**748,5**	**728,9**	**698,4**	**679,7**	**658,3**
	P	226,1	247,6	256,9	271,8	284,4	295,4
	V_e	136,7	128,6	125,2	120,0	116,8	113,1
	Δp_e	46,7	41,3	39,2	36,0	34,1	32,0
7	Q_e	**817,6**	**769,2**	**749,0**	**717,7**	**699,1**	**677,1**
	P	228,6	250,4	259,8	274,8	287,2	298,2
	V_e	140,5	132,1	128,7	123,3	120,1	116,3
	Δp_e	49,3	43,7	41,4	38,0	36,1	33,8
10	Q_e	**882,9**	**830,5**	**808,6**	**774,7**	**756,9**	**733,2**
	P	236,0	258,4	268,1	283,5	295,1	306,3
	V_e	151,8	142,8	139,1	133,2	130,2	126,1
	Δp_e	57,6	51,0	48,3	44,4	42,4	39,7
12	Q_e	**925,7**	**870,7**	**847,7**	**812,2**	**795,1**	**770,2**
	P	240,8	263,5	273,4	289,0	300,0	311,3
	V_e	159,3	149,9	145,9	139,8	136,8	132,6
	Δp_e	63,5	56,1	53,2	48,9	46,8	43,9
15	Q_e	**989,1**	**930,1**	**905,5**	**867,5**	**851,9**	**825,4**
	P	247,6	270,9	281,0	297,0	306,9	318,4
	V_e	170,4	160,3	156,0	149,5	146,8	142,2
	Δp_e	72,6	64,2	60,9	55,9	53,9	50,6

T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

Unit does not operate in quiet mode

Performance Data – SL Unit
GLAC 8301-8321 CD2.SL – Cooling

GLAC 8301 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**817,4**	**769,0**	**748,8**	**717,5**	**697,5**	**675,4**
	P	234,4	256,6	266,3	282,0	295,5	307,1
	V_e	140,4	132,1	128,6	123,3	119,8	116,0
	Δp_e	49,3	43,6	41,4	38,0	35,9	33,7
6	**Q_e**	**840,5**	**790,7**	**769,9**	**737,7**	**717,8**	**695,2**
	P	237,0	259,5	269,4	285,2	298,5	310,2
	V_e	144,4	135,8	132,3	126,7	123,3	119,4
	Δp_e	52,1	46,1	43,7	40,2	38,0	35,7
7	**Q_e**	**863,4**	**812,3**	**790,9**	**757,8**	**738,1**	**714,9**
	P	239,6	262,4	272,4	288,4	301,4	313,2
	V_e	148,3	139,5	135,9	130,2	126,8	122,8
	Δp_e	55,0	48,7	46,2	42,4	40,2	37,7
10	**Q_e**	**931,4**	**876,1**	**853,0**	**817,4**	**798,5**	**773,5**
	P	247,1	270,7	281,1	297,5	309,7	321,8
	V_e	160,2	150,7	146,7	140,6	137,3	133,0
	Δp_e	64,1	56,8	53,8	49,4	47,1	44,2
12	**Q_e**	**976,1**	**918,1**	**893,9**	**856,5**	**838,3**	**812,2**
	P	251,9	276,1	286,6	303,4	315,0	327,2
	V_e	168,0	158,0	153,8	147,4	144,3	139,8
	Δp_e	70,6	62,4	59,2	54,3	52,0	48,8
15	**Q_e**	**1042,0**	**980,0**	**954,1**	**964,6**	**897,6**	**869,7**
	P	258,8	283,7	294,5	293,3	322,2	334,7
	V_e	179,5	168,8	164,4	166,2	154,7	149,8
	Δp_e	80,6	71,3	67,6	69,1	59,8	56,1

GLAC 8321 CD2.SL							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**859,0**	**807,6**	**786,0**	**752,8**	**739,0**	**715,8**
	P	248,3	272,0	282,5	299,3	309,7	322,1
	V_e	147,6	138,7	135,0	129,3	127,0	123,0
	Δp_e	54,4	48,1	45,6	41,8	40,3	37,8
6	**Q_e**	**882,9**	**830,0**	**807,9**	**773,7**	**760,5**	**736,7**
	P	251,1	275,1	285,7	302,8	312,8	325,3
	V_e	151,7	142,6	138,8	132,9	130,6	126,6
	Δp_e	57,5	50,8	48,2	44,2	42,7	40,0
7	**Q_e**	**906,7**	**852,4**	**829,7**	**794,6**	**781,8**	**757,4**
	P	253,8	278,1	288,9	306,2	315,9	328,5
	V_e	155,8	146,4	142,5	136,5	134,3	130,1
	Δp_e	60,7	53,6	50,8	46,6	45,1	42,3
10	**Q_e**	**977,1**	**918,5**	**894,0**	**856,2**	**845,4**	**819,2**
	P	261,6	287,0	298,2	316,2	324,6	337,6
	V_e	168,0	157,9	153,7	147,2	145,4	140,9
	Δp_e	70,6	62,4	59,1	54,2	52,8	49,6
12	**Q_e**	**1023,3**	**961,8**	**936,2**	**896,6**	**887,4**	**860,0**
	P	266,6	292,7	304,1	322,4	330,0	343,2
	V_e	176,1	165,5	161,1	154,3	152,7	148,0
	Δp_e	77,5	68,5	64,9	59,5	58,3	54,8
15	**Q_e**	**1091,4**	**1025,7**	**998,4**	**1020,0**	**949,8**	**920,6**
	P	273,8	300,7	312,5	306,5	337,5	351,0
	V_e	188,1	176,7	172,0	175,7	163,7	158,6
	Δp_e	88,4	78,1	74,0	77,2	67,0	62,9

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

Unit does not operate in quiet mode

GLAC 4131 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**389,2**	**369,8**	**361,6**	**348,9**	**326,6**	**298,0**
	P	99,9	108,2	111,8	117,6	128,3	142,8
	V_e	66,9	63,5	62,1	59,9	56,1	51,2
	Δp_e	64,8	58,5	55,9	52,1	45,7	38,0
6	Q_e	**401,2**	**381,1**	**372,7**	**359,7**	**336,7**	**307,3**
	P	100,7	109,1	112,7	118,6	129,4	143,9
	V_e	68,9	65,5	64,0	61,8	57,9	52,8
	Δp_e	68,9	62,2	59,5	55,4	48,5	40,4
7	Q_e	**413,1**	**392,5**	**383,9**	**370,5**	**346,9**	**316,6**
	P	101,6	110,0	113,6	119,6	130,4	145,0
	V_e	71,0	67,4	66,0	63,6	59,6	54,4
	Δp_e	73,0	65,9	63,1	58,7	51,5	42,9
10	Q_e	**448,8**	**426,6**	**417,3**	**402,7**	**377,3**	**344,5**
	P	103,9	112,5	116,2	122,2	133,2	148,0
	V_e	77,2	73,4	71,8	69,3	64,9	59,3
	Δp_e	86,4	78,0	74,7	69,6	61,0	50,9
12	Q_e	**472,6**	**449,3**	**439,4**	**424,2**	**397,5**	**363,2**
	P	105,4	114,0	117,8	123,9	135,0	149,9
	V_e	81,3	77,3	75,6	73,0	68,4	62,5
	Δp_e	95,9	86,7	82,9	77,3	67,9	56,6
15	Q_e	**508,1**	**483,1**	**472,6**	**456,4**	**427,8**	**391,1**
	P	107,4	116,2	120,1	126,2	137,4	152,5
	V_e	87,5	83,2	81,4	78,6	73,7	67,4
	Δp_e	111,1	100,5	96,2	89,7	78,8	65,9

GLAC 4141 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**410,8**	**390,5**	**382,0**	**368,8**	**345,6**	**315,7**
	P	105,1	113,4	117,1	123,2	134,4	149,8
	V_e	70,6	67,1	65,6	63,4	59,4	54,2
	Δp_e	51,3	46,4	44,4	41,3	36,3	30,3
6	Q_e	**423,3**	**402,4**	**393,7**	**380,1**	**356,2**	**325,5**
	P	105,9	114,3	118,1	124,2	135,5	151,0
	V_e	72,7	69,1	67,6	65,3	61,2	55,9
	Δp_e	54,5	49,2	47,1	43,9	38,6	32,2
7	Q_e	**435,7**	**414,3**	**405,3**	**391,4**	**366,8**	**335,3**
	P	106,7	115,2	119,0	125,1	136,5	152,1
	V_e	74,9	71,2	69,6	67,2	63,0	57,6
	Δp_e	57,7	52,2	49,9	46,6	40,9	34,2
10	Q_e	**472,9**	**449,9**	**440,2**	**425,1**	**398,7**	**364,7**
	P	108,9	117,6	121,5	127,8	139,4	155,3
	V_e	81,3	77,4	75,7	73,1	68,6	62,7
	Δp_e	68,1	61,7	59,0	55,1	48,4	40,5
12	Q_e	**497,7**	**473,5**	**463,4**	**447,6**	**419,9**	**384,3**
	P	110,3	119,1	123,1	129,4	141,2	157,2
	V_e	85,7	81,5	79,8	77,0	72,3	66,1
	Δp_e	75,6	68,4	65,5	61,1	53,8	45,1
15	Q_e	**534,7**	**508,9**	**498,1**	**481,2**	**451,7**	**413,7**
	P	112,1	121,2	125,2	131,7	143,6	159,8
	V_e	92,1	87,7	85,8	82,9	77,8	71,3
	Δp_e	87,4	79,2	75,9	70,8	62,4	52,3

GLAC 4161 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**462,4**	**439,0**	**429,2**	**413,9**	**387,2**	**352,8**
	P	119,0	128,2	132,4	139,3	152,2	170,3
	V_e	79,4	75,4	73,7	71,1	66,5	60,6
	Δp_e	65,0	58,6	56,0	52,1	45,6	37,8
6	Q_e	**476,0**	**451,9**	**441,9**	**426,2**	**398,7**	**363,5**
	P	119,9	129,2	133,5	140,4	153,5	171,8
	V_e	81,8	77,6	75,9	73,2	68,5	62,4
	Δp_e	68,9	62,1	59,4	55,2	48,3	40,2
7	Q_e	**489,5**	**464,9**	**454,5**	**438,4**	**410,3**	**374,1**
	P	120,8	130,2	134,5	141,5	154,8	173,2
	V_e	84,1	79,9	78,1	75,3	70,5	64,3
	Δp_e	72,8	65,7	62,8	58,4	51,2	42,5
10	Q_e	**529,9**	**503,4**	**492,3**	**475,0**	**444,8**	**405,9**
	P	123,2	133,0	137,4	144,7	158,3	177,2
	V_e	91,1	86,6	84,7	81,7	76,5	69,8
	Δp_e	85,5	77,2	73,8	68,7	60,3	50,2
12	Q_e	**556,7**	**529,0**	**517,3**	**499,3**	**467,6**	**427,1**
	P	124,6	134,6	139,2	146,6	160,4	179,6
	V_e	95,8	91,0	89,0	85,9	80,5	73,5
	Δp_e	94,6	85,4	81,7	76,1	66,7	55,7
15	Q_e	**596,7**	**567,1**	**554,7**	**535,5**	**501,8**	**458,7**
	P	126,6	136,9	141,6	149,2	163,3	182,8
	V_e	102,8	97,7	95,6	92,3	86,5	79,0
	Δp_e	108,9	98,4	94,1	87,7	77,0	64,3

GLAC 5171 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**506,5**	**480,9**	**470,1**	**453,4**	**424,1**	**386,6**
	P	128,4	139,1	143,8	151,4	165,5	184,6
	V_e	87,0	82,6	80,8	77,9	72,9	66,4
	Δp_e	59,1	53,2	50,9	47,3	41,4	34,4
6	Q_e	**521,8**	**495,5**	**484,4**	**467,3**	**437,1**	**398,5**
	P	129,5	140,3	145,0	152,7	166,9	186,1
	V_e	89,6	85,1	83,2	80,3	75,1	68,5
	Δp_e	62,7	56,5	54,0	50,3	44,0	36,6
7	Q_e	**537,2**	**510,1**	**498,7**	**481,1**	**450,1**	**410,4**
	P	130,6	141,4	146,2	154,0	168,2	187,5
	V_e	92,3	87,6	85,7	82,6	77,3	70,5
	Δp_e	66,4	59,9	57,3	53,3	46,6	38,8
10	Q_e	**583,0**	**553,8**	**541,5**	**522,4**	**489,0**	**446,1**
	P	133,6	144,7	149,6	157,5	172,0	191,6
	V_e	100,3	95,2	93,1	89,8	84,1	76,7
	Δp_e	78,4	70,7	67,6	63,0	55,2	45,9
12	Q_e	**613,4**	**582,8**	**569,9**	**549,9**	**514,9**	**469,9**
	P	135,4	146,7	151,7	159,7	174,4	194,2
	V_e	105,6	100,3	98,1	94,6	88,6	80,9
	Δp_e	86,9	78,5	75,0	69,9	61,3	51,0
15	Q_e	**658,8**	**626,1**	**612,3**	**591,0**	**553,6**	**505,6**
	P	138,0	149,6	154,6	162,7	177,6	197,7
	V_e	113,5	107,9	105,5	101,8	95,4	87,1
	Δp_e	100,5	90,8	86,8	80,9	71,0	59,2

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

Performance Data – HE Unit
GLAC 6181-6231 CD2.HE – Cooling

GLAC 6181 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**544,0**	**516,5**	**505,0**	**487,1**	**455,7**	**415,5**
	P	137,6	149,8	155,1	163,5	178,7	198,9
	V_e	93,5	88,7	86,8	83,7	78,3	71,4
	Δp_e	68,1	61,4	58,7	54,6	47,8	39,7
6	**Q_e**	**560,9**	**532,6**	**520,8**	**502,3**	**470,0**	**428,5**
	P	138,9	151,2	156,5	165,0	180,2	200,4
	V_e	96,4	91,5	89,5	86,3	80,7	73,6
	Δp_e	72,4	65,3	62,4	58,1	50,9	42,3
7	**Q_e**	**577,8**	**548,7**	**536,5**	**517,5**	**484,3**	**441,6**
	P	140,2	152,5	157,9	166,3	181,6	201,9
	V_e	99,3	94,3	92,2	88,9	83,2	75,9
	Δp_e	76,9	69,3	66,3	61,7	54,0	44,9
10	**Q_e**	**628,3**	**596,9**	**583,6**	**563,1**	**527,0**	**480,7**
	P	143,8	156,3	161,7	170,3	185,7	206,2
	V_e	108,1	102,6	100,4	96,8	90,6	82,7
	Δp_e	91,1	82,2	78,6	73,1	64,1	53,3
12	**Q_e**	**661,9**	**628,9**	**615,0**	**593,4**	**555,5**	**506,8**
	P	146,1	158,7	164,2	172,8	188,3	208,9
	V_e	113,9	108,2	105,8	102,1	95,6	87,2
	Δp_e	101,2	91,4	87,4	81,4	71,3	59,3
15	**Q_e**	**712,1**	**676,7**	**661,9**	**638,8**	**598,2**	**546,0**
	P	149,2	162,1	167,6	176,3	192,0	212,6
	V_e	122,7	116,6	114,0	110,1	103,1	94,1
	Δp_e	117,4	106,0	101,4	94,5	82,9	69,0

GLAC 5201 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**579,2**	**549,9**	**537,6**	**518,4**	**484,9**	**441,8**
	P	148,9	160,3	165,6	174,2	190,4	213,0
	V_e	99,5	94,5	92,4	89,1	83,3	75,9
	Δp_e	47,5	42,8	40,9	38,1	33,3	27,7
6	**Q_e**	**596,3**	**566,1**	**553,5**	**533,8**	**499,3**	**455,1**
	P	150,0	161,6	166,9	175,6	192,0	214,8
	V_e	102,4	97,3	95,1	91,7	85,8	78,2
	Δp_e	50,4	45,4	43,4	40,4	35,3	29,3
7	**Q_e**	**613,3**	**582,3**	**569,3**	**549,2**	**513,8**	**468,5**
	P	151,1	162,8	168,2	177,0	193,6	216,6
	V_e	105,4	100,0	97,8	94,3	88,3	80,5
	Δp_e	53,3	48,0	45,9	42,7	37,4	31,1
10	**Q_e**	**664,0**	**630,7**	**616,7**	**595,1**	**557,1**	**508,4**
	P	154,1	166,3	171,9	180,9	198,0	221,6
	V_e	114,2	108,5	106,1	102,3	95,8	87,4
	Δp_e	62,6	56,5	54,0	50,3	44,1	36,7
12	**Q_e**	**697,6**	**662,8**	**648,2**	**625,5**	**585,8**	**534,9**
	P	155,9	168,4	174,1	183,3	200,6	224,6
	V_e	120,1	114,1	111,6	107,7	100,8	92,1
	Δp_e	69,2	62,5	59,7	55,6	48,8	40,7
15	**Q_e**	**747,8**	**710,6**	**695,1**	**670,9**	**628,6**	**574,5**
	P	158,4	171,3	177,1	186,6	204,3	228,7
	V_e	128,8	122,4	119,8	115,6	108,3	99,0
	Δp_e	79,7	72,0	68,8	64,1	56,3	47,0

GLAC 6211 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**622,9**	**591,3**	**578,1**	**557,5**	**521,5**	**475,3**
	P	158,2	171,2	177,0	186,3	203,6	227,2
	V_e	107,0	101,6	99,3	95,8	89,6	81,6
	Δp_e	55,0	49,5	47,3	44,0	38,5	32,0
6	**Q_e**	**641,6**	**609,2**	**595,6**	**574,5**	**537,4**	**489,9**
	P	159,5	172,6	178,5	187,9	205,3	229,0
	V_e	110,2	104,7	102,3	98,7	92,3	84,2
	Δp_e	58,3	52,6	50,3	46,8	40,9	34,0
7	**Q_e**	**660,4**	**627,1**	**613,1**	**591,4**	**553,3**	**504,5**
	P	160,8	174,0	179,9	189,4	206,9	230,9
	V_e	113,5	107,7	105,3	101,6	95,1	86,7
	Δp_e	61,8	55,7	53,3	49,5	43,4	36,1
10	**Q_e**	**716,5**	**680,5**	**665,4**	**642,0**	**600,9**	**548,2**
	P	164,4	178,0	184,0	193,7	211,6	236,0
	V_e	123,2	117,0	114,4	110,4	103,3	94,3
	Δp_e	72,9	65,7	62,9	58,5	51,3	42,7
12	**Q_e**	**753,6**	**716,0**	**700,2**	**675,6**	**632,6**	**577,3**
	P	166,7	180,4	186,6	196,4	214,5	239,1
	V_e	129,7	123,2	120,5	116,3	108,9	99,4
	Δp_e	80,8	72,9	69,7	64,9	56,9	47,4
15	**Q_e**	**809,2**	**769,0**	**752,1**	**725,9**	**679,9**	**621,0**
	P	169,8	183,8	190,1	200,1	218,5	243,4
	V_e	139,4	132,5	129,6	125,1	117,1	107,0
	Δp_e	93,3	84,3	80,6	75,1	65,9	55,0

GLAC 6231 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**666,3**	**632,8**	**618,8**	**597,0**	**558,7**	**509,5**
	P	171,6	184,9	190,9	200,8	219,3	245,1
	V_e	114,5	108,7	106,3	102,6	96,0	87,5
	Δp_e	53,7	48,5	46,3	43,1	37,8	31,4
6	**Q_e**	**686,0**	**651,7**	**637,3**	**614,9**	**575,5**	**525,1**
	P	172,9	186,3	192,4	202,4	221,1	247,1
	V_e	117,9	112,0	109,5	105,6	98,9	90,2
	Δp_e	57,0	51,4	49,1	45,7	40,1	33,4
7	**Q_e**	**705,8**	**670,5**	**655,7**	**632,7**	**592,4**	**540,6**
	P	174,1	187,7	193,9	204,0	222,9	249,1
	V_e	121,2	115,2	112,6	108,7	101,8	92,9
	Δp_e	60,3	54,4	52,0	48,4	42,5	35,4
10	**Q_e**	**764,7**	**726,8**	**710,8**	**686,1**	**642,7**	**587,0**
	P	177,6	191,7	198,1	208,4	227,8	254,6
	V_e	131,5	125,0	122,2	118,0	110,5	101,0
	Δp_e	70,9	64,1	61,3	57,1	50,1	41,8
12	**Q_e**	**803,9**	**764,1**	**747,4**	**721,6**	**676,2**	**617,9**
	P	179,8	194,1	200,6	211,2	230,9	258,0
	V_e	138,4	131,5	128,6	124,2	116,4	106,4
	Δp_e	78,5	70,9	67,8	63,2	55,5	46,4
15	**Q_e**	**862,3**	**819,9**	**802,1**	**774,5**	**726,1**	**664,2**
	P	182,7	197,4	204,1	214,9	234,9	262,5
	V_e	148,6	141,3	138,2	133,5	125,1	114,4
	Δp_e	90,5	81,8	78,3	73,0	64,2	53,7

T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAC 6241 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**693,2**	**658,1**	**643,4**	**620,6**	**580,4**	**528,9**
	P	178,5	192,3	198,6	208,9	228,3	255,4
	V_e	119,1	113,1	110,5	106,6	99,7	90,9
	Δp_e	58,1	52,4	50,1	46,6	40,8	33,9
6	Q_e	**713,5**	**677,5**	**662,4**	**638,9**	**597,8**	**544,9**
	P	179,9	193,8	200,2	210,6	230,3	257,6
	V_e	122,6	116,4	113,8	109,8	102,7	93,6
	Δp_e	61,6	55,5	53,1	49,4	43,2	35,9
7	Q_e	**733,8**	**696,9**	**681,4**	**657,3**	**615,1**	**560,9**
	P	181,2	195,3	201,7	212,3	232,1	259,8
	V_e	126,1	119,7	117,1	112,9	105,7	96,4
	Δp_e	65,2	58,8	56,2	52,3	45,8	38,1
10	Q_e	**794,4**	**754,7**	**738,0**	**712,1**	**666,8**	**608,6**
	P	184,7	199,4	206,1	217,0	237,4	265,8
	V_e	136,6	129,8	126,9	122,5	114,7	104,7
	Δp_e	76,5	69,1	66,0	61,5	53,9	44,9
12	Q_e	**834,5**	**793,0**	**775,5**	**748,5**	**701,1**	**640,3**
	P	186,9	201,9	208,7	219,8	240,6	269,4
	V_e	143,6	136,5	133,5	128,8	120,7	110,2
	Δp_e	84,6	76,4	73,0	68,0	59,7	49,8
15	Q_e	**894,5**	**850,1**	**831,5**	**802,7**	**752,3**	**687,7**
	P	189,9	205,4	212,3	223,7	244,9	274,2
	V_e	154,1	146,5	143,3	138,3	129,6	118,5
	Δp_e	97,4	88,0	84,2	78,4	68,9	57,6

GLAC 8241 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**736,2**	**699,4**	**684,0**	**660,1**	**618,1**	**564,2**
	P	187,5	203,6	210,6	221,7	241,7	268,3
	V_e	126,5	120,2	117,5	113,4	106,2	96,9
	Δp_e	59,2	53,4	51,1	47,6	41,7	34,8
6	Q_e	**759,2**	**721,3**	**705,4**	**680,8**	**637,5**	**582,0**
	P	189,2	205,4	212,4	223,5	243,6	270,3
	V_e	130,4	123,9	121,2	117,0	109,5	100,0
	Δp_e	62,9	56,8	54,3	50,6	44,4	37,0
7	Q_e	**782,1**	**743,2**	**726,9**	**701,5**	**657,0**	**599,8**
	P	190,9	207,1	214,2	225,3	245,5	272,2
	V_e	134,4	127,7	124,9	120,5	112,9	103,0
	Δp_e	66,8	60,3	57,7	53,7	47,1	39,3
10	Q_e	**850,8**	**808,7**	**791,0**	**763,6**	**715,3**	**653,3**
	P	195,6	212,1	219,2	230,5	250,8	277,8
	V_e	146,3	139,1	136,0	131,3	123,0	112,4
	Δp_e	79,2	71,6	68,5	63,8	56,0	46,7
12	Q_e	**896,4**	**852,3**	**833,7**	**804,9**	**754,2**	**689,1**
	P	198,5	215,2	222,4	233,7	254,2	281,3
	V_e	154,3	146,7	143,5	138,5	129,8	118,6
	Δp_e	88,1	79,6	76,2	71,0	62,3	52,0
15	Q_e	**964,7**	**917,5**	**897,6**	**866,8**	**812,5**	**742,8**
	P	202,7	219,5	226,8	238,3	258,9	286,1
	V_e	166,2	158,1	154,7	149,3	140,0	128,0
	Δp_e	102,2	92,5	88,5	82,5	72,5	60,6

GLAC 8261 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**777,4**	**738,6**	**722,3**	**696,9**	**652,5**	**595,5**
	P	199,7	216,3	223,6	235,2	256,6	285,5
	V_e	133,6	126,9	124,1	119,7	112,1	102,3
	Δp_e	66,0	59,6	57,0	53,0	46,5	38,7
6	Q_e	**801,3**	**761,3**	**744,5**	**718,5**	**672,7**	**614,0**
	P	201,4	218,1	225,4	237,2	258,7	287,7
	V_e	137,7	130,8	127,9	123,4	115,6	105,5
	Δp_e	70,1	63,3	60,5	56,4	49,4	41,2
7	Q_e	**825,1**	**784,0**	**766,8**	**740,0**	**693,0**	**632,6**
	P	203,1	219,8	227,2	239,0	260,7	289,9
	V_e	141,8	134,7	131,7	127,1	119,0	108,7
	Δp_e	74,3	67,1	64,2	59,8	52,4	43,7
10	Q_e	**896,4**	**852,0**	**833,4**	**804,4**	**753,6**	**688,3**
	P	207,7	224,9	232,4	244,4	266,4	295,9
	V_e	154,2	146,5	143,3	138,3	129,6	118,4
	Δp_e	87,9	79,4	76,0	70,8	62,1	51,8
12	Q_e	**943,8**	**897,2**	**877,7**	**847,3**	**794,0**	**725,5**
	P	210,6	228,0	235,6	247,7	269,9	299,7
	V_e	162,4	154,4	151,1	145,8	136,7	124,9
	Δp_e	97,6	88,2	84,4	78,7	69,1	57,7
15	Q_e	**1014,6**	**964,8**	**943,9**	**911,5**	**854,5**	**781,3**
	P	214,6	232,3	240,0	252,3	274,8	304,8
	V_e	174,8	166,2	162,6	157,1	147,2	134,6
	Δp_e	113,1	102,3	97,9	91,3	80,2	67,1

GLAC 8281 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**823,7**	**783,0**	**765,9**	**739,3**	**692,7**	**632,8**
	P	210,3	226,9	234,4	246,5	269,0	299,8
	V_e	141,5	134,5	131,6	127,0	119,0	108,7
	Δp_e	50,1	45,2	43,3	40,3	35,4	29,5
6	Q_e	**848,7**	**806,9**	**789,3**	**762,0**	**714,0**	**652,4**
	P	211,9	228,7	236,3	248,5	271,1	302,1
	V_e	145,8	138,6	135,6	130,9	122,7	112,1
	Δp_e	53,2	48,0	46,0	42,8	37,6	31,4
7	Q_e	**873,7**	**830,7**	**812,7**	**784,6**	**735,4**	**672,1**
	P	213,5	230,5	238,1	250,4	273,2	304,4
	V_e	150,1	142,7	139,6	134,8	126,3	115,5
	Δp_e	56,3	50,9	48,7	45,4	39,9	33,3
10	Q_e	**948,5**	**902,2**	**882,7**	**852,4**	**799,3**	**731,1**
	P	218,0	235,4	243,2	255,7	279,0	310,7
	V_e	163,1	155,2	151,8	146,6	137,5	125,7
	Δp_e	66,5	60,2	57,6	53,7	47,2	39,5
12	Q_e	**998,2**	**949,7**	**929,3**	**897,6**	**841,9**	**770,4**
	P	220,7	238,4	246,3	259,0	282,5	314,6
	V_e	171,8	163,4	159,9	154,5	144,9	132,6
	Δp_e	73,8	66,8	63,9	59,7	52,5	44,0
15	Q_e	**1072,6**	**1020,7**	**998,9**	**965,1**	**905,7**	**829,4**
	P	224,4	242,5	250,6	263,5	287,4	319,9
	V_e	184,8	175,9	172,1	166,3	156,1	142,9
	Δp_e	85,4	77,3	74,1	69,1	60,9	51,1

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

Performance Data – HE Unit
GLAC 8301-8321 CD2.HE – Cooling

GLAC 8301 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**873,9**	**830,3**	**811,9**	**783,4**	**733,4**	**669,2**
	P	224,1	241,5	249,4	262,3	286,5	319,9
	V_e	150,1	142,6	139,5	134,6	126,0	115,0
	Δp_e	56,4	50,9	48,6	45,3	39,7	33,0
6	**Q_e**	**900,0**	**855,2**	**836,3**	**807,0**	**755,6**	**689,7**
	P	225,8	243,4	251,4	264,4	288,8	322,5
	V_e	154,6	146,9	143,7	138,6	129,8	118,5
	Δp_e	59,8	54,0	51,6	48,1	42,1	35,1
7	**Q_e**	**926,1**	**880,0**	**860,6**	**830,6**	**777,8**	**710,1**
	P	227,5	245,3	253,4	266,5	291,1	325,1
	V_e	159,1	151,2	147,9	142,7	133,6	122,0
	Δp_e	63,3	57,1	54,7	50,9	44,6	37,2
10	**Q_e**	**1003,9**	**954,3**	**933,4**	**901,1**	**844,3**	**771,4**
	P	232,1	250,5	258,8	272,3	297,5	332,2
	V_e	172,6	164,1	160,5	155,0	145,2	132,7
	Δp_e	74,5	67,3	64,4	60,0	52,7	44,0
12	**Q_e**	**1055,5**	**1003,6**	**981,7**	**947,9**	**888,5**	**812,3**
	P	234,9	253,6	262,1	275,8	301,4	336,5
	V_e	181,7	172,7	169,0	163,1	152,9	139,8
	Δp_e	82,5	74,6	71,4	66,5	58,5	48,9
15	**Q_e**	**1132,7**	**1077,2**	**1054,0**	**1017,9**	**954,5**	**873,4**
	P	238,7	258,0	266,6	280,6	306,6	342,3
	V_e	195,2	185,6	181,6	175,4	164,5	150,5
	Δp_e	95,2	86,1	82,4	76,9	67,6	56,6

GLAC 8321 CD2.HE							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**933,0**	**885,8**	**866,0**	**835,3**	**781,2**	**711,9**
	P	238,1	256,4	264,8	278,5	304,4	340,6
	V_e	160,3	152,2	148,8	143,5	134,2	122,3
	Δp_e	64,2	57,9	55,3	51,5	45,0	37,4
6	**Q_e**	**960,4**	**911,9**	**891,6**	**860,0**	**804,6**	**733,4**
	P	239,8	258,4	266,9	280,8	307,0	343,5
	V_e	165,0	156,7	153,2	147,7	138,2	126,0
	Δp_e	68,1	61,4	58,7	54,6	47,8	39,7
7	**Q_e**	**987,7**	**938,0**	**917,1**	**884,7**	**827,9**	**754,9**
	P	241,5	260,4	269,0	283,0	309,5	346,4
	V_e	169,7	161,1	157,6	152,0	142,2	129,7
	Δp_e	72,0	64,9	62,1	57,8	50,6	42,1
10	**Q_e**	**1069,2**	**1015,8**	**993,3**	**958,5**	**897,4**	**819,1**
	P	246,3	265,9	274,8	289,3	316,5	354,4
	V_e	183,9	174,7	170,8	164,8	154,3	140,9
	Δp_e	84,5	76,3	73,0	67,9	59,5	49,6
12	**Q_e**	**1123,3**	**1067,3**	**1043,9**	**1007,5**	**943,6**	**861,8**
	P	249,3	269,2	278,3	293,1	320,8	359,2
	V_e	193,3	183,7	179,7	173,4	162,4	148,3
	Δp_e	93,4	84,4	80,7	75,2	65,9	55,0
15	**Q_e**	**1204,0**	**1144,3**	**1119,3**	**1080,5**	**1012,6**	**925,6**
	P	253,2	273,8	283,1	298,3	326,6	365,6
	V_e	207,4	197,2	192,9	186,2	174,5	159,5
	Δp_e	107,6	97,2	93,0	86,6	76,1	63,6

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 4131 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**361,6**	**341,7**	**333,3**	**320,4**	**297,8**	**288,4**
	P	104,0	113,4	117,5	123,9	135,7	140,7
	V_e	62,1	58,7	57,3	55,0	51,2	49,5
	Δp_e	56,0	50,0	47,5	43,9	37,9	35,6
6	Q_e	**372,3**	**351,8**	**343,2**	**329,9**	**306,6**	**296,9**
	P	105,1	114,6	118,7	125,2	137,0	142,0
	V_e	64,0	60,4	59,0	56,7	52,7	51,0
	Δp_e	59,3	53,0	50,4	46,6	40,2	37,7
7	Q_e	**383,0**	**361,9**	**353,1**	**339,4**	**315,4**	**305,5**
	P	106,2	115,7	119,8	126,4	138,3	143,4
	V_e	65,8	62,2	60,7	58,3	54,2	52,5
	Δp_e	62,8	56,1	53,4	49,3	42,6	39,9
10	Q_e	**414,9**	**392,1**	**382,5**	**367,7**	**341,7**	**330,9**
	P	109,3	119,0	123,2	129,9	142,0	147,1
	V_e	71,4	67,4	65,8	63,2	58,8	56,9
	Δp_e	73,8	65,9	62,7	58,0	50,1	47,0
12	Q_e	**436,0**	**411,9**	**401,9**	**386,3**	**359,1**	**347,8**
	P	111,2	121,1	125,4	132,1	144,3	149,5
	V_e	75,0	70,9	69,2	66,5	61,8	59,9
	Δp_e	81,6	72,9	69,4	64,1	55,4	51,9
15	Q_e	**467,2**	**441,5**	**430,7**	**414,1**	**384,9**	**372,8**
	P	114,0	124,1	128,4	135,3	147,6	152,9
	V_e	80,5	76,1	74,2	71,3	66,3	64,2
	Δp_e	94,0	83,9	79,9	73,8	63,8	59,8

GLAH 4141 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**386,4**	**365,5**	**356,7**	**343,2**	**319,4**	**309,5**
	P	108,9	118,5	122,7	129,5	141,9	147,3
	V_e	66,4	62,8	61,3	59,0	54,9	53,2
	Δp_e	48,9	43,8	41,7	38,6	33,4	31,4
6	Q_e	**397,8**	**376,3**	**367,3**	**353,3**	**328,8**	**318,7**
	P	110,0	119,7	123,9	130,8	143,3	148,7
	V_e	68,3	64,6	63,1	60,7	56,5	54,7
	Δp_e	51,8	46,4	44,2	40,9	35,4	33,3
7	Q_e	**409,1**	**387,0**	**377,7**	**363,4**	**338,3**	**327,8**
	P	111,0	120,8	125,1	132,0	144,6	150,1
	V_e	70,3	66,5	64,9	62,4	58,1	56,3
	Δp_e	54,8	49,1	46,7	43,3	37,5	35,2
10	Q_e	**442,9**	**419,0**	**409,0**	**393,5**	**366,4**	**355,1**
	P	114,0	124,1	128,5	135,5	148,4	154,0
	V_e	76,2	72,1	70,3	67,7	63,0	61,1
	Δp_e	64,4	57,6	54,9	50,8	44,1	41,4
12	Q_e	**465,2**	**440,1**	**429,6**	**413,4**	**385,0**	**373,1**
	P	115,9	126,1	130,6	137,8	150,8	156,4
	V_e	80,1	75,8	73,9	71,1	66,3	64,2
	Δp_e	71,1	63,7	60,7	56,2	48,7	45,8
15	Q_e	**498,3**	**471,5**	**460,3**	**443,0**	**412,6**	**400,0**
	P	118,5	129,0	133,6	140,9	154,2	159,9
	V_e	85,9	81,3	79,3	76,3	71,1	68,9
	Δp_e	81,8	73,3	69,8	64,7	56,1	52,7

GLAH 4161 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**424,2**	**400,4**	**390,5**	**375,0**	**348,1**	**336,9**
	P	124,6	135,6	140,5	148,4	163,0	169,4
	V_e	72,9	68,8	67,1	64,4	59,8	57,9
	Δp_e	59,0	52,5	49,9	46,1	39,7	37,2
6	Q_e	**436,2**	**411,8**	**401,6**	**385,7**	**358,1**	**346,5**
	P	125,8	137,0	141,9	149,9	164,8	171,2
	V_e	74,9	70,7	69,0	66,3	61,5	59,5
	Δp_e	62,3	55,6	52,8	48,7	42,0	39,3
7	Q_e	**448,2**	**423,1**	**412,6**	**396,4**	**368,0**	**356,2**
	P	127,0	138,3	143,3	151,4	166,4	173,0
	V_e	77,0	72,7	70,9	68,1	63,2	61,2
	Δp_e	65,8	58,7	55,8	51,5	44,4	41,6
10	Q_e	**483,8**	**456,7**	**445,4**	**428,0**	**397,4**	**384,7**
	P	130,5	142,2	147,4	155,8	171,3	178,0
	V_e	83,2	78,6	76,6	73,6	68,4	66,2
	Δp_e	76,8	68,5	65,1	60,1	51,9	48,6
12	Q_e	**507,2**	**478,9**	**467,1**	**448,8**	**416,9**	**403,6**
	P	132,6	144,6	150,0	158,5	174,3	181,1
	V_e	87,3	82,4	80,4	77,2	71,7	69,5
	Δp_e	84,6	75,4	71,7	66,2	57,1	53,6
15	Q_e	**541,9**	**511,7**	**499,1**	**479,6**	**445,6**	**-**
	P	135,7	148,1	153,6	162,3	178,4	-
	V_e	93,4	88,2	86,0	82,6	76,8	-
	Δp_e	96,8	86,3	82,1	75,8	65,4	-

GLAH 6171 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	Q_e	**464,5**	**438,4**	**427,5**	**410,6**	**380,9**	**368,6**
	P	134,8	147,4	152,9	161,4	176,6	183,1
	V_e	79,8	75,3	73,4	70,5	65,4	63,3
	Δp_e	40,1	35,7	34,0	31,3	27,0	25,3
6	Q_e	**478,3**	**451,5**	**440,2**	**422,8**	**392,2**	**379,5**
	P	136,4	149,0	154,5	163,0	178,3	184,8
	V_e	82,2	77,6	75,6	72,6	67,4	65,2
	Δp_e	42,5	37,9	36,0	33,2	28,6	26,8
7	Q_e	**492,1**	**464,5**	**452,9**	**434,9**	**403,4**	**390,3**
	P	137,9	150,6	156,1	164,6	179,9	186,4
	V_e	84,5	79,8	77,8	74,7	69,3	67,1
	Δp_e	45,0	40,1	38,1	35,2	30,3	28,3
10	Q_e	**533,2**	**503,2**	**490,6**	**471,1**	**436,8**	**422,5**
	P	142,2	155,1	160,6	169,3	184,6	191,1
	V_e	91,7	86,5	84,4	81,0	75,1	72,7
	Δp_e	53,0	47,2	44,8	41,3	35,6	33,3
12	Q_e	**560,3**	**528,7**	**515,4**	**494,9**	**458,8**	**443,8**
	P	145,0	158,0	163,5	172,2	187,6	194,1
	V_e	96,4	91,0	88,7	85,2	79,0	76,4
	Δp_e	58,6	52,2	49,6	45,7	39,3	36,8
15	Q_e	**600,4**	**566,5**	**552,3**	**530,2**	**491,5**	**475,3**
	P	149,0	162,1	167,7	176,3	191,7	198,1
	V_e	103,5	97,6	95,2	91,4	84,7	81,9
	Δp_e	67,4	60,0	57,1	52,6	45,2	42,3

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 6181 CD2							
T_{eo}	T_a	25	30	32	35	40	42
5	**Q_e**	**508,1**	**480,3**	**468,7**	**450,6**	**419,1**	**405,9**
	P	146,2	159,6	165,3	174,4	190,6	197,5
	V_e	87,3	82,5	80,5	77,4	72,0	69,7
	Δp_e	48,0	42,9	40,8	37,8	32,7	30,6
6	**Q_e**	**523,5**	**494,8**	**482,8**	**464,2**	**431,7**	**418,1**
	P	147,8	161,2	167,0	176,1	192,4	199,3
	V_e	89,9	85,0	82,9	79,8	74,2	71,8
	Δp_e	51,0	45,5	43,3	40,1	34,7	32,5
7	**Q_e**	**538,8**	**509,3**	**496,9**	**477,8**	**444,3**	**430,3**
	P	149,3	162,8	168,7	177,8	194,1	201,1
	V_e	92,6	87,5	85,4	82,1	76,3	73,9
	Δp_e	54,0	48,2	45,9	42,4	36,7	34,4
10	**Q_e**	**584,3**	**552,3**	**538,9**	**518,1**	**481,8**	**466,6**
	P	153,9	167,6	173,5	182,7	199,2	206,2
	V_e	100,5	95,0	92,7	89,1	82,9	80,2
	Δp_e	63,6	56,8	54,1	50,0	43,2	40,6
12	**Q_e**	**614,4**	**580,7**	**566,6**	**544,8**	**506,6**	**490,6**
	P	156,7	170,6	176,5	185,8	202,5	209,5
	V_e	105,7	100,0	97,5	93,8	87,2	84,4
	Δp_e	70,4	62,9	59,9	55,4	47,9	44,9
15	**Q_e**	**659,1**	**623,0**	**607,9**	**584,5**	**543,5**	**526,4**
	P	160,9	174,9	180,9	190,3	207,1	214,2
	V_e	113,6	107,3	104,7	100,7	93,7	90,7
	Δp_e	81,2	72,6	69,1	63,9	55,3	51,8

T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 4131 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**369,9**	**351,3**	**343,4**	**331,3**	**310,0**	**282,8**
	P	101,2	109,6	113,3	119,2	130,1	144,7
	V_e	63,5	60,3	59,0	56,9	53,3	48,6
	Δp_e	58,5	52,8	50,5	47,0	41,1	34,2
6	Q_e	**381,2**	**362,1**	**354,0**	**341,5**	**319,6**	**291,5**
	P	102,0	110,5	114,2	120,2	131,1	145,9
	V_e	65,5	62,2	60,8	58,7	54,9	50,1
	Δp_e	62,2	56,1	53,6	49,9	43,7	36,4
7	Q_e	**392,5**	**372,9**	**364,6**	**351,8**	**329,2**	**300,3**
	P	102,9	111,4	115,2	121,2	132,2	147,0
	V_e	67,4	64,1	62,6	60,4	56,6	51,6
	Δp_e	65,9	59,5	56,9	53,0	46,4	38,6
10	Q_e	**426,4**	**405,1**	**396,2**	**382,3**	**358,0**	**326,7**
	P	105,3	114,0	117,8	123,9	135,1	150,1
	V_e	73,3	69,7	68,1	65,8	61,6	56,2
	Δp_e	78,0	70,4	67,3	62,7	55,0	45,8
12	Q_e	**448,9**	**426,6**	**417,2**	**402,7**	**377,1**	**344,3**
	P	106,8	115,6	119,5	125,7	136,9	152,0
	V_e	77,3	73,4	71,8	69,3	64,9	59,3
	Δp_e	86,5	78,2	74,8	69,6	61,1	50,9
15	Q_e	**482,5**	**458,7**	**448,6**	**433,1**	**405,8**	**370,7**
	P	108,9	117,9	121,8	128,1	139,4	154,7
	V_e	83,1	79,0	77,3	74,6	69,9	63,9
	Δp_e	100,2	90,6	86,6	80,7	70,9	59,2

GLAH 4141 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**390,5**	**371,1**	**363,0**	**350,4**	**328,2**	**299,8**
	P	107,2	115,7	119,6	125,8	137,3	153,1
	V_e	67,1	63,8	62,4	60,2	56,4	51,5
	Δp_e	50,0	45,1	43,2	40,2	35,3	29,4
6	Q_e	**402,3**	**382,4**	**374,1**	**361,1**	**338,3**	**309,1**
	P	108,0	116,7	120,5	126,8	138,4	154,3
	V_e	69,1	65,7	64,3	62,0	58,1	53,1
	Δp_e	53,0	47,9	45,8	42,7	37,5	31,3
7	Q_e	**414,1**	**393,7**	**385,1**	**371,8**	**348,4**	**318,3**
	P	108,9	117,6	121,5	127,8	139,4	155,4
	V_e	71,1	67,6	66,2	63,9	59,9	54,7
	Δp_e	56,2	50,8	48,6	45,3	39,8	33,2
10	Q_e	**449,5**	**427,5**	**418,2**	**403,8**	**378,6**	**346,2**
	P	111,2	120,1	124,1	130,5	142,4	158,7
	V_e	77,3	73,5	71,9	69,5	65,1	59,5
	Δp_e	66,3	60,0	57,4	53,5	47,1	39,3
12	Q_e	**472,9**	**449,9**	**440,2**	**425,1**	**398,7**	**364,8**
	P	112,6	121,7	125,7	132,2	144,3	160,7
	V_e	81,4	77,4	75,8	73,2	68,6	62,8
	Δp_e	73,5	66,5	63,7	59,4	52,3	43,7
15	Q_e	**508,0**	**483,4**	**473,1**	**457,0**	**428,8**	**392,6**
	P	114,5	123,8	127,9	134,5	146,8	163,4
	V_e	87,5	83,3	81,5	78,7	73,9	67,6
	Δp_e	85,1	77,0	73,7	68,8	60,6	50,8

GLAH 4161 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**439,8**	**417,5**	**408,1**	**393,5**	**367,9**	**335,1**
	P	120,5	129,8	134,1	141,0	154,2	172,5
	V_e	75,6	71,7	70,1	67,6	63,2	57,6
	Δp_e	63,4	57,1	54,6	50,7	44,4	36,8
6	Q_e	**452,7**	**429,7**	**420,1**	**405,2**	**378,9**	**345,2**
	P	121,4	130,8	135,2	142,2	155,5	174,1
	V_e	77,8	73,8	72,2	69,6	65,1	59,3
	Δp_e	67,1	60,5	57,8	53,8	47,0	39,0
7	Q_e	**465,5**	**442,0**	**432,1**	**416,8**	**389,9**	**355,3**
	P	122,2	131,8	136,2	143,4	156,8	175,5
	V_e	80,0	75,9	74,2	71,6	67,0	61,0
	Δp_e	71,0	64,0	61,2	56,9	49,8	41,4
10	Q_e	**503,9**	**478,6**	**468,0**	**451,5**	**422,6**	**385,5**
	P	124,7	134,7	139,2	146,6	160,4	179,6
	V_e	86,7	82,3	80,5	77,6	72,7	66,3
	Δp_e	83,4	75,2	71,9	66,9	58,6	48,8
12	Q_e	**529,4**	**502,9**	**491,7**	**474,5**	**444,3**	**405,5**
	P	126,2	136,4	141,0	148,5	162,6	182,1
	V_e	91,1	86,5	84,6	81,7	76,5	69,8
	Δp_e	92,1	83,1	79,5	74,0	64,9	54,1
15	Q_e	**567,3**	**539,0**	**527,2**	**508,8**	**476,6**	**435,5**
	P	128,3	138,8	143,5	151,2	165,6	185,4
	V_e	97,8	92,9	90,8	87,7	82,1	75,0
	Δp_e	106,1	95,8	91,6	85,3	74,9	62,5

GLAH 6171 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**475,8**	**452,1**	**442,1**	**426,6**	**399,3**	**364,2**
	P	129,0	140,3	145,2	152,9	167,0	185,7
	V_e	81,7	77,7	76,0	73,3	68,6	62,6
	Δp_e	42,1	38,0	36,3	33,8	29,7	24,7
6	Q_e	**490,6**	**466,2**	**455,9**	**439,9**	**411,8**	**375,6**
	P	130,2	141,5	146,4	154,2	168,3	187,1
	V_e	84,3	80,1	78,3	75,6	70,7	64,5
	Δp_e	44,8	40,4	38,6	36,0	31,5	26,2
7	Q_e	**505,4**	**480,3**	**469,7**	**453,2**	**424,3**	**387,0**
	P	131,4	142,7	147,7	155,5	169,6	188,4
	V_e	86,8	82,5	80,7	77,9	72,9	66,5
	Δp_e	47,5	42,9	41,0	38,2	33,5	27,9
10	Q_e	**549,6**	**522,4**	**510,9**	**493,1**	**461,7**	**421,3**
	P	134,7	146,2	151,2	159,1	173,3	192,1
	V_e	94,5	89,8	87,9	84,8	79,4	72,5
	Δp_e	56,3	50,8	48,6	45,3	39,7	33,1
12	Q_e	**578,9**	**550,4**	**538,4**	**519,7**	**486,7**	**444,2**
	P	136,7	148,4	153,4	161,3	175,5	194,3
	V_e	99,6	94,7	92,7	89,4	83,8	76,4
	Δp_e	62,5	56,5	54,1	50,4	44,2	36,8
15	Q_e	**622,8**	**592,3**	**579,5**	**559,4**	**524,1**	**478,5**
	P	139,7	151,4	156,4	164,4	178,6	197,3
	V_e	107,3	102,1	99,8	96,4	90,3	82,4
	Δp_e	72,5	65,6	62,8	58,5	51,4	42,8

T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 6181 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**529,6**	**503,1**	**491,9**	**474,7**	**444,3**	**405,5**
	P	143,5	155,9	161,3	169,8	185,2	205,6
	V_e	91,0	86,4	84,5	81,5	76,3	69,7
	Δp_e	52,2	47,1	45,0	41,9	36,7	30,6
6	**Q_e**	**546,1**	**518,8**	**507,3**	**489,5**	**458,3**	**418,2**
	P	144,8	157,3	162,7	171,2	186,6	207,1
	V_e	93,8	89,1	87,2	84,1	78,7	71,8
	Δp_e	55,5	50,0	47,9	44,6	39,1	32,5
7	**Q_e**	**562,6**	**534,5**	**522,7**	**504,4**	**472,2**	**431,0**
	P	146,1	158,6	164,0	172,6	188,1	208,6
	V_e	96,7	91,8	89,8	86,7	81,1	74,0
	Δp_e	58,8	53,1	50,8	47,3	41,5	34,5
10	**Q_e**	**611,8**	**581,5**	**568,7**	**548,9**	**514,0**	**469,3**
	P	149,8	162,4	167,9	176,6	192,2	212,9
	V_e	105,2	100,0	97,8	94,4	88,4	80,7
	Δp_e	69,8	63,0	60,3	56,1	49,2	41,0
12	**Q_e**	**644,6**	**612,7**	**599,3**	**578,5**	**541,9**	**494,8**
	P	152,0	164,8	170,4	179,1	194,8	215,6
	V_e	110,9	105,5	103,1	99,6	93,3	85,2
	Δp_e	77,5	70,1	67,0	62,4	54,8	45,7
15	**Q_e**	**693,5**	**659,4**	**645,1**	**622,8**	**583,6**	**533,3**
	P	155,2	168,2	173,8	182,6	198,5	219,4
	V_e	119,5	113,6	111,2	107,3	100,6	91,9
	Δp_e	90,0	81,3	77,8	72,5	63,7	53,2

GLAH 6201 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**564,3**	**536,4**	**524,6**	**506,4**	**474,4**	**433,3**
	P	154,7	167,2	172,8	181,8	198,4	220,9
	V_e	97,0	92,1	90,1	87,0	81,5	74,4
	Δp_e	45,1	40,8	39,0	36,3	31,9	26,6
6	**Q_e**	**581,6**	**552,9**	**540,8**	**522,0**	**489,1**	**446,8**
	P	155,9	168,6	174,2	183,3	199,9	222,6
	V_e	99,9	95,0	92,9	89,7	84,0	76,8
	Δp_e	47,9	43,3	41,4	38,6	33,9	28,3
7	**Q_e**	**598,9**	**569,3**	**556,9**	**537,6**	**503,8**	**460,4**
	P	157,1	169,9	175,6	184,7	201,5	224,2
	V_e	102,9	97,8	95,7	92,4	86,6	79,1
	Δp_e	50,8	45,9	43,9	41,0	36,0	30,0
10	**Q_e**	**650,6**	**618,7**	**605,3**	**584,5**	**547,9**	**501,0**
	P	160,6	173,7	179,5	188,8	205,8	228,9
	V_e	111,9	106,4	104,1	100,5	94,2	86,2
	Δp_e	60,1	54,3	52,0	48,5	42,6	35,6
12	**Q_e**	**684,9**	**651,5**	**637,4**	**615,6**	**577,3**	**528,1**
	P	162,8	176,0	181,9	191,3	208,5	231,7
	V_e	117,9	112,1	109,7	106,0	99,4	90,9
	Δp_e	66,7	60,3	57,8	53,9	47,4	39,7
15	**Q_e**	**736,3**	**700,6**	**685,6**	**662,3**	**621,3**	**568,8**
	P	165,7	179,3	185,2	194,7	212,2	235,7
	V_e	126,9	120,7	118,1	114,1	107,1	98,0
	Δp_e	77,2	69,9	67,0	62,5	55,0	46,1

GLAH 6211 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**587,1**	**558,0**	**545,7**	**526,7**	**493,4**	**450,5**
	P	160,9	173,7	179,5	188,8	206,0	229,7
	V_e	100,9	95,9	93,8	90,5	84,8	77,4
	Δp_e	48,8	44,1	42,2	39,3	34,5	28,8
6	**Q_e**	**604,9**	**575,0**	**562,4**	**542,9**	**508,5**	**464,5**
	P	162,1	175,1	180,9	190,3	207,7	231,5
	V_e	103,9	98,8	96,6	93,3	87,4	79,8
	Δp_e	51,8	46,8	44,8	41,7	36,6	30,6
7	**Q_e**	**622,7**	**592,0**	**579,0**	**559,0**	**523,7**	**478,5**
	P	163,4	176,4	182,3	191,7	209,3	233,3
	V_e	107,0	101,7	99,5	96,0	90,0	82,2
	Δp_e	54,9	49,6	47,5	44,3	38,9	32,4
10	**Q_e**	**676,0**	**642,8**	**628,8**	**607,2**	**569,2**	**520,4**
	P	166,8	180,3	186,2	195,9	213,8	238,2
	V_e	116,2	110,5	108,1	104,4	97,9	89,5
	Δp_e	64,9	58,7	56,1	52,3	46,0	38,4
12	**Q_e**	**711,3**	**676,5**	**661,9**	**639,3**	**599,4**	**548,3**
	P	169,0	182,6	188,7	198,5	216,5	241,2
	V_e	122,4	116,4	113,9	110,0	103,2	94,4
	Δp_e	71,9	65,1	62,3	58,1	51,1	42,7
15	**Q_e**	**764,2**	**727,1**	**711,5**	**687,2**	**644,8**	**590,2**
	P	171,9	185,8	192,0	202,0	220,3	245,3
	V_e	131,7	125,3	122,6	118,4	111,1	101,7
	Δp_e	83,2	75,3	72,1	67,3	59,2	49,6

GLAH 6241 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**659,3**	**625,8**	**611,8**	**589,9**	**551,6**	**502,5**
	P	180,7	194,7	201,1	211,5	231,3	258,8
	V_e	113,3	107,5	105,1	101,4	94,8	86,3
	Δp_e	52,6	47,4	45,3	42,1	36,8	30,6
6	**Q_e**	**678,6**	**644,2**	**629,8**	**607,4**	**568,1**	**517,6**
	P	182,0	196,2	202,7	213,3	233,3	261,1
	V_e	116,6	110,7	108,2	104,3	97,6	88,9
	Δp_e	55,7	50,2	48,0	44,6	39,1	32,4
7	**Q_e**	**697,9**	**662,6**	**647,8**	**624,8**	**584,5**	**532,7**
	P	183,3	197,7	204,3	215,0	235,2	263,3
	V_e	119,9	113,8	111,3	107,3	100,4	91,5
	Δp_e	58,9	53,1	50,8	47,2	41,3	34,3
10	**Q_e**	**755,4**	**717,5**	**701,5**	**676,8**	**633,5**	**577,9**
	P	187,0	202,0	208,8	219,8	240,6	269,4
	V_e	129,9	123,4	120,6	116,4	108,9	99,4
	Δp_e	69,2	62,4	59,7	55,5	48,7	40,5
12	**Q_e**	**793,5**	**753,8**	**737,1**	**711,3**	**666,0**	**608,0**
	P	189,3	204,6	211,5	222,8	243,9	273,1
	V_e	136,6	129,7	126,9	122,4	114,6	104,6
	Δp_e	76,5	69,0	66,0	61,4	53,9	44,9
15	**Q_e**	**850,4**	**808,0**	**790,3**	**762,7**	**714,5**	**652,8**
	P	192,4	208,1	215,2	226,8	248,3	278,1
	V_e	146,5	139,2	136,2	131,4	123,1	112,5
	Δp_e	88,0	79,5	76,0	70,8	62,1	51,9

T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 8241 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**700,1**	**665,0**	**650,3**	**627,4**	**587,3**	**535,9**
	P	189,8	206,2	213,3	224,5	244,8	271,8
	V_e	120,3	114,2	111,7	107,8	100,9	92,1
	Δp_e	53,5	48,3	46,2	43,0	37,7	31,4
6	Q_e	**722,0**	**685,8**	**670,6**	**647,1**	**605,7**	**552,7**
	P	191,6	208,0	215,1	226,4	246,7	273,8
	V_e	124,0	117,8	115,2	111,2	104,1	95,0
	Δp_e	56,9	51,4	49,1	45,7	40,1	33,4
7	Q_e	**743,7**	**706,6**	**690,9**	**666,7**	**624,2**	**569,6**
	P	193,3	209,8	216,9	228,2	248,7	275,8
	V_e	127,8	121,4	118,7	114,5	107,2	97,9
	Δp_e	60,4	54,5	52,1	48,5	42,5	35,4
10	Q_e	**808,9**	**768,7**	**751,8**	**725,6**	**679,5**	**620,2**
	P	198,1	214,8	222,1	233,5	254,1	281,5
	V_e	139,1	132,2	129,3	124,8	116,8	106,7
	Δp_e	71,6	64,7	61,8	57,6	50,5	42,1
12	Q_e	**852,2**	**810,0**	**792,3**	**764,7**	**716,3**	**654,1**
	P	201,1	218,0	225,3	236,8	257,6	285,0
	V_e	146,7	139,4	136,4	131,6	123,3	112,6
	Δp_e	79,6	71,9	68,8	64,1	56,2	46,9
15	Q_e	**917,0**	**871,9**	**852,9**	**823,4**	**771,5**	**704,9**
	P	205,4	222,5	229,9	241,5	262,4	290,0
	V_e	158,0	150,2	147,0	141,9	132,9	121,5
	Δp_e	92,4	83,5	79,9	74,5	65,4	54,6

GLAH 8261 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**746,1**	**708,6**	**692,8**	**668,4**	**625,5**	**570,5**
	P	202,3	219,1	226,5	238,4	260,1	289,4
	V_e	128,2	121,7	119,0	114,8	107,5	98,0
	Δp_e	60,8	54,8	52,4	48,8	42,7	35,5
6	Q_e	**769,0**	**730,4**	**714,2**	**689,0**	**644,9**	**588,2**
	P	204,0	221,0	228,4	240,4	262,2	291,7
	V_e	132,1	125,5	122,7	118,4	110,8	101,1
	Δp_e	64,6	58,3	55,7	51,8	45,4	37,8
7	Q_e	**791,8**	**752,1**	**735,5**	**709,6**	**664,2**	**606,0**
	P	205,7	222,8	230,3	242,3	264,3	293,9
	V_e	136,0	129,2	126,3	121,9	114,1	104,1
	Δp_e	68,5	61,8	59,1	55,0	48,2	40,1
10	Q_e	**860,0**	**817,2**	**799,2**	**771,2**	**722,2**	**659,2**
	P	210,5	227,9	235,6	247,8	270,1	300,1
	V_e	147,9	140,5	137,4	132,6	124,2	113,4
	Δp_e	80,9	73,1	69,9	65,1	57,1	47,6
12	Q_e	**905,4**	**860,4**	**841,5**	**812,2**	**760,8**	**694,7**
	P	213,5	231,1	238,9	251,2	273,7	304,0
	V_e	155,8	148,1	144,8	139,8	130,9	119,6
	Δp_e	89,8	81,1	77,6	72,3	63,4	52,9
15	Q_e	**973,1**	**925,1**	**904,9**	**873,6**	**818,5**	**747,9**
	P	217,6	235,6	243,5	256,0	278,8	309,3
	V_e	167,7	159,4	155,9	150,5	141,0	128,9
	Δp_e	104,0	94,0	89,9	83,8	73,6	61,4

GLAH 8281 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**783,0**	**744,1**	**727,8**	**702,4**	**657,9**	**600,8**
	P	214,5	231,6	239,3	251,7	274,7	306,3
	V_e	134,5	127,8	125,0	120,7	113,0	103,2
	Δp_e	45,2	40,9	39,1	36,4	31,9	26,6
6	Q_e	**806,7**	**766,8**	**750,0**	**723,9**	**678,2**	**619,4**
	P	216,2	233,5	241,2	253,7	276,9	308,7
	V_e	138,6	131,7	128,8	124,4	116,5	106,4
	Δp_e	48,0	43,4	41,5	38,7	33,9	28,3
7	Q_e	**830,4**	**789,4**	**772,2**	**745,4**	**698,4**	**638,0**
	P	217,8	235,3	243,1	255,7	279,0	311,0
	V_e	142,7	135,6	132,7	128,1	120,0	109,6
	Δp_e	50,9	46,0	44,0	41,0	36,0	30,0
10	Q_e	**901,4**	**857,2**	**838,6**	**809,7**	**759,0**	**693,9**
	P	222,5	240,3	248,3	261,2	285,0	317,6
	V_e	155,0	147,4	144,2	139,2	130,5	119,3
	Δp_e	60,1	54,3	52,0	48,5	42,6	35,6
12	Q_e	**948,6**	**902,2**	**882,7**	**852,5**	**799,4**	**731,2**
	P	225,3	243,5	251,6	264,6	288,7	321,6
	V_e	163,3	155,3	151,9	146,7	137,6	125,8
	Δp_e	66,6	60,3	57,7	53,8	47,3	39,6
15	Q_e	**1019,1**	**969,6**	**948,8**	**916,5**	**859,8**	**787,1**
	P	229,2	247,8	256,0	269,3	293,8	327,0
	V_e	175,6	167,1	163,5	157,9	148,1	135,6
	Δp_e	77,1	69,8	66,8	62,3	54,9	46,0

GLAH 8301 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	Q_e	**831,0**	**789,3**	**771,8**	**744,6**	**696,8**	**635,5**
	P	226,8	244,5	252,5	265,6	290,1	324,0
	V_e	142,8	135,6	132,6	127,9	119,7	109,2
	Δp_e	51,0	46,0	43,9	40,9	35,8	29,8
6	Q_e	**855,8**	**812,9**	**794,9**	**766,9**	**717,9**	**654,9**
	P	228,5	246,4	254,5	267,8	292,5	326,7
	V_e	147,0	139,7	136,6	131,8	123,3	112,5
	Δp_e	54,0	48,8	46,6	43,4	38,0	31,7
7	Q_e	**880,5**	**836,5**	**818,0**	**789,3**	**738,9**	**674,3**
	P	230,2	248,3	256,5	269,9	294,8	329,3
	V_e	151,3	143,7	140,5	135,6	126,9	115,8
	Δp_e	57,2	51,6	49,4	46,0	40,3	33,6
10	Q_e	**954,3**	**906,9**	**887,0**	**856,2**	**802,0**	**732,4**
	P	234,9	253,6	262,1	275,8	301,4	336,6
	V_e	164,1	156,0	152,5	147,2	137,9	126,0
	Δp_e	67,3	60,8	58,2	54,2	47,6	39,7
12	Q_e	**1003,3**	**953,7**	**932,9**	**900,5**	**843,8**	**771,1**
	P	237,8	256,9	265,5	279,4	305,4	341,0
	V_e	172,7	164,1	160,6	155,0	145,2	132,7
	Δp_e	74,5	67,4	64,4	60,1	52,7	44,0
15	Q_e	**1076,5**	**1023,6**	**1001,3**	**966,9**	**906,4**	**829,0**
	P	241,7	261,4	270,2	284,4	310,8	347,0
	V_e	185,5	176,4	172,5	166,6	156,2	142,8
	Δp_e	86,0	77,8	74,4	69,4	61,0	51,0

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 8321 CD2.LT							
T_{eo}	T_a	25	30	32	35	40	46
5	**Q_e**	**879,2**	**834,6**	**815,8**	**786,7**	**735,6**	**670,0**
	P	240,9	259,5	268,1	282,0	308,4	345,1
	V_e	151,0	143,4	140,2	135,2	126,4	115,1
	Δp_e	57,0	51,4	49,1	45,7	39,9	33,1
6	**Q_e**	**905,0**	**859,1**	**839,9**	**810,0**	**757,5**	**690,2**
	P	242,7	261,6	270,3	284,4	311,0	348,1
	V_e	155,5	147,6	144,3	139,1	130,1	118,6
	Δp_e	60,4	54,5	52,0	48,4	42,3	35,2
7	**Q_e**	**930,7**	**883,6**	**863,8**	**833,2**	**779,4**	**710,4**
	P	244,5	263,6	272,4	286,7	313,6	351,0
	V_e	159,9	151,8	148,4	143,1	133,9	122,0
	Δp_e	63,9	57,6	55,1	51,2	44,8	37,2
10	**Q_e**	**1007,4**	**956,8**	**935,5**	**902,6**	**844,8**	**770,7**
	P	249,4	269,3	278,4	293,1	320,8	359,2
	V_e	173,2	164,5	160,9	155,2	145,3	132,5
	Δp_e	75,0	67,7	64,7	60,2	52,8	43,9
12	**Q_e**	**1058,2**	**1005,2**	**983,0**	**948,5**	**888,1**	**810,7**
	P	252,4	272,8	282,0	297,0	325,2	364,1
	V_e	182,1	173,0	169,2	163,3	152,9	139,5
	Δp_e	82,9	74,8	71,6	66,6	58,4	48,7
15	**Q_e**	**1134,0**	**1077,6**	**1053,9**	**1017,2**	**952,9**	**870,6**
	P	256,5	277,5	287,0	302,4	331,1	370,8
	V_e	195,4	185,7	181,6	175,3	164,2	150,0
	Δp_e	95,5	86,2	82,4	76,8	67,4	56,3

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: chilled water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 4131 CD2							
Tco	T_a	-5	-2	0	3	7	10
30	Q_e	**283,5**	**304,3**	**319,3**	**343,5**	**379,1**	**408,2**
	P	89,8	90,7	91,3	92,3	93,9	95,1
	V_e	49,0	52,6	55,2	59,4	65,6	70,6
	Δp_e	34,9	40,1	44,2	51,2	62,3	72,2
35	Q_e	**283,4**	**303,8**	**318,5**	**342,1**	**376,6**	**404,8**
	P	98,2	99,0	99,6	100,6	102,1	103,4
	V_e	49,1	52,6	55,2	59,3	65,2	70,1
	Δp_e	34,9	40,1	44,1	50,9	61,7	71,3
40	Q_e	**283,8**	**303,6**	**317,9**	**340,7**	**373,9**	**401,0**
	P	107,9	108,6	109,2	110,2	111,7	113,0
	V_e	49,2	52,7	55,1	59,1	64,9	69,6
	Δp_e	35,2	40,2	44,1	50,7	61,0	70,2
45	Q_e	**284,8**	**303,8**	**317,4**	**339,3**	**371,0**	**396,9**
	P	118,9	119,5	120,0	121,0	122,4	123,8
	V_e	49,5	52,8	55,2	59,0	64,5	69,0
	Δp_e	35,5	40,4	44,1	50,4	60,3	69,0
50	Q_e	-	-	**317,2**	**337,9**	**367,9**	**392,4**
	P	-	-	132,2	133,0	134,5	135,8
	V_e	-	-	55,2	58,8	64,1	68,3
	Δp_e	-	-	44,2	50,2	59,5	67,7
55	Q_e	-	-	-	-	**364,6**	**387,6**
	P	-	-	-	-	147,8	149,1
	V_e	-	-	-	-	63,6	67,6
	Δp_e	-	-	-	-	58,7	66,3

GLAH 4141 CD2							
Tco	T_a	-5	-2	0	3	7	10
30	Q_e	**320,0**	**336,8**	**350,0**	**372,8**	**408,7**	**439,8**
	P	97,1	97,6	98,1	99,0	100,4	101,7
	V_e	55,3	58,2	60,5	64,5	70,7	76,0
	Δp_e	34,0	37,6	40,7	46,1	55,4	64,2
35	Q_e	**315,3**	**333,3**	**347,0**	**370,0**	**405,3**	**435,2**
	P	104,9	105,6	106,2	107,1	108,7	110,0
	V_e	54,6	57,7	60,1	64,1	70,2	75,4
	Δp_e	33,1	37,0	40,1	45,6	54,7	63,1
40	Q_e	**311,6**	**330,5**	**344,5**	**367,4**	**401,7**	**430,3**
	P	114,3	115,1	115,7	116,8	118,4	119,8
	V_e	54,1	57,3	59,8	63,7	69,7	74,6
	Δp_e	32,4	36,5	39,6	45,1	53,9	61,9
45	Q_e	**309,1**	**328,4**	**342,3**	**364,9**	**398,0**	**425,1**
	P	125,3	126,2	126,8	127,9	129,7	131,1
	V_e	53,7	57,1	59,5	63,4	69,2	73,9
	Δp_e	32,0	36,2	39,3	44,6	53,1	60,6
50	Q_e	-	-	**340,6**	**362,6**	**394,2**	**419,8**
	P	-	-	139,4	140,6	142,5	144,0
	V_e	-	-	59,3	63,1	68,6	73,1
	Δp_e	-	-	39,0	44,2	52,3	59,3
55	Q_e	-	-	-	-	**390,3**	**414,2**
	P	-	-	-	-	156,8	158,4
	V_e	-	-	-	-	68,1	72,3
	Δp_e	-	-	-	-	51,5	58,0

GLAH 4161 CD2							
Tco	T_a	-5	-2	0	3	7	10
30	Q_e	**364,4**	**377,5**	**389,1**	**410,5**	**446,7**	**479,7**
	P	109,9	110,2	110,5	111,1	112,3	113,4
	V_e	63,0	65,3	67,3	71,0	77,2	82,9
	Δp_e	44,1	47,3	50,2	55,9	66,2	76,3
35	Q_e	**357,0**	**372,1**	**384,6**	**406,7**	**442,8**	**474,7**
	P	117,0	117,6	118,1	118,9	120,4	121,8
	V_e	61,8	64,5	66,6	70,4	76,7	82,2
	Δp_e	42,4	46,1	49,2	55,1	65,3	75,0
40	Q_e	**350,7**	**367,6**	**380,8**	**403,4**	**439,1**	**469,9**
	P	126,1	126,9	127,6	128,8	130,6	132,1
	V_e	60,9	63,8	66,1	70,0	76,2	81,5
	Δp_e	41,1	45,1	48,4	54,4	64,4	73,8
45	Q_e	**345,6**	**363,9**	**377,7**	**400,7**	**435,7**	**465,3**
	P	137,1	138,3	139,2	140,6	142,8	144,5
	V_e	60,1	63,2	65,6	69,6	75,7	80,9
	Δp_e	40,0	44,4	47,8	53,8	63,7	72,6
50	Q_e	-	-	**375,3**	**398,5**	**432,7**	**460,8**
	P	-	-	152,7	154,4	157,0	159,0
	V_e	-	-	65,4	69,4	75,3	80,2
	Δp_e	-	-	47,4	53,4	63,0	71,5
55	Q_e	-	-	-	-	**429,9**	**456,5**
	P	-	-	-	-	173,2	175,5
	V_e	-	-	-	-	75,0	79,6
	Δp_e	-	-	-	-	62,4	70,4

GLAH 6171 CD2							
Tco	T_a	-5	-2	0	3	7	10
30	Q_e	**379,6**	**395,4**	**409,1**	**434,3**	**476,6**	**515,0**
	P	114,1	114,7	115,3	116,4	118,4	120,1
	V_e	65,6	68,4	70,7	75,1	82,4	89,0
	Δp_e	27,1	29,5	31,5	35,5	42,8	50,0
35	Q_e	**375,7**	**394,0**	**408,8**	**434,6**	**476,1**	**512,5**
	P	125,6	126,2	126,8	127,9	129,9	131,7
	V_e	65,1	68,2	70,8	75,3	82,5	88,8
	Δp_e	26,7	29,3	31,6	35,7	42,8	49,6
40	Q_e	**373,2**	**393,2**	**408,5**	**434,6**	**474,9**	**509,3**
	P	138,6	139,3	139,9	141,0	142,8	144,6
	V_e	64,7	68,2	70,9	75,4	82,4	88,4
	Δp_e	26,4	29,3	31,7	35,8	42,8	49,2
45	Q_e	**372,1**	**392,9**	**408,4**	**434,1**	**472,9**	**505,4**
	P	153,3	153,9	154,5	155,5	157,2	158,9
	V_e	64,7	68,3	71,0	75,4	82,2	87,8
	Δp_e	26,3	29,4	31,7	35,9	42,6	48,6
50	Q_e	-	-	**408,3**	**433,1**	**470,2**	**500,8**
	P	-	-	170,6	171,5	173,1	174,6
	V_e	-	-	71,1	75,4	81,9	87,2
	Δp_e	-	-	31,8	35,8	42,2	47,9
55	Q_e	-	-	-	-	**466,7**	**495,5**
	P	-	-	-	-	190,4	191,7
	V_e	-	-	-	-	81,4	86,4
	Δp_e	-	-	-	-	41,8	47,1

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: warm water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 6181 CD2							
Tco	**T_a**	**-5**	**-2**	**0**	**3**	**7**	**10**
30	**Q_e**	**398,0**	**422,7**	**441,5**	**473,1**	**521,9**	**563,3**
	P	123,4	124,6	125,5	126,9	129,2	131,2
	V_e	68,8	73,1	76,3	81,8	90,2	97,4
	Δp_e	29,8	33,7	36,7	42,2	51,3	59,8
35	**Q_e**	**396,7**	**422,3**	**441,3**	**472,8**	**520,2**	**559,8**
	P	136,3	137,3	138,1	139,4	141,6	143,4
	V_e	68,7	73,1	76,4	81,9	90,1	97,0
	Δp_e	29,7	33,7	36,8	42,2	51,1	59,2
40	**Q_e**	**396,5**	**422,4**	**441,3**	**472,1**	**517,7**	**555,5**
	P	150,8	151,5	152,2	153,4	155,4	157,2
	V_e	68,8	73,3	76,6	81,9	89,8	96,4
	Δp_e	29,8	33,8	36,9	42,3	50,8	58,5
45	**Q_e**	**397,6**	**423,0**	**441,3**	**471,0**	**514,6**	**550,3**
	P	166,8	167,3	167,8	168,8	170,6	172,3
	V_e	69,1	73,5	76,7	81,9	89,4	95,6
	Δp_e	30,1	34,0	37,1	42,2	50,4	57,6
50	**Q_e**	**-**	**-**	**441,5**	**469,6**	**510,7**	**544,2**
	P	-	-	185,0	185,8	187,3	188,9
	V_e	-	-	76,9	81,8	88,9	94,8
	Δp_e	-	-	37,2	42,1	49,8	56,6
55	**Q_e**	**-**	**-**	**-**	**-**	**506,1**	**537,4**
	P	-	-	-	-	205,5	206,9
	V_e	-	-	-	-	88,3	93,7
	Δp_e	-	-	-	-	49,1	55,4

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: warm water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 4131 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	Q_e	**233,0**	**287,3**	**330,9**	**359,0**	**398,7**	**430,1**
	P	85,0	87,0	88,7	89,8	91,5	92,8
	V_e	40,3	49,7	57,2	62,1	68,9	74,4
	Δp_e	23,5	35,8	47,5	55,9	68,9	80,2
35	Q_e	**240,4**	**288,7**	**328,9**	**355,4**	**393,4**	**423,9**
	P	93,8	95,3	96,8	97,9	99,6	100,9
	V_e	41,6	50,0	57,0	61,6	68,1	73,4
	Δp_e	25,1	36,2	47,1	54,9	67,3	78,2
40	Q_e	**247,6**	**290,2**	**327,2**	**352,0**	**388,2**	**417,7**
	P	103,8	104,9	106,2	107,3	108,9	110,3
	V_e	43,0	50,3	56,8	61,1	67,4	72,5
	Δp_e	26,8	36,7	46,7	54,1	65,8	76,1
45	Q_e	**254,5**	**291,8**	**325,7**	**348,9**	**383,2**	**411,5**
	P	115,1	115,8	116,9	117,9	119,5	121,0
	V_e	44,2	50,7	56,6	60,6	66,6	71,5
	Δp_e	28,4	37,3	46,5	53,3	64,3	74,1
50	Q_e	**-**	**293,6**	**324,4**	**346,0**	**378,3**	**405,2**
	P	-	127,9	128,9	129,8	131,4	132,9
	V_e	-	51,1	56,5	60,2	65,9	70,6
	Δp_e	-	37,9	46,3	52,6	62,9	72,2
55	Q_e	**-**	**-**	**-**	**-**	**373,5**	**398,9**
	P	-	-	-	-	144,6	146,1
	V_e	-	-	-	-	65,2	69,6
	Δp_e	-	-	-	-	61,6	70,2

GLAH 4141 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	Q_e	**277,9**	**321,3**	**360,4**	**387,1**	**426,5**	**458,9**
	P	93,5	94,8	96,2	97,2	98,7	100,0
	V_e	48,0	55,6	62,3	66,9	73,8	79,4
	Δp_e	25,6	34,3	43,1	49,7	60,4	69,9
35	Q_e	**275,5**	**318,4**	**356,5**	**382,5**	**420,6**	**451,8**
	P	101,5	102,8	104,2	105,2	106,8	108,3
	V_e	47,7	55,1	61,8	66,2	72,8	78,3
	Δp_e	25,3	33,7	42,3	48,7	58,9	68,0
40	Q_e	**273,6**	**316,0**	**353,1**	**378,2**	**414,9**	**444,8**
	P	110,9	112,2	113,7	114,8	116,6	118,1
	V_e	47,5	54,8	61,3	65,6	72,0	77,2
	Δp_e	25,0	33,4	41,7	47,8	57,5	66,1
45	Q_e	**272,1**	**314,1**	**350,2**	**374,3**	**409,4**	**437,8**
	P	121,7	123,2	124,8	126,0	127,8	129,4
	V_e	47,3	54,6	60,9	65,1	71,1	76,1
	Δp_e	24,8	33,1	41,1	47,0	56,2	64,3
50	Q_e	**-**	**312,7**	**347,7**	**370,8**	**404,1**	**430,9**
	P	-	135,6	137,4	138,6	140,6	142,3
	V_e	-	54,4	60,5	64,6	70,4	75,0
	Δp_e	-	32,9	40,7	46,3	55,0	62,5
55	Q_e	**-**	**-**	**-**	**-**	**399,1**	**424,0**
	P	-	-	-	-	154,9	156,7
	V_e	-	-	-	-	69,6	74,0
	Δp_e	-	-	-	-	53,8	60,7

GLAH 4161 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	Q_e	**333,1**	**365,2**	**400,5**	**426,7**	**467,4**	**502,3**
	P	105,2	106,3	107,6	108,4	109,8	110,9
	V_e	57,6	63,1	69,3	73,8	80,8	86,8
	Δp_e	36,8	44,2	53,2	60,4	72,5	83,7
35	Q_e	**320,9**	**358,0**	**394,9**	**421,1**	**461,0**	**494,5**
	P	112,3	113,7	115,1	116,1	117,7	119,1
	V_e	55,6	62,0	68,4	72,9	79,8	85,7
	Δp_e	34,3	42,7	51,9	59,1	70,8	81,4
40	Q_e	**311,4**	**352,2**	**390,0**	**416,1**	**454,9**	**487,1**
	P	121,1	122,8	124,6	125,8	127,8	129,4
	V_e	54,0	61,1	67,7	72,2	78,9	84,5
	Δp_e	32,4	41,4	50,8	57,8	69,1	79,3
45	Q_e	**304,3**	**347,7**	**385,8**	**411,6**	**449,2**	**480,0**
	P	131,5	133,9	136,1	137,6	139,8	141,7
	V_e	52,9	60,4	67,1	71,5	78,1	83,4
	Δp_e	31,1	40,5	49,9	56,8	67,7	77,2
50	Q_e	**-**	**344,5**	**382,4**	**407,5**	**443,8**	**473,1**
	P	-	146,8	149,6	151,4	153,9	156,0
	V_e	-	60,0	66,6	71,0	77,3	82,4
	Δp_e	-	39,9	49,2	55,9	66,3	75,3
55	Q_e	**-**	**-**	**-**	**-**	**438,8**	**466,6**
	P	-	-	-	-	170,1	172,4
	V_e	-	-	-	-	76,5	81,4
	Δp_e	-	-	-	-	65,0	73,6

GLAH 6171 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	Q_e	**329,0**	**382,6**	**431,4**	**464,9**	**514,4**	**555,3**
	P	108,7	111,1	113,3	114,8	117,0	118,8
	V_e	56,9	66,2	74,6	80,4	88,9	96,0
	Δp_e	20,4	27,6	35,1	40,7	49,8	58,1
35	Q_e	**328,4**	**381,2**	**428,6**	**461,0**	**508,7**	**547,8**
	P	120,9	122,6	124,5	125,9	128,1	130,0
	V_e	56,9	66,0	74,2	79,8	88,1	94,9
	Δp_e	20,4	27,5	34,7	40,2	48,9	56,7
40	Q_e	**328,3**	**380,2**	**426,1**	**457,2**	**502,8**	**540,0**
	P	134,5	135,7	137,3	138,6	140,7	142,6
	V_e	57,0	66,0	73,9	79,3	87,2	93,7
	Δp_e	20,4	27,4	34,4	39,6	47,9	55,3
45	Q_e	**328,6**	**379,6**	**423,9**	**453,5**	**496,7**	**531,8**
	P	149,5	150,2	151,6	152,8	154,8	156,6
	V_e	57,1	66,0	73,7	78,8	86,3	92,4
	Δp_e	20,6	27,4	34,2	39,1	46,9	53,8
50	Q_e	**-**	**379,5**	**421,9**	**449,9**	**490,5**	**523,2**
	P	-	166,3	167,4	168,5	170,3	172,0
	V_e	-	66,1	73,5	78,3	85,4	91,1
	Δp_e	-	27,5	34,0	38,7	45,9	52,3
55	Q_e	**-**	**-**	**-**	**-**	**484,1**	**514,2**
	P	-	-	-	-	187,3	188,8
	V_e	-	-	-	-	84,4	89,7
	Δp_e	-	-	-	-	44,9	50,7

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: warm water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 6181 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**323,3**	**397,9**	**458,2**	**497,3**	**552,6**	**596,6**
	P	115,6	118,9	121,6	123,4	125,9	128,0
	V_e	55,9	68,8	79,2	86,0	95,6	103,2
	Δp_e	19,7	29,8	39,6	46,6	57,5	67,0
35	**Q_e**	**332,7**	**400,1**	**456,3**	**493,3**	**546,3**	**588,8**
	P	129,6	131,7	133,9	135,4	137,8	139,8
	V_e	57,6	69,3	79,0	85,4	94,6	102,0
	Δp_e	20,9	30,3	39,4	46,0	56,4	65,5
40	**Q_e**	**341,9**	**402,5**	**454,6**	**489,3**	**539,8**	**580,7**
	P	145,0	146,0	147,7	149,0	151,2	153,2
	V_e	59,3	69,8	78,9	84,9	93,6	100,7
	Δp_e	22,2	30,7	39,2	45,4	55,2	63,9
45	**Q_e**	**350,8**	**405,1**	**453,1**	**485,6**	**533,2**	**572,1**
	P	161,8	161,9	163,0	164,2	166,2	168,1
	V_e	61,0	70,4	78,7	84,4	92,7	99,4
	Δp_e	23,4	31,2	39,1	44,9	54,1	62,3
50	**Q_e**	**-**	**407,8**	**451,7**	**481,9**	**526,4**	**563,1**
	P	-	179,2	179,9	180,8	182,6	184,5
	V_e	-	71,0	78,7	83,9	91,7	98,0
	Δp_e	-	31,8	39,0	44,3	52,9	60,6
55	**Q_e**	**-**	**-**	**-**	**-**	**519,6**	**553,8**
	P	-	-	-	-	200,6	202,3
	V_e	-	-	-	-	90,6	96,6
	Δp_e	-	-	-	-	51,8	58,8

GLAH 6201 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**392,8**	**457,3**	**514,6**	**553,4**	**610,5**	**657,2**
	P	131,8	134,2	136,4	137,9	140,2	142,2
	V_e	67,9	79,1	89,0	95,7	105,6	113,6
	Δp_e	22,1	30,0	38,0	44,0	53,5	62,0
35	**Q_e**	**390,7**	**453,8**	**509,4**	**547,1**	**602,2**	**647,3**
	P	144,5	146,4	148,4	150,0	152,3	154,3
	V_e	67,7	78,6	88,2	94,8	104,3	112,1
	Δp_e	22,0	29,6	37,4	43,1	52,2	60,3
40	**Q_e**	**389,2**	**451,0**	**505,0**	**541,3**	**594,2**	**637,4**
	P	159,0	160,6	162,5	164,0	166,4	168,5
	V_e	67,5	78,2	87,6	93,9	103,1	110,6
	Δp_e	21,9	29,4	36,8	42,3	51,0	58,7
45	**Q_e**	**388,2**	**449,0**	**501,2**	**536,0**	**586,5**	**627,4**
	P	175,4	176,7	178,7	180,2	182,6	184,8
	V_e	67,5	78,0	87,1	93,2	101,9	109,0
	Δp_e	21,9	29,2	36,4	41,6	49,9	57,1
50	**Q_e**	**-**	**447,8**	**498,0**	**531,2**	**578,9**	**617,4**
	P	-	194,9	196,8	198,3	200,8	203,0
	V_e	-	78,0	86,7	92,5	100,8	107,5
	Δp_e	-	29,2	36,1	41,1	48,8	55,5
55	**Q_e**	**-**	**-**	**-**	**-**	**571,7**	**607,3**
	P	-	-	-	-	221,1	223,3
	V_e	-	-	-	-	99,7	105,9
	Δp_e	-	-	-	-	47,7	53,9

GLAH 6211 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**415,9**	**482,0**	**541,1**	**581,3**	**640,5**	**689,0**
	P	139,8	141,9	144,0	145,5	147,7	149,6
	V_e	71,9	83,3	93,6	100,5	110,7	119,1
	Δp_e	24,8	33,3	42,0	48,5	58,9	68,1
35	**Q_e**	**413,4**	**477,7**	**535,1**	**574,0**	**631,3**	**678,2**
	P	151,9	153,8	155,9	157,5	159,9	162,0
	V_e	71,6	82,7	92,7	99,4	109,3	117,5
	Δp_e	24,6	32,9	41,2	47,4	57,4	66,2
40	**Q_e**	**411,1**	**474,2**	**529,8**	**567,4**	**622,5**	**667,5**
	P	166,1	168,0	170,2	171,8	174,4	176,6
	V_e	71,3	82,3	91,9	98,4	108,0	115,8
	Δp_e	24,4	32,5	40,6	46,5	56,0	64,4
45	**Q_e**	**409,1**	**471,4**	**525,3**	**561,5**	**614,1**	**656,9**
	P	182,4	184,4	186,8	188,5	191,2	193,6
	V_e	71,1	81,9	91,3	97,6	106,7	114,2
	Δp_e	24,3	32,2	40,0	45,7	54,7	62,6
50	**Q_e**	**-**	**469,3**	**521,6**	**556,3**	**606,2**	**646,5**
	P	-	203,1	205,6	207,5	210,4	212,8
	V_e	-	81,7	90,8	96,9	105,6	112,6
	Δp_e	-	32,0	39,6	45,0	53,5	60,8
55	**Q_e**	**-**	**-**	**-**	**-**	**598,7**	**636,3**
	P	-	-	-	-	231,8	234,4
	V_e	-	-	-	-	104,4	111,0
	Δp_e	-	-	-	-	52,4	59,1

GLAH 6241 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**497,9**	**547,3**	**600,8**	**640,1**	**701,2**	**753,3**
	P	158,2	159,7	161,4	162,7	164,7	166,4
	V_e	86,1	94,6	103,9	110,7	121,2	130,2
	Δp_e	30,4	36,7	44,2	50,2	60,3	69,6
35	**Q_e**	**481,3**	**537,0**	**592,3**	**631,6**	**691,4**	**741,7**
	P	168,5	170,5	172,7	174,3	176,7	178,8
	V_e	83,4	93,0	102,6	109,4	119,8	128,5
	Δp_e	28,5	35,5	43,1	49,1	58,8	67,7
40	**Q_e**	**467,9**	**528,5**	**584,9**	**624,0**	**682,2**	**730,5**
	P	181,5	184,3	187,0	188,9	191,8	194,2
	V_e	81,2	91,7	101,5	108,3	118,4	126,7
	Δp_e	27,0	34,5	42,2	48,1	57,4	65,9
45	**Q_e**	**457,7**	**521,8**	**578,6**	**617,2**	**673,6**	**719,9**
	P	197,0	200,8	204,2	206,5	209,9	212,7
	V_e	79,5	90,7	100,6	107,3	117,1	125,1
	Δp_e	25,9	33,7	41,5	47,2	56,2	64,2
50	**Q_e**	**-**	**517,0**	**573,5**	**611,2**	**665,6**	**709,6**
	P	-	220,3	224,5	227,2	231,1	234,2
	V_e	-	90,0	99,9	106,4	115,9	123,6
	Δp_e	-	33,2	40,9	46,4	55,1	62,6
55	**Q_e**	**-**	**-**	**-**	**-**	**658,1**	**699,9**
	P	-	-	-	-	255,3	258,8
	V_e	-	-	-	-	114,8	122,1
	Δp_e	-	-	-	-	54,0	61,1

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: warm water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 8241 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**430,7**	**529,0**	**608,8**	**660,6**	**734,0**	**792,4**
	P	153,9	158,3	162,0	164,3	167,7	170,4
	V_e	74,5	91,5	105,3	114,2	126,9	137,0
	Δp_e	20,5	31,0	41,0	48,3	59,6	69,5
35	**Q_e**	**442,1**	**531,6**	**606,2**	**655,3**	**725,7**	**782,2**
	P	172,6	175,4	178,3	180,4	183,6	186,2
	V_e	76,6	92,1	105,0	113,5	125,7	135,5
	Δp_e	21,7	31,4	40,8	47,7	58,4	67,9
40	**Q_e**	**453,7**	**534,6**	**603,9**	**650,1**	**717,2**	**771,5**
	P	193,1	194,5	196,7	198,5	201,4	204,0
	V_e	78,7	92,7	104,8	112,8	124,4	133,8
	Δp_e	22,9	31,8	40,6	47,1	57,3	66,3
45	**Q_e**	**465,5**	**538,0**	**602,0**	**645,2**	**708,5**	**760,2**
	P	215,6	215,7	217,2	218,7	221,3	223,8
	V_e	80,9	93,5	104,6	112,1	123,1	132,1
	Δp_e	24,2	32,4	40,5	46,5	56,1	64,6
50	**Q_e**	**-**	**541,9**	**600,3**	**640,4**	**699,6**	**748,4**
	P	-	238,8	239,6	240,8	243,2	245,6
	V_e	-	94,3	104,5	111,5	121,8	130,3
	Δp_e	-	32,9	40,4	46,0	54,9	62,8
55	**Q_e**	**-**	**-**	**-**	**-**	**690,5**	**736,0**
	P	-	-	-	-	267,2	269,4
	V_e	-	-	-	-	120,5	128,4
	Δp_e	-	-	-	-	53,7	61,0

GLAH 8261 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**467,1**	**574,9**	**661,8**	**717,8**	**797,0**	**859,9**
	P	170,3	174,2	177,6	179,8	183,1	185,8
	V_e	80,8	99,4	114,4	124,1	137,8	148,7
	Δp_e	24,1	36,6	48,4	57,0	70,3	81,8
35	**Q_e**	**481,0**	**577,4**	**657,8**	**710,7**	**786,6**	**847,6**
	P	187,9	190,8	193,9	196,0	199,3	202,1
	V_e	83,3	100,0	113,9	123,1	136,2	146,8
	Δp_e	25,7	37,0	48,0	56,1	68,7	79,7
40	**Q_e**	**494,7**	**580,2**	**654,3**	**704,0**	**776,4**	**835,3**
	P	207,9	210,0	212,7	214,8	218,1	221,0
	V_e	85,8	100,7	113,5	122,1	134,7	144,9
	Δp_e	27,3	37,5	47,7	55,2	67,1	77,7
45	**Q_e**	**508,2**	**583,4**	**651,3**	**697,8**	**766,4**	**822,8**
	P	230,3	231,7	234,1	236,1	239,4	242,3
	V_e	88,3	101,4	113,2	121,3	133,2	143,0
	Δp_e	28,9	38,0	47,4	54,4	65,6	75,7
50	**Q_e**	**-**	**587,0**	**648,9**	**692,0**	**756,6**	**810,3**
	P	-	256,0	258,0	259,9	263,2	266,2
	V_e	-	102,2	113,0	120,5	131,7	141,1
	Δp_e	-	38,6	47,2	53,7	64,2	73,6
55	**Q_e**	**-**	**-**	**-**	**-**	**747,0**	**797,7**
	P	-	-	-	-	289,6	292,6
	V_e	-	-	-	-	130,3	139,1
	Δp_e	-	-	-	-	62,8	71,6

GLAH 8281 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**554,5**	**642,6**	**721,5**	**775,1**	**854,0**	**918,8**
	P	186,3	189,1	191,9	193,9	196,9	199,5
	V_e	95,9	111,1	124,7	134,0	147,7	158,9
	Δp_e	23,0	30,9	38,9	44,9	54,5	63,1
35	**Q_e**	**551,2**	**637,0**	**713,4**	**765,4**	**841,7**	**904,3**
	P	202,5	205,1	207,9	210,0	213,2	215,9
	V_e	95,5	110,3	123,6	132,6	145,8	156,6
	Δp_e	22,8	30,4	38,2	43,9	53,1	61,3
40	**Q_e**	**548,2**	**632,3**	**706,4**	**756,6**	**830,0**	**890,0**
	P	221,4	224,0	226,9	229,1	232,5	235,5
	V_e	95,1	109,7	122,6	131,3	144,0	154,4
	Δp_e	22,6	30,1	37,6	43,1	51,8	59,6
45	**Q_e**	**545,5**	**628,5**	**700,5**	**748,7**	**818,9**	**875,9**
	P	243,1	245,9	249,0	251,3	254,9	258,1
	V_e	94,8	109,2	121,7	130,1	142,3	152,2
	Δp_e	22,5	29,8	37,1	42,3	50,6	57,9
50	**Q_e**	**-**	**625,7**	**695,5**	**741,7**	**808,3**	**862,1**
	P	-	270,8	274,1	276,6	280,4	283,7
	V_e	-	108,9	121,1	129,1	140,7	150,1
	Δp_e	-	29,7	36,7	41,7	49,5	56,3
55	**Q_e**	**-**	**-**	**-**	**-**	**798,3**	**848,4**
	P	-	-	-	-	309,0	312,5
	V_e	-	-	-	-	139,3	148,0
	Δp_e	-	-	-	-	48,5	54,8

GLAH 8301 CD2.LT							
Tco	T_a	-12	-5	0	3	7	10
30	**Q_e**	**610,9**	**687,5**	**762,6**	**815,7**	**896,1**	**963,5**
	P	198,9	201,8	204,6	206,5	209,4	211,7
	V_e	105,6	118,9	131,9	141,0	154,9	166,6
	Δp_e	27,9	35,3	43,5	49,7	60,0	69,4
35	**Q_e**	**598,5**	**677,9**	**752,8**	**805,1**	**883,3**	**948,3**
	P	214,4	217,2	220,2	222,3	225,5	228,2
	V_e	103,7	117,4	130,4	139,4	153,0	164,2
	Δp_e	26,9	34,5	42,5	48,6	58,5	67,4
40	**Q_e**	**588,2**	**669,9**	**744,4**	**795,5**	**871,2**	**933,6**
	P	232,9	236,0	239,3	241,6	245,3	248,4
	V_e	102,0	116,2	129,1	138,0	151,2	162,0
	Δp_e	26,0	33,8	41,7	47,6	57,1	65,6
45	**Q_e**	**580,0**	**663,7**	**737,4**	**787,1**	**860,0**	**919,5**
	P	254,4	258,2	261,9	264,6	268,7	272,1
	V_e	100,8	115,3	128,1	136,8	149,5	159,8
	Δp_e	25,4	33,3	41,1	46,8	55,8	63,8
50	**Q_e**	**-**	**659,2**	**731,7**	**779,8**	**849,5**	**905,9**
	P	-	283,7	288,1	291,2	295,7	299,4
	V_e	-	114,8	127,4	135,8	147,9	157,7
	Δp_e	-	32,9	40,6	46,1	54,7	62,2
55	**Q_e**	**-**	**-**	**-**	**-**	**839,8**	**892,7**
	P	-	-	-	-	326,4	330,4
	V_e	-	-	-	-	146,5	155,7
	Δp_e	-	-	-	-	53,7	60,6

T_a [°C] Outside air temperature
T_{eo} [°C] Chilled water outlet temperature
Q_e [kW] Cooling duty

P [kW] Power consumption of unit (total)
V_e [m³/h] Chilled water volume flow
Δp_e [kPa] Water side pressure drop
– Operation outside operating range

** The performance data are valid for the following input parameters: warm water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

GLAH 8321 CD2.LT							
Tco	**T_a**	**-12**	**-5**	**0**	**3**	**7**	**10**
30	**Q_e**	**665,9**	**730,2**	**800,9**	**853,3**	**934,7**	**1004,4**
	P	210,2	212,7	215,2	216,9	219,6	221,9
	V_e	115,1	126,3	138,5	147,5	161,6	173,7
	Δp_e	33,1	39,9	47,9	54,4	65,3	75,4
35	**Q_e**	**641,8**	**716,0**	**789,7**	**842,2**	**921,9**	**988,9**
	P	224,7	227,4	230,2	232,3	235,6	238,3
	V_e	111,2	124,0	136,8	145,9	159,7	171,3
	Δp_e	30,9	38,4	46,8	53,2	63,7	73,3
40	**Q_e**	**622,7**	**704,3**	**779,9**	**832,1**	**909,8**	**974,1**
	P	242,3	245,8	249,3	251,8	255,6	258,9
	V_e	108,0	122,2	135,3	144,4	157,8	169,0
	Δp_e	29,2	37,3	45,8	52,1	62,3	71,4
45	**Q_e**	**608,6**	**695,4**	**771,6**	**823,1**	**898,4**	**959,8**
	P	263,1	267,9	272,3	275,3	279,8	283,5
	V_e	105,8	120,8	134,1	143,0	156,1	166,8
	Δp_e	28,0	36,5	45,0	51,2	60,9	69,6
50	**Q_e**	**-**	**689,0**	**764,8**	**815,0**	**887,6**	**946,2**
	P	-	293,7	299,2	302,8	308,0	312,2
	V_e	-	120,0	133,2	141,9	154,5	164,7
	Δp_e	-	36,0	44,3	50,3	59,7	67,9
55	**Q_e**	**-**	**-**	**-**	**-**	**877,5**	**933,2**
	P	-	-	-	-	340,4	345,0
	V_e	-	-	-	-	153,1	162,8
	Δp_e	-	-	-	-	58,6	66,3

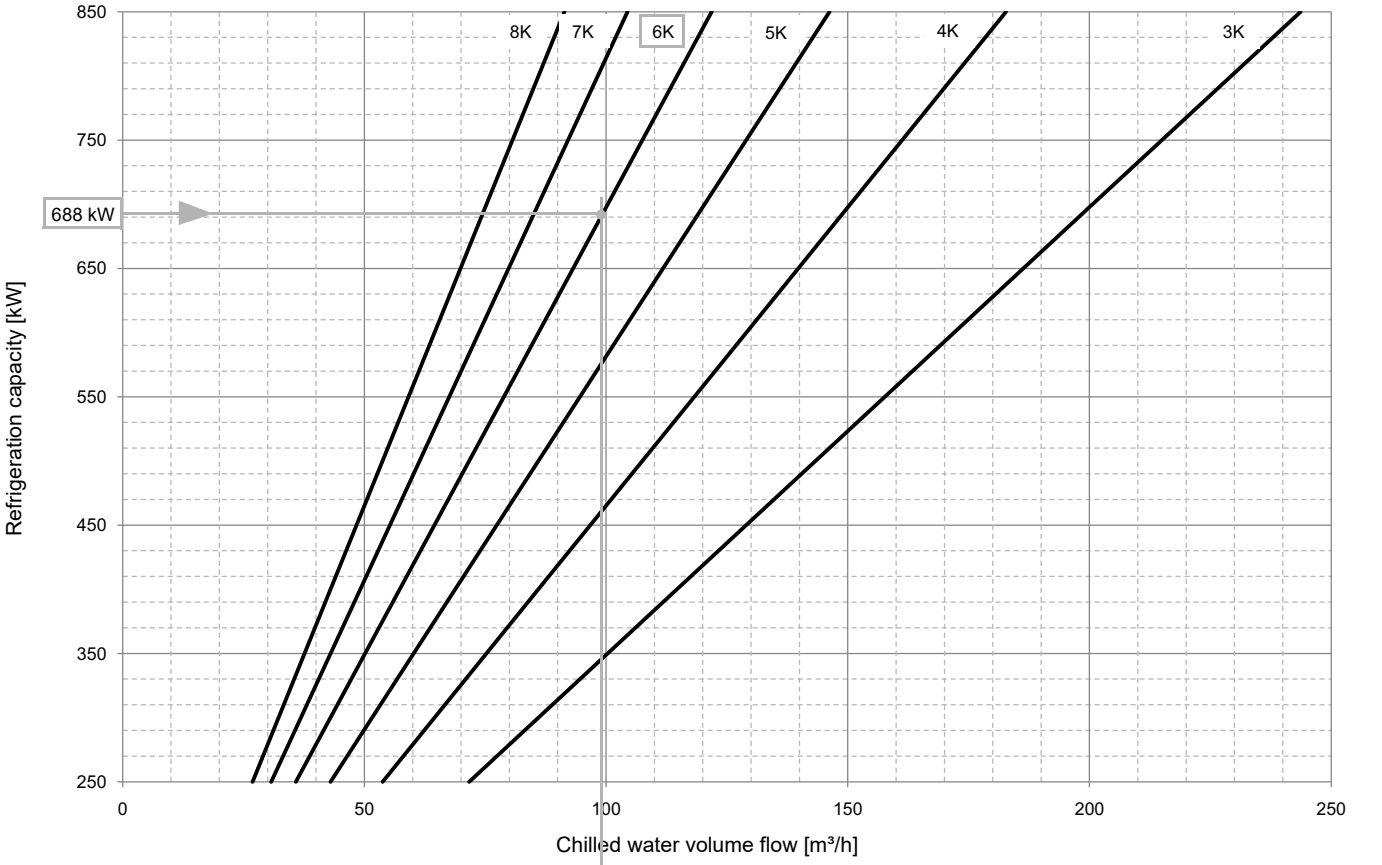
T_a	[°C]	Outside air temperature
T_{eo}	[°C]	Chilled water outlet temperature
Q_e	[kW]	Cooling duty
P	[kW]	Power consumption of unit (total)
V_e	[m³/h]	Chilled water volume flow
Δp_e	[kPa]	Water side pressure drop
–		Operation outside operating range

** The performance data are valid for the following input parameters: warm water temperature difference (inlet temperature – outlet temperature) = 5 °C*
Coolant medium = 100% water

For other temperature differences and/or media see the note on page 20 and following pages.

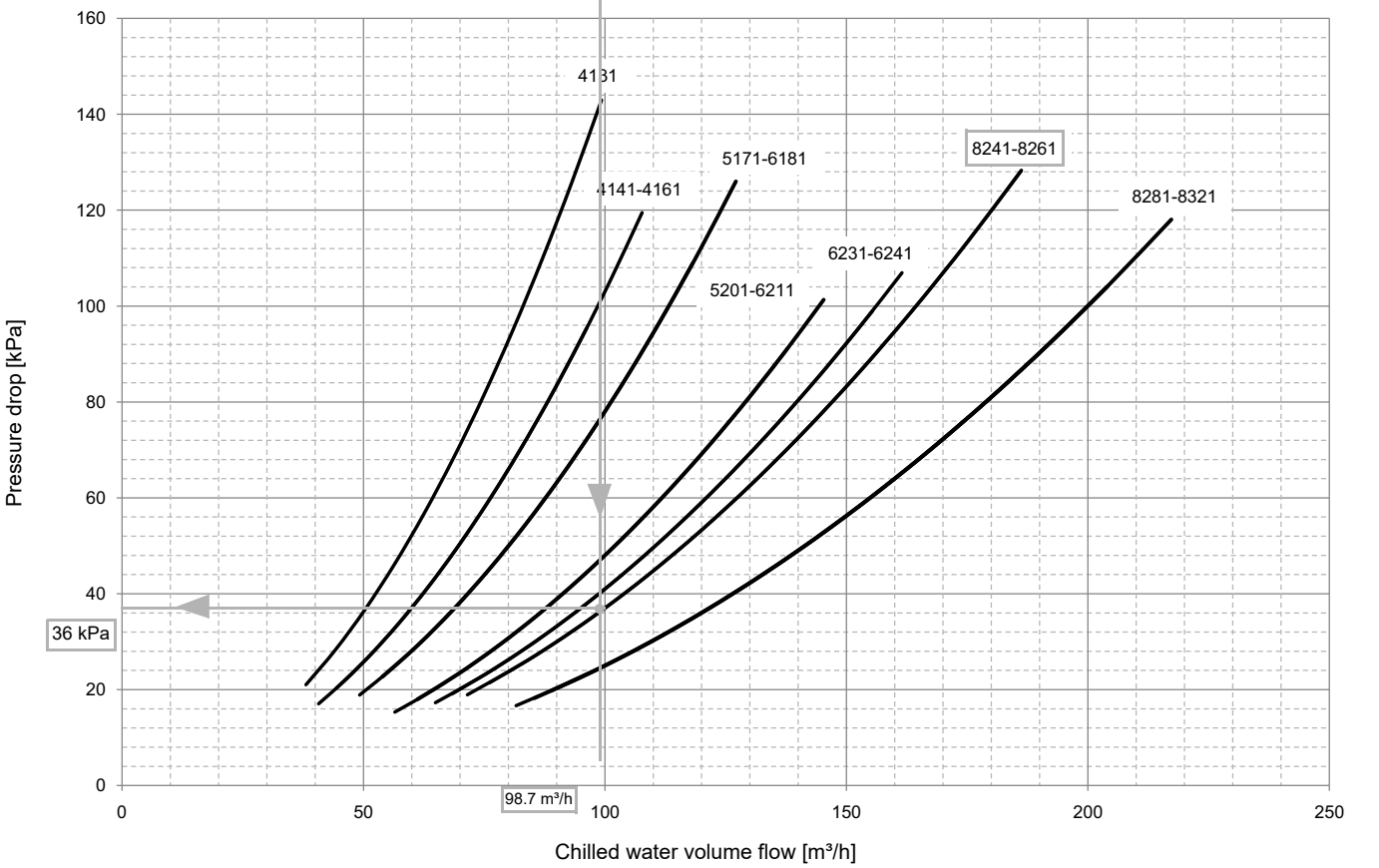
Chilled water volume flow
Unit series GLAC 4131-8321 CD2(.SL/.HE)

D. 1



Water side pressure drop
Unit series GLAC 4131-8321 CD2(.SL/.HE)

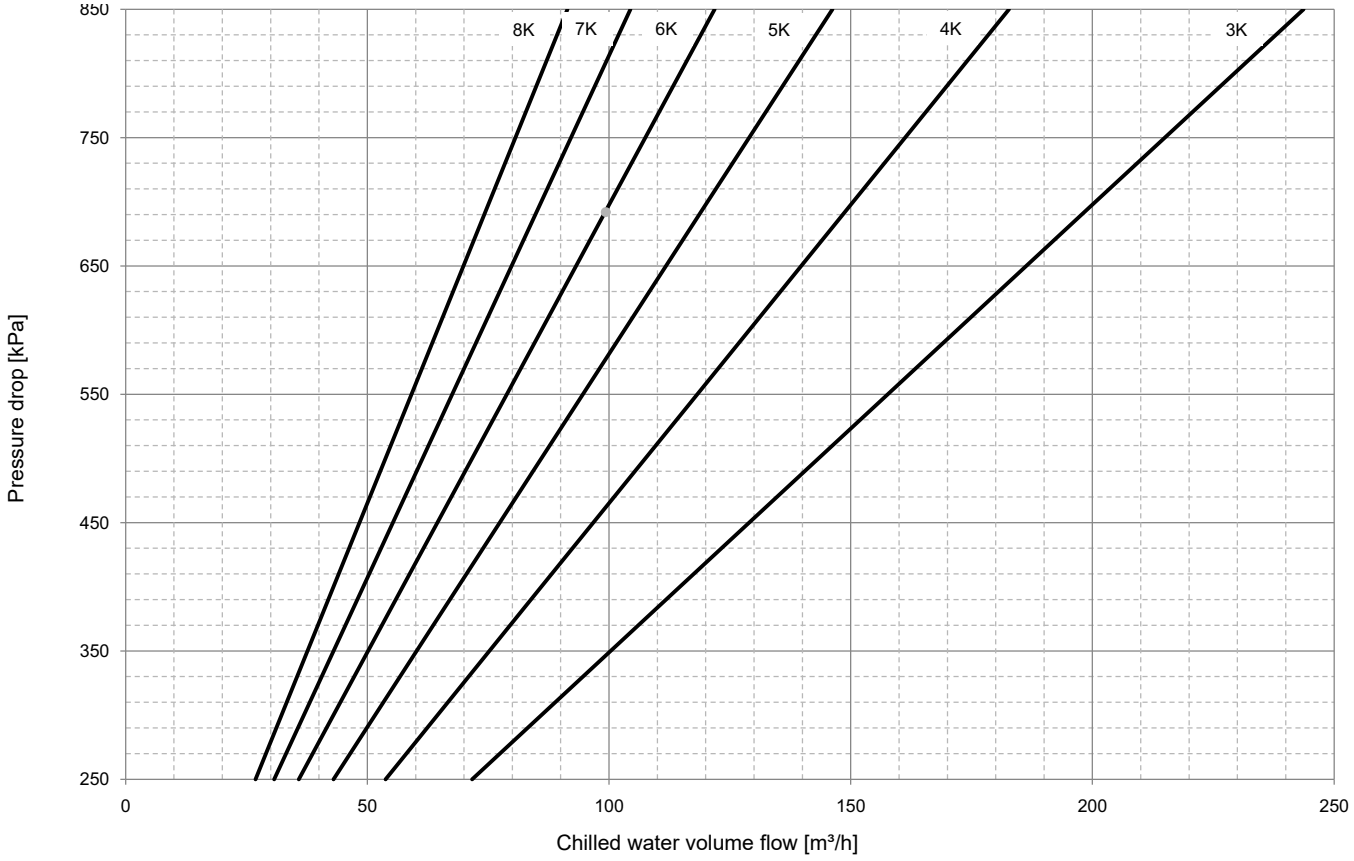
D. 2



Consider the maximum allowed water volume flow rate on page 22 and following pages.

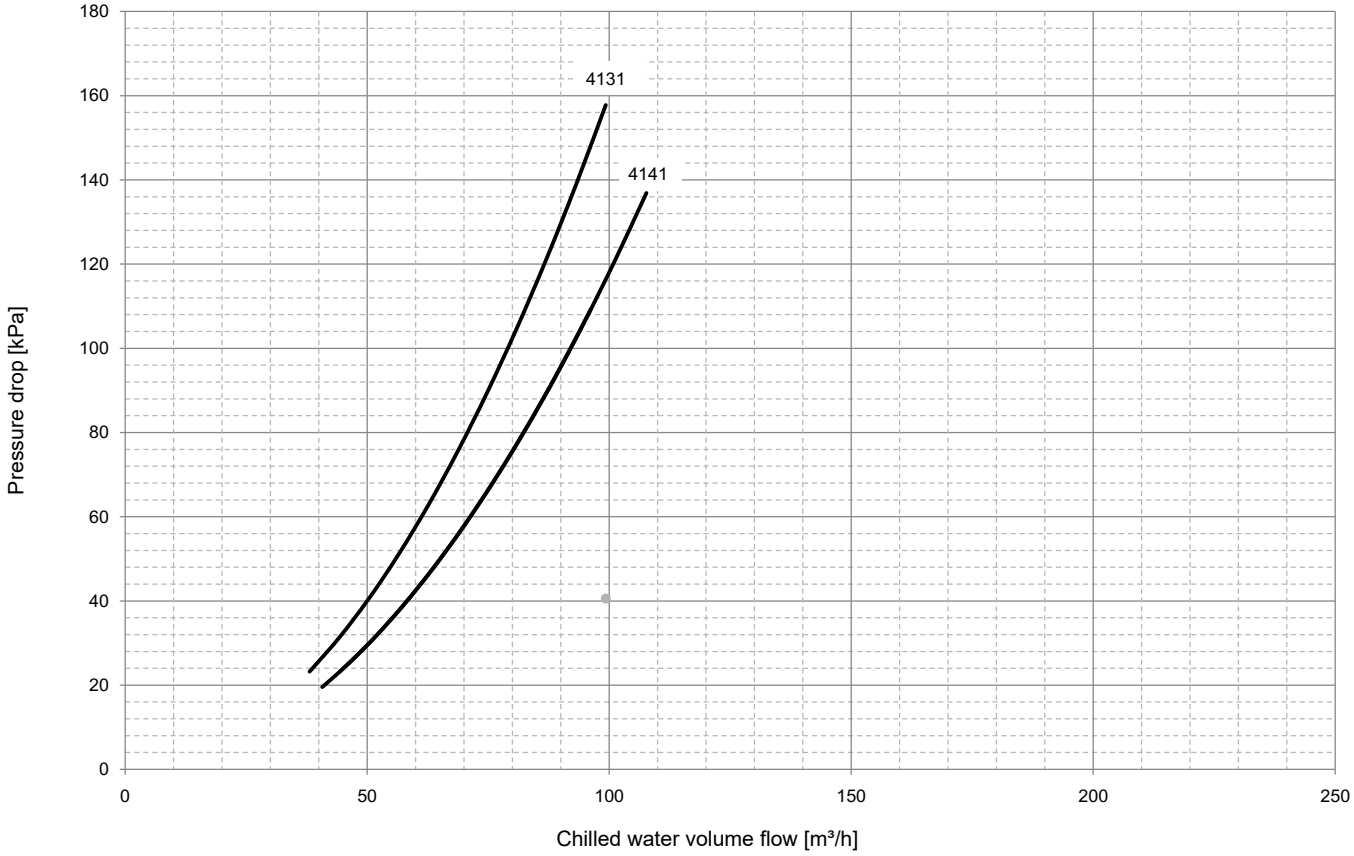
Chilled water volume flow
Unit series GLAC 4131-8321 CD2(.SL/.HE)

D. 3



Water side pressure drop
Unit series GLAC 4131-8321 CD2(.SL/.HE) with GLHM hydraulic module

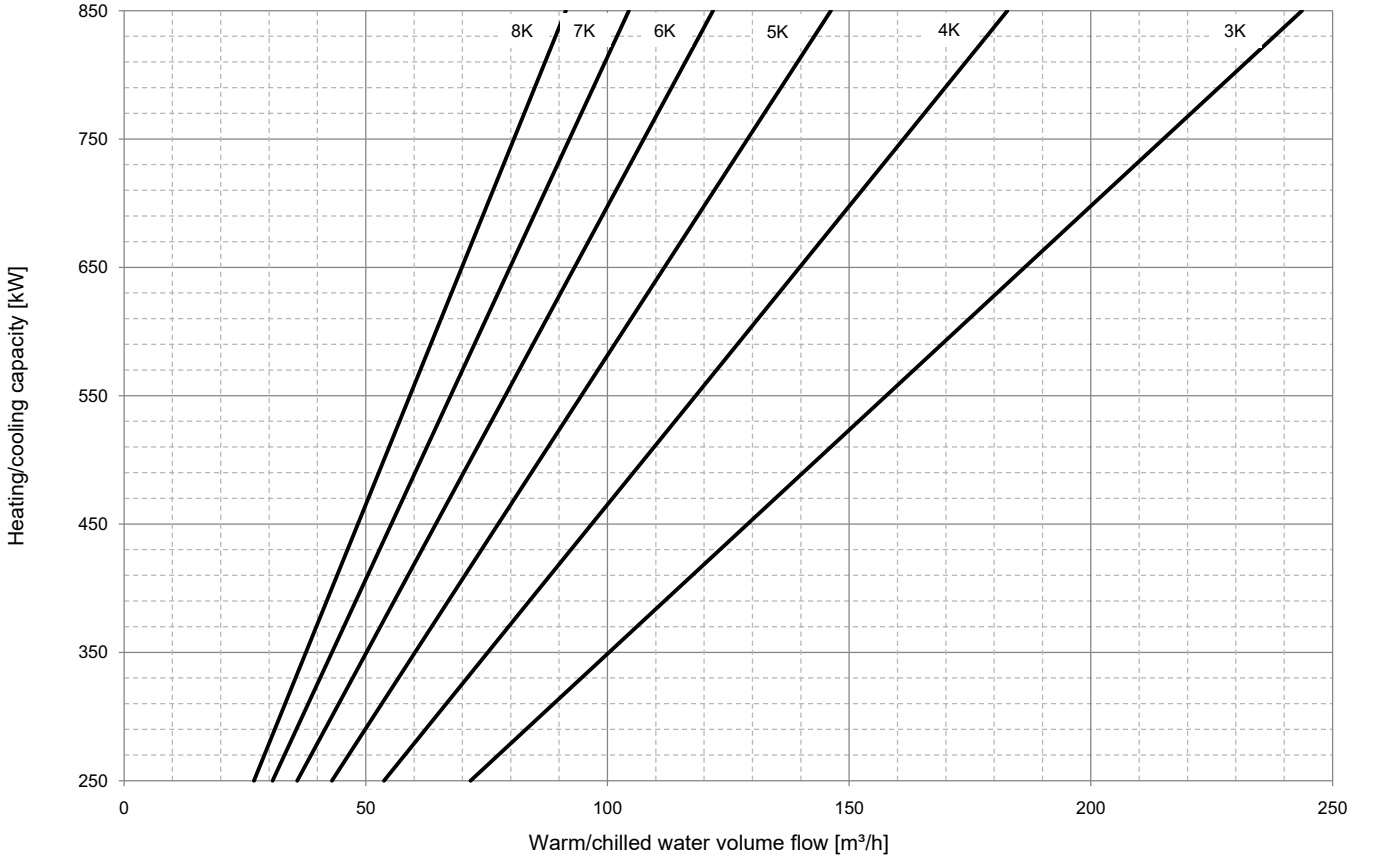
D. 4



Consider the maximum allowed water volume flow rate on page 22 and following pages.

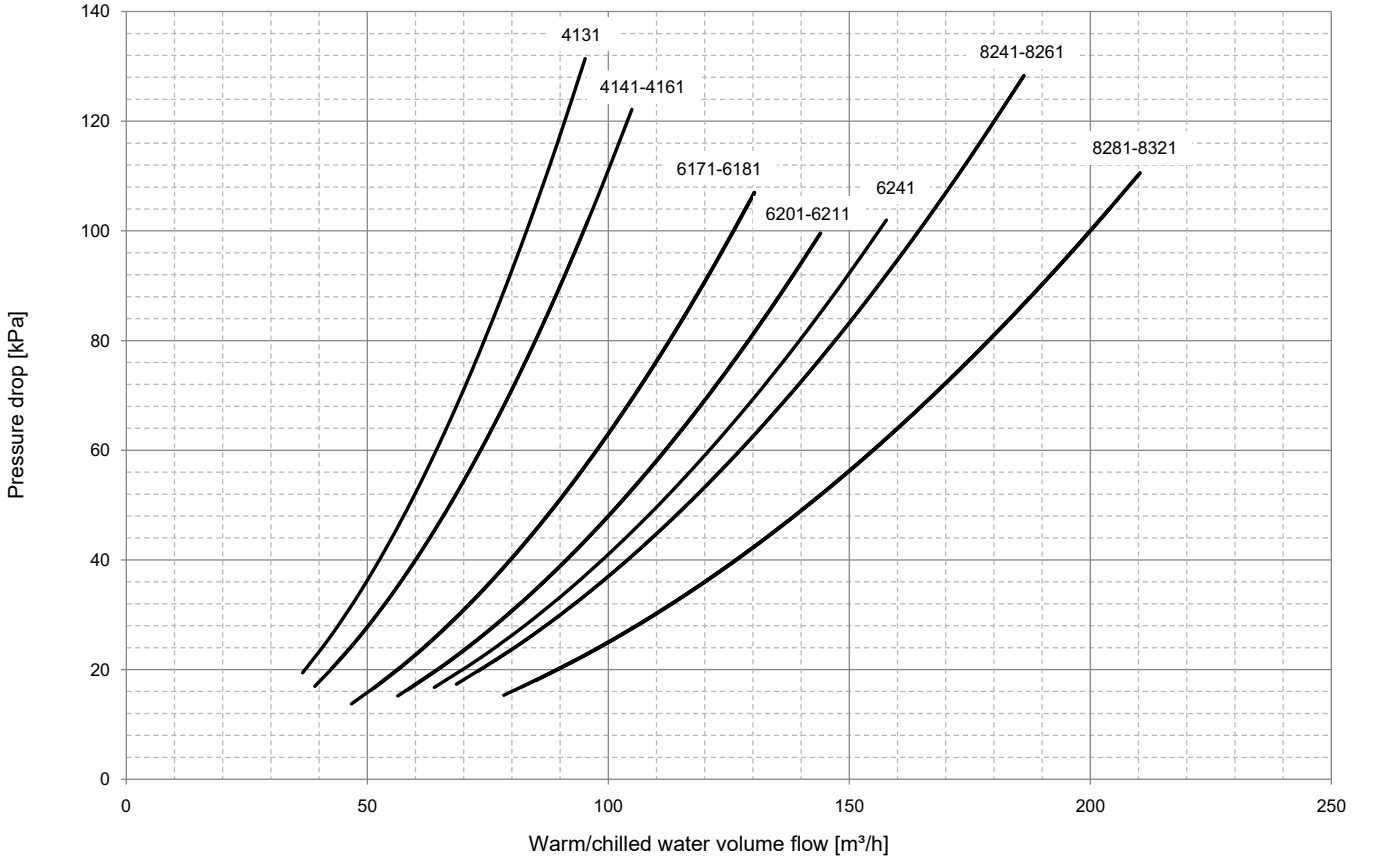
Warm and chilled water volume flow
Unit series GLAH 4131-8321 CD2(.LT)

D. 5



Water side pressure drop
Unit series GLAH 4131-8321 CD2(.LT)

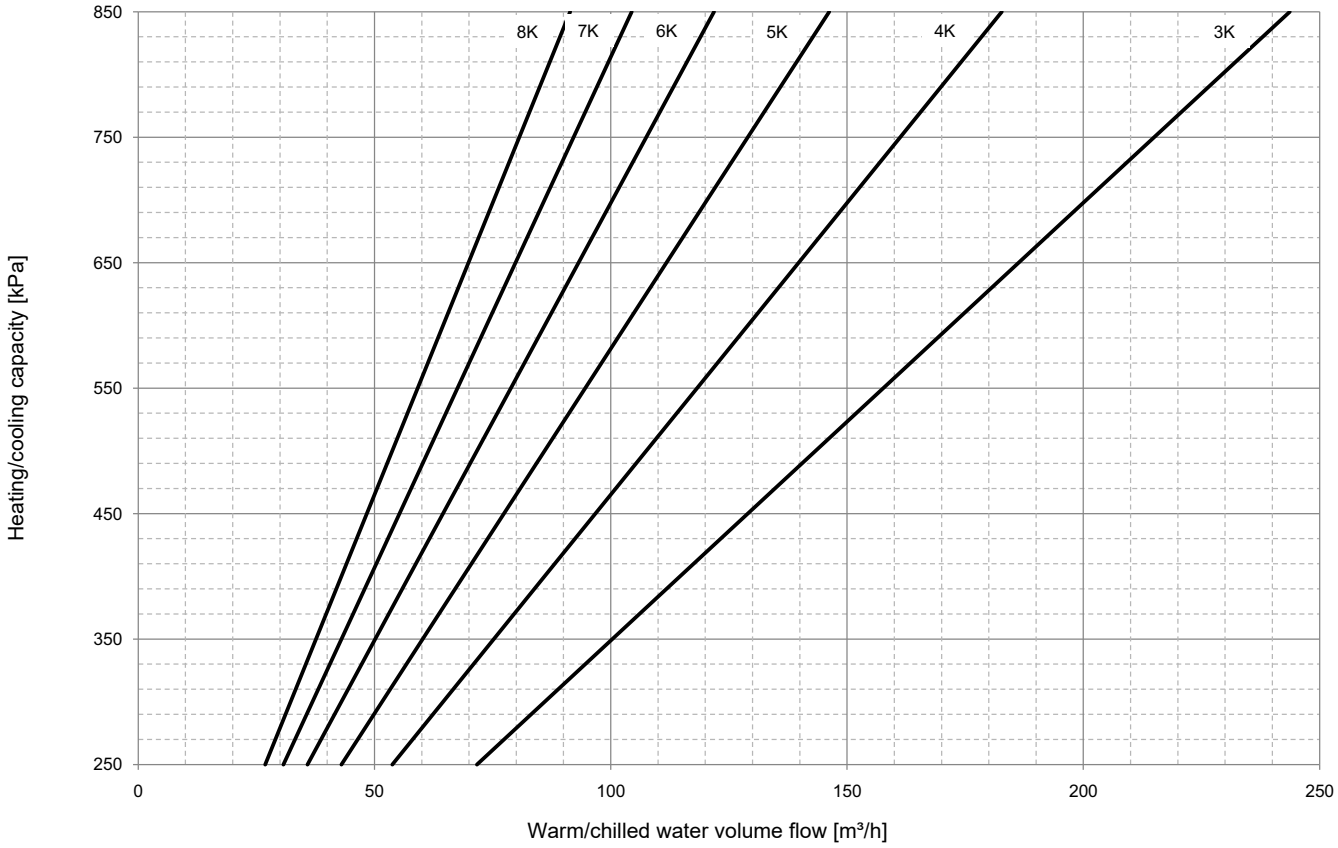
D. 6



Consider the maximum allowed water volume flow rate on page 22 and following pages.

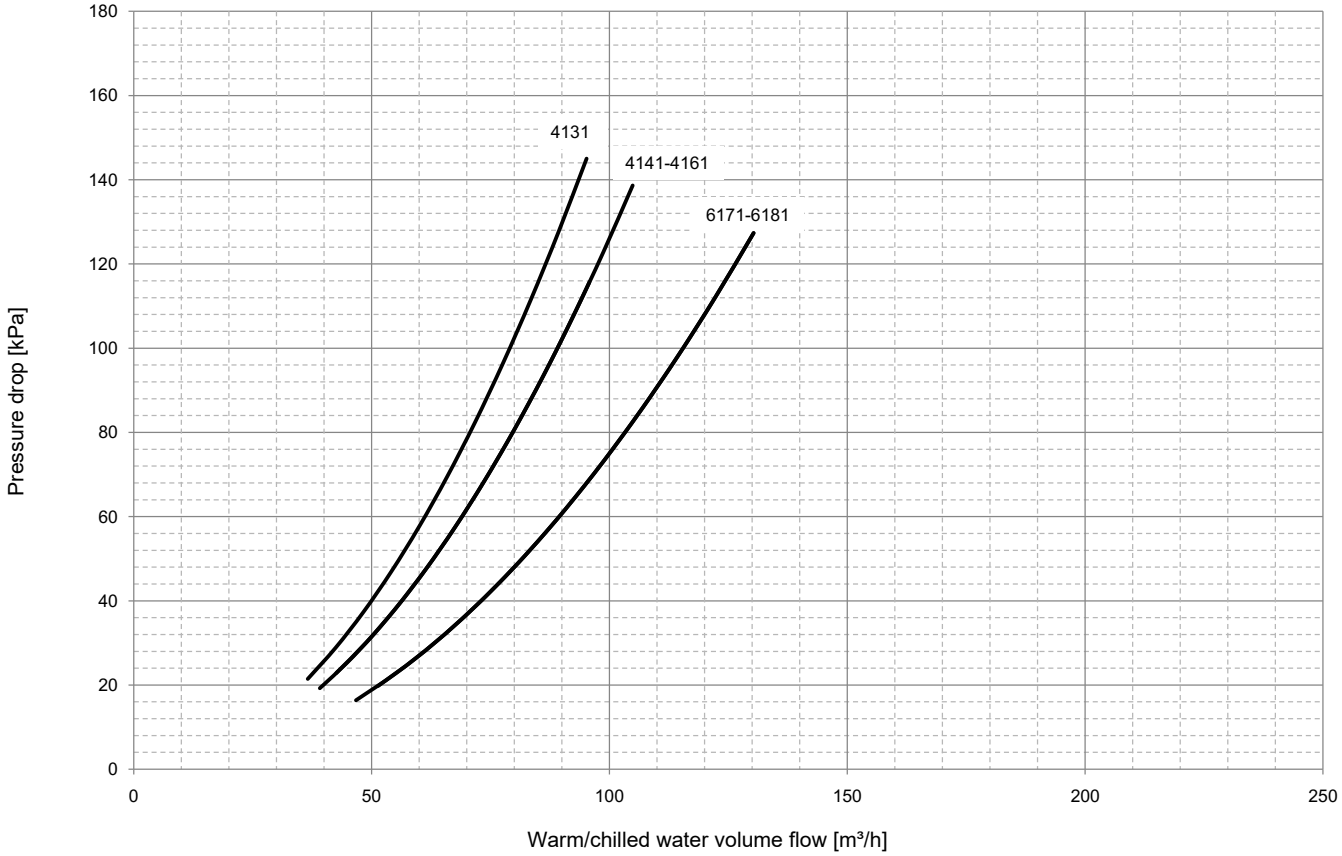
Warm and chilled water volume flow
Unit series 4131-6181 CD2(.LT)

D. 7



Water side pressure drop
Unit series 4131-6181 CD2(.LT) with GLHM hydraulic module

D. 8



Consider the maximum allowed water volume flow rate on page 22 and following pages.

Chilled water volume flow and chilled water side pressure drop (for $\Delta T_e \neq 5$ K)

The diagrams can be used to determine the chilled water flow and the pressure drop (page 64 and on).

For the procedure on how to read out data refer to the example on page page 20 and on.

NOTE!
The minimum and maximum permissible chilled water flow rates at evaporator are calculated and presented in the curve.
Extrapolation is not permitted.

Water glycol mixtures

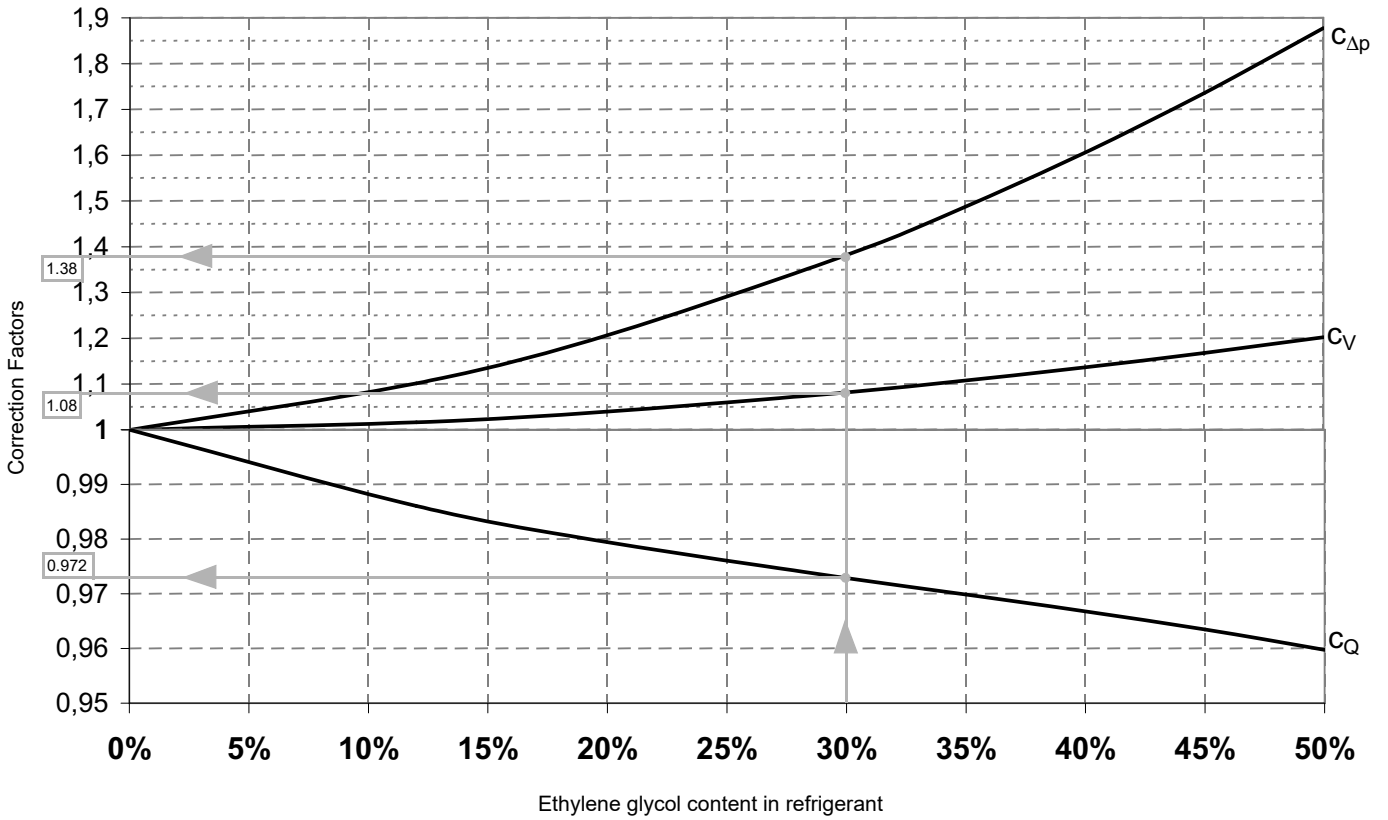
Using water-glycol mixtures instead of clean and pure water as a coolant medium changes the performance of the unit. The performance and operating data for cooling capacity, chilled water flow rate and pressure drop on the chilled water side are calculated with the help of correction factors from the diagram and conditional equations (next page).

Freezing point	[°C]	0	-5	-10	-15	-20	-25	-30	-35
Ethylene glycol content	[V-%]	0	12	20	30	35	40	45	50

Tab. 19: Freeze resistance of the cooling medium and the required glycol concentration

Correction Factors for Glycol Concentration

D. 9



c_Q - Correction factor for refrigeration/heating capacity
c_V - Correction factor for chilled/warm water volume flow
$c_{\Delta p}$ - Correction factor for water side pressure drop

NOTE!
Extrapolation is not permitted.

The values read from the diagram must be used in the following equations in order to arrive at correct values for the water glycol mixtures. Refer to the example page 20 for the procedure on calculation.

Cooling capacity
in relation to ethylene glycol concentration

If ethylene glycol is added to the cooling medium (water) the cooling capacity is reduced. Check that the necessary cooling capacity is achieved. Otherwise the next larger size must be selected (unit type) and the calculation repeated.

➔

$$\dot{Q}_{e,G} = c_Q \bullet \dot{Q}_e \qquad \text{Gl. 2}$$

$\dot{Q}_{e,G}$ [kW] - Cooling capacity in relation to ethylene glycol concentration
c_Q [-] - Correction factor for refrigeration capacity
$\dot{Q}_e$ [kW] - refrigeration capacity (from table „Performance data“)

Chilled water volume flow
depending on ethylene glycol content

➔

$$\dot{V}_{e,G} = c_V \bullet \dot{V}_e \qquad \text{Gl. 3}$$

$\dot{V}e,G$ [m³/h] - Volume flow depending on ethylene glycol content
c_V [-] - Correction factor for chilled water volume flow
$\dot{V}_e$ [m³/h] - chilled water volume flow (from table „Performance data“ or calculated value with chilled water temperature difference ≠ 5 K)

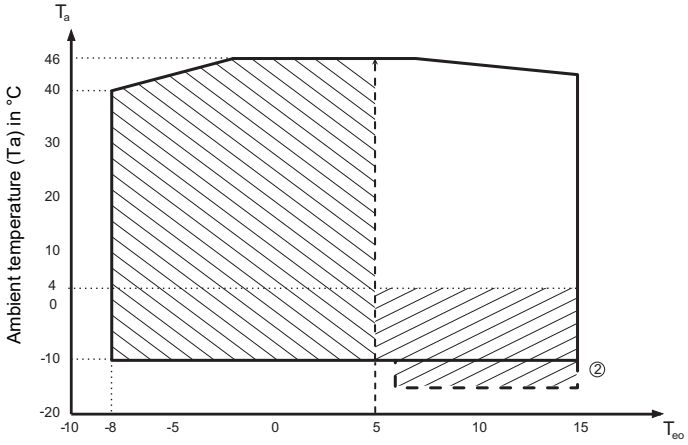
Pressure drop (water side)
in relation to ethylene glycol content

➔

$$\Delta p_{e,G} = c_{\Delta p} \bullet \Delta p_e \qquad \text{Gl. 4}$$

Δpe,G[kPa] - Pressure drop in relation to ethylene glycol concentration
cΔp [-] - Pressure drop factor in relation to unit size
Δp_e [kPa] - pressure drop (water side) (from “Performance data” table or calculated value where chilled water temperature difference ≠ 5 K)

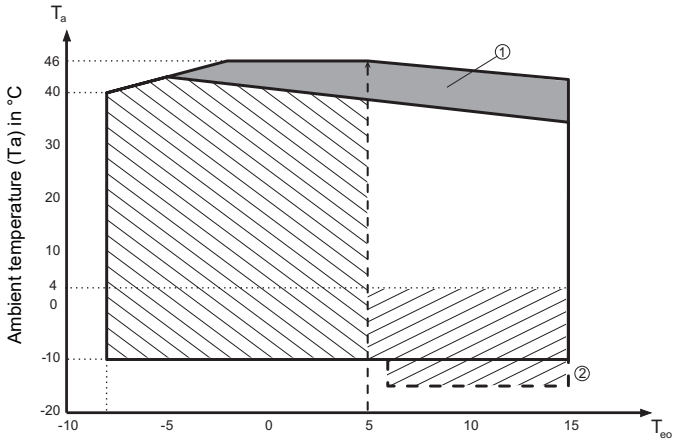
Basic unit



Chilled water outlet temperature at evaporator (Teo) in °C

SL unit

D. 10



Chilled water outlet temperature at evaporator (Teo) in °C

The operating limits apply for continuous operation of the unit and the chilled water pump given that proper commissioning, cleaning, maintenance and setup/installation of the chiller and the system is carried out.

For operational reasons water must be protected from freezing by adding glycol. FläktGroup recommends the use of at least 30% ethylene glycol.

The unit must be protected from freezing at low ambient temperatures.

① *Operation range depends on unit type.*

② *Operation at -15°C outside temperature as wind protected installation.*

GLAC #### CD2			
		Evaporator	
		Min.	Max.
Water in	[°C]	-5	23
Water out	[°C]	-8	15
Δ T with water outlet temp. > 5 °C	[K]	4	8
Δ T at water outlet temp. ≤ 5 °C	[K]	3	5

Tab. 20

For detailed design please contact your FläktGroup sales office.

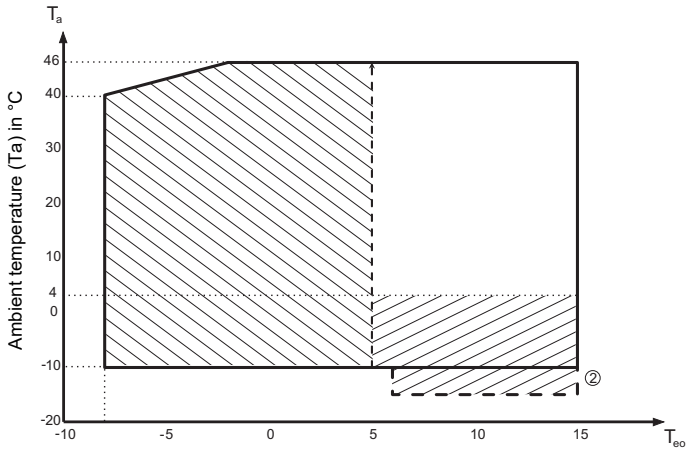
NOTE!

Ensure frost protection for the unit.
FläktGroup recommends the use of at least 30% ethylene glycol.

Relative humidity during operation shall not exceed 90 %!

HE Unit

D. 11



Chilled water outlet temperature at evaporator (Teo) in °C

The operating limits apply for continuous operation of the unit and the chilled water pump given that proper commissioning, cleaning, maintenance and setup/installation of the chiller and the system is carried out.

For operational reasons water must be protected from freezing by adding glycol. FläktGroup recommends the use of at least 30% ethylene glycol.

The unit must be protected from freezing at low ambient temperatures.

② *Operation at -15°C outside temperature as wind protected installation.*

GLAC #### CD2			
		Evaporator	
		Min.	Max.
Water in	[°C]	-5	23
Water out	[°C]	-8	15
Δ T with water outlet temp. > 5 °C	[K]	4	8
Δ T at water outlet temp. ≤ 5 °C	[K]	3	5

Tab. 21

For detailed design please contact your FläktGroup sales office.

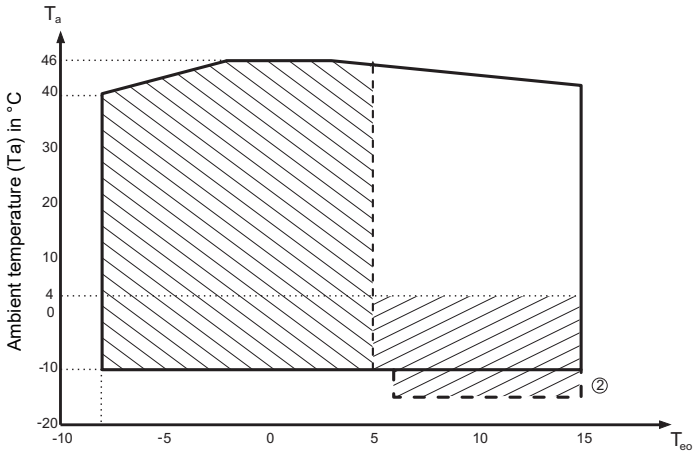
NOTE!
Ensure frost protection for the unit. FläktGroup recommends the use of at least 30% ethylene glycol.

Relative humidity during operation shall not exceed 90 %!

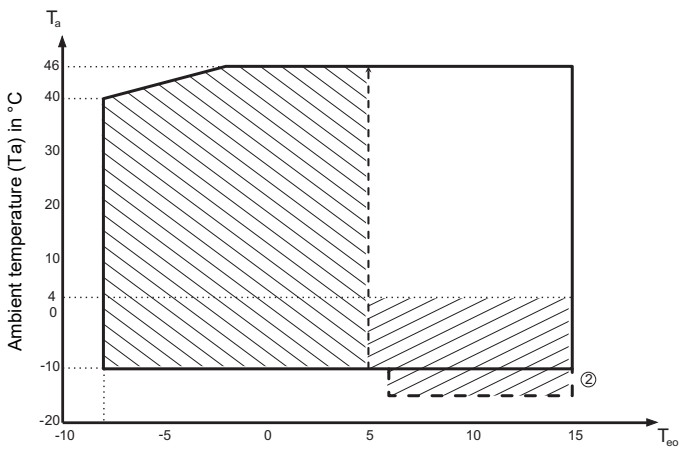
Basic unit

LT unit

D. 12



Chilled water outlet temperature at evaporator (Teo) in °C



Chilled water outlet temperature at evaporator (Teo) in °C

The operating limits apply for continuous operation of warm and chilled water pump given that the correct commissioning, cleaning, maintenance and setup/installation of the heat pumps and the system is carried out.

For operational reasons water must be protected from freezing by adding glycol. FläktGroup recommends the use of at least 30% ethylene glycol.

The unit must be protected from freezing at low ambient temperatures.

② *Operation at -15°C outside temperature as wind protected installation.*

Cooling mode:

GLAH #### CD2			
		Evaporator	
		Min.	Max.
Water in	[°C]	-5	23
Water out	[°C]	-8	15
Δ T with water outlet temp. > 5 °C	[K]	4	8
Δ T with water outlet temp. ≤ 5 °C	[K]	3	5

Heating mode:

GLAH #### CD2			
		Evaporator	
		Min.	Max.
Water in	[°C]	18	51
Water out	[°C]	26	55
Δ T in condenser	[K]	4	8

Tab. 22

For detailed design please contact your FläktGroup sales office.

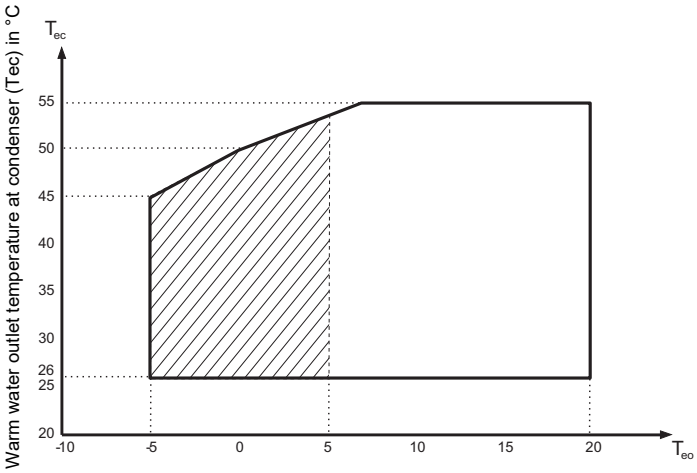
NOTE!

Ensure frost protection for the unit. FläktGroup recommends the use of at least 30% ethylene glycol.

Relative humidity during operation shall not exceed 90 %!

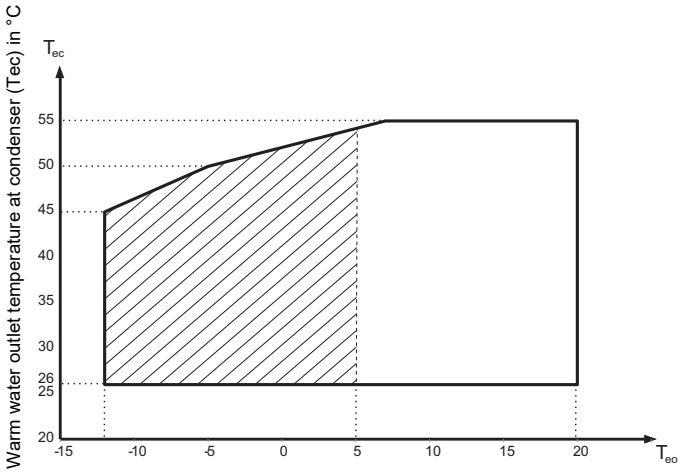
D. 13

Basic unit



Ambient temperature (Ta) in °C

LT unit



Ambient temperature (Ta) in °C

The operating limits apply for continuous operation of warm and chilled water pump given that the correct commissioning, cleaning, maintenance and setup/installation of the heat pumps and the system is carried out.

The unit must be protected from freezing at low ambient temperatures.

Cooling mode:

GLAH #### CD2			
		Evaporator	
		Min.	Max.
Water in	[°C]	-5	23
Water out	[°C]	-8	15
Δ T with water outlet temp. > 5 °C	[K]	4	8
Δ T with water outlet temp. ≤ 5 °C	[K]	3	5

Heating mode:

GLAH #### CD2			
		Evaporator	
		Min.	Max.
Water in	[°C]	18	51
Water out	[°C]	26	55
Δ T in condenser	[K]	4	8

Tab. 23

For detailed design please contact your FläktGroup sales office.

NOTE!

Ensure frost protection for the unit. FläktGroup recommends the use of at least 30% ethylene glycol.

Relative humidity during operation shall not exceed 90 %!

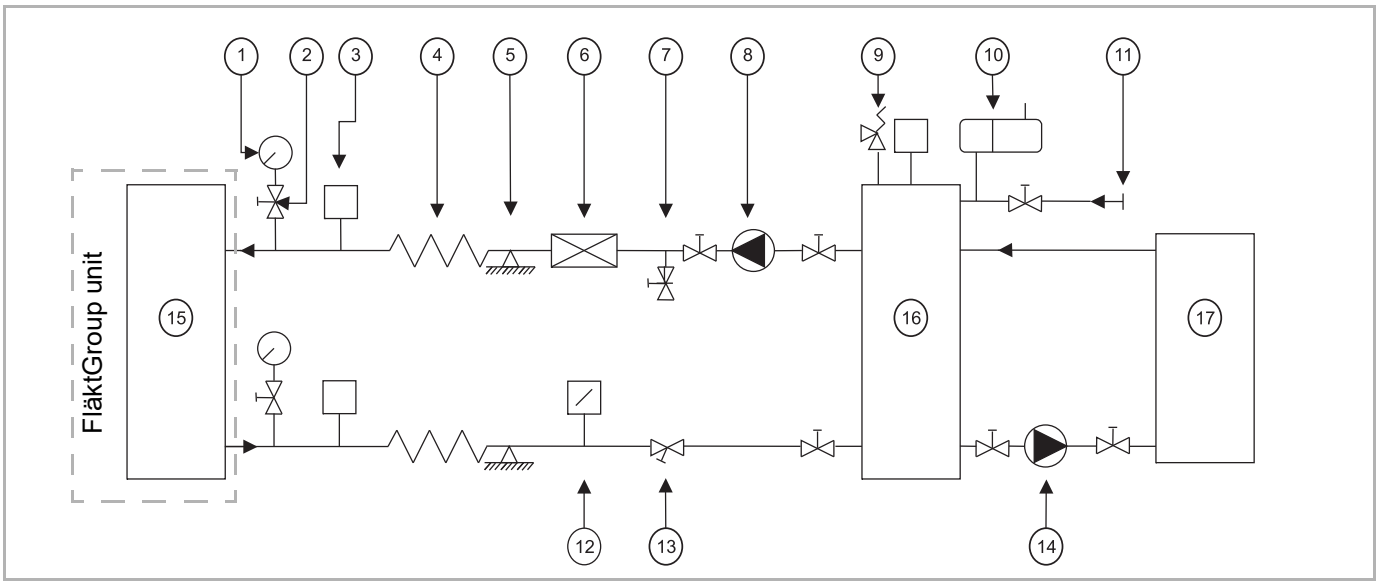


Fig. 16: Hydraulic circuit of twin-circuit buffer tank

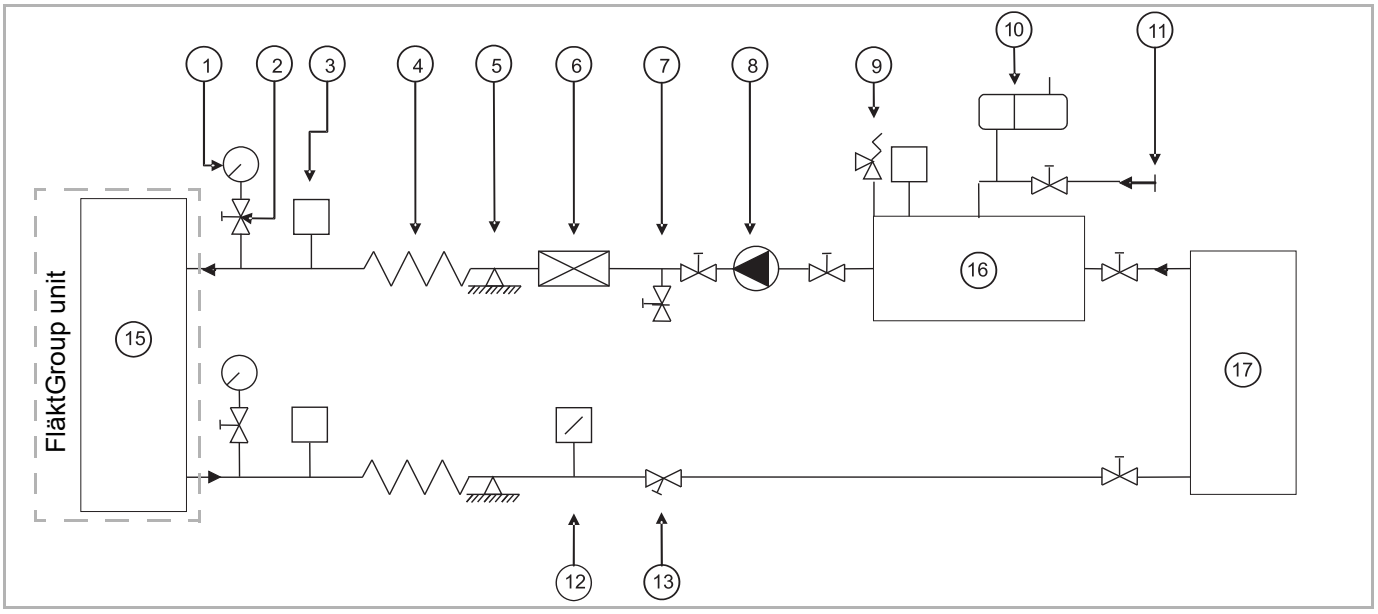


Fig. 17: Hydraulic circuit of single-circuit buffer tank

1: Pressure gauge
2: Shut off cock
3: Automatic venting
4: Vibration damping connection
5: Unit-independent pipeline fixing point
6: Water filter (maximum mesh size 1 mm^2)
7: Drain valve
8: Pump – primary circuit
9: Safety valve
10: Expansion tank
11: Filling valve
12: FläktGroup flow switch (unit standard for GLHM)
13: Balancing valve
14: Pump – secondary circuit
15: FläktGroup unit
16: Buffer tank/hydraulic switch suitable for chilled water systems
17: Consumer

Items 4, 5, 6 and 12 are also specified by FläktGroup in addition to the internal parts required by legal regulations.

DAMAGE TO THE UNIT!

Under all circumstances please remember to install a water filter before direct inlet into the water side heat exchanger. With water cooled units both the evaporator and condenser must be protected. The water filter prevents formation of dirt and scale on heat exchangers. The water filter is a requirement for safe and trouble-free operation of the unit and in such a way this requirement constitutes an integral part for the validity of the guarantee.

Consider that a constant water volume flow must be secured in the evaporator/condenser during unit operation. Refer to the "Planning Manual on Chillers" for further instructions on hydraulic integration of chillers and heat pumps.

Sound Level Basic Unit

Unit type	Total sound level		Octave band [Hz]							
	Sound power [1] [dB(A)]	Sound pressure level [2] [dB(A)] 10 m	63	125	250	500	1000	2000	4000	8000
			Sound power level [dB]							
4131	96	64	99	98	95	93	92	87	81	76
4141	96	64	99	98	95	93	92	87	81	76
4161	96	64	99	98	95	93	92	87	81	76
5171	96	64	99	98	95	93	92	87	81	76
6181	97	65	100	99	96	94	93	88	82	76
5201	97	65	100	99	96	94	93	88	82	76
6211	97	64	100	99	96	94	93	88	82	76
6231	97	64	100	99	96	94	93	88	82	76
6241	98	65	100	99	97	95	94	89	83	77
8241	98	65	100	99	97	95	94	89	83	77
8261	98	65	100	99	97	95	94	89	83	77
8281	99	66	101	100	98	96	95	90	84	78
8301	99	66	101	100	98	96	95	90	84	78
8321	99	66	101	100	98	96	95	90	84	78

Tab. 24: Sound values basic unit

***** ***Data on operating conditions***
Data applies only to water inlet and outlet temperature of 12 °C/ 7 C° and ambient air temperatures of 35 °C.

[1] *Specification of sound power (EUROVENT certified value)*
Manufacturer determines the sound power value for Eurovent certified units in accorsdance with ISO 9614 and Eurovent 8/1 standard. For units, that are not participating in the Eurovent certification programme, sound power is determined in accordance with the ISO 3744 standard.

NOTE!
This certification expressly refers to sound power in dB(A), which thus constitutes obligatory data in this case.

2 Specification of sound power level
The sound pressure level is determined according to enveloping surface method with a reflecting plane (Q=2). The above-mentioned distance refers to external dimensions of the unit. ***Clearance of 10 m is valid for external dimensions of the unit.***
For the sound pressure level the following correction values can be used:
Sound pressure level at 5 m: +5 dB added to sound pressure level in 10 meters distance
Sound pressure level at 15 m: -3 dB deducted from sound pressure level in 10 meters distance
Sound pressure level at 20 m: -6 dB deducted from sound pressure level in 10 meters distance
The values of octave band are average values calculated on the basis sound power level.

NOTE!
Specific sound level calculations, that are valid for particular installation location, can only be carried out by an acoustics engineer, commissioned by third party.

Sound level SL unit*

Unit type	Total sound level		Octave band [Hz]							
	Sound power[1] [dB(A)]	Sound pressure level [2] [dB(A)] 10 m	63	125	250	500	1000	2000	4000	8000
			Sound power level [dB]							
4131	86	54	88	87	86	84	81	76	69	63
4141	86	54	88	87	86	84	81	76	69	63
4161	86	54	88	87	86	84	81	76	69	63
5171	87	54	89	88	87	85	82	77	70	64
6181	87	54	89	88	87	85	82	77	70	64
5201	87	54	89	88	87	85	82	77	70	64
6211	87	54	89	88	87	85	82	77	70	64
6231	88	55	90	89	88	86	83	78	71	65
6241	88	55	90	89	88	86	83	78	71	65
8241	88	55	90	89	88	86	83	78	71	65
8261	89	56	91	90	89	87	84	79	72	66
8281	90	57	92	91	90	88	85	80	73	67
8301	90	57	92	91	90	88	85	80	73	67
8321	90	57	92	91	90	88	85	80	73	67

Tab. 25: Sound values SL unit

**** Data on operating conditions***
Data applies only to water inlet and outlet temperature of 12 °C/ 7 C° and ambient air temperatures of 35 °C.

[1] Specification of sound power (EUROVENT certified value)
Manufacturer determines the sound power value for Eurovent certified units in accorsdance with ISO 9614 and Eurovent 8/1 standard. For units, that are not participating in the Eurovent certification programme, sound power is determined in accordance with the ISO 3744 standard.

NOTE!
This certification expressly refers to sound power in dB(A), which thus constitutes obligatory data in this case.

2 Specification of sound power level
The sound pressure level is determined according to enveloping surface method with a reflecting plane (Q=2). The above-mentioned distance refers to external dimensions of the unit. ***Clearance of 10 m is valid for external dimensions of the unit.***
For the sound pressure level the following correction values can be used:
Sound pressure level at 5 m: +5 dB added to sound pressure level in 10 meters distance
Sound pressure level at 15 m: -3 dB deducted from sound pressure level in 10 meters distance
Sound pressure level at 20 m: -6 dB deducted from sound pressure level in 10 meters distance
The values of octave band are average values calculated on the basis sound power level.

NOTE!
Specific sound level calculations, that are valid for particular installation location, can only be carried out by an acoustics engineer, commissioned by third party.

Sound level HE unit

Unit type	Total sound level		Octave band [Hz]							
	Sound power [1] [dB(A)]	Sound pressure level [2] [dB(A)] 10 m	63	125	250	500	1000	2000	4000	8000
			Sound power level [dB]							
4131	97	65	100	99	96	94	93	88	82	76
4141	97	65	100	99	96	94	93	88	82	76
4161	97	65	100	99	96	94	93	88	82	76
5171	97	64	100	99	96	94	93	88	82	76
6181	98	65	100	99	97	95	94	89	83	77
5201	98	65	100	99	97	95	94	89	83	77
6211	98	65	100	99	97	95	94	89	83	77
6231	99	66	101	100	98	96	95	90	84	78
6241	99	66	101	100	98	96	95	90	84	78
8241	99	66	101	100	98	96	95	90	84	78
8261	99	66	101	100	98	96	95	90	84	78
8281	100	67	101	101	99	97	96	91	85	78
8301	100	67	101	101	99	97	96	91	85	78
8321	100	67	101	101	99	97	96	91	85	78

Tab. 26: Sound values HE unit

**** Data on operating conditions***
Data applies only to water inlet and outlet temperature of 12 °C/ 7 C° and ambient air temperatures of 35 °C.

[1] Specification of sound power (EUROVENT certified value)
Manufacturer determines the sound power value for Eurovent certified units in accorsdance with ISO 9614 and Eurovent 8/1 standard. For units, that are not participating in the Eurovent certification programme, sound power is determined in accordance with the ISO 3744 standard.

NOTE!
This certification expressly refers to sound power in dB(A), which thus constitutes obligatory data in this case.

2 Specification of sound power level
The sound pressure level is determined according to enveloping surface method with a reflecting plane (Q=2). The above-mentioned distance refers to external dimensions of the unit. ***Clearance of 10 m is valid for external dimensions of the unit.***
For the sound pressure level the following correction values can be used:
Sound pressure level at 5 m: +5 dB added to sound pressure level in 10 meters distance
Sound pressure level at 15 m: -3 dB deducted from sound pressure level in 10 meters distance
Sound pressure level at 20 m: -6 dB deducted from sound pressure level in 10 meters distance
The values of octave band are average values calculated on the basis sound power level.

NOTE!
Specific sound level calculations, that are valid for particular installation location, can only be carried out by an acoustics engineer, commissioned by third party.

Sound level of basic unit

Unit type	Total sound level		Octave band [Hz]							
	Sound power [1][dB(A)]	Sound pressure level [2] [dB(A)] 10 m	63	125	250	500	1000	2000	4000	8000
			Sound power level [dB]							
4131	96	64	99	98	95	93	92	87	81	76
4141	96	64	99	98	95	93	92	87	81	76
4161	96	64	99	98	95	93	92	87	81	76
6171	96	64	99	98	95	93	92	87	81	76
6181	97	65	100	99	96	94	93	88	82	76

Tab. 27: Sound values basic unit

**** Data on operating conditions***
Data applies only to water inlet and outlet temperature of 12 °C/ 7 C° and ambient air temperatures of 35 °C.

[1] Specification of sound power (EUROVENT certified value)
Manufacturer determines the sound power value for Eurovent certified units in accorsdance with ISO 9614 and Eurovent 8/1 standard. For units, that are not participating in the Eurovent certification programme, sound power is determined in accordance with the ISO 3744 standard.

NOTE!
This certification expressly refers to sound power in dB(A), which thus constitutes obligatory data in this case.

2 Specification of sound power level
The sound pressure level is determined according to enveloping surface method with a reflecting plane (Q=2). The above-mentioned distance refers to external dimensions of the unit. ***Clearance of 10 m is valid for external dimensions of the unit.***
For the sound pressure level the following correction values can be used:
Sound pressure level at 5 m: +5 dB added to sound pressure level in 10 meters distance
Sound pressure level at 15 m: -3 dB deducted from sound pressure level in 10 meters distance
Sound pressure level at 20 m: -6 dB deducted from sound pressure level in 10 meters distance
The values of octave band are average values calculated on the basis sound power level.

NOTE!
Specific sound level calculations, that are valid for particular installation location, can only be carried out by an acoustics engineer, commissioned by third party.

Sound level of LT unit

Unit type	Total sound level		Octave band [Hz]							
	Sound power [1] [dB(A)]	Sound pressure level [2] [dB(A)] 10 m	63	125	250	500	1000	2000	4000	8000
			Sound power level [dB]							
4131	97	65	100	99	96	94	93	88	82	76
4141	97	65	100	99	96	94	93	88	82	76
4161	97	65	100	99	96	94	93	88	82	76
6171	97	64	100	99	96	94	93	88	82	76
6181	98	65	100	99	97	95	94	89	83	77
6201	98	65	100	99	97	95	94	89	83	77
6211	98	65	100	99	97	95	94	89	83	77
6241	99	66	101	100	98	96	95	90	84	78
8241	99	66	101	100	98	96	95	90	84	78
8261	99	66	101	100	98	96	95	90	84	78
8281	100	67	101	101	99	97	96	91	85	78
8301	100	67	101	101	99	97	96	91	85	78
8321	100	67	101	101	99	97	96	91	85	78

Tab. 28: Sound values HE unit

**** Data on operating conditions***
Data applies only to water inlet and outlet temperature of 12 °C/ 7 C° and ambient air temperatures of 35 °C.

[1] Specification of sound power (EUROVENT certified value)
Manufacturer determines the sound power value for Eurovent certified units in accorsdance with ISO 9614 and Eurovent 8/1 standard. For units, that are not participating in the Eurovent certification programme, sound power is determined in accordance with the ISO 3744 standard.

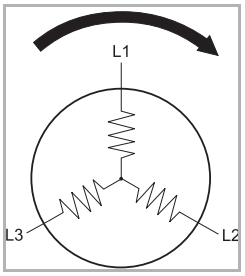
NOTE!
This certification expressly refers to sound power in dB(A), which thus constitutes obligatory data in this case.

2 Specification of sound power level
The sound pressure level is determined according to enveloping surface method with a reflecting plane (Q=2). The above-mentioned distance refers to external dimensions of the unit. ***Clearance of 10 m is valid for external dimensions of the unit.***
For the sound pressure level the following correction values can be used:
Sound pressure level at 5 m: +5 dB added to sound pressure level in 10 meters distance
Sound pressure level at 15 m: -3 dB deducted from sound pressure level in 10 meters distance
Sound pressure level at 20 m: -6 dB deducted from sound pressure level in 10 meters distance
The values of octave band are average values calculated on the basis sound power level.

NOTE!
Specific sound level calculations, that are valid for particular installation location, can only be carried out by an acoustics engineer, commissioned by third party.

Before you start setting up the unit's electrical connections, check the following:

– Before the electric connection is carried out, the unit has to charged with water or water/glycol mixture. Dry run of pumps should be by all means avoided!
– The properties of the mains power supply shall comply with EN 60204-1 regulations and the power requirements of the unit.
– The mains power supply voltage shall have a rating of ± 10% with a maximum phase difference of 3%. Do not operate the motors if the voltage difference between the phases exceeds 3% as this will invalidate all warranty claims. For checking, use the following formula (see example).



$$\text{Voltage deviation } \Delta U_{max} = \frac{\text{max. voltage deviation from average value}}{\text{average voltage } U_m} \times 100$$

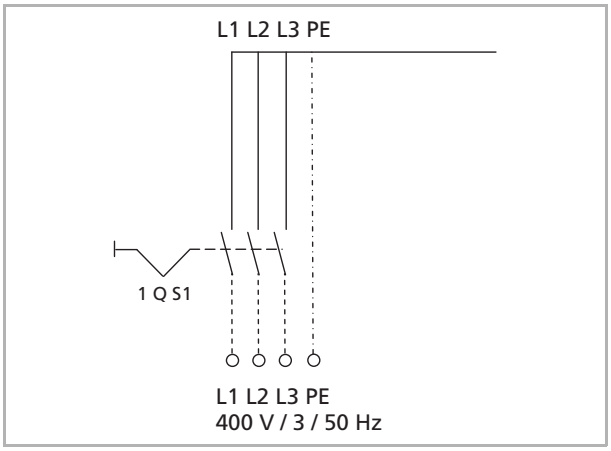
EXAMPLE

	Input data		**Result**
Requirements You must first determine certain input data/measured values.	Rated voltage	➔ 400 V/50 Hz/3 phases	
	Voltage between phases	➔ L1/L2 = 409 V; L2/L3 = 398 V; L1/L3 = 396 V	
1. Step Determine the average voltage U_m	Average voltage	➔ $U_m = \frac{\Sigma U}{3}$ $\frac{(409 + 398 + 396)}{3} = 401$ V	➔ **U_m = 401 V**
2. Step Determine the maximum voltage deviation ΔU_{max}	Voltage deviation ΔU_{max} in %? U_{max} = 409 V U_m = 401 V	➔ $\Delta U_{max} = \frac{\text{max. voltage deviation}}{U_m} \times 100$ $\frac{(409 - 401)\text{V}}{401\text{ V}} \times 100 = 2$ %	➔ **ΔU_{max} = 2 % ✓**

NOTE!

When connecting the supply voltage, make sure to observe the **clockwise rotating direction**! If the rotation direction is incorrect, an adjustment shall be performed by changing the phases using the main connection of the unit. Change the phase sequence of the power supply line by others – never change the wiring in the unit switch cabinet.

Connecting power supply using the main isolator of chiller



GLAC 4131-8321 CD2(.SL/.HE)
GLAH 4131-8321 CD2(.LT)
Fig. 18: GLAC/H main isolator

Integrating common fault signal

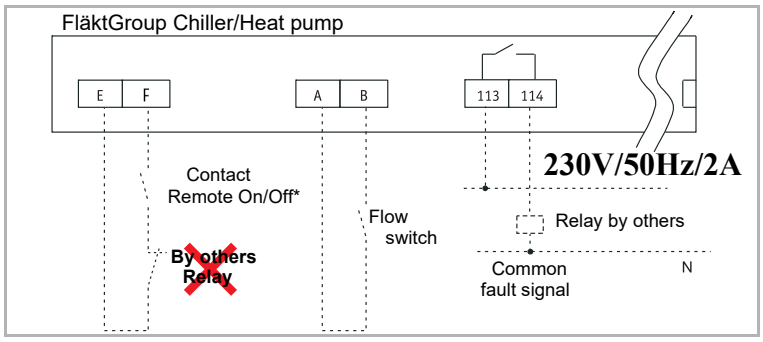


Fig. 19: Electric integration of error message

Terminals: A - B: Connecting the flow switch by others
E - F: Remote contact for switching the unit off and on via NO contact by others
113 - 114: Common fault signal (voltage by others max. 230 V AC/50 Hz/2 A)

DAMAGE TO THE UNIT!

✗ Do **not** open the remote on/off contact, e.g. via the changeover contact of the relay by others, if the system is faulty.

– In such a way the error can be reset.
– The cause of the malfunction cannot be determined.
– The entire unit stops operating although it is possible that only one refrigeration circuit is affected.

Integrating flow switch

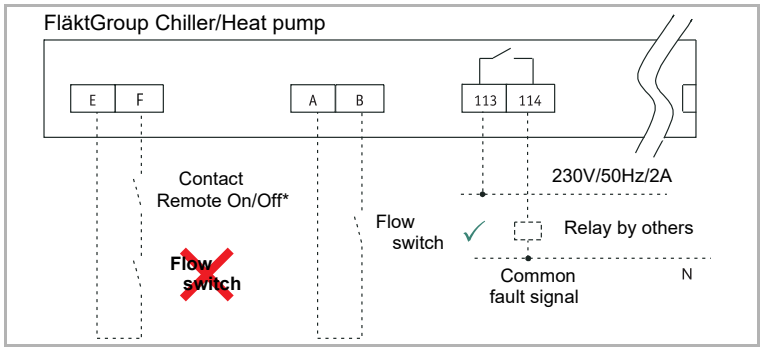


Fig. 20: Electrical integration of flow switch

Terminals: A - B: Connecting the flow switch by others
E - F: Remote contact for switching the unit off and on via NO contact by others
113 - 114: Common fault signal (voltage by others max. 230 V AC/50 Hz/2 A)

DAMAGE TO THE UNIT!

✗ Do not use the flow switch to switch the remote On/Off contact.

✓ Connect the flow switch to terminals A-B in the chiller's control cabinet. The flow switch acts as a safety device and not as a regular switching device for the unit.

NOTE!

Under all circumstances remember to install an additional flow switch at chilled water outlet of the unit and connect it to terminals A-B in the control cabinet of the unit. The additional flow switch can be optionally ordered and is a requirement for safe and trouble-free operation of the unit and in such a way this requirement constitutes an integral part for the validity of the guarantee.

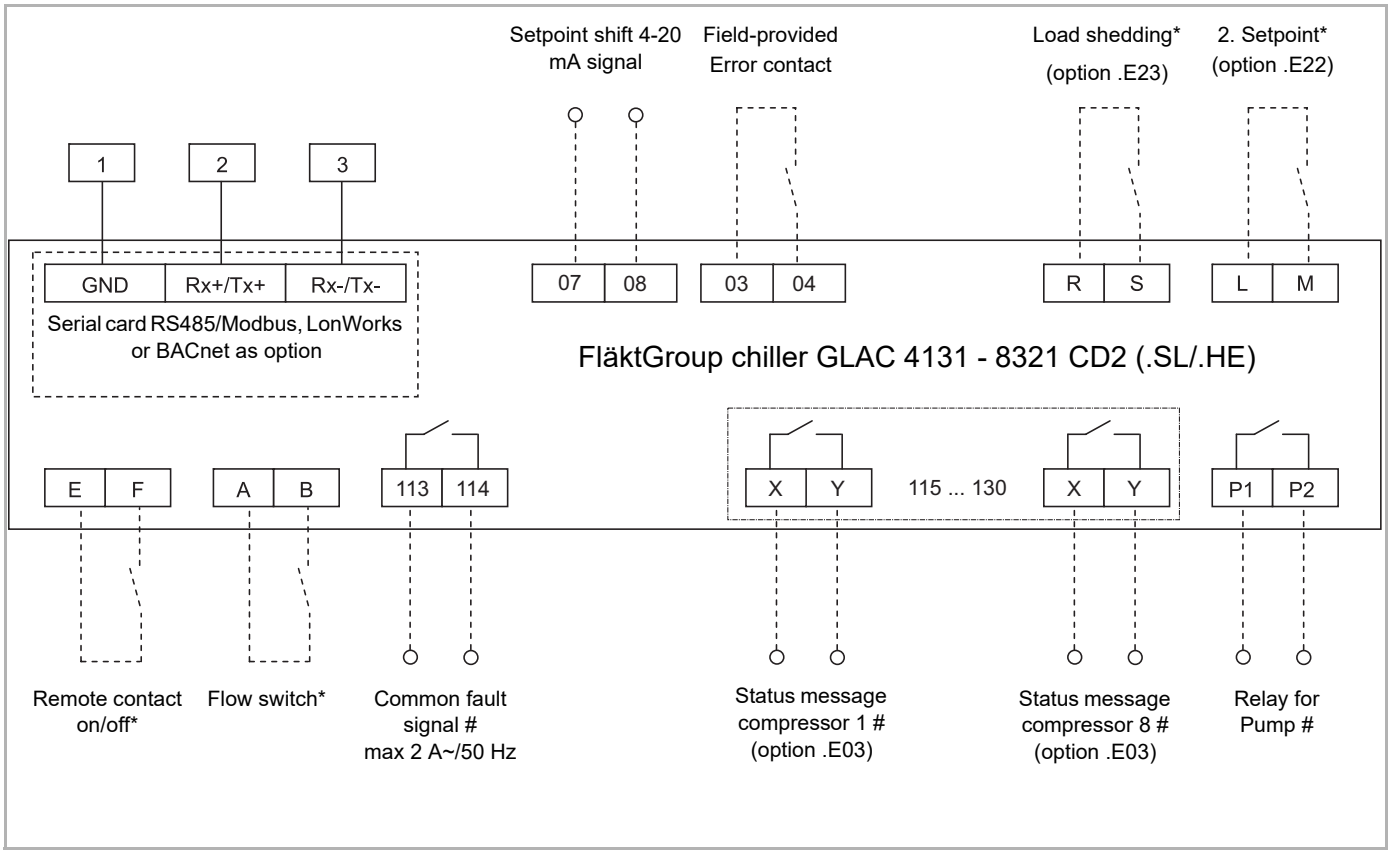


Fig. 21: Electrical integration GLAC 4131-8321 CD2

Legend with explanations:

Terminals:	*A - B:*	*Connecting flow switch by others (requirement for validity of guarantee)*
	E - F:	*Remote contact for switching the machine off and on via the NO contact by others*
	L - M:	*Activation of 2nd setpoint (option .E22)*
	P1 - P2:	*Relay for regulation of chiller pump by others (option)*
	07 - 08:	*Setpoint shift via 4-20 mA signal*
	113 - 114:	*Common fault signal*
	115 - 116:	*Status message compressor 1 (option .E03)*
	117 - 118:	*Status message compressor 2 (option .E03)*
	119 - 120:	*Status message compressor 3 (option .E03)*
	121 - 122:	*Status message compressor 4 (option .E03)*
	123 - 124:	*Status message compressor 5 (option .E03)*
	125 - 126:	*Status message compressor 6 (option .E03)*
	127 - 128:	*Status message compressor 7 (option .E03)*
	129 - 130:	*Status message compressor 8 (option .E03)*
	03 - 04:	*Error contact by others [1)]*
	R - S:	*Load shedding by unit, capacity limitation via NC contact by others (option .E23)[2)]*
	1 - 2 - 3 :	*Connection to serial card (option)[3)]*
	- - - - - - -	*Cabling by others*
	#	*potential to be supplied by others (max. 230 V / 50 Hz / 2 A)*
	*	*potential may not be supplied by others (supplied by controller)*

[1)] The unit is stopped by opening a contact by others and an error message appears. The contact can also be used to stop the unit if the water pressure in the connected water network drops (pressure switch by others).

[2)] Reduction of refrigeration capacity (load shedding switch) and electrical power consumption by opening a potential-free floating contact by others

[3)] The serial card is required to link the chiller to a building management system or for communication with a master/slave control sequencer.

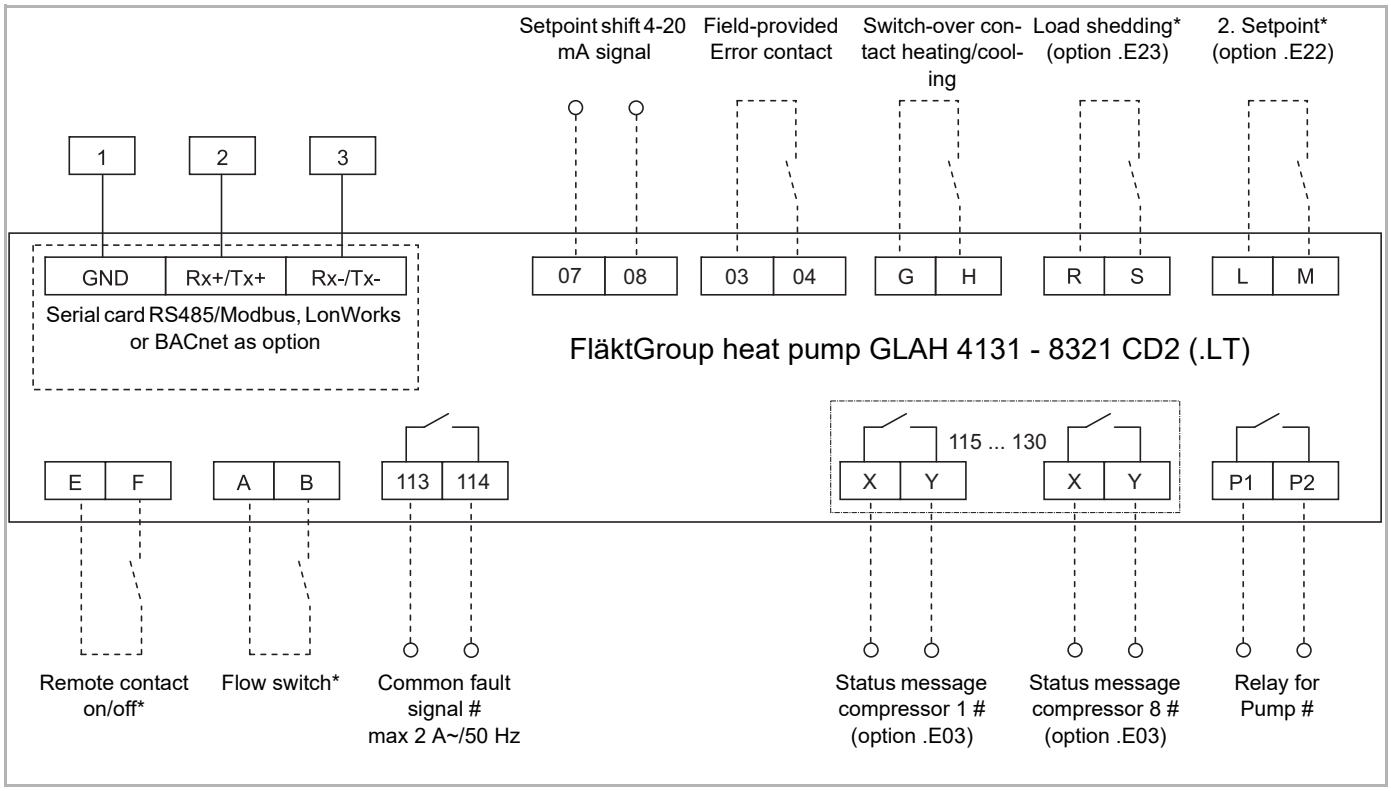


Fig. 22: Electrical integration GLAH 4131-8321 CD2 (.LT)

Legend with explanations:

Terminals:	*A - B:*	*Connecting flow switch by others (requirement for validity of guarantee)*
	E - F:	*Remote contact for switching the machine off and on via the NO contact by others*
	G - H:	*Switch-over contact heating/cooling*
	L - M:	*Activation of 2nd setpoint (optional)*
	P1 - P2:	*Relay for regulation of chiller pump by others (option)*
	07 - 08:	*Setpoint shift via 4-20 mA signal*
	113 - 114:	*Common fault signal*
	115 - 116:	*Status message compressor 1 (option .E03)*
	117 - 118:	*Status message compressor 2 (option .E03)*
	119 - 120:	*Status message compressor 3 (option .E03)*
	121 - 122:	*Status message compressor 4 (option .E03)*
	123 - 124:	*Status message compressor 5 (option .E03)*
	125 - 126:	*Status message compressor 6 (option .E03)*
	127 - 128:	*Status message compressor 7 (option .E03)*
	129 - 130:	*Status message compressor 8 (option .E03)*
	03 - 04:	*Error contact by others [1)]*
	R - S:	*Load shedding by unit, capacity limitation via NC contact by others (option .E23) [2)]*
	1 - 2 - 3:	*Connection to serial card (option)[3)]*
	- - - - - - - -	*Cabling by others*
	#	*potential to be supplied by others (max. 230 V / 50 Hz / 2 A)*
	*	*potential may not be supplied by others (supplied by controller)*

[1)] The unit is stopped by opening a contact by others and an error message appears. The contact can also be used to stop the unit if the water pressure in the connected water network drops (pressure switch by others).

[2)] Reduction of refrigeration capacity (load shedding switch) and electrical power consumption by opening a potential-free floating contact by others

[3)] The serial card is required to link the chiller to a building management system or for communication with a master/slave control sequencer.

NOTE!

In order to switch from heating into cooling mode or the other round, the romote contact for switch on and off of the unit has be opened. After that, the unit operation mode has to be changed by opening or closing the contact. Then, the remote contact for switch on and off of the unit can be closed again and the unit will start its operation. Please consider the operating limits of the unit. Switching over e.g. from heating to cooling mode at increased water temperatures can lead to faults and disruptions.

Weight Data Chillers

Standard unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAC 4131 CD2	298	314	295	475	291	469	287	302	-	-	2730
GLAC 4141 CD2	303	319	299	482	294	475	289	305	-	-	2765
GLAC 4161 CD2	304	325	300	490	295	482	290	310	-	-	2795
GLAC 5171 CD2	349	366	357	572	366	383	378	604	-	-	3375
GLAC 6181 CD2	350	387	367	403	386	646	409	682	-	-	3630
GLAC 5201 CD2	407	421	401	416	395	626	386	613	-	-	3665
GLAC 6211 CD2	558	620	356	608	531	593	337	578	-	-	4180
GLAC 6231 CD2	557	621	358	612	537	601	344	590	-	-	4220
GLAC 6241 CD2	560	628	362	622	548	616	354	609	-	-	4300
GLAC 8241 CD2	544	703	538	696	530	685	343	532	340	344	5255
GLAC 8261 CD2	545	709	540	703	532	693	345	538	342	349	5295
GLAC 8281 CD2	553	721	547	713	538	702	348	544	345	352	5365
GLAC 8301 CD2	554	727	548	719	539	708	349	549	346	356	5395
GLAC 8321 CD2	557	736	550	727	540	714	349	553	345	358	5430

SL unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAC 4131 CD2.SL	348	366	336	542	322	520	304	322	-	-	3060
GLAC 4141 CD2.SL	348	365	343	550	336	540	328	345	-	-	3155
GLAC 4161 CD2.SL	351	372	346	561	339	550	330	351	-	-	3200
GLAC 5171 CD2.SL	369	556	368	554	560	551	364	548	-	-	3870
GLAC 6181 CD2.SL	383	600	582	595	377	590	373	585	-	-	4085
GLAC 5201 CD2.SL	529	573	353	584	553	597	370	611	-		4170
GLAC 6211 CD2.SL	529	736	510	713	321	538	307	338	298	329	4620
GLAC 6231 CD2.SL	520	728	513	719	331	556	326	358	323	355	4730
GLAC 6241 CD2.SL	528	743	516	728	329	558	321	356	315	350	4745
GLAC 8241 CD2.SL	544	736	546	727	536	713	346	552	342	357	5410
GLAC 8261 CD2.SL	510	682	504	674	497	665	490	657	481	645	5805
GLAC 8281 CD2.SL	545	722	537	713	528	701	519	689	507	674	6135
GLAC 8301 CD2.SL	547	729	539	720	530	708	521	696	509	680	6180
GLAC 8321 CD2.SL	550	738	542	727	532	715	522	701	508	684	6220

HE Unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAC 4131 CD2.HE	339	345	336	542	332	519	329	335	-	-	3060
GLAC 4141 CD2.HE	344	351	340	532	336	525	331	338	-	-	3095
GLAC 4161 CD2.HE	346	358	342	541	337	533	331	342	-	-	3130
GLAC 5171 CD2.HE	363	530	364	530	557	531	364	531	-	-	3770
GLAC 6181 CD2.HE	380	584	580	581	377	578	375	575	-	-	4030
GLAC 5201 CD2.HE	524	550	350	562	549	575	368	589	-	-	4065
GLAC 6211 CD2.HE	520	708	505	687	319	522	308	330	300	322	4520
GLAC 6231 CD2.HE	512	700	508	695	329	539	326	349	324	347	4630
GLAC 6241 CD2.HE	520	714	511	703	327	540	321	346	316	342	4640
GLAC 8241 CD2.HE	530	675	526	670	522	665	517	659	511	651	5925
GLAC 8261 CD2.HE	532	683	528	678	524	672	519	665	512	657	5970
GLAC 8281 CD2.HE	536	691	531	686	526	679	520	671	513	662	6015
GLAC 8301 CD2.HE	538	698	533	692	527	685	521	677	513	667	6050
GLAC 8321 CD2.HE	541	707	535	700	528	691	521	682	511	669	6085

Tab. 29

Weight of chillers with GLHM hydraulic module

SL unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAC 4131 CD2.SL + GLHM	537	561	526	550	514	687	645	675	-	-	4695
GLAC 4141 CD2.SL + GLHM	542	567	534	559	526	703	664	695	-	-	4790
GLAC 4161 CD2.SL + GLHM	549	579	538	568	528	712	663	700	-	-	4835
GLAC 5171 CD2.SL + GLHM	596	633	771	640	611	828	617	835	-	-	5530
GLAC 6181 CD2.SL + GLHM	626	648	622	822	617	816	783	810	-	-	5745
GLAC 5201 CD2.SL + GLHM	582	747	761	764	611	784	794	797	-	-	5840
GLAC 6211 CD2.SL + GLHM	565	713	722	712	564	710	563	710	562	555	6375
GLAC 6231 CD2.SL + GLHM	565	708	731	717	581	728	585	733	592	581	6520
GLAC 6241 CD2.SL + GLHM	572	721	735	725	579	730	580	732	583	576	6535
GLAC 8241 CD2.SL + GLHM	653	828	642	813	628	622	792	785	609	772	7145
GLAC 8261 CD2.SL + GLHM	641	598	823	1046	648	774	832	1058	645	611	7685
GLAC 8281 CD2.SL + GLHM	611	814	605	806	763	796	1028	1072	742	774	8010
GLAC 8301 CD2.SL + GLHM	616	822	608	813	767	802	1031	1079	743	779	8060
GLAC 8321 CD2.SL + GLHM	625	826	620	820	784	812	1058	1096	767	795	8200

HE Unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAC 4131 CD2.HE + GLHM	519	539	516	536	513	681	652	678	-	-	4635
GLAC 4141 CD2.HE + GLHM	527	548	521	542	515	685	652	679	-	-	4670
GLAC 4161 CD2.HE + GLHM	532	558	524	550	515	692	650	684	-	-	4705
GLAC 5171 CD2.HE + GLHM	580	608	752	617	599	802	607	811	-	-	5375
GLAC 6181 CD2.HE + GLHM	615	635	611	805	606	799	769	794	-	-	5635
GLAC 5201 CD2.HE + GLHM	574	718	754	739	610	764	796	781	-	-	5735
GLAC 6211 CD2.HE + GLHM	552	689	706	690	553	691	553	691	554	541	6220
GLAC 6231 CD2.HE + GLHM	551	684	716	695	570	709	575	714	583	567	6365
GLAC 6241 CD2.HE + GLHM	558	697	719	703	568	710	570	713	575	562	6375
GLAC 8241 CD2.HE + GLHM	587	773	582	766	735	757	990	1021	716	739	7665
GLAC 8261 CD2.HE + GLHM	594	776	591	772	750	766	1015	1037	739	755	7795
GLAC 8281 CD2.HE + GLHM	599	786	595	780	753	773	1017	1045	738	758	7845
GLAC 8301 CD2.HE + GLHM	601	815	665	811	661	731	842	803	656	800	7350
GLAC 8321 CD2.HE + GLHM	610	796	607	792	771	787	1043	1066	760	777	8010

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Weight of heat pumps

Standard unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAH 4131 CD2	333	351	338	543	342	551	347	365	-	-	3170
GLAH 4141 CD2	345	362	347	557	350	561	353	370	-	-	3245
GLAH 4161 CD2	347	368	349	567	351	570	354	375	-	-	3280
GLAH 6171 CD2	522	560	545	583	376	614	388	632	-	-	4220
GLAH 6181 CD2	589	628	603	642	403	656	415	674	-	-	4610

LT unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAH 4131 CD2.LT	373	379	379	588	385	597	392	398	-	-	3490
GLAH 4141 CD2.LT	387	392	390	604	394	609	398	402	-	-	3575
GLAH 4161 CD2.LT	390	399	392	613	395	617	398	406	-	-	3610
GLAH 6171 CD2.LT	654	683	649	677	420	672	416	665	-	-	4835
GLAH 6181 CD2.LT	561	709	540	683	520	657	325	492	316	312	5115
GLAH 6201 CD2.LT	562	712	550	697	537	681	342	519	337	334	5270
GLAH 6211 CD2.LT	576	731	560	710	544	689	344	522	336	334	5345
GLAH 6241 CD2.LT	580	744	562	722	545	699	344	528	335	337	5395
GLAH 8241 CD2.LT	586	762	585	760	583	758	581	755	578	752	6700
GLAH 8261 CD2.LT	584	761	589	767	595	774	601	782	609	792	6855
GLAH 8281 CD2.LT	609	790	610	792	612	795	614	797	616	800	7035
GLAH 8301 CD2.LT	610	796	611	798	613	801	615	803	617	806	7070
GLAH 8321 CD2.LT	613	805	613	806	614	806	614	807	615	807	7100

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Weight of heat pumps with GLHM hydraulic module

Standard unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAH 4131 CD2 + GLHM	455	597	466	611	476	623	486	637	-	-	4350
GLAH 4141 CD2 + GLHM	470	615	476	623	482	631	489	639	-	-	4425
GLAH 4161 CD2 + GLHM	472	624	478	631	482	637	488	644	-	-	4455
GLAH 6171 CD2 + GLHM	not available										
GLAH 6181 CD2 + GLHM	855	836	853	835	626	833	625	832	-	-	6295

LT unit	Weight distribution operating weight in [kg]										
	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	Total
GLAH 4131 CD2.LT + GLHM	569	562	564	712	559	705	709	700	-	-	5080
GLAH 4141 CD2.LT + GLHM	589	582	579	729	566	714	711	702	-	-	5170
GLAH 4161 CD2.LT + GLHM	594	591	580	738	566	720	709	706	-	-	5205
GLAH 6171 CD2.LT + GLHM	633	838	873	849	886	862	657	871	-	-	6470
GLAH 6181 CD2.LT + GLHM	735	916	739	922	583	534	585	536	587	688	6825

Tab. 32

Anti-vibration mounts for chillers

GLAC ####	4131	4141	4161	5171	6181	5201	6211
CD2	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	3 x SR21-550H + 5 x SR21-800
CD2.SL	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	3 x SR21-550H + 5 x SR21-800	3 x SR21-550H + 5 x SR21-800	3 x SR21-550H + 5 x SR21-800	5 x SR21-550H + 3 x SR21-800 + 2 x SR21-1000
CD2.HE	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	3 x SR21-550H + 5 x SR21-800	3 x SR21-550H + 5 x SR21-800	3 x SR21-550H + 5 x SR21-800	5 x SR21-550H + 3 x SR21-800 + 2 x SR21-1000
GLAC ####	**6231**	**6241**	**8241**	**8261**	**8281**	**8301**	**8321**
CD2	3 x SR21-550H + 5 x SR21-800	3 x SR21-550H + 5 x SR21-800	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000
CD2.SL	5 x SR21-550H + 3 x SR21-800 + 2 x SR21-1000	5 x SR21-550H + 3 x SR21-800 + 2 x SR21-1000	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000
CD2.HE	5 x SR21-550H + 3 x SR21-800 + 2 x SR21-1000	5 x SR21-550H + 3 x SR21-800 + 2 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000

Tab. 33

Anti-vibration mounts for chillers with GLHM hydraulic module

GLAC #### + GLHM	4131	4141	4161	5171	6181	5201	6211
CD2	3 x SR21-550H + 5 x SR21-800	3 x SR21-550H + 5 x SR21-800	-	-	-	-	-
CD2.SL	5 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 3 x SR21-1000	4 x SR21-800 + 4 x SR21-1000	2 x SR21-800 + 6 x SR21-1000	5 x SR21-800 + 5 x SR21-1000
CD2.HE	5 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 3 x SR21-1000	4 x SR21-800 + 4 x SR21-1000	2 x SR21-800 + 6 x SR21-1000	5 x SR21-800 + 5 x SR21-1000
GLAC #### + GLHM	**6231**	**6241**	**8241**	**8261**	**8281**	**8301**	**8321**
CD2.SL	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 3 x SR21-1000 + 2 x SR21-1200	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200
CD2.HE	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200	2 x SR21-800 + 6 x SR21-1000 + 2 x SR21-1200

Tab. 34

Anti-vibration mounts for heat pumps

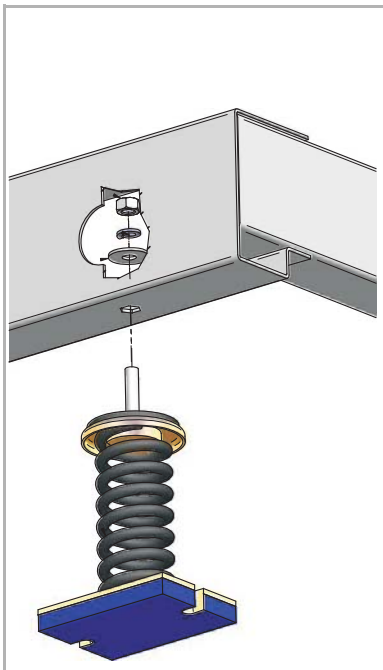
GLAH ####	4131	4141	4161	6171	6181	6201	6211
CD2	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	2 x SR21-550H + 6 x SR21-800	2 x SR21-550H + 6 x SR21-800	-	-
CD2.LT	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	6 x SR21-550H + 2 x SR21-800	2 x SR21-550H + 6 x SR21-800	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000
GLAC ####	**6241**	**8241**	**8261**	**8281**	**8301**	**8321**	**-**
CD2.LT	3 x SR21-550H + 4 x SR21-800 + 3 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	5 x SR21-800 + 5 x SR21-1000	-

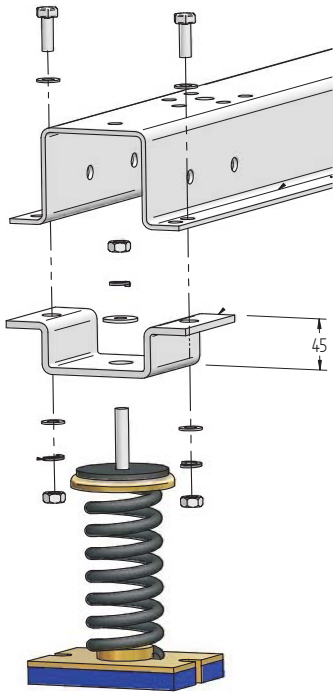
Tab. 35

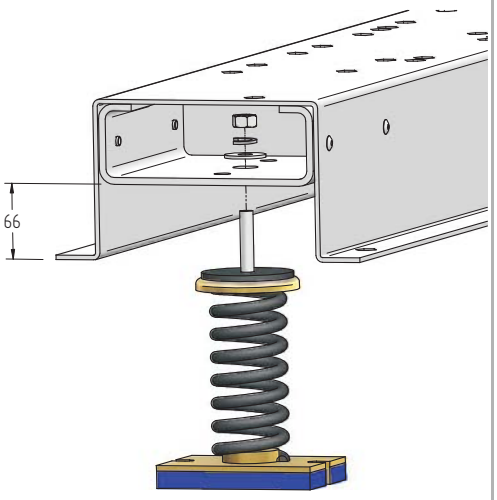
Anti-vibration mounts for heat pumps with GLHM hydraulic module

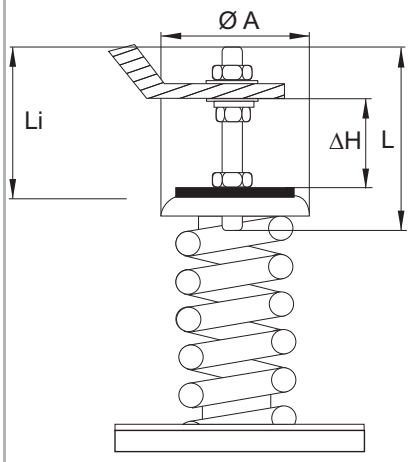
GLAH #### + GLHM	4131	4141	4161	6171	6181
CD2	4 x SR21-800 + 4 x SR21-1000	4 x SR21-800 + 4 x SR21-1000	4 x SR21-800 + 4 x SR21-1000	not available	2 x SR21-1000 + 6 x SR21-1200
CD2.SL	4 x SR21-800 + 4 x SR21-1000	4 x SR21-800 + 4 x SR21-1000	4 x SR21-800 + 4 x SR21-1000	2 x SR21-1000 + 6 x SR21-1200	5 x SR21-800 + 3 x SR21-1000 + 2 x SR21-1200

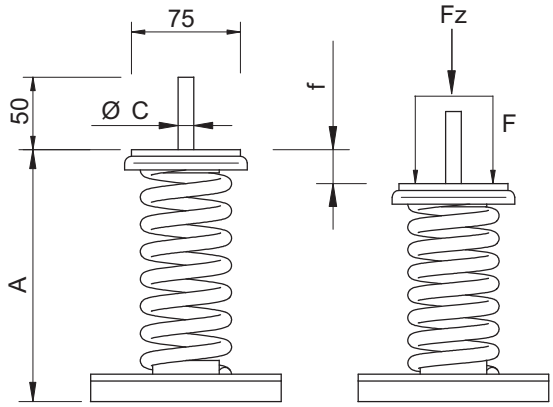
Tab. 36

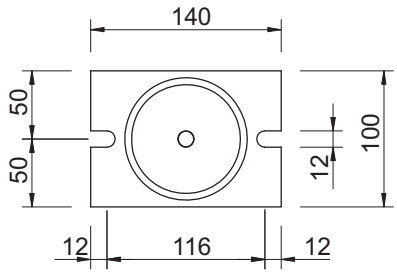












f [mm] = F/k

F [kg]: refer to weight on page 84 and following pages.
k [kg]: see Table 37 below

Type	A [mm]	∅ C	L [mm]	Li [mm]	Fz [N]	ΔH [mm]	Frequency (Hz)
SR21-550H-AM/L	185	M12	100	80	180-650	from 25 to 58*	5 - 2.65
SR21-800-AM/L	185	M12	100	80	270-800	from 25 to 58*	5 - 2.95
SR21-1000-AM/L	185	M12	100	80	350-1000	from 25 to 58*	5 - 3
SR21-1200-AM/L	185	M12	100	80	480-1200	from 25 to 58*	5 - 3.2

Tab. 37: Size of anti-vibration mounts

** applies to unit feet with 10 mm thick carrying frame*

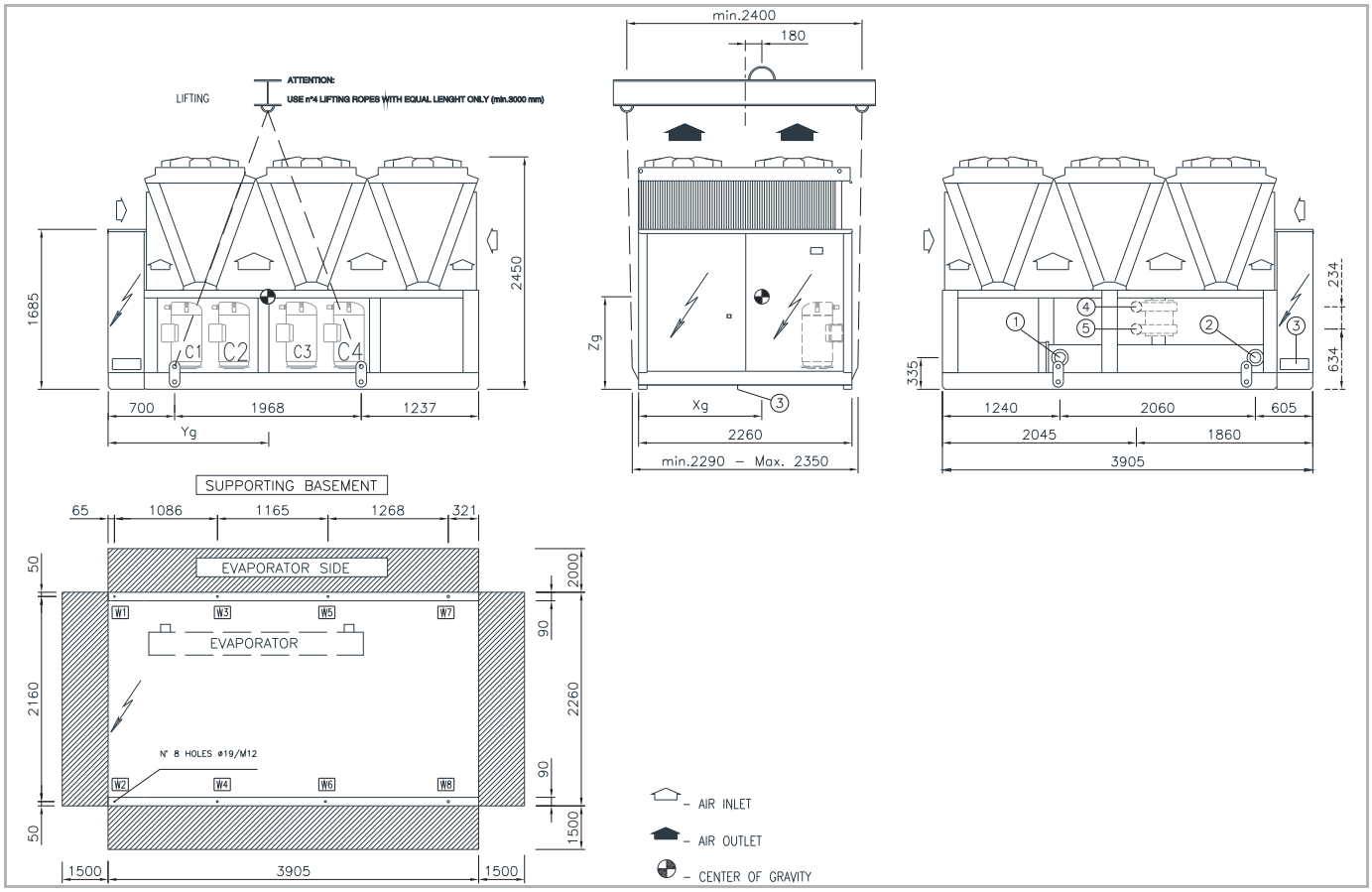


Fig. 23: DE137500-0 - GLAC 4131-4161 CD2

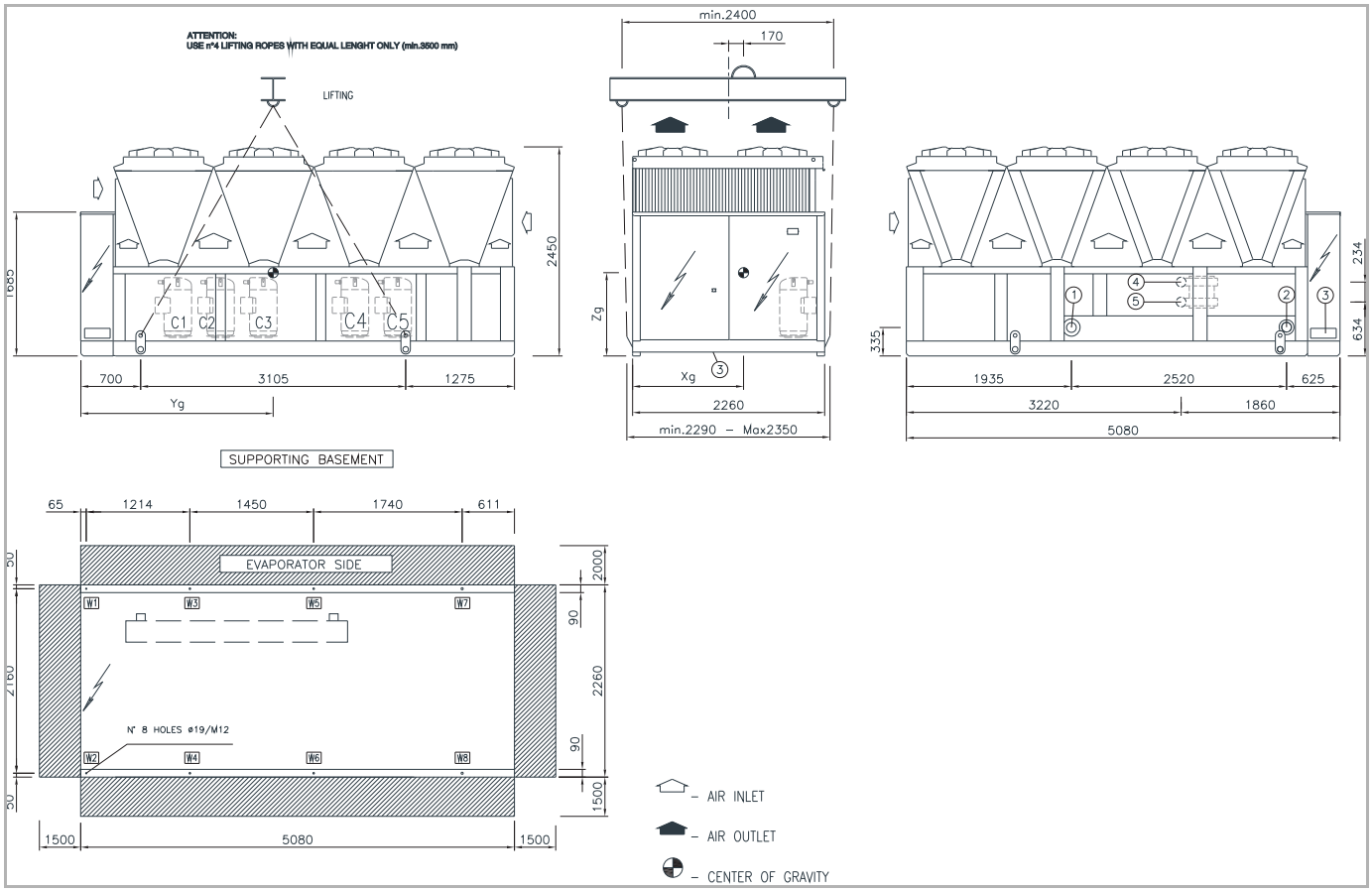


Fig. 24: DE152500-0 - GLAC 5171 CD2

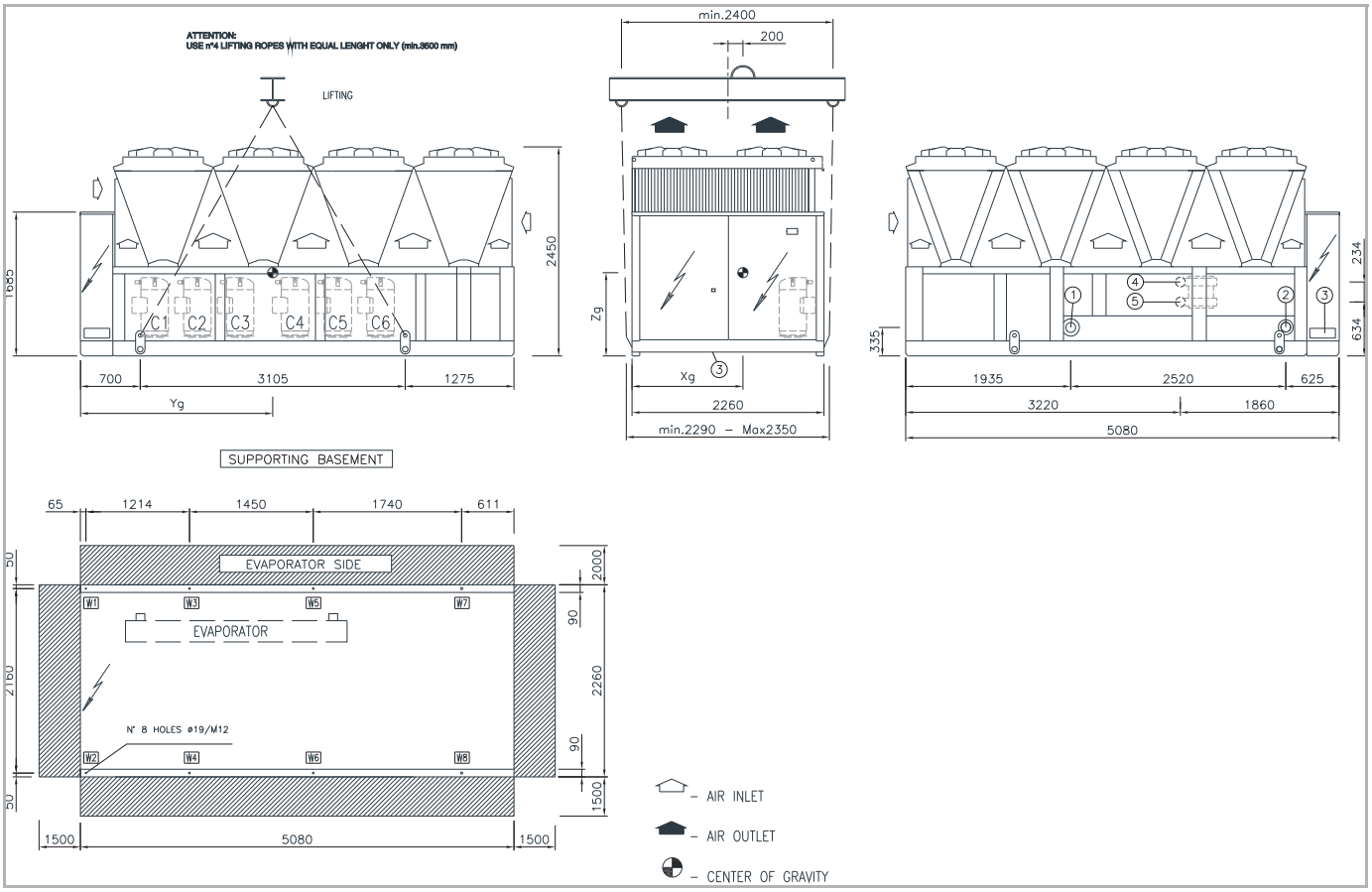


Fig. 25: DE155500-0 - GLAC 6181 CD2

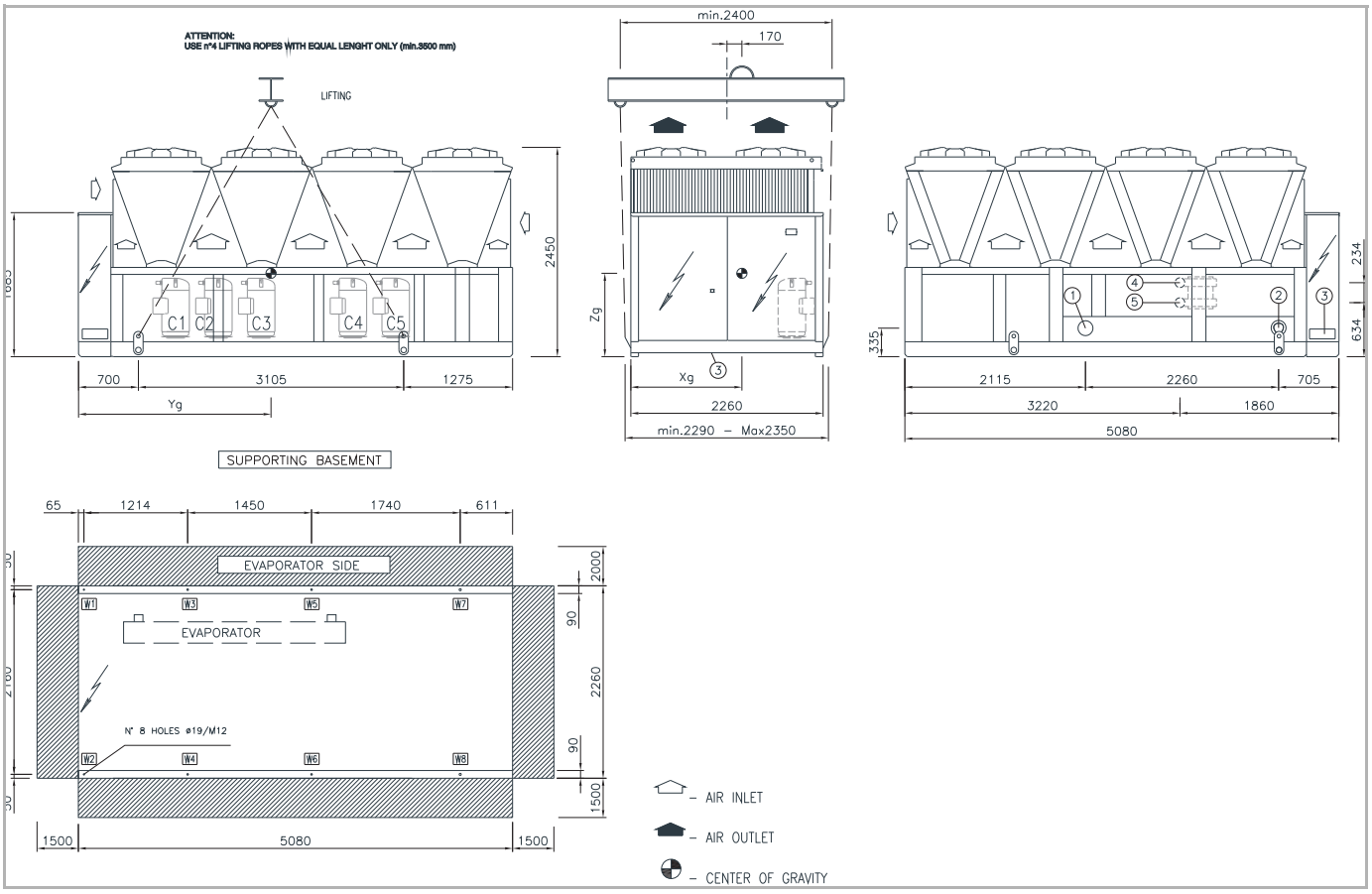


Fig. 26: DE159500-0 - GLAC 5201 CD2

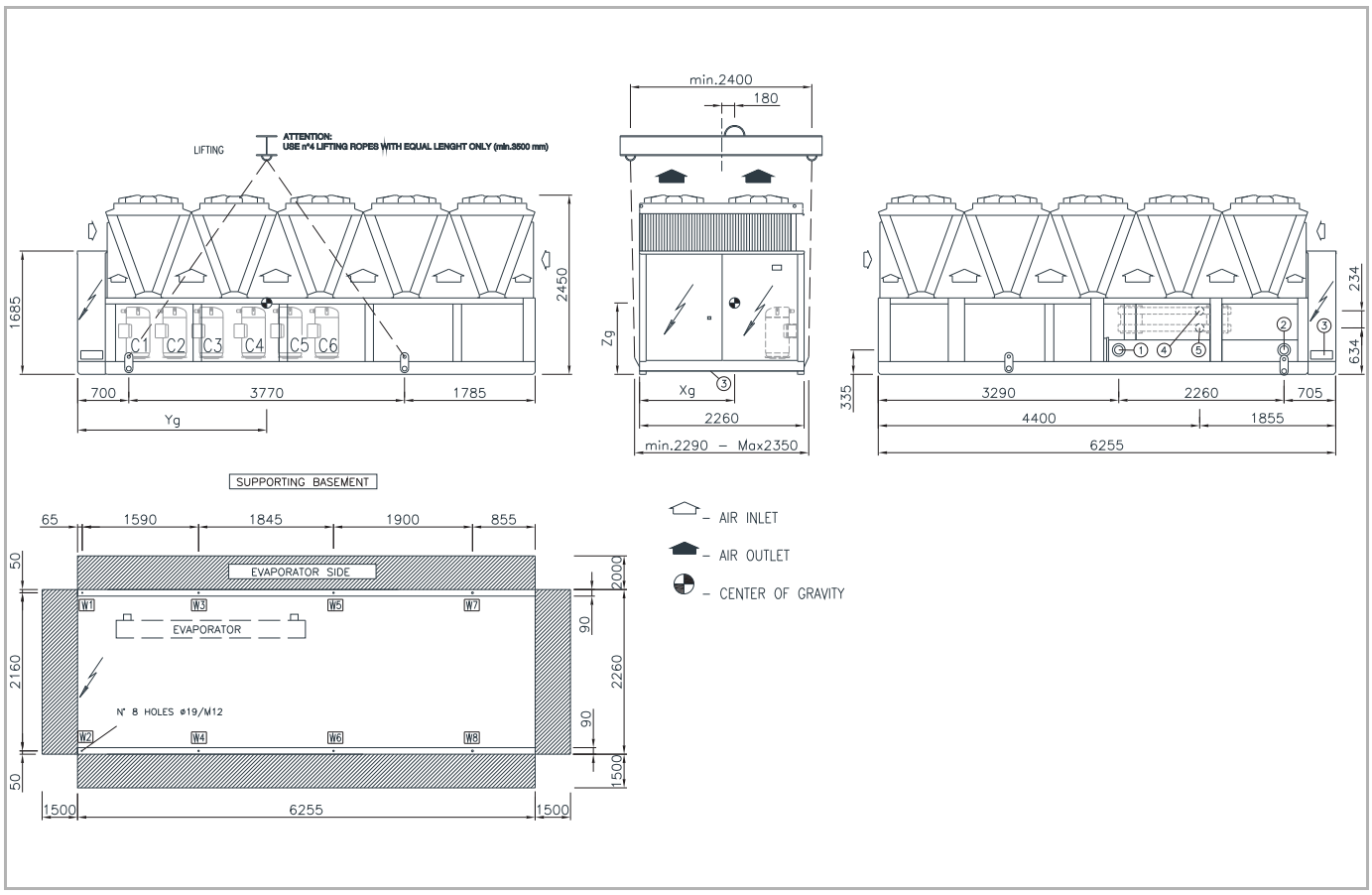


Fig. 27: DE160500-0 - GLAC 6211-6214 CD2

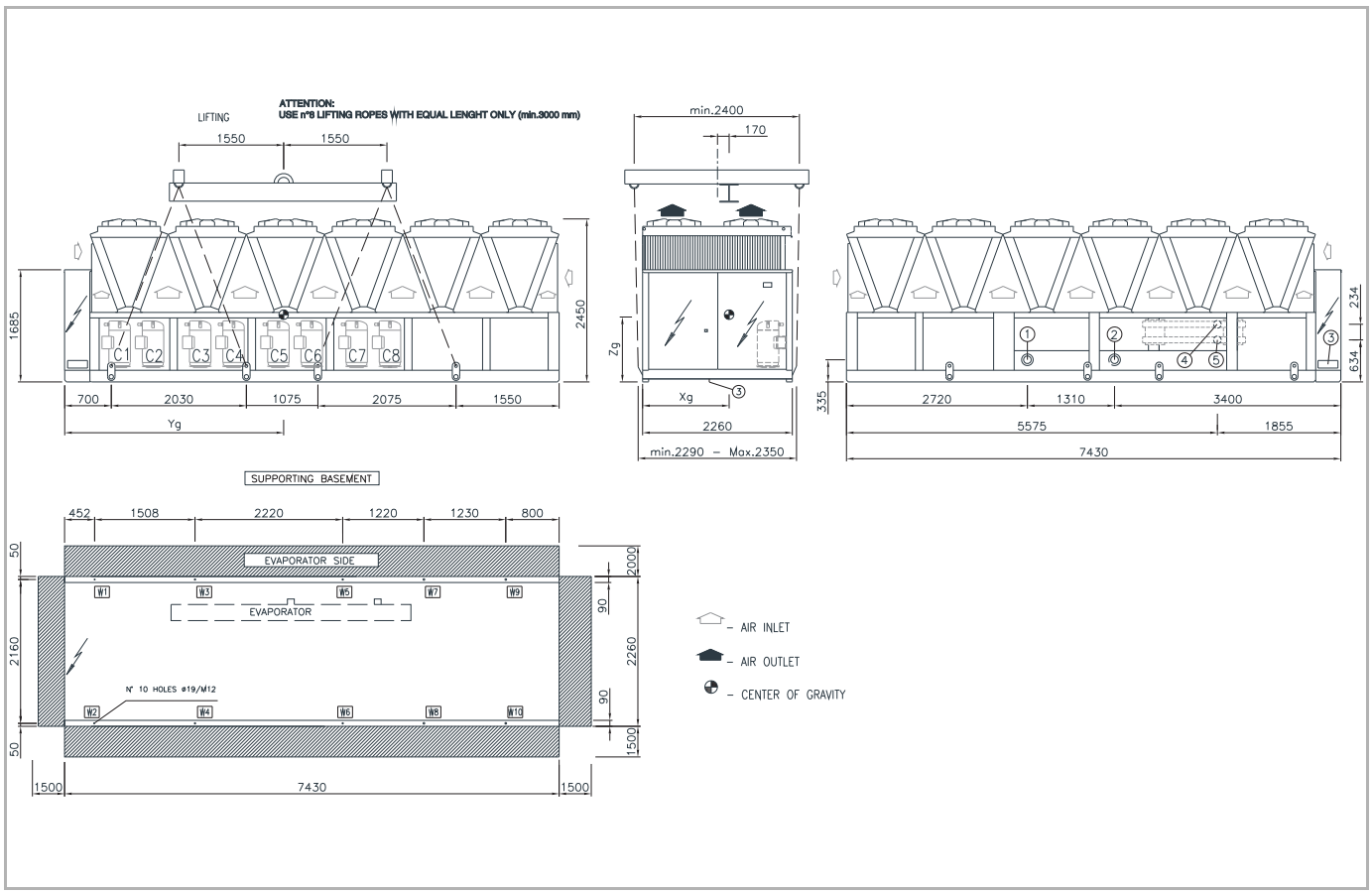


Fig. 28: DE163500-0 - GLAC 8241-8321 CD2

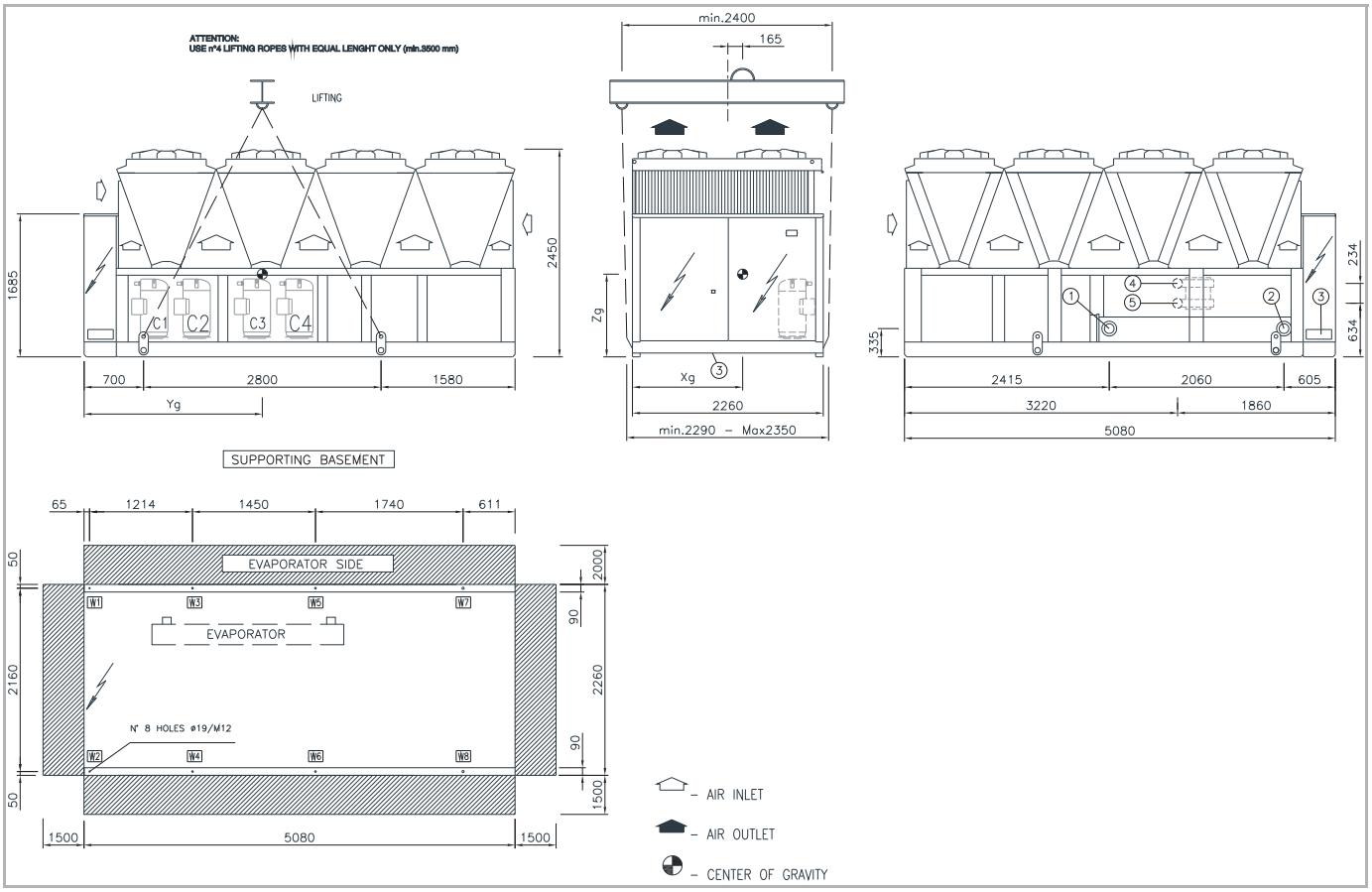


Fig. 29: DE137510-0 - GLAC 41314-4161 CD2.SL/.HE

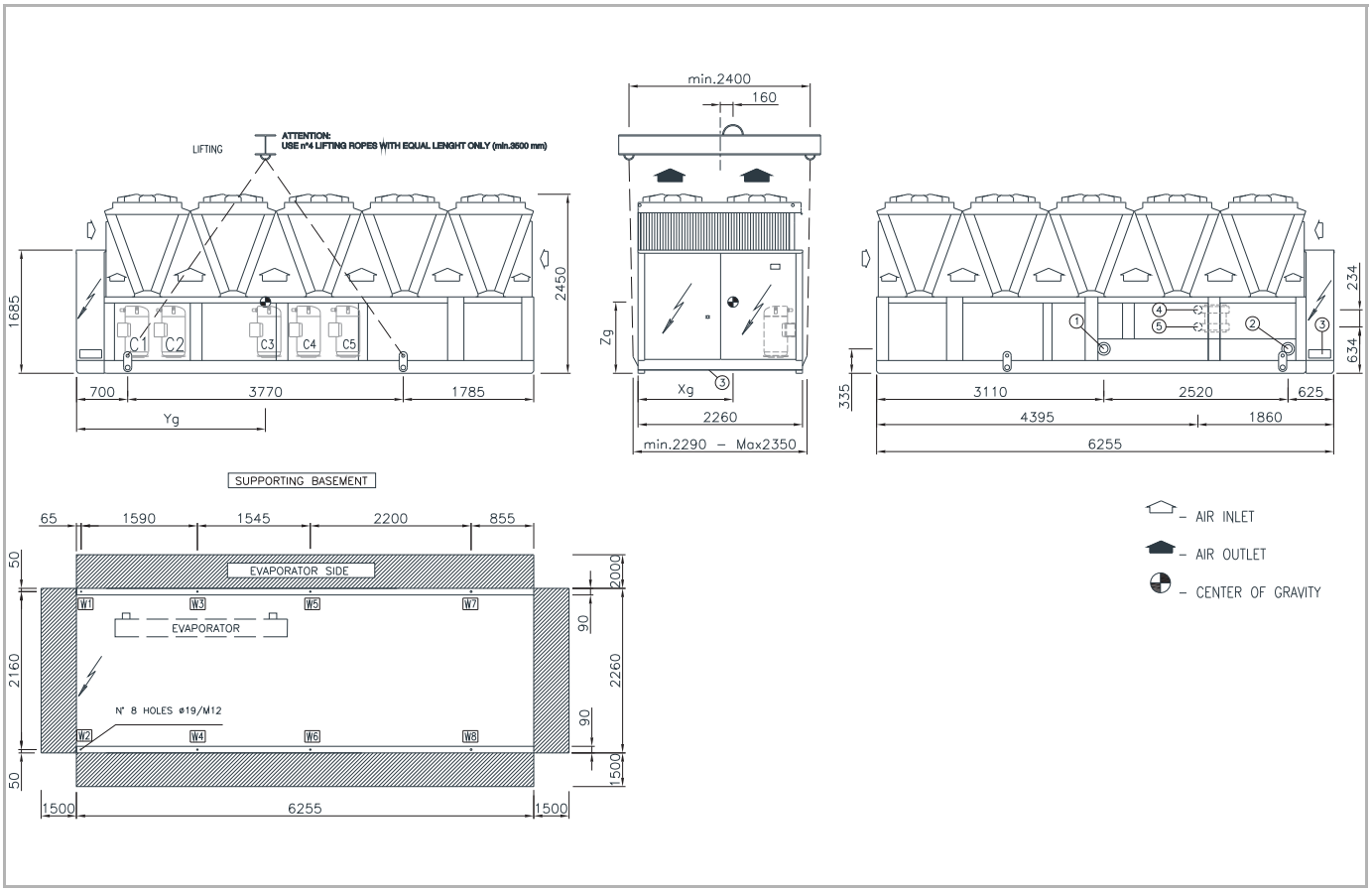


Fig. 30: DE152510-0 - GLAC 5171 CD2.SL/.HE

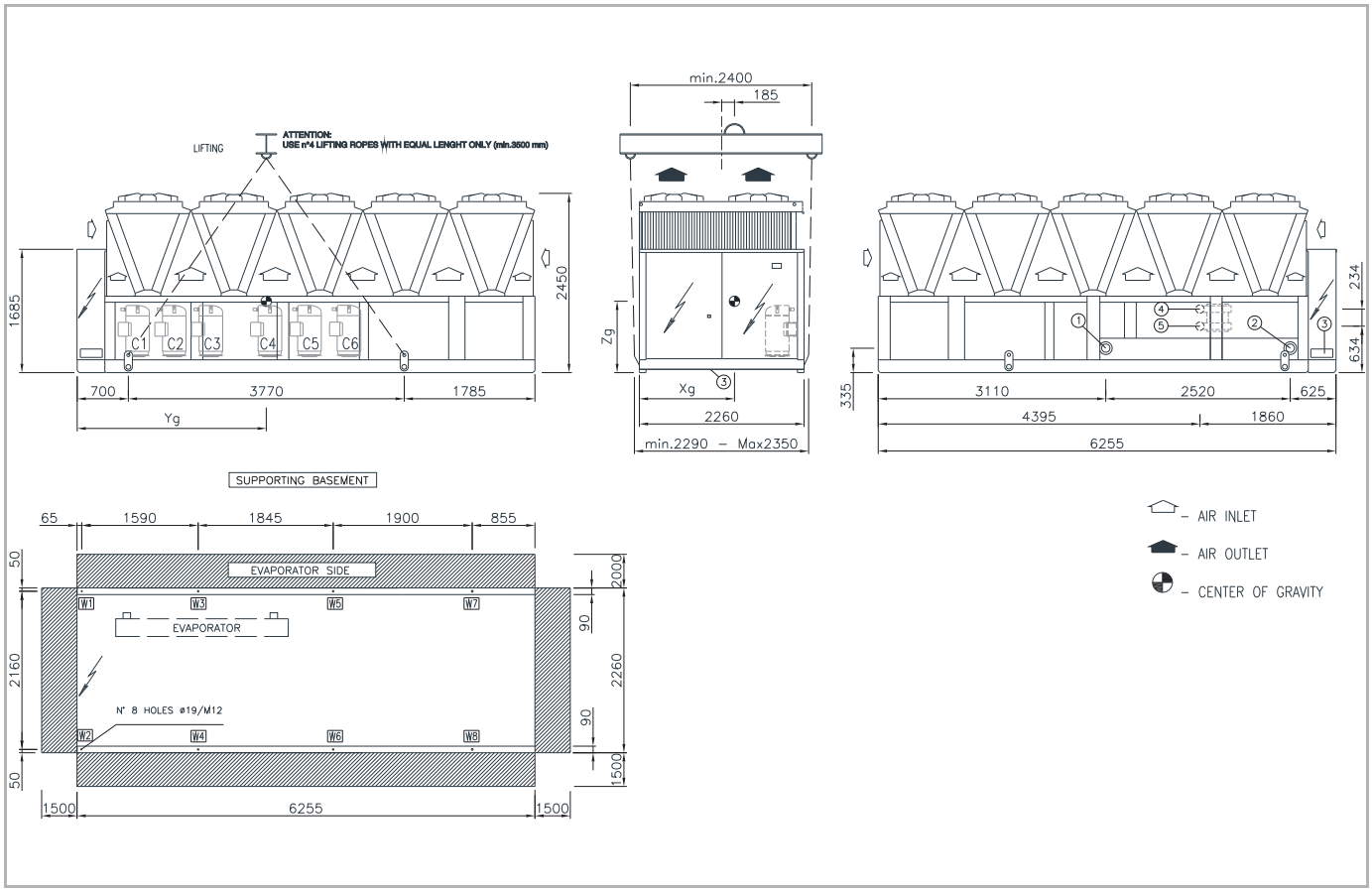


Fig. 31: DE155510-0 - GLAC 6181 CD2.SL/.HE

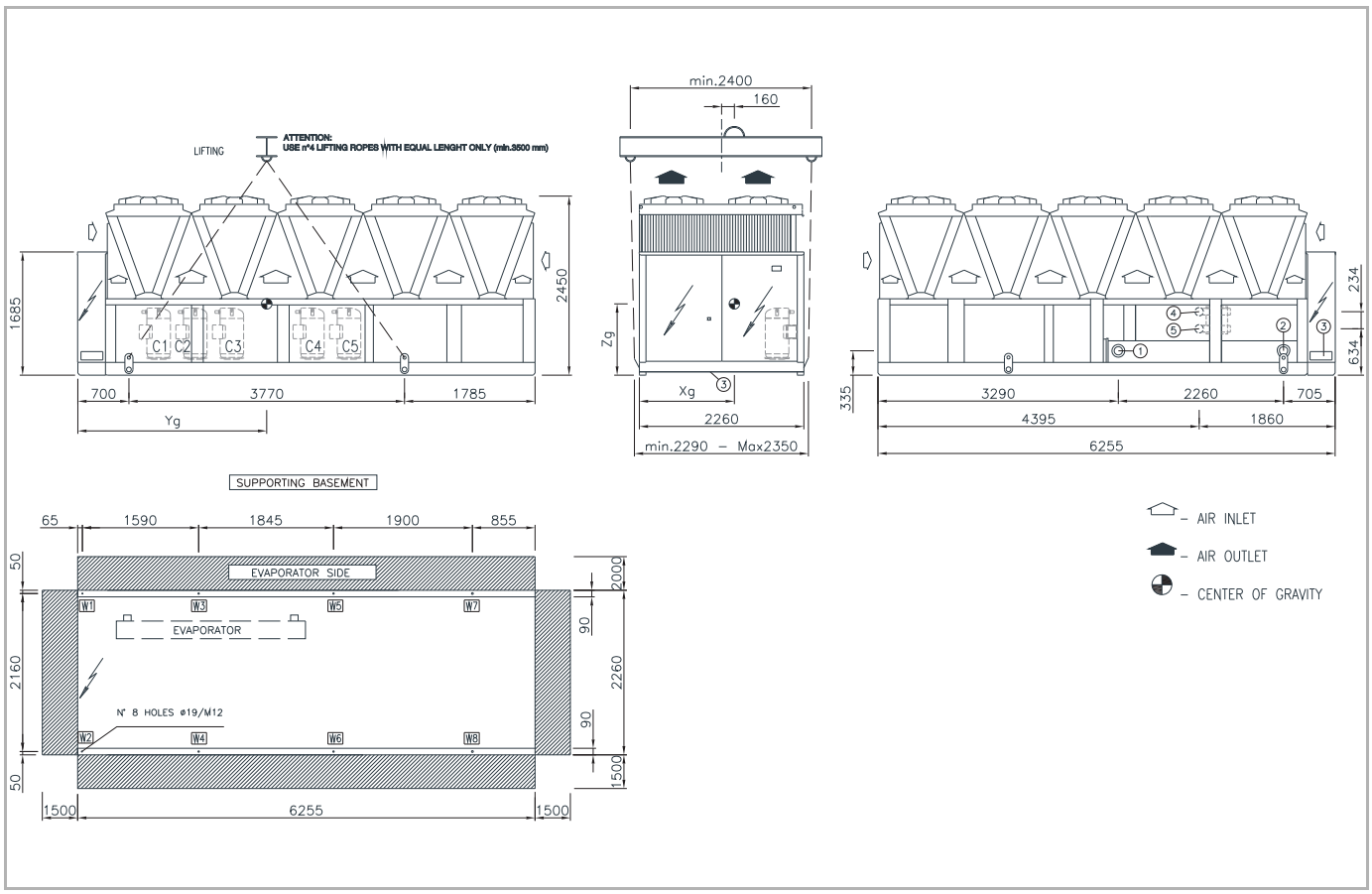


Fig. 32: DE159510-0 - GLAC 5201 CD2.SL/.HE

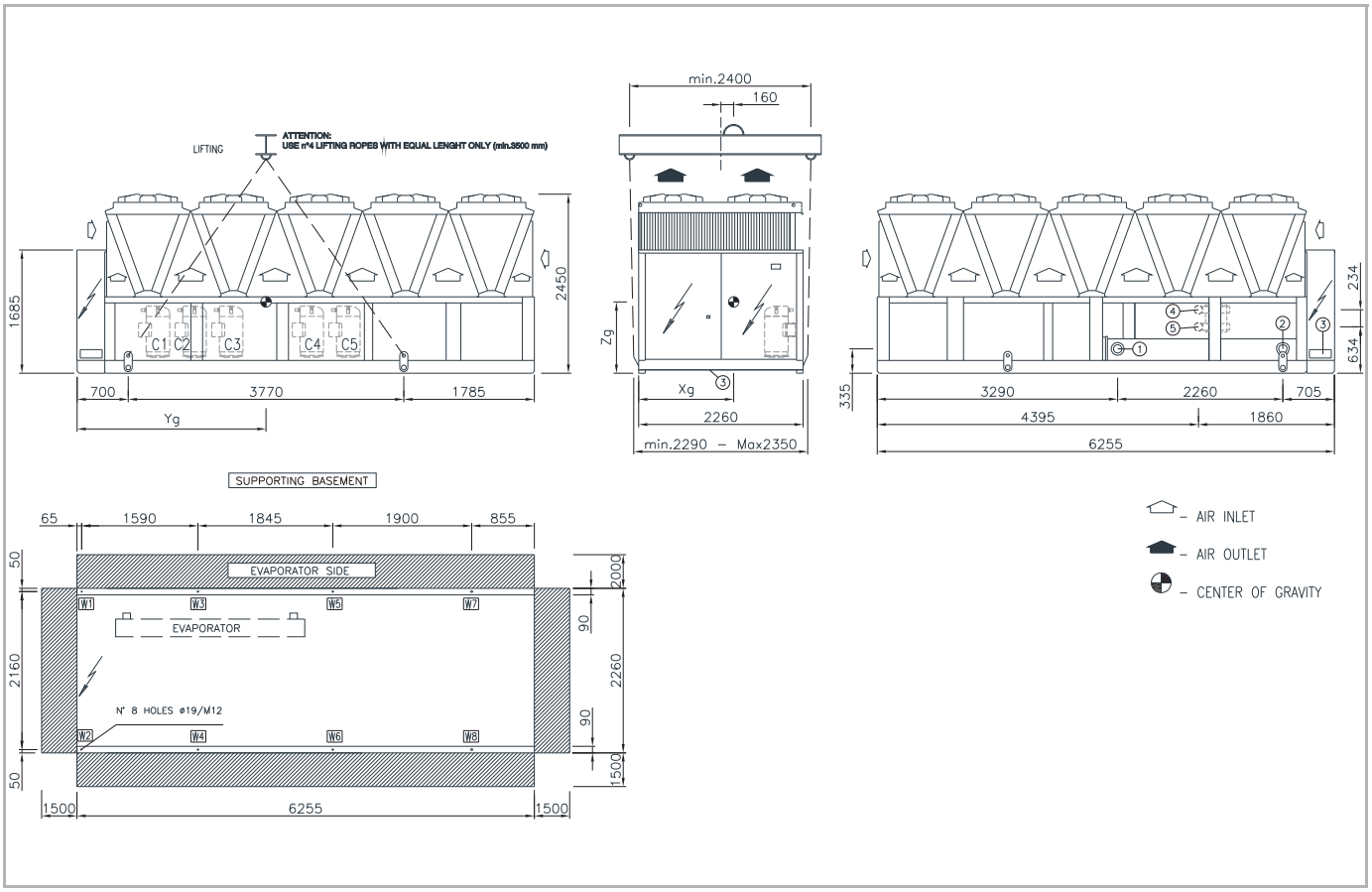


Fig. 33: DE155520-0 - GLAC 6211-6241 CD2.SL/.HE

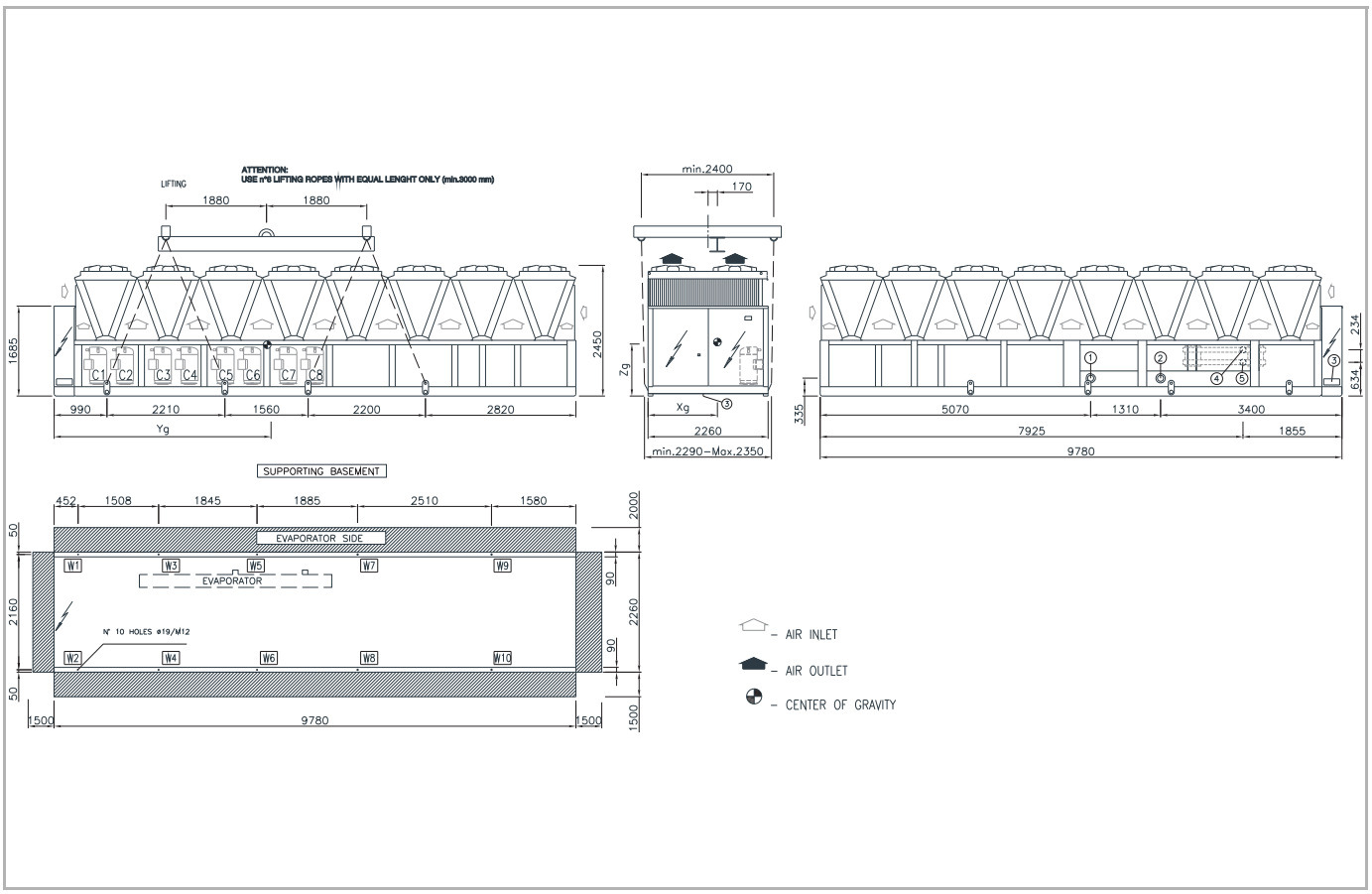


Fig. 34: DE163510-0 - GLAC 8218-8321 CD2.SL/.HE without GLAC 8241 CD2.SL

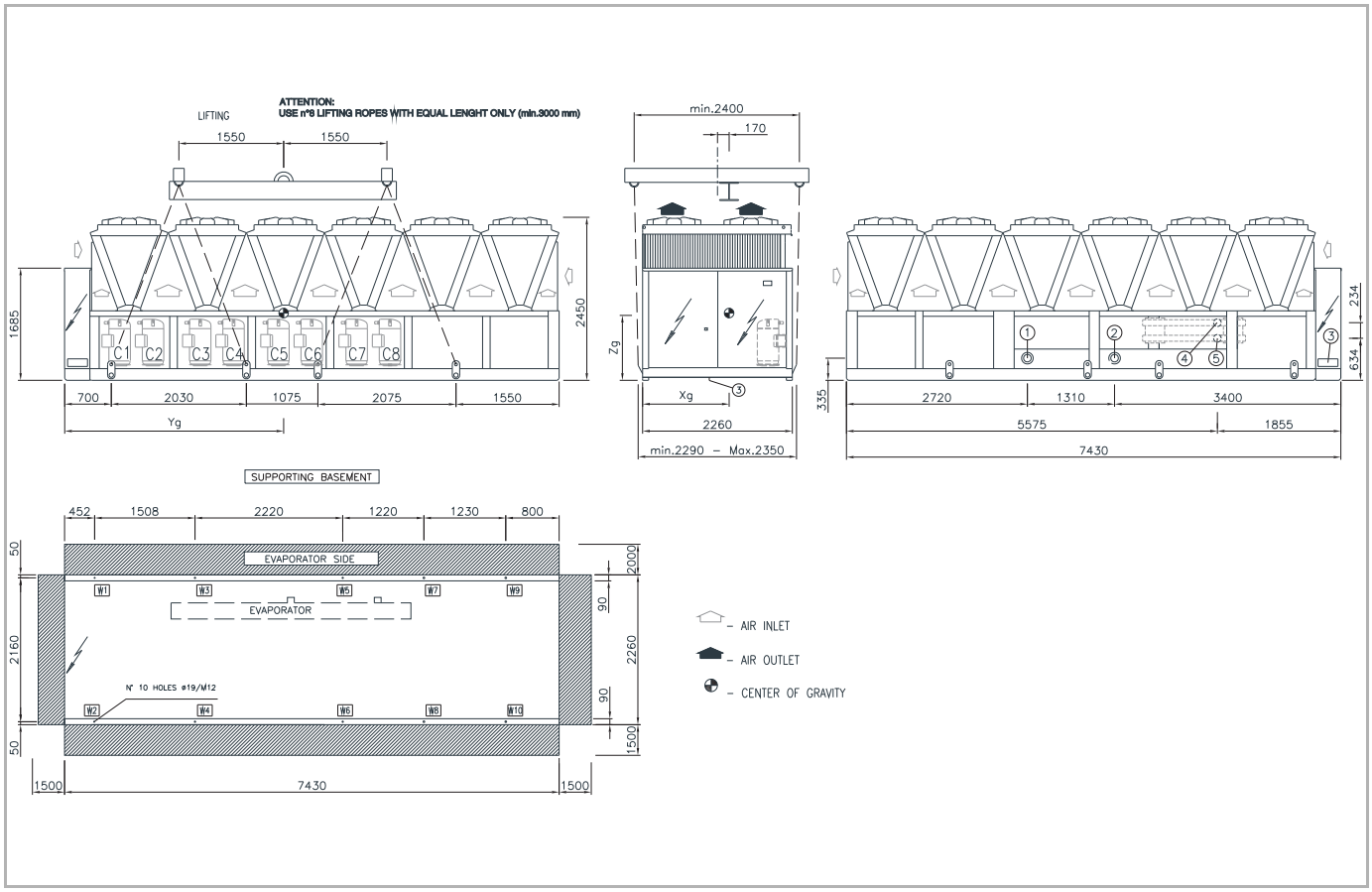


Fig. 35: DE163500-0 - GLAC 8241 CD2.SL

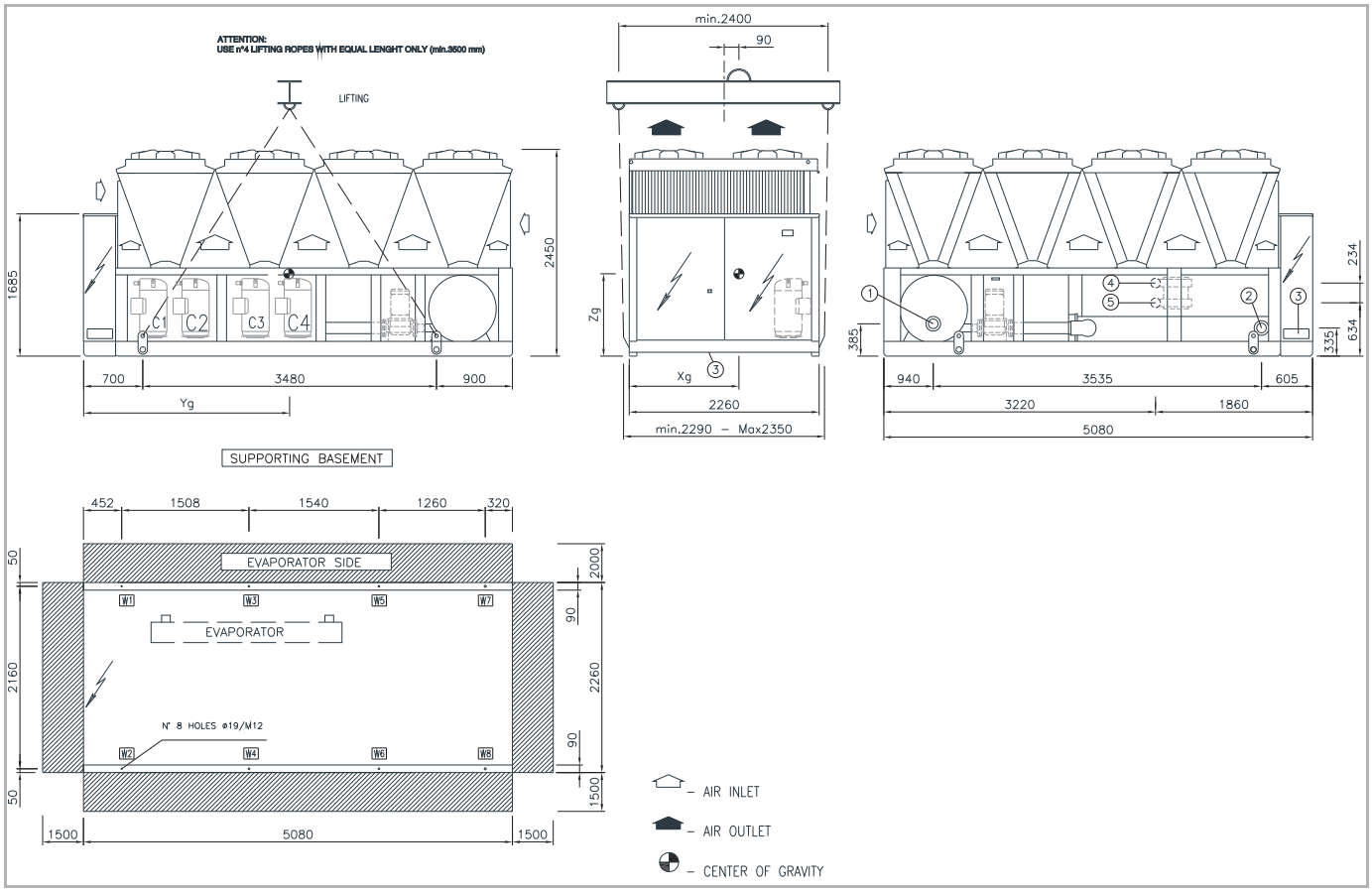


Fig. 36: DE137518-0 - GLAC 4131-4161 CD2.SL/.HE + GLHM

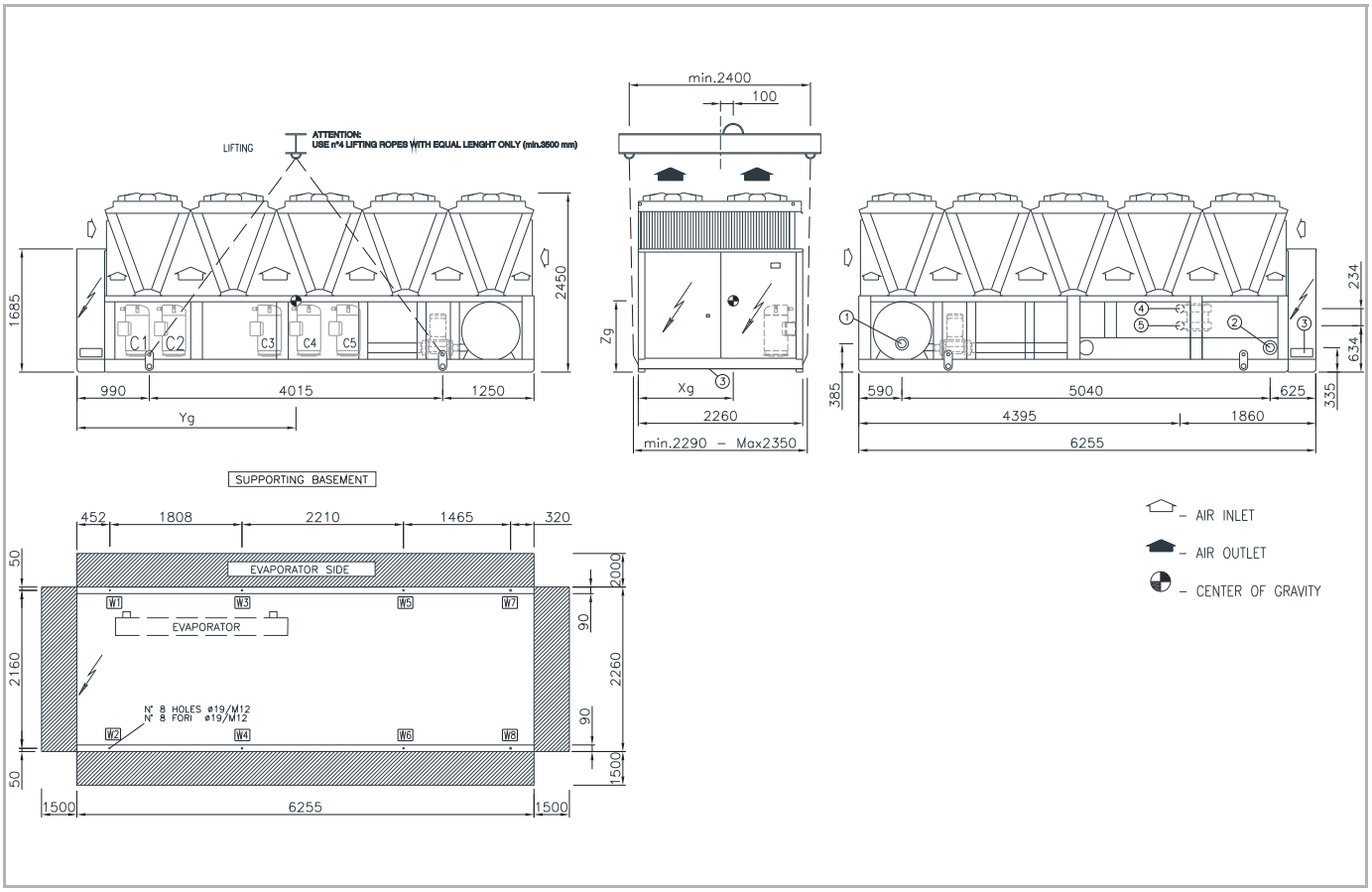


Fig. 37: DE152518-0 - GLAC 5171 CD2.SL/.HE + GLHM

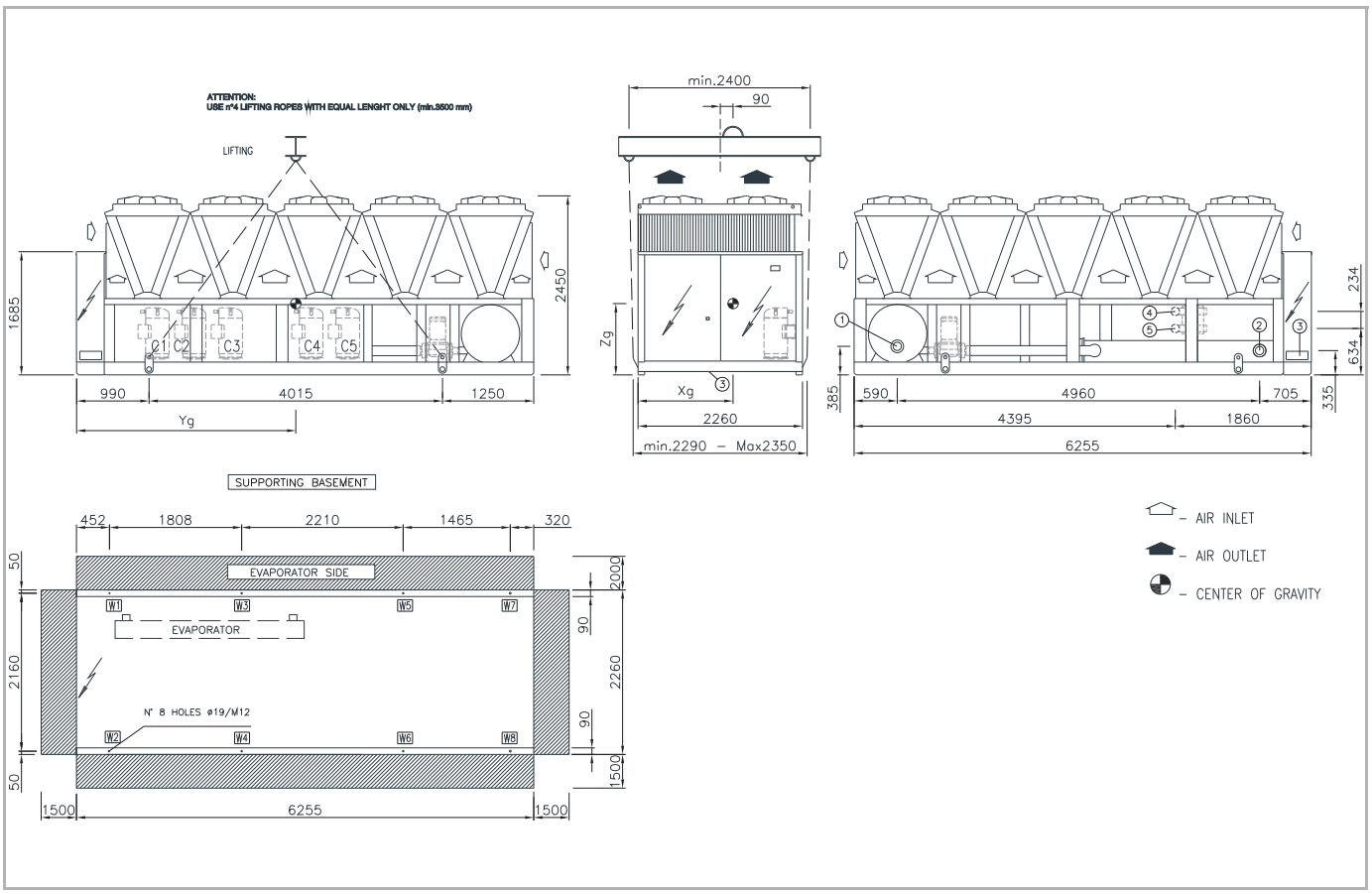


Fig. 38: DE159518-0 - GLAC 5201 CD2.SL/.HE + GLHM

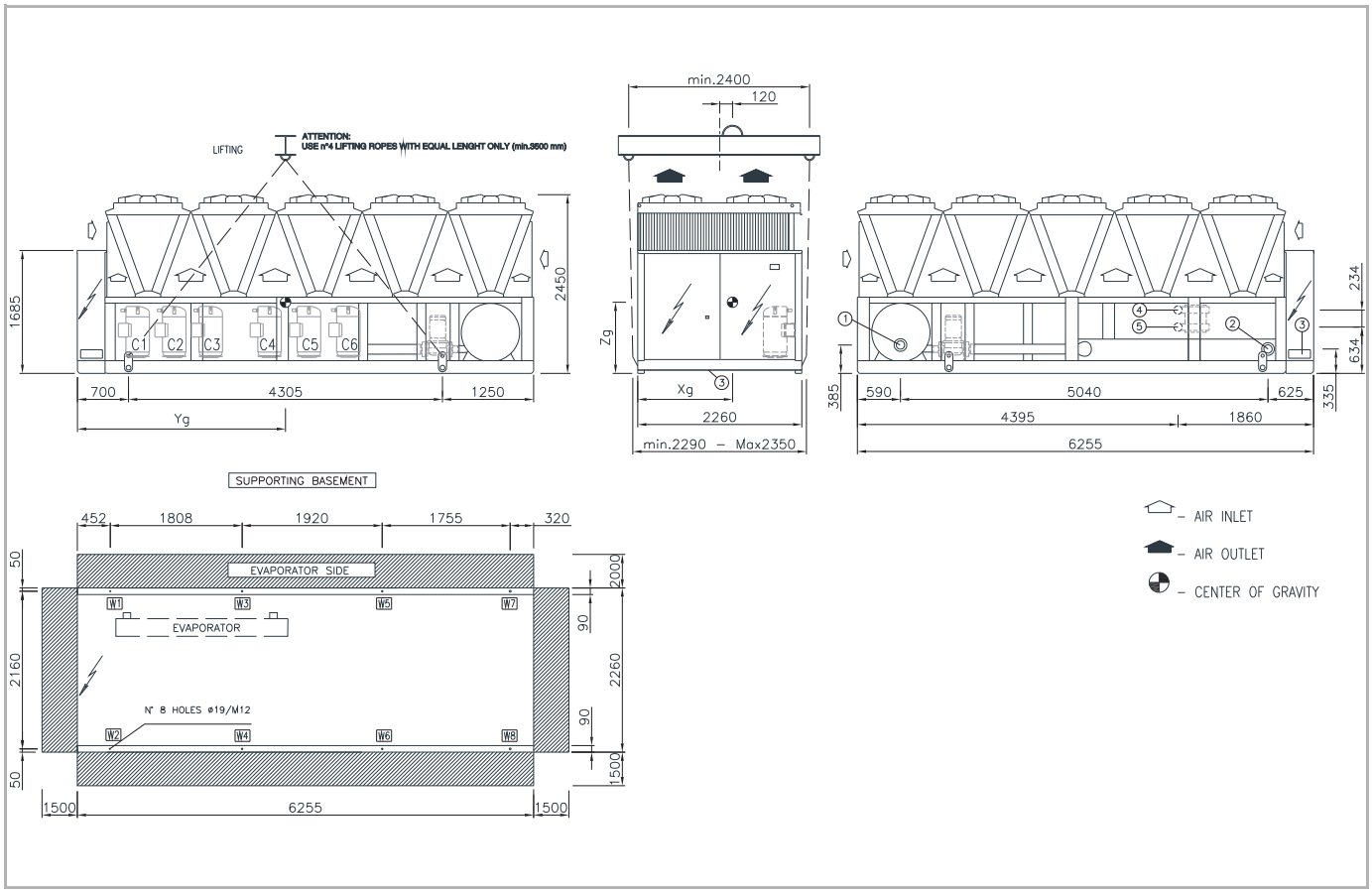


Fig. 39: DE155518-0 - GLAC 6181 CD2.SL/.HE + GLHM

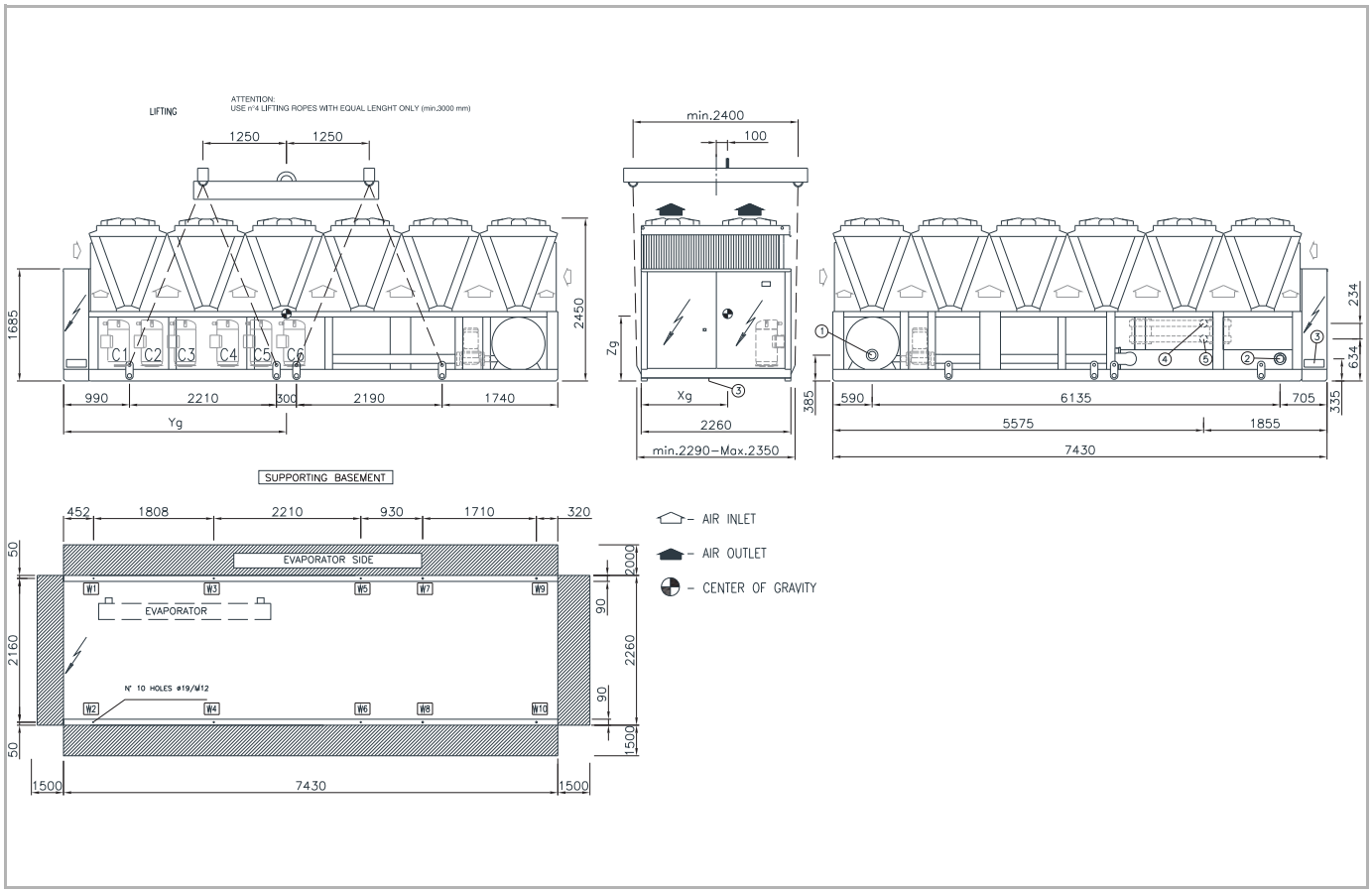


Fig. 40: DE155528-0 - GLAC 6211-6241 CD2.SL/.HE + GLHM

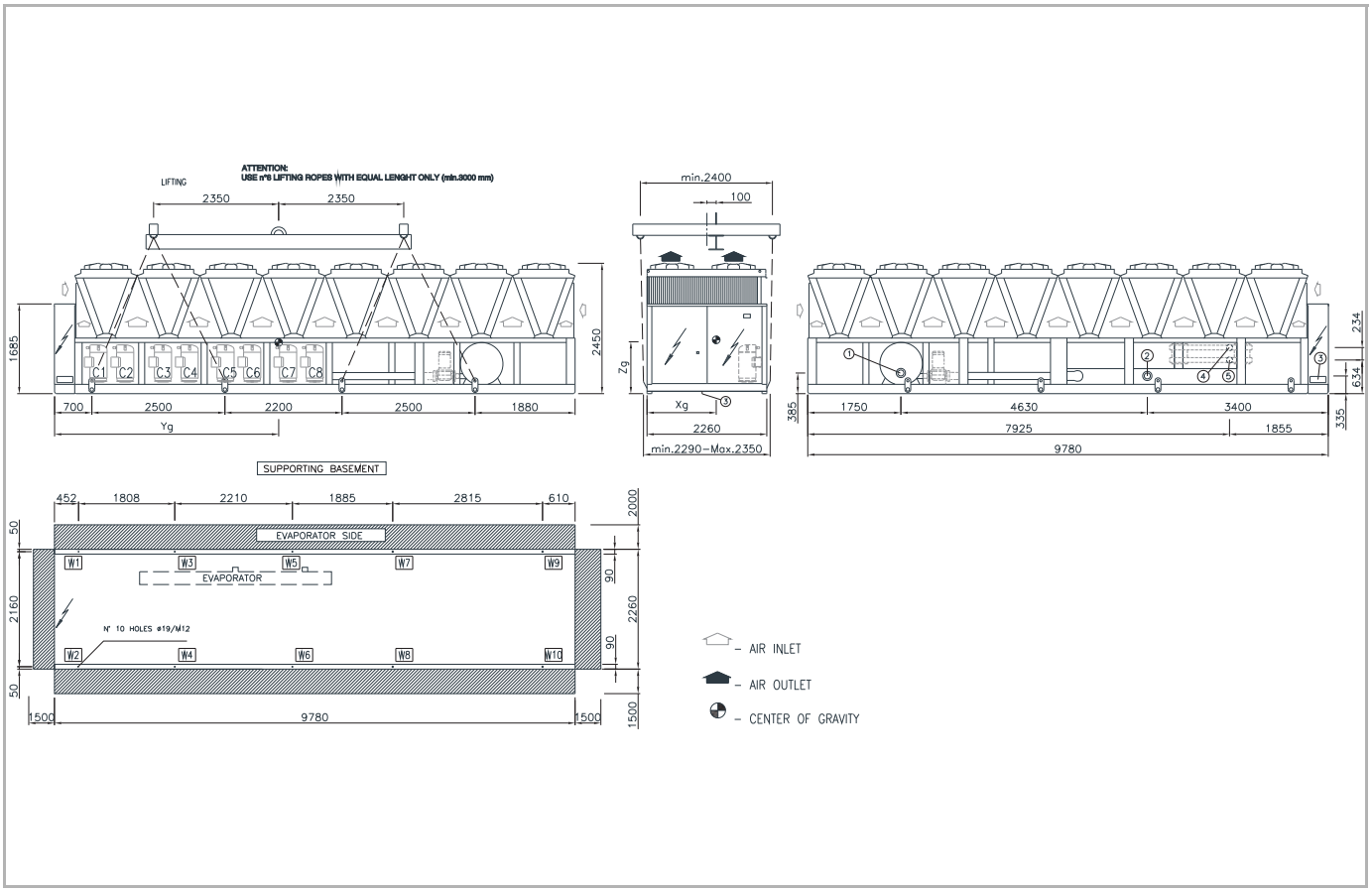


Fig. 41: DE163518-0 - GLAC 8241-8321 CD2.SL/HE + GLHM without GLAC 8241-8261 CD2.SL

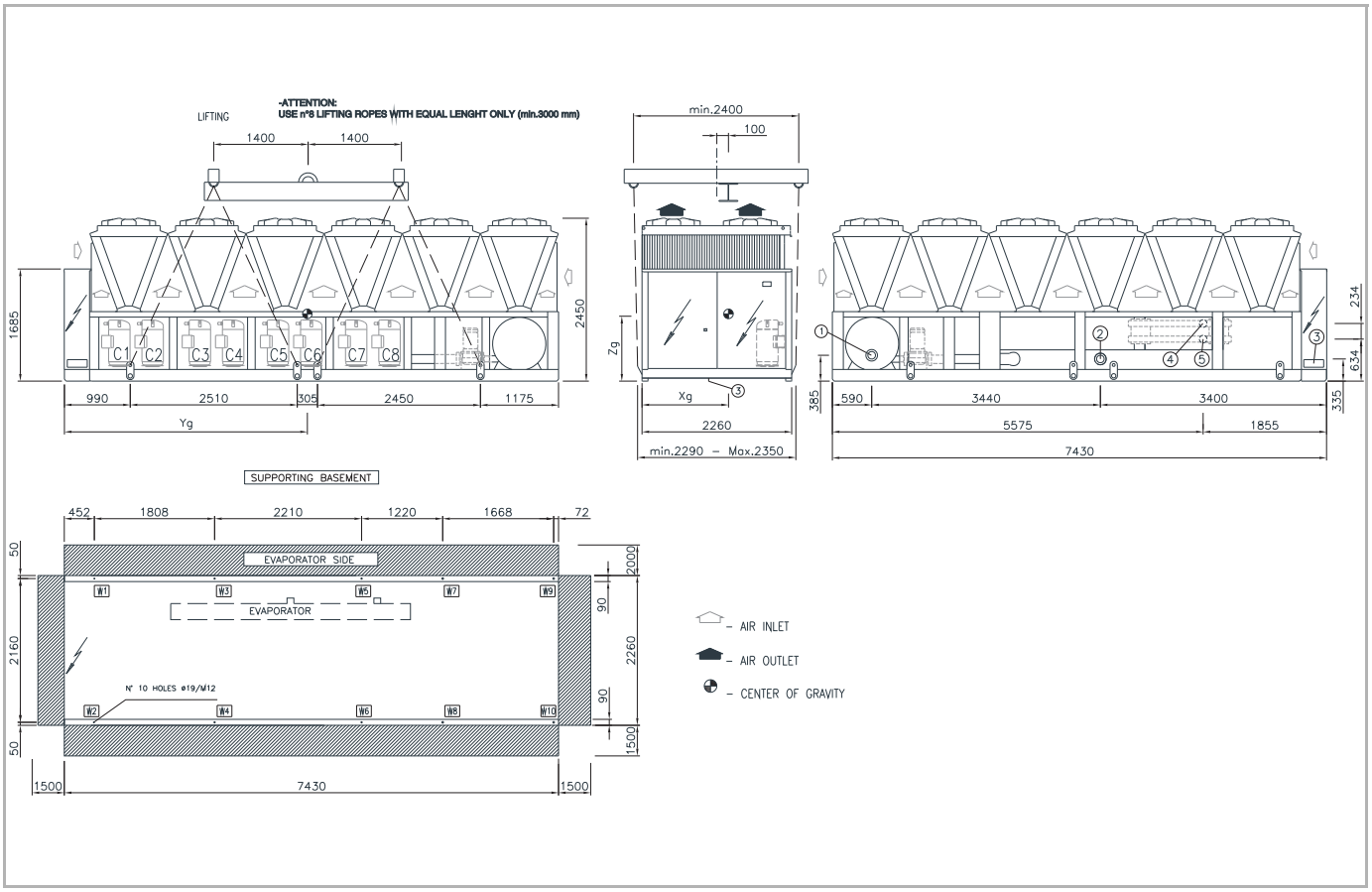


Fig. 42: DE163508-0 - GLAC 8241 CD2.SL+GLHM

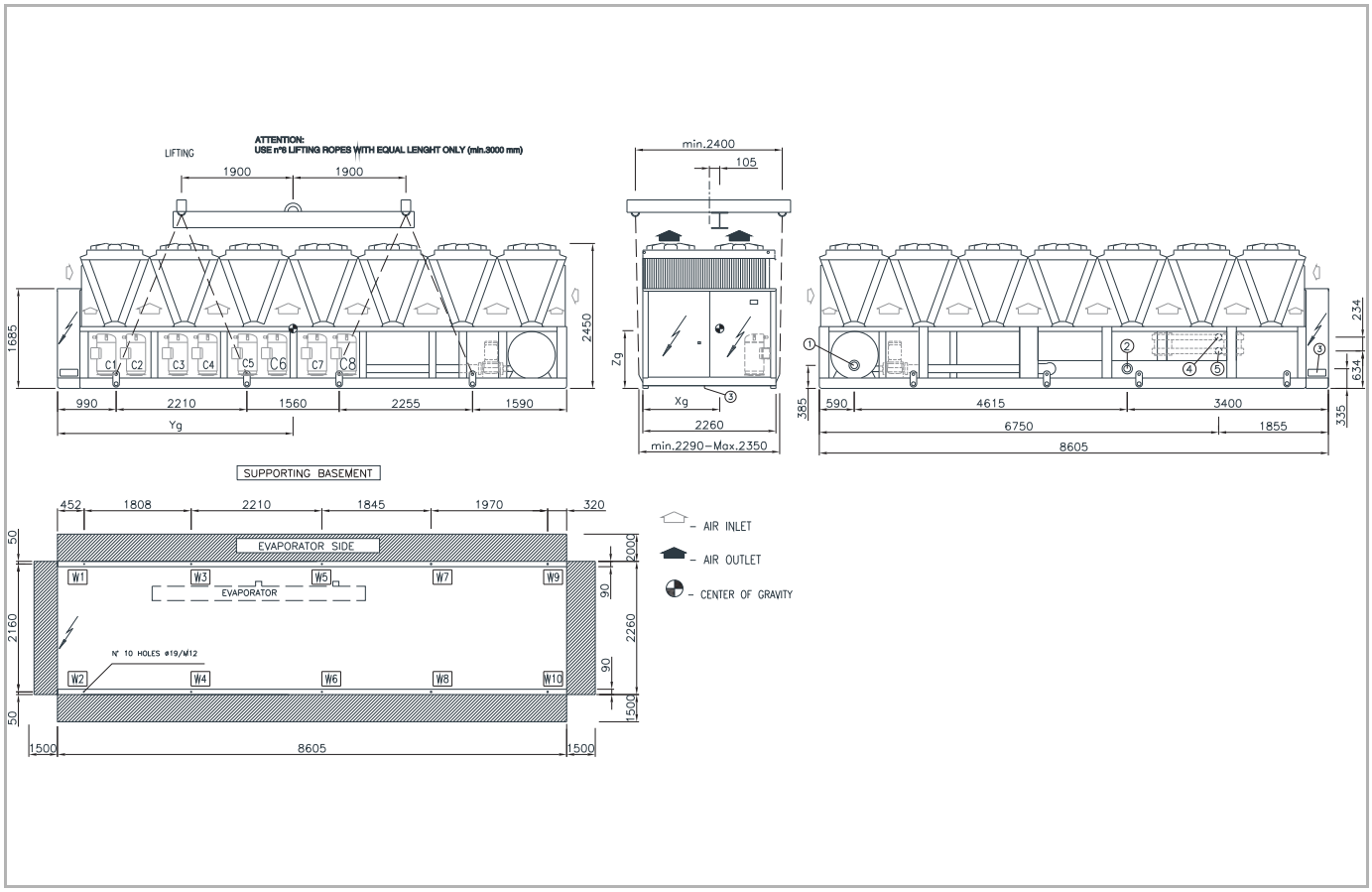


Fig. 43: DE165508-0 - GLAC 8261 CD2.SL+GLHM

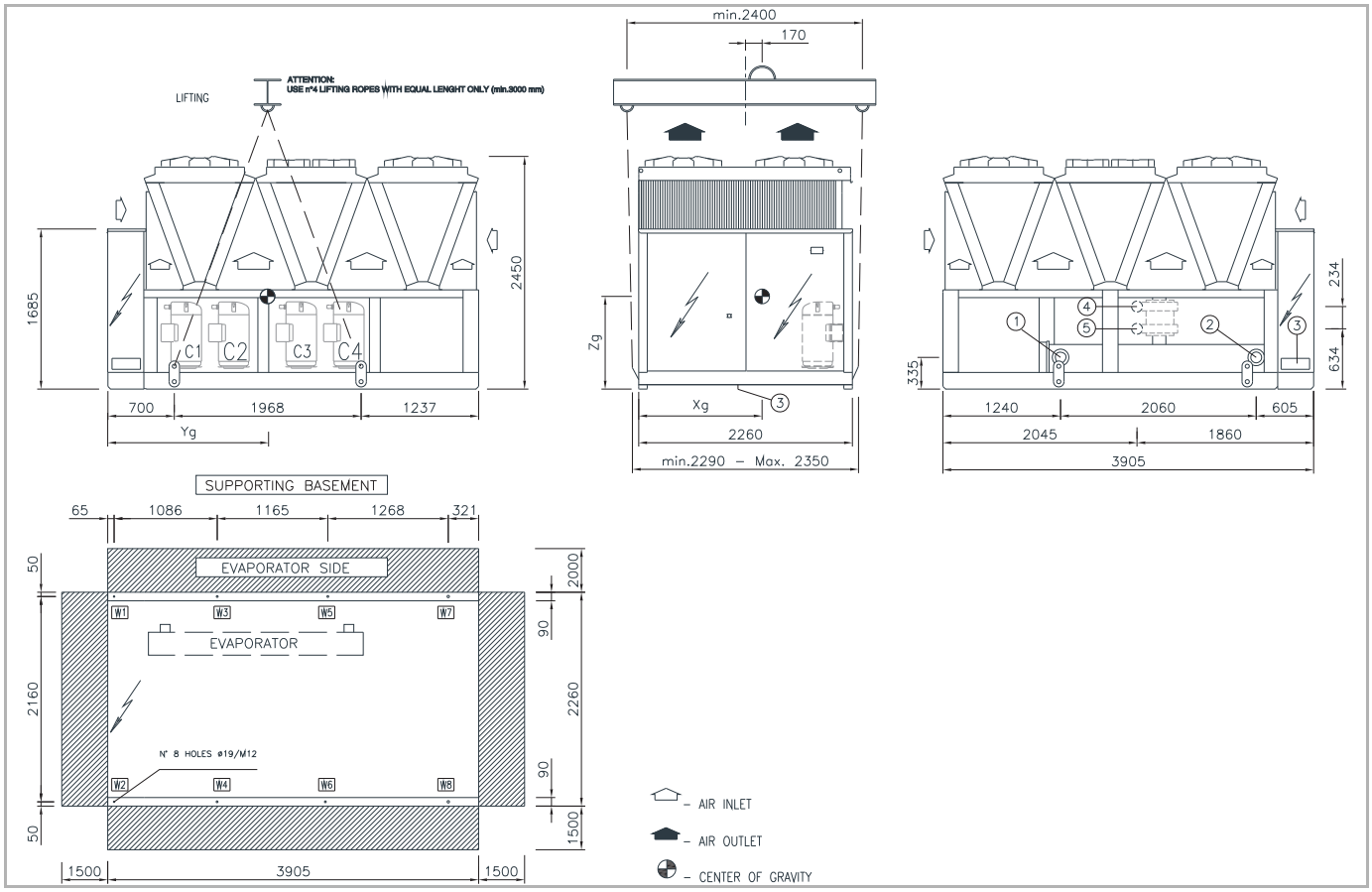


Fig. 44: DE237500-1 - GLAH 4131-4161 CD2

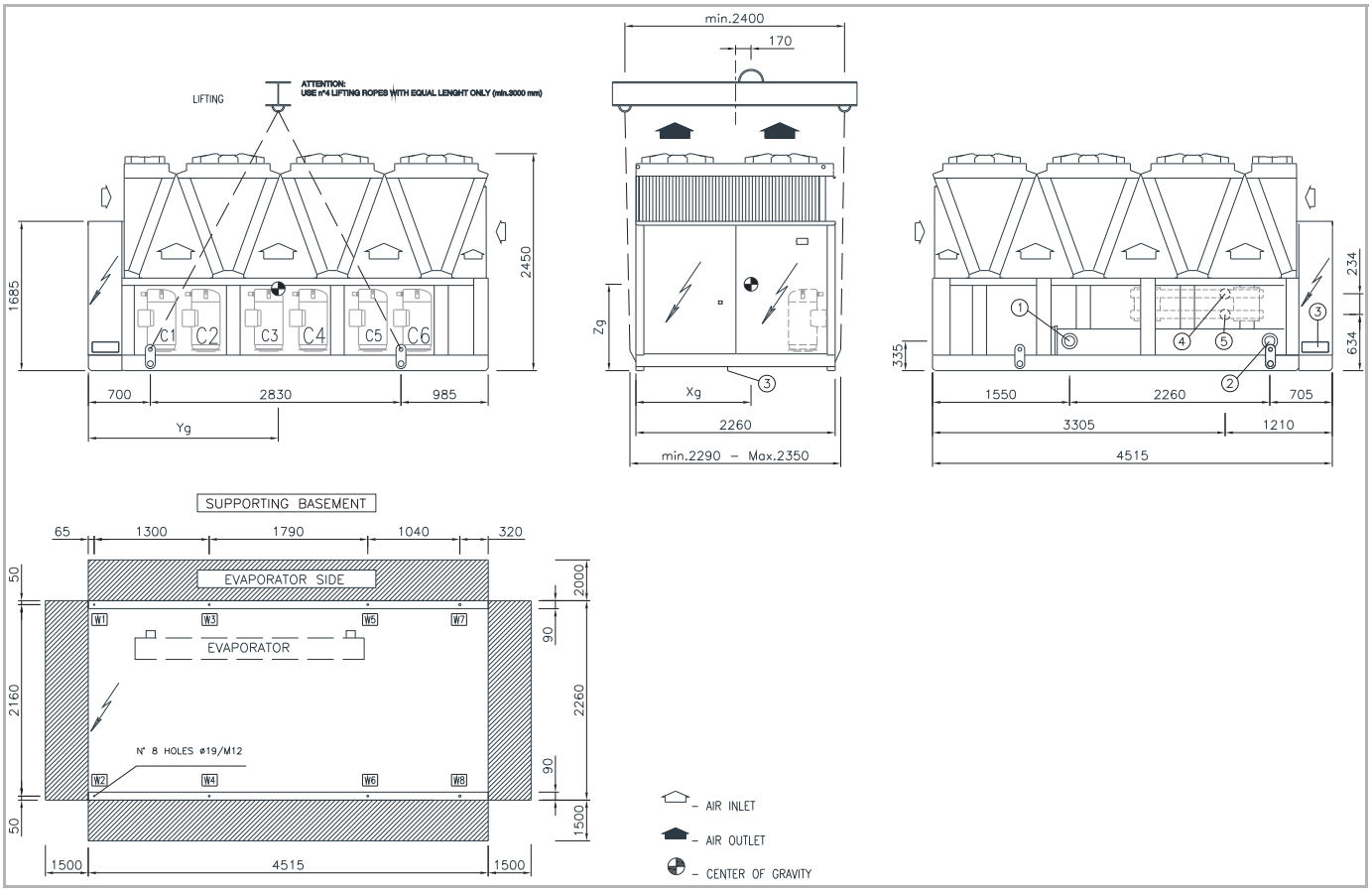


Fig. 45: DE252500-0 - GLAH 6171 CD2

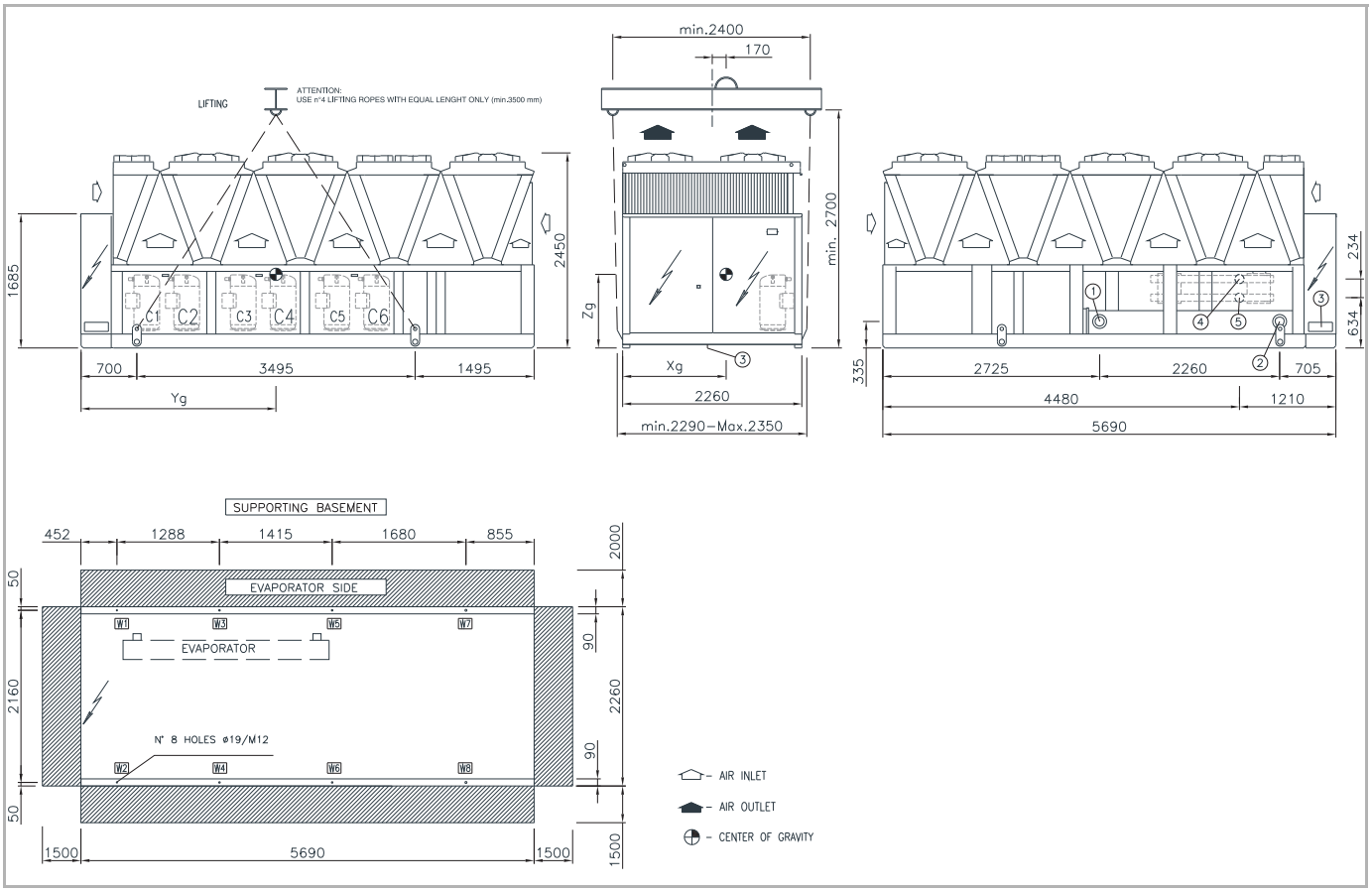


Fig. 46: DE252510-0 - GLAH 6181 CD2

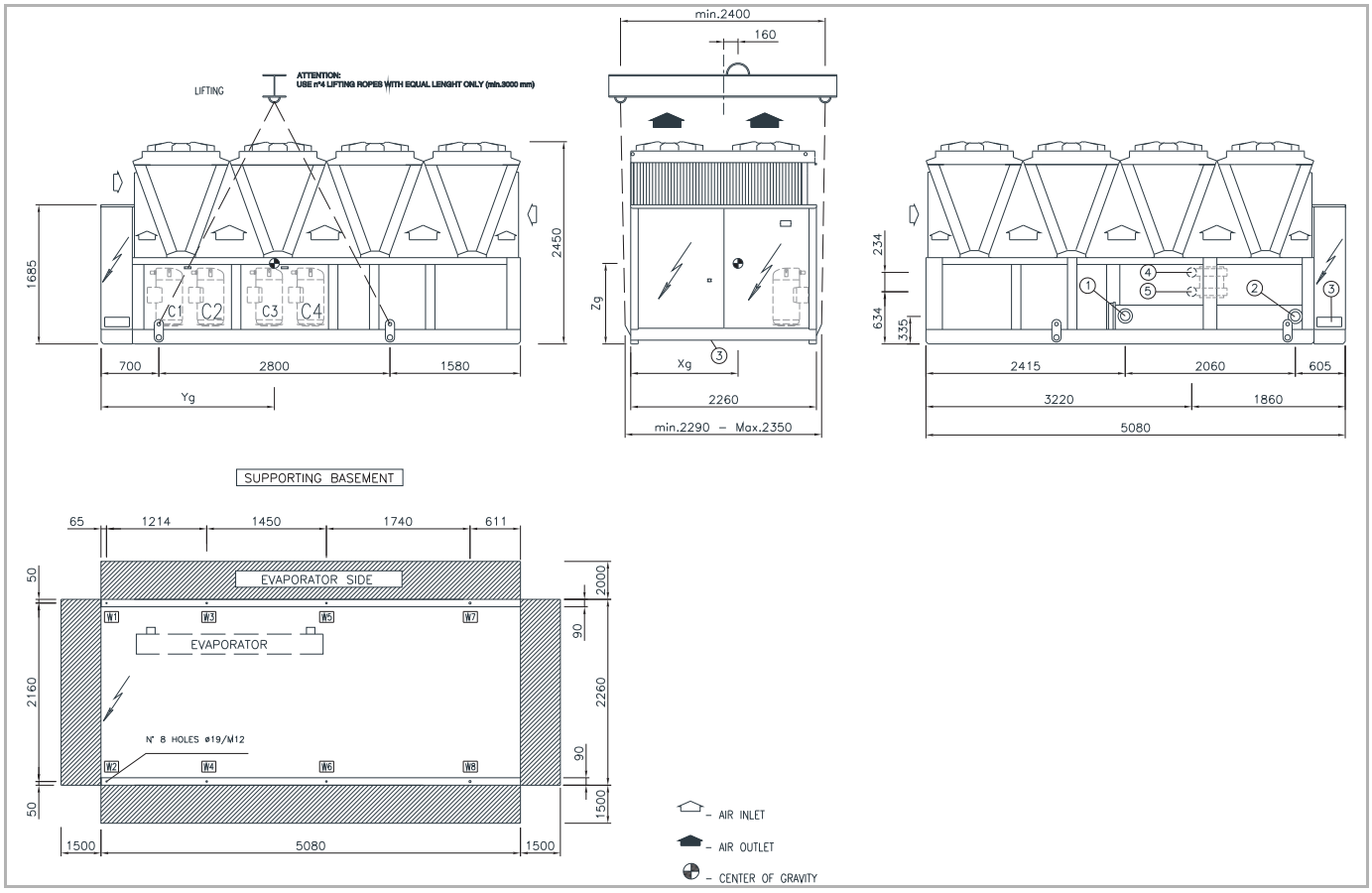


Fig. 47: DE237520-1 - GLAH 4131-4161 CD2.LT

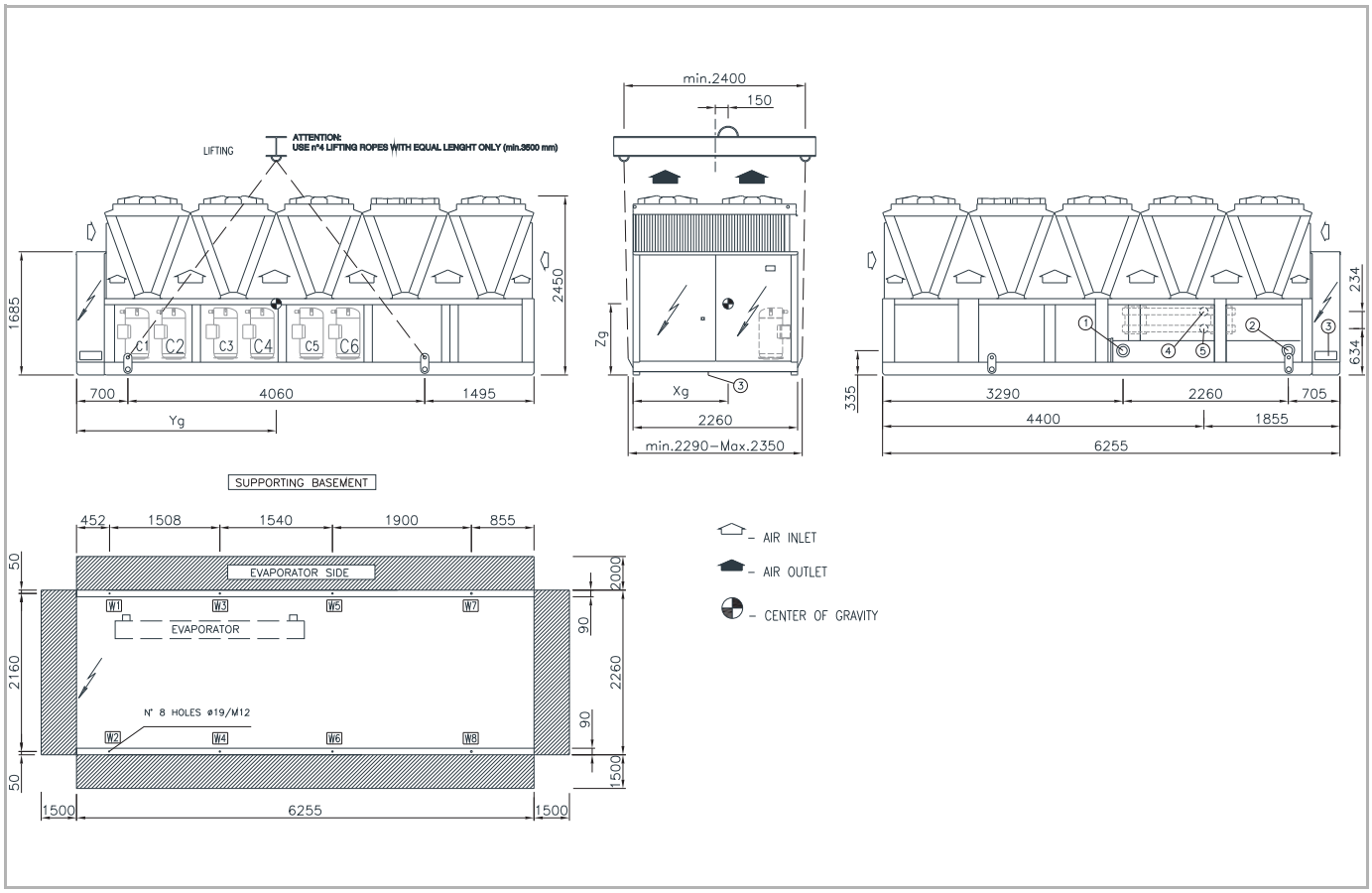


Fig. 48: DE252520-0 - GLAH 6171 CD2.LT

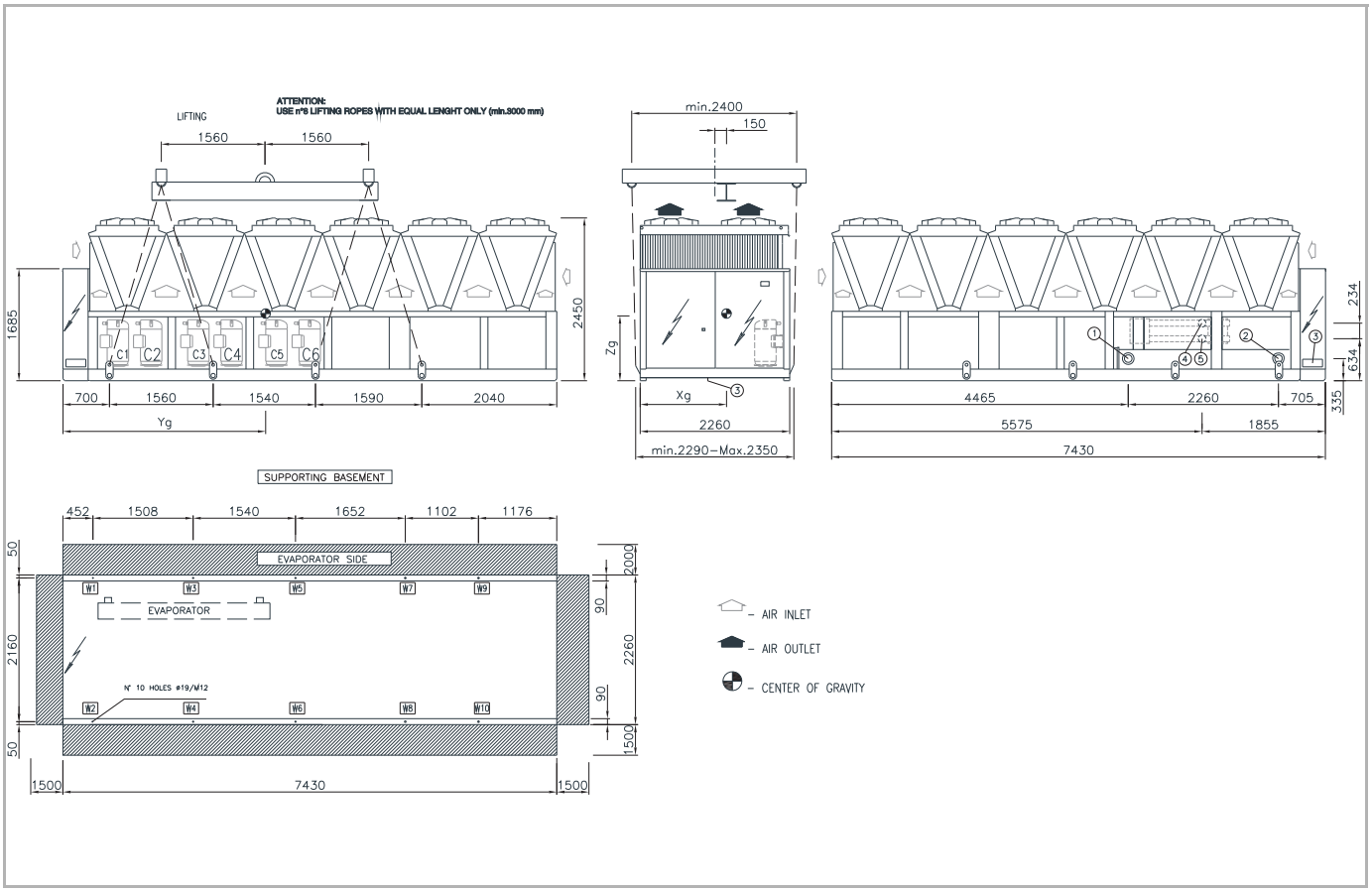


Fig. 49: DE255500-0 - GLAH 6181-6241 CD2.LT

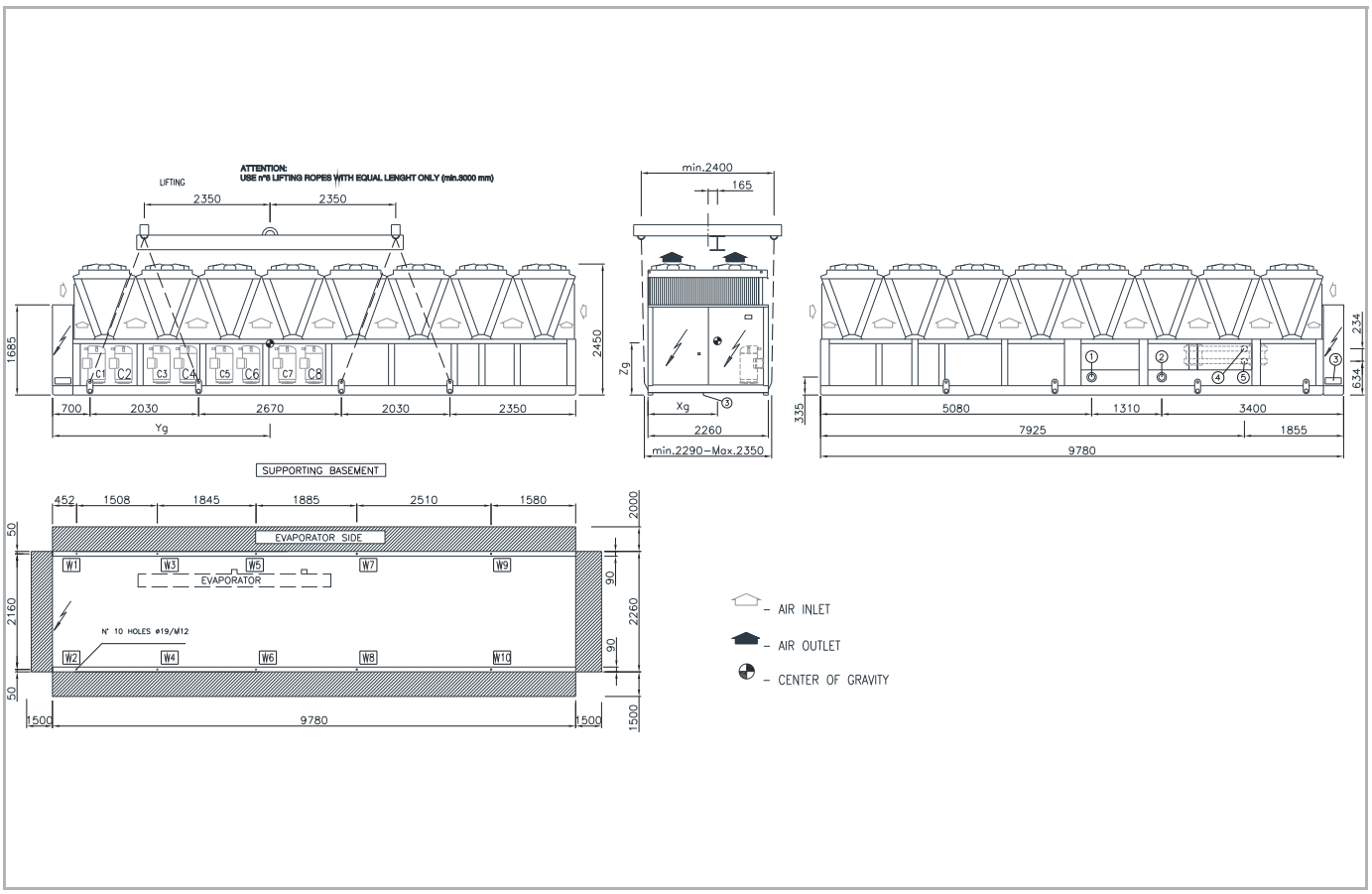


Fig. 50: DE263510-0 - GLAH 8241-8321 CD2.LT

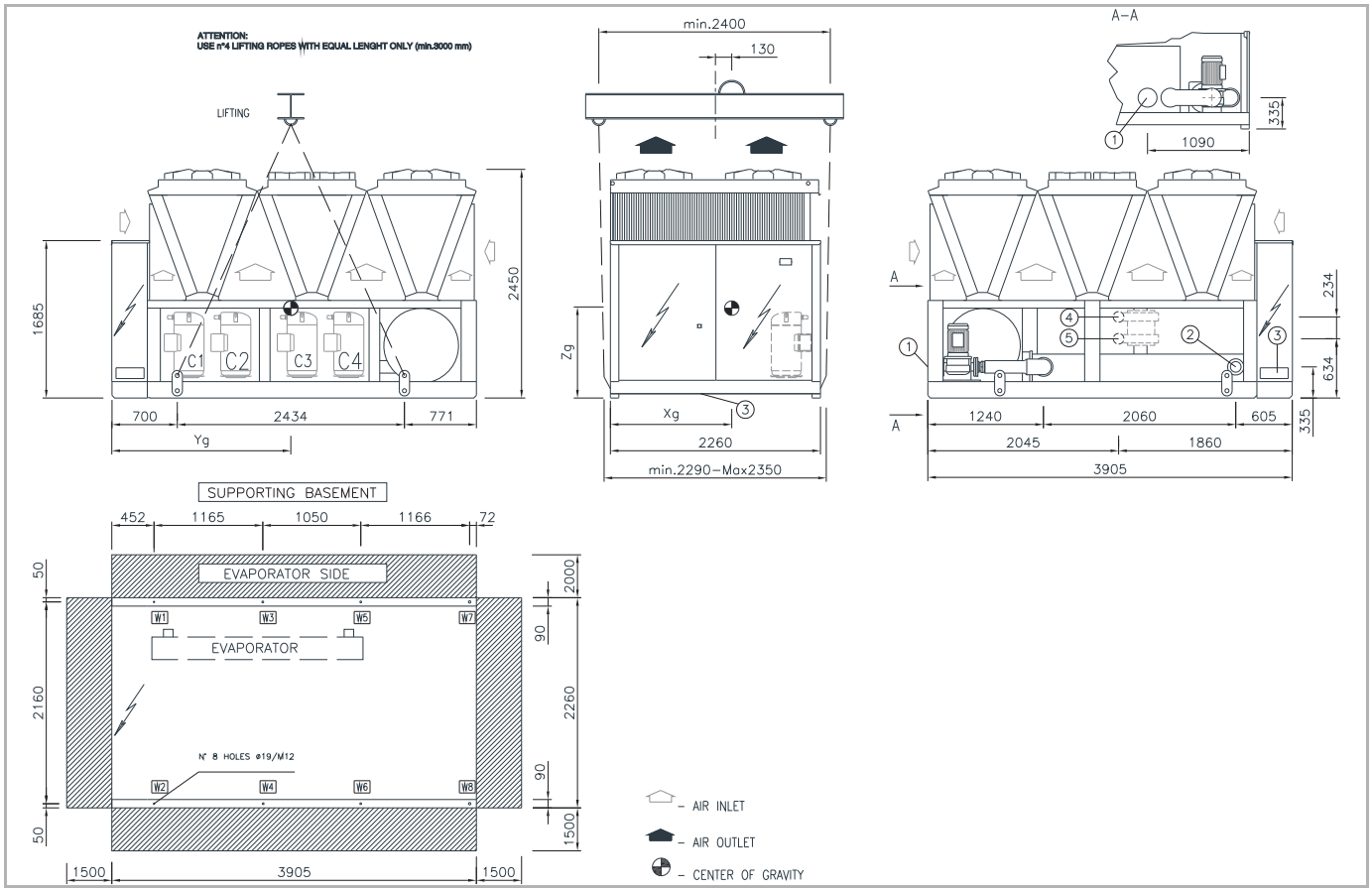


Fig. 51: DE237508-1 - GLAH 4131-4161 CD2 + GLHM

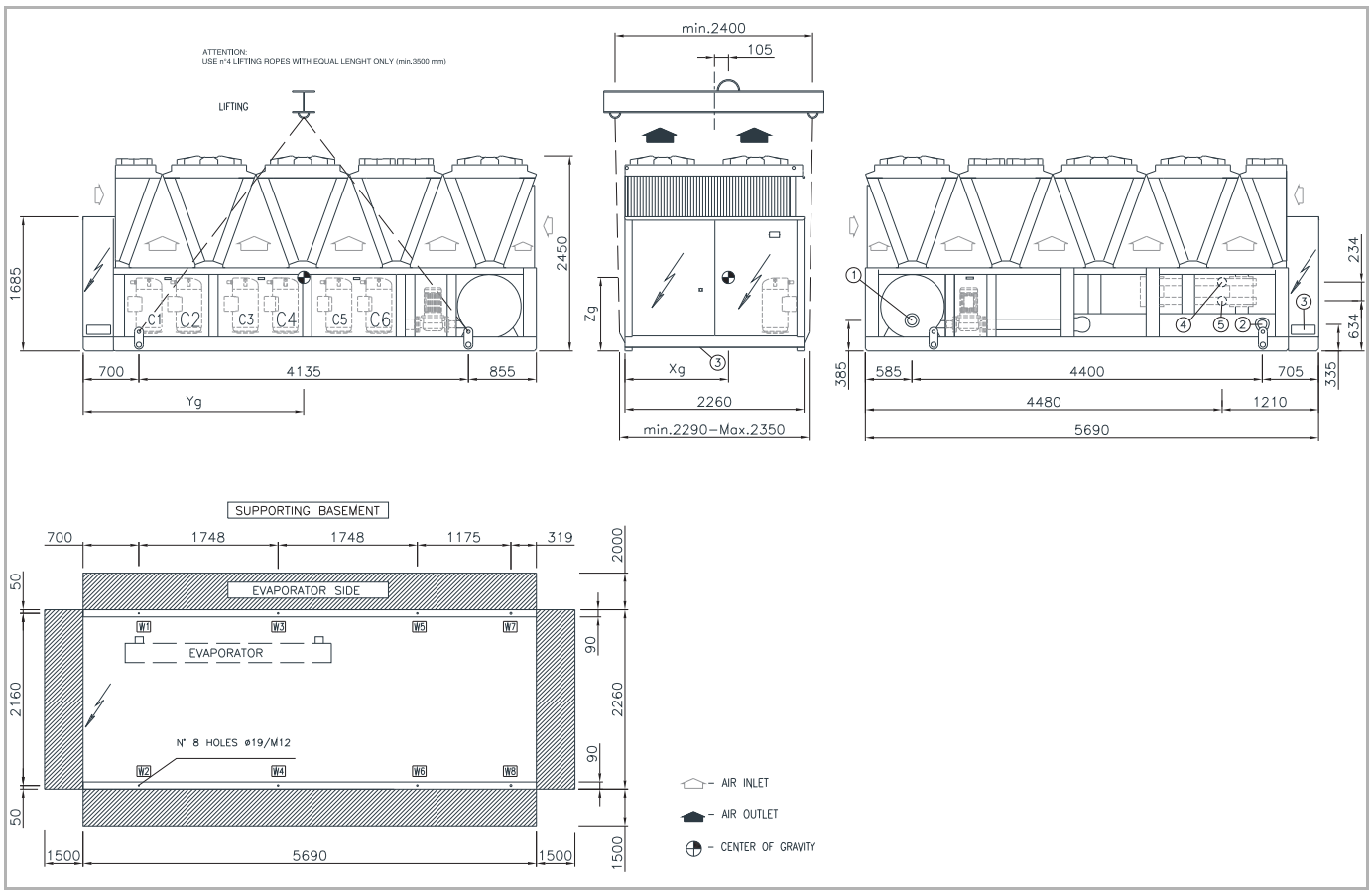


Fig. 52: DE252518-0 - GLAH 6181 CD2 + GLHM

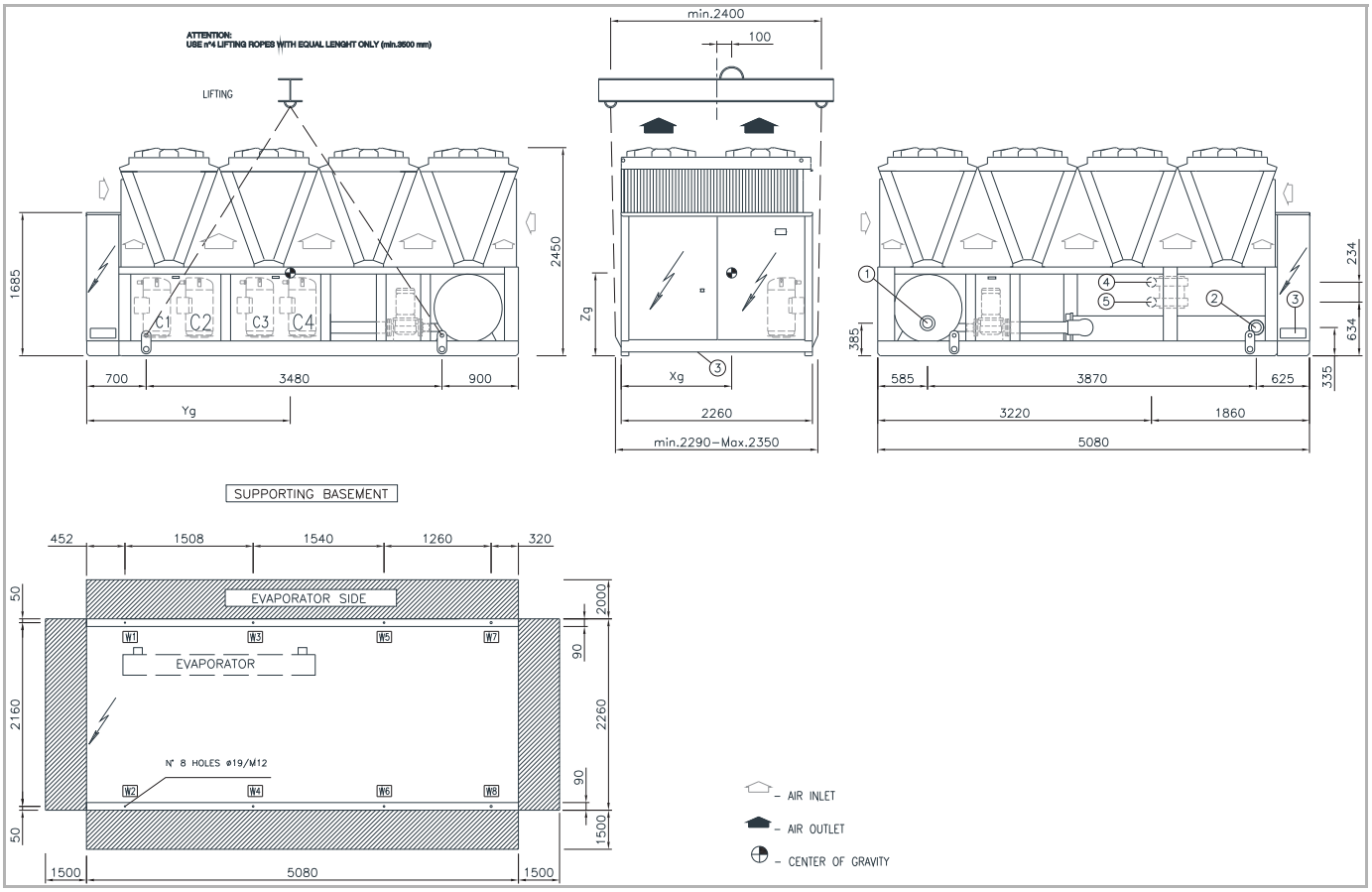


Fig. 53: DE237528-1 - GLAH 4131-4161 CD2.LT + GLHM

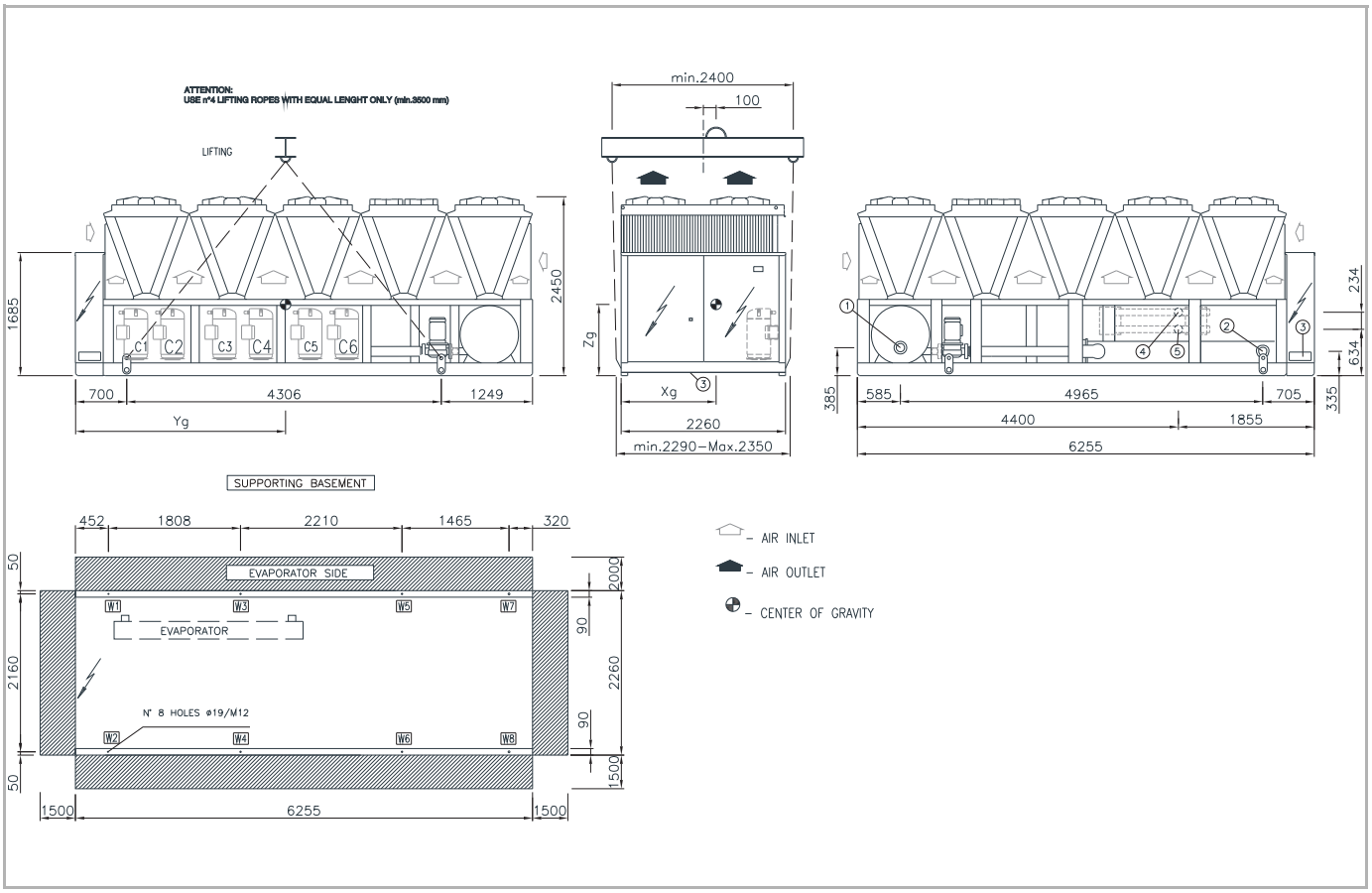


Fig. 54: DE252528-0 - GLAH 6171 CD2.LT + GLHM

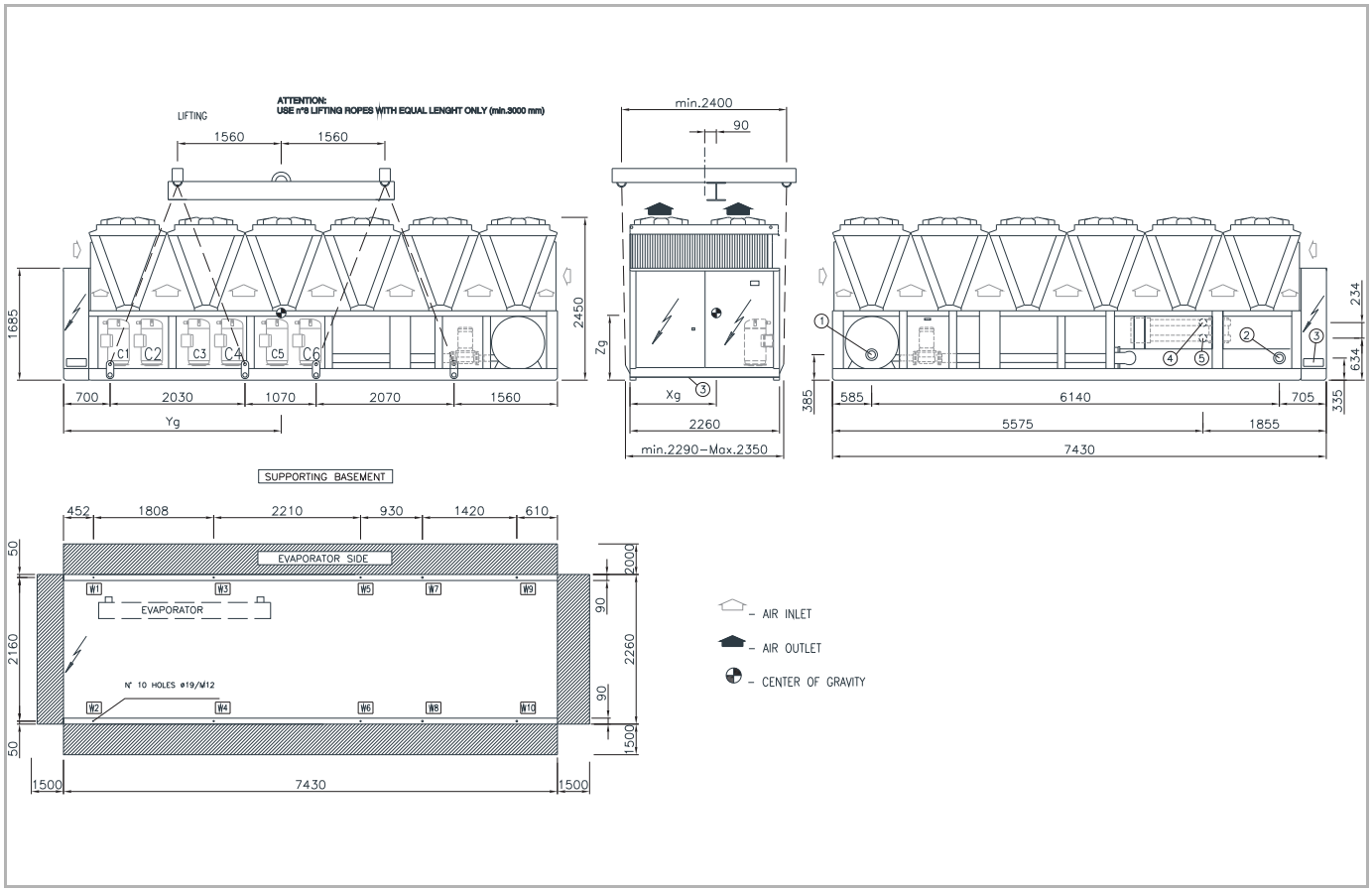


Fig. 55: DE255508-0 - GLAH 6181 CD2.LT + GLHM

Legend for dimensional drawings

Acronym	Description
1	Water inlet heat exchanger– G XX [''] (connection size see Technical Data on page 22 and following pages)
2	Water outlet heat exchanger – G XX [''] (connection size see Technical Data from page 22 and following pages)
3	Supply voltage

Tab. 38

Description of pipe connections		
Threaded connections (defined as of UNI ISO 7/1)		
Rp XX	[']	Parallel internal thread with seal through thread
Rc XX	[']	Conical internal thread with seal through thread
R XX	[']	Conical external thread with seal through thread
Threaded connections (defined as of UNI ISO 288/1)		
XX	[']	ISO G: parallel external thread not sealing through thread
Flange connections		
DN XX / PN XX	-	Nominal diameter with pressure class (e. g. DN 80 PN16: nominal diameter 80 mm, nominal pressure 16 bar)
Groove-lock connections		
G	[']	flexible joint: rated diameter (also known as „Victaulic®“ trade mark)

Tab. 39

NOTE!

For detailed planning please only use the order related documentation. Detailed dimensional drawings can be obtained on request from your relevant FläktGroup sales office. Specifications and technical data are subject to regular updates. The manufacturer reserves the right to make necessary changes to information without prior written notice.

FläktGroup hydraulic modules

G	L	HM	2	7	0	G	-	24

for

FläktGroup air cooled chiller for outdoor installation
GLAC 4131-8321 CD2 (.SL / .HE)

and

FläktGroup air cooled heat pump for outdoor installation
GLAH 4131-8321 CD2 (.LT)

	FläktGroup Chiller	Hydraulic module	Number of pumps	Buffer tank content:	Pump characteristics curve	-	Capacity stage
GL	FläktGroup Large						
HM	Hydraulic module						
1	1 pump						
2	2 pumps						
70	700 l						
10	1000 l						
A - P	Pump characteristics curve on page 114 and following pages						
-	-						
12	4131						
14	4141						
16	4161						
17	5171 (chiller), 6171 (heat pump)						
18	6181						
20	5201 (chiller), 6201 (heat pump)						
21	6211 (chiller)						
23	6231 (chiller)		Unit model size				
24	6241 (chiller)						
25	8241 (chiller)						
26	8261 (chiller)						
28	8281 (chiller)						
30	8301 (chiller)						
32	8321 (chiller)						

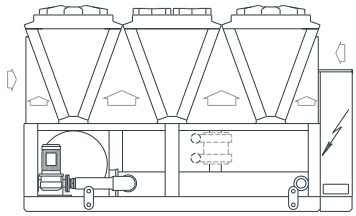
Unit		Delivery head: standard				Delivery head: heavy-duty			
	Buffer tank	GLHM 1 pump	Pump curve	GLHM 2 pumps	Pump curve	GLHM 1 pump	Pump curve	GLHM 2 pumps	Pump curve
GLAC 4131 CD2.SL/.HE	1000 l	GLHM110A-12	A	GLHM210G-12	G	GLHM110C-12	C	GLHM210I-12	I
GLAC 4141 CD2.SL/.HE	1000 l	GLHM110A-14	A	GLHM210G-14	G	GLHM110C-14	C	GLHM210I-14	I
GLAC 4161 CD2.SL/.HE	1000 l	GLHM110B-16	B	GLHM210H-16	H	GLHM110C-16	C	GLHM210I-16	I
GLAC 5171 CD2.SL/.HE	1000 l	GLHM110B-17	B	GLHM210H-17	H	GLHM110C-17	C	GLHM210I-17	I
GLAC 6181 CD2.SL/.HE	1000 l	GLHM110B-18	B	GLHM210H-18	H	GLHM110C-18	C	GLHM210I-18	I
GLAC 5201 CD2.SL/.HE	1000 l	GLHM110C-20	C	GLHM210I-20	I	GLHM110M-20	M	GLHM210O-20	O
GLAC 6211 CD2.SL/.HE	1000 l	GLHM110C-21	C	GLHM210I-21	I	GLHM110E-21	E	GLHM210K-21	K
GLAC 6231 CD2.SL/.HE	1000 l	GLHM110D-23	D	GLHM210J-23	J	GLHM110E-23	E	GLHM210K-23	K
GLAC 6241 CD2.SL/.HE	1000 l	GLHM110D-24	D	GLHM210J-24	J	GLHM110E-24	E	GLHM210K-24	K
GLAC 8241 CD2.SL/.HE	1000 l	GLHM110D-25	D	GLHM210J-25	J	GLHM110E-25	E	GLHM210K-25	K
GLAC 8261 CD2.SL/.HE	1000 l	GLHM110E-26	E	GLHM210K-26	K	GLHM110N-26	N	GLHM210P-26	P
GLAC 8281 CD2.SL/.HE	1000 l	GLHM110E-28	E	GLHM210K-28	K	GLHM110N-28	N	GLHM210P-28	P
GLAC 8301 CD2.SL/.HE	1000 l	GLHM110E-30	E	GLHM210K-30	K	GLHM110N-30	N	GLHM210P-30	P
GLAC 8321 CD2.SL/.HE	1000 l	GLHM110F-32	F	GLHM210L-32	L	GLHM110N-32	N	GLHM210P-32	P

Tab. 40

Unit		Delivery head: standard				Delivery head: heavy-duty			
	Buffer tank	GLHM 1 pump	Pump curve	GLHM 2 pumps	Pump curve	GLHM 1 pump	Pump curve	GLHM 2 pumps	Pump curve
GLAH 4131 CD2	700 l	GLHM170A-12	A	GLHM270G-12	G	GLHM170C-12	C	GLHM270I-12	I
GLAH 4131 CD2.LT	1000 l	GLHM110A-12	A	GLHM210G-12	G	GLHM110C-12	C	GLHM210I-12	I
GLAH 4141 CD2	700 l	GLHM170A-14	A	GLHM270G-14	G	GLHM170C-14	C	GLHM270I-14	I
GLAH 4141 CD2.LT	1000 l	GLHM110A-14	A	GLHM210G-14	G	GLHM110C-14	C	GLHM210I-14	I
GLAH 4161 CD2	700 l	GLHM170B-16	B	GLHM270H-16	H	GLHM170C-16	C	GLHM270I-16	I
GLAH 4161 CD2.LT	1000 l	GLHM110B-16	B	GLHM210H-16	H	GLHM110C-16	C	GLHM210I-16	I
GLAH 6171 CD2.LT	1000 l	GLHM110B-17	B	GLHM210H-17	H	GLHM110C-17	C	GLHM210I-17	I
GLAH 6181 CD2(.LT)	1000 l	GLHM110B-18	B	GLHM210H-18	H	GLHM110M-18	M	GLHM210O-18	O

Tab. 41

FläktGroup Chiller / Heat pump



with GLHM hydraulic module

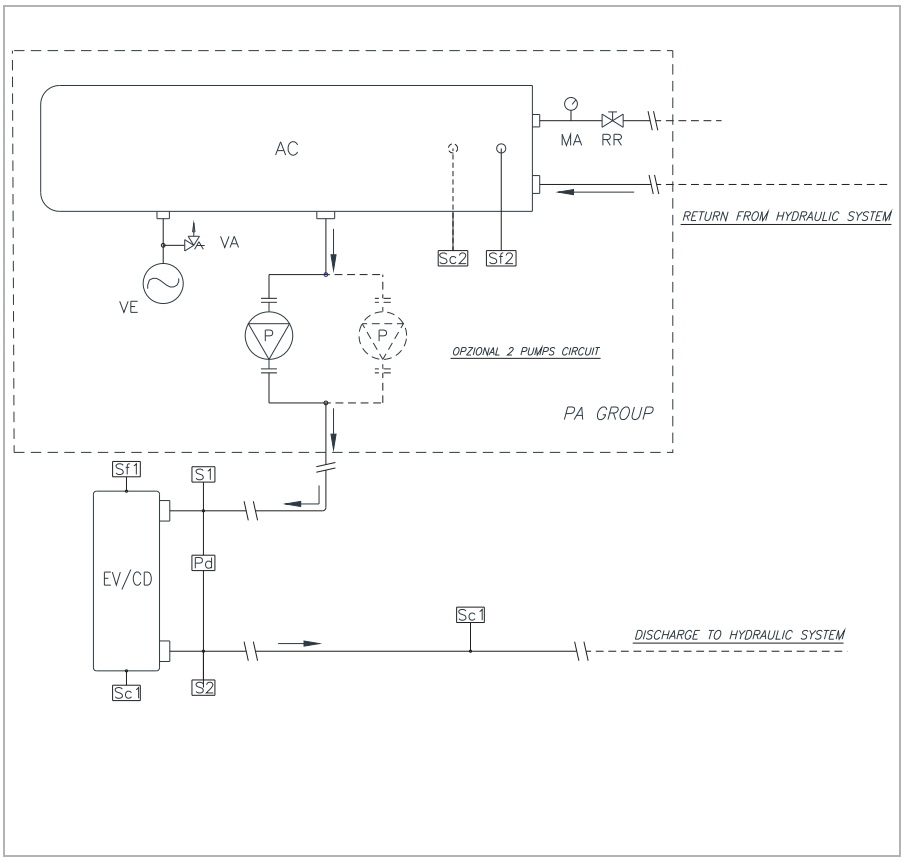
The GLAC 4131-8321 CD2 (.SL/.HE) and GLAH 4131-6181 CD2(.LT) units can be optionally delivered with a hydraulic module. This significantly reduces the on-site installation costs.

The hydraulic modules basically consist of:

– One or two chilled/warm water pumps
– Expansion tank (dimensioned only for the unit!)
– Safety valve (6 bar)
– Pressure gauge
– Buffer tank
– Fill and drain valve
– Air vent valve
– Pipework trace heating (not applicable for buffer tank)

All above-mentioned components are already fitted in the chiller/heat pump and pre-cabled, where necessary. On site only water pipework has to be connected with the hydraulic network; besides an electric supply line has to be mounted on the chiller's main isolator. Supply voltage and regulation of lead and overrun time of the warm water pump is performed by the control system of chiller or heat pump.

Hydraulic circuit



Acronym	Description
AC	Buffer tank
EV/CD	Evaporator (in cooling mode) (shell and tube heat exchanger)
MA	Pressure gauge
P	Pump
Pd	Water side differential pressure switch
RR	Filling valve
S1	Water inlet sensor
S2	Water outlet sensor
Sc1	Drain valve evaporator
Sc2	Drain valve buffer tank
Sf1	Air vent valve evaporator
Sf2	Air vent valve buffer tank
VA	Safety valve (6 bar)
VE	Expansion tank

Fig. 56: Hydraulic circuit of unit series GLAC 4131-8321 CD2 and GLAH 4131-8321 CD2 with GLHM

Other optional accessories

Second pump

The hydraulic module can be equipped with a second pump for redundant change-over operation. The chiller/heat pump control system regulates the pump activations in order to compensate operating hours or if a pump failure occurs. Hydraulic modules with two pumps are completely supplied with a non-return valve for each pump. The non-return valve is integrated in the pump casing.

Frost protection heating of hydraulic modules

The frost protection heating for the buffer tank can be optionally supplied for the hydraulic module. The frost protection heating is necessary to protect the buffer tank charge against freezing in water standby operating mode.

NOTE!

Under all circumstances remember to install an additional flow switch at chilled water outlet of the unit and connect it to terminals A-B in the control cabinet of the unit. The additional flow switch can be optionally ordered and is a requirement for safe and trouble-free operation of the unit and in such a way this requirement constitutes an integral part for the validity of the guarantee.

As an example for pump design and planning pump head refer to the following procedure:

EXAMPLE

	Input data			→	Result
Requirements You must first determine certain input data.	Unit:	→	GLAC 8261 BD2 with integrated pump and buffer tank	→	**Basic unit**
	Minimum chilled water volume flow	→	76.1 m³/h		(See page 22 and following pages)
	Max. chilled water volume flow:	→	186.2 m³/h		(See page 22 and following pages)
	Chilled water volume flow at nominal conditions (ΔT = 6 K):	→	98.7 m³/h	→	(See example on page 20)
	Buffer tank content:	→	1000 liter		(refer to page 109).
	Minimum system content:	→	2030 liter		(See page 22 and following pages)
1. Step Determine the pressure drop for evaporator, pump and buffer tank on the basis of the diagram „Water side pressure drop Unit series GLAH 4131-8321 CD2(.LT) “ on page 66	$\dot{V}_e$ = 98.7 m³/h	→	Determine the pressure drop for evaporator, pump and buffer tank using the diagram D. 3 on page 65.	→	**Δp_e = 45.0 kPa**
2. Step When using water-glycol mixtures the factor amounts to 1.38 according to „Correction Factors for Glycol Concentration “ on page 68.	Water-glycol ratio in cooling medium (water) for frost protection up to -15 °C.	→	(„Freeze resistance of the cooling medium and the required glycol concentration “ on page 68)	→	**30 % glycol ratio**
			Determine chilled water side pressure drop depending on ethylene glycol content (D. 9 on page 68) according to the equation Gl. 4 on page 69.		
			$\Delta p_{e,G}$ = 1.38 • 45.0 kPa = 62.1 kPa		
				→	**$\Delta p_{e,G}$ = 62.1 kPa**
3. Step Determine the pump head with the corrected chilled water volume flow using the pump characteristics curve„Pump curve A-N “ on page 114.	Corrected chilled water volume flow due to the glycol use:	→	$\dot{V}_{e,G}$ = 106.6 m³/h (refer to example on page 20)		
		→	Pump delivery head at 106.6 m³/h according to diagram D. 14 on page 114.	→	**$p_{Hu,D}$ = 245 kPa**

EXAMPLE

	Input data	→ **Result**
4. Step Determine the available pump head for the hydraulic circuit. If the available pump head for the hydraulic circuit is not enough, select more powerful pump type and check available pump head of improved pump in a similar way.	p_{Hu} = 245 kPa $\Delta p_{e,G}$ = 62.1 kPa	→ $p_{avail.} = p_{Hu} - \Delta p_{e,G}$ $p_{avail.}$ = 245 kPa - 62.1 kPa = 183.8 kPa → $p_{avail.}$ = 183.8 kPa

Unit				Unit with buffer tank											
				1 pump with standard head						1 pump with heavy-duty head					
Unit	$\dot{Q}_e$[1] [kW]	$\dot{V}_e$[1] [m³/h]	Volume Buffer tank charge [l]	F.L.I. [kW]	F.L.A. [A]	Pump Charac-teristic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]	F.L.I. [kW]	F.L.A. [A]	Pump Charac-teristic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]
GLAC 4131 CD2.SL/.HE	354.3	61.0	1000 l	4	8.1	A	156	54	102	7.5	13.7	C	246	54	192
GLAC 4141 CD2.SL/.HE	378.8	65.2	1000 l	4	8.1	A	151	44	107	7.5	13.7	C	242	44	199
GLAC 4161 CD2.SL/.HE	413.4	71.2	1000 l	5.5	10.1	B	180	52	128	7.5	13.7	C	237	52	184
GLAC 5171 CD2.SL/.HE	458.2	78.9	1000 l	5.5	10.1	B	170	49	122	7.5	13.7	C	228	49	180
GLAC 6181 CD2.SL/.HE	501.3	86.6	1000 l	5.5	10.1	B	159	58	101	7.5	13.7	C	219	58	161
GLAC 5201 CD2.SL/.HE	526.6	90.5	1000 l	7.5	13.7	C	215	39	175	11	20	M	260	39	221
GLAC 6211 CD2.SL/.HE	569.4	98.0	1000 l	7.5	13.7	C	205	46	159	11	20	E	253	46	207
GLAC 6231 CD2.SL/.HE	603.7	103.9	1000 l	7.5	15.3	D	175	44	130	11	20	E	247	44	203
GLAC 6241 CD2.SL/.HE	634.9	109.3	1000 l	7.5	15.3	D	169	48	121	11	20	E	242	48	194
GLAC 8241 CD2.SL/.HE	665.3	114.5	1000 l	7.5	15.3	D	164	49	115	11	20	E	237	49	188
GLAC 8261 CD2.SL/.HE	707.9	121.9	1000 l	11	20	E	229	55	174	18.5	32.8	N	339	55	285
GLAC 8281 CD2.SL/.HE	759.4	130.7	1000 l	11	20	E	219	43	177	18.5	32.8	N	328	43	285
GLAC 8301 CD2.SL/.HE	793.5	136.6	1000 l	11	20	E	212	47	166	18.5	32.8	N	320	47	273
GLAC 8321 CD2.SL/.HE	826.6	142.3	1000 l	11	22.5	F	190	51	139	18.5	32.8	N	312	51	261

Tab. 42: Values are rounded up or down.

[1] *Values with pure water refer to rated conditions*
$\dot{Q}_e$: Cooling capacity ofunit
$\dot{V}e$:Water flow rate through evaporator
F.L.I. max. power consumption of pump
F.L.A.: max. current consumption of pump
Hp: Pump delivery head
Dpu: Total pressure drop of unit
Hu: available delivery head

Pump curve A-N

D. 14

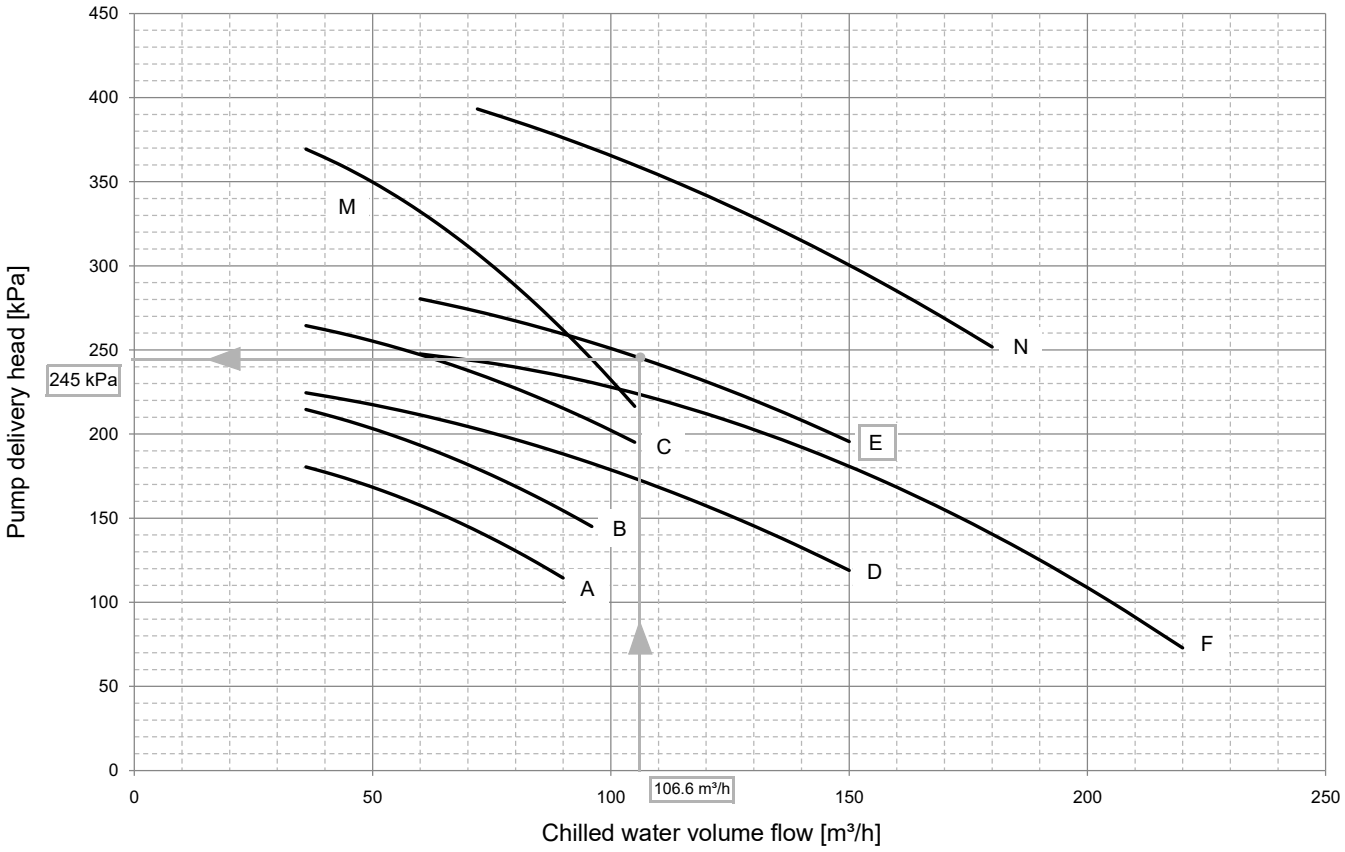


Diagram values from example page 112

Unit				Unit with buffer tank											
				2 pumps with standard delivery head						2 pumps with heavy-duty delivery head					
Unit	• Q_e[1] [kW]	• V_e[1] [m³/h]	Volume Buffer tank charge [l]	F.L.I. [kW]	F.L.A. [A]	Pump Character-istic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]	F.L.I. [kW]	F.L.A. [A]	Pump Charac-teristic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]
GLAC 4131 CD2.SL/.HE	354.3	61.0	1000 l	4	8.1	G	150	54	96	7.5	13.7	I	248	54	194
GLAC 4141 CD2.SL/.HE	378.8	65.2	1000 l	4	8.1	G	144	44	100	7.5	13.7	I	244	44	200
GLAC 4161 CD2.SL/.HE	413.4	71.2	1000 l	5.5	10.1	H	185	52	132	7.5	13.7	I	236	52	184
GLAC 5171 CD2.SL/.HE	458.2	78.9	1000 l	5.5	10.1	H	172	49	124	7.5	13.7	I	226	49	177
GLAC 6181 CD2.SL/.HE	501.3	86.6	1000 l	5.5	10.1	H	159	58	101	7.5	13.7	I	214	58	156
GLAC 5201 CD2.SL/.HE	526.6	90.5	1000 l	7.5	13.7	I	207	39	168	11	20	O	271	39	231
GLAC 6211 CD2.SL/.HE	569.4	98.0	1000 l	7.5	13.7	I	193	46	147	11	20	K	243	46	197
GLAC 6231 CD2.SL/.HE	603.7	103.9	1000 l	7.5	15.3	J	163	44	119	11	20	K	236	44	191
GLAC 6241 CD2.SL/.HE	634.9	109.3	1000 l	7.5	15.3	J	157	48	109	11	20	K	229	48	181
GLAC 8241 CD2.SL/.HE	665.3	114.5	1000 l	7.5	15.3	J	151	49	102	11	20	K	222	49	174
GLAC 8261 CD2.SL/.HE	707.9	121.9	1000 l	11	20	K	212	55	157	18.5	32.8	P	332	55	278
GLAC 8281 CD2.SL/.HE	759.4	130.7	1000 l	11	20	K	198	43	156	18.5	32.8	P	321	43	279
GLAC 8301 CD2.SL/.HE	793.5	136.6	1000 l	11	20	K	189	47	142	18.5	32.8	P	314	47	267
GLAC 8321 CD2.SL/.HE	826.6	142.3	1000 l	11	22.5	L	170	51	119	18.5	32.8	P	306	51	255

Tab. 43: Values are rounded up or down.

[1] *Values with pure water refer to rated conditions*
Q_e: Cooling capacity ofunit
Ve:Water flow rate through evaporator
F.L.I. max. power consumption of pump
F.L.A.: max. current consumption of pump
Hp: Pump delivery head
Dpu:Total pressure drop of unit
Hu: available delivery head

Pump curve G-P

D. 15

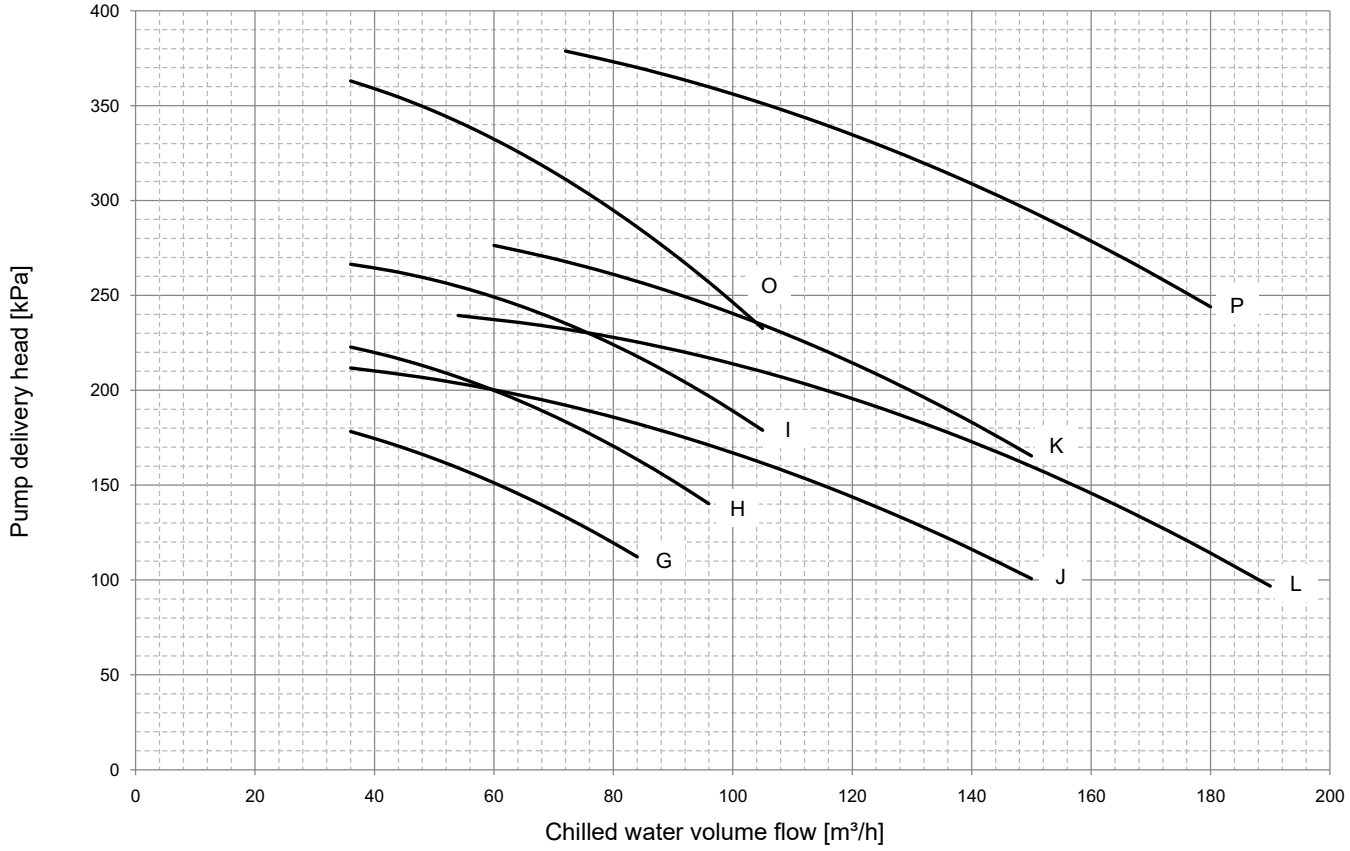


Diagram values from example page 112

Unit				Unit with buffer tank											
				1 pump with standard head						1 pump with heavy-duty head					
Unit	• Q_e[1] [kW]	• V_e[1] [m³/h]	Volume Buffer tank charge [l]	F.L.I. [kW]	F.L.A. [A]	Pump Character-istic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]	F.L.I. [kW]	F.L.A. [A]	Pump Charac-teristic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]
GLAH 4131 CD2	339.4	58.4	700 l	4	8.1	A	159	53.2	106	7.5	13.7	C	248	53.2	195
GLAH 4131 CD2.LT	339.4	58.4	1000 l	4	8.1	A	159	53.2	106	7.5	13.7	C	248	53.2	195
GLAH 4141 CD2	363.4	62.6	700 l	4	8.1	A	154	45.5	109	7.5	13.7	C	245	45.5	199
GLAH 4141 CD2.LT	363.4	62.6	1000 l	4	8.1	A	154	45.5	109	7.5	13.7	C	245	45.5	199
GLAH 4161 CD2	396.4	68.2	700 l	5.5	10.1	B	184	57.1	127	7.5	13.7	C	240	57.1	182
GLAH 4161 CD2.LT	396.4	68.2	1000 l	5.5	10.1	B	184	57.1	127	7.5	13.7	C	240	57.1	182
GLAH 6171 CD2(.LT)	434.9	74.9	1000 l	5.5	10.1	B	176	38.4	137	7.5	13.7	C	233	38.4	194
GLAH 6181 CD2(.LT)	477.8	82.2	1000 l	5.5	10.1	B	166	47.5	118	11	20	M	283	47.5	235

Tab. 44: Values are rounded up or down.

[1] *Values with pure water refer to rated conditions*
Q_e: Cooling capacity ofunit
V_e:Water flow rate through evaporator/condenser
F.L.I. max. power consumption of pump
F.L.A.: max. current consumption of pump
Hp: Pump delivery head
Dpu: Total pressure drop of unit
Hu: available delivery head

Pump curve A-N

D. 16

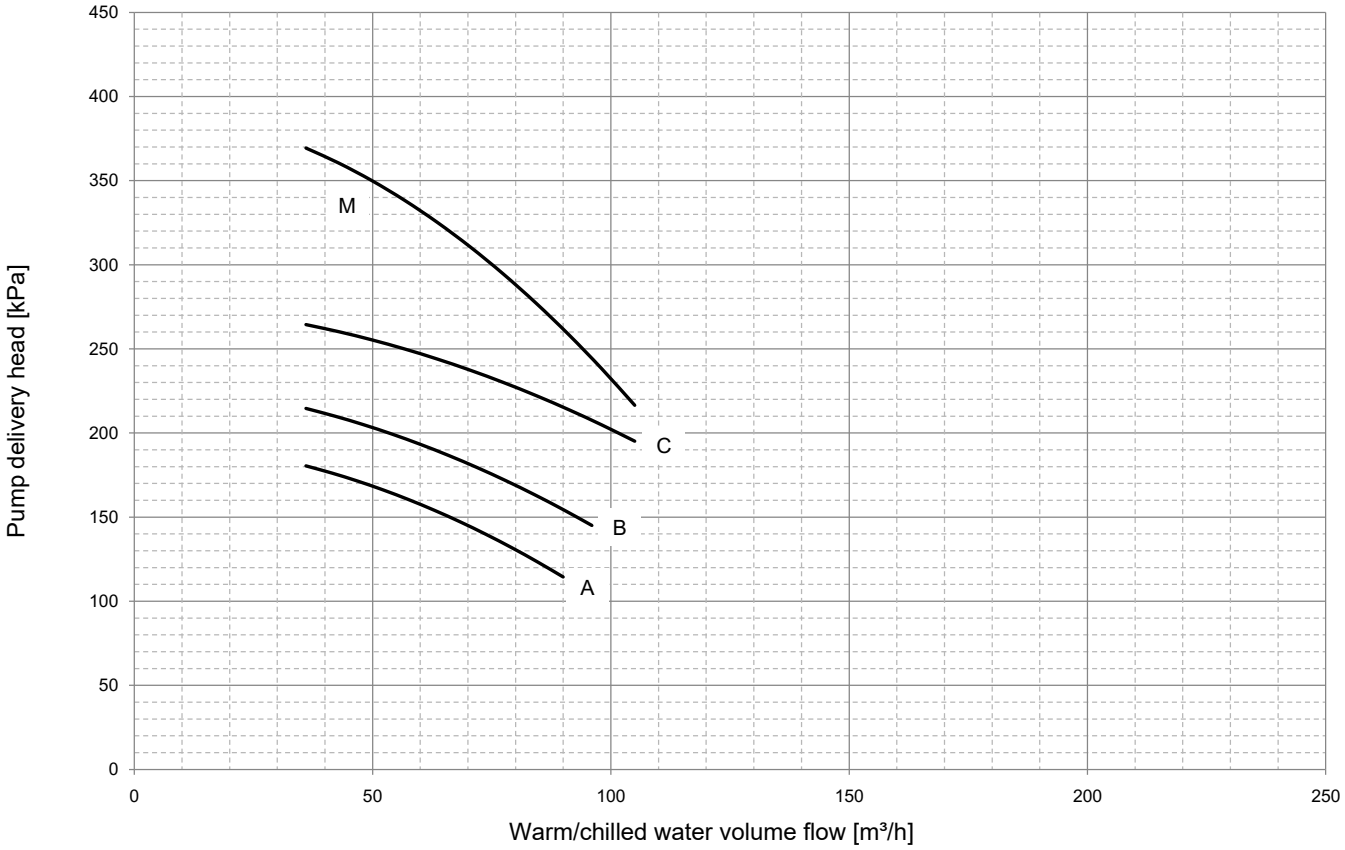


Diagram values from example page 112

Unit				Unit with buffer tank											
				2 pump with standard head						2 pumps with heavy-duty head					
Unit	$\dot{Q}_e$ [1] [kW]	$\dot{V}_e$ [1] [m³/h]	Volume Buffer tank charge [l]	F.L.I. [kW]	F.L.A. [A]	Pump Character-istic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]	F.L.I. [kW]	F.L.A. [A]	Pump Charac-teristic curve	Hp[1] [kPa]	Dpu[1] [kPa]	Hu 1 [kPa]
GLAH 4131 CD2	339.4	58.4	700 l	4	8.1	G	153	53.2	100	7.5	13.7	I	251	53.2	198
GLAH 4131 CD2.LT	339.4	58.4	1000 l	4	8.1	G	153	53.2	100	7.5	13.7	I	251	53.2	198
GLAH 4141 CD2	363.4	62.6	700 l	4	8.1	G	148	45.5	102	7.5	13.7	I	246	45.5	201
GLAH 4141 CD2.LT	363.4	62.6	1000 l	4	8.1	G	148	45.5	102	7.5	13.7	I	246	45.5	201
GLAH 4161 CD2	396.4	68.2	700 l	5.5	10.1	H	189	57.1	132	7.5	13.7	I	240	57.1	183
GLAH 4161 CD2.LT	396.4	68.2	1000 l	5.5	10.1	H	189	57.1	132	7.5	13.7	I	240	57.1	183
GLAH 6171 CD2(.LT)	434.9	74.9	1000 l	5.5	10.1	H	179	38.4	141	7.5	13.7	I	231	38.4	193
GLAH 6181 CD2(.LT)	477.8	82.2	1000 l	5.5	10.1	H	167	47.5	119	11	20	O	290	47.5	243

Tab. 45: Values are rounded up or down.

[1] *Values with pure water refer to rated conditions*
Q_e: Cooling capacity ofunit
V_e:Water flow rate through evaporator/condenser
F.L.I. max. power consumption of pump
F.L.A.: max. current consumption of pump
Hp: Pump delivery head
Dpu: Total pressure drop of unit
Hu: available delivery head

Pump curve G-P

D. 17

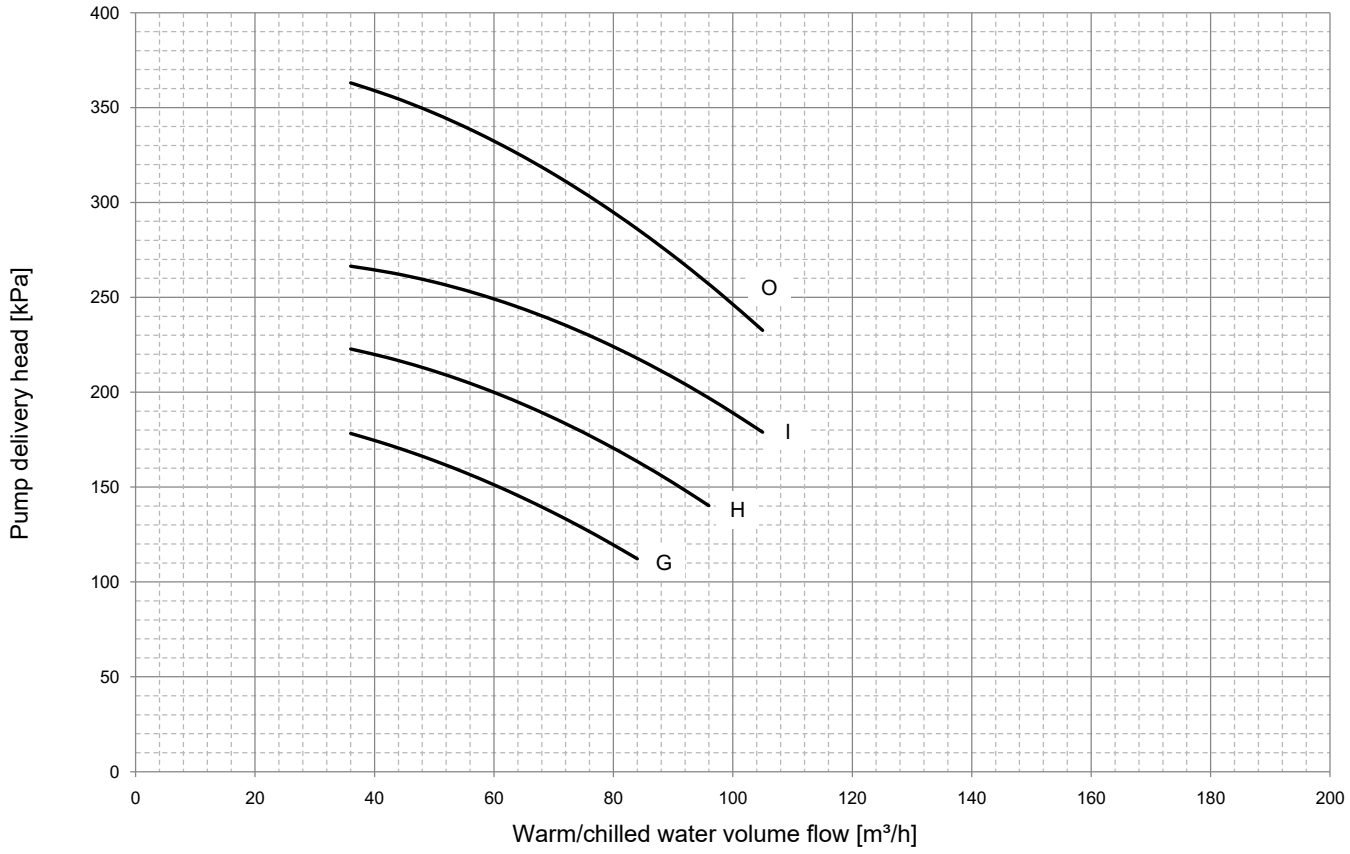


Diagram values from example page 112

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