Modular Air-cooled Chillers

High Seasonal Efficiency (HSE) version
With inverter

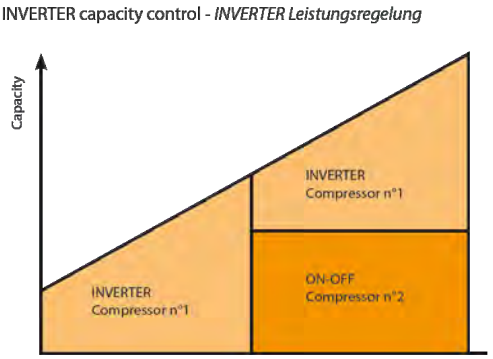
CG-PRC048B-GB **January 2021**

Table of contents

Product description

Continuous modulation of the cooling capacity according to the plant thermal load

The innovative scroll compressors feature continuous speed modulation. The use of inverter allows the unit to partialize the total cooling capacity with a minimum capacity step down to 7%. The minimum capacity step for each unit size is available in the technical data table in this document.

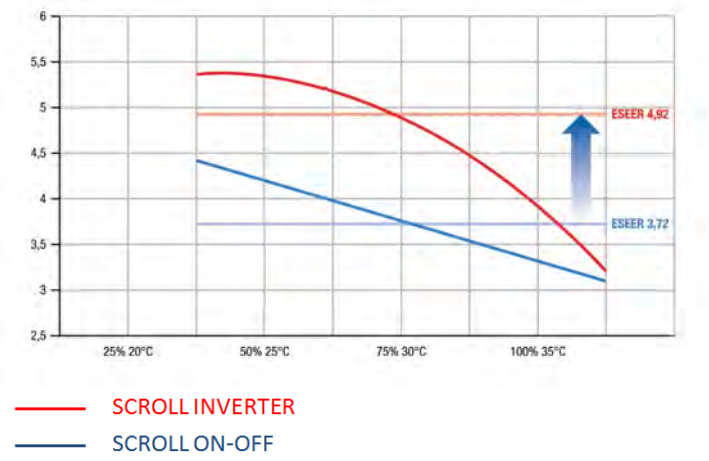


Inverter compessors

The variable speed compressors allow safe, efficient and versatile operation in a frequency range from 30 to 80 Hz.
The compact scroll compressors with inverter feature distinctive technical advantages:

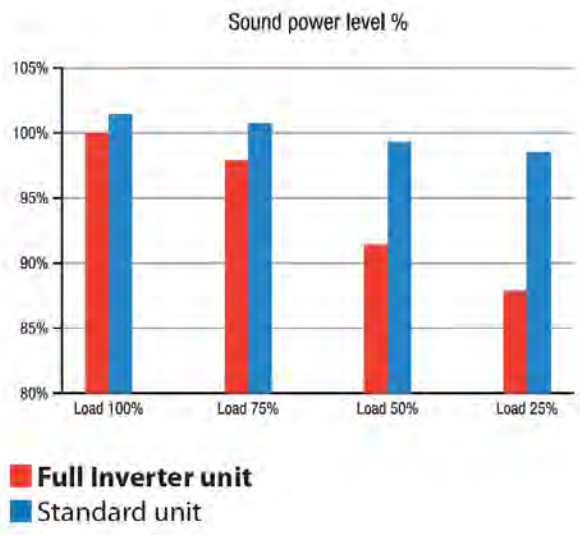
- Reduced inverter dimensions
- Reduced inrush currents in comparison to traditional on/off scroll compressors
- Wider setting range
- Precise capacity adjustment to installation load requirements
- Electrical protection of the compressor integrated into the inverter

Maximum efficiency at partial loads



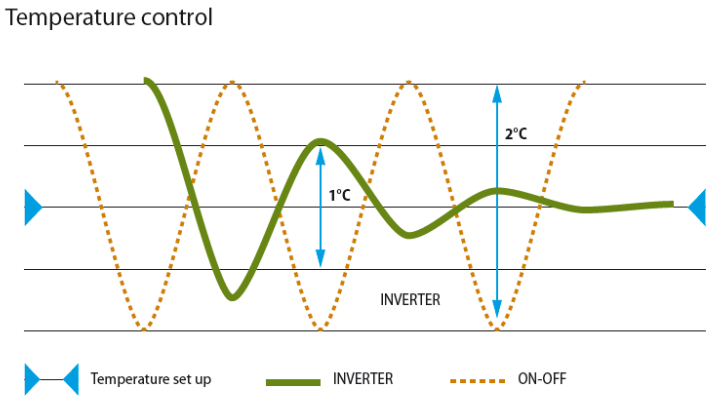
A chiller usually works in nominal conditions for short periods during the whole year thus measuring the efficiency by EER is limiting. Therefore, in order to estimate the real energy consumption according to the different seasonal load conditions it is necessary to use the ESEER index.
Flex HSE chillers are specifically designed and sized to optimize unit efficiency at partial loads. Thanks to the full inverter control, the unit reaches ESEER values more than 30% higher compared to units equipped with constant speed scroll compressors.

Extremely quiet



When the unit operates at partial load, thanks to the modulation of all components driven by electric motors such as fans and compressors, the supplied cooling capacity follows the exact cooling demand of the plant. Consequently, the noise level is significantly reduced under partial load conditions. For even more demanding noise level requirements, a super low noise version is available.

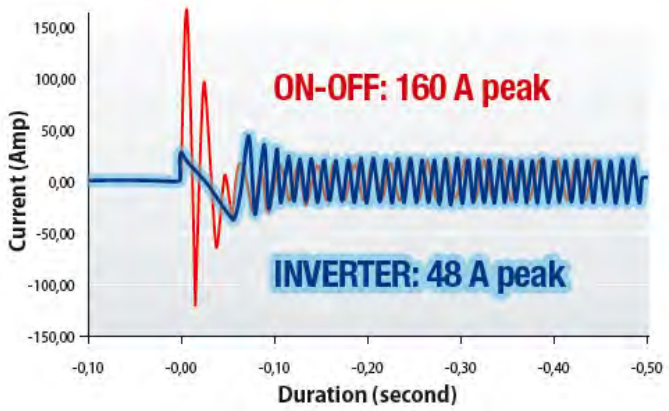
Smooth and precise temperature control



The technology used for the variable speed compressor guarantees smooth and precise water temperature control, ensuring:

- Comfort level reached in shorter time
- Reduced time to reach the chilled water temperature setpoint

Reduced inrush currents



Key benefit inverter scroll compressor = Strong reduction of inrush current.
Subsequent advantages:

* Decreased impact on the power grid
* No need for expensive starters like star-delta starter
* Reduced sizing of power backup systems
* Lower electricity bill

WFC technology and hydronic kit with inverter pumps (optional)

Pumps are equipped with inverter-controlled motors suitable for frequency modulation and the same performance is obtained with 70% reduction of power input.
The **WFC technology water flow control** adjusts the rotation speed of the pumps through the inverter, measuring out the correct amount of water flow according to the needs of the system by reducing the power input due to the pumping of the primary fluid.

Electronic expansion valve

Key benefit of electronic expansion valves:

- Maximize heat exchange at the evaporator
- Minimize the response time according to the load variation
- Optimize the superheating regulation and ensure maximum energy efficiency

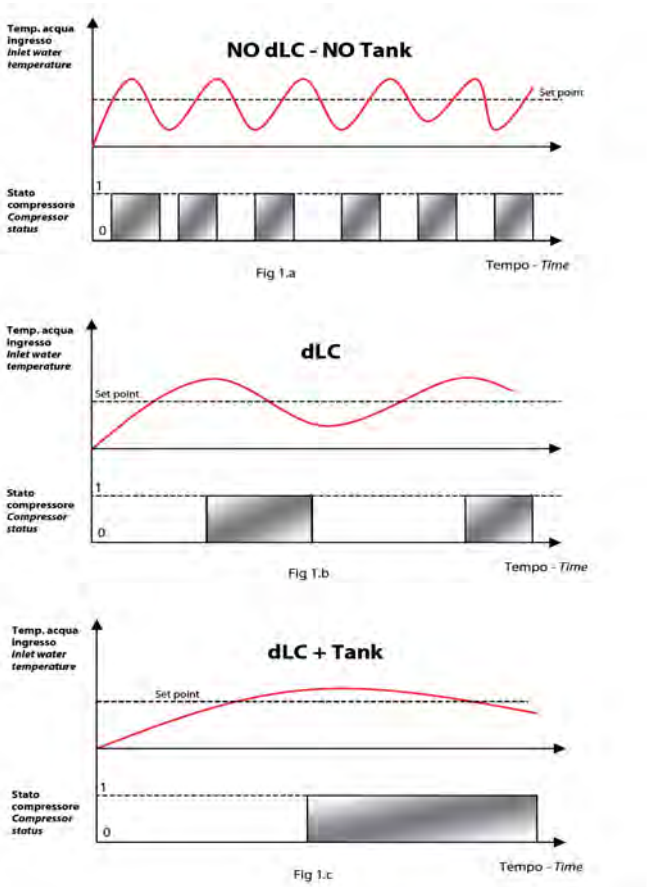
Microchannel condensing coils

Air-cooled microchannel condensing coils with aluminum fins. The coil is made up of three components: the multichannel tubes, the fins which are placed between the microchannels and the two refrigerant headers.

- Reduced refrigerant charge: thanks to microchannel technology (heat exchanger) the refrigerant charge is reduced by up to 37% compared to equivalent units with Al-Cu fin & tube condensers.
- Compact: The heat transfer surface in contact with the refrigerant is greatly increased, so these heat exchangers are more compact and provide higher performance compared to fin & tube.
- Reduced emissions: lower emissions of refrigerant into the atmosphere with considerable benefits in terms of environmental protection.
- Reduced consumption and noise level with lower pressure drop in the air side and small size of microchannels condensing coils, the turbulence on the condensing coil and pressure drops losses are reduced resulting in reduced noise, power and/or number of fans needed.
- Reduced weight: a significant reduction of costs and maintenance time, and lower CO_2 emissions in transport.

Optional coatings are available to protect the coils and to increase the corrosion resistance and for the use in chemical risk environment.

Dynamic logic control



Thanks to the function DYNAMIC LOGIC CONTROL, the electronic controller can manage the differential of the inlet water temperature on the basis of the speed of its variation.
The function dLC works partially as a simulator of a water tank: it allows to reduce the number of the compressor's starts.
The main advantage of the function dLC is during the conditions of low load, that is:

- the compressor is switched off and the water temperature increases very slowly; in this situation the dLC is able to delay the start of the compressor by replacing itself to the thermal inertia that would be obtained from the water tank;
- the compressor is switched on and the water temperature decreases very quickly; in this situation the dLC is able to delay the compressor's switching off. In this way it is reached the same result that would be obtained from the water tank's thermal inertia.

As result the function dLC makes possible to reduce the dimensions of the water tank, with huge advantages for the footprint of the unit .
Figure 1 shows how the compressor's startups decrease by passing from a system with no tank and without dLC (1.a) to a system with dLC (1.b) and to a system with dLC and a small water tank (1.c). It can be seen that this last solution is still the best, though the tank dimensions can be reduced.

Dynamic set point

During the cooling season the outdoor temperature changes from the design temperature, and consequently the cooling load of the plant changes too. It is therefore possible to adjust the outlet water temperature according to outdoor temperature by the use of a set point regulation following a climatic curve.
The function DYNAMIC SET POINT allows to change simultaneously the set point to achieve always theconditions of best comfort and, above all, the maximum energy saving. In fact if the outdoor temperature increases, through the function DSP it is possible:
• To increase of a certain value the set point in case it is necessary to reduce the power consumption and it is needed to ensure a difference between the indoor and outdoor temperature such to avoid health problems due to the excessive changes of temperature.
• To reduce of a certain value the set point in case it is required to compensate in such a way the excess of thermal load; of course this is a function to be used with precaution because it generates higher power consumptions and a big difference in temperature between inside and outside that could be dangerous for the health of people who are forced for any reason to get in and out from the air conditioned room.

EC-Brushless fans technology

The E**C-Brushless** fans ensure a higher efficiency thanks to lower energy consumption compared to traditional AC motors. The EC motors allow therefore lower sound emissions during the air flow modulation.

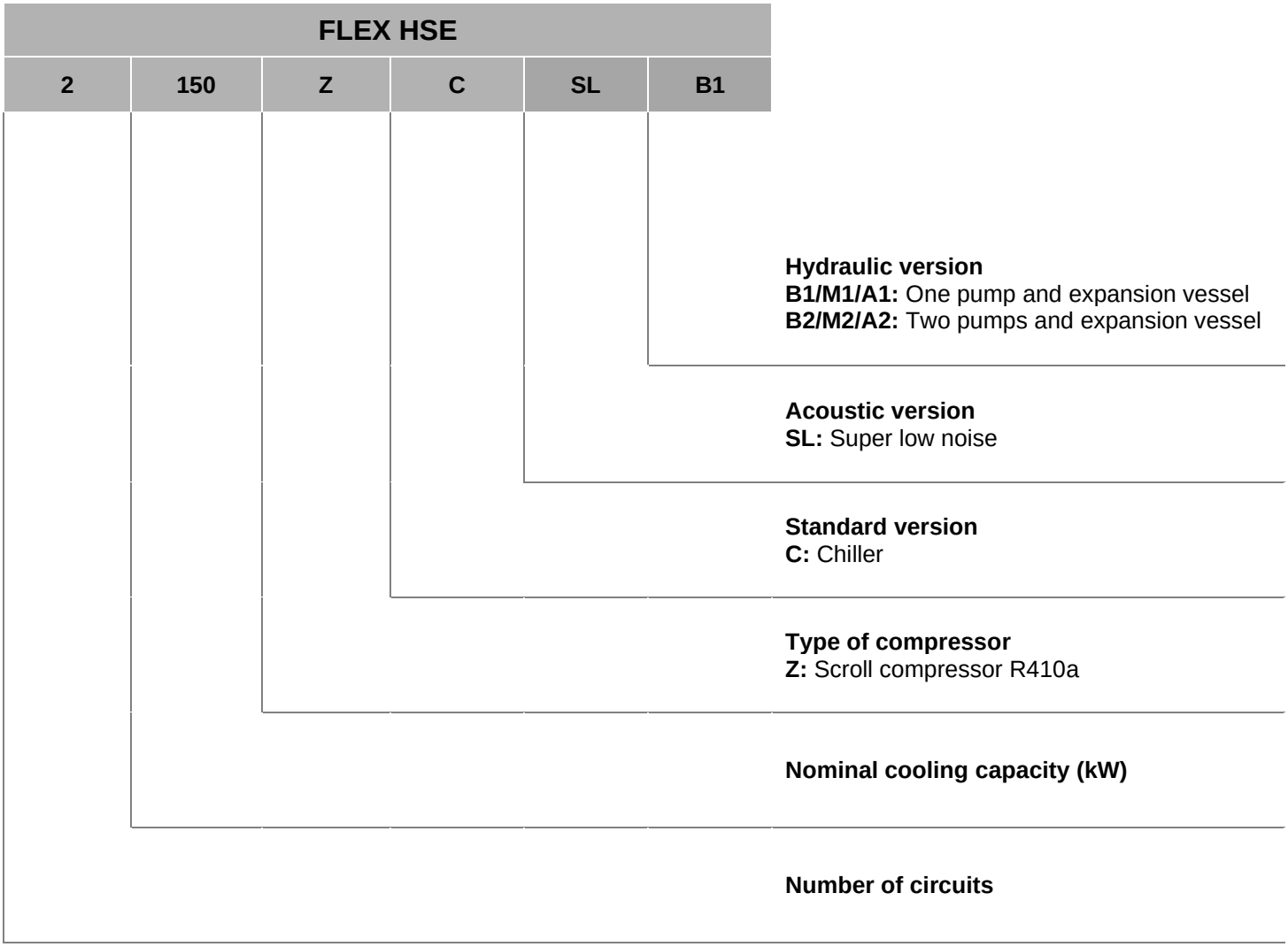
The blade profile has been studied to reduce noise and ensure high acoustic comfort levels.

Energy saving function

The unit can be turned off according to time bands. An innovative energy saving function can be also activated to regulate the on-off of the unit. By activating this function, at certain time bands, the controller will adjust the set point value to those required by the user.
The unit will be “forced to work more” at certain times when the cost of electricity is lower or even to work less when there is a lower heating load.
The electronic control gives priority to the automatic shutdown, if the two functions should be active for the same daily time band.

Model numbers

The model number is simple and as follows:



Example of typical identification code: FLEX HSE 150 ZC SL B1

Technical specifications

Flex HSE units are air-water chillers for outdoor installation, equipped with innovative inverter scroll compressors and EC axial fans, available in 9 sizes and in the following standard version:

C: Chiller

ACOUSTIC VERSIONS (to be associated with the standard version)
SL: super low noise units. The noise reduction is achieved by reduced fans speed in accordance with the condensing pressure, muffler on the compressors delivery lines, soundproof insulation box for compressors and Axitop diffuser. Compared to standard versions, the Super Low Noise version allows a reduction of about 5 dB(A) in sound levels.

HYDRAULIC VERSIONS (Integrated hydraulic kit available for On-Off pumps and/or Inverter pumps)

ONE PUMP AND EXPANSION VESSEL
B1 Low available pressure 150kPa
M1 Medium available pressure 250kPa
A1 High available pressure 450kPa

TWO PUMPS AND EXPANSION VESSEL
B2 Low available pressure 150kPa
M2 Medium available pressure 250kPa
A2 High available pressure 450kPa

CASING
Casing made with heavy gauge structure in galvanized steel. The powder paint anti-corrosive treatment over the entire frame provides long lasting resistance for outdoor installation, even in aggressive environmental conditions. Its design allows these machines to be manufactured in modular units and, at same time, it ensures a constant air flow through the finned coils and makes for easy maintenance and service.

COMPRESSORS
The units are equipped with hermetic scroll compressors with Inverter technology, characterized by high performances, reduced vibrations and little sound emissions. During operation a more uniform compression and pulsation are developed, there are no alternative movements of pistons accompanied by masses or vibration forces to benefit the low noise.
High performance values are guaranteed by high volumetric efficiency. During operation the compressor maintains a supply of power output with limited variations, it guaranteed continuous operation of the compressor, with limited number of stat and stops than the other type of compressors.
The inverter technology, applied to last generation compressors, allows to control and to adapt the speed of the compressor in relation to the set-point. Reached the required temperature, it is kept constant modulating the power delivered to a minimum, ensuring much higher energy saving.
For this reason, it is possible to save energy, faster in achieving the desired set-point. The temperature of the gas flow is significantly lower thanks to the limited internal heat of the gas aspirated it allows you to work with pressures condensation reduced with more comfort and much long life cycle of the compressor.
The electric inverter motor, cooled by the refrigerant inlet, equipped with internal thermal protection.

FANS
ELECTRONIC propeller fans, statically and dynamically balanced, driven directly by the DC Brushless electric motors, closed type, external rotor and thermal protection for outdoor installation, protected to IP 54. Fans are characterized by low speed and “owlet” profile to reduce the effect of vortices, thereby reducing the energy consumed for operation and noise, reducing it by an average of 6dB (A) compared with standard fans. The EC fans are also equipped with an integrated control for the continuous modulation of the fans speed according to the condensing pressure, allowing minimum power input and ensuring the maximum efficiency of the circuit.

PLATE HEAT EXCHANGER
Direct expansion, stainless steel AISI 316 brazed plate type with double circuit, externally insulated with closed cell anticondensation material and equipped with water differential pressure switch and antifreeze protection electric heater.

SOURCE HEAT EXCHANGER: MICROCHANNELS COILS
Air-cooled microchannel condensing coils with aluminum fins. The coil is made up of three components: the multichannel tubes, the fins which are placed between the microchannels and the two refrigerant headers.
Main features:
- Reduced consumption and noise level with lower pressure drop in the air side and small size of microchannels condensing coils, the turbulence on the condensing coil and pressure drops losses are reduced resulting in reduced noise, power and/or number of fans needed.
- Compact: the heat transfer surface in contact with the refrigerant is greatly increased, so these heat exchangers are more compact and provide higher performance compared to the tube & fin.
- Reduced refrigerant charge: thanks to new Microchannel technology (heat exchanger) the refrigerant charge is reduced by up to 37% compared to equivalent units with Al-Cu fin & tube condensers.
- Reduced emissions of refrigerant into the atmosphere with considerable benefits in terms of environmental protection.
- Significant reductions in weight, which is a double advantage, a significant reduction of costs and maintenance time, and at the same time lower CO2 emissions in transport.
Optional coatings are available to protect the coils and to increase the corrosion resistance and for the use in chemical risk environment.

REFRIGERANT CIRCUIT
One or two independent refrigerant circuits, entirely constructed with copper tubes, each supplied by its own compressor. Each circuit includes:

- Refrigerant charge R410a
- Electronic expansion valve
- Filter drier with interchangeable cartridge suitable for the use of ecological fluids and polyesters oils
- Indicator lamp for liquid flow and humidity presence
- Shut off valve on the liquid line complete of balancing pressure system making easier the opening and closing operations
- Solenoid valve on the liquid line
- High pressure switch
- Low pressure switch
- Safety valve on the discharge line
- Safety valve on the suction line
- High pressure transducers
- Low pressure transducers

ELECTRICAL PANEL
The electrical panel made in accordance with CEI-EN 60204-1 (CEI44-5; CEI EN 62061) standards, is housed in watertight box, the opening system of the box needs the use of a retractable handle or dedicated tools, in each case the opening is allowed only after disconnection of the power supply through the main switch with door lock handle lockable in OFF position.
The electrical panel includes:
• Protection fuses for the supply line of each compressor
• Protection fuses for the supply line of fans for each refrigerant circuit
• Protection fuses of auxiliary circuit
• Start up contactors for compressors On/Off (size with tandem Inverter+On/Off) dimensioned according to the maximum stress
• VSD for compressor
• Start up contactors for fans
• Adjustable thermal magnetic circuit breaker for the protection of the pump (only in case of units equipped with hydraulic kit)
• Start up contactors for pump (only in case of units equipped with hydraulic kit)
• single-phase transformer for the power supply of the auxiliary circuits
• numbered wires
• microprocessor control
In case of phase failure an automatic system protects fans and compressors.
The wiring of the electric panel and the connection with the components of the units are made using cables appropriately calculated for operation at 55°C and according to the maximum electrical stress of the components.
All the cables and the terminals are univocally numbered according to the electrical scheme in order to avoid possible misinterpretation. The identification system of the cables connected to the components allow also an easy and intuitive recognition of the component.

Each component of the electrical panel is provided with an identification plate according to what is shown on the electrical scheme. All the connection to the electrical panel are made from the bottom and are equipped with cover preventing from break.
The electrical panel supply is 400V/3ph+n/50Hz and no additional power supply is necessary. The input of the power cables is provided on the bottom of the box where it is provided a dismountable flange suitable for the purpose.

POWER AND CONTROL ELECTRICAL PANEL

The units are controlled by one single device, that handles all circuits. The keypad allows a complete and intuitive display of all the main control variables of both circuits .
The programmable controller is based on a powerful platform with 256bit microprocessor, 4MB mass storage with a hardware and software configuration made with the most innovative technology in terms of processing speed and connectivity.
The diagnostics includes a complete alarm management, alarm history and data logger which stores an archive of about 4 days (further expandable by USB memory) where the main variables and the operating status of the unit are recorded. ModBus master and slave communication protocol. The temperature regulation us carried out by two hydraulic circuits (cooled water and hot water), with a continuous proportional logic according to the return water temperature.
The operating parameters of the machine are protected by 3 levels of password (user-maintainer-builder). The user panel provides information LCD dysplay with exhaustive descriptions in Italian and English (selectable).

- Ability to interface with the main BMS systems via RS485, BACnet™ and Lontalk
- Ability to interface with I/O expansion modules via CanBus
- Ability to control the unit by voltage free contacts
- Input Ethernet RJ45, for routing on the web of all the parameters of the unit, providing a total remote control of unit
- USB input to upload parameter files, system files, firmware and to download files of historical alarms, residing parameters files and default parameters files
- User interface on the door of the panel, low-reflection LCD, equipped with 8 function keys, easy iconic display, easy sliding between the dynamic screens
- Control of condensation air through an inverter directly managed by the electronic controller based on proportional logic
- Management of electronic expansion valves through controller based on PID logic, with LOP control (low operating pressure), maintenance of the minimum working pressure and of the MOP (maximum operating pressure) for the management of the maximum working pressure
- Management of the inverter pump of the cold user side with a continuous proportional signal managed by the electronic

The microprocessor manages:

- Starting of the compressors with the start-up and stop time control
- Fans start up and modulation according with condensation pressure
- Solenoid valves of liquid lines with pump-down management during stops through double control of sunction pressure and maximum time of the procedure
- Electric anti-freeze heater for user exanchangers
- Water pumps management through voltage free contacts for standard versions; for hydraulic versions the pump management is automatically controlled
- General alarm signal for the unit through voltage free contacts

The microprocessor will control and display by suitable measuring transducers the following variables:

- Inlet and outlet water temperature to the user exchanger
- Outdoor temperature

- Condensing pressure of each refrigerant circuit
- Evaporating pressure of each refrigerant circuit
- Total operating time of each compressor
- Total operating time of the unit

The microprocessor will protect the unit in the following cases, the resetting of any alarm will always be manual.

- Low evaporating pressure by analogical and digital input with possibility to edit the marking details
- High condensing pressure by analogical and digital input
- High temperature of the compressors windings
- Reverse rotation of each compressor
- Low pressure difference between discharge and suction (to allow a correct lubrification of the compressor) with the possibility to edit the start-up delay and the minimum requested value
- High pressure difference on the oil filter
- High temperature of fans motor windings
- High temperature of pumps motor windings
- Lack of water flow on evaporator
- Low evaporator outlet water temperature

It is also possible to display and edit through the microprocessor the following value:

- Operating setpoint of the unit
- Operating differential of the unit
- Set point and anti-freeze block differential
- Set point and differential of activation of the evaporator heater
- Minimum operating time of each compressor
- Minimum stop time of each compressor
- Maximum number of starts per hour of each compressor
- Set point and optimal condensation pressure differential (condensation control)

Other functionalities ensured from the microprocessor are:

- Activating of preventive functions at extreme conditions of high pressure
- Activating of preventive functions at extreme conditions of low pressure
- Activation of preventive functions at limit conditions of high discharge temperature
- Activating preventive functions at extreme conditions of low evaporator leaving water temperature
- Activating preventive functions at extreme conditions of high evaporator inlet water temperature
- Protection from unwanted changes of the parameters thanks of the use of password and systems to confirm the changed data
- Indication of the unit status and the components status
- Possibility to exclude each compressor for the maintenance
- Possibility to change the set point by external analog signal
- Possibility of ON/OFF remote signal through digital external signal
- Communication with supervision systems (data and parameters exchange)
- Continuous adjustment of the set point according to the outdoor air temperature both with direct and reverse direction logic (DSP)
- Auto power on-off of the unit using time slots
- Adjustment of the set point by time bands both with direct and reverse direction logic (Energy Saving)

Accessories

Mounted accessories

- Power factor correction to cos phi 0.91
- Control panel electric heater with thermostat
- Water pumps automatic changeover
- Phase failure protection relay
- Serial card with BACnet™ protocol MS/TP
- Serial card with BACnet™ protocol TCP/IP
- Gateway Modbus Lontalk
- Soft - Start (for ON-OFF compressors)
- Power supply without neutral
- Automatic circuit breakers(for ON-OFF compressors)
- High Static Pressure 100 Pa electronic fans
- Gas gauges
- Low outdoor air temperature kit for operation down to -10°C (in cooling mode)
- Complete anti-intrusion grilles
- Compressor jackets for noise emission reduction
- Powder coated condensing coils
- Anti-corrosion coated condensing coils

Loose accessories

- Remote control display
- Sea container kit
- Flow switch
- Automatic water filling
- Water strainer
- Water gauges
- Victaulic kit
- Rubber anti vibration mounts
- Spring antivibration mounts

Regulation and certifications

Reference standard

THE PRESSURE EQUIPMENT DIRECTIVE 2014/68/UE
UNI EN ISO 3744 ACOUSTIC REGULATION
UNI-EN-ISO 9001:2008: QUALITY MANAGEMENT SYSTEMS
LOW VOLTAGE DIRECTIVE (LVD) 2014/35/UE.
MACHINERY DIRECTIVE 2006/42/EC
DIRECTIVE FOR ELECTROMAGNETIC COMPATIBILITY 2014/30/EU
CEI-EN 60204-1 DIRECTIVE (CEI44-5; CEI EN 62061) MACHINERY SAFETY – ELECTRIC MACHINERY – EQUIPMENTS
ERP DIRECTIVE (ENERGY-RELATED-PRODUCTS ECODESIGN 2009/125/CE)
UNI EN 14511-1-2-3-4 TESTING CONDITIONS.

Certifications

PED RELEASED FROM IMQ SPA - NOTIFIED BODY FOR REGULATION 2014/68/UE (NO. 0051) ACCORDING TO THE FOLLOWING STATEMENTS:

- DECLARATION OF QUALITY SYSTEM APPROVAL - FORM H1 (QUALITY ASSURANCE WITH DESIGN CONTROL AND MONITORING OF FINAL CHECK DETAIL): CERTIFICATE N. PEC-0051-1105003
- CERTIFICATES OF EXAMINATION OF THE PROJECT N. 0051-PEC-1105004/05/06/07/08

ACCORDING TO THE STANDARD QUALITY CERTIFICATION UNI EN ISO 9001:2008 ISSUED BY CSQ (ACCREDITED ACCREDIA)
CERTIFICATION OF PERFORMANCE UNIT BY MEANS OF TESTING TO PRESENT WHEN THE THIRD BODY - RINA SPA (OPTIONAL)

GOST - (OPTIONAL) FOR PRESSURE RECIPIENTS OF THE RUSSIAN FEDERATION.

Technical data

General data - Standard noise unit

MODEL		150 ZC	170 ZC	180 ZC	1115 ZC
Cooling EN 14511 VALUE (1)					
Total cooling capacity	kW	48,4	67,8	80,9	114,0
Compressors power input	kW	13,0	20,0	22,1	31
Total EER		3,02	2,95	3,04	3,08
ESEER		4,41	4,47	4,51	4,49
EER Class (Eurovent)		B	B	B	B
Water flow	m³/h	8,30	11,7	13,9	19,6
Water pressure drop	kPa	30,5	26,4	35,9	23,7
SEASONAL EFFICIENCY IN COOLING ACCORDING TO EN14825 (2)					
SEER		4,21	4,34	4,29	4,35
$\eta_{s,c}$	%	165	171	169	171
COMPRESSORS					
Number of compressors		1	1	2	2
Number of refrigerant circuits		1	1	1	1
Type of compressor(s) per circuit		1 VSD scroll		1 VSD scroll + 1 fixed speed scroll	
Type of regulation		Stepless			
Minimum capacity step		37%	37%	21%	23%
Refrigerant charge	kg	8,00	8,40	12,3	16,5
Oil charge	kg	3,6	6,7	6,9	13,4
FANS					
Number of fans		2	2	3	4
Air flow	m³/h	35200	35200	52800	70400
Power input for each fan	kW	1,5	1,5	1,5	1,5
Absorbed current for each fan	A	3,0	3,0	3,0	3,0
SOUND LEVEL					
Sound power level (ISO 3744)	dB(A)	87	92	88	93
Sound pressure level at 10 m	dB(A)	55	60	56	61
DIMENSIONS AND WEIGHT					
Length	mm	2461	2461	3599	2257
Depth	mm	1100	1100	1100	2146
Height	mm	2179	2179	2179	2175
Operating Weight	kg	598	657	954	1226
Shipping Weight	kg	593	652	946	1218

(1) Outdoor air temperature 35°C and chilled water temperature 12/7°C
(2) Ecodesign rating for comfort chiller. Outdoor air temperature 35°C and chilled water temperature in/out: 12°C/7°C.
ηs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016.

General data – Standard noise unit (continued)

MODEL		2135 ZC	2150 ZC	2185 ZC	2215 ZC	2230 ZC
Cooling EN 14511 VALUE (1)						
Total cooling capacity	kW	134,0	151,0	183,0	214,0	232,0
Compressors power input	kW	39,3	41,4	47,9	59,9	66,4
Total EER		2,97	2,99	3,05	2,98	2,96
ESEER		4,27	4,27	4,18	4,11	4,24
EER Class (Eurovent)		B	B	B	B	B
Water flow	m³/h	23,1	26	31,5	36,8	39,9
Water pressure drop	kPa	29	34,2	29,5	42,4	38,3
SEASONAL EFFICIENCY IN COOLING ACCORDING TO EN14825 (2)						
SEER		4,11	4,13	4,15	4,12	4,10
$\eta_{s,c}$	%	161	162	163	162	161
COMPRESSORS						
Number of compressors		2	4	4	4	4
Number of refrigerant circuits		2	2	2	2	2
Type of compressor(s) per circuit		1 VSD scroll	1 VSD scroll + 1 fixed speed scroll			
Type of regulation		Stepless				
Minimum capacity step		19%	10%	9%	7%	10%
Refrigerant charge	kg	16,6	23,9	32,1	32,1	32,5
Oil charge	kg	13,4	13,8	14,4	20,6	26,8
FANS						
Number of fans		4	6	8	8	8
Air flow	m³/h	70400	105600	140800	140800	140800
Power input for each fan	kW	1,5	1,5	1,5	1,5	1,5
Absorbed current for each fan	A	3,0	3,0	3,0	3,0	3,0
SOUND LEVEL						
Sound power level (ISO 3744)	dB(A)	95	91	92	94	96
Sound pressure level at 10 m	dB(A)	63	59	60	62	64
DIMENSIONS AND WEIGHT						
Length	mm	2257	3421	4550	4550	4550
Depth	mm	2146	2138	2244	2244	2244
Height	mm	2175	2469	2458	2458	2458
Operating Weight	kg	1283	1897	2297	2421	2543
Shipping Weight	kg	1270	1884	2280	2404	2522

(1) Outdoor air temperature 35°C and chilled water temperature 12/7°C
(2) Ecodesign rating for comfort chiller. Outdoor air temperature 35°C and chilled water temperature in/out: 12°C/7°C.
$\eta_{s,c}$ / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016.

General data – Super low noise unit

MODEL		150 ZC	170 ZC	180 ZC	1115 ZC
Cooling EN 14511 VALUE (1)					
Total cooling capacity	kW	47,7	65,0	79,3	110,0
Compressors power input	kW	13,9	21,0	23,5	32,8
Total EER		3,17	2,93	3,16	3,14
ESEER		4,58	4,63	4,71	4,79
EER Class (Eurovent)		A	B	A	A
Water flow	m³/h	8,20	11,2	13,6	18,9
Water pressure drop	kPa	29,6	24,3	34,5	22,1
SEASONAL EFFICIENCY IN COOLING ACCORDING TO EN14825 (2)					
SEER		4,33	4,27	4,36	4,34
$\eta_{s,c}$	%	170	168	171	171
COMPRESSORS					
Number of compressors		1	1	2	2
Numbe of refrigerant circuits		1	1	1	1
Type of compressor(s) per circuit		1 VSD scroll		1 VSD scroll + 1 fixed speed scroll	
Type of regulation		Stepless			
Minimum capacity step		37%	37%	21%	23%
Refrigerant charge	kg	8,00	8,40	12,3	16,5
Oil charge	kg	3,6	6,7	6,9	13,4
FANS					
Number of fans		2	2	3	4
Air flow	m³/h	24640	24640	36960	49280
Power input for each fan	kW	0,55	0,55	0,55	0,55
Absorbed current for each fan	A	1,1	1,1	1,1	1,1
SOUND LEVEL					
Sound power level (ISO 3744)	dB(A)	82	87	83	88
Sound pressure level at 10 m	dB(A)	50	55	51	56
DIMENSIONS AND WEIGHT					
Length	mm	2461	2461	3599	2257
Depth	mm	1100	1100	1100	2146
Height	mm	2179	2179	2179	2175
Operating Weight	kg	782	841	1192	1518
Shipping Weight	kg	777	836	1181	1510

(1) Outdoor air temperature 35°C and chilled water temperature 12/7°C
(2) Ecodesign rating for comfort chiller. Outdoor air temperature 35°C and chilled water temperature in/out: 12°C/7°C.
ηs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016.

General data – Super low noise unit (continued)

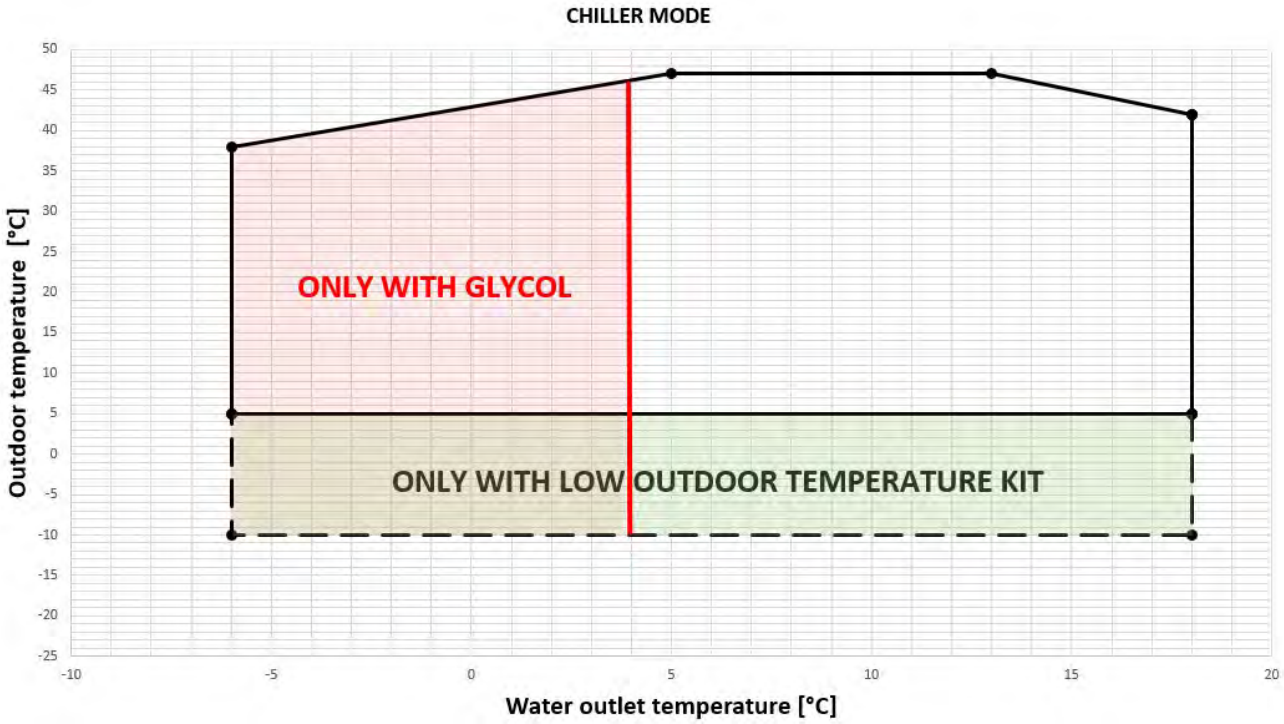
MODEL		2135 ZC	2150 ZC	2185 ZC	2215 ZC	2230 ZC
Cooling EN 14511 VALUE (1)						
Total cooling capacity	kW	130,0	144,0	181,0	210,0	222,0
Compressors power input	kW	41,3	45,3	51,4	63,9	70,9
Total EER		2,99	2,97	3,24	3,07	2,95
ESEER		4,17	4,19	4,25	4,29	4,15
EER Class (Eurovent)		B	B	A	B	B
Water flow	m³/h	22,3	24,9	31,1	36,1	38,2
Water pressure drop	kPa	27	31,4	28,9	40,8	35,1
SEASONAL EFFICIENCY IN COOLING ACCORDING TO EN14825 (2)						
SEER		4,14	4,10	4,31	4,25	4,10
$\eta_{s,c}$	%	163	161	169	167	161
COMPRESSORS						
Number of compressors		2	4	4	4	4
Number of refrigerant circuits		2	2	2	2	2
Type of compressor(s) per circuit		1 VSD scroll	1 VSD scroll + 1 fixed speed scroll			
Type of regulation		Stepless				
Minimum capacity step		19%	10%	9%	7%	10%
Refrigerant charge	kg	16,6	23,9	32,1	32,1	32,5
Oil charge	kg	13,4	13,8	14,4	20,6	26,8
FANS						
Number of fans		4	6	8	8	8
Air flow	m³/h	49280	73920	98560	98560	98560
Power input for each fan	kW	0,55	0,55	0,55	0,55	0,55
Absorbed current for each fan	A	1,1	1,1	1,1	1,1	1,1
SOUND LEVEL						
Sound power level (ISO 3744)	dB(A)	90	86	86	89	91
Sound pressure level at 10 m	dB(A)	58	53	54	57	59
DIMENSIONS AND WEIGHT						
Length	mm	2257	3421	4550	4550	4550
Depth	mm	2146	2138	2244	2244	2244
Height	mm	2175	2469	2458	2458	2458
Operating Weight	kg	1651	2373	2881	3005	3127
Shipping Weight	kg	1638	2360	2864	2988	3106

(1) Outdoor air temperature 35°C and chilled water temperature 12/7°C
(2) Ecodesign rating for comfort chiller. Outdoor air temperature 35°C and chilled water temperature in/out: 12°C/7°C.
$\eta_{s,c}$ / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016.

Operating range

Version	Operating mode	Outdoor air temperature (°C)		Outlet chilled water temperature (°C)	
		Min	Max	Min	Max
C	Cooling	-10(2)	47	-6 (1)	18

(1) With glycol
(2) With Low Outdoor Temperature kit (optional)



Scaling correction schedules

To calculate performance with glycoled solutions, multiply main sizes by respective coefficients.

Ethylene glycol correction schedule

% Ethylene glycol	5%	10%	15%	20%	25%	30%	35%	40%
Freezing temperature (°C)	-2	-3.9	-6.5	-8.9	-11.8	-15.6	-19	-23.4
Suggested security limit (°C)	3	1	-1	-4	-6	-10	-14	-19
Cooling capacity coefficient	0.995	0.99	0.985	0.981	0.977	0.974	0.971	0.968
Power input coefficient	0.997	0.993	0.99	0.988	0.986	0.984	0.982	0.981
Flow rate coefficient	1.003	1.01	1.02	1.033	1.05	1.072	1.095	1.124
Pressure drop coefficient	1.029	1.06	1.09	1.118	1.149	1.182	1.211	1.243

Glycol percentage based on freezing temperature

	% Glycol based on freezing temperature					
Freezing temperature (°C)	0	-5	-10	-15	-20	-25
% Ethylene glycol (%)	5	12	20	28	35	40
Flow rate coefficient	1.02	1.033	1.05	1.072	1.095	1.124

Fouling factor correction table

Fouling Factor	Plant side – chilled water heat exchanger		
[m^2°C*W]	Capacity correction factor	Compressor power input correction factor	Tmin
0	1,00	1,00	0,00
1,80E-05	1,00	1,00	0,00
4,40E-05	1,00	1,00	0,00
8,80E-05	0,96	0,99	0,70
1,32E-04	0,94	0,99	1,00
1,72E-04	0,93	0,98	1,50

Tmin Minimum evaporator outlet water temperature increase

Hydraulic data

WATER FLOW AND RECOMMENDED WATER CONTENT OF THE PLANT

Size	Plant side cold heat exchanger							
	COOLING			Vmin	Vopt	K	Q min	Q max
	P	Q	dpw	[m³]	[m³]		[m³/h]	[m³/h]
150 ZC	48,4	8,32	30,5	0,2	0,3	440	5,2	13,9
170 ZC	67,8	11,66	26,4	0,3	0,4	194,2	7,3	19,4
180 ZC	80,9	13,91	35,9	0,4	0,5	185,4	8,7	23,2
1115 ZC	114	19,57	23,7	0,5	0,7	61,9	12,2	32,6
2135 ZC	134	23,12	29	0,6	0,9	54,2	14,5	38,5
2150 ZC	151	25,97	34,2	0,7	1	50,8	16,2	43,3
2185 ZC	183	31,46	29,5	0,8	1,2	29,8	19,7	52,4
2215 ZC	214	36,83	42,4	1	1,4	31,3	23	61,4
2230 ZC	232	39,93	38,3	1,1	1,5	24	25	66,6
150 ZC SL	47,7	8,2	29,6	0,2	0,3	439,8	5,1	13,7
170 ZC SL	65	11,18	24,3	0,3	0,4	194,2	7	18,6
180 ZC SL	79,3	13,64	34,5	0,4	0,5	185,4	8,5	22,7
1115 ZC SL	110	18,89	22,1	0,5	0,7	61,9	11,8	31,5
2135 ZC SL	130	22,32	27	0,6	0,8	54,2	14	37,2
2150 ZC SL	144	24,85	31,4	0,7	0,9	50,8	15,5	41,4
2185 ZC SL	181	31,13	28,9	0,8	1,2	29,8	19,5	51,9
2215 ZC SL	210	36,12	40,8	1	1,3	31,3	22,6	60,2
2230 ZC SL	222	38,24	35,1	1	1,4	24	23,9	63,7

Vmin = minimum water content of the plant with dT equal to the regulation band set on the unit controller

Vopt = optimal water content of the plant with equal to the regulation band set on the unit controller

Q min: minimum water flow admitted to the exchanger

Q max: maximum water flow admitted to the exchanger

$dPw = K \cdot Q^2 / 1000$

$Q = 0{,}86\ P / \Delta t$

P: Cooling capacity [kW]

Δt: ΔT at heat exchange (min =3, max = 8) [°C]

Dpw: Pressure drop [kPa]

HYDRAULIC VERSIONS

The units of the **FLEX HSE** family are also available in multiple hydraulic versions which include complete kits of all major hydraulic components for easier installation, with reduced time, cost and space.
The wide range of hydraulic versions available make the unit suitable for any type of installation

HYDRAULIC VERSIONS (Integrated hydraulic kit available for On-Off pumps and/or Inverter pumps)
B1/M1/A1: One pump and expansion vessel
B2/M2/A2: Two pumps and expansion vessel

Centrifugal pumps with 2 poles, axial suction bowls and radial delivery, available in low, medium or high head pressure. Pumps with cast iron body and impeller entirely welded usinjg laser technology. Mechanical seal with ceramic components, coal and EPDM elastomers. Three phase electric motor with IP55 protection and insulation class F, suitable for continuous service. Series motors with higher efficiency IE3 technology.

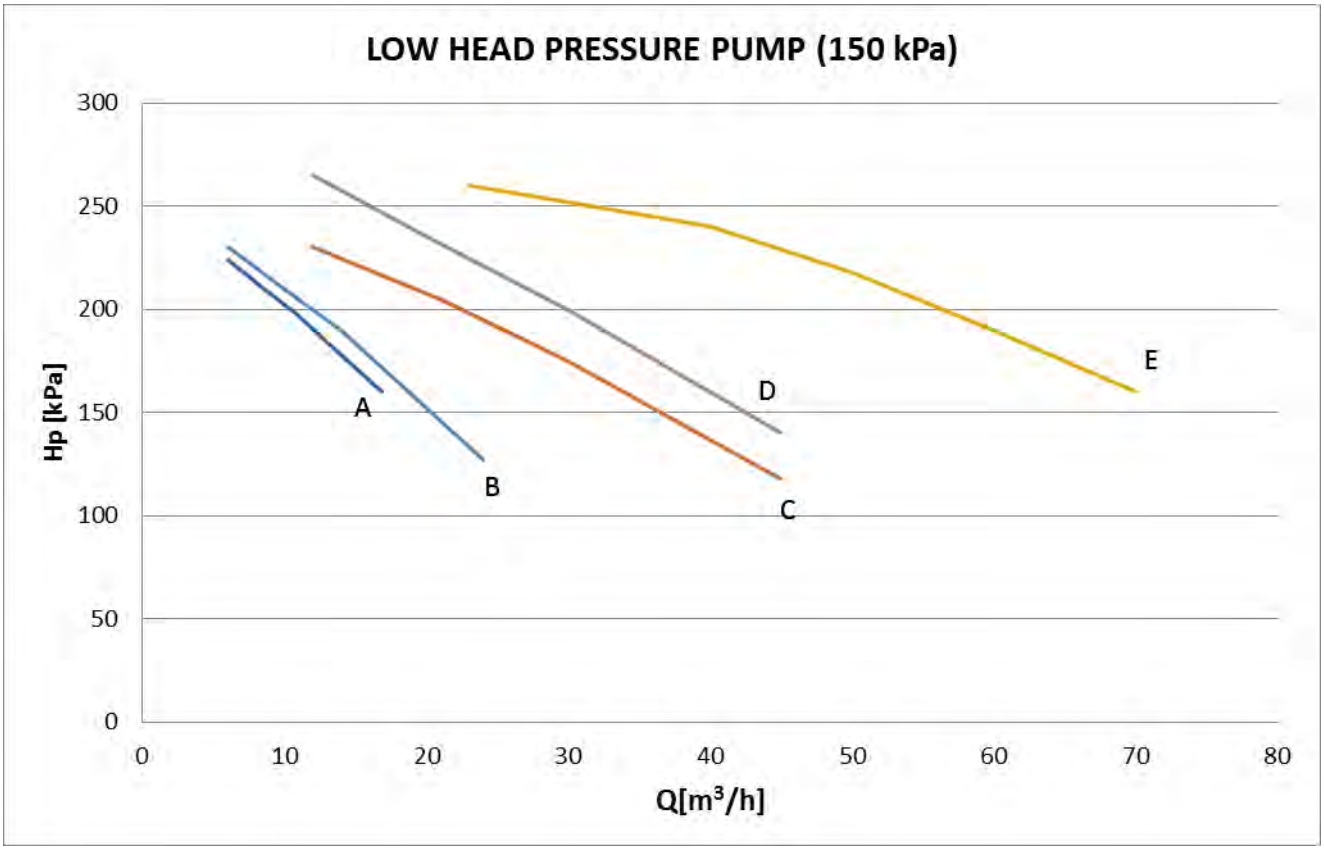
- Differential pressure switch on exchanger
- Service valve
- Taps on pumps suction / delivery which allow the replacement of a damaged pump eliminating the plant shutdown differently from other types of common use
- Check valve
- Relief valve
- Discharge valve

The water pumps automatic changeover for hydraulic versions equipped with two pumps is also available as optional, The pumps operate with the balance of the related working hours. In case of failure of one pump the controller in automatic switches on the additional pump. The control panel is equipped with fuses and contactor with thermal protection.

HYDRONIC ACCESSORIES ON REQUEST

- Water pumps automatic changeover for 2 pumps hydraulic kits, which also includes the secondary pump pressure switch
- “Y” water strainer (sold separately), consists of body and stainless steel mesh, with replaceable filter through the inspection cap
- Automatic water filling (sold separately)

LOW HEAD PRESSURE PUMP (150 kPa)

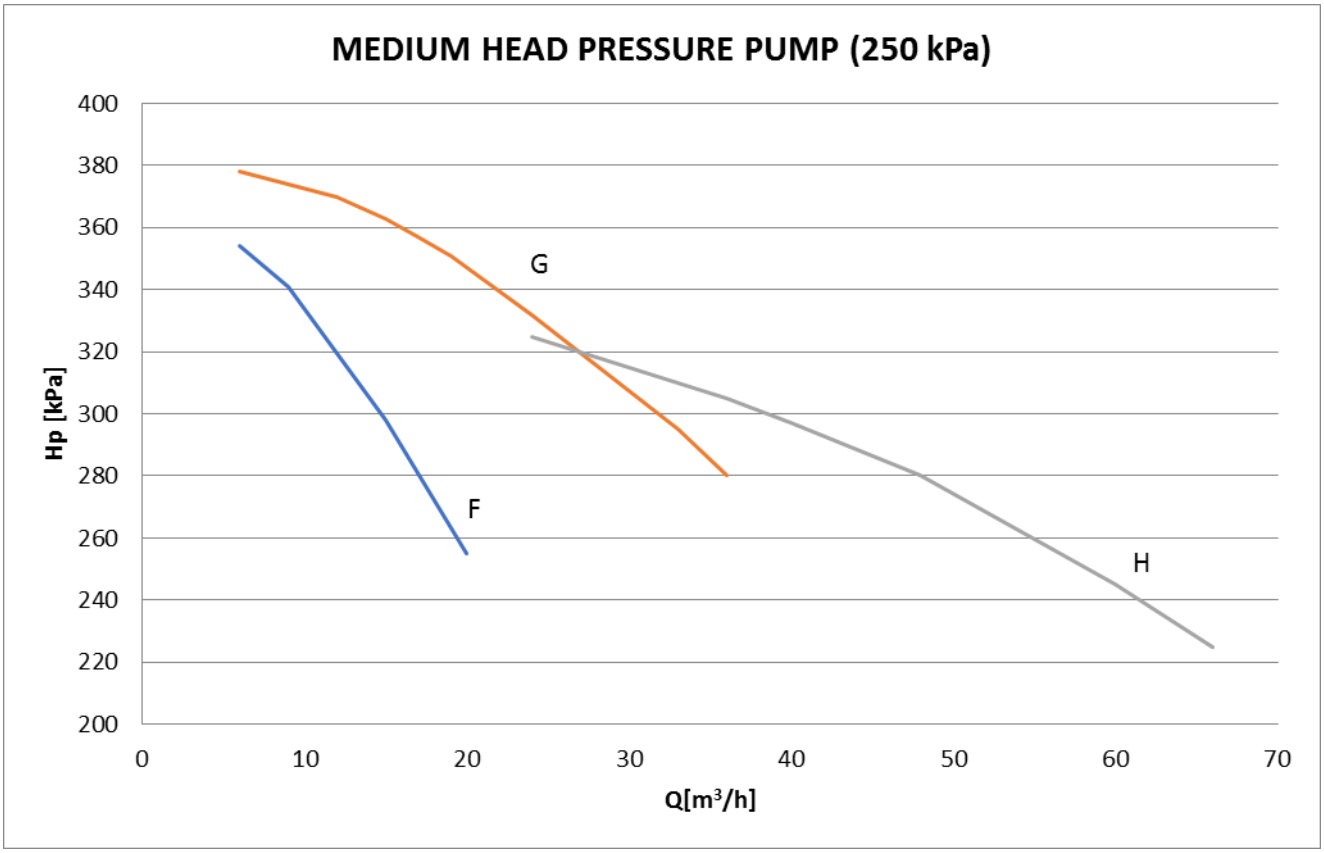


COOLING ONLY MODE

Size	Pf	qw	dpw	Ref. Curve	Expansion vessel	On-off Pumps		Hp	Hu
						F.L.I.	F.L.A.		
	[kW]	[m^3/h]	[kPa]		[l]	[kW]	[A]	[kPa]	[kPa]
150	48,4	8,3	30,5	A	5	1,77	3,30	212	181
170	68	11,7	26,4	A	5	1,77	3,30	193	166
180	81	13,9	35,9	B	5	1,78	3,80	190	154
1115	114	19,6	23,7	C	5	2,55	4,70	209	185
2135	134	23,1	29,0	C	12	2,55	4,70	209	180
2150	151	26,0	34,2	D	12	3,44	6,40	214	180
2185	183	31,5	29,5	D	12	3,44	6,40	194	164
2215	214	36,8	42,4	E	12	4,52	8,70	244	201
2230	232	39,9	38,3	E	12	4,52	8,70	239	200

Pf Cooling capacity (kW)
qw Water flow (m^3/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power input
F.L.A. Full load operating current
Hp Pump Head pressure
Hu Available head pressure

MEDIUM HEAD PRESSURE PUMP (250 kPa)

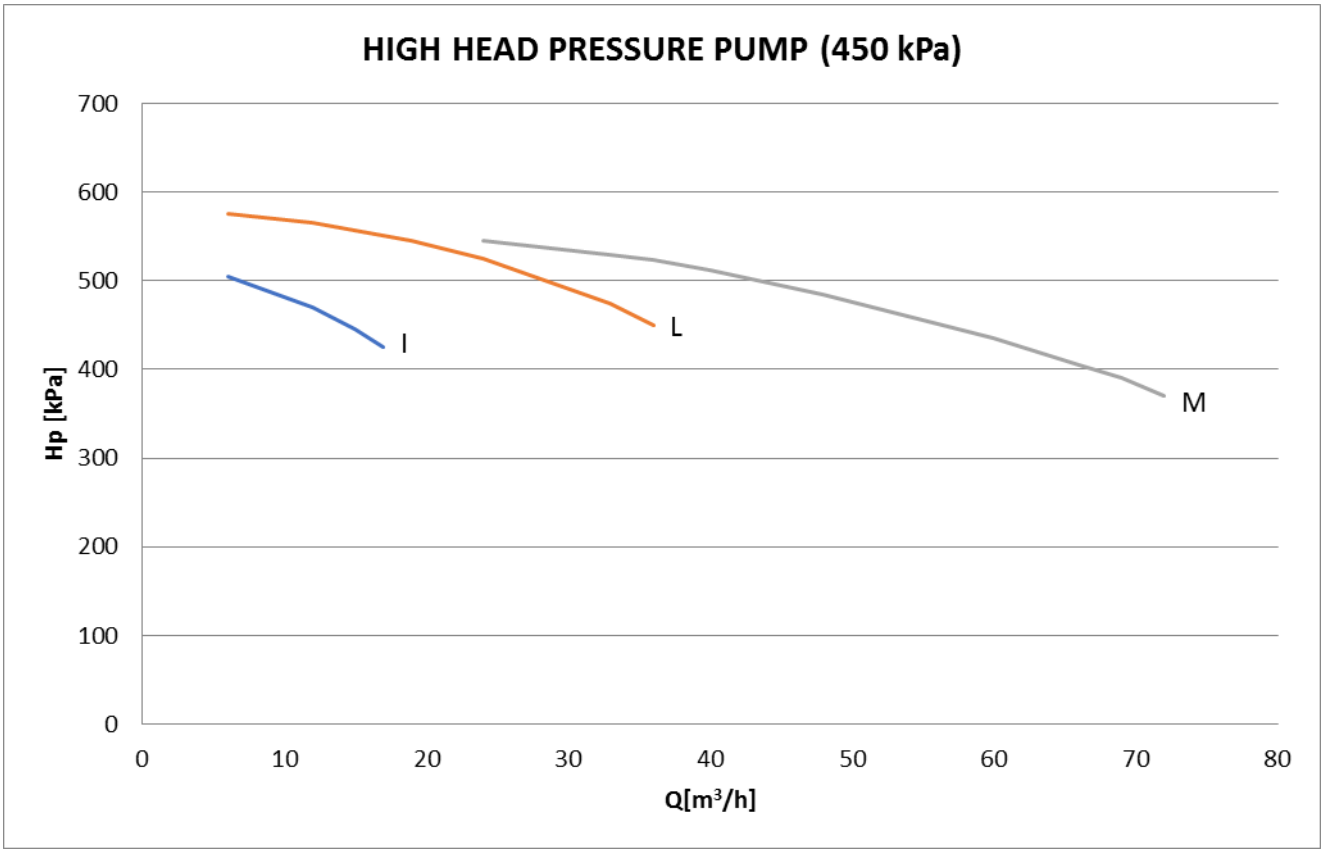


COOLING ONLY MODE

Size	Pf	qw	dpw	Ref. Curve	Expansion vessel	On-off Pumps		Hp	Hu
						F.L.I.	F.L.A.		
	[kW]	[m^3/h]	[kPa]		[l]	[kW]	[A]	[kPa]	[kPa]
150	48,4	8,3	30,5	F	5	2,55	4,70	333	303
170	68	11,7	26,4	F	5	2,55	4,70	313	287
180	81	13,9	35,9	F	5	2,55	4,70	297	261
1115	114	19,6	23,7	G	5	4,52	8,70	349	325
2135	134	23,1	29,0	G	12	4,52	8,70	337	308
2150	151	26,0	34,2	G	12	4,52	8,70	326	292
2185	183	31,5	29,5	H	12	6,10	10,60	313	284
2215	214	36,8	42,4	H	12	6,10	10,60	304	261
2230	232	39,9	38,3	H	12	6,10	10,60	297	259

Pf Cooling capacity (kW)
qw Water flow (m^3/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power input
F.L.A. Full load operating current
Hp Pump Head pressure
Hu Available head pressure

HIGH HEAD PRESSURE PUMP (450 kPa)



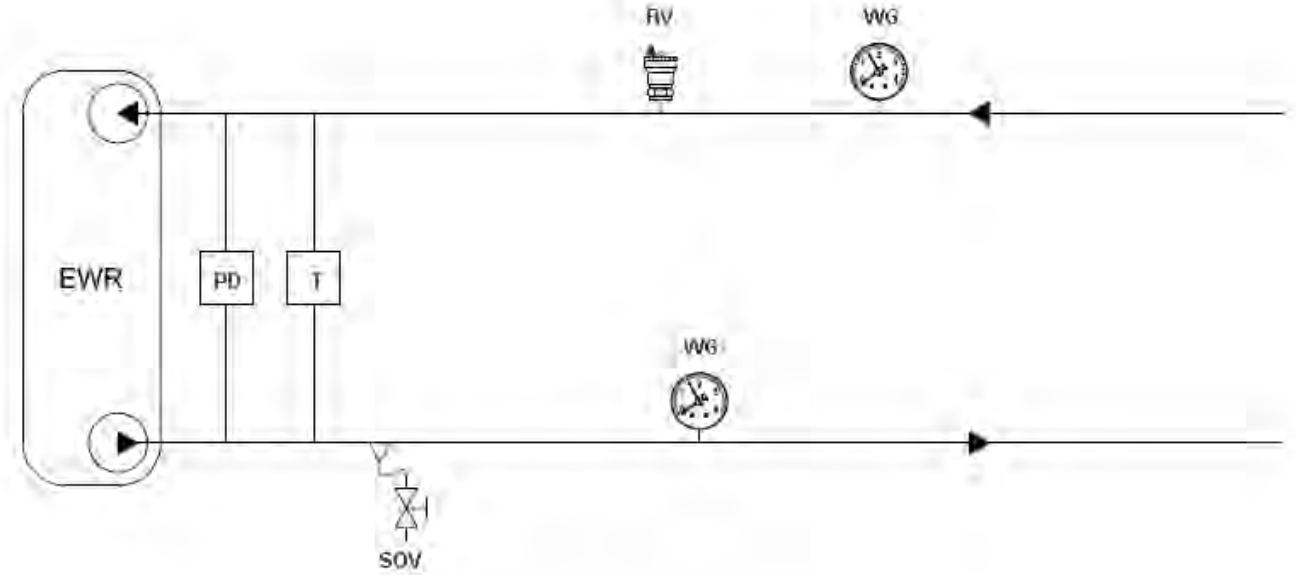
COOLING ONLY MODE

Size	Pf	qw	dpw	Ref. Curve	Expansion vessel	On-off Pumps		Hp	Hu
						F.L.I.	F.L.A.		
	[kW]	[m^3/h]	[kPa]		[l]	[kW]	[A]	[kPa]	[kPa]
150	48,4	8,3	30,5	I	5	4,25	8,7	494	463
170	68	11,7	26,4	I	5	4,25	8,7	473	446
180	81	13,9	35,9	I	5	4,25	8,7	455	419
1115	114	19,6	23,7	L	5	8,26	13,6	543	519
2135	134	23,1	29,0	L	12	8,26	13,6	528	499
2150	151	26,0	34,2	L	12	8,26	13,6	514	480
2185	183	31,5	29,5	L	12	8,26	13,6	533	503
2215	214	36,8	42,4	M	12	11,98	21,3	520	478
2230	232	39,9	38,3	M	12	11,98	21,3	512	474

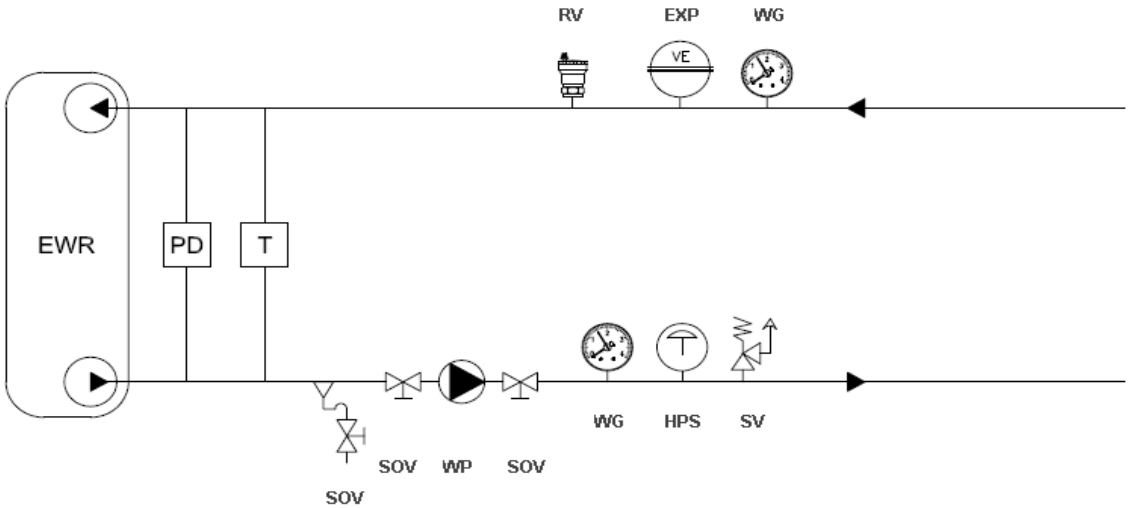
Pf Cooling capacity (kW)
qw Water flow (m^3/h)
dpw Pressure drop (kPa)
F.L.I. Full load electrical power input
F.L.A. Full load operating current
Hp Pump Head pressure
Hu Available head pressure

CONNECTION SCHEMES

STANDARD VERSION



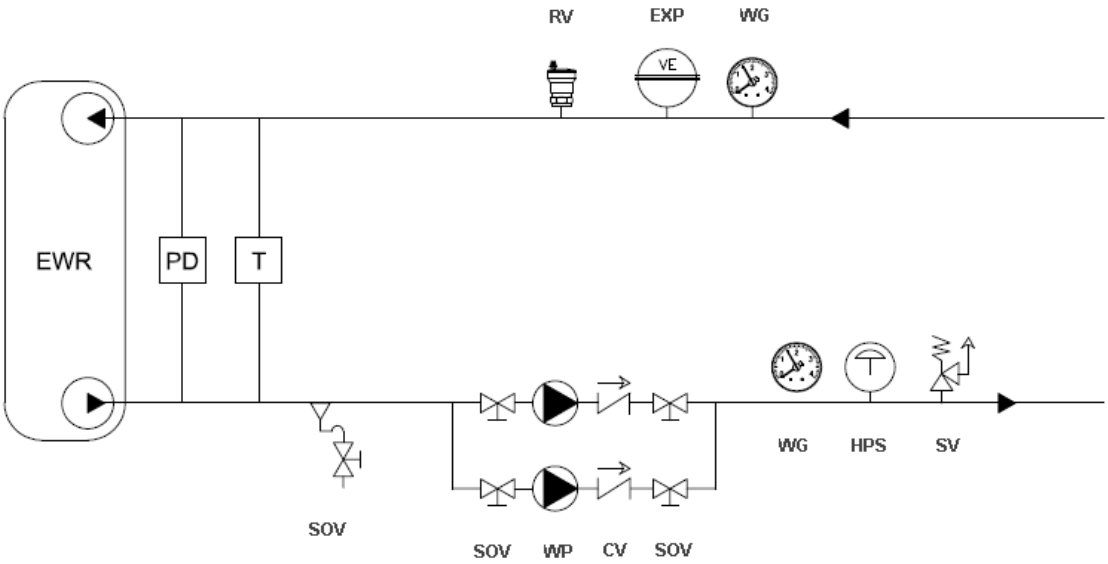
HYDRONIC KIT WITH 1 PUMP – B1/M1/A1



PD = Water differential pressure switch
T = Water temperature probes
RV = Relief valve
WG = Water gauge (optional)
SOV = Shut off valve
EXP = Expansion vessel
WP = Water pump
HPS = High pressure switch
SV = Safety valve (6 bar)

Note: a water strainer shall always be installed on the inlet water pipe

HYDRONIC KIT WITH 2 PUMPS - B2/M2/A2



PD = Water differential pressure switch
T = Water temperature probes
RV = Relief valve
WG = Water gauge (optional)
SOV = Shut off valve
EXP = Expansion vessel
WP = Water pump
HPS = High pressure switch
SV = Safety valve (6 bar)
CV = Check valve

Note: a water strainer shall always be installed on the inlet water pipe

Electrical data

Standard noise

NOMINAL VALUES Outdoor air temperature 35°C, chilled water temperature in/out 12/7°C									MAXIMUM VALUES (1)		
	Compressors (2)			Fans		TOTAL			TOTAL		
	F.L.I.	F.L.A.	L.R.A	E.P.	O.C.	F.L.I.	F.L.A.	S.A.	F.L.I.	F.L.A.	S.A.
Model	kW	A	A	kW	A	kW	A	A	kW	A	A
150 ZC	13,0	22,2	55,0	3,0	6,0	16,0	28,2	61,0	23,0	41,0	61,0
170 ZC	20,0	29,8	76,3	3,0	6,0	23,0	35,8	82,3	31,3	55,6	82,3
180 ZC	22,1	39,5	147,0	4,5	9,0	26,6	48,5	173,0	37,5	66,7	178,7
1115 ZC	31,0	51,6	170,0	6,0	12,0	37,0	63,6	205,3	50,9	90,5	210,9
2135 ZC	39,3	59,6	76,3	6,0	12,0	45,3	71,6	118,1	62,7	111,2	137,9
2150 ZC	41,4	79,2	147,0	9,0	18,0	50,4	97,2	221,6	74,9	133,4	245,4
2185 ZC	47,9	86,5	197,0	12,0	24,0	59,9	110,5	285,4	85,5	152,6	314,6
2215 ZC	59,9	100,9	215,0	12,0	24,0	71,9	124,9	311,3	98,7	175,7	352,9
2230 ZC	66,4	114,8	260,0	12,0	24,0	78,4	138,8	365,3	111,8	198,7	412,1

Super low noise

NOMINAL VALUES Outdoor air temperature 35°C, chilled water temperature in/out 12/7°C									MAXIMUM VALUES (1)		
	Compressors (2)			Fans		TOTAL			TOTAL		
	F.L.I.	F.L.A.	L.R.A	E.P.	O.C.	F.L.I.	F.L.A.	S.A.	F.L.I.	F.L.A.	S.A.
Model	kW	A	A	kW	A	kW	A	A	kW	A	A
150 ZC	13,9	22,4	55,0	1,1	2,2	15,0	24,6	57,2	23,0	41,0	61,0
170 ZC	21,0	30,1	76,3	1,1	2,2	22,1	32,3	78,5	31,3	55,6	82,3
180 ZC	23,4	39,8	147,0	1,7	3,3	25,1	43,1	167,4	37,5	66,7	178,7
1115 ZC	32,8	52,0	170,0	2,2	4,4	35,0	56,4	197,8	50,9	90,5	210,9
2135 ZC	41,3	60,1	76,3	2,2	4,4	43,5	64,5	110,8	62,7	111,2	137,9
2150 ZC	45,3	79,7	147,0	3,3	6,6	48,6	86,3	210,6	74,9	133,4	245,4
2185 ZC	51,4	87,1	197,0	4,4	8,8	55,8	95,9	270,6	85,5	152,6	314,6
2215 ZC	63,9	101,7	215,0	4,4	8,8	68,3	110,5	296,7	98,7	175,7	352,9
2230 ZC	70,9	115,7	260,0	4,4	8,8	75,3	124,5	350,8	111,8	198,7	412,1

Electrical data referred to 400V - 3PH+N-50Hz
Maximum operating admitted conditions: 10%
Maximum phase unbalance: 3%
F.L.I. full load electrical power with max thermal load
F.L.A. full load operating current with max thermal load
L.R.A. compressor motor locked rotor current (direct starting)
S.A. sum of LRA of the most powerful compressor, FLA of other compressor and fans current
E.P. electrical power
O.C. operating current

(1) Values to be considered in the sizing of the power cables and line protection
(2) Data referred to the biggest compressor for units with different compressors

Acoustic data

Standard noise

Size	Octave Band (Hz)								Lw (db(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level (dB)								
150 Z	64,5	60,5	55,9	51,7	49,3	64,5	47,0	36,0	**87**
170 Z	69,5	65,5	60,9	56,7	54,3	69,5	52,0	41,0	**92**
180 Z	65,3	61,3	56,7	52,5	50,1	65,3	47,8	36,8	**88**
1115 Z	70,4	66,4	61,8	57,6	55,2	70,4	52,9	41,9	**93**
2135 Z	72,4	68,4	63,8	59,6	57,2	72,4	54,9	43,9	**95**
2150 Z	68,2	64,2	59,6	55,4	53,0	68,2	50,7	39,7	**91**
2185 Z	69,0	65,0	60,4	56,2	53,8	69,0	51,5	40,5	**92**
2215 Z	71,0	67,0	62,4	58,2	55,8	71,0	53,5	42,5	**94**
2230 Z	73,0	69,0	64,4	60,2	57,8	73,0	55,5	44,5	**96**

Super low noise

Size	Octave Band (Hz)								Lw (db(A)
	63	125	250	500	1000	2000	4000	8000	
	Sound power level (dB)								
150 Z	59,5	55,5	50,9	46,7	44,3	59,5	42,0	31,0	**82**
170 Z	64,5	60,5	55,9	51,7	49,3	64,5	47,0	36,0	**87**
180 Z	60,3	56,3	51,7	47,5	45,1	60,3	42,8	31,8	**83**
1115 Z	65,4	61,4	56,8	52,6	50,2	65,4	47,9	36,9	**88**
2135 Z	67,4	63,4	58,8	54,6	52,2	67,4	49,9	38,9	**90**
2150 Z	63,2	59,2	54,6	50,4	48,0	63,2	45,7	34,7	**86**
2185 Z	64,0	60,0	55,4	51,2	48,8	64,0	46,5	35,5	**87**
2215 Z	66,0	62,0	57,4	53,2	50,8	66,0	48,5	37,5	**89**
2230 Z	68,0	64,0	59,4	55,2	52,8	68,0	50,5	39,5	**91**

NOTE: Data refer to units without the hydraulic version

NOISE CORRECTION FACTORS FOR HYDRAULIC VERSION

Consider the noise emission increase due to the addition of the hydraulic group.

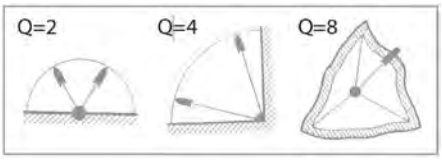
Standard

Size	Low head pressure		Medium head pressure		High head pressure	
	1 pump	2 pumps	1 pump	2 pumps	1 pump	2 pumps
	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
150 ZC	0,3	0,3	0,4	0,4	0,8	0,8
170 ZC	0,1	0,1	0,1	0,1	0,3	0,3
180 ZC	0,2	0,2	0,4	0,4	0,7	0,7
1115 ZC	0,1	0,1	0,2	0,2	0,5	0,5
2135 ZC	0,1	0,1	0,2	0,2	0,3	0,3
2150 ZC	0,3	0,3	0,4	0,4	0,8	0,8
2185 ZC	0,2	0,2	0,4	0,4	0,6	0,6
2215 ZC	0,2	0,2	0,3	0,3	0,7	0,7
2230 ZC	0,1	0,1	0,2	0,2	0,4	0,4

Super Low Noise

Size	Low head pressure		Medium head pressure		High head pressure	
	1 pump	2 pumps	1 pump	2 pumps	1 pump	2 pumps
	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
150 ZC	0,8	0,8	1,3	1,3	2,2	2,2
170 ZC	0,3	0,3	0,4	0,4	0,8	0,8
180 ZC	0,7	0,7	1,0	1,0	1,8	1,8
1115 ZC	0,4	0,4	0,7	0,7	1,5	1,5
2135 ZC	0,2	0,2	0,5	0,5	1,0	1,0
2150 ZC	0,8	0,8	1,1	1,1	2,1	2,1
2185 ZC	0,8	0,8	1,5	1,5	2,1	2,1
2215 ZC	0,6	0,6	0,8	0,8	1,8	1,8
2230 ZC	0,4	0,4	0,6	0,6	1,2	1,2

Chilled water temperature in/out 12°C/7°C – outdoor air temperature 35°C.
Testing point: Average sound pressure levels calculated according to ISO 9614 at 10 m from unit.
Measurement conditions: Free field on reflecting surface (Q factor Q=2).



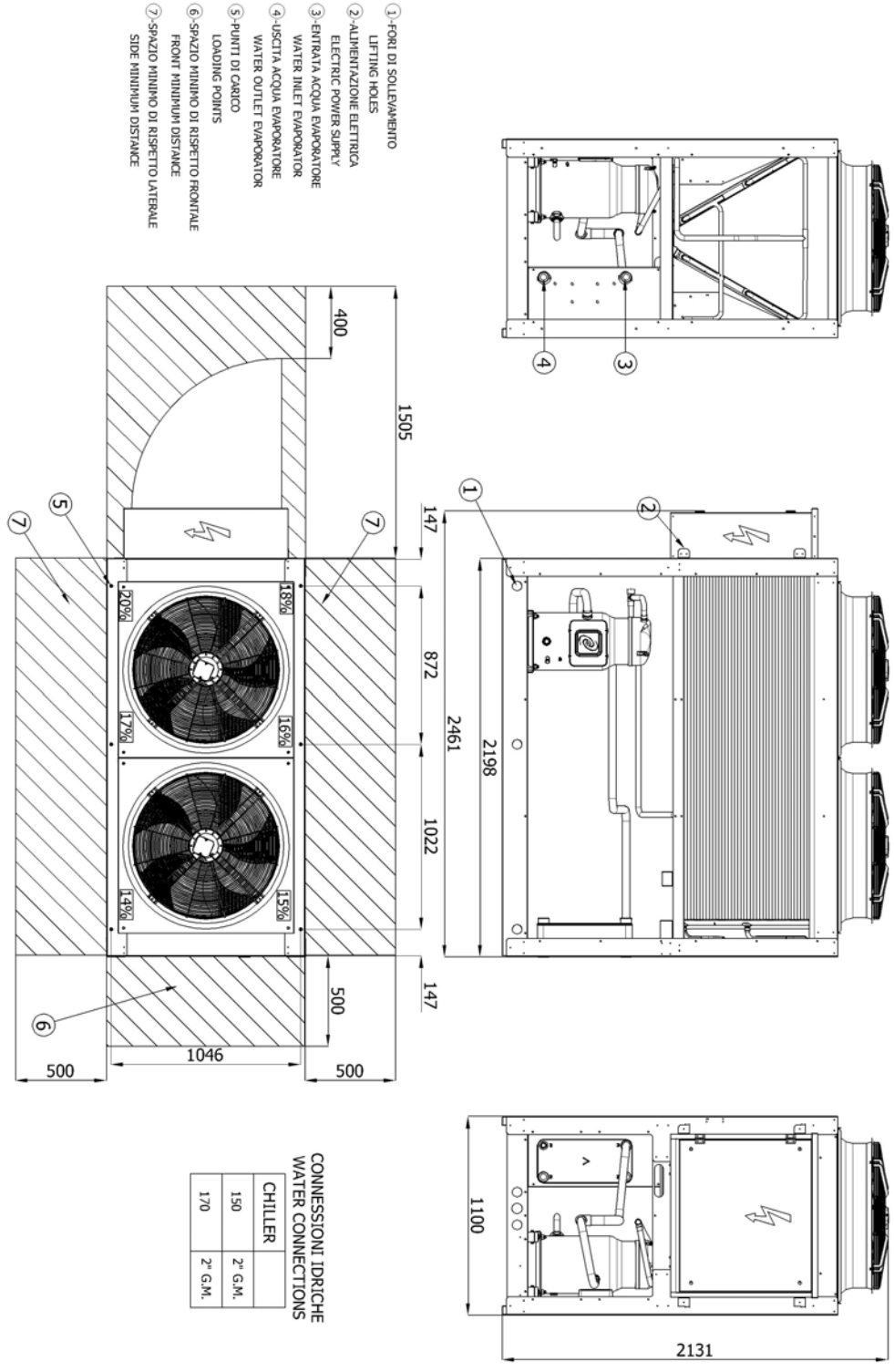
- For units installed in the presence of 2 reflecting surfaces (Q factor Q=4) 3 dB have to be added at values above mentioned.
- For units installed in the presence of 3 reflecting surfaces (Q factor Q=8) 6 dB have to be added at values above mentioned.
- For units installed at a certain height from the ground, the sound energy coming out from the bottom of the unit leads an increase of the noise pressure level of around 3 dB.

Sound emission values in octave bands are shown just as an indication and they are not to be considered as a commitment. Sound pressure values, according to ISO 3744 standards and in observance of EUROVENT certification program, are the only ones to be used for every calculation to make a prevision of the sound pressure level at the operating conditions. The sound pressure level data are not binding. For a more precise value please refer to the sound power level.

Dimensions and weights

STANDARD VERSION

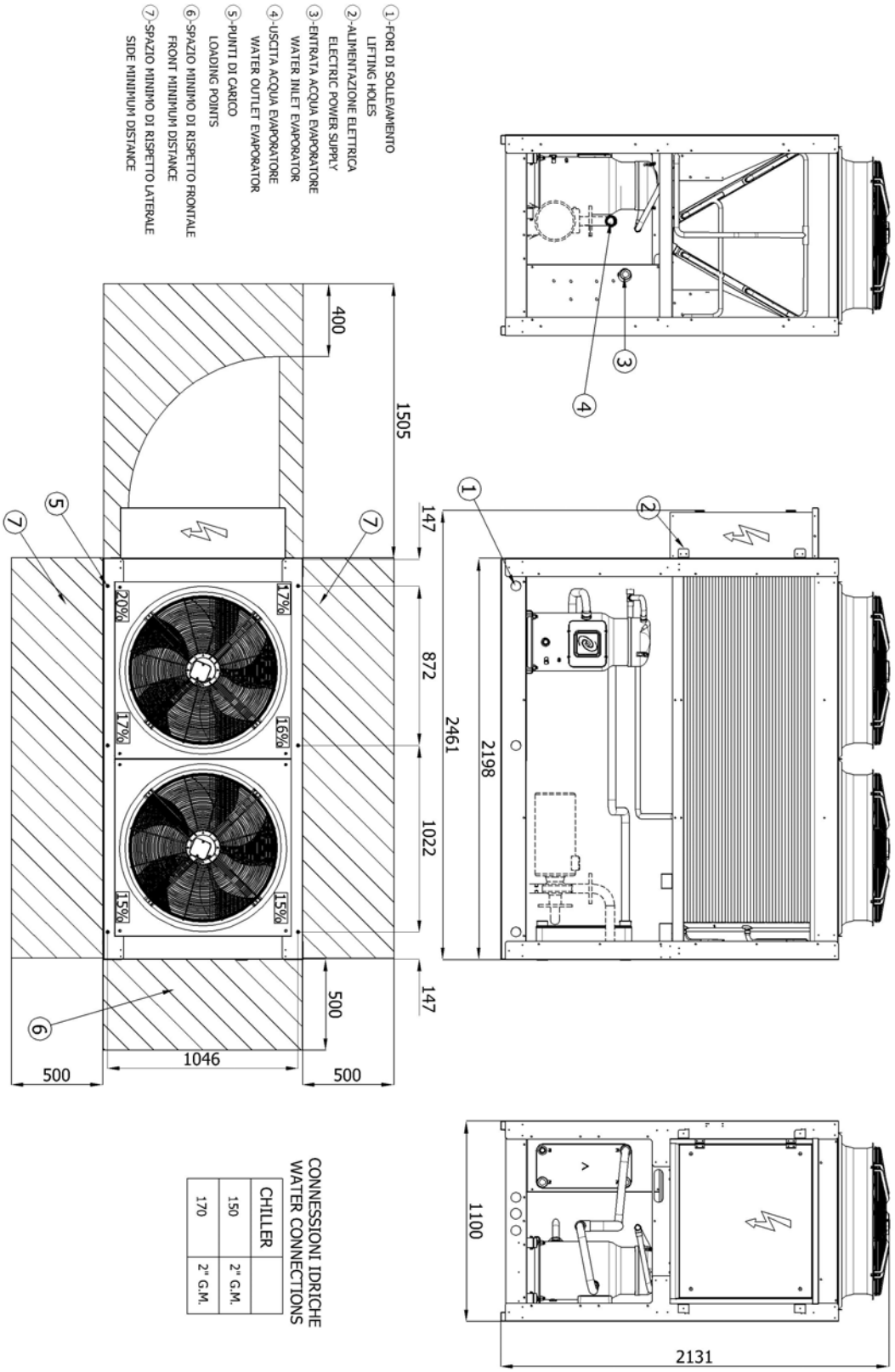
Sizes 150 ZC - 170 ZC



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
150	2" G.M.
170	2" G.M.

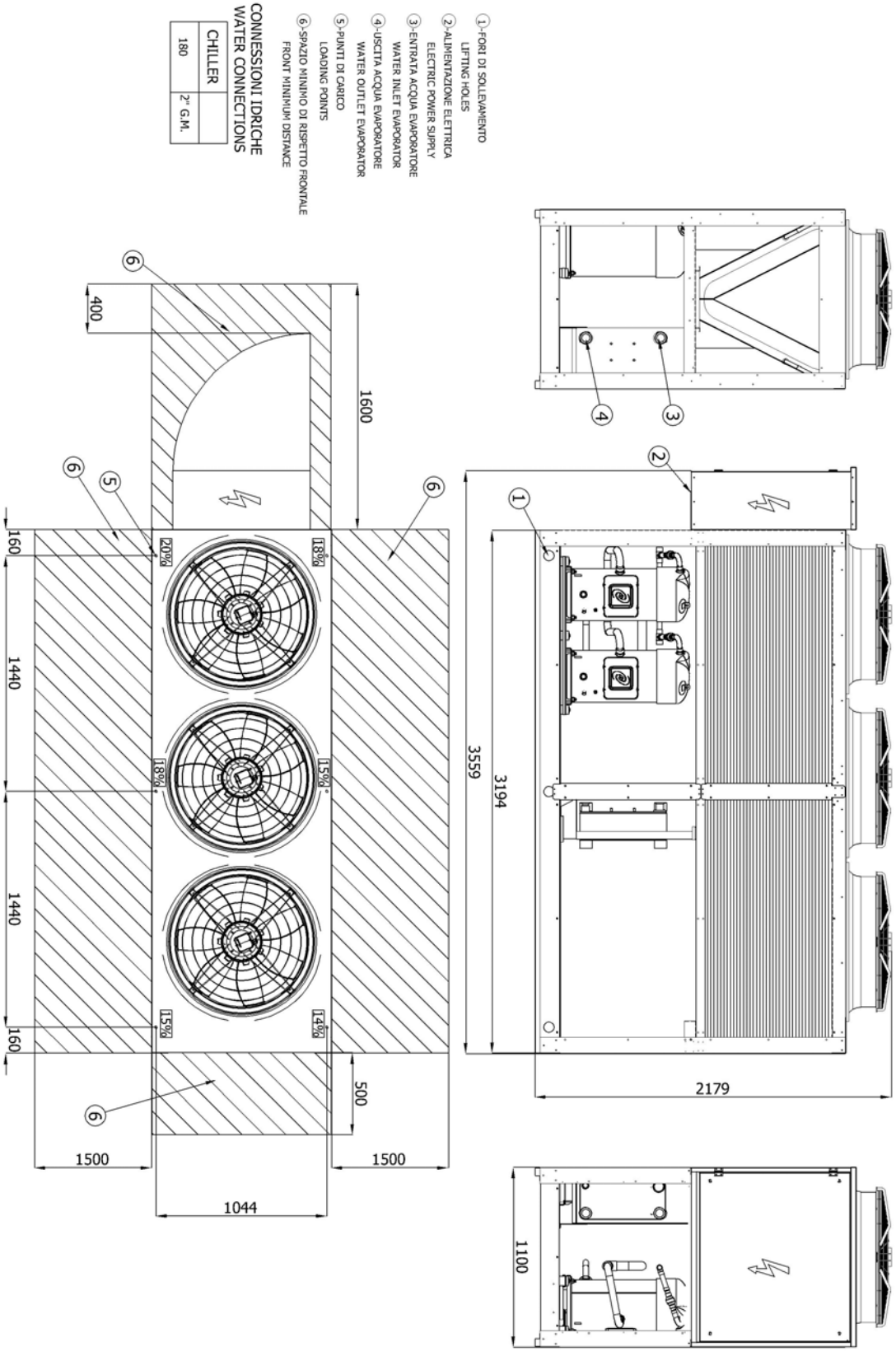
Sizes 150 ZC - 170 ZC + B1/M1/A1- B2/M2/A2



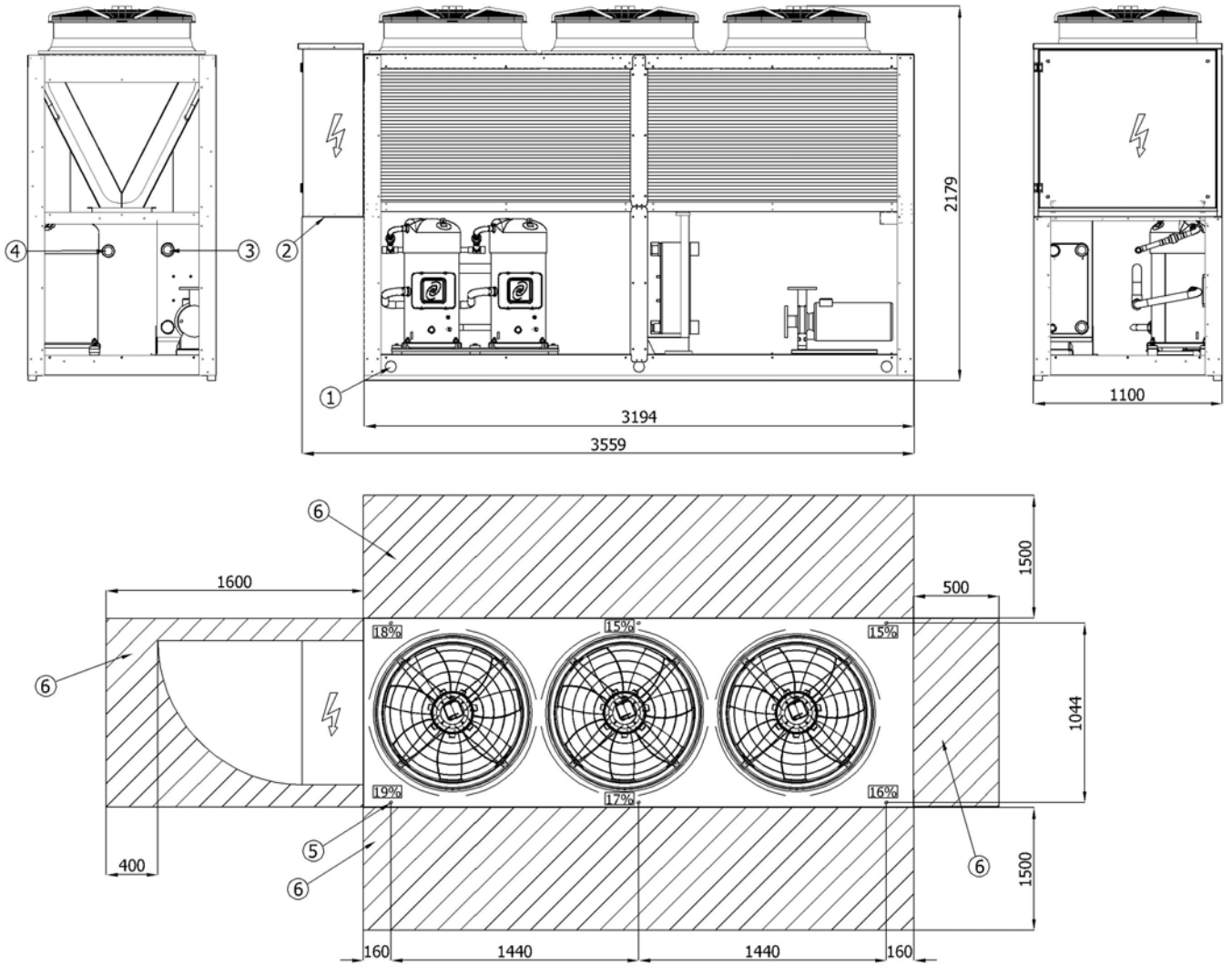
CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
150	2" G.M.
170	2" G.M.

Size 180 ZC



Size 180 ZC + B1/M1/A1- B2/M2/A2



① -FORI DI SOLLEVAMENTO
LIFTING HOLES

② -ALIMENTAZIONE ELETTRICA
ELECTRIC POWER SUPPLY

③ -ENTRATA ACQUA EVAPORATORE
WATER INLET EVAPORATOR

④ -USCITA ACQUA EVAPORATORE
WATER OUTLET EVAPORATOR

⑤ -PUNTI DI CARICO
LOADING POINTS

⑥ -SPAZIO MINIMO DI RISPETTO FRONTALE
FRONT MINIMUM DISTANCE

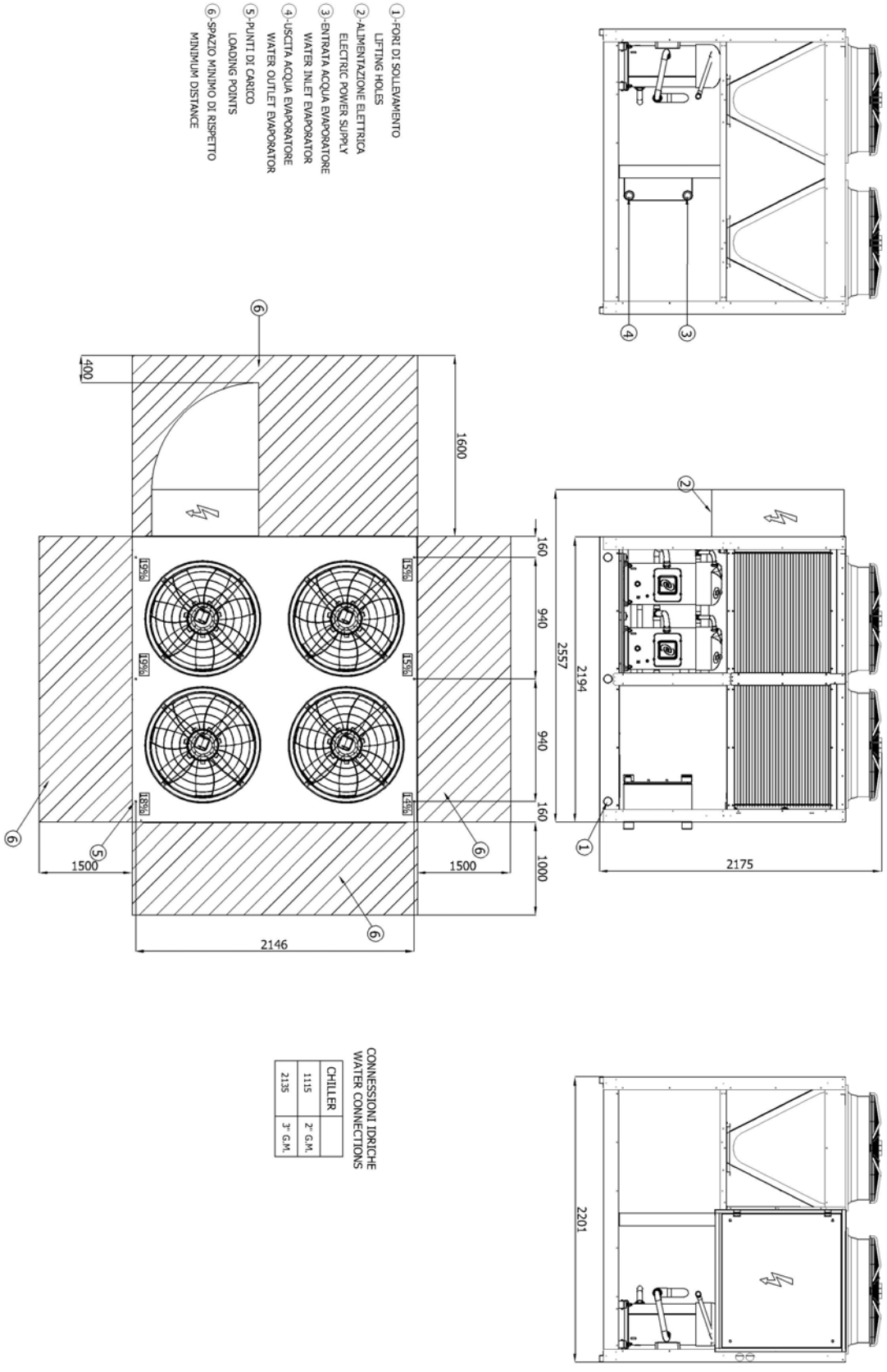
⑦ -INGRESSO ACQUA RECUPERATORE/DESURRISCALDATORE
WATER INLET HEAT RECOVER/DESUPERHEATERS

⑧ -USCITA ACQUA RECUPERATORE/DESURRISCALDATORE
WATER OUTLET HEAT RECOVER/DESUPERHEATERS

CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
180	2" G.M.

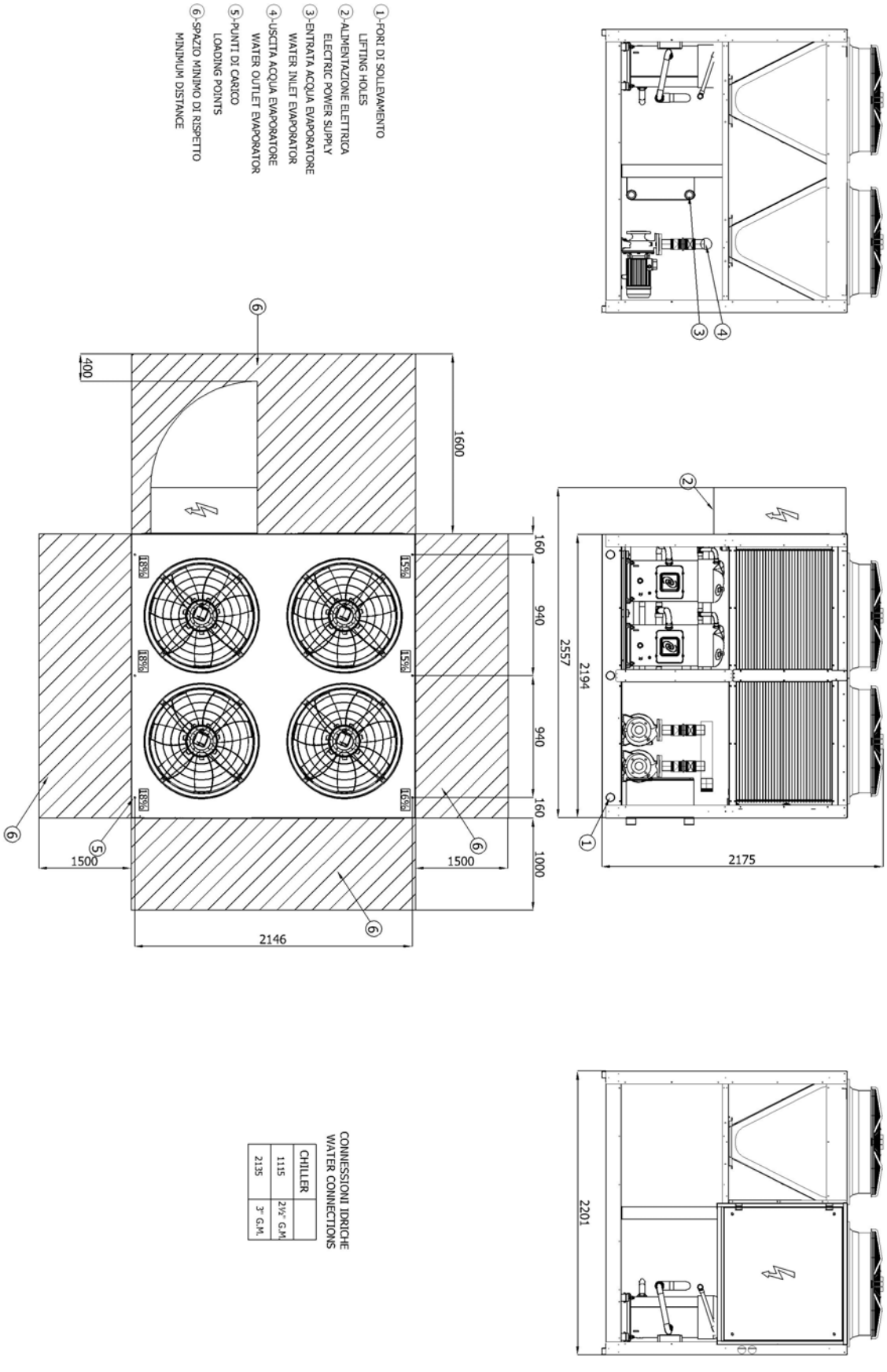
Sizes 1115 ZC - 2135 ZC



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
1115	2" G.M.
2135	3" G.M.

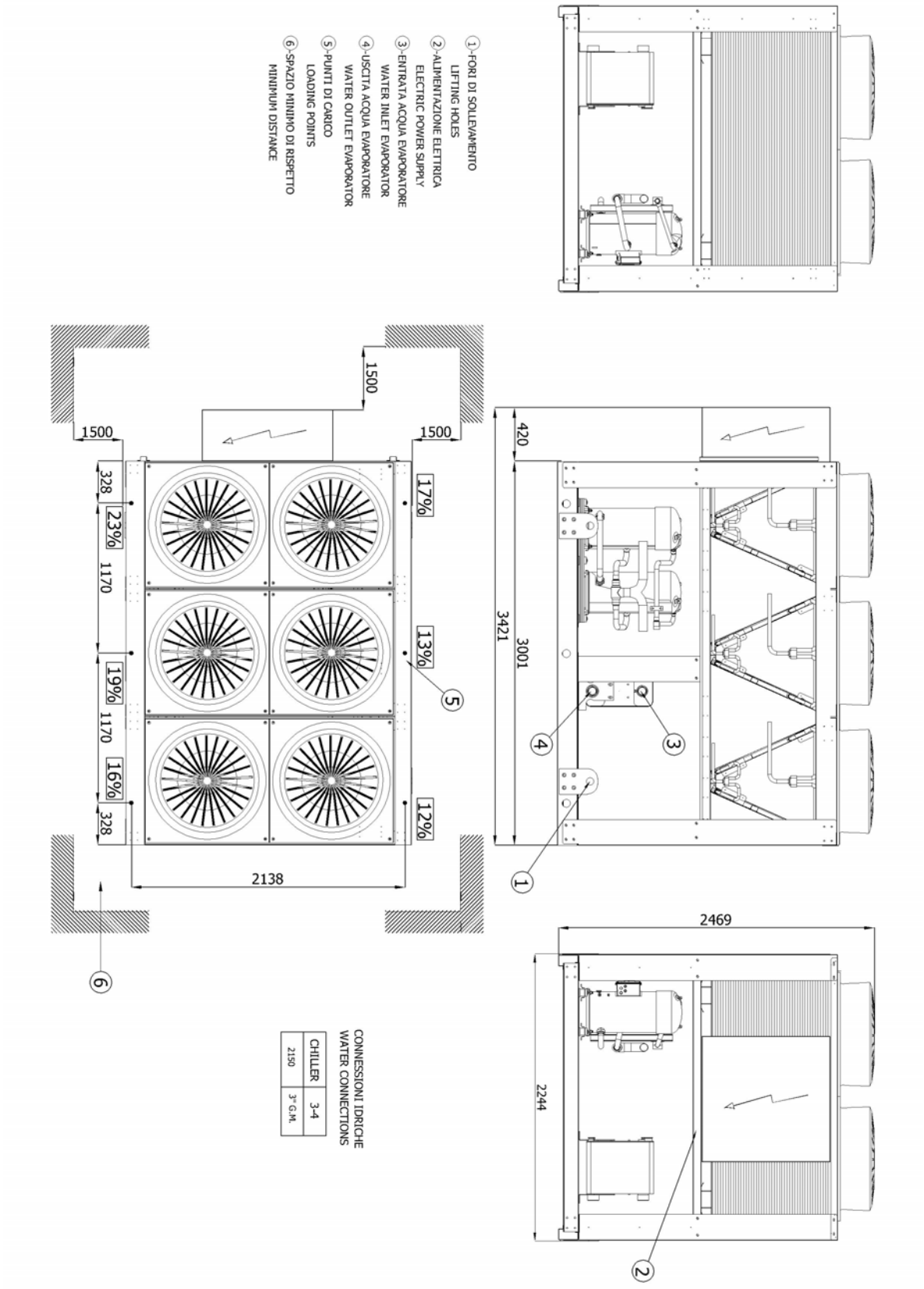
Sizes 1115 ZC - 2135 ZC + B1/M1/A1- B2/M2/A2



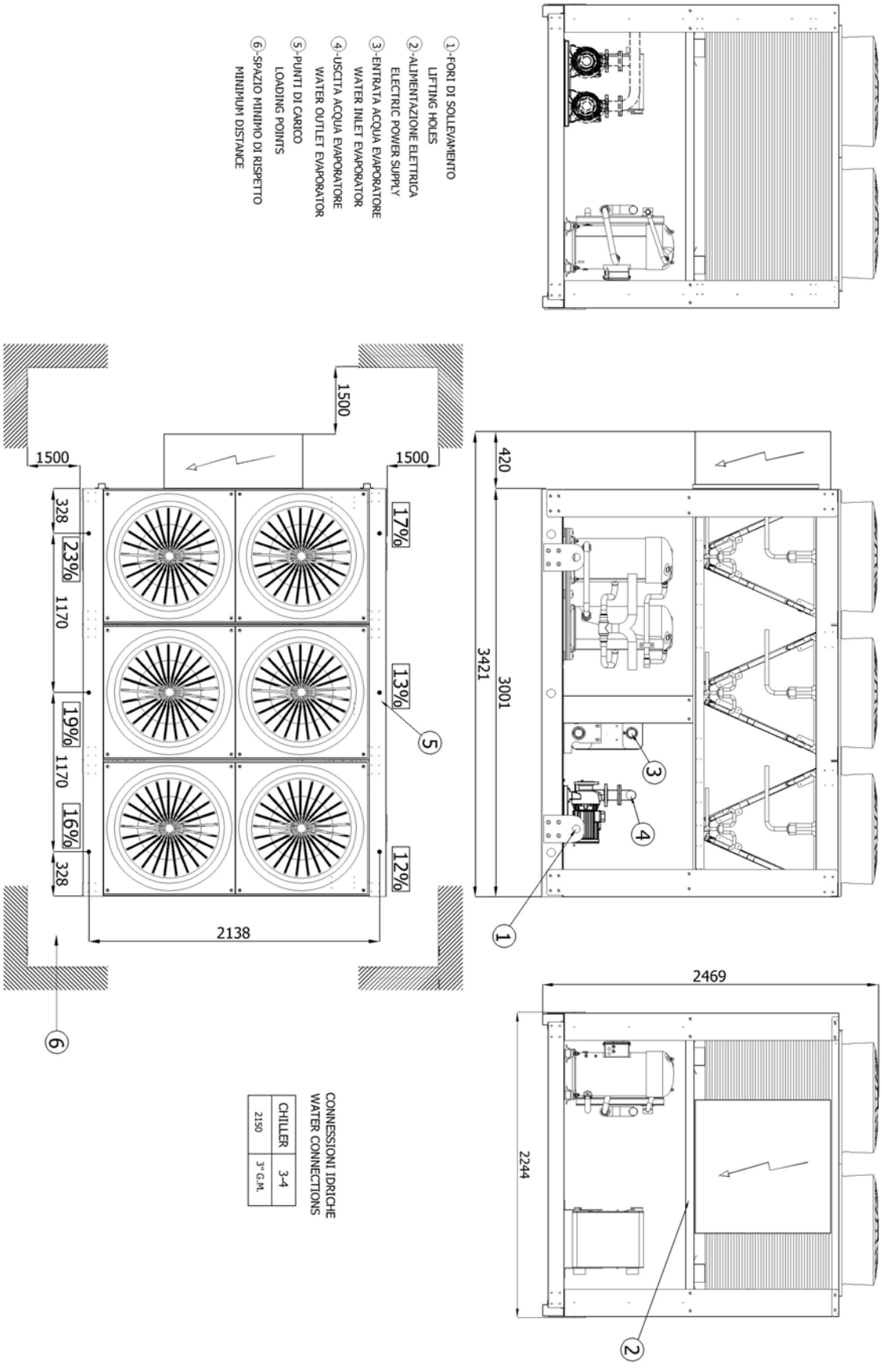
CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
1115	2½" G.M.
2135	3" G.M.

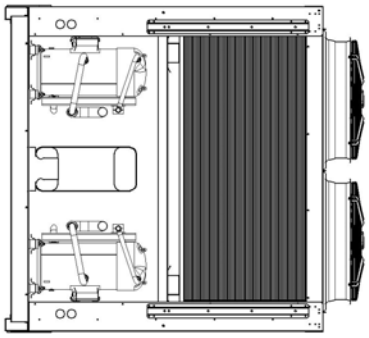
Size 2150 ZC

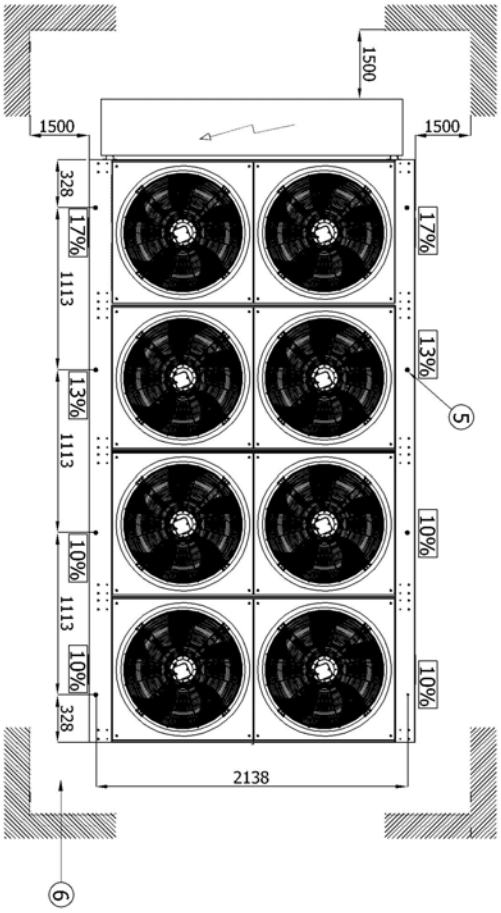

1)-FORI DI SOLLEVAMENTO
LIFTING HOLES
2)-ALIMENTAZIONE ELETTRICA
ELECTRIC POWER SUPPLY
3)-ENTRATA ACQUA EVAPORATORE
WATER INLET EVAPORATOR
4)-USCITA ACQUA EVAPORATORE
WATER OUTLET EVAPORATOR
5)-PUNTI DI CARICO
LOADING POINTS
6)-SPAZIO MINIMO DI RISPETTO
MINIMUM DISTANCE
1500
1500
1500
328
23%
1170
19%
1170
16%
328
17%
13%
12%
2138
420
3001
3421
2469
2244
CONNESSIONI IDRICHE
WATER CONNECTIONS
CHILLER
3-4
2150
3" G.M.

Size 2150 ZC+ B1/M1/A1- B2/M2/A2

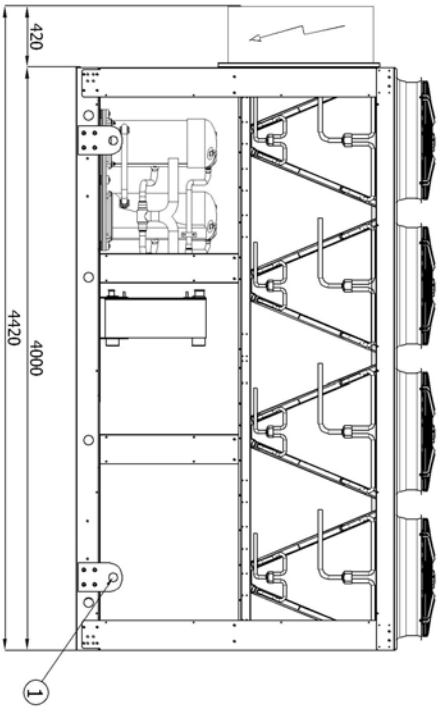


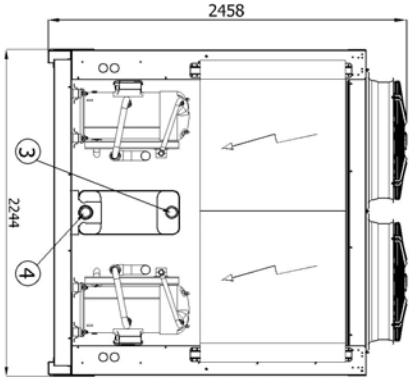
Size 2185 ZC - 2230 ZC





1-FORI DI SOLLEVAMENTO
LIFTING HOLES
2-ALIMENTAZIONE ELETTRICA
ELECTRIC POWER SUPPLY
3-ENTRATA ACQUA EVAPORATORE
WATER INLET EVAPORATOR
4-USCITA ACQUA EVAPORATORE
WATER OUTLET EVAPORATOR
5-PUNTI DI CARICO
LOADING POINTS
6-SPAZIO MINIMO DI RISPETTO
MINIMUM DISTANCE

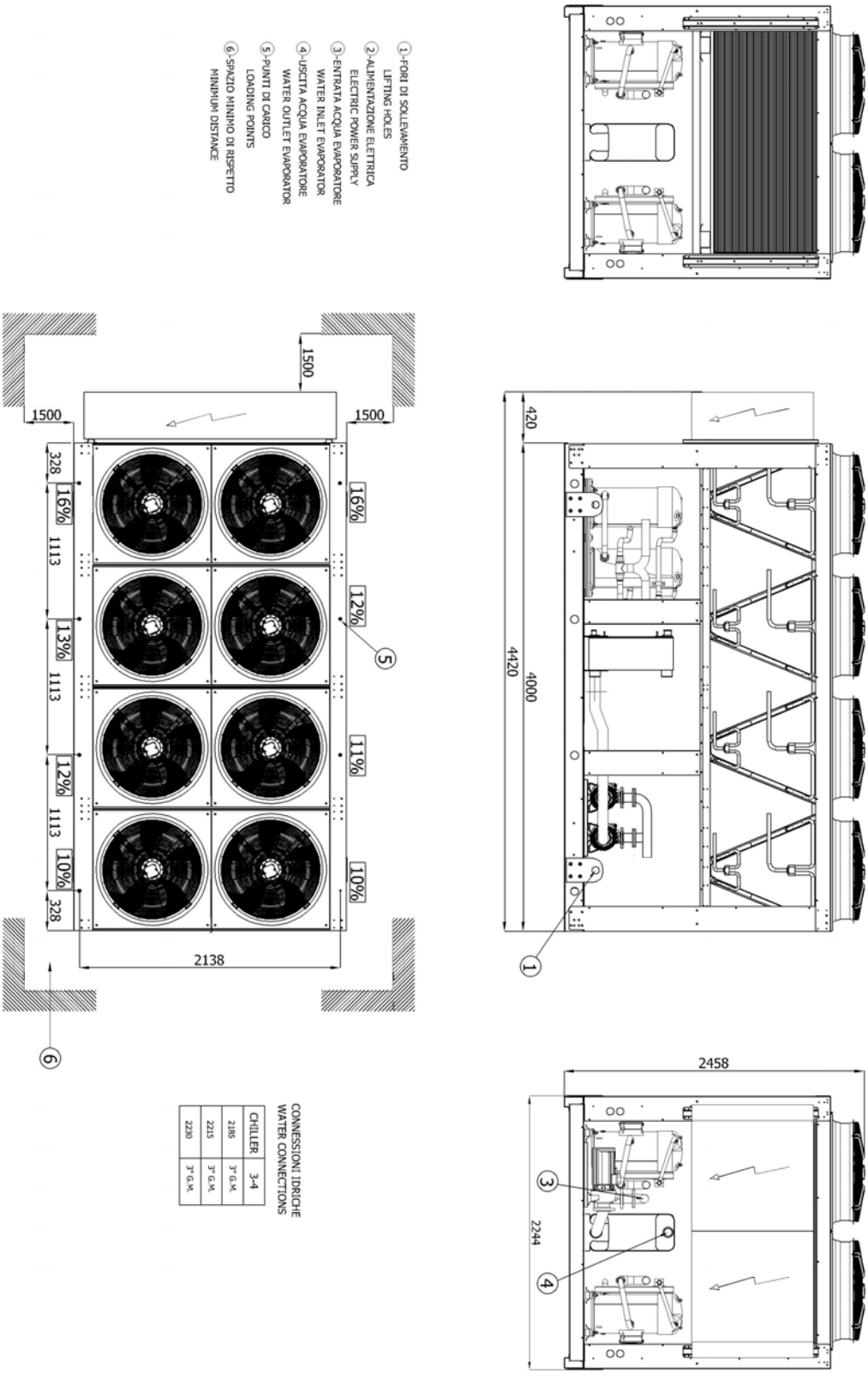




CONNESSIONI IDRICHE
WATER CONNECTIONS

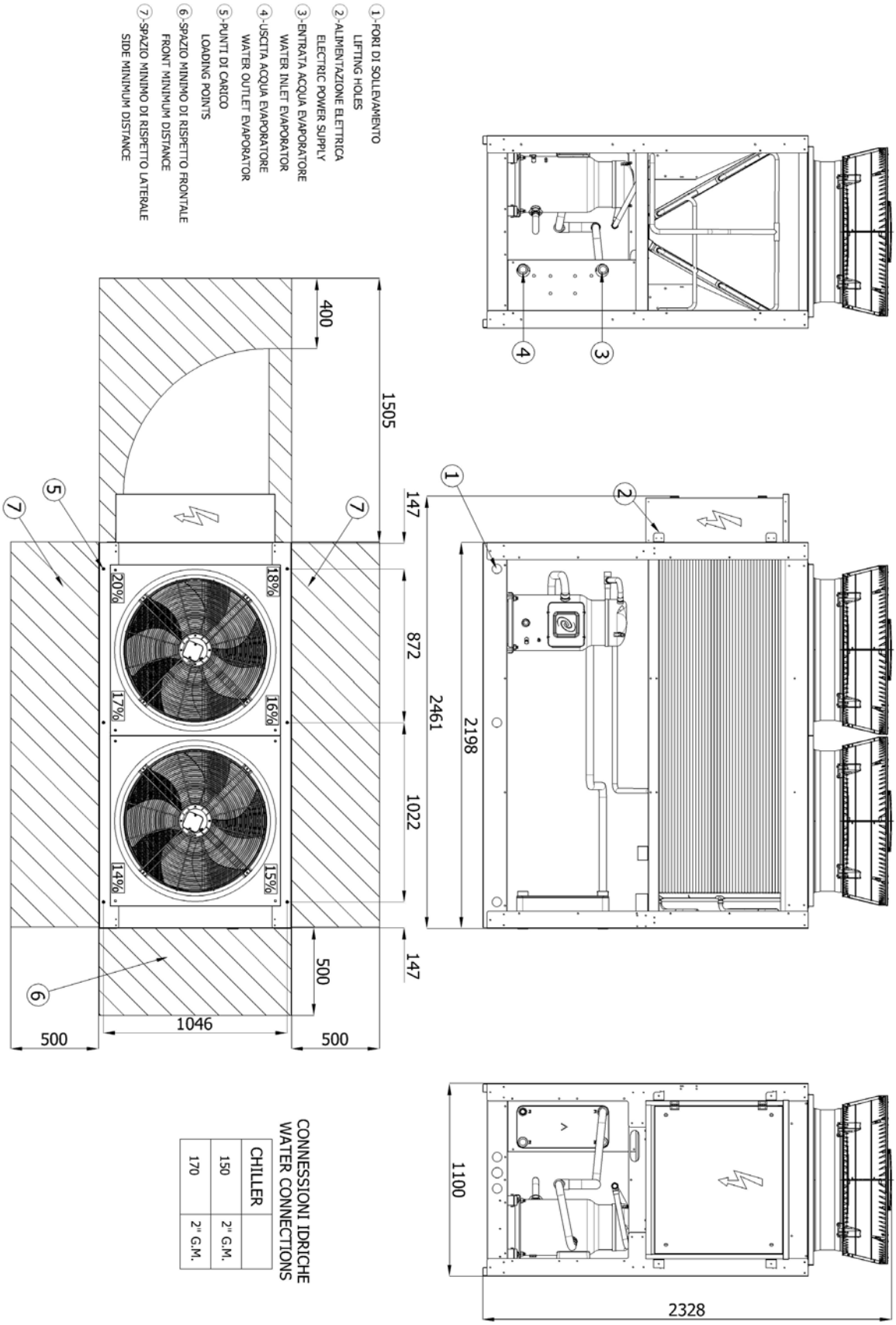
CHILLER	3-4
2185	3" G.M.
2215	3" G.M.
2230	3" G.M.

Size 2185 ZC - 2230 ZC + B1/M1/A1- B2/M2/A2



FLEX HSE - SUPER LOW NOISE VERSION

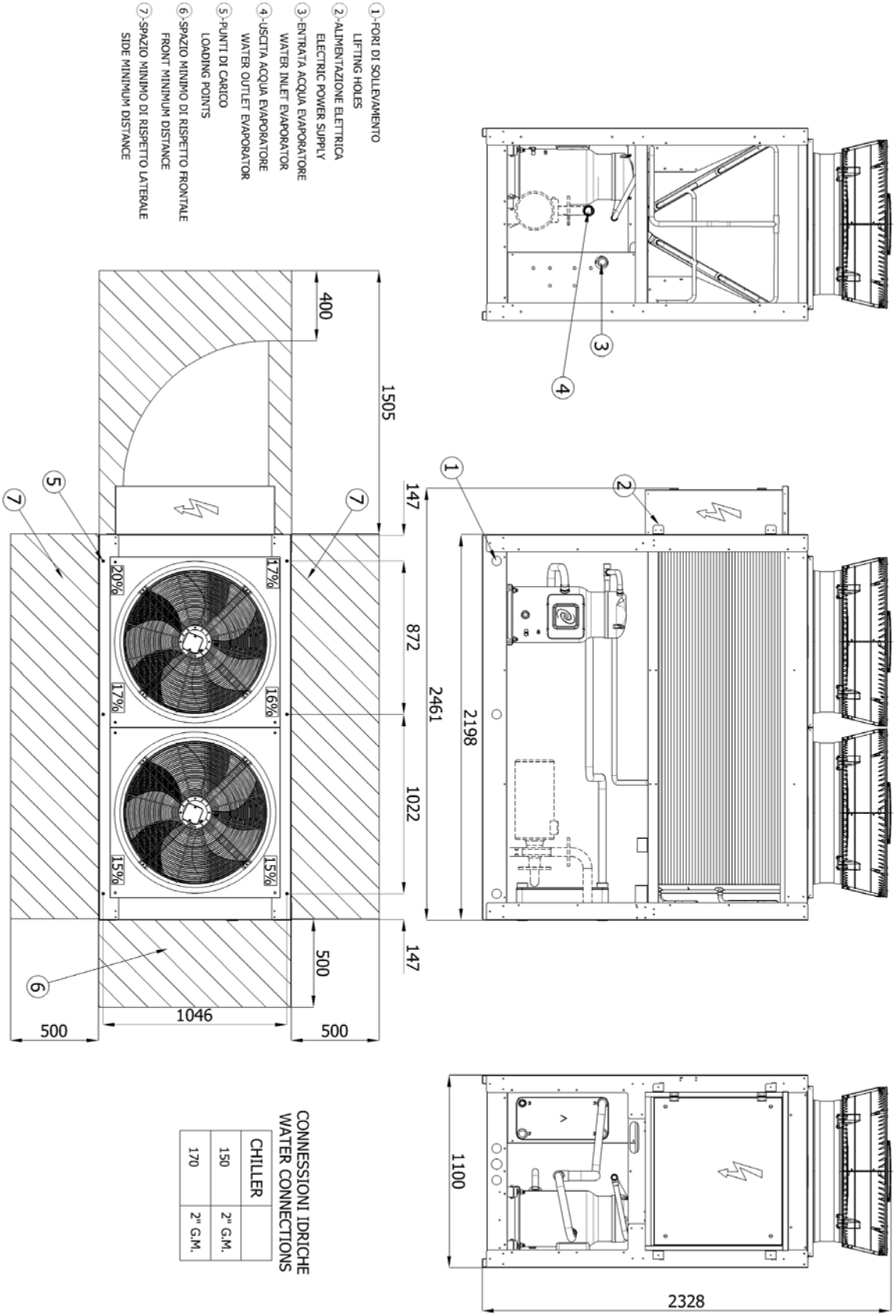
Sizes 150 ZC SL - 170 ZC SL



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
150	2" G.M.
170	2" G.M.

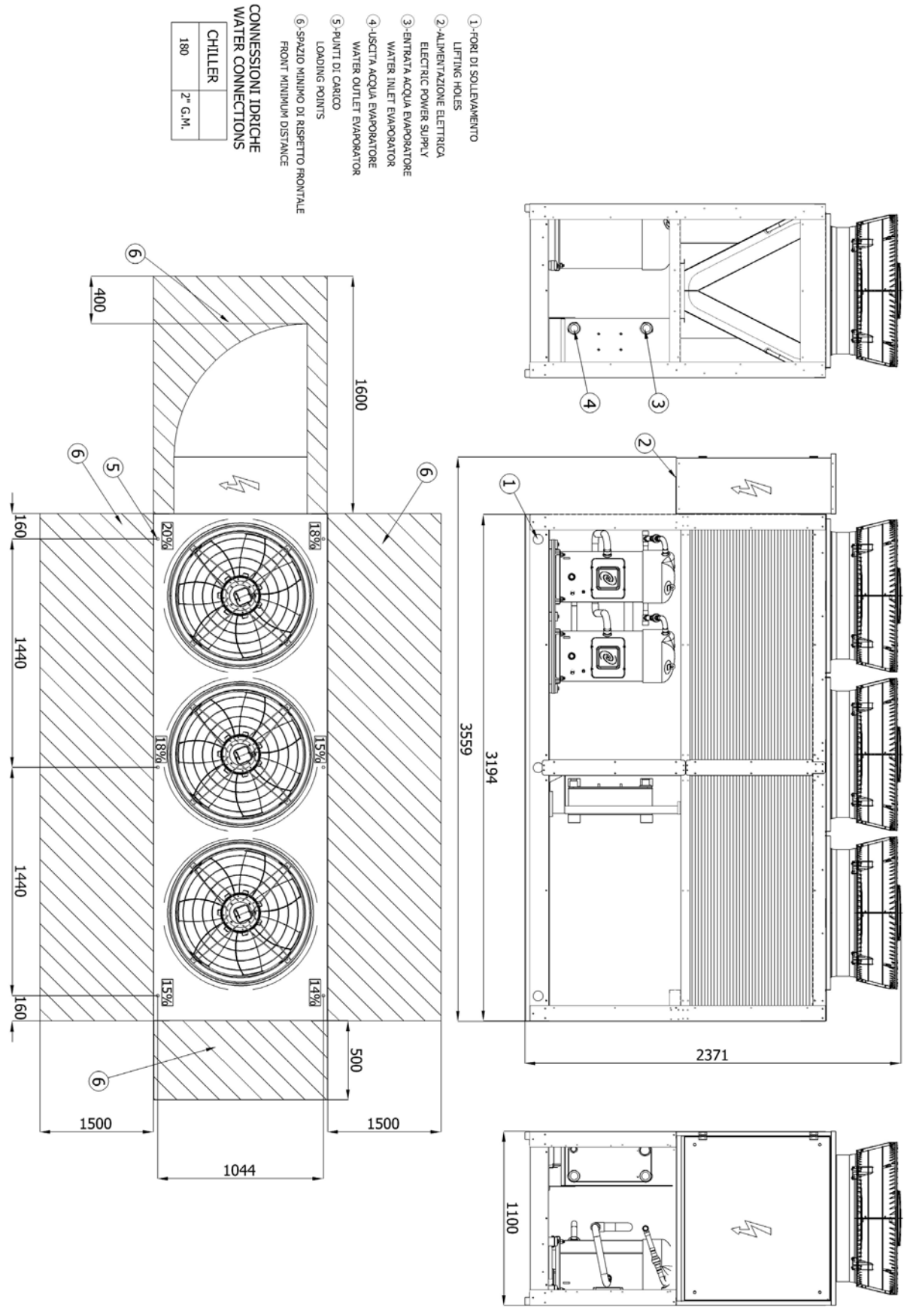
Sizes 150 ZC SL - 170 ZC SL + B1/M1/A1- B2/M2/A2



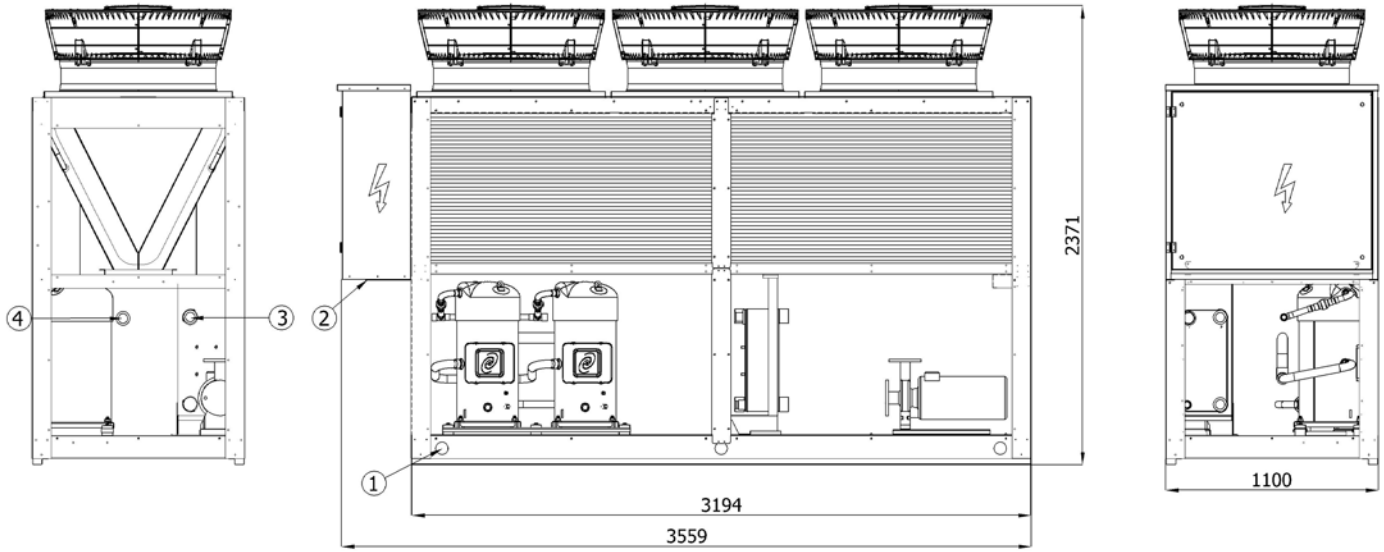
CONNESSIONI IDRICHE
WATER CONNECTIONS

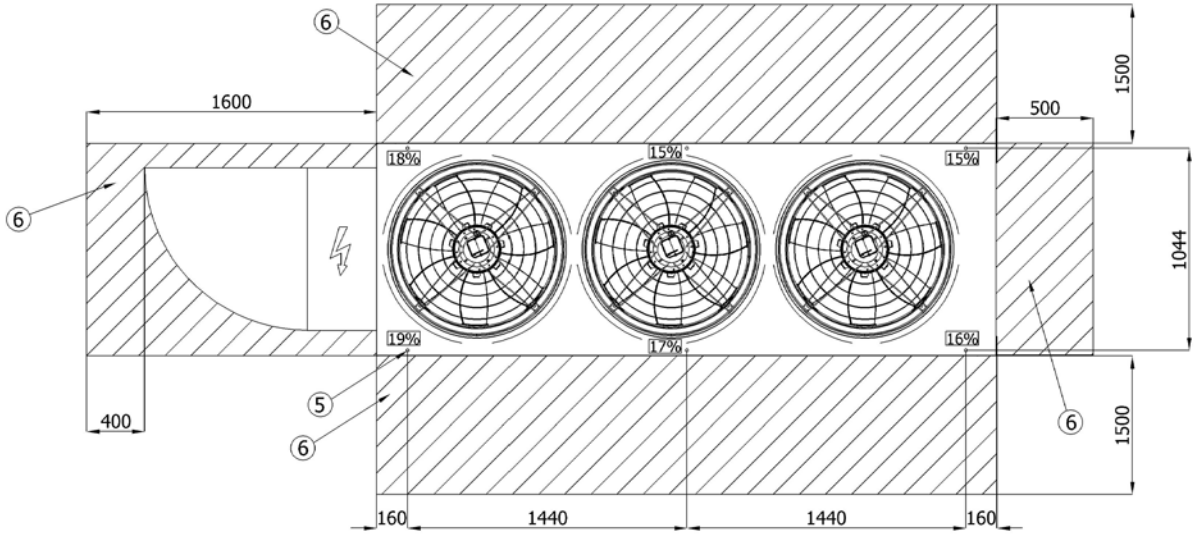
CHILLER	
150	2" G.M.
170	2" G.M.

Size 180 ZC SL



Size 180 ZC SL + B1/M1/A1- B2/M2/A2





①-FORI DI SOLLEVAMENTO
LIFTING HOLES

②-ALIMENTAZIONE ELETTRICA
ELECTRIC POWER SUPPLY

③-ENTRATA ACQUA EVAPORATORE
WATER INLET EVAPORATOR

④-USCITA ACQUA EVAPORATORE
WATER OUTLET EVAPORATOR

⑤-PUNTI DI CARICO
LOADING POINTS

⑥-SPAZIO MINIMO DI RISPETTO FRONTALE
FRONT MINIMUM DISTANCE

⑦-INGRESSO ACQUA RECUPERATORE/DESURRISCALDATORE
WATER INLET HEAT RECOVER/DESUPERHEATERS

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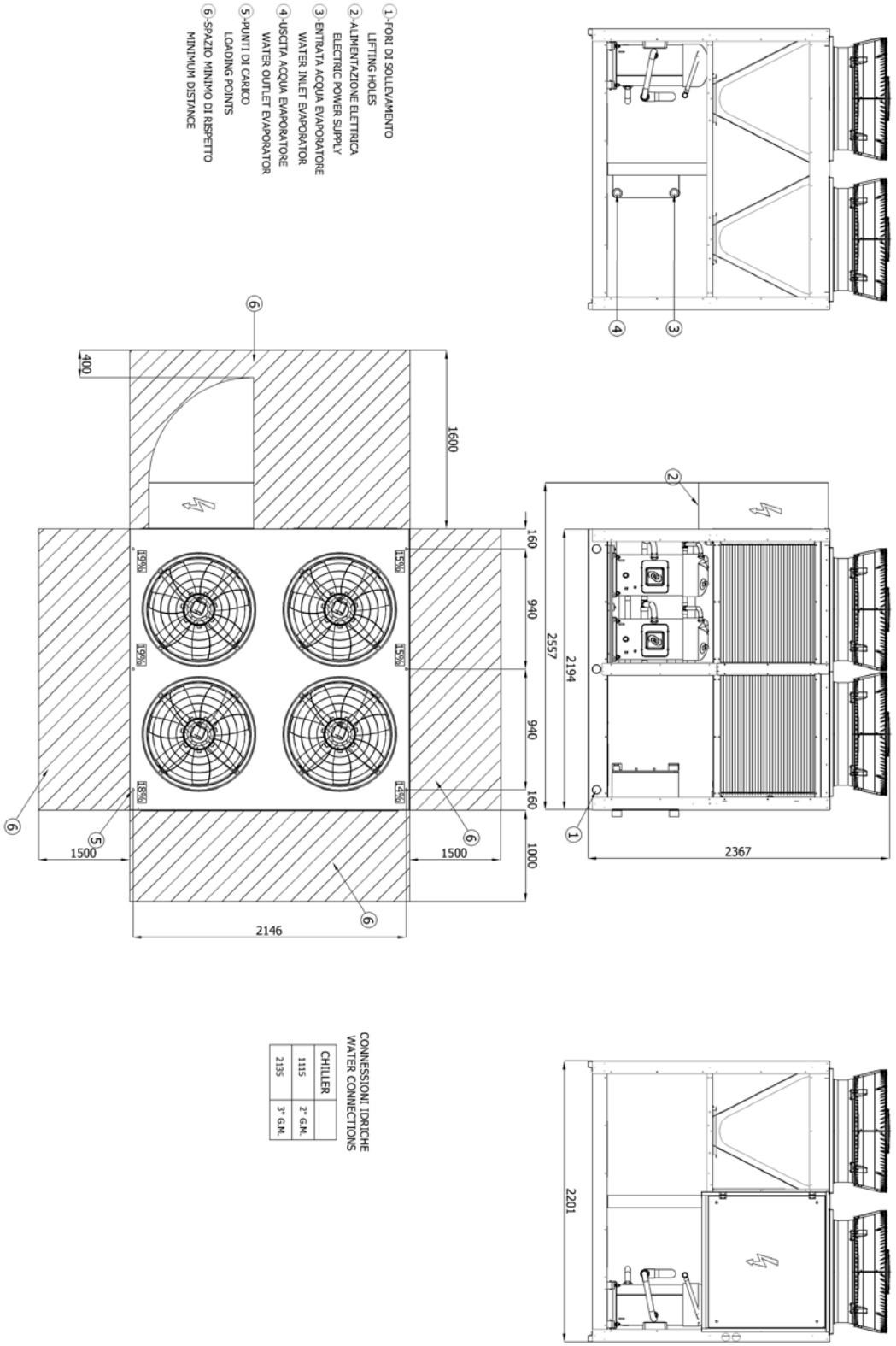
WATER OUTLET HEAT RECOVER/DESUPERHEATERS

CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
180	2" G.M.

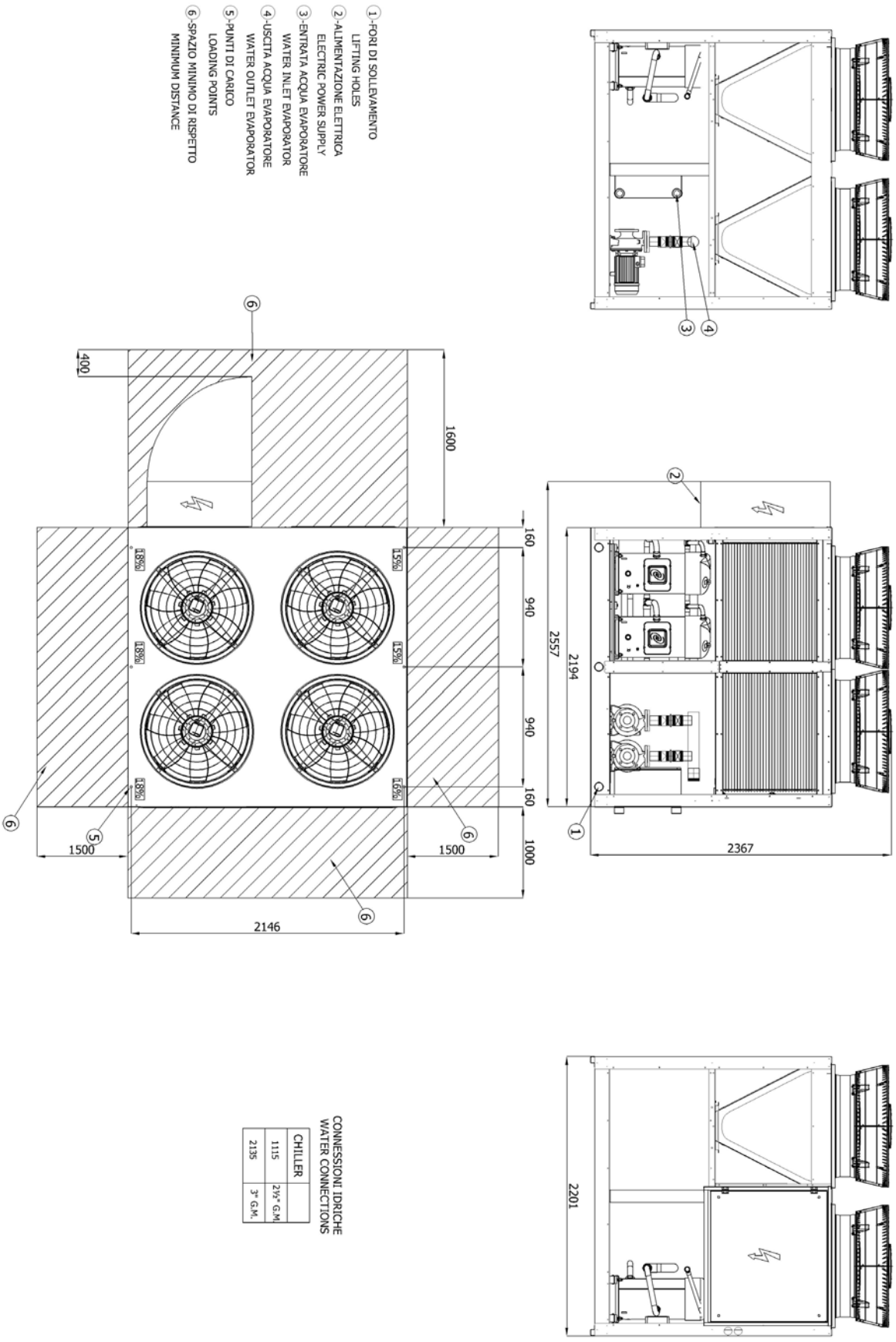
Sizes 1115 ZC SL - 2135 ZC SL



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
1115	2" G.M.
2135	3" G.M.

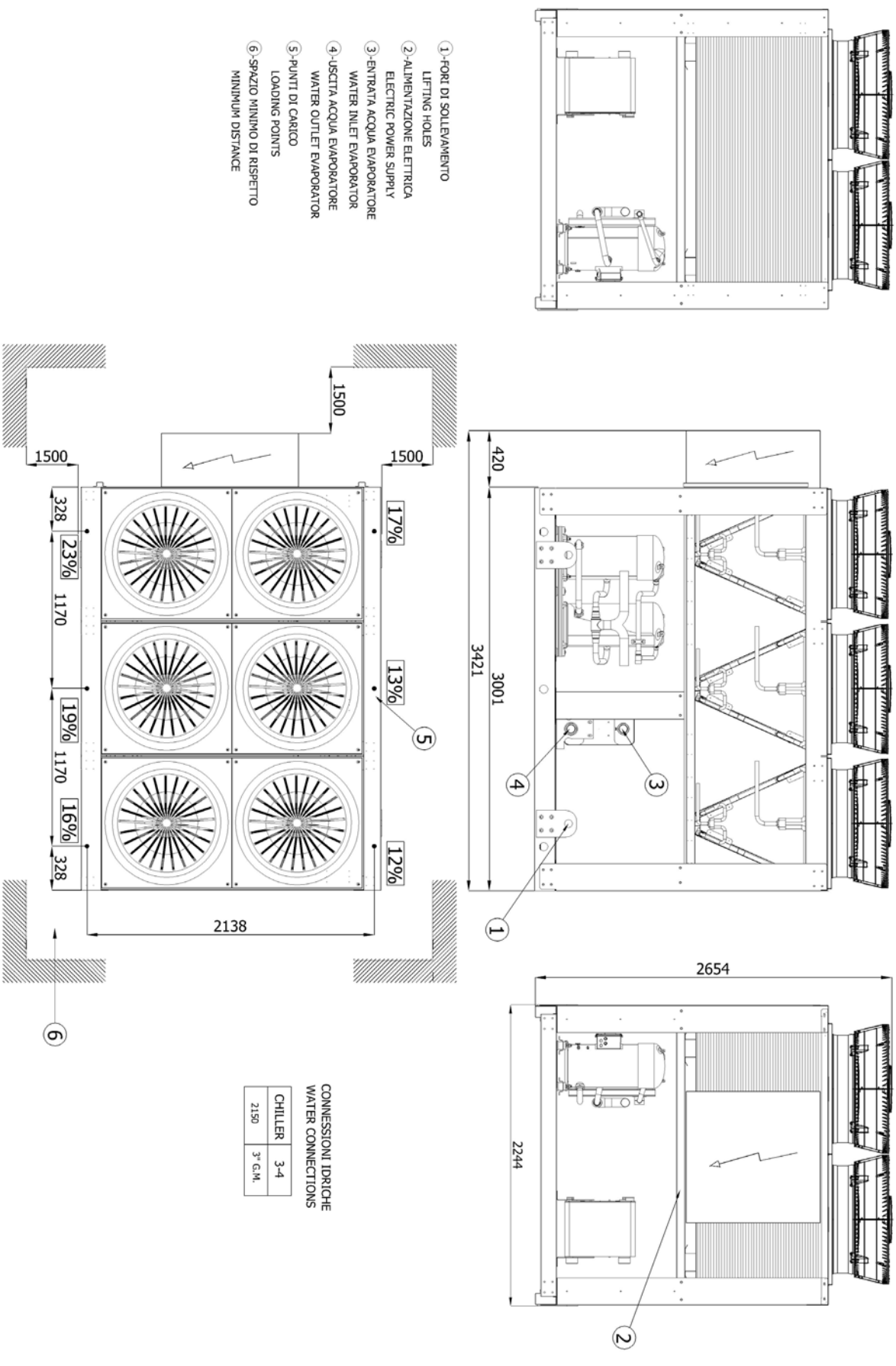
Sizes1115 ZC SL - 2135 ZC SL + B1/M1/A1- B2/M2/A2



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	
1115	2½" G.M.
2135	3" G.M.

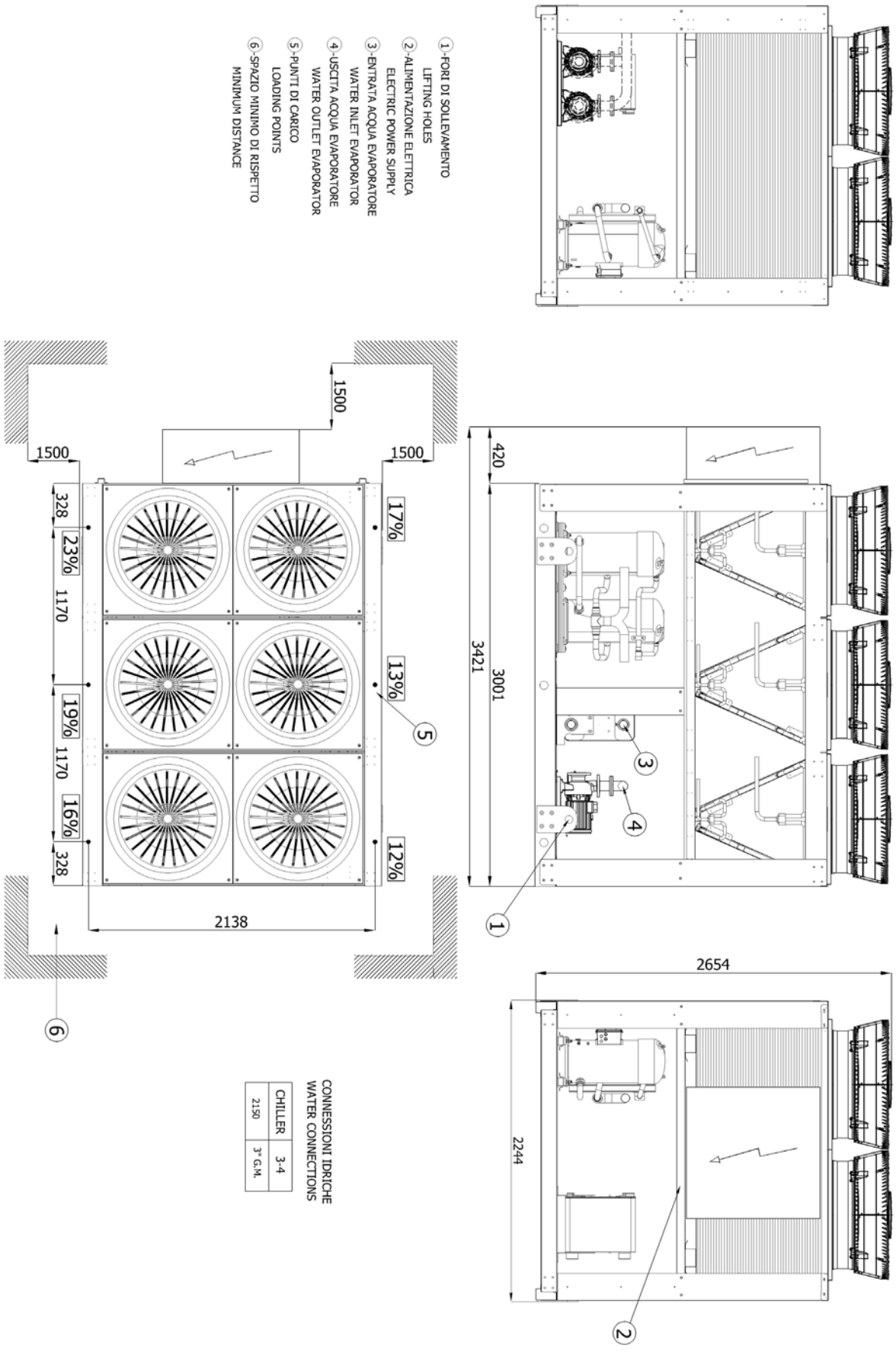
Size 2150 ZC SL



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	3-4
2150	3" G.M.

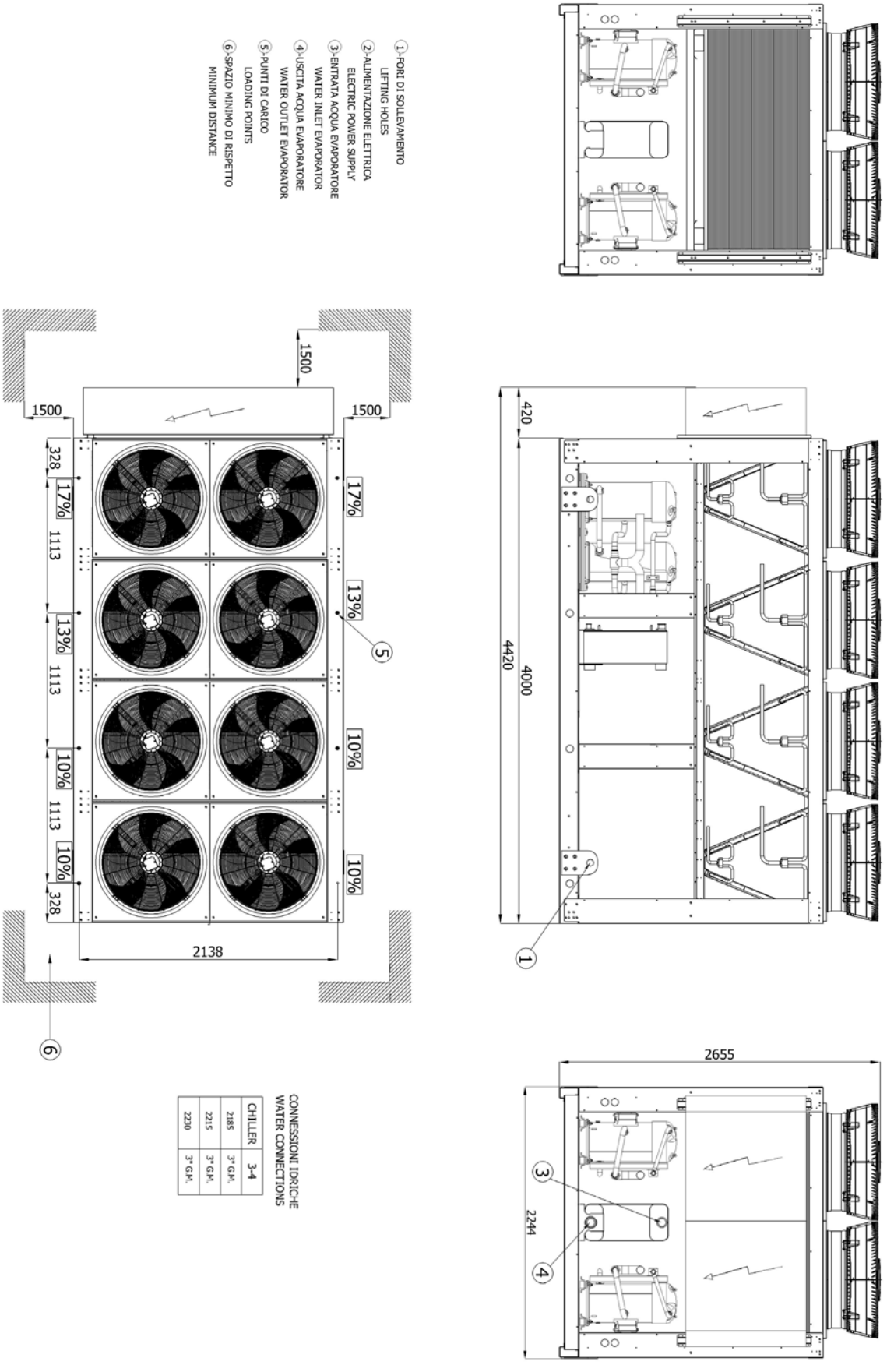
Size 2150 ZC SL + B1/M1/A1- B2/M2/A2



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	3-4
2150	3" G.M.

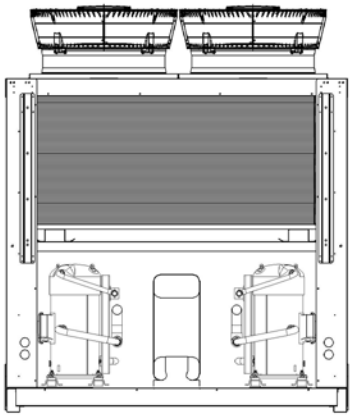
Sizes 2185 ZC SL - 2230 ZC SL

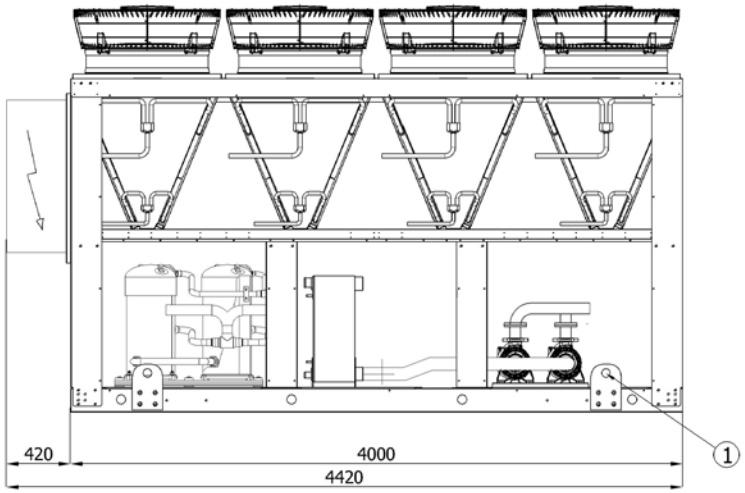


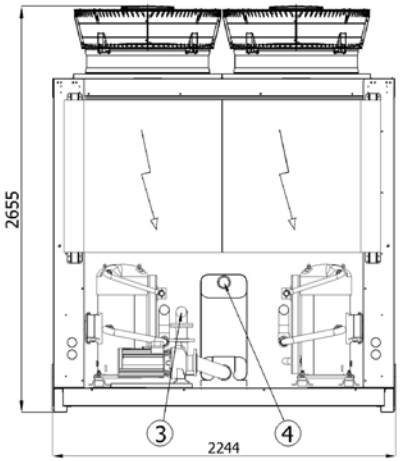
CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	3-4
2185	3" G.M.
2215	3" G.M.
2230	3" G.M.

Sizes 2185 ZC SL - 2230 ZC SL + B1/M1/A1- B2/M2/A2







1-FORI DI SOLLEVAMENTO
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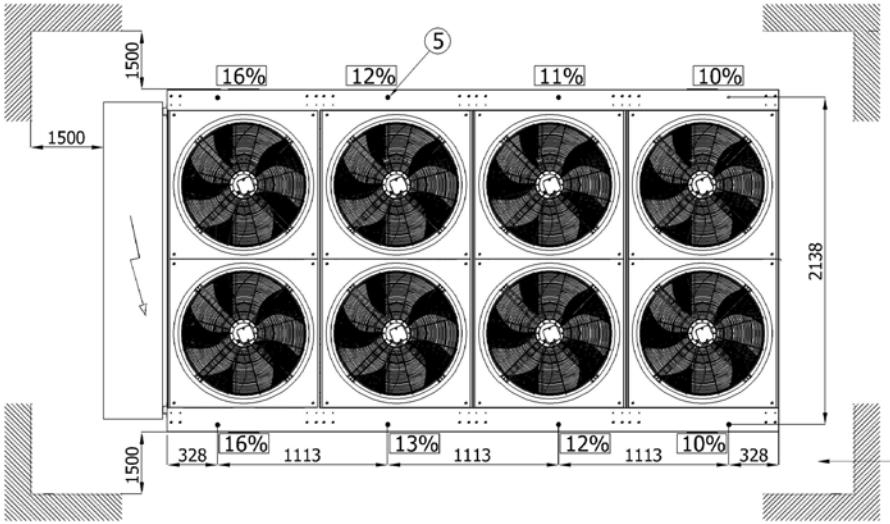
WATER OUTLET EVAPORATOR
5-PUNTI DI CARICO
LOADING POINTS
6-SPAZIO MINIMO DI RISPETTO
MINIMUM DISTANCE



CONNESSIONI IDRICHE
WATER CONNECTIONS

CHILLER	3-4
2185	3" G.M.
2215	3" G.M.
2230	3" G.M.

Weights (kg)

Operating weights	150 ZC	170 ZC	180 ZC	1115 ZC	2135 ZC	2150 ZC	2185 ZC	2215 ZC	2230 ZC
Standard Version	598	657	954	1226	1283	1897	2297	2421	2543
1 Pump - Low head pressure	32	32	23	26	26	31	31	74	74
2 Pumps - Low head pressure	60	60	43	49	49	58	58	140	140
1 Pump - Medium Head pressure	55	55	55	74	74	74	93	93	93
2 Pumps - Medium head pressure	104	104	104	140	140	140	176	176	176
1 Pump - High head pressure	77	77	77	102	102	102	102	127	127
2 Pumps - High head pressure	146	146	146	193	193	193	193	241	241
Additional									
Super low noise	184	184	238	292	368	476	584	584	584

Shipping weights	150 ZC	170 ZC	180 ZC	1115 ZC	2135 ZC	2150 ZC	2185 ZC	2215 ZC	2230 ZC
Standard Version	593	652	943	1218	1270	1884	2280	2404	2522
1 Pump - Low head pressure	32	32	23	26	26	31	31	74	74
2 Pumps - Low head pressure	60	60	43	49	49	58	58	140	140
1 Pump - Medium Head pressure	55	55	55	74	74	74	93	93	93
2 Pumps - Medium head pressure	104	104	104	140	140	140	176	176	176
1 Pump - High head pressure	77	77	77	102	102	102	102	127	127
2 Pumps - High head pressure	146	146	146	193	193	193	193	241	241
Additional									
Super low noise	184	184	238	292	368	476	584	584	584

Trane optimizes the performance of homes and buildings around the world. Trane offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts. For more information, visit www.trane.eu.
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Supersedes CG-PRC048A-GB_0717