AERMEC
air conditioning

R410A · FREE COOLING · CPU · RS485

CHILLERS- Technical manual - installation - maintenance

NRL FREE-COOLING
Multiscroll 2000-3600

AERMEC
COMPANY QUALITY SYSTEM
ICIM
ISO 9001:2000 - Cert. n° 0128/5
CISQ IQNet
AERMEC S.P.A.

CE

EN

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INRLPY. 11.11 4086926_03

Dear Customer,
Thank you for choosing AERMEC. It is the fruit of many years of experience and special design studies and has been made of the highest grade materials and with cutting edge technology.
In addition, all our products bear the EC mark indicating that they meet the requirements of the European Machine Directive regarding safety. The standard of quality is permanently being monitored and AERMEC products are therefore a synonym for Safety, Quality and Reliability.

The data may undergo modifications considered necessary for the improvement of the product, at any time and without the obligation for any notice thereof.

Thank you again.
AERMEC S.p.A

CONTENT

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NRL FREE-COOLING

SERIAL NUMBER	

CONFORMITY DECLARATION	We, the undersigned, declare on our own exclusive responsibility that the object in question, so defined:
NAME	**NRL FREECOOLING**
TYPE	**AIR - WATER CHILLER**
MODEL	

and to which this declaration refers, complies with the following standardised regulations:

CEI EN 60335-2-40	Safety regulation regarding electric heat pumps, air conditioners and dehumidifiers
CEI EN 61000-6-1 **CEI EN 61000-6-3**	Electromagnetic immunity and emission in residential environment
CEI EN 61000-6-2 **CEI EN 61000-6-4**	Electromagnetic immunity and emission in industrial environment
EN378	Refrigerating system and heat pumps - Safety and environmental requirements
UNI EN 12735 **UNI EN 14276**	Round welding-free copper pipes for air conditioning and cooling Pressure equipment for refrigerating systems and heat pumps

thus meeting the essential requisites of the following directives:

- LV Directive: 2006/95/EC
- Electromagnetic Compatibility Directive 2004/108/EC
- Machine Directive 2006/42/EC
- PED Directive relating to pressure equipment 97/23/EC

In compliance with Directive 97/23/EC, the product meets the Total Quality Warranty procedure (module H) with certificate no. 06/270-QT3664 Rev.5 issued by the notified body no. 1131 CEC via Pisacane 46 Legnano (MI) - Italy
The person authorized to compile the technical file is: Massimiliano Sfragara - 37040 Bevilacqua (VR) Italy–Via Roma, 996

Bevilacqua 28/12/2009

Marketing Director
Signature

1. GENERAL WARNINGS

Standards and directives to be followed in the design and manufacture of the unit:

Safety system:
Machine Directive
2006/42/EC
Low voltage directive
LVD 2006/95/EC
Electromagnetic compatibility directive
EMC 2004/108/EC
Pressure containers directive
PED 97/23/CE EN 378, UNI EN 14276
Electrical part:
EN 60204-1
Protection rating
IP24
Acoustic part:
SOUND POWER (EN ISO 9614-2)
SOUND PRESSURE (EN ISO 3744)
Refrigerant GAS:
This unit contains fluorinated greenhouse gases covered by the Kyoto Protocol. Maintenance and disposal operations must be only carried out by qualified staff.
R410A GWP=1900

The AERMEC NRL units are built according to the recognised standards and safety regulations. They have been designed for air conditioning and production of hot water and must be used for this purpose in accordance with their performance characteristics. The company shall not be contractually or non-contractually liable for any damage to people, animals or objects, for failures caused by errors during installation, adjustment and maintenance or incorrect use. All the uses not expressly indicated in this manual are not allowed.

1.1. CONSERVING THE DOCUMENTATION

Deliver the following instructions plus all the complementary documentation to the system user, who shall be responsible for keeping the instructions so that they are always available when needed.
Read carefully this chapter; all the procedures must be carried out by qualified personnel according to the regulations in force in the different countries (M.D. 329/2004).
It must be installed in such a way as to make all maintenance and/or repair operations possible (SEE INSTALLER SECTION page 25).
The warranty of the device does not in any case cover costs owing to ladder trucks, lifts or other lifting systems that may be required in order to carry out the interventions under guarantee.
Do not modify or tamper the with chiller as this may cause dangerous situations and the manufacturer shall not be liable for any damages. The warranty shall not be valid if the indications mentioned above are not observed.

1.2. SAFETY PRECAUTIONS AND INSTALLATION

- The chiller must be installed by an authorised and qualified technician, in compliance with the national legislation in force in the country of destination (MD 329/2004). **Aermec shall not be held responsible for any damage whatsoever resulting from the non-compliance with these instructions.**
- Before starting any kind of work, it is necessary TO READ CAREFULLY THE INSTRUCTIONS, AND TO PERFORM THE SAFETY CHECKS TO AVOID ANY RISKS. All the personnel in charge must know the operations and the risks that may arise when all the unit installation operations begin.

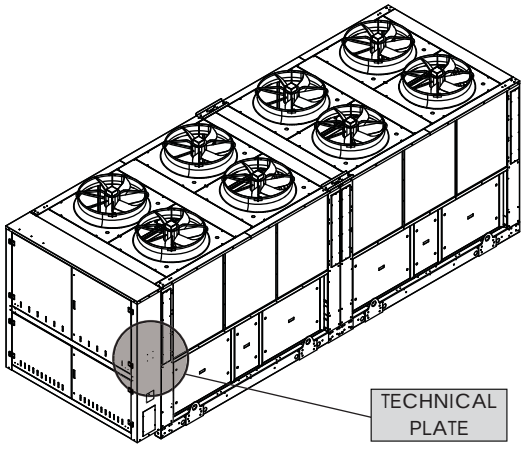
2. PRODUCT IDENTIFICATION

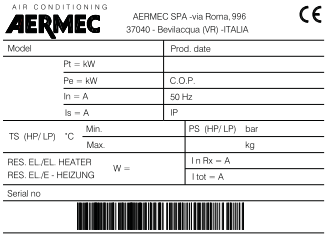
The NRL can be identified by the following:

- PACKING LABEL
  which shows the product identification data
- TECHNICAL PLATE
  Positioned on the right lateral side-member (see fig.1)

⚠ ATTENTION
Tampering, removal and/or a missing identification plate does not allow safe identification of the product and will complicate any installation or maintenance operation.

TECHNICAL PLATE POSITION





⚠ ATTENTION
⚠ Drawings are only an example

Fig.1

3. DESCRIPTION AND CHOICE OF THE UNIT

The **NRL Free-cooling** series appliances are water chillers equipped with an external air cooling capacity recovery system called "free-cooling".
The water free-cooling system consists in integrating and eventually completely replacing the cooling capacity delivered by the compressors through an additional water coil that exploits the low temperature of the external air to cool the system's return water.
Therefore, basically free chilled water can be obtained with this system for all installations where a continuos production is not required and therefore also with low external air temperatures; e.g. industrial processes, shopping centres, hospitals and other civil applications.
Considerable energy saving can be achieved with this type of solution: when the return flow of the system is 2°C below the external air temperature, a three-way valve diverts the water into the free-cooling coil to be pre-cooled, after which it is sent to the evaporator where it is taken to the desired temperature.
The NRL free-cooling units are comprised of two R410A refrigerating circuits and one water circuit that by means of a three-wayvalve can activate the free-cooling water coil positioned in series with the plate evaporator.
The water circuit may or may not be supplied with an accumulator assembly.
Thanks to several scroll type compressors and the fan speed control by means of the speed regulator, the NRL chillers can obtain various cooling capacity levels both in the compressors only mode as well as the free-cooling mode (partial or total).
The electronic adjustment with optimised microprocessor for free-cooling controls and manages all the unit components and operating parameters; an internal memory registers the operating condition as soon as an alarm arises and subsequently displays it.
The units have an IP 24 safety level. All appliances in the various versions are equipped as standard with:
– fan speed control device,
– evaporator antifreeze heating element,
– compressor casing heater,
– remote control panel,
– water filter
– flow switch

OPERATING MODE:

– FREE-COOLING ONLY:
when the external temperature is sufficiently low to allow water cooling inside the free-cooling coils at the desired temperature. This is the most economical mode of the unit with only the fans operating in speed modulation.

– MIXED FREE-COOLING + COMPRESSORS:
the compressors operate in integration with the free-cooling when the cooling capacity recovered from the external air is no longer sufficient for the power required by the system.
The higher the cooling capacity recovery with free-cooling the lower the integration is.

– COMPRESSORS ONLY:
when the external air temperature is greater than the return temperature of the system water.

3.1. VERSIONS AVAILABLE

- **“COOLING ONLY” (A - E)**
- maximum permissible external temperature **46°C**;
- **processed water temperature 18°C;**

The units with desuperheater (D) are not available in the versions:
YD
XD (only for temperature lower than **4°C**)

Danger!
The refrigerant circuit is under steam. High temperatures are also possible. The unit may only be opened by a service technician (SAT) or by an authorised technician. The operations in the cooling circuit can only be performed by a qualified refrigeration technician.

GAS R410A
The chiller is delivered with the correct refrigerant load. The R410A is free of chlorine, it is not flammable and does not harm the ozone layer. However, any interventions are always competence of the technical service assistance (SAT) or an authorised technician.

4. CONFIGURATOR

1, 2, 3	4, 5, 6	7	8	9	10	11	12	13	14	15, 16
NRL	200	0	°	F	°	A	°	°	°	00

field

1, 2, 3 **Code** **NRL**

4, 5, 6 **Size** 200, 225, 250, 280, 300, 330, 360

7 **Compressors**
- **0** Standard compressor

8 **Thermostatic valve**
- **°** Standard mechanical thermostatic valve
- **Y** Mechanical thermostatic valve with produced water from +4°C to -6°C
- **x** Electronic thermostatic valve with produced water up to -6°C

9 **Model**
- **F** Free-cooling

10 **Heat recovery**
- **°** Without recovery units
- **D** Desuperheater

11 **Version**
- **A** High efficiency
- **E** High efficiency, silenced version

12 **Coils**
- **°** Made of aluminium
- **R** Made of copper
- **S** Tinned copper
- **V** Painted aluminium (epoxy paint)

13 **Fans**
- **°** Standard
- **J** Inverter

14 **Fuel feed**
- **°** 400V-3-50Hz with thermomagnetic switches
- **2** 500V-3-50Hz with thermomagnetic switches

15, 16 **Accumulation**
- **00** Without water storage
- **03** Water storage tank and high-head single pump
- **04** Water storage tank, with high-head pump and reserve pump
- **P3** Without water storage tank, with high-head pump
- **P4** Without water storage tank, with high-head pump and reserve pump

5. CHILLER CIRCUIT

Compressors
High efficiency scroll-type hermetic compressors (assembled on elastic anti-vibration supports) driven by a 2-pole electric motor with internal thermal protection of the electric heater casing included as standard.
The heater is automatically powered when the unit stops, provided that the unit is kept under tension.

Air side heat
exchanger
High efficiency device made of copper pipes and aluminium blades locked into place via mechanical pipe expansion.

Water side heat exchanger
Of the plate-type (AISI 316), externally insulated with closed cell material to reduce thermal dispersion. Fitted, as standard, with antifreeze heater.

Filter drier
Of the mechanical cartridge type, made of ceramics and hygroscopic material able to trap impurities and any traces of humidity in the chiller circuit.

Sight glass
For checking the refrigerating gas load and any humidity in the refrigerating circuit.

Thermostatic valve
The mechanical type valve, with outside equaliser on the evaporator outlet, modulates the gas flow to the evaporator on the basis of the thermal load, in such a way as to ensure the proper degree of overheating of the intake gas.

Taps
Present in the liquid and discharge lines, and allow to intercept the refrigerant in case of extraordinary maintenance.

Solenoid valve
The valve closes when the compressor turns off, preventing the flow of refrigerant gas towards the evaporator.

Desuperheater (optional)
(2 per parallel circuit)
Of the plate-type (AISI 316), externally insulated with closed cell material to reduce thermal dispersion.

5.1. FRAME AND FANS

Fan unit
Screw type, statically and dynamically balanced. The electric fans are protected electrically with thermomagnetic switches and mechanically with metal anti-intrusion grilles, in accordance with the standard CEI EN 60335-2-40.

Load-bearing structure
Made of hot-galvanised steel sheet of a suitable thickness, varnished with polyester powders able to resist atmospheric agents over time.

5.2. HYDRAULIC COMPONENTS

Circulation pumps (versions with pump only or with accumulator)
Depending on the characteristics of the pump chosen, it offers a useful head to overcome the pressure drops in the system. There is also the possibility to have a reserve pump.
The reserve pump is managed by the electronic card.

3-way valve
This is an electric servo-controlled ON-OFF diverting valve on the water side of the freecooling circuit controlled.

Flow switch 1 per circuit (installed as standard)
Controls that the water is circulating, otherwise the unit blocks.

Water filter (installed as standard)
Allows you to block and eliminate any impurities in the hydraulic circuits. Inside, it has a filtering mesh with holes not greater than one millimetre. It is essential for avoiding serious damage to the plate-type exchanger.

Drain valve 1 per circuit (installato di serie)
Of the automatic type, assembled on the upper part of the hydraulic system; it releases any air bubbles that may be present in the system.

Storage tank
In stainless steel, with a 700-litre capacity. In order to reduce the thermal dispersion and eliminate the phenomenon of the formation of condensation, it is insulated with polyurethane material of a suitable thickness.
One antifreeze electric heater of 300W (down to -20°C outside temperature and tank water temperature 5°C) assembled as standard and commanded from the card via an antifreeze sensor inserted in the tank.

Expansion tank 2 per circuit (2x25 Lt)
Of the membrane type, with nitrogen precharge.

Hydraulic circuit safety valve 1 per circuit
Calibrated to 6 bar and with ductable discharge, it releases overpressure in the event of abnormal working pressure levels.

5.3. SAFETY AND CONTROL COMPONENTS

High pressure switch (AP) (installed as standard)
With fixed calibration, placed on the high pressure side of the chiller circuit, it shuts down compressor operation in the case of abnormal operating pressure.

Low pressure transducer (BP) - (TP2) (installed as standard)
Of fixed calibration, located on the low pressure side of the refrigerating circuit, it stops the operation of the compressor in the event of anomalous work pressures.

High pressure transducer - (TP3) (installed as standard)
Placed on the high pressure side of the chiller circuit, it communicates to the control card the operating pressure, sending a prealarm in case of abnormal pressure.

Evaporator antifreeze heating element
Its operation is commanded by the antifreeze probe located in the plate-type evaporator. It is activated when the water temperature is +3°C, and deactivated when the water temperature is +5°C. The dedicated software in the regulation card manages the heater.

Refrigerating circuit safety valve
This intervenes by releasing overpressure in the event of abnormal working pressure levels.
- Calibrated at 45 bar on the HP branch

5.4. ELECTRICAL COMPONENTS

ELECTRICAL PANEL
Contains the power section and the management of the controls and safety devices.
In accordance with standards:
CEI EN 61000-6-1
CEI EN 61000-6-2
CEI EN 61000-6-4 (immunity and electromagnetic emissions for the industrial sector).
and Directives EMC 89/336/EEC and 92/31/EEC concerning electromagnetic compatibility, Low Voltage Directive LVD 2006/95/EC.

DOOR LOCK KNIFE SWITCH
IT is possible to access the electrical panel by disconnecting the voltage, then using the opening lever of the panel itself. This lever can be blocked with one or more padlocks during maintenance, in order to prevent the machine being powered up accidentally.

CONTROL KEYPAD
Provides full control functions. For a detailed description refer to the user manual.

Remote control panel (PR3)
This allows the chiller command operations to be given from a distance.

Compressor protection thermomagnetic switch;
Fan protection thermomagnetic switch;
Auxiliary protection thermomagnetic switch;
Discharge gas temperature control thermostat.

ELECTRONIC REGULATION MICROPROCESSOR CARD
Consisting of a management/control card and a visualisation card.
- Functions carried out:
  - adjustment of water temperature at evaporator inlet, with thermostat control for up to 4 levels and integral-proportional fan speed control (with DCPX accessory);
  - compressor start-up delay;
  - compressor sequence rotation;

- count of compressor work hours;
- start/stop;
- reset;
- permanent alarms memory;
- autostart after voltage drop;
- multi-lingual messages;
- operation with local or remote control.

• Machine status display:
- ON/OFF compressors;
- alarms summary.

• Alarm management:
- high pressure;
- flow switch;
- low pressure;
- anti-freeze;
- compressor overload;
- fan overload;
- pump overload.

• Display of the following parameters:
- water inlet temperature;
- accumulator temperature;
- water outlet temperature;
- delta T;
- high pressure;
- low pressure;
- waiting time for restart;
- alarms visualisation.

• Settings:
a) without password:
cooling set;
total differential.
b) with password:
antifreeze set;
low pressure exclusion time;
display language;
access code.

For further information, refer to the user manual.

6. ACCESSORIES

	200	225	250	280	300	330	360
AER485P1		Through this accessory it is possible to connect the unit with BMS supervision systems with electrical standard RS 485 and MODBUS type protocol.					
A	•	•	•	•	•	•	•
E	•	•	•	•	•	•	•
AVX (00)		Sprung anti-vibration supports. Select the model using the compatibility table.					
A E	770	776	782	788	794	801	801
AVX (03-04)		Sprung anti-vibration supports. Select the model using the compatibility table.					
A E	771	777	783	789	795	802	802
AVX (P3-P4)		Sprung anti-vibration supports. Select the model using the compatibility table.					
A E	772	778	784	790	796	803	803
GP		Protect the external coils from accidental knocks.					
A E	260x2	260 350	350x2	350x2	350x2	500x2	500x2
PGS		Card to be inserted in the electronic card of the unit. Allows you to programme two time bands per day (two switch on/off cycles) and to have differentiated programming for each day of the week.					
A	•	•	•	•	•	•	•
E	•	•	•	•	•	•	•
AERWEB30		AERWEB30: the AERWEB device allows the remote control of a chiller from a common PC, using a serial connection. Using additional modules, the device allows the chiller to be controlled via the telephone line, using the AERMODEM accessory, or via the GSM network, using the AERMODEM GSM accessory. AERWEB can pilot up to 9 chillers, but each of these must be equipped with accessory AER485 or AER485P2.					
A	•	•	•	•	•	•	•
E	•	•	•	•	•	•	•
RIF		Current rephaser. Parallel connection with the motor makes the reduction of input current possible. It can only be installed when the machine is being made and must therefore be specified when the order is placed.					
A E	RIFNRL2000	RIFNRL2250	RIFNRL2500	RIFNRL2800	RIFNRL3000	RIFNRL3300	RIFNRL3600
TRX1		The water accumulators with holes and supplementary electric heaters leave the factory with plastic protection caps. Before loading the system, if the installation of an electric heater is not envisaged it is compulsory to replace the plastic caps with the special TRX1.					
A	•	•	•	•	•	•	•
E	•	•	•	•	•	•	•
PRM 1		FACTORY-ASSEMBLED ACCESSORY. Pressure switch with manual reset (using a tool), electrically connected in series to the high pressure switch on the compressor delivery pipe.					
A	•	-	-	-	-	-	-
E	•	-	-	-	-	-	-
PRM 2		FACTORY-ASSEMBLED ACCESSORY. Pressure switch with manual reset (using a tool), electrically connected in series to the high pressure switch on the compressor delivery pipe.					
A	-	•	•	•	•	•	•
E	-	•	•	•	•	•	•

7. TECHNICAL DATA

7.1. CHILLER FUNCTION TECHNICAL DATA

COOLING			2000	2250	2500	2800	3000	3300	3600
Cooling output	kW	A	494	557	620	674	728	860	904
		E	456	517	578	620	662	800	842
Total input power	kW	A	206	217	228	272	314	318	350
		E	218	229	240	290	338	338	372
Water flow rate	l/h	A	84970	95800	106640	115930	125220	147920	155490
		E	78430	88920	99420	106640	113860	137600	144820
Total pressure drops	kPa	A	81	92	92	98	83	104	107
		E	69	80	80	84	70	90	93
Energy indices									
EER	W/W	A	2.40	2.57	2.72	2.48	2.32	2.70	2.58
		E	2.09	2.26	2.41	2.14	1.96	2.37	2.26
ELECTRICAL DATA									
Fuel feed	A	A	400V - 3 - 50 Hz						
		E							
Input current	A	A	389	403	417	504	592	597	634
		E	407	421	435	529	624	621	665
Maximum current	A	A	442	495	548	606	664	747	813
		E							
Peak current	A	A	651	763	816	815	873	1015	1081
		E							
COMPRESSORS (SCROLL)									
Number/Circuit	no./no.	A	8/4	8/4	8/4	10/4	12/4	12/4	12/4
		E							
FANS (AXIAL)									
Quantity	no.	A	8	10	12	12	12	16	16
		E							
Air flow rate	m³/h	A	156000	193200	230400	228000	225600	310400	307200
		E	111600	136400	161200	159600	161400	217200	219600
Input power	kW	A	13.9	17.4	20.9	20.9	20.9	27.9	27.9
		E	10.5	13.1	15.7	15.7	15.7	20.9	20.9
Input current	A	A	29.6	37	44.4	44.4	44.4	59.2	59.2
		E	22.2	27.75	33.3	33.3	33.3	44.4	44.4
INVERTER FANS									
Quantity	no.	A	8	10	12	12	12	16	16
		E							
Input power	kW	A	13.9	17.4	20.9	20.9	20.9	27.9	27.9
		E	-	-	-	-	-	-	-
Input current	A	A	29.6	37	44.4	44.4	44.4	59.2	59.2
		E	-	-	-	-	-	-	
Available head [1]	A	A	46	47	46	45	44	46	46
		E	-	-	-	-	-	-	-
EVAPORATORS (PLATES)									
Quantity	no.	A	2	2	2	2	2	2	2
		E							
Water connections (in/out) [*]	diam	A	3"	3"/4"*	4"	4"	4"	4"	4"
		E							
Useful head	kPa	A	204	242	242	223	224	192	182
		E	-	-	-	-	-	-	-
HYDRAULIC CIRCUIT									
Accumulator capacity	No./l	A	2 x 700						
		E							
Accumulator antifreeze heater	n°/W	A	2 x 300						
		E							
Expansion tank capacity	No./l	A	4 x 25						
		E							

[*] The water connections are all of the Victaulic type
*** For the 2250 version, 3" connectors are foreseen for the 1000 model and 4" for the 1250 model**
[1] The useful heads refer to the nominal air flow rate

			2000	2250	2500	2800	3000	3300	3600
HIGH-HEAD CIRCULATION PUMP									
Input power	KW	A	13.0	6.5+8.6	17.2	17.2	17.2	24.7	24.7
		E							
Input current	A	A	22.0	11+14.6	29.2	29.2	29.2	42.4	42.4
		E							
Useful head	kPa	A	204	242	242	223	224	192	182
		E	223	262	262	250	255	214	206
SOUND DATA									
Sound power (1)	dBA	A	91.5	93.5	94.5	94	93.5	95	97
		E	85.5	87.5	88.5	88.0	87.5	89.0	91.0
Sound pressure (2)	dBA	A	59.5	61.5	62.5	62	61.5	63	65
		E	53.5	55.5	56.5	56	55.5	57	59
DIMENSIONS									
Height	mm	A	2450	2450	2450	2450	2450	2450	2450
		E							
Width	mm	A	2200	2200	2200	2200	2200	2200	2200
		E							
Depth	mm	A	6400	7250	8100	8100	8100	11100	11100
		E							
Weight when empty	kg	A	5670	6190	6700	7120	7580	9060	9330
		E							

NOMINAL REFERENCE CONDITIONS

COOLING MODE
- Inlet water temperature 12°C
- Outlet water temperature 7°C
- Outside air temperature 35°C
- Δt 5°C

(1) SOUND POWER
Aermec determines the sound power value on the basis of measurements taken in accordance with standard 9614-2.

(2) SOUND PRESSURE
Sound pressure in an unrestricted range on a reflective plane (directional fact. Q=2), 10m away from the unit external surface, complying with ISO 3744.

7.2. FREE COOLING FUNCTION TECHNICAL DATA

COOLING			2000	2250	2500	2800	3000	3300	3600
Cooling output	kW	A	458	486	514	582	652	798	880
		E	446	486	526	576	627	792	887
Total input power	kW	A	15	19	22	22	22	29	29
		E							
Water flow rate	l/h	A	85115	95903	106691	115871	125052	147870	155459
		E	78413	88871	99330	106518	113706	137540	144658
Total pressure drops	kPa	A	110	123	123	131	117	140	145
		E	94	107	107	111	97	122	126
ENERGY INDICES									
EER	W/W	A	30.53	25.58	23.36	26.45	29.64	27.52	30.34
		E	29.73	25.58	23.91	26.18	28.50	27.31	30.59
ELECTRICAL DATA									
Fuel feed	A	A	400V-3-50Hz						
		E							
Input current	A	A	30	37	44	44	44	59	59
		E							
Maximum current	A	A	442	495	548	606	664	747	813
		E							
Peak current	A	A	651	763	816	815	873	1015	1081
		E							
COMPRESSORS (SCROLL)									
Number/Circuit	no./ no.	A	8/4	8/4	8/4	10/4	12/4	12/4	12/4
		E							
FANS (AXIAL)									
Quantity	no.	A	8	10	12	12	12	16	16
		E							
Air flow rate	m³/h	A	156000	193200	230400	228000	225600	310400	307200
		E	111600	136400	161200	159600	161400	217200	219600
Input power	kW	A	13.9	17.4	20.9	20.9	20.9	27.9	27.9
		E	10.5	13.1	15.7	15.7	15.7	20.9	20.9
Input current	A	A	29.6	37	44.4	44.4	44.4	59.2	59.2
		E	22.2	27.75	33.3	33.3	33.3	44.4	44.4
INVERTER FANS									
Quantity	no.	A	8	10	12	12	12	16	16
		E							
Input power	kW	A	13.9	17.4	20.9	20.9	20.9	27.9	27.9
		E	-	-	-	-	-	-	-
Input current	A	A	29.6	37	44.4	44.4	44.4	59.2	59.2
		E	-	-	-	-	-	-	
Available head **[1]**	A	A	46	47	46	45	44	46	46
		E	-	-	-	-	-	-	-
EVAPORATORS (PLATES)									
Quantity	no.	A	2	2	2	2	2	2	2
		E							
Water connections (in/out) [*]	diam	A	3"	3"/4"	4"	4"	4"	4"	4"
		E							
HYDRAULIC CIRCUIT									
Accumulator capacity	No./l	A	2 X 700						
		E							
Accumulator antifreeze heater	n°/W	A	2 x 300						
		E							
Expansion tank capacity	No./l	A	4 x 25						
		E							

*** The water connections are all of the Victaulic type**
*** For the 2250 version, 3" connectors are foreseen for the 1000 model and 4" for the 1250 model**
[1] The useful heads refer to the nominal air flow rate

			2000	2250	2500	2800	3000	3300	3600
HIGH-HEAD CIRCULATION PUMP									
Input power	KW	A	13.0	6.5+8.6	17.2	17.2	17.2	24.7	24.7
		E							
Input current	A	A	18.0	9+13.2	26.4	26.4	26.4	33.6	33.6
		E							
Useful head	kPa	A	177	214	214	195	195	165	155
		E	199	239	239	226	231	191	182
SOUND DATA									
Sound power (1)	dBA	A	91.5	93.5	94.5	94	93.5	95	97
		E	85.5	87.3	88.5	88.0	87.5	89.0	91.0
Sound pressure (2)	dBA	A	59.5	61.5	62.5	62	61.5	63	65
		E	53.5	55.3	56.5	56.0	55.5	57.0	59.0
DIMENSIONS									
Height	mm	A	2450	2450	2450	2450	2450	2450	2450
		E							
Width	mm	A	2200	2200	2200	2200	2200	2200	2200
		E							
Depth	mm	A	6400	7250	8100	8100	8100	11100	11100
		E							
Weight when empty	kg	A	5670	6190	6700	7120	7580	9060	9330
		E							

NOMINAL REFERENCE CONDITIONS FC

COOLING MODE
- Inlet water temperature 15°C
- Outside air temperature 2°C
- Nominal water flow rate
- Compressors OFF

(1) SOUND POWER
Aermec determines the sound power value on the basis of measurements taken in accordance with standard 9614-2.

(2) SOUND PRESSURE
Sound pressure in an unrestricted range on a reflective plane (directional fact. Q=2), 10m away from the unit external surface, complying with ISO 3744.

7.3. Technical data **Desuperheater**

DESUPERHEATER	U.M.	2000	2250	2500	2800	3000	3300	3600
Total recovered heating capacity	kW	191	206	221	253	285	310	335
Water flow rate	l/h	32800	35470	38140	43600	49040	53360	57680
Pressure drop	kPa	29.1		38	48.2	59.7	70.6	82.3

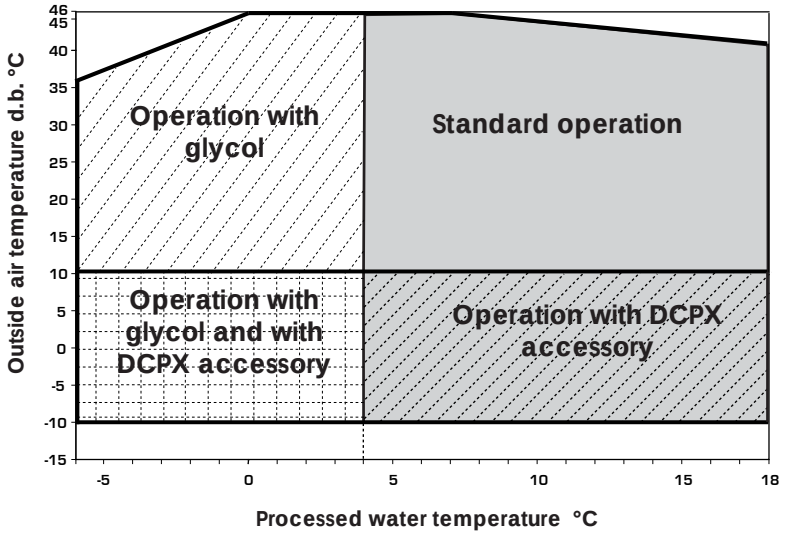
8. OPERATING LIMITS

The devices in their standard configurations are not suitable for installation in salty environments.
For the operating limits, refer to diagram 6.1, valid for Δt = 5°C.

⚠ ***ATTENTION***
Contact our technical sales department if the unit needs to operated outside the operating limits

Wind breaks should be implemented if the unit is installed in particularly windy areas, to prevent a malfunction of the DCPX

8.1. COOLING MODE



8.2. DESIGN SPECIFICATIONS

COOLING	U.M.	Side High pressure	Side Low pressure
Maximum allowable pressure	bar	42	25
Maximum allowable temperature	°C	120	52
Minimum allowable temperature	°C	-16	-16

9. CORRECTION FACTORS

9.1. INPUT POWER AND COOLING CAPACITY "HIGH EFFICIENCY VERSION"

The refrigerating capacity yielded and the input electrical capacity in conditions other than rated conditions are obtained by multiplying the rated values (Pf, Pa) by the respective correction coefficients (Cf, Ca).
The following diagrams allow you to obtain the correction coefficients to be used for the various versions of the devices, in cold mode; next to each curve you can see the outside air temperature to which it refers.

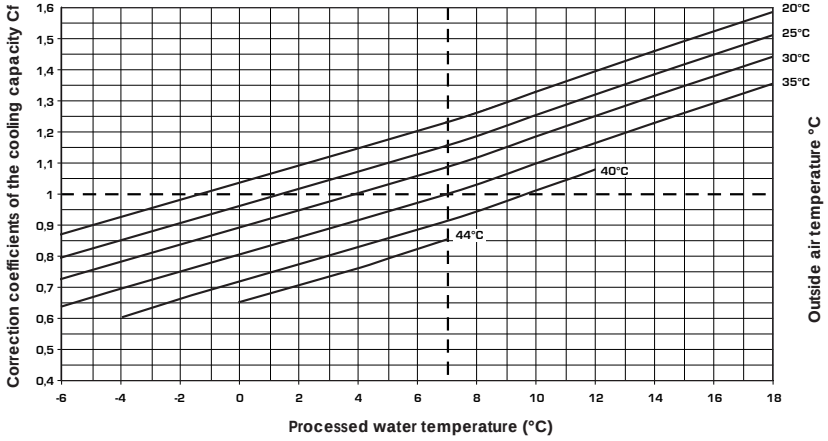
KEY

Cf: correction coefficient of the cooling capacity.

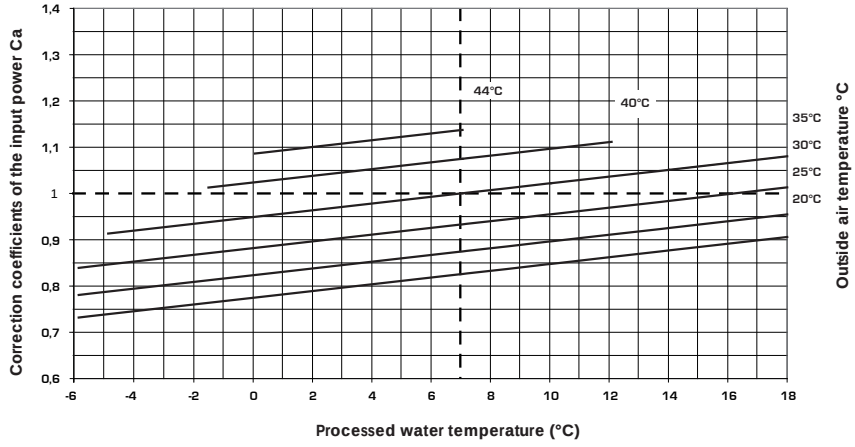
Ca: correction coefficient of the input power.

⚠ ***ATTENTION***
FOR Δt DIFFERENT FROM 5°C
Tab. 9.2.1. is used for the correction factors of the cooling capacity and input power of the water consumption. To take into account the soiling of the exchanger, apply the relative fouling factors, Tab. 9.3.1.

CORRECTION COEFFICIENTS OF THE COOLING CAPACITY



CORRECTION COEFFICIENTS OF THE INPUT POWER IN COOLING MODE



9.2. FOR Δt DIFFERENT FROM THE RATED VALUE

The performances given by the technical data refer to Δt 5°C.
Use table 7.2.1 to obtain the corrective factors of the cooling capacity and input power different than Δt 5°C.

9.2.1. Δt different from the rated value

Δt different from the rated value	3	5	8	10
Cooling capacity correction factors	0.99	1	1.02	1.03
Cooling capacity correction factors	0.99	1	1.01	1.02

9.3. FOULING FACTORS

The performance levels given by the technical data refer to conditions with clean tubes, with a fouling factor = 1.
For other fouling factor values, multiply the data of performance table 7.3.1. by the coefficients given.

9.3.1. Fouling factor [K*m²]/[W]

Fouling factor [K*m²]/[W]	0.00005	0.0001	0.0002
Cooling capacity correction factors	1	0.98	094
Cooling capacity correction factors	1	0.98	0.95

10. TOTAL PRESSURE DROPS

The pressure drops include:

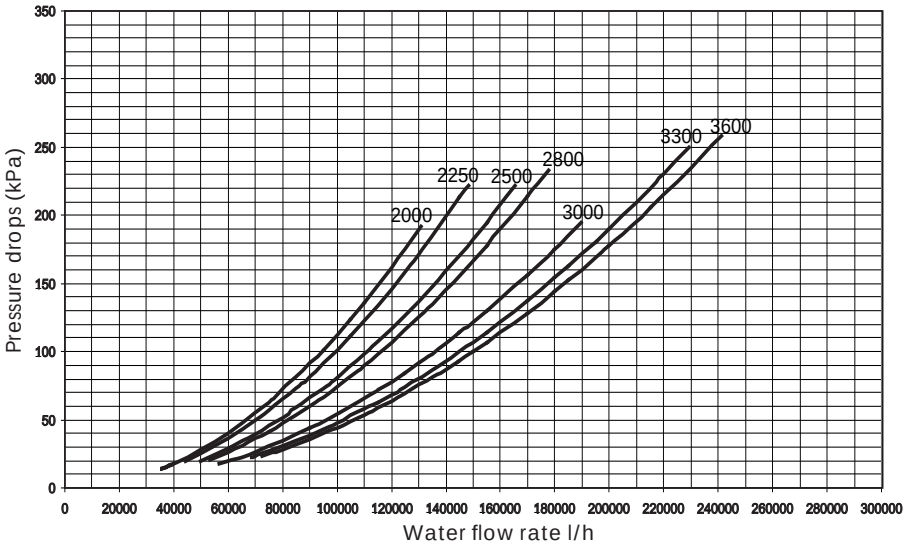
- *EVAPORATORS*
- WATER FILTERS
- HYDRAULIC CIRCUITS

The diagram pressure drops are related to an average water temperature of 10 °C. The following table shows the correction to apply to the pressure drops when the average water temperature varies

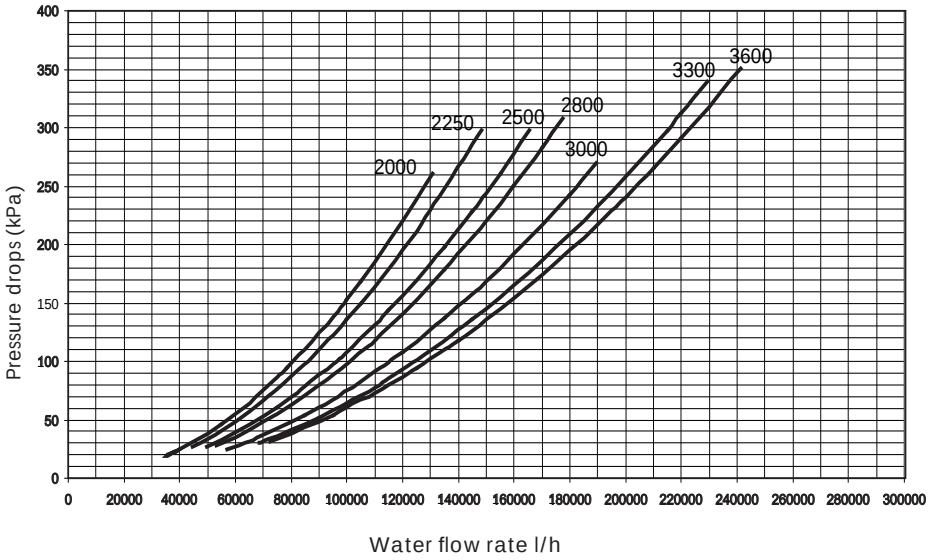
The chiller comprises two hydraulic circuits
The pressure drops indicated in the graphics are relative to a single circuit **SINCE THE HYDRAULIC PARALLEL IS IN CHARGE OF THE CUSTOMER OR THE OR THE PERSON IN CHARGE.**

⚠ ***ATTENTION***
The water outlet probe (WOP) with its trap is free, near the electrical box, remember to insert it in the collector of the outlet hydraulic parallel, using a sleeve of ½ inch.

Chiller function pressure drop



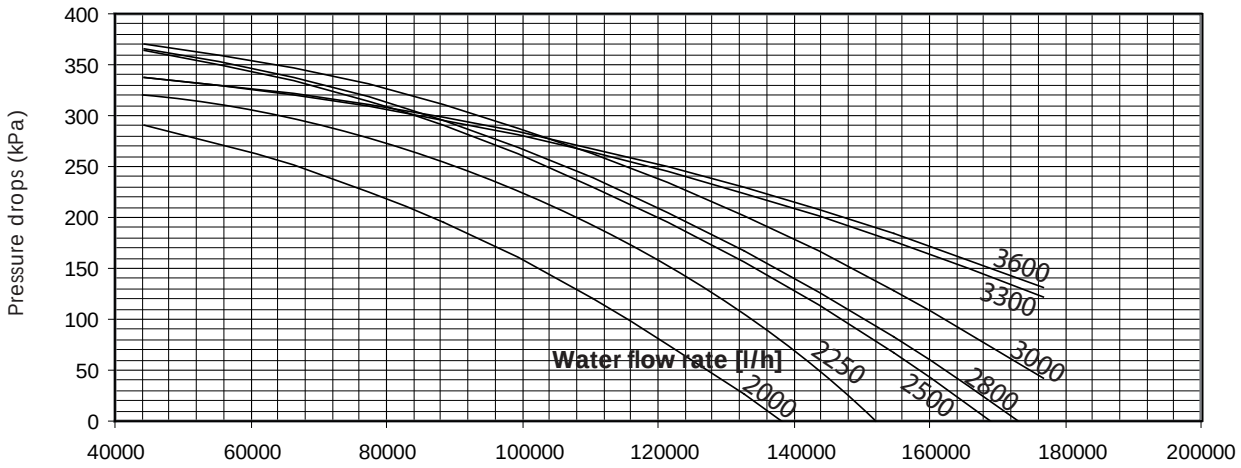
Free-cooling function pressure drop



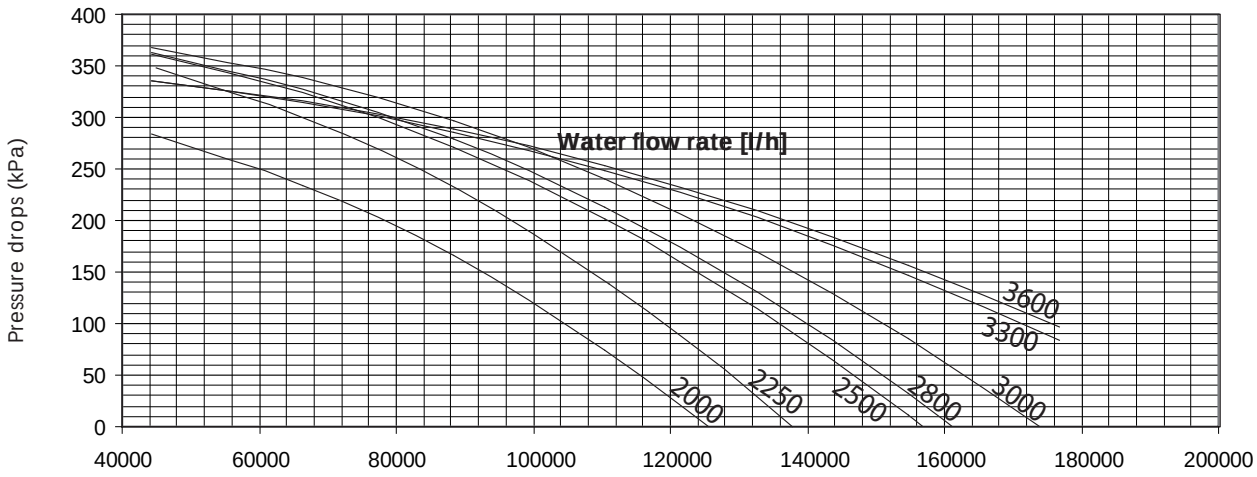
Average water temperature [°C]	5	10	15	20	30	40	50
Multiplicational coefficient	1.02	1	0.985	0.97	0.95	0.93	0.91

11. USEFUL HEADS

NRL chiller function useful head



NRL free-cooling function useful heads



12. GLYCOL

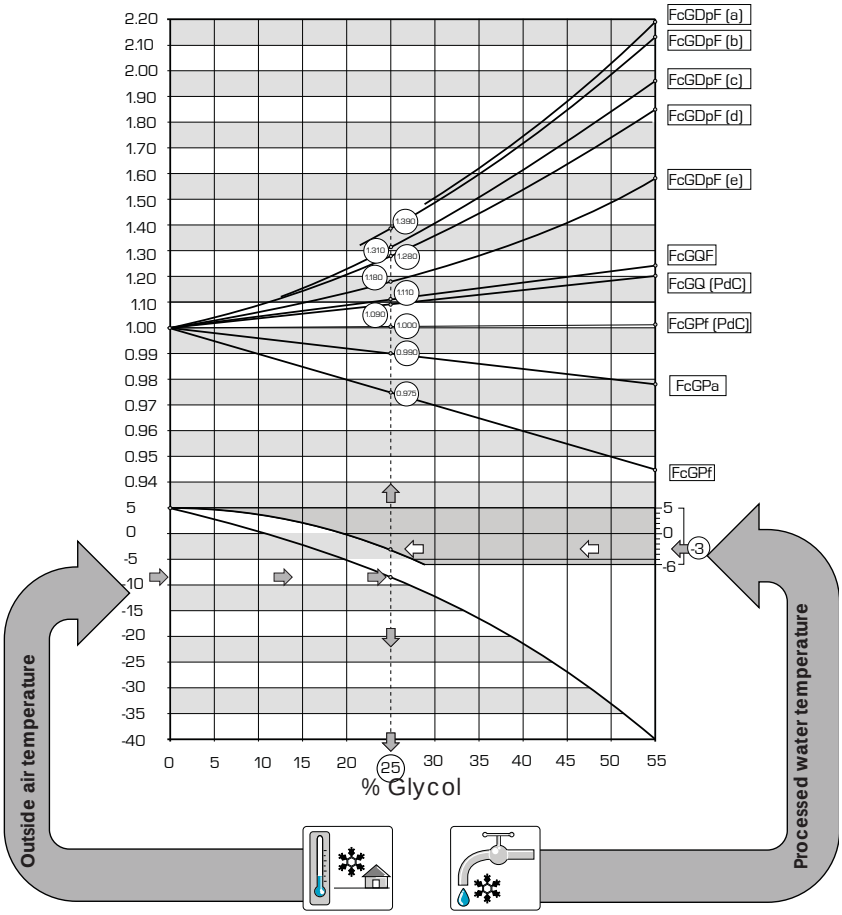
- The cooling capacity and input power correction factors make allowance for the presence of glycol and the different evaporation temperature.
- The pressure drop correction factor already takes account of the different flow rate deriving from the application of the water flow rate correction factor.
- The correction factor of the water flow rate is calculated so as to maintain the same Δt that would be used in the absence of glycol.

NOTE
To make it easier to read the following graph, an example is given.
By using the diagram below it possible to establish the percentage of glycol necessary; this percentage can be calculated taking into account one of the following factors:
On the basis of the fluid considered (water or air), it will be necessary to enter the graph from the right or left side, from the intersection of the outside air temperature or processed water temperature straight lines and the relative curves, a point is obtained through which the vertical line that will identify both the percentage of glycol and the relative correction coefficients will have to pass.

12.1. HOW TO READ THE GLYCOL CURVES

The curves shown in the figure summarise a notable quantity of data, each of which is represented by a specific curve. In order to use these curves correctly, it is necessary to make some initial considerations:

- If you want to calculate the percentage of glycol on the basis of the outside air temperature, you must enter from the left-hand axis and, once you have intersected the curve, trace a vertical line which, in turn, will intercept all the other curves; the points obtained from the upper curves represent the coefficients for the correction of the cooling capacity and input power, for the flow rates and the pressure drops (remember that these coefficients must anyway be multiplied by the nominal value of the sizes examined); the lower axis advises the percentage of glycol necessary on the basis of the outside air temperature considered.
- If you want to calculate the percentage of glycol on the basis of the temperature of the processed water, you must enter from the right-hand axis and, once you have intersected the curve, trace a vertical line which, in turn, will intercept all the other curves; the points obtained from the upper curves represent the coefficients for the cooling capacity and input power, for the flow rates and the pressure drops (remember that these coefficients must anyway be multiplied by the nominal value of the sizes examined); the lower axis advises the percentage of glycol necessary to produce water at the required temperature.
- REMEMBER THAT THE INITIAL SIZES "Outside air temperature" AND "Processed water temperature", are not directly linked to each other, so it is not possible to enter the curve of one of these sizes, and obtain the corresponding point on the other curve.



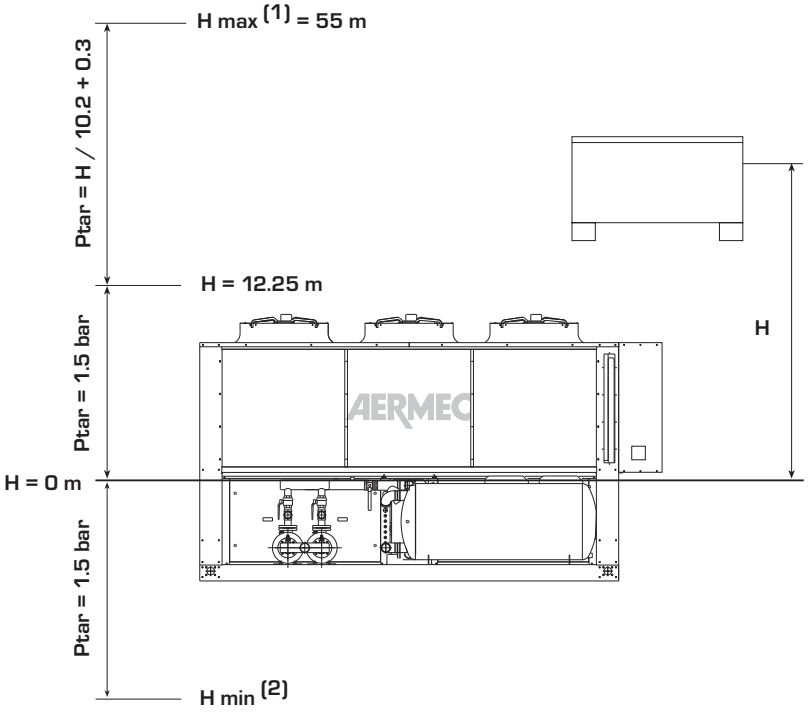
KEY:

FcGPf	Correction factor of the cooling capacity
FcGPa	Correction factor of the input power
FcGDpF (a)	Correction factor of the pressure drops (evaporator) (average temp. = -3.5°C)
FcGDpF (b)	Correction factor of the pressure drops (average temp. = 0.5°C)
FcGDpF (c)	Correction factor of the pressure drops (average temp. = 5.5°C)
FcGDpF (d)	Correction factor of the pressure drops (average temp. = 9.5°C)
FcGDpF (e)	Correction factor of the pressure drops (average temp. = 47.5°C)
FcGQF	Correction factor of the outputs (evaporator) (average temp. = 9.5°C)
FcGQC	Correction factor of the outputs (condenser) (average temp. = 47.5°C)

NB:
Although the graph reaches outside air temperatures of -40°C, it is necessary to maintain the machine's operating limits as reference.

13. EXPANSION TANK CALIBRATION

The standard pressure value for pre-charging the expansion tank is 1.5 bar, and the volume is 25 litres. Maximum value 6 bar.
The tank must be calibrated according to the maximum difference in height (H) of the device (see figure) according to the formula:
p (calibration) [bar] = H [m] / 10.2 + 0.3.
For example, if the level difference H is 20m, the calibration value of the tank will be 2.3 bar.
If the calibration value obtained from the calculation is lower than 1.5 bar (i.e. for H < 12.25), maintain the standard calibration.



Key:
[1] Check that the highest user does not exceed a level difference of 55 metres.
[2] Check that the lowest user can sustain the global pressure acting at that point

Hydraulic height	H m	30	25	20	15	≥ 12.25
Expansion tank calibration	bar	3.2	2.8	2.3	1.8	1.5
Water content reference value	l (1)	2.174	2.646	3.118	3590	3852
Water content reference value	l (2)	978	1190	1404	1616	1732
Water content reference value	l (3)	510	622	732	844	904

Working reference conditions:
(1) Cooling: Max. water temp. = 40°C, Min. water temp. = 4°C.
(2) Heating (heat pump): Max. water temp. = 60°C, Min. water temp. = 4°C.
(3) Heating (boiler): Max. water temp. = 85°C, Min. water temp. = 4°C.

14. MINIMUM WATER CONTENT

NRL	U.M.	VERS.	2000	2250	2500	2800	3000	3300	3600
Compressor - quantity	n°	All				10	12		
Minimum water content	l/kW(1)		4						
	l/kW(2)		8						

15. DESUPERHEATER

The heating capacity that can be obtained from the desuperheater is obtained by multiplying the nominal value (Pd) shown in table 11.1.1 by a suitable coefficient (Cd).
The diagrams will give you the correction coefficients to be used for the chillers in the various versions; next to each curve you can see the outside air temperature to which it refers.

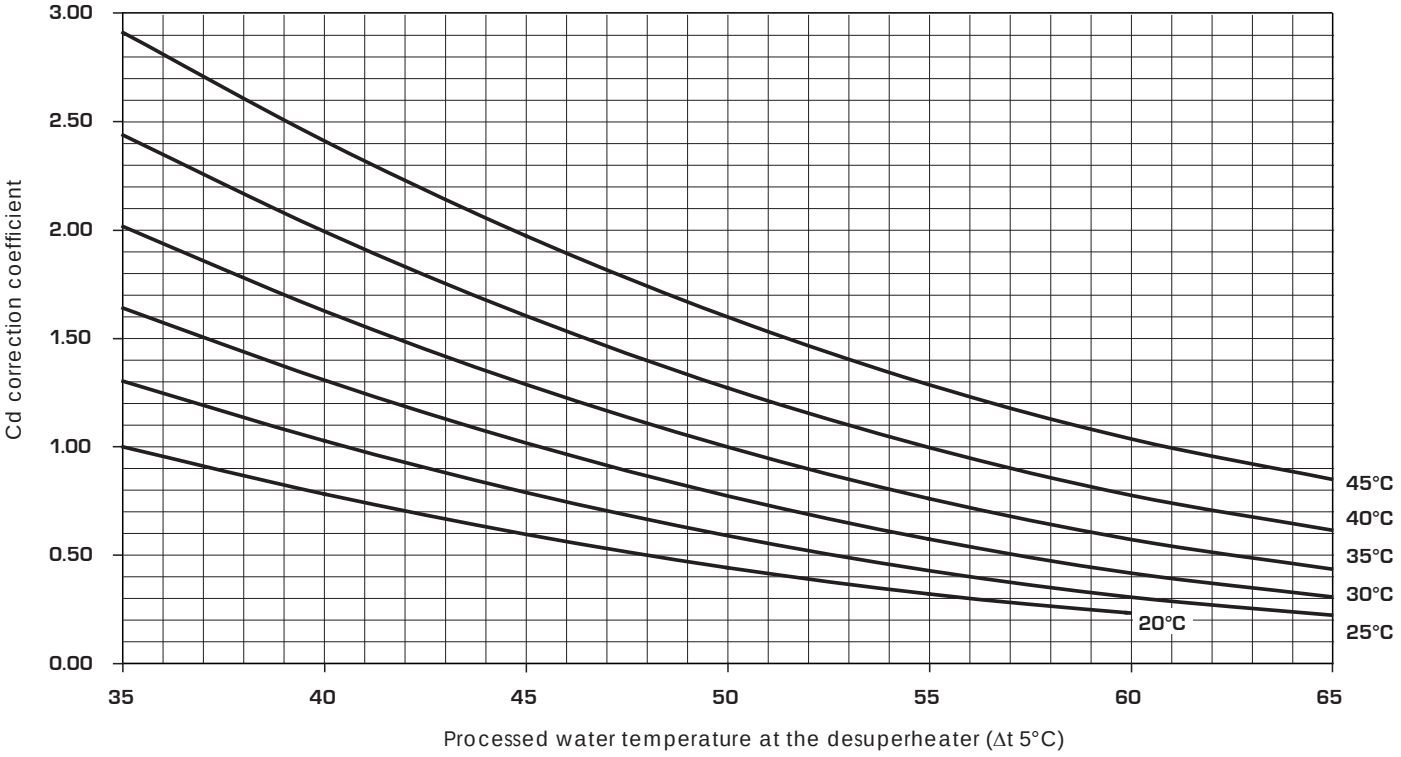
15.1. PRESSURE DROPS

The NRL has 2 parallel desuperheaters, for circuits without filters.

N.B.:
the characteristics of the desuperheaters and the pressure drop curves are shown below.
For processed water temperatures different from 50°C, the result obtained is multiplied by the correction factor that can be obtained from Table 11.1.1.

The nominal value refers to:
air temperature ..... 35°C
water at the desuperheater..... 45/50°C
Δt ..... 5°C

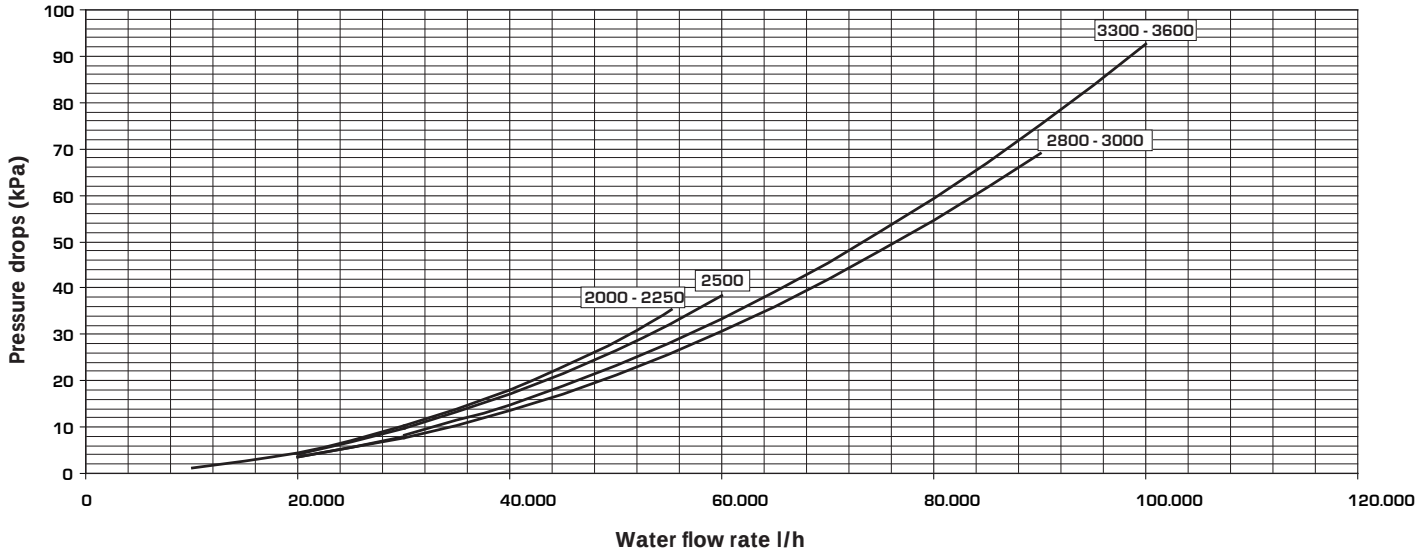
DESUPERHEATER CORRECTION COEFFICIENTS



15.1.1. Corrective factors for water temperatures different than the nominal water temperature

Average water temperature °C	30	40	50	60	70
Multiplication coefficient	1.04	1.02	1	0.98	0.96

15.2. DESUPERHEATER PRESSURE DROP OF HYDRAULIC CIRCUIT 2



16. SOUND DATA

Sound power
Aermec determines the sound power value on the basis of measurements taken in accordance with standard 9614-2.

Sound pressure
Sound pressure in free field, on a reflecting plane (directional factor Q=2), in accordance with standard ISO 3744.

⚠ ***ATTENTION***
The data refer to the version with standard fans.

NRL FC	Total sound levels			Octave band[Hz]						
	Pow. dB(A)	Pressure		125	250	500	1000	2000	4000	8000
		dB(A) 10m	dB(A) 1m	Sound power by central band frequency [dB]						
NRL2000A	92.0	60.0	74.0	101.0	90.0	87.8	85.9	82.1	78.1	70.0
NRL2250A	93.0	61.0	75.0	101.7	94.4	89.4	87.4	83.9	78.6	69.2
NRL2500A	94.5	62.5	76.5	102.2	96.5	90.5	88.5	85.2	79.0	68.2
NRL2800A	94.0	62.0	76.0	104.0	93.0	89.0	90.0	82.0	74.0	67.0
NRL3000A	93.5	61.5	75.5	105.0	92.0	89.0	88.0	82.0	74.5	68.0
NRL3300A	95.0	63.0	77.0	104.0	95.5	91.5	90.0	84.0	76.0	69.0
NRL3600A	97.0	65.0	79.0	105.0	98.0	93.5	92.5	85.0	76.0	70.0

17. CONTROL AND SAFETY PARAMETERS CALIBRATION

CHECK PARAMETERS			
Cold Setting	Water inlet temperature in cooling mode	**MIN.**	-10°C
		MAX.	20°C
		DEFAULT	7.0°C
heating Setting	Water inlet temperature in heat mode	**MIN.**	30°C
		MAX.	50°C
		DEFAULT	50°C
Anti-freeze intervention	Anti-freeze alarm intervention temperature on EV side (water output temperature).	**MIN.**	-15°C
		MAX.	4°C
		DEFAULT	3°C
Total differential	Proportional temperature band within which the compressors are activated and deactivated	**MIN.**	3°C
		MAX.	10°C
		DEFAULT	5°C
Autostart	auto		

NRL	2000		2250		2500	
COMPRESSOR THERMOMAGNETIC SWITCHES 400V	**CIRCUIT 1°**	**CIRCUIT 2°**	**CIRCUIT 1°**	**CIRCUIT 2°**	**CIRCUIT 1°**	**CIRCUIT 2°**
MTC1	51A	51A	51A	62A	62A	62A
mtc1a	51A	51A	51A	62A	62A	62A
mtc1b	\	\	\	\	\	\
mtc2	51A	51A	51A	62A	62A	62A
mtc2a	51A	51A	51A	62A	62A	62A
mtc2b	\	\	\	\	\	\
HIGH PRESSURE SWITCH WITH MANUAL RESET						
PA (bar)	40		40		40	
High pressure transducer						
TAP (bar)	50		50		50	
LOW PRESSURE TRANSDUCER						
TBP (bar)	30		30		30	
CHILLER CIRCUIT SAFETY VALVE						
AP (bar)	45		45		45	
BP (bar) only in heat pump	30		30		30	
FAN THERMOMAGNETIC SWITCHES [°] The calibration is carried out on a thermomagnetic switch (single ventilation line)						
A-E fans	9A	9A	9A	13A	13A	13A
NUMBER OF FANS						
No. A-E fans	4	4	4	6	6	6

NRL	2800		3000	
COMPRESSOR THERMOMAGNETIC SWITCHES 400V	**CIRCUIT 1°**	**CIRCUIT 2°**	**CIRCUIT 1°**	**CIRCUIT 2°**
MTC1	62A	62A	51A	51A
MTC1A	62A	62A	51A	51A
MTC1B	\	\	51A	51A
MTC2	51A	51A	51A	51A
MTC2A	51A	51A	51A	51A
MTC2B	51A	51A	51A	51A
HIGH PRESSURE SWITCH WITH MANUAL RESET				
PA (bar)	40		40	
High pressure transducer				
TAP (bar)	50		50	
LOW PRESSURE TRANSDUCER				
TBP (bar)	30		30	
CHILLER CIRCUIT SAFETY VALVE				
AP (bar)	45		45	
BP (bar) only in heat pump	30		30	
FAN THERMOMAGNETIC SWITCHES [°] The calibration is carried out on a thermomagnetic switch (single ventilation line)				
A-E fans	13A	13A	13A	13A
NUMBER OF FANS				
No. A-E fans	6	6	6	6

NRL	3300		3600	
COMPRESSOR THERMOMAGNETIC SWITCHES 400V	**CIRCUIT 1°**	**CIRCUIT 2°**	**CIRCUIT 1°**	**CIRCUIT 2°**
MTC1	51A	51A	62A	62A
MTC1A	51A	51A	62A	62A
MTC1B	51A	51A	62A	62A
MTC2	62A	62A	62A	62A
MTC2A	62A	62A	62A	62A
MTC2B	62A	62A	62A	62A
HIGH PRESSURE SWITCH WITH MANUAL RESET				
PA (bar)	40		40	
High pressure transducer				
TAP (bar)	50		50	
LOW PRESSURE TRANSDUCER				
TBP (bar)	30		30	
CHILLER CIRCUIT SAFETY VALVE				
AP (bar)	45		45	
BP (bar) only in heat pump	30		30	
FAN THERMOMAGNETIC SWITCHES [°] **The calibration is carried out on a thermomagnetic switch (single ventilation line)**				
A-E fans	18A	18A	18A	18A
NUMBER OF FANS				
No. A-E fans	8	8	8	8

FOR THE INSTALLER

18. SELECTION AND PLACE OF INSTALLATION

Before installing the unit, decide with the customer the position in which it will be placed, pay attention to the following points:

- the support surface must be able to withstand the weight of the unit;
- the safety distance between the units and other equipment or structures must be strictly respected so that the air in fans inlet and outlet circulates freely.
- The unit must be installed by an authorised technician in compliance with the national laws in the country of destination respecting the minimum technical spaces to allow maintenance.

The unit must be installed by an authorised and qualified technician, in compliance with the national legislation in force in the country of destination (MD 329/2004).
We shall not be held responsible for any damage whatsoever resulting from the non-compliance with these instructions.

Before starting any kind of work, it is necessary TO READ CAREFULLY THE INSTRUCTIONS, AND TO PERFORM THE SAFETY CHECKS TO REDUCE ANY RISK TO A MINIMUM. All the personnel in charge must know the operations and possible risks that may arise when all the unit installation operations begin.

19. POSITIONING

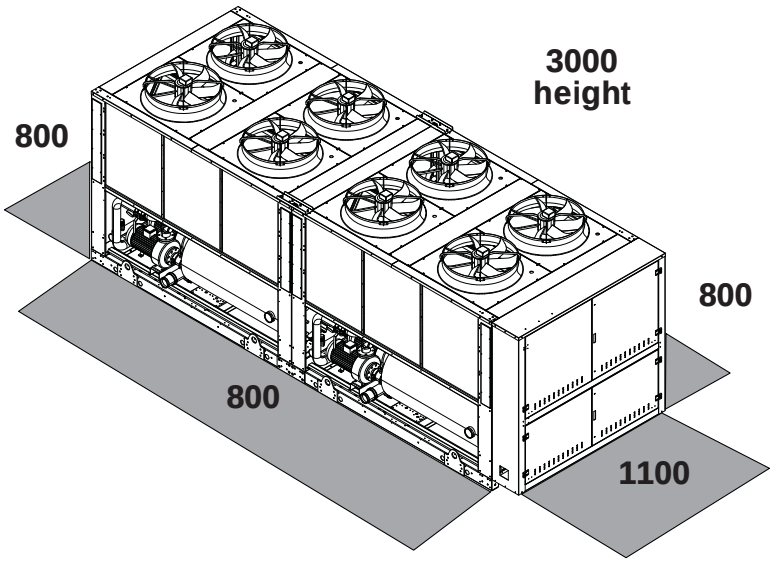
The machine is delivered from the factory wrapped in estincoil.
Before moving the unit, check the lifting capacity of the machines used.
Once the packaging has been removed, the unit must be handled by qualified personnel with the suitable equipment. To handle the machine: see figure

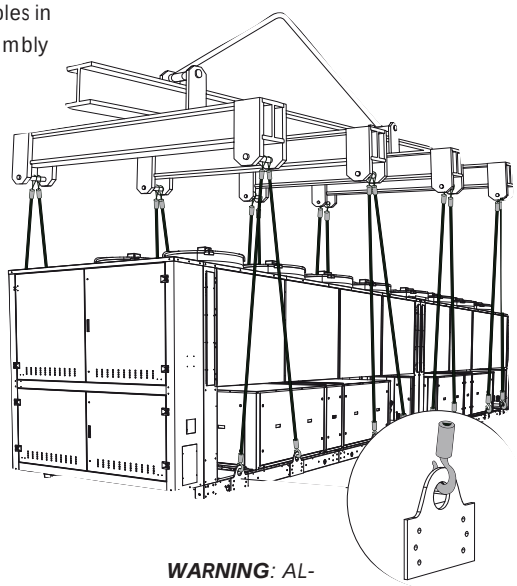
- hook up the lifting belts to the provided eyebolts (as indicated in figure).
  WARNING: *ALWAYS USE ALL THE PROVIDED EYEBOLTS*
- Interpose protections between the straps and the machine to prevent the structure of the unit being damaged by the straps. It is absolutely forbidden to stand under the unit.
- Take into account that when the chiller is working, vibrations may be generated; it is therefore advisable to install anti-vibration supports (AVX accessories), fitting them to the holes in the base according to the assembly diagram.

It is compulsory to provide the necessary technical spaces, to allow REGULAR AND EXTRAORDINARY MAINTENANCE INTERVENTIONS

- Fasten the unit by checking carefully that its on the same level; check that easy access to the hydraulic and electric part is allowed.

19.1. MINIMUM TECHNICAL SPACES (mm)

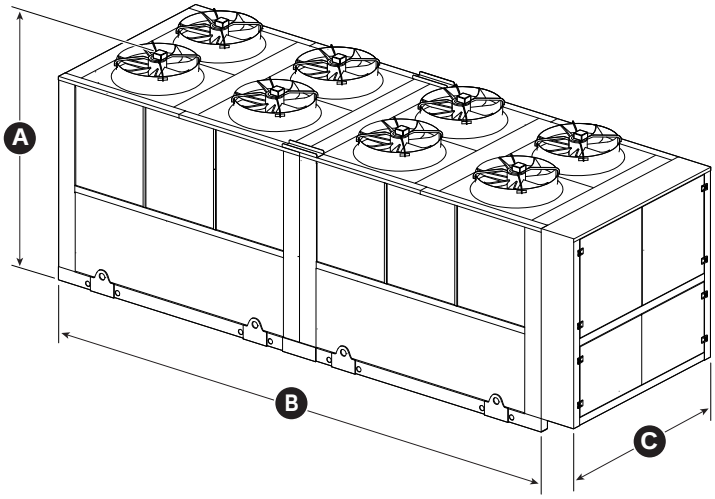


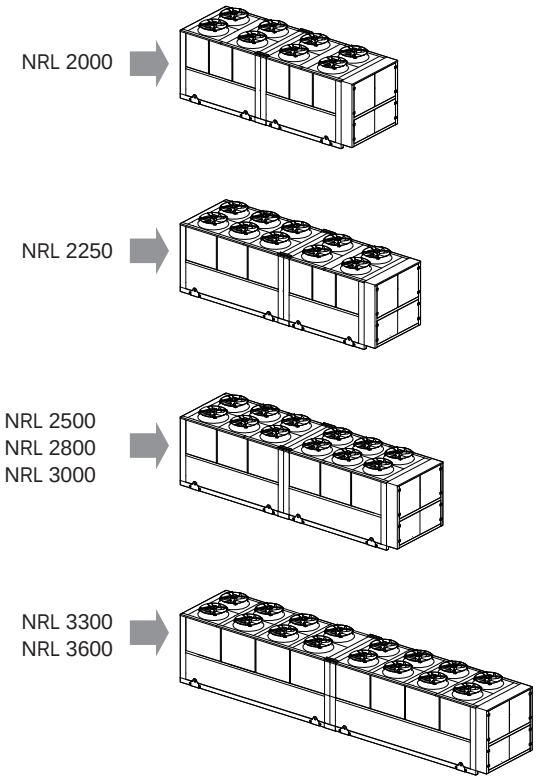


WARNING: *ALWAYS USE ALL THE PROVIDED EYEBOLTS*

20. DIMENSIONAL TABLES

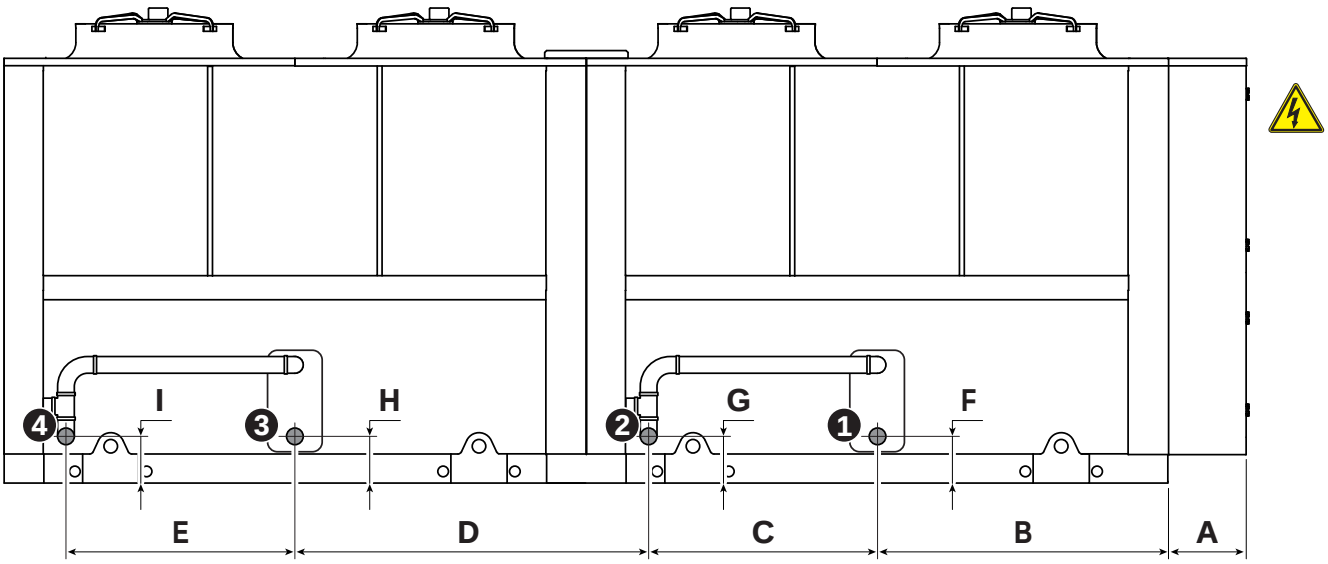
20.1. MAXIMUM DIMENSIONS (ALL VERSIONS)





Model		2000	2250	2500	2800	3000	3300	3600
DIMENSION								
Height A	mm	2450	2450	2450	2450	2450	2450	2450
Depth B	mm	6400	7250	8100	8100	8100	11100	11100
Width C	mm	2200	2200	2200	2200	2200	2200	2200
Quantity	°n	8	10	12	12	12	16	16

20.2. HYDRAULIC CONNECTIONS - STANDARD (00)

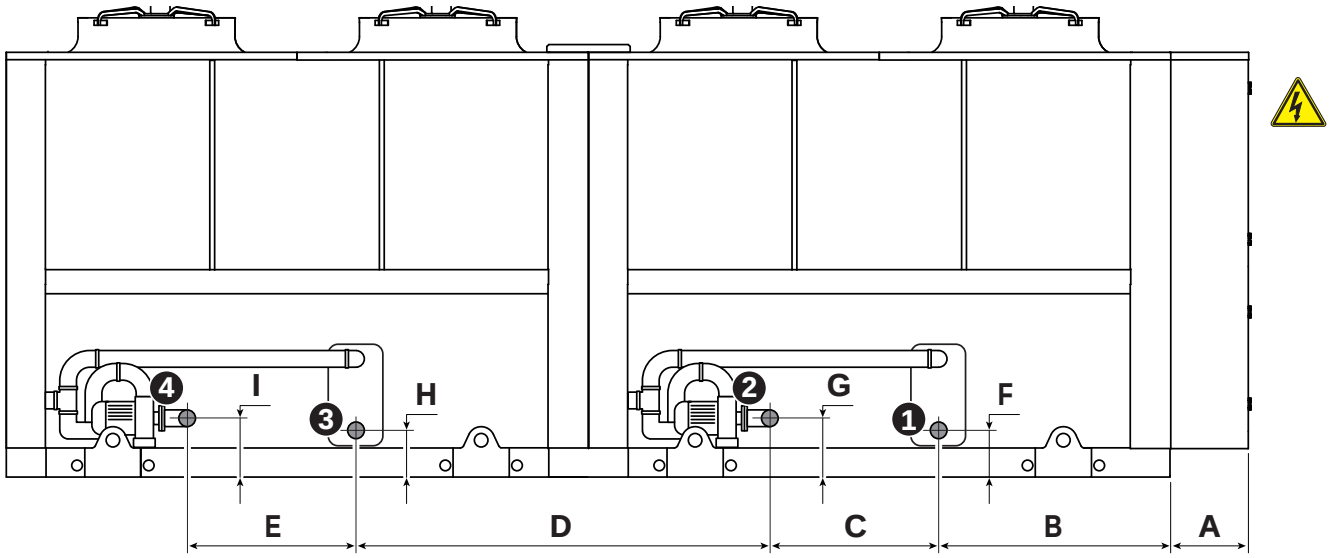


DIMENSION	U.M.	MODEL						
		2000	2250	2500	2800	3000	3300	3600
A	mm	400	400	400	400	400	400	400
B	mm	1500	1500	1924	1924	1924	2676	2676
C	mm	1210	1210	1581	1581	1581	2331	2331
D	mm	1790	2215	2269	2269	2269	3019	3019
E	mm	1210	1580	1581	1581	1581	2331	2331
F	mm	241	241	241	281	281	280	280
G	mm	241	241	241	241	241	241	241
H	mm	241	241	241	281	281	280	280
I	mm	241	241	241	241	241	241	241

HYDRAULIC CONNECTION		MODEL						
		2000	2250	2500	2800	3000	3300	3600
1	In/Out	OUT	OUT	OUT	OUT	OUT	OUT	OUT
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	3"	3"	4"	4"	4"	4"	4"
2	In/Out	IN	IN	IN	IN	IN	IN	IN
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	3"	3"	4"	4"	4"	4"	4"
3	In/Out	OUT	OUT	OUT	OUT	OUT	OUT	OUT
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	3"	4"	4"	4"	4"	4"	4"
4	In/Out	IN	IN	IN	IN	IN	IN	IN
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	3"	4"	4"	4"	4"	4"	4"

NOTE
The drawings are only examples of the hydraulic connection

20.3. HYDRAULIC CONNECTIONS WITH PUMPS (P3-P4)

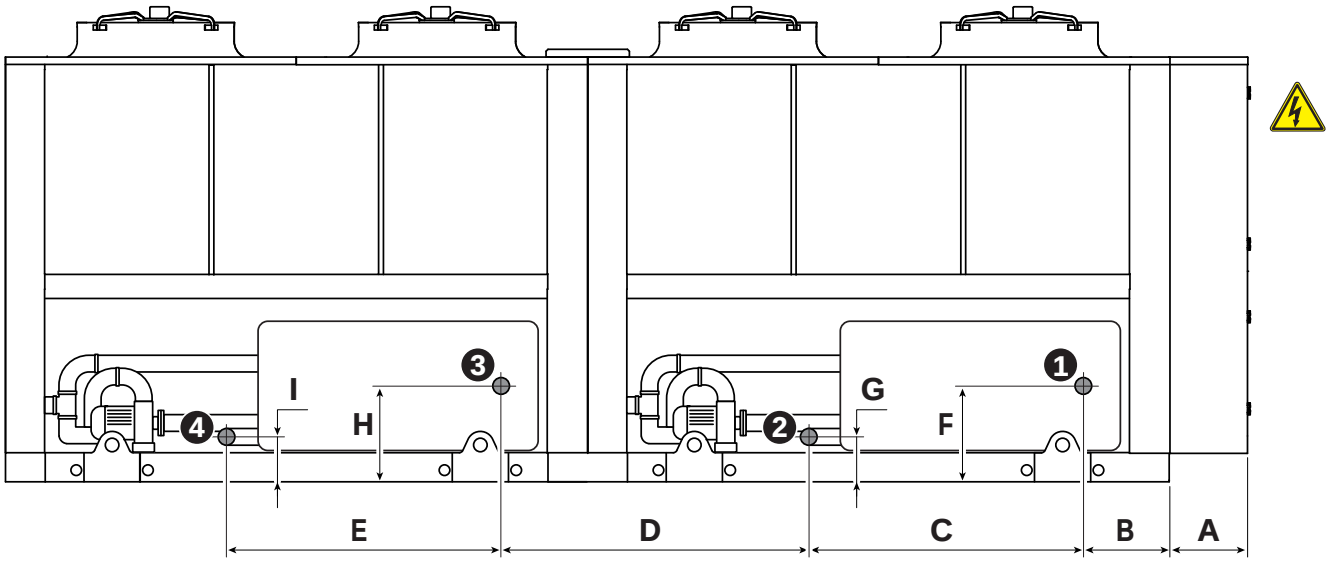


DIMENSION	U.M.	MODEL						
		2000	2250	2500	2800	3000	3300	3600
A	mm	400	400	400	400	400	400	400
B	mm	1500	1500	1925	1925	1925	2674	2676
C	mm	200	200	200	200	200	110	110
D	mm	2800	3226	3650	3650	3650	5350	5240
E	mm	200	200	200	200	200	110	110
F	mm	241	241	243	280	280	280	280
G	mm	423	423	423	423	423	423	423
H	mm	241	241	241	280	280	280	280
I	mm	423	423	423	423	423	423	423

HYDRAULIC CONNECTION		MODELLO						
		2000	2250	2500	2800	3000	3300	3600
1	In/Out	OUT	OUT	OUT	OUT	OUT	OUT	OUT
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"
2	In/Out	IN	IN	IN	IN	IN	IN	IN
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"
3	In/Out	OUT	OUT	OUT	OUT	OUT	OUT	OUT
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"
4	In/Out	IN	IN	IN	IN	IN	IN	IN
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"

NOTE
The drawings are only examples of the hydraulic connection

20.4. HYDRAULIC CONNECTIONS WITH STORAGE TANK AND PUMPS (03-04)

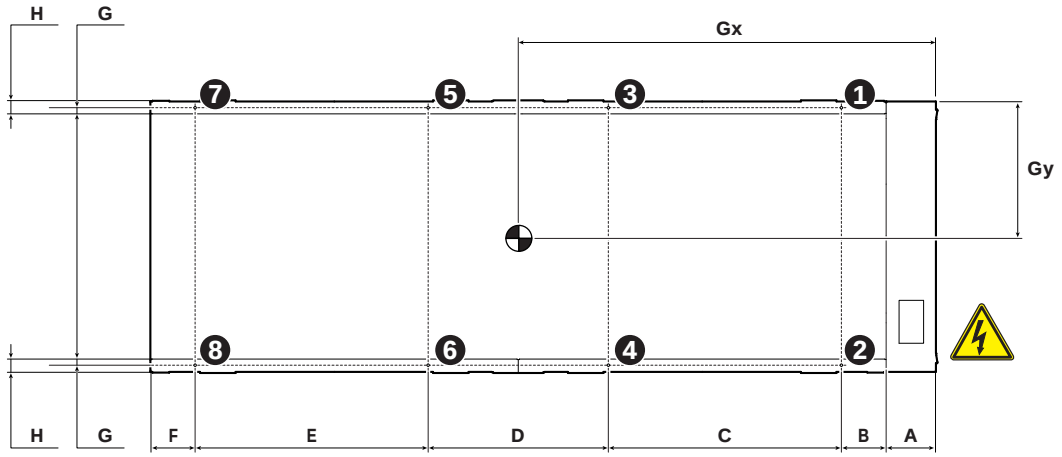


DIMENSION	U.M.	MODEL						
		2000	2250	2500	2800	3000	3300	3600
A	mm	400	400	400	400	400	400	400
B	mm	351	351	351	351	351	1098	1098
C	mm	1564	1564	1572	1572	1572	1577	1577
D	mm	1436	1426	2277	2277	2277	3773	3773
E	mm	1564	1584	1572	1572	1572	1577	1577
F	mm	572	572	572	572	572	572	572
G	mm	241	241	241	280	280	280	280
H	mm	572	572	572	572	572	572	572
I	mm	241	241	241	280	280	280	280

HYDRAULIC CONNECTION		MODEL						
		2000	2250	2500	2800	3000	3300	3600
❶	In/Out	IN	IN	IN	IN	IN	IN	IN
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"
❷	In/Out	OUT	OUT	OUT	OUT	OUT	OUT	OUT
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"
❸	In/Out	IN	IN	IN	IN	IN	IN	IN
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"
❹	In/Out	OUT	OUT	OUT	OUT	OUT	OUT	OUT
	Tipe	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC	VICTAULIC
	Ø	4"	4"	4"	4"	4"	4"	4"

NOTE
The drawings are only examples of the hydraulic connection

20.5. POSIZION AVX AND PERCENTAGE WEIGHT DISTRIBUTION (NRL 2000)



DIMENSION	mm	A	B	C	D	E	F	G	H
Model									
2000		400	365	1900	1470	1900	365	50	100

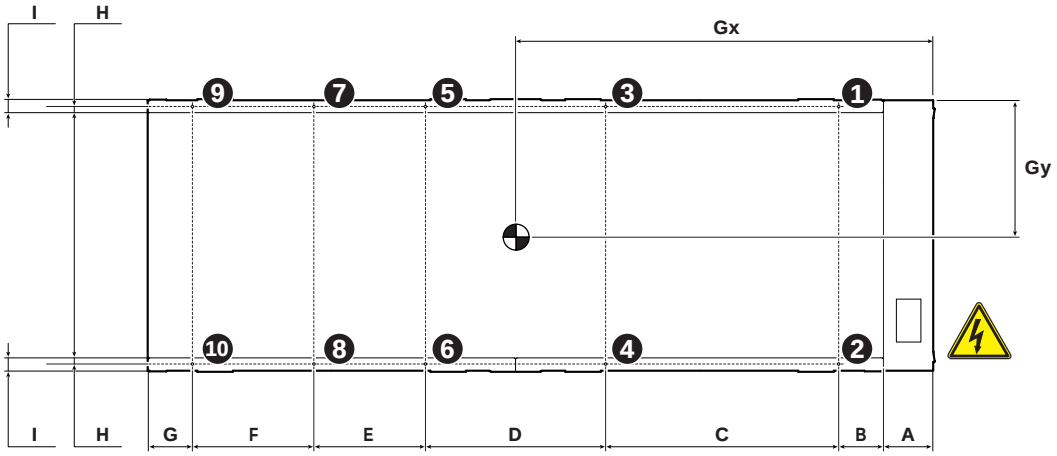
CENTER OF GRAVITY

		Empty			Running			
		Center of gravity		Weight (kg)	Center of gravity		Weight (kg)	
		Gx (mm)	Gy (mm)		Gx (in)	Gy (in)	Unit	Water
Model	Version							
2000	00	3168	868	5670	3181	898	6100	430
	03	3145	959	6370	3123	1108	8260	1890
	04	3141	975	6510	3120	1118	8400	1890
	P3	3194	916	6020	3215	961	6620	600
	P4	3201	929	6120	3220	972	6720	600

PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)

		PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)								AVX
		1	2	3	4	5	6	7	8	
Model	Version									
2000	00	10,3%	14,9%	12,0%	17,4%	9,7%	14,0%	8,8%	12,8%	770
	03	13,2%	13,0%	14,4%	14,2%	13,4%	13,2%	9,3%	9,2%	771
	04	13,3%	12,9%	14,5%	14,1%	13,6%	13,2%	9,3%	9,0%	771
	P3	10,6%	13,6%	13,1%	17,0%	10,5%	13,6%	9,4%	12,2%	772
	P4	10,6%	13,4%	13,3%	16,9%	10,7%	13,5%	9,6%	12,1%	772

20.6. POSIZION AVX AND PERCENTAGE WEIGHT DISTRIBUTION (NRL 2250)



DIMENSION	mm	A	B	C	D	E	F	G	H	I
Model										
2250		400	365	1900	1100	1560	1560	365	50	100

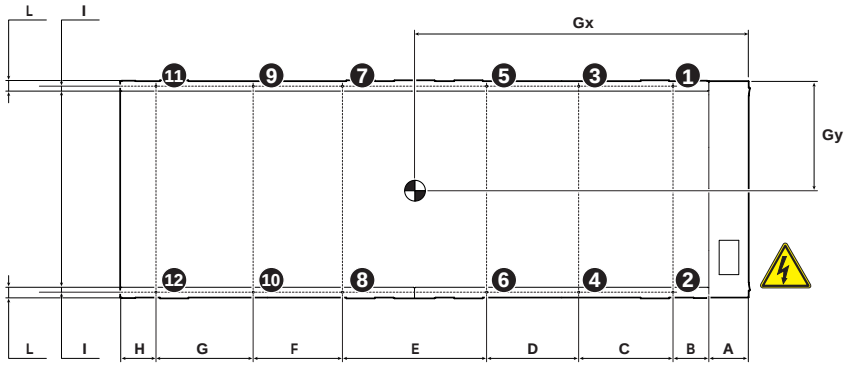
CENTER OF GRAVITY

		Empty			Running			
		Center of gravity		Weight (kg)	Center of gravity		Weight (kg)	
		Gx (mm)	Gy (mm)		Gx (in)	Gy (in)	Unit	Water
Model	Version							
2250	00	3484	871	6190	3506	899	6640	450
	03	3452	955	6890	3423	1095	8800	1910
	04	3446	970	7030	3420	1105	8940	1910
	P3	3525	915	6540	3559	957	7160	620
	P4	3536	927	6640	3569	967	7260	620

PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)

		PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)										AVX
		1	2	3	4	5	6	7	8	9	10	
Model	Version											
2250	00	9,4%	13,6%	10,7%	15,4%	6,1%	8,8%	8,7%	12,7%	6,0%	8,7%	776
	03	12,1%	12,3%	12,8%	12,9%	7,2%	7,2%	12,1%	12,2%	5,6%	5,7%	777
	04	12,3%	12,2%	12,9%	12,8%	7,2%	7,2%	12,3%	12,1%	5,6%	5,5%	777
	P3	9,3%	12,1%	12,1%	15,7%	5,8%	7,5%	9,8%	12,8%	6,4%	8,4%	778
	P4	9,3%	11,9%	12,3%	15,7%	5,7%	7,3%	10,0%	12,8%	6,5%	8,3%	778

20.7. POSIZION AVX AND PERCENTAGE WEIGHT DISTRIBUTION (NRL 2500 - 2800 - 3000)



DIMENSIONI	mm	A	B	C	D	E	F	G	H	I	L
Model											
2500		400	365	1560	1560	730	1560	1560	365	50	100
2800		400	365	1560	1560	730	1560	1560	365	50	100
3000		400	365	1560	1560	730	1560	1560	365	50	100

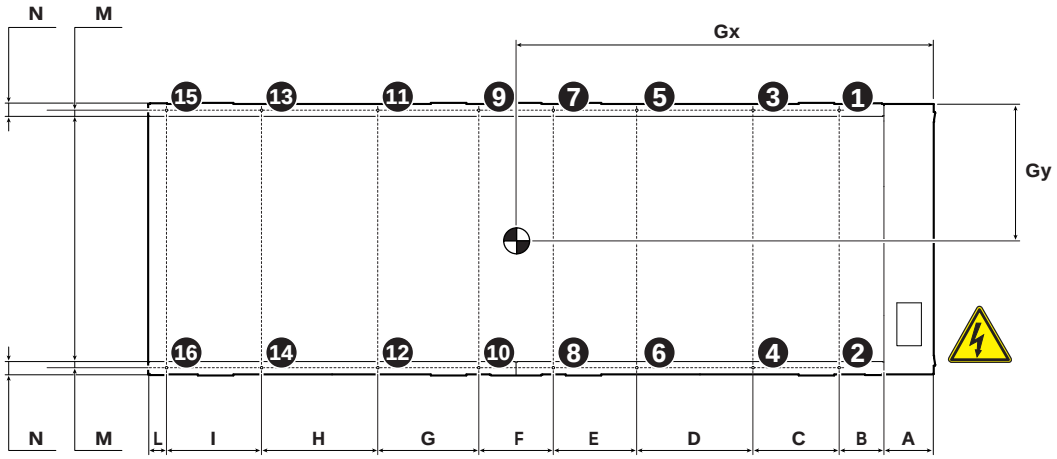
CENTER OF GRAVITY

		Empty			Running			
		Center of gravity		Weight (kg)	Center of gravity		Weight (kg)	
Model	Version	Gx (mm)	Gy (mm)		Gx (in)	Gy (in)	Unit	Water
2500	00	3876	876	6700	3896	907	7170	470
	03	3829	955	7410	3777	1091	9340	1930
	04	3820	970	7560	3771	1101	9490	1930
	P3	3884	918	7060	3906	962	7700	640
	P4	3887	930	7170	3908	972	7810	640
2800	00	3942	853	7120	3958	882	7640	520
	03	3891	930	7830	3831	1063	9810	1980
	04	3881	944	7980	3825	1072	9960	1980
	P3	3967	894	7480	3991	935	8170	690
	P4	3974	905	7590	3997	945	8280	690
3000	00	3949	847	7580	3967	879	8150	570
	03	3901	920	8290	3844	1052	10320	2030
	04	3891	934	8440	3837	1061	10470	2030
	P3	3972	886	7940	3997	929	8680	740
	P4	3979	897	8050	4002	939	8790	740

PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)

		PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)												AVX
		1	2	3	4	5	6	7	8	9	10	11	12	
Model	Version													
2500	00	7,8%	11,2%	9,4%	13,4%	4,6%	6,5%	5,7%	8,1%	8,1%	11,5%	5,7%	8,1%	782
	03	10,2%	10,4%	11,7%	11,9%	3,5%	3,5%	9,0%	9,1%	10,1%	10,2%	5,1%	5,2%	783
	04	10,4%	10,3%	11,8%	11,8%	3,4%	3,4%	9,2%	9,1%	10,2%	10,2%	5,1%	5,1%	783
	P3	7,9%	10,2%	10,7%	13,7%	4,3%	5,5%	6,0%	7,8%	9,2%	11,9%	5,6%	7,2%	784
	P4	7,9%	10,0%	10,9%	13,8%	4,2%	5,4%	6,1%	7,7%	9,5%	11,9%	5,6%	7,0%	784
2800	00	7,2%	10,8%	9,0%	13,4%	5,2%	7,7%	5,0%	7,4%	7,9%	11,9%	5,8%	8,6%	788
	03	9,6%	10,3%	11,2%	12,0%	4,2%	4,4%	8,1%	8,7%	9,9%	10,6%	5,3%	5,7%	789
	04	9,7%	10,2%	11,4%	11,9%	4,1%	4,3%	8,3%	8,7%	10,0%	10,5%	5,3%	5,6%	789
	P3	7,2%	9,7%	10,0%	13,6%	5,5%	7,5%	4,7%	6,4%	9,1%	12,4%	5,9%	8,0%	790
	P4	7,2%	9,5%	10,3%	13,6%	5,6%	7,4%	4,7%	6,2%	9,4%	12,4%	5,9%	7,9%	790
3000	00	7,0%	10,4%	9,4%	14,2%	4,7%	7,1%	5,0%	7,6%	8,4%	12,6%	5,5%	8,2%	794
	03	9,2%	10,0%	11,6%	12,6%	3,8%	4,1%	8,0%	8,7%	10,2%	11,1%	5,1%	5,6%	795
	04	9,3%	10,0%	11,7%	12,5%	3,7%	4,0%	8,2%	8,8%	10,3%	11,0%	5,1%	5,4%	795
	P3	6,9%	9,4%	10,4%	14,3%	5,0%	6,9%	4,8%	6,6%	9,5%	13,0%	5,6%	7,6%	796
	P4	6,9%	9,2%	10,6%	14,3%	5,1%	6,8%	4,8%	6,4%	9,7%	13,0%	5,6%	7,5%	796

20.8. POSIZION AVX AND PERCENTAGE WEIGHT DISTRIBUTION (NRL 3300 - 3600)



DIMENSION	mm	A	B	C	D	E	F	G	H	I	L	M	N
Model													
3300		400	400	1915	720	1915	800	1915	720	1915	400	50	100
3600		400	400	1915	720	1915	800	1915	720	1915	400	50	100

CENTER OF GRAVITY

		Empty			Running			
		Center of gravity		Weight (kg)	Center of gravity		Weight (kg)	
		Gx (mm)	Gy (mm)		Gx (in)	Gy (in)	Unit	Water
Model	Version							
3300	00	5187	873	9060	5221	898	9720	660
	03	5163	938	9830	5158	1047	11950	2120
	04	5157	953	10040	5154	1059	12160	2120
	P3	5221	909	9480	5264	944	10310	830
	P4	5234	923	9650	5275	956	10480	830
3600	00	5189	881	9330	5227	909	10060	730
	03	5166	943	10100	5164	1053	12290	2190
	04	5160	959	10310	5160	1064	12500	2190
	P3	5223	916	9750	5267	953	10650	900
	P4	5235	930	9920	5278	965	10820	900

PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)

	PERCENTAGE OF WEIGHT DISTRIBUTION SUPPORTS (%)																AVX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Model	Version																
3300	00	6,9%	10,0%	7,1%	10,3%	3,5%	5,1%	3,3%	4,7%	5,7%	8,3%	7,4%	10,7%	2,3%	3,4%	4,6%	6,7%	801
	03	7,6%	8,4%	10,5%	11,6%	3,0%	3,3%	2,5%	2,8%	7,4%	8,1%	10,3%	11,3%	2,0%	2,2%	4,4%	4,8%	802
	04	7,6%	8,2%	10,8%	11,6%	2,9%	3,1%	2,4%	2,6%	7,5%	8,1%	10,5%	11,3%	2,0%	2,1%	4,4%	4,7%	802
	P3	6,8%	9,1%	7,3%	9,7%	4,4%	5,9%	3,3%	4,4%	5,7%	7,5%	7,6%	10,1%	3,2%	4,3%	4,6%	6,1%	803
	P4	6,8%	8,9%	7,4%	9,6%	4,6%	6,0%	3,3%	4,3%	5,6%	7,3%	7,7%	10,0%	3,5%	4,5%	4,6%	6,0%	803
3600	00	7,0%	9,9%	7,2%	10,2%	3,6%	5,1%	3,3%	4,7%	5,9%	8,3%	7,5%	10,6%	2,4%	3,4%	4,6%	6,6%	801
	03	7,6%	8,3%	10,5%	11,4%	3,0%	3,3%	2,5%	2,8%	7,4%	8,1%	10,3%	11,2%	2,0%	2,2%	4,4%	4,8%	802
	04	7,7%	8,2%	10,8%	11,5%	3,0%	3,2%	2,5%	2,6%	7,6%	8,1%	10,5%	11,2%	2,0%	2,2%	4,4%	4,7%	802
	P3	6,9%	9,0%	7,4%	9,7%	4,4%	5,8%	3,3%	4,3%	5,8%	7,6%	7,7%	10,0%	3,2%	4,2%	4,6%	6,0%	803
	P4	6,9%	8,8%	7,4%	9,5%	4,7%	6,0%	3,3%	4,2%	5,8%	7,4%	7,7%	9,9%	3,5%	4,5%	4,6%	5,9%	803

21. HYDRAULIC CIRCUIT

The NRL consists of TWO CIRCUITS both fitted with:
- **Evaporators 1 x circuit**
- **Water filter 1 per circuit (supplied)** *supplied with log and Victaulic gaskets*
- **Desuperheaters (2 per circuit in parallel mode)** without filter
- **Water inlet probe SIW**
- **Water outlet probe SUW**

⚠ ***ATTENTION***
The water outlet probe (WOP) with its trap is free, near the electrical box, remember to insert it in the collector of the outlet hydraulic parallel, using a sleeve of ½ inch.

21.1. EXTERNAL HYDRAULIC CIRCUIT RECOMMENDED

The selection and installation of components outside the NRL should be carried out by the installer, who should work according to the technical code of practice and in compliance with the legislation in force in the country of destination (MD 329/2004).
Before connecting the pipes make sure that they do not contain stones, sand, rust, slag or any foreign bodies that may damage the system. It is necessary to make a by-pass to the unit to be able to carry out the cleaning of the pipes without having to disconnect the machine. The connection pipes must be properly supported so as not to burden the unit with their weight.
On the water circuit, it is advisable to install the following instruments, if not foreseen in the version you have:
1. Two pressure gauges of suitable size (input and output section).
2. Two antivibrating couplings (input and output section).
3. Two shut-off valves (normal input section, output section calibrating valve).
4. Two thermometers (input and output section).
5. Expansion tanks
6. Pump
7. Accumulation
8. Flow switch
9. Safety valve
10. Charging unit
11. Chiller drain tap in the tube output evaporator (for standard version)

⚠ ***ATTENTION***
*In case of **version with pumping unit, without standby pump,** it is recommended to install unidirectional valves to the delivery of each module. So water reflow is avoided in the circuit of the pump/s from the other circuit.*

*For **NRL 2250 model with pumping unit**, it is recommended the installation, to the delivery of the module 1250, of a capacity balance valve, to balance the capacities between the two evaporators (module 1000 and 1250).*

It is necessary, that the water flow rate to the chiller unit complies with the values reported in the performance tables.

The systems loaded with anti-freeze or specific regulations, need the water backflow system.
Special supply/recovery water, is carried out with appropriate treatment systems.

21.2. SYSTEM LOAD

- Before starting the load, check that the system drain tap is closed.
- Open all the drain valves of the system and of the related terminals.
- Open the shut-off devices of the system.
- Start the filling by slowly opening the water system load cock placed outside the machine.
- When water begins to flow from the terminal vent valves, close them and continue loading up to read on the gauge the value of 1.5 bar.

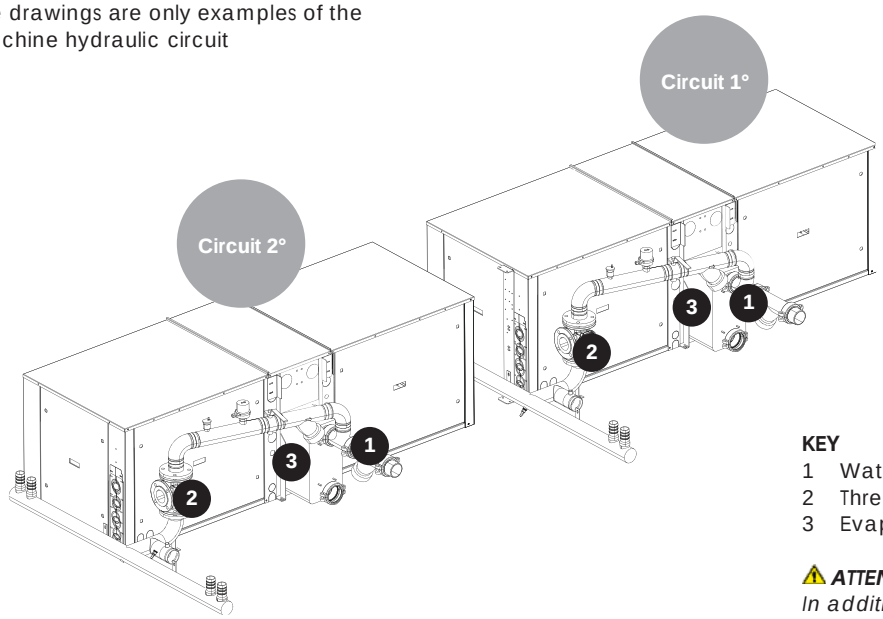
The system is loaded at a pressure between 1 and 2 bar.
It is advisable to repeat this operation once the machine has worked for some hours and to periodically check the system pressure, restoring if it drops below 1 bar.
Check the hydraulic seal of the joints.

21.3. EMPTYING THE SYSTEM

- Before starting to drain the system, turn "off" the unit
- Check that the water system load/restore tap is closed
- Open the drain tap outside the machine and all the vent valves of the system and the corresponding terminals.

If the system uses glycol, this liquid should not be drained to the environment because it is a pollutant. It must be collected and, if possible, reused.

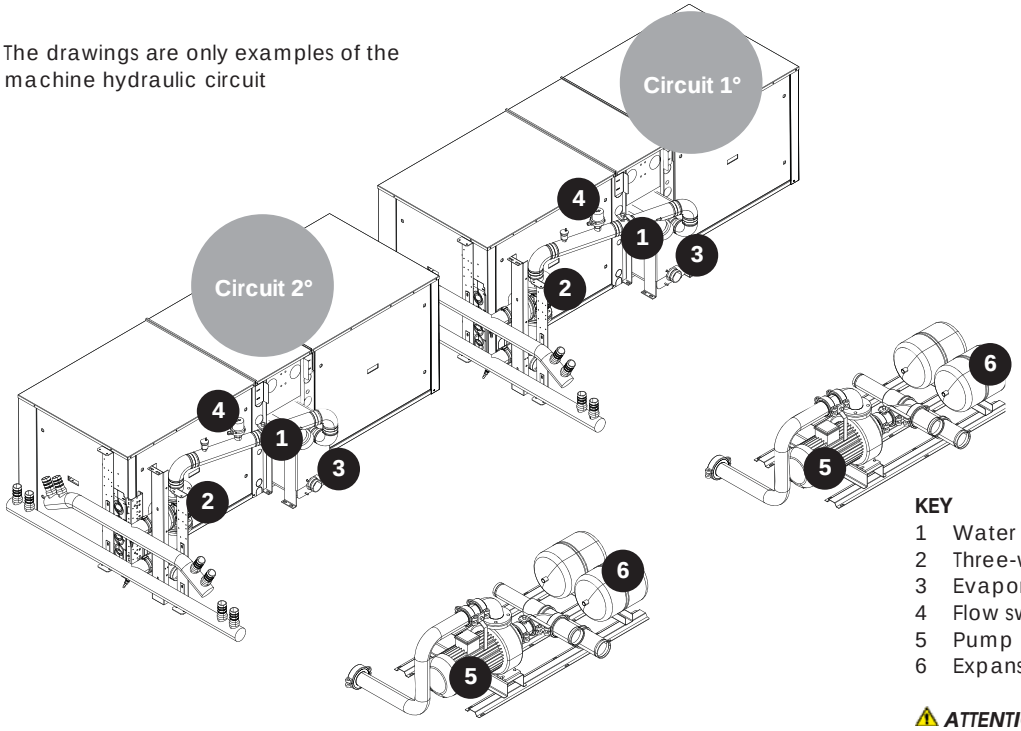
The drawings are only examples of the machine hydraulic circuit



KEY
1 Water filter 1 x circuit SUPPLIED
2 Three-way valve
3 Evaporator

⚠ ***ATTENTION***
In addition to the filter, Victaulic and welded pipes are provided

The drawings are only examples of the machine hydraulic circuit

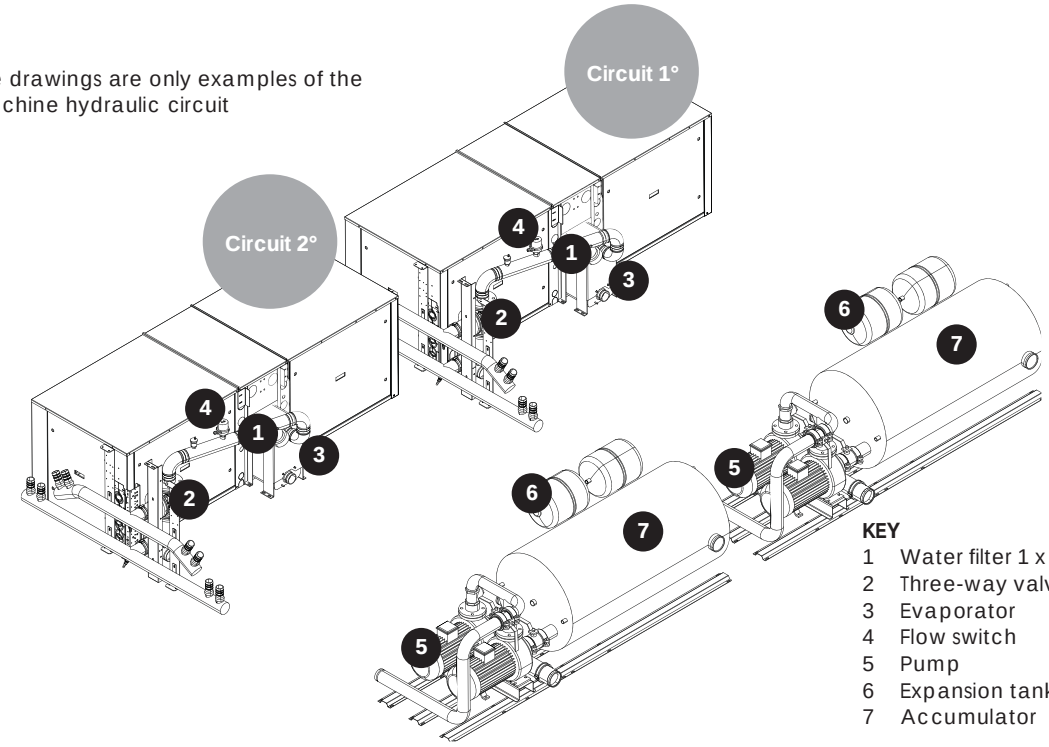


KEY

1 Water filter
2 Three-way valve
3 Evaporator
4 Flow switch
5 Pump
6 Expansion tank

⚠ ***ATTENTION***
In addition to the filter, Victaulic and welded pipes are provided

The drawings are only examples of the machine hydraulic circuit



KEY

1 Water filter 1 x circuit
2 Three-way valve
3 Evaporator
4 Flow switch
5 Pump
6 Expansion tank
7 Accumulator

⚠ ***ATTENTION***
In addition to the filter, Victaulic and welded pipes are provided

22. ELECTRICAL WIRINGS

The default NRL chillers are completely wired and only need the connection to the power supply net, downstream to a group switch, according to the to the regulations in force in the country where the machine is installed.
It is also suggested to check:

- the mains supply characteristics, to ensure it is suitable for the levels indicated in the electrical data table, also taking into consideration any other equipment that may be operating at the same time.
- The unit is only powered after the last (hydraulic and electric) installations.
- Follow the connections instructions of the phase conductors, and earth.
- The power line will have a special protection upstream against short circuits and earth losses that sections the system according to other users.
- The voltage should be within a tolerance of ± 10% of the rated supply voltage of the machine (for Three-phase units displacement max 3% between the phases). If these parameters are not respected, contact the energy supplier. For electrical wirings use isolated double cables according to the standards in force in the different countries.
- It is necessary to use a omnipolar thermomagnetic switch, in compliance with the CEI-EN standards (contact opening of at least 3 mm), with adequate switch capability and differential protection based on the followed electrical data table, installed as close as possible to the machine.
- It is necessary to carry out an efficient earth connection. The manufacturer can not be held responsible for any damage caused by the failure and ineffective earthing of the machine.
- For units with Three-phase power check the correct connection of the phases.

⚠ ***WARNING***
It is forbidden to use water pipes for the earthing of the machine.

All electrical operations must be carried out BY QUALIFIED PERSONNEL, IN ACCORDANCE WITH THE CORRESPONDING REGULATIONS, trained and informed about the risks related to such operations.

The characteristics of electric lines and related components must be established by PERSONNEL AUTHORISED TO DESIGN ELECTRIC INSTALLATIONS, following international regulations and the national regulations of the country in which the unit is installed, in compliance with the legislative regulations in force at the moment of installation.

For installation requirements, the wiring layout supplied with the unit must be compulsory referred to. The wiring layout together with the manuals must be kept in good conditions and readily ACCESSIBLE FOR FUTURE OPERATIONS ON THE UNIT.

It is compulsory to check the machine sealing before connecting the electrical wiring. The machine should only be powered once the hydraulic and electric operations are completed.

22.1. RECOMMENDED SECTION OF ELECTRIC CABLES

The cable sections indicated in the table are advised for a maximum length of 50 m.

Cable sections recommended max. length: 50m			NRL BASE						
			2000	2250	2500	2800	3000	3300	3600
No. power supplies			1	1	1	1	1	1	1
Versions			00	00	00	00	00	00	00
(no. conductors - sect.) for each phase	SECT. A	mm^2	2x185	2x240	3x240	3x240	3x240	4x185	4x185
	Earth	mm^2	1x185	1x240	2x185	2x185	2x185	2x185	2x185
	IL	A	630	630	630	800	800	800	800

Cable sections recommended max. length: 50m			NRL WITH PUMP		
			2000	2250	2500
No. power supplies			1	1	1
Versions			with hydronic kit	with hydronic kit	with hydronic kit
(no. conductors - sect.) for each phase	SECT. A	mm^2	2x240	3x185	3x240
	Earth	mm^2	1x185	1x240	2x185
	IL	A	630	630	630

Cable sections recommended max. length: 50m			NRL WITH PUMP			
			2800	3000	3300	3600
No. power supplies			1	1	1	1
Versions			with hydronic kit	with hydronic kit	with hydronic kit	with hydronic kit
(no. conductors - sect.) for each phase	SECT. A	mm^2	3x240	4X185	4x185	4x185
	Earth	mm^2	2x185	2x185	2x185	2x185
	IL	A	800	800	800	800

KEY

Sec. A: Fuel feed
Terra
IL: Main switch

For higher lengths or different types of cable installation, it will be the DESIGNERS responsibility to carefully measure the line main switch, the supply power line and the earthing protection connection, and the working connection cables:

- the length
- the type of cable
- Absorption of the unit and its physical position, and room temperature.

***WARNING**:*
Check that all power cables are correctly secured to the terminals when switched on for the first time and after 30 days of use. Afterwards, check the connection of the power cables every six months.Slack terminals could cause the cables and components to overheat.

22.4. CONNECTION TO THE POWER SUPPLY

- Check there is no voltage on the electric line you want to use.

22.4.1. To access the electric box:

- Turn ¼ the screws of the electrical panel in counter-clockwise direction
- Turn the handle of the door lock knife switch to OFF (see figure) In this way, there is access to the electrical panel

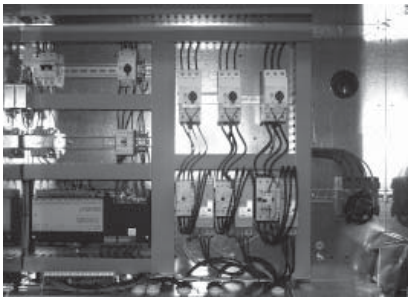


Fig.1

22.2. ELECTRICAL POWER CONNECTION

- For functional connection of the unit take the supply power cable to the electrical panel inside the unit fig.1 in the previous page and connect it to the knife switch terminals observing the phase, and the earth. fig.2

22.3. AUXILIARY CONNECTIONS AT THE USER/INSTALLER EXPENSE

The terminals indicated in future explanations are part of the GR3 control boards. For installation requirements, refer to the wiring diagram supplied with the unit. The wiring diagram together with the manuals must be kept in good conditions and readily ACCESSIBLE FOR FUTURE OPERATIONS ON THE UNIT.

22.3.1. Auxiliary switch (IAD)

To prepare the auxiliary switch, connect the device to the clamp 4 of the control board M7 SC and to the clamp 4 of the remote panel.

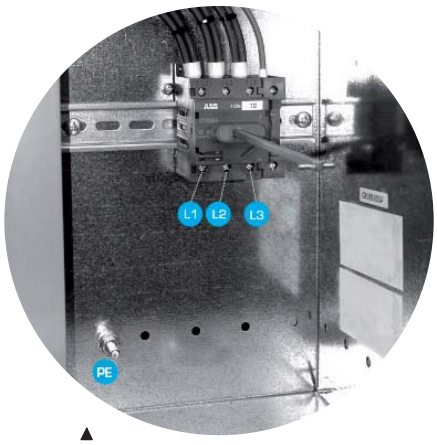
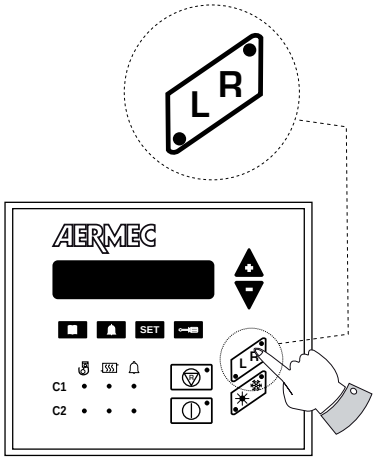


Fig.2

Key fig. 2	
L1	Line 1
L2	Line 2
L3	Line 3
PE	Earth



22.3.2. Pump contactor (CP01 - CP02)

To prepare the pump contactor, connect the device CP01 to the clamp 2 of the control board M16 SC and the device CP02 to the clamp 4 and 6 of the control board M1 SE2.

22.3.3. External alarm (EA)

To prepare an external alarm device, connect the device contact to the clamp 1 and 2 of the control board M17.

22.3.4. Connection PR3 (standard)

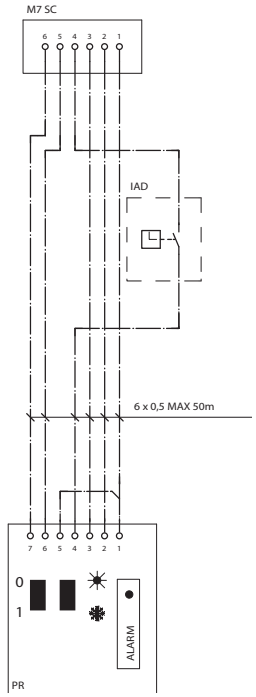
Connect the remote panel PR3 to the control board M7 SC (as shown below), remember that the maximum allowed distance is 50 m.

THE PR3 CONNECTED MUST BE ENABLED, AS WELL. See next procedure

CONNECTION
REMOTE PANEL - PR3

COMANDO A DISTANZA

REMOTE CONTROL



ENABLING
REMOTE PANEL - PR3

To enable the remote panel PR3:
- act on the L/R key on the small panel of the GR3 on the machine (as shown in the figure above)
- when the LED next to the letter R (Remote) lights up, the machine function will be enabled by the remote panel.

23. CONTROL AND FIRST START-UP

23.1. PREPARATION FOR COMMISSIONING

Bear in mind that a free start-up service is offered by the Aermec Technical Service for the unit of this series, at the request of Aermec customers or legitimate owners and in ITALY only.
The start-up must be previously agreed on the basis of the system implementation times. Before the intervention of the AERMEC After Sales Service, all the operations (electrical and hydraulic hook ups, loading and breather from the system) must be completed.

Before starting the unit make sure that:
- All the safety conditions have been respected
- The unity has been properly fixed to the support base
- The minimum technical spaces have been observed;
- Water connections have been performed respecting the input and output
- The hydraulic system has been loaded and vented.
- The hydraulic circuit taps are open
- The electrical connections have been properly carried out;
- The voltage is within a tolerance of 10% of the unit nominal voltage
- The earthing has been carried out correctly
- Tightening of all electrical and hydraulic connections have been well carried out.

23.2. FIRST COMMISSIONING OF THE MACHINE

Before activating the unit:
- Close the electric panel lid.
- Position the door lock knife switch of the machine on ON,
  turning the handle down. (fig3)
- Press the key ON to start the machine (fig 4),
  when the access LED appears the unit is ready for the operation.

23.3. SEASON CHANGEOVER

- For each seasonal change check that the operation conditions return to the limit.
- Check that the absorption current of the compressor is less than the maximum indicated in the technical data table.
- Check in the models with Three-phase supply power that the noise level of the compressor is not abnormal, in this case invert a phase.
- Make sure that the voltage value are within the prefixed limits and that the displacements between the three phases (Three-phase supply power) do not get above 3%.

23.3.1. Season change of the panel on the machine

To activate the season change, just press the indicated key
in **(fig. 5)**. To ensure that the operation is successful,
machine must be active as remote or local.
For further information refer to the USE manual.

23.3.2. Season change of PR3

- Just act directly on the switch. The machine turns off automatically and it restarts with the selected operation mode.

WARNING
The first start-up has to be carried out with the standard settings, only at last test vary the values of the operation Set Point.
Before starting, power the unit for at least 12-24 hours by positioning the protection thermomagnetic switch and the door lock knife switch on ON fig.1
Make sure that the control panel is turned off until it allows the oil heater system the compressor casing.

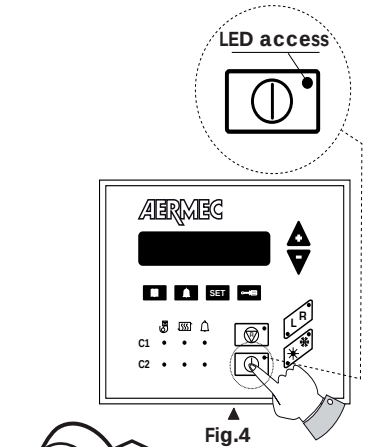


Fig.4

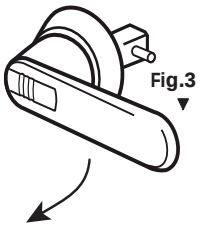


Fig.3

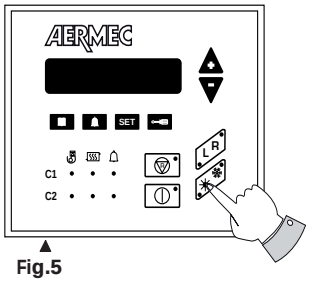
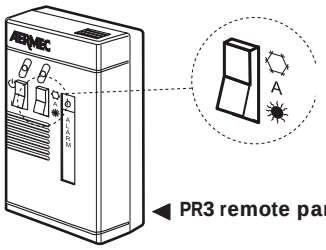


Fig.5



PR3 remote panel

24. FUNCTIONING CHARACTERISTICS

24.1. COOLING SET POINT

(Default defined) = 7°C, Δt = 5°C.

24.2. HEATING SET POINT

(Default defined) = 45°C, Δt = 5°C.
In case of restoring of the unit supplied power after a momentary interruption, the pre-set mode is maintained in memory.

24.3. COMPRESSOR START DELAY

To prevent the compressor start too close to each other, two functions have been arranged.
- Minimum time from last turn-off 60 seconds.
- Minimum time from last start 300 seconds.

24.4. CIRCULATION PUMP

The electronic board provides an output to manage the circulation pump.
After the first 10 seconds of the pump operation, when the water flow rate is running, activate the function of water flow rate alarm (flow switch).

24.5. ANTI-FREEZE ALARM

The anti-freeze alarm is active as if the machine is turned-off or if the machine is in standby mode. In order to prevent breakage of the plate-type exchanger due to freezing water contained, the compressor is locked (if the machine is turned on under 4° C) and the resistance starts up (if standby below 5° C). If the temperature detected by the probe in the exchanger output and in the chiller input is below +4 ° C.

WARNING:
THE ANTI-FREEZE SET TEMPERATURE CAN BE VARIED ONLY BY AN AUTHORISED SERVICE CENTRE AND ONLY AFTER VERIFYING THAT IN THE WATER CIRCUIT IS AN ANTIFREEZE SOLUTION.

The intervention of this alarm sets the compressor block and not of the pump, which remains active, and the resistance starts-up if installed.
For the restoration of the normal functions of the temperature of the water output have to come back over +4 ° C, the reset is manual.

WARNING:
AT ANY INTERVENTIONS OF THIS ALARM IT IS RECOMMENDED TO IMMEDIATELY CONTACT THE NEAREST TECHNICAL SERVICE ASSISTANCE

24.6. WATER FLOW RATE ALARM

The GR3 manages a water flow alarm controlled by a flow meter installed as standard on the machine. This type of safety device can activate after the first 10 operating seconds of the pump if the water flow is insufficient.
This alarm sets the block of the compressor and the pump.

25. REGULAR MAINTENANCE

WARNING
Inspection, maintenance and possible repair operations must be carried out only by an authorised technician according to the law.

A deficient check/maintenance operation may result in damage to things and people.

For machines installed near the sea the maintenance intervals must be halved.

Any cleaning operation is forbidden before disconnecting the unit from the power supply.
Check for voltage before operating.
Periodic maintenance is essential to maintain the unit in perfect working order under the functional as well as the energetic aspect.
Therefore it is essential to provide yearly controls for the:

25.6.1. Hydraulic circuit

CONTROL:
- Water circuit filling
- Water filter cleaning
- Flow switch control
- Air in the circuit (leaks)
- That the water flow rate to the evaporator is always constant
- The hydraulic piping thermal insulation state
- Where provided the percentage of glycol

25.6.2. Electric circuit

CONTROL:
- Efficiency of safety devices
- Electrical power supply
- Electrical power consumption
- Connections tightened
- Function of the compressor housing resistance

25.6.3. Chiller circuit

CONTROL:
- Compressor conditions
- Efficiency of the plate-type exchanger resistance
- Working pressure
- Loss test for the control of the sealing of the refrigerant circuit
- Function of high and low pressure switches
- Perform the necessary checks on the filter-drier to verify their efficiency.

25.6.4. Mechanical controls

CONTROL:
- The screws, compressors and the electric box of the unit external panelling are properly tightened. If they are poorly tightened, they produce abnormal noise and vibrations
- The structure conditions.
  If necessary, treat oxidised parts with paints suitable for eliminating or reducing oxidation.

26. EXTRAORDINARY MAINTENANCE

The NRL are loaded with R410A gas and tested in the factory. In normal conditions, no Technical Assistance Service operation is needed for the refrigerant gas check. Along time, however, small leaks from the joints may be generated. Due to these lea-

ks, the refrigerant comes out and the circuit is drained, causing the unit malfunction. In these cases, the refrigerant leakage points are found and repaired, and the cooling circuit is recharged, operating in compliance with Law 28 December 1993 no. 549.

26.6.1. Loading procedure

The loading procedure is as follows:

- Empty and dehydrated the entire refrigeration circuit using a vacuum pump connected to the low grip as to the high grip of high pressure till the vacuum gauge reading up to about 10 Pa. Wait some minutes and check that this value does not goes back again over 50 Pa.
- Connect the refrigerant gas bomb or a load cylinder to the grip on the low-pressure line.
- Charge the amount of refrigerant gas indicated on the characteristics plate of the machine.
- After any operation control that the liquid indicator indicates a dry circuit (dry-green) In case of partial loss the circuit has to be emptied completely before reloading it.
- The refrigerant R410A has to be loaded only in liquid phase.
- Different operating conditions from the normal can result in different values.
- Leak testing or leaking research must be carried out only by using refrigerant gas R410A by checking with a suitable leak detection.
- It is prohibited to use in the refrigeration circuit, oxygen or acetylene or other flammable or poisonous gas because they can cause explosions or intoxication.

A machine logbook should ideally be kept (not supplied, but at the user's responsibility), allowing the operation carried out on the unit to be tracked, and to facilitate the organisation of operations making the troubleshooting and prevention of possible failures to machine easier. The logbook should contain, the type of operation performed (routine maintenance, inspection or repair), description of the operation, measures implemented ...

It is forbidden to CHARGE the cooling circuits with a refrigerant different from the one indicated. If a different refrigerant gas is used, the compressor may result seriously damaged.

DISPOSAL
Provided that the disposal of the unit is carried out according to the rules in force in different countries.

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